



COUNTY OF UNION

DEPARTMENT OF ENGINEERING, PUBLIC WORKS & FACILITIES MANAGEMENT
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THOMAS O. MINEO, P.E.
*County Engineer,
Director, Division of
Engineering*

MEMO TO: TO ALL PROSPECTIVE BIDDERS

FROM: Thomas O. Mineo, P.E.
County Engineer

DATE: November 8, 2017

**RE: ADDENDUM NUMBER 3
BA#56-2017 - UNION COUNTY COURTHOUSE FIRE CODE
UPGRADES PHASE C1 ROTUNDA AND
PHASE C2 TOWER (INTERNAL STAIR)
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
UNION COUNTY ENGINEERING PROJECT #2010-033C**

Attached is Addendum Number 3 dated November 8, 2017.

Bidder's Name: _____

ACKNOWLEDGMENT OF ADDENDUM

ADDENDUM NUMBER 3 – November 8, 2017

COUNTY OF UNION

**UNION COUNTY COURTHOUSE FIRE CODE UPGRADES
PHASE C1 ROTUNDA AND PHASE C2 TOWER (INTERNAL
STAIR)**

**CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
(Name of Construction /Public Works Project)**

BA#56-2017

UC ENGINEERING PROJECT # 2010-033C

(Project or Bid Number)

Pursuant to N.J.S.A. 40A:11-23.1a., the undersigned bidder, hereby acknowledges receipt of the following notices, revisions, or addenda to the bid advertisement, specifications or bid documents. By indicating date of receipt, bidder acknowledges the submitted bid takes into account the provisions of the notice, revision or addendum. Note that the County of Union's record of notice to bidders shall take precedence and that failure to include provisions of changes in a bid proposal may be subject for rejection of the bid.

Local Unit Reference Number or Title of Addendum/Revision	How Received (mail, fax, pick- up, etc.)	Date Received
<u>ADDENDUM NUMBER 3:</u> • Addendum Number 3: (8 pages)		

ACKNOWLEDGMENT BY BIDDER:

NAME OF BIDDER: _____

ORIGINAL SIGNATURE: _____

PRINTED NAME AND TITLE: _____

DATE: _____

ADDENDUM NUMBER 3
NOVEMBER 8, 2017
BA#56-2017 – UNION COUNTY COURTHOUSE FIRE CODE UPGRADES
PHASE C1 ROTUNDA AND PHASE C2 TOWER (INTERNAL STAIR)
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
UNION COUNTY ENGINEERING PROJECT NUMBER 2010-033C

This Addendum is issued for the purpose of amending certain requirements of the contract documents as noted hereinafter and to answer questions submitted by the bidders, which are hereby made part of and incorporated in full force as part of the contract documents.

Bidders must acknowledge receipt of this Addendum and submit with original bid submission packet. (*Copy of Acknowledgement of Addendum Number 3 dated November 8, 2017 is attached*). **Failure to acknowledge receipt of this Addendum may result in bid rejection.**

A. Changes to the Project Manual:

1. NO CHANGE - Sealed bids will be received by the Director of the Division of Purchasing, or her designee, at the County of Union New Jersey on **November 21, 2017**, at 10:30 a.m., prevailing time, in the 6th Floor Freeholder Conference Room, Union County Administration Building, 10 Elizabethtown Plaza, New Jersey 07202.
2. Add Section 017310 – Cutting & Patching to the Project Manual.

B. Changes to the Project Drawings for the Union County Courthouse Internal Stair (Tower):

1. The following attached drawings have been revised:

Architectural:

A.000	Cover Sheet with Drawing Index
D.101	1st Floor Demolition Plan
D.102	2 nd Floor Demolition Plan
D.103	3 rd Floor demolition Plan
D.104	4 th Floor Demolition Plan
D.105	5 th Floor Demolition Plan
D.106	6 th Floor Demolition Plan
D.107	7 th Floor Demolition Plan
D.108	8 th Floor Demolition Plan
D.109	9 th Floor Demolition Plan
D.110	10 th & 11 th Floor demolition Plan
D.111	12 th & 13 th Floor Demolition Plan
D.112	14 th & 15 th Floor demolition Plan
D.113	16 th & penthouse Floor demolition Plan
A.101	1 st Floor Plan

A.102	2 nd Floor Plan
A.103	3 rd Floor Plan
A.104	4 th Floor Plan
A.105	5 th Floor Plan
A.106	6 th Floor Plan
A.107	7 th Floor Plan
A.108	8 th Floor Plan
A.109	9 th Floor Plan
A.110	10 th & 11 th Floor Plan
A.111	12 th & 13 th Floor Plan
A.112	14 th & 15 th Floor Plan
A.113	16 th & Penthouse Floor Plan
A.201	Interior Elevation & Wall Detail
A.401	Enlarged Stair Plans
A.402	Enlarged Stair Plans
A.403	Enlarged Plans & Detail Section of Stair
A.404	Enlarged Existing Stair Plan 1 st – 4 th Flr
A.405	Enlarged Fifth Thru Eighth Stair Plans
A.406	Enlarged Ninth Thru Twelfth Stair Plans
A.701	Basement, Ground, 1 st , 2 nd , 3 rd , 4 th Floor Finish plan
A.702	5 th , 6 th , 7 th , 8 th , 9 th & 10 th Floor Finish plan
A.703	11 th , 12 th , 13 th , 14 th , 15 th , 16 th & Penthouse Floor Finish plan
A.704	Finish Schedule

Mechanical:

M.101	Mechanical General Notes Symbols & Abbreviations
M.402	Mechanical HVAC 2 nd Floor
M.403	Mechanical HVAC 3 rd Floor
M.404	Mechanical HVAC 4 th Floor
M.405	Mechanical HVAC 5 th Floor
M.406	Mechanical HVAC 6 th Floor
M.407	Mechanical HVAC 7 th Floor
M.408	Mechanical HVAC 8 th Floor
M.409	Mechanical HVAC 9 th Floor
M.410	Mechanical HVAC 10 th & 11 th Floor
M.411	Mechanical HVAC 12 th & 13 th Floor
M.412	Mechanical HVAC 14 th & 15 th Floor
M.413	Mechanical HVAC 16 th & Penthouse Floor
M.701	Mechanical Control Diagram

Electrical:

E.101	Electrical General Notes
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Plumbing:

P.101	Plumbing General Notes
P.301	Plumbing Piping Plan 1 st & 3 rd Floor
P.302	Plumbing Piping Plan 4 th – 8 th Floor
P.303	Plumbing Piping Plan 9 th & 10 th Floor

P.304 Plumbing Piping Plan 11th – 15th Floor
P.801 Plumbing Details

Fire protection:

FP.101 General Notes, Symbols & Abbreviations

C. Changes to the Project Drawings for the Union County Courthouse Fire Suppression Rotunda Building:

1. The following attached drawings have been revised:

Architectural:

A.000 Drawing Cover-Drawing Index
D.105 Roof demolition Plan
A.105 Roof Construction Plan
A.401 Partial Roof Details

HVAC Drawings:

M.101 Mechanical General Notes, Abbreviations, Symbols
M.301 Mechanical Air Flow Diagram
M.302 Mechanical Water Flow Diagram
DM.400G Mechanical Demolition Plan - Ground Floor
DM.401 Mechanical Demolition Plan - First Floor
DM.402 Mechanical Demolition Plan - Second Floor
DM.403 Mechanical Demolition Plan - Third Floor
DM.404 Mechanical Demolition Plan - Fourth Floor
M.400B Mechanical - HVAC Plan - Basement
M.400G Mechanical - HVAC Plan - Ground Floor
M.401 Mechanical - HVAC Plan - First Floor
M.403 Mechanical - HVAC Plan - Third Floor
M.404 Mechanical - HVAC Plan – Fourth Floor
M.405 Mechanical - HVAC Plan - Roof
M.501 Mechanical – Piping Plan – First Floor
M.703 Mechanical – Control Diagram
M.704 Mechanical - Control Diagram

Electrical Drawings:

E.101 Electrical General Notes
E.301 Electrical - Power Plan – First Floor
E.401 Electrical – Lighting Plan – First Floor

Plumbing Drawings:

P.101 Plumbing General Notes
DP.300B Plumbing – Demolition Piping Plan – Basement
DP.300G Plumbing – Demolition Piping Plan – Ground Floor
DP.301 Plumbing – Demolition Piping Plan – First Floor
DP.302 Plumbing – Demolition Piping Plan – Second Floor

DP.303 Plumbing – Demolition Piping Plan – Third Floor
DP.304 Plumbing – Demolition Piping Plan – Fourth Floor

Fire Protection Drawings:

FP.101 Fire Protection General Notes, Symbols & Abbrevs

D. Responses to RFI's received:

General Conditions RFI's

Q1: Please advise as to whom the current Siemens Fire Alarm vendor/maintenance contractor is for these buildings? Considering that the work required on this project is an expansion and integration of the current system, the current contractor will need to be contacted for information related to the system.

A1: The fire alarm vendor for the buildings is DavEd Fire Systems, Inc. Their contact number is 201-342-7800.

Q2: Can the County confirm that a dumpster location will be provided on site for the removal of debris?

A2: The County will provide an on-site location for contractors to place a 30 yard dumpster. The exact location is to be determined.

Q3: During the walkthrough it was stated that one of the three elevators in the Tower building can be used for construction only during both the Rotunda and Tower renovations, as long as it is protected by the contractor. Please confirm.

A3: The County will permit contractors to utilize one of the 3 elevator cabs in the Tower building provided that it protected against damage by the contractor. During Tower construction, the County will allow for one of the cabs to be shut down for construction use for the entirety of work in the Tower building. However, during Rotunda construction, the County will only permit the contractor to utilize one of the Tower elevators as it is needed (and requested) to bring materials/equipment up and down. This use of the elevator is to be coordinated with the County through MAST Construction.

Q4: Please confirm that permit fees will either be waived or paid for by the owner?

A4: Permit fees will be waived by the City of Elizabeth.

Q5: Due to the fact that work will be performed on multiple levels and the use of an elevator is required to transport materials and labor, please advise if the PLA requires the hiring of a full time machine operator to operate the elevators during working hours.

A5: An elevator operator will only be required for use in the new Rotunda elevator until such time as it has been completed and passed final inspections. All other elevators within the Rotunda and Tower buildings are currently operational under the building certificate of occupancy and will not require an operator for use.

Q6: Can excess/umbrella policies be utilized to meet the limits requested for the general liability and commercial auto insurance limits required for this project?

- A6: Comply with General Specifications Section 13 – Insurance Requirements
- Q7: Please provide specifications and details for the required plaster work specified on the drawings.
- A7: See attached Specification Section 017310 – Cutting & Patching, refer to Tower Construction Drawing # 201 for details.
- Q8: Where we are working in occupied areas will we be required to put the existing ceiling grid and tiles back in every night? Since the fire inspector will be required to visually inspect all pipe fittings can existing ceiling tiles be reinstalled upon inspection? Please clarify.
- A8: Reinstallation of ceiling grid and tiles will not be required every night and may wait until after final inspections have been passed. However, the occupied spaces must be returned to safe, clean working conditions (for occupants) at the end of each work day.

Internal Stair (Tower):

- Q1: Demolition drawings note 6 indicates existing floor tile finish in stair T2 to be removed and prepared for new finish. Finish plans do not indicate a new floor finish in stair T2. Please advise.
- A1: Refer to revised drawings enclosed with this Addendum #3. All Finish floor plans show revision to finish tags and A.704 has been revised to show new flooring.
- Q2: Finish plans generally indicate a T1 flooring in all the lobby areas. T1 is a 3/8" terrazzo tile. The room finish schedule indicates terrazzo to match existing. Is the finish to be new throughout or patched to match? Also many of the indicated finishes on the room finish schedule do not match those indicated on the finish plans. Please clarify.
- A2: Refer to revised drawings enclosed with this Addendum #3. Most the areas affected by the work calls out to patch to match. Finish Floor plans indicate T1 flooring patch to match see drawings # A.701 – A.704.
- Q3: Demolition drawing # D.112 indicates an item #48 in stair # T2. There is no #48 in the key note legend. Please advise.
- A3: Drawing # D.112 note #48 is to remove AC wall unit and to patch the wall opening with a two hour rated wall assembly similar to partition type # D1. It is an existing wall that will be infilled during renovation of Stair # T2. Refer to drawing #A.112.dwg.
- Q4: Please indicate the existing slab thickness and reinforcing to be removed for the new stair tower T1?
- A4: The existing reinforced concrete slab average 9" +/-.
- Q5: In the area of stair # T1 on demolition drawing # D.100G there is a key note # 23 which indicates the column to be removed and temporary shoring to be provided. The structural drawings do not indicate new structure to replace the column. Please clarify.
- A5: Delete Note #23 from the Demolition Drawings. The existing 1st floor structure is to remain and reinforced as indicated in the structural drawings. GC will remove all existing ceiling at the Ground floor level to perform the reinforcement of existing steel

for the bearing of steel post and provide a suspended ceiling system to match the existing along with all light fixtures.

Q6: The mechanical drawings indicate new vertical ductwork for the stair pressurization system. The ductwork penetrates each floor outside the stair enclosure and is exposed in the room adjacent to the stair at every floor. There are no structural, demolition or architectural requirements to address the 24"x36" floor penetrations or duct concealment at every floor. Please advise.

A6: Refer to revised drawings enclosed with this Addendum #3.

Q7: Demolition key note #2 indicates existing window to be removed. There are no new windows or infill indicated for the resulting openings. Please clarify.

A7: Delete key note #2 from the Demolition Drawings. Key note #2 is keyed on two exterior windows on floors 3rd, 4th, 5th, 6th, 7th and 8th for a total of 12 windows, GC to provide guard rails as indicated on enlarged T1 floor plans and section.

Q8: Based on the specified ACM abatement quantities for plaster we assume the scope is based on removal of all the existing courtroom lobby ceilings & moldings in the area of stair T1. Is this correct? Please confirm.

A8: Refer to Item # B.2 in Addendum #2 for clarification of scope of work.

Q9: Third floor finish plan indicates floor finish CPT-1 over existing raised access floor. There is no finish CPT-1 in the finish schedule. Please clarify.

A9: Refer to revised drawings enclosed with this Addendum #3. Revised Drawing A.701 indicates no finish tag for room. P3/B1 for new wall only in 3rd floor Open Office space.

Q10: There are many courtrooms on the finish plans indicated to receive floor finish CPT-1 & CPT-2. There are no finishes on the finish schedule for CPT-1 & CPT-2. Please clarify.

A10: Refer to revised drawings enclosed with this Addendum #3

Q11: The reflected ceiling plans for the Tower building do not detail all of the ceilings that are required to be removed in areas outside of the footprint of the stair construction where sprinkler installations will take place. Are those ceilings required to be removed and replaced or can the existing ceiling grid be retained and existing ceiling tiles be removed and replaced following sprinkler installations?

A11: Refer to revised drawings enclosed with this Addendum #3

Q12: The summary of work states that all work associated with Tower building is to be performed 2nd shift due to the concern of excessive noise during demolition. Can work associated with sprinkler installations in other areas outside of footprint of stair construction be performed during normal working hours?

A12: Work associated with sprinkler installations will be permitted during normal working hours as long as the work does not create any excessive noise such as slab cutting or drilling or fastening into the slab.

Q13: Will we be allowed to penetrate the high plaster ceilings approximately every 40 feet or so to allow access for sprinkler pipe and manpower above, or will all work need to be done from the minimal space above the existing ceilings? Please advise.

A13: The Design intent is to install the sprinkler pipe from the catwalk above the Ceremonial Court Rooms and only to core drill an area on the existing plaster to install the sprinkler heads. The intent is to perform this work by way of O&M procedures, If we were to allow the Contractor to “penetrate the high plaster ceilings approximately every 40 feet or so to allow access for sprinkler pipe and manpower above” the work in these Ceremonial Courtroom spaces would exceed the O&M threshold and require full work area asbestos abatement work practices, set up and monitoring and that is not part of the overall specifications

Fire Suppression Rotunda Building:

Q1: Please provide additional construction details for temporary stair and egress door at first floor window. What is existing window construction? Are stairs constructed of lumber material?

A1: This is a temporary means of egress. The existing window is an Aluminum Clad. The Design Intent is to temporarily remove the existing window and reinstall the window after the completion of the project. Provide a temporary hollow metal door and frame with security lock and exit device. The temporary stair shall be constructed out wood.

Q2: Partial roof detail on drawing A.401 indicates existing roof construction to be removed and replaced with new to match existing. Please provide section details to clarify existing construction removal (glass lite panels beneath roof?) and new construction requirements (flat?, sloped?, insulated?).

A2: Refer to revised drawings enclosed with this Addendum #3.

Q3: Fourth floor demolition plan key note #36 indicates ramp to be removed and a new steel stair is to be provided per drawing A.104. Does the existing surrounding plywood floor & framing extend below the ramp or will new framing & plywood flooring be needed? Please provide clarification.

A3: Refer to Demolition Drawing #D.104 for extend of demolition. The surrounding plywood floor shall be removed around the area where the new steel dunnage is to be install to support the new AHU-7 & AHU-8 refer to Structural and Mechanical Drawings.

Q4: Is sprinkler piping in the courtrooms to run below existing ceiling or is existing ceiling to be cut & patched? Please clarify type of ceiling at ground floor courtroom.

A4: Sprinkler piping in the courtrooms is to run above ceiling. For ACT suspended ceilings remove existing tiles for the installation of sprinklers and ducts, provide new tiles after the installation. For hard ceilings remove portions of ceilings and install new sprinkler piping and patch ceiling to match existing.

Q5: Please confirm security system including all card readers, cameras, etc. are by the owners security vendor and are not part of this projects scope of work.

A5: Owner’s vendor will provide security system (card readers, cameras, etc). GC to provide empty conduit with junction boxes, refer to Electrical Drawing # E.102.

Q6: Finish schedule indicates rubber flooring & tread/risers as well as painted railing & stringers in the stair. Finish plans indicate no new finish at any of the stairs. Please clarify.

- A6: No new finishes at any of the stairs. Delete Stair finishes from schedule in Drawings # A.700B, A.700G and A.701 to A.704.
- Q7: Finish schedule indicates carpet C1 at “Game Room”. This room is not on finish plan, where is game room located?
- A7: Carpet C1 not used. Game Room not in project. Delete Carpet Sheet from Finish Schedule in Drawings # A.700B, A.700G and A.701 to A.704.
- Q8: Finish schedule indicates wall finish FP1 at “Housekeeping”. This room is not on finish plan, where is housekeeping room located?
- A8: FP1 not used. Housekeeping room not in project. Delete FRP Panel from Finish Schedule in Drawings # A.700B, A.700G and A.701 to A.704.
- Q9: How will the occupied spaces of the Rotunda building (Room #107 and basement courtroom) be climate controlled upon the demolition of the existing HVAC systems? Can the engineer identify which units control these areas so that they can be segregated during construction, or will temporary services be required?
- A9: The basement of the rotunda consists of mechanical spaces. The spaces are not currently air conditioned and it is not intended to condition anywhere except for the new proposed elevator room. Room #107 is not in the basement, but is on the first floor and is one of the mechanical chases. Likewise, it is not necessary to condition this area
- Q10: Plans show concealed pipe in the rotunda basement. Are we removing the ceilings or are we installing exposed pipe? Please clarify.
- A10: Basement piping is to be exposed. Please also see responses to questions under Fire Suppression Rotunda Building answers # A4 & A9.

Attachments:

1. Drawings as listed under Item #B.1. and Item #C.1. of Addendum Number 3 (92 pages).
2. Added specification section 017310 – Cutting and Patching (3 pages)
3. Copy of Acknowledgement of Addendum Number 3 dated November 8, 2017. ***(Failure to acknowledge receipt of this Addendum may result in bid rejection)***

END OF ADDENDUM NUMBER 3

SECTION 017310 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general requirements pertaining to cutting, fitting and patching work, including but not limited to the following:
 - 1. Cutting and patching decorative plaster ceiling elements
 - 2. Patching terrazzo flooring.
 - 3. Uncover work to provide for installation and inspection.
 - 4. Removal and replacement work as required.
- B. Related Requirements:
 - 1. Division 01 Section "Historic Treatment Procedures" for requirements relating to cutting and patching historic elements.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods for proper performance of the work of this section.

1.4 SUBMITTALS

- A. Prior to starting, submit written request to the Architect for permission to proceed with cutting that may impact structural stability.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.
- B. Shop Drawings: For repair and replacement of decorative plaster, terrazzo and stone components. Show location and extent of replacement work, with enlarged details of replacement parts indicating materials, profiles, joinery, reinforcing, method of splicing into or attaching to existing adjacent work, accessory items, and finishes. Include field-verified dimensions and the following:

1. Full-size shapes and profiles with complete dimensions for new plaster components and their jointing, showing relation of existing to new components.
- C. Samples for Verification: For each type, material, color, and pattern of patching terrazzo showing the full range of color, texture, and pattern variations expected. Label each terrazzo Sample to identify manufacturer's matrix color and aggregate types, sizes, and proportions. Prepare 6-inch square samples of same thickness and from same material to be used for the patching Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Gypsum Plaster and Accessories
 1. Base Coat Plaster: ASTM C 28/C 28M, for use with job-mixed aggregates.
 2. Gypsum Ready-Mixed Finish Plaster: Manufacturer's standard, mill-mixed, gaged, interior finish.
- B. Epoxy Terrazzo: Manufacturer's standard mix with accessory strips and sealer as recommended and required, complying with the following:
 1. Hardness: 60 to 85 per ASTM D 2240, Shore D.
 2. Minimum Tensile Strength: 3000 psi per ASTM D 638 for a 2-inch specimen made using a "C" die per ASTM D 412.
 3. Minimum Compressive Strength: 10,000 psi per ASTM D 695, Specimen B cylinder.
 4. Chemical Resistance: No deleterious effects by contaminants listed below after seven-day immersion at room temperature per ASTM D 1308.
 5. Mix Color and Pattern: To match existing adjacent terrazzo to remain.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Preparation: Clean substrates of substances, including oil, grease, and curing compounds, that might impair patching. Provide clean, dry, and neutral substrate for product application. Provide required protection including but not necessarily limited to shoring, bracing and support to maintain structural integrity of the work.
- B. Inspection: Inspect existing conditions, including elements subject to movement or damage during cutting and patching.

3.2 PERFORMANCE

- A. Perform cutting and demolition by methods, which will prevent damage to other portions of the work and provide proper surfaces to receive installation of repair and new work.
- B. Perform fitting and adjusting of products to provide finished installation complying with the specified tolerances and finishes.

3.3 DECORATIVE PLASTER REPAIR

A. Cornice

1. Cross Section: Determine cross section by sawing through the molding, inserting a sheet metal blank in the slot and tracing the profile directly on the template then transferred onto 22-gauge galvanized sheet metal.
2. Run replacement cornice on a bench using gypsum and lime; the reproduction molding should be longer than the required length.
3. The new footage is cut and fit in place to match the existing cornice, then securely countersunk-screwed to studs, joists and/or blocking. The resulting joints are pointed with flat mitering rods, flush with adjacent members

B. Ceiling Medallion

1. Repair sections of plain-run circular molding by determining a section through the run and the radius from molding to pivot point.
2. The run should be made on a bench to a length greater than required, then cut and fit in place.
3. Install circular run sections with plaster adhesives on bonded surfaces or approved (wet or dry) construction adhesives.
4. Attach with coarse-threaded, galvanized screws countersunk for bonding; if possible, the screws should be inserted at points that will ultimately be covered.

3.4 TERRAZZO REPAIR

A. Concrete Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft.

1. Moisture-Vapor-Emission Test: Maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours when tested according to ASTM F 1869 using anhydrous calcium chloride.
2. Proceed with terrazzo installation only after concrete substrates pass moisture testing or after installation of moisture-vapor-emission-control membrane on substrate areas that fail testing

B. Cut out and replace terrazzo areas that evidence lack of bond with substrate. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo, or repair panels according to NTMA's written recommendations, as approved by Architect.

C. Place, rough grind, grout, cure grout, fine grind, and finish terrazzo according to manufacturer's written instructions.

1. Installed Thickness: Flush with adjacent terrazzo surface

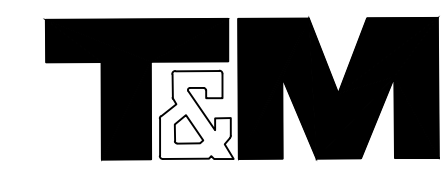
D. Terrazzo Finishing: Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint strips.

END OF SECTION 017310



UNION COUNTY COURTHOUSE INTERNAL STAIR (TOWER)

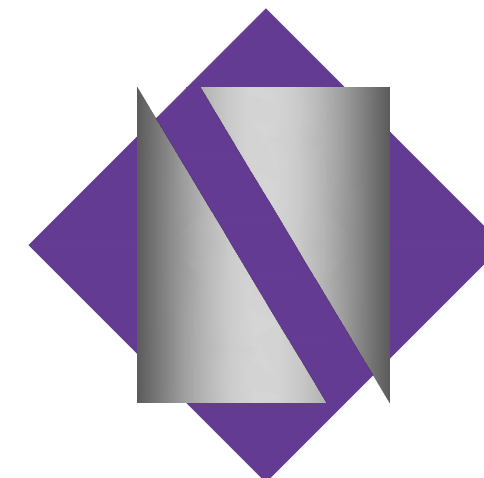
2 BROAD STREET, ELIZABETHTOWN PLAZA
ELIZABETH, NJ 07202



ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365
NEW JERSEY BOARD OF
PROFESSIONAL ENGINEERS AND
LAND SURVEYORS
CERTIFICATE OF AUTHORIZATION
24GA27987500



ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2860 FAX: 973-286-2864
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

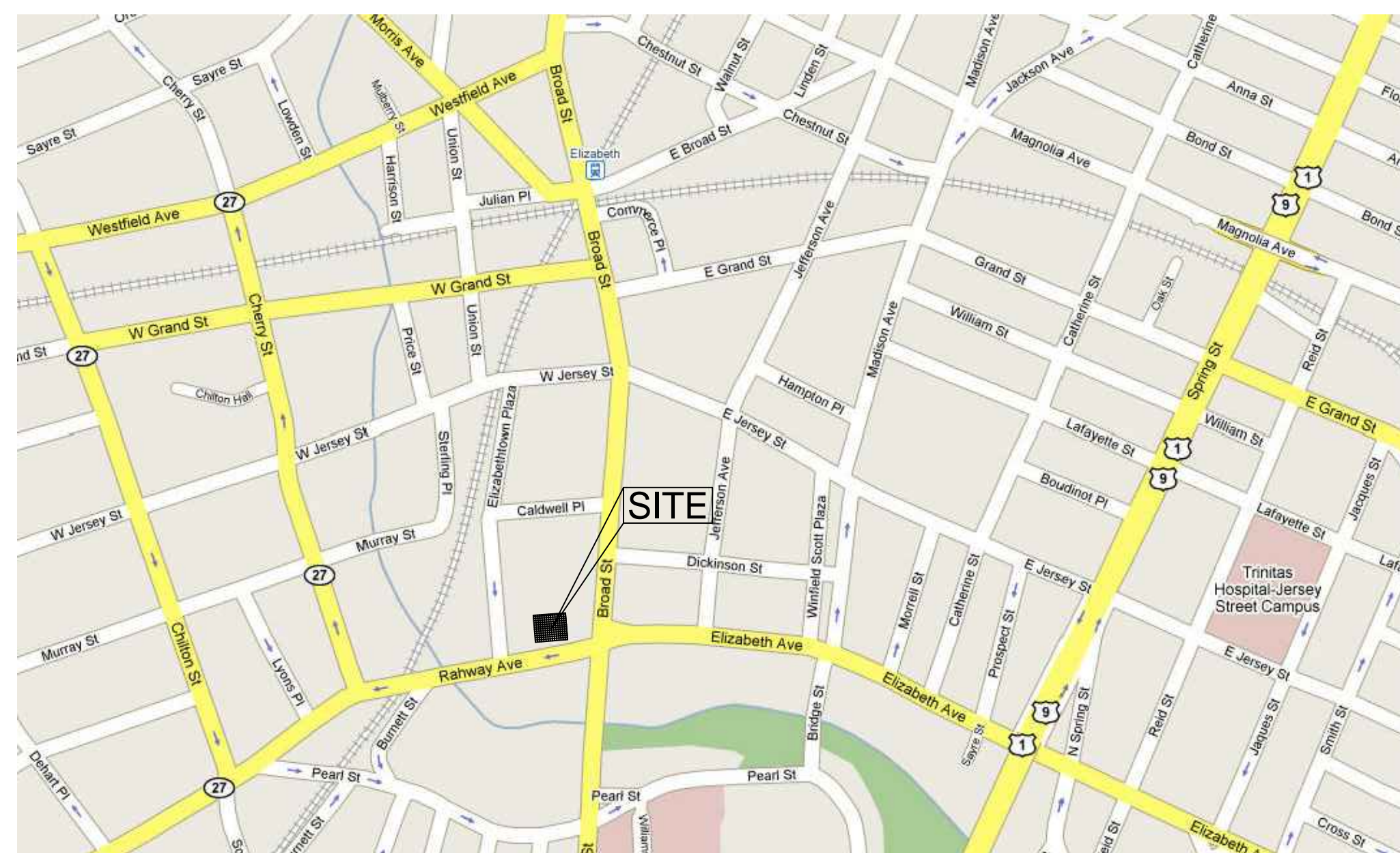


NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

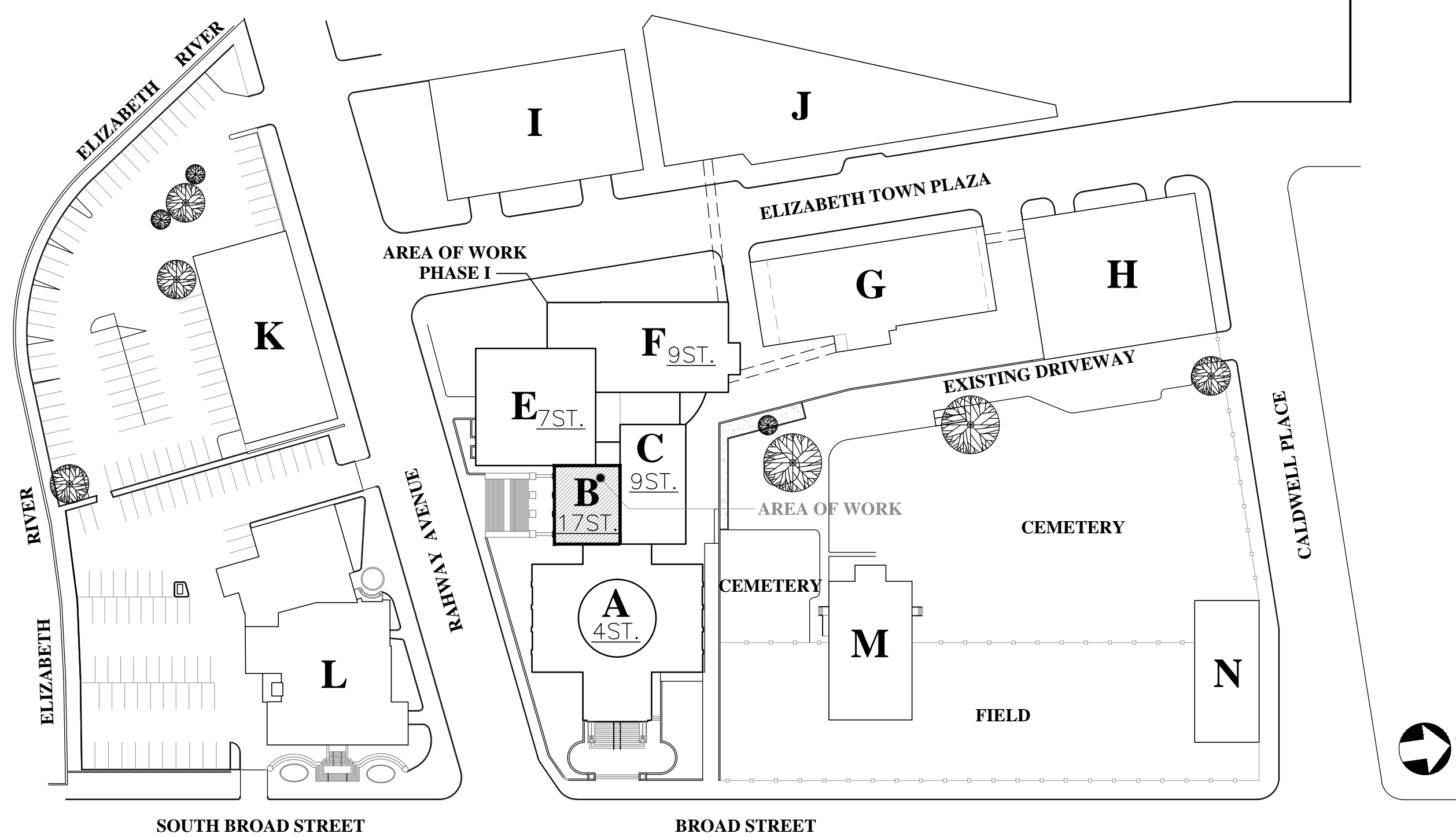


1160 Route 22 West, 2nd Floor, Mountainside, New Jersey 07092
o 908.379.2911 d 908.379.2911 x210 m 908.377.0938
epanzarino@o-n.com w o-n.com

ISSUED FOR BID
SEPTEMBER 7, 2017

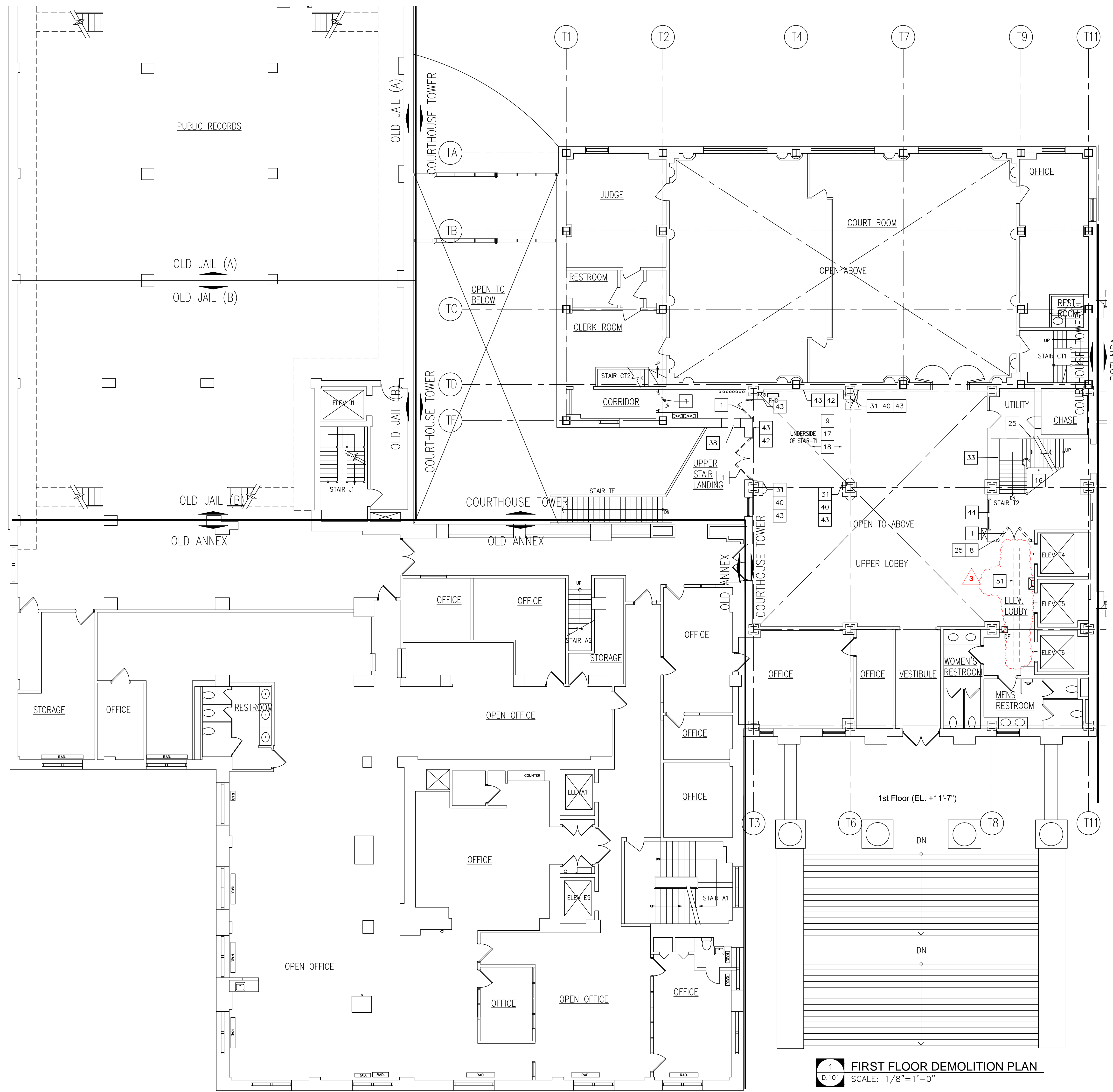


LOCATION PLAN
NO SCALE



- LEGEND
- A. COURT HOUSE ROTUNDA
 - B. TOWER COURT HOUSE
 - C. OLD COURT HOUSE
 - D. OMITTED
 - E. OLD COURT HOUSE ANNEX
 - F. OLD COURT HOUSE JAIL
 - G. NEW COURT HOUSE ANNEX
 - H. PARKING GARAGE / DETENTION CENTER
 - I. ADMINISTRATION
 - J. RALPH ORISCHELLO CORRECTIONAL FACILITY
 - K. JUSTICE FACILITY
 - L. PUBLIC LIBRARY
 - M. FIRST PRESBYN. CHURCH
 - N. PARISH HO.

DRAWING INDEX		DRAWING INDEX	
ARCHITECTURAL		STRUCTURAL	
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		FP.303	SPRINKLER PIPING PLAN THIRD FLOOR
		FP.304	SPRINKLER PIPING PLAN FOURTH FLOOR
		FP.305	SPRINKLER PIPING PLAN FIFTH FLOOR
		FP.306	SPRINKLER PIPING PLAN SIXTH FLOOR
		FP.307	SPRINKLER PIPING PLAN SEVENTH FLOOR
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		FP.309	SPRINKLER PIPING PLAN NINTH FLOOR
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		FP.312	SPRINKLER PIPING PLAN 14TH & 15TH FLR.
		FP.313	SPRINKLER PIPING PLAN 16TH & 17TH FLR.
		FP.601	FIRE PROTECTION RISER DIAGRAM
		FP.801	FIRE PROTECTION DETAILS

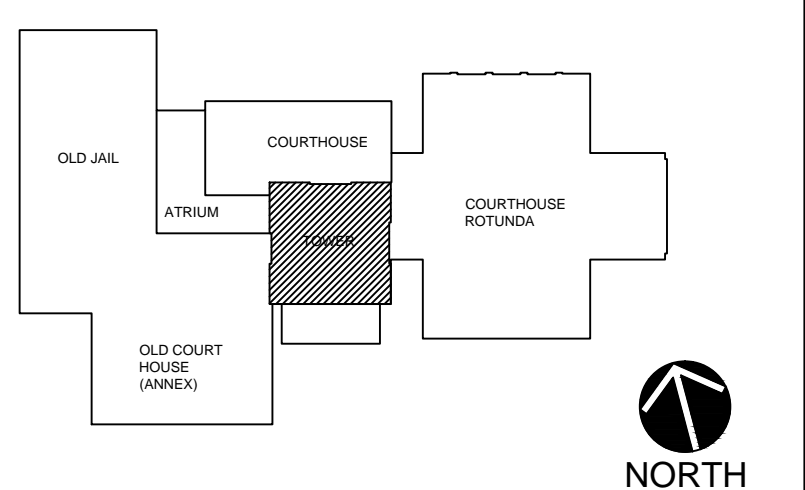


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0.101
SCALE: 1/8"=1'-0"

DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC)
- 2 REMOVE EXISTING WINDOW SYSTEM.
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10 REMOVED EXIST. LDW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23 EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24 RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS
- 27 PROVIDE FLOOR OPENING FOR NEW DUCT OPENINGS; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNLOGGED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENGASEMENT. PATCH ENGASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTROOM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH. PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWGS. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS. SEE MECH'L DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCONCE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41 RELOCATE EXISTING CAMERA
- 42 N/A
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLOCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47 REMOVE, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION.
- 48 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.
- 49 EXISTING AIR HANDLING UNIT TO BE RELOCATED. PROVIDE NEW SUPPORTS ON EXISTING STRUCTURAL. REFER TO MEP DWGS.
- 50 PROVIDE CORE DRILL HOLE FOR MECHANICAL PIPINGS SEE MECH DRAWINGS.
- 51 SAW CUT EXISTING GYPSUM BOARD CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE) RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH TO MATCH EXISTING.

KEYPLAN



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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973.379-1061
CERTIFICATE OF AUTHORIZATION AC-438

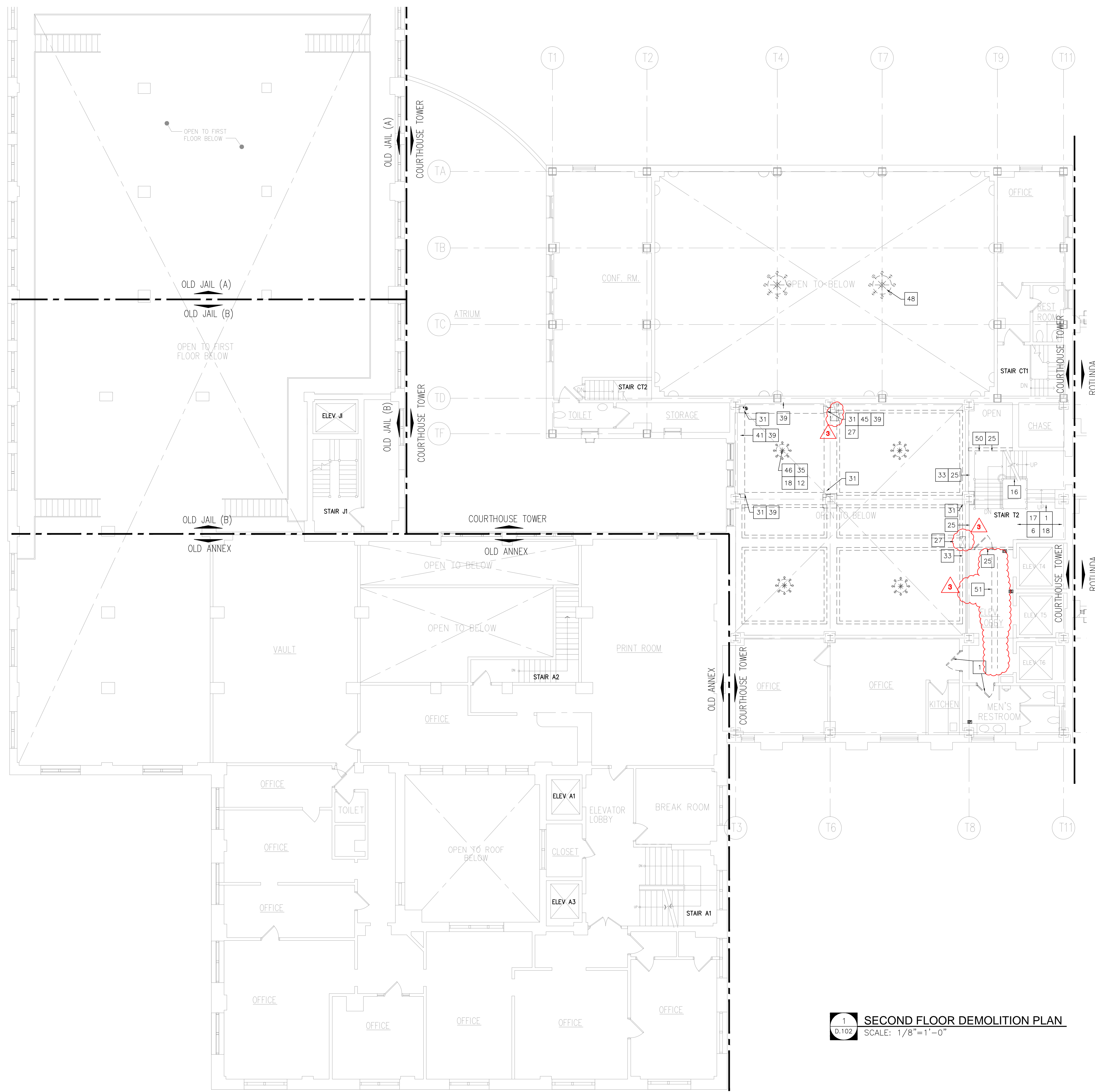
PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FIRST FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						
10.30.15	95% SUBMISSION	KD	FM						
05.31.17	100% SUBMISSION	MC	FM						
08.30.17	ISSUED FOR BID	MC	FM						
11.6.17	ADDENDUM#3	MC	FM						

DRAWN BY: BT
CHKD BY: NJN
JOB NO: 2141151
SHEET: 26 OF: 160
DWG NO:

D.101

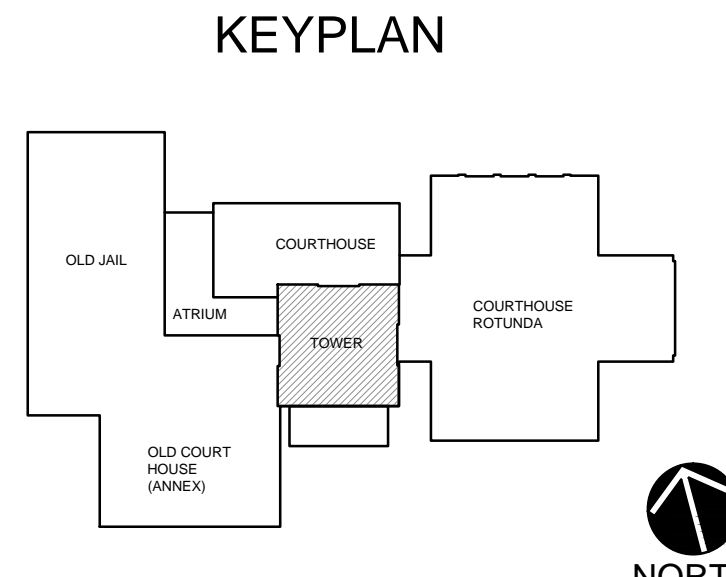


DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXISTING WINDOW SYSTEM.
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR, CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELEC. DWGS.
- 10 REMOVED EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES IN ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23 EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24 RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS.
- 27 PROVIDE FLOOR OPENING FOR NEW DUCT OPENINGS, CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNBLOCKED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTRM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH. PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWGS. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF.
- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REDROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCNDCE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.

- 41 RELOCATE EXISTING CAMERA
- 42 N/A
- 43 REMOVE EXISTING FIRE RATED GLAZING.
- 44 RELOCATE EXISTING ELECTRIC CLOCK
- 45 REMOVE EXISTING LIGHTING FIXTURE AT DESIGNATED AREAS. REFER TO REFLECTED CEILING PLAN AND ELEC. DRAWINGS
- 46 REMOVE, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACOUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 47 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION
- 48 EXISTING AIR HANDLING UNIT TO BE RELOCATED. PROVIDE NEW SUPPORTS ON EXISTING STRUCTURAL. REFER TO MEP DWGS.
- 49 PROVIDE CORE DRILL HOLE FOR MECHANICAL PIPINGS SEE MECH DRAWINGS.
- 51 SAW CUT EXISTING GYPSUM BOARD CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE). RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH TO MATCH EXISTING.

1 SECOND FLOOR DEMOLITION PLAN
SCALE: 1/8" = 1'-0"



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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

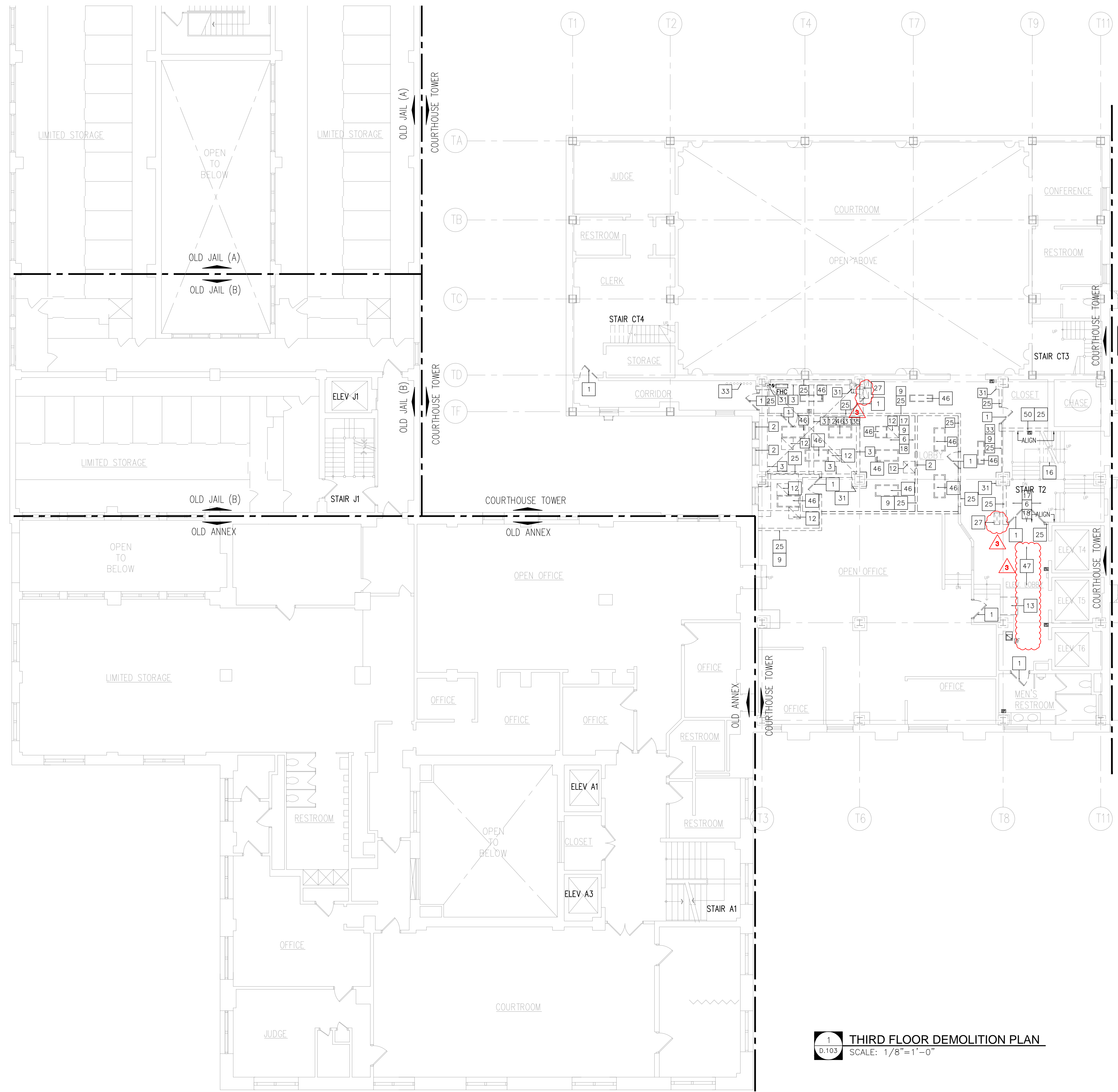


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SECOND FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	NJN
05.31.17	100% SUBMISSION	MC	FM					JOB NO	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	27 OF: 160
11.6.17	ADDENDUM#3	MC	FM					DWG NO	

D.102

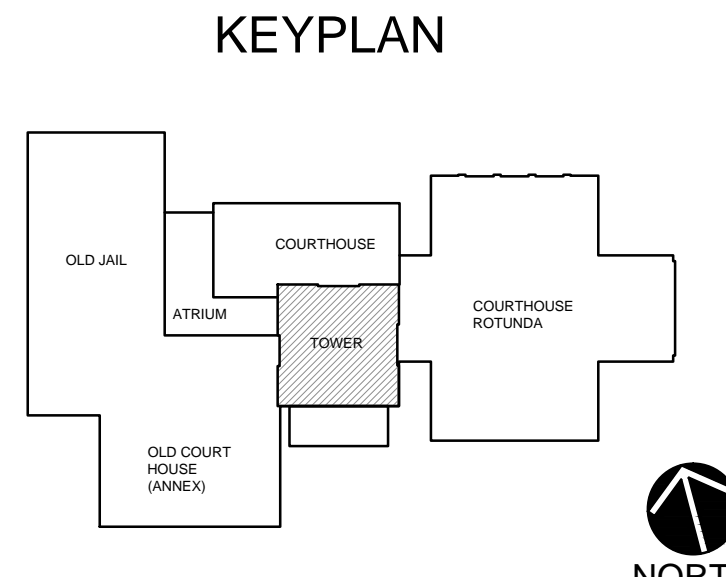


DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXISTING WINDOW SYSTEM
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR, CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE UP EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELEC. DWGS.
- 10 REMOVED EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS. MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23 EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24 RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS.
- 27 PROVIDE FLOOR OPENING FOR NEW DUCT OPENINGS. CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNLOGGED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTROOM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWGS. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF.
- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH. DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH. DWGS.
- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCENE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.

- 41 RELOCATE EXISTING CAMERA
- 42 N/A
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLOCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELEC. DRAWINGS
- 47 REMOVED, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACOUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 48 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.
- 49 EXISTING AIR HANDLING UNIT TO BE RELOCATED. PROVIDE NEW SUPPORTS ON EXISTING STRUCTURAL. REFER TO MEP DWGS.
- 50 PROVIDE CORE DRILL HOLE FOR MECHANICAL PIPINGS SEE MECH DRAWINGS.
- 51 SAW CUT EXISTING GYPSUM BOARD CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE) RIN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH TO MATCH EXISTING.

1 THIRD FLOOR DEMOLITION PLAN
SCALE: 1/8" = 1'-0"



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FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

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NJ License No. AI 16160

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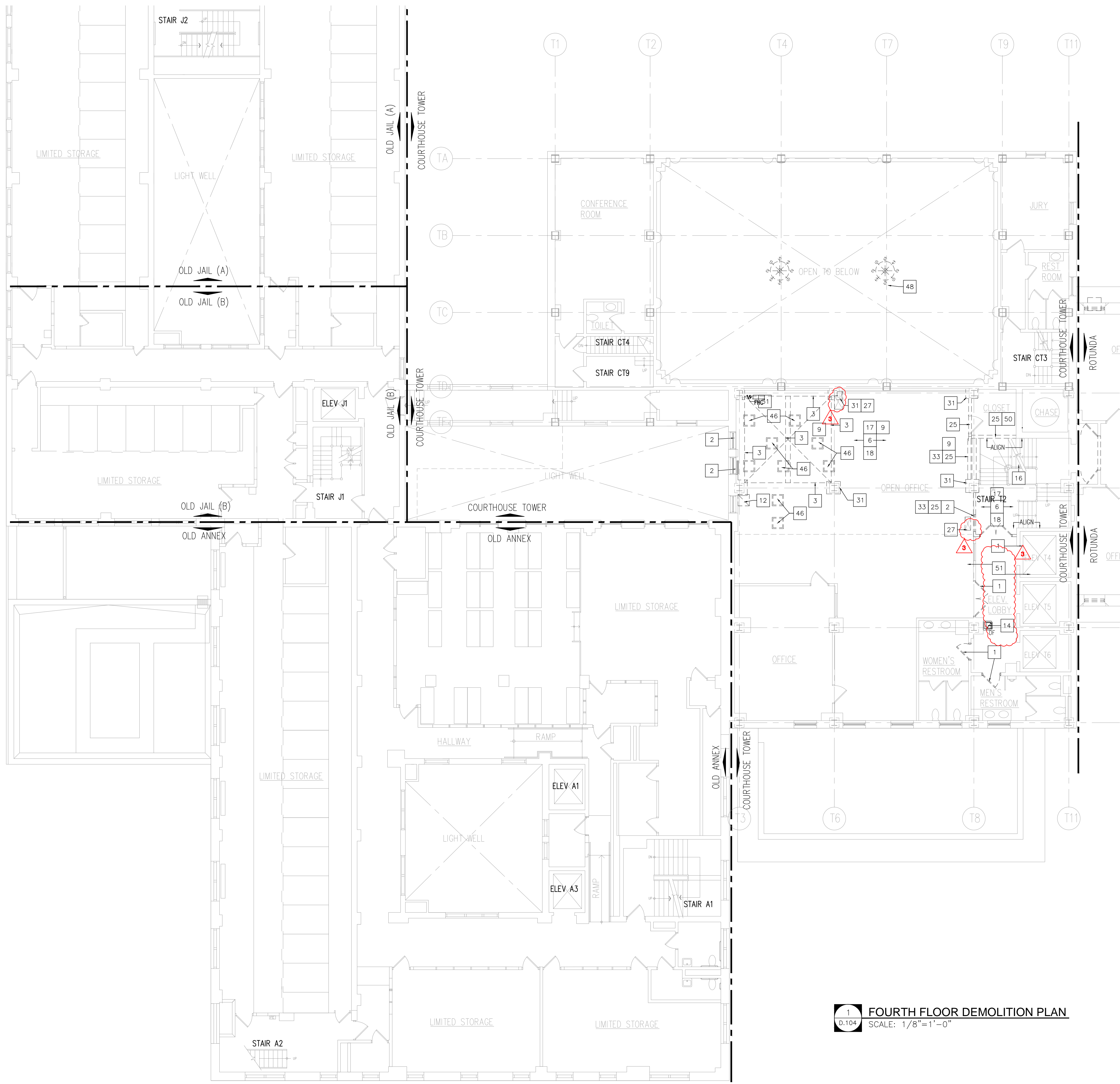
PROJECT: UC COURTHOUSE INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
THIRD FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
04.02.15	DD SUBMISSION	KD	FM				
10.30.15	95% SUBMISSION	KD	FM				
05.31.17	100% SUBMISSION	MC	FM				
08.30.17	ISSUED FOR BID	MC	FM				
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DATE	SCALE	DATE	AS SHOWN
10-10-15	AS SHOWN		
	DRAWN BY	BT	
	CHKD BY	NJN	
	JOB NO	2141151	
	SHEET:	28 OF: 160	
	DWG NO		

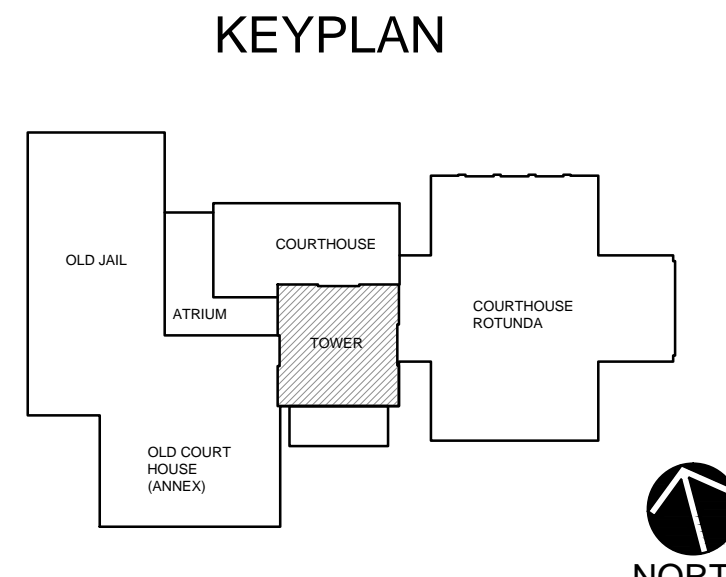
D.103



DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXISTING WINDOW SYSTEM.
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10 REMOVED EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
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- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
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- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTHOUSE DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH. PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
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- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCIENCE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41 RELOCATE EXISTING CAMERA
- 42 N/A
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC GLAZING
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS. REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47 REMOVED, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACUSTICAL CEILING TILES. REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION.
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- 50 PROVIDE CORE DRILL HOLE FOR MECHANICAL PIPINGS SEE MECH DRAWINGS.
- 51 SAW CUT EXISTING GYPSUM BOARD CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE) RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH TO MATCH EXISTING.

1 FOURTH FLOOR DEMOLITION PLAN
SCALE: 1/8" = 1'-0"



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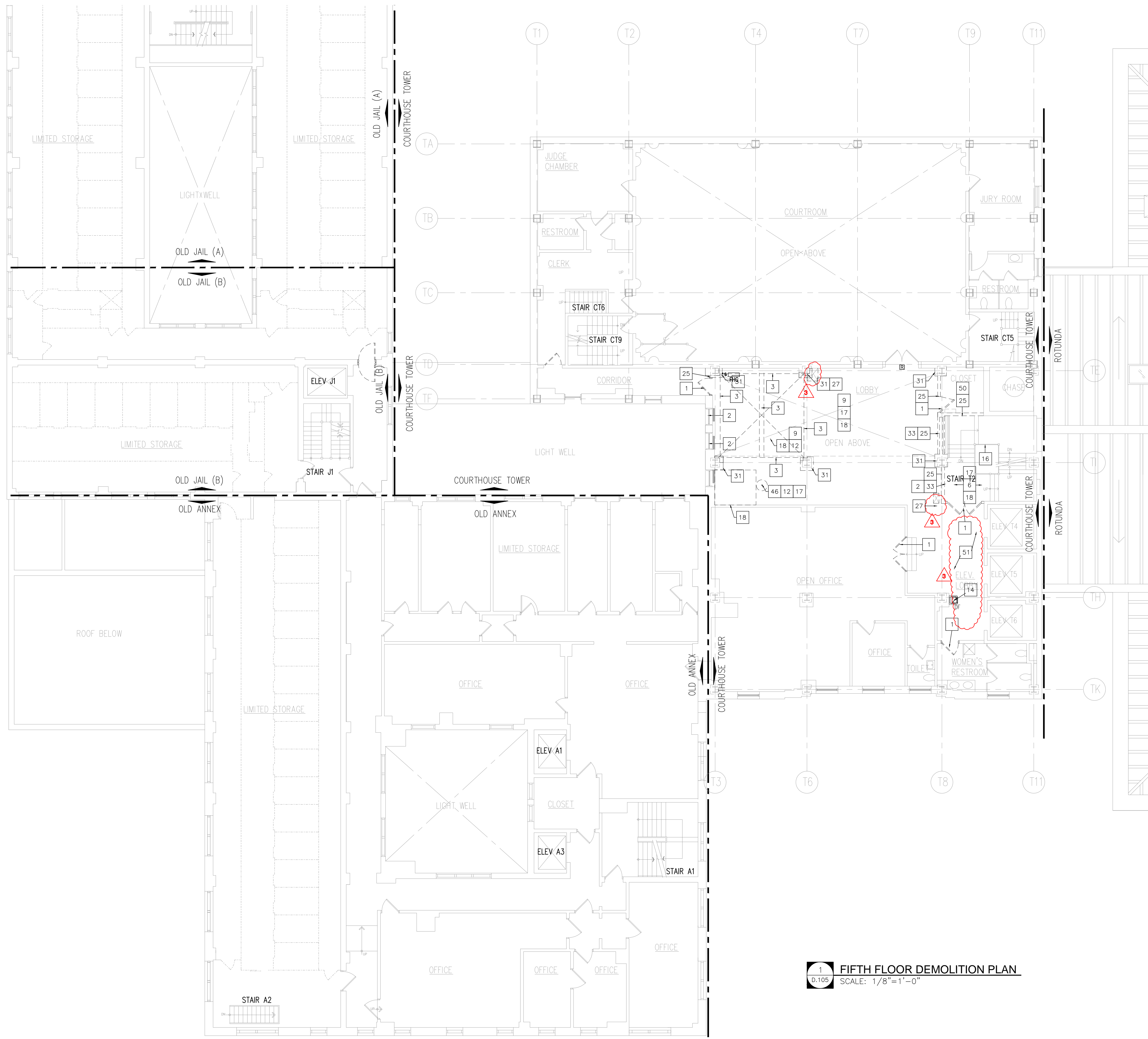
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0098 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FOURTH FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 29 OF 160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

D.104



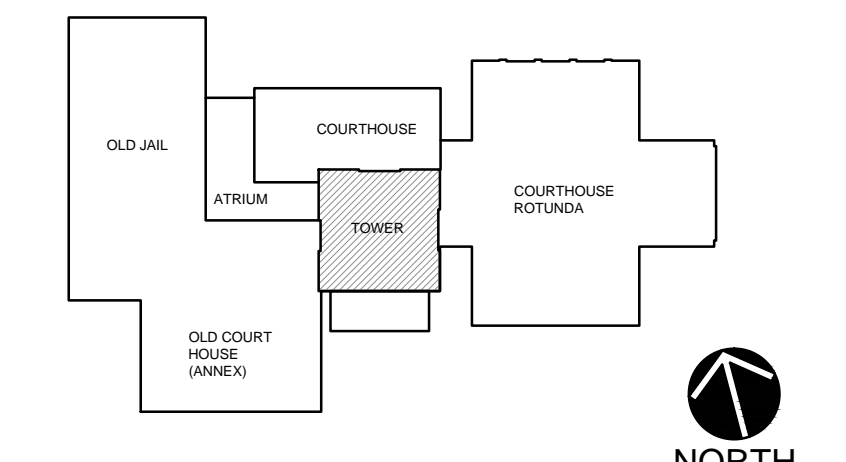
1 FIFTH FLOOR DEMOLITION PLAN
 0.105 SCALE: 1/8" = 1'-0"

DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC)
- 2 REMOVE EXISTING WINDOW SYSTEM.
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE UP EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10 REMOVED EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
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- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENGAGEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTROOM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL, AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
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- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCIENCE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.

- 41 RELOCATE EXISTING CAMERA
- 42 N/A
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- 48 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.
- 49 EXISTING AIR HANDLING UNIT TO BE RELOCATED. PROVIDE NEW SUPPORTS ON EXISTING STRUCTURAL. REFER TO MEP DWGS.
- 50 PROVIDE CORE DRILL HOLE FOR MECHANICAL PIPINGS SEE MECH DRAWINGS.
- 51 SAW CUT EXISTING GYPSUM BOARD CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE) RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH TO MATCH EXISTING

KEYPLAN



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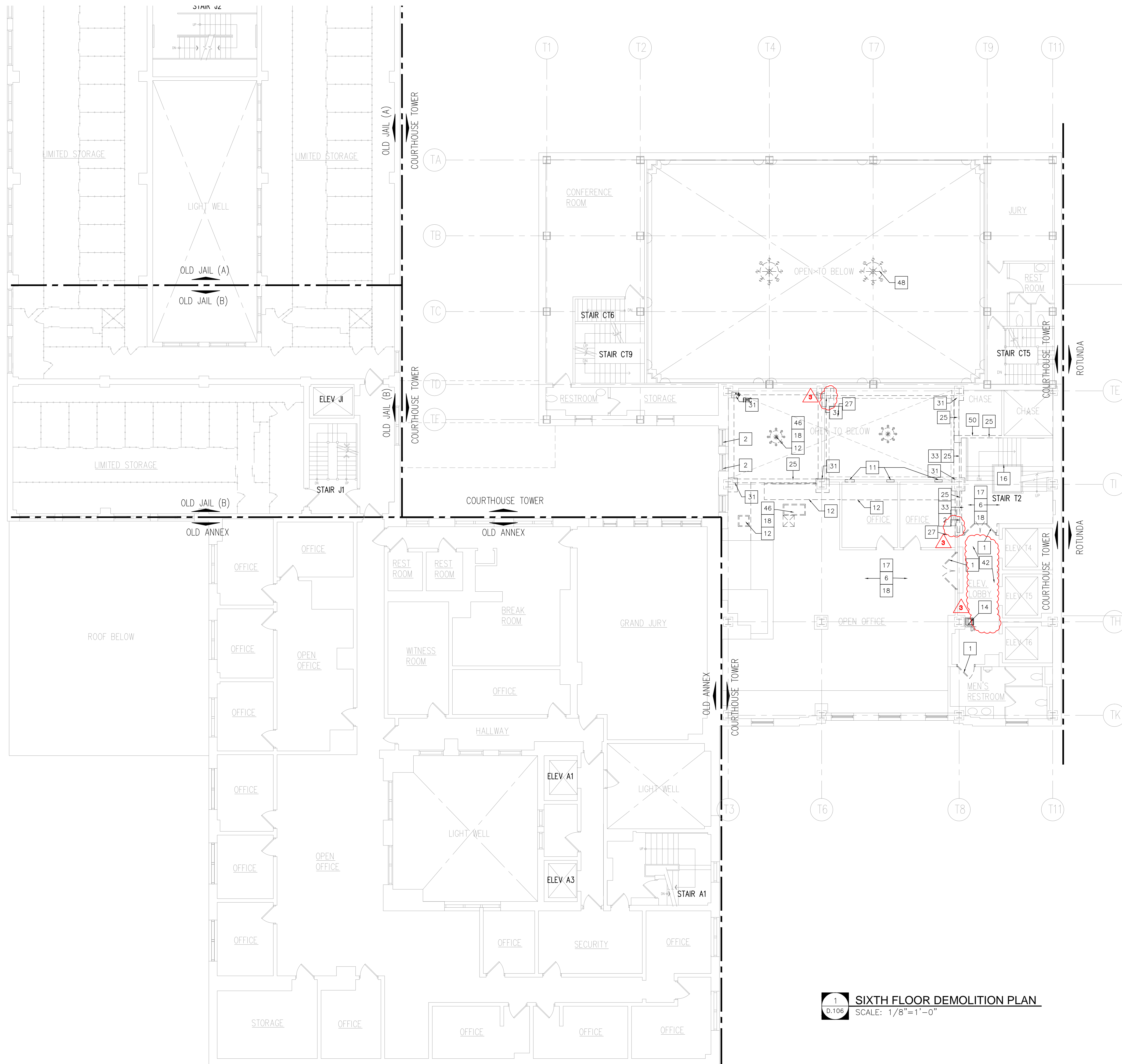
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PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FIFTH FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 30 OF: 160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

D.105

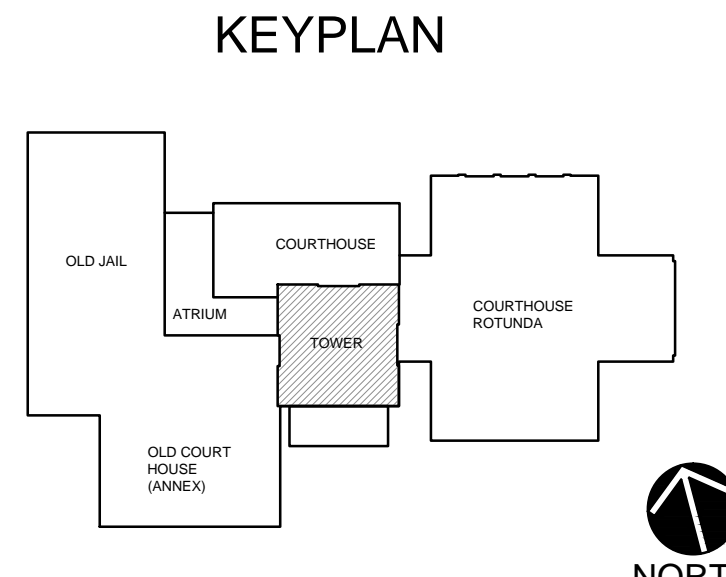


DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXISTING WINDOW SYSTEM.
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE UP EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10 REMOVE EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DIACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVE EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE. REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION.
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23 EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24 RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS.
- 27 PROVIDE FLOOR OPENING FOR NEW DUCT OPENINGS; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNBLOCKED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM.
- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTRROOM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH. PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWGS. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF.
- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS. SEE MECH'L DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCENE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.

- 41 RELOCATE EXISTING CAMERA
- 42 N/A
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLOCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47 REMOVE, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION.
- 48 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.
- 49 EXISTING AIR HANDLING UNIT TO BE RELOCATED. PROVIDE NEW SUPPORTS ON EXISTING STRUCTURAL. REFER TO MEP DWGS.
- 50 PROVIDE CORE DRILL HOLE FOR MECHANICAL PIPINGS SEE MECH DRAWINGS.
- 51 SAW CUT EXISTING GYPSUM BOARD CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE) RUN SPRINKLER MAIN ABOVE CEILING 1/2" RECESSED & CONCEALED SPRINKLER HEADS. PATCH TO MATCH EXISTING.
- 52 EXISTING ACUSTICAL CEILING TO BE REMOVED AND REPLACED TO RECEIVE NEW SPRINKLERS.

1 SIXTH FLOOR DEMOLITION PLAN
SCALE: 1/8" = 1'-0"



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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0008 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

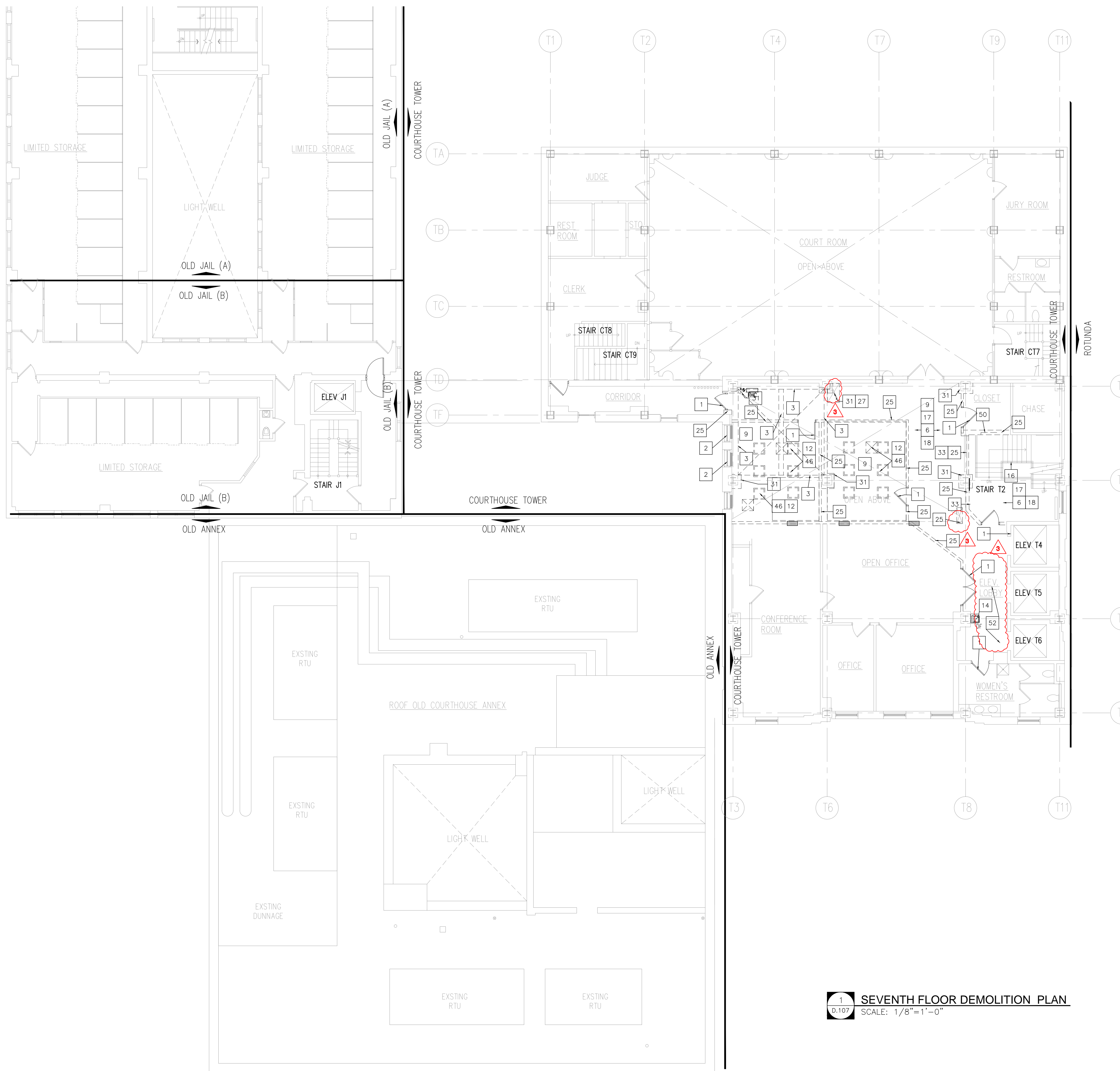
PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SIXTH FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						
10.30.15	95% SUBMISSION	KD	FM						
05.31.17	100% SUBMISSION	MC	FM						
08.30.17	ISSUED FOR BID	MC	FM						
11.6.17	ADDENDUM#3	MC	FM						

DRAWN BY: BT
CHKD BY: NJN
JOB NO: 2141151
SHEET: 31 OF: 160
DWG NO:

D.106



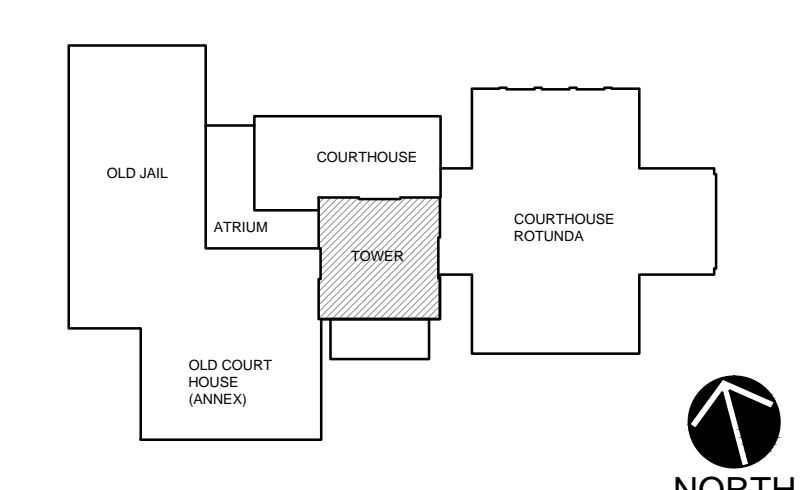
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- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELEC. DWGS.
- 10 REMOVED EXIST. LOW PARTITION DIVIDER.
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- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
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- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS.
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- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
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- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCIENCE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.

- 41 RELOCATE EXISTING CAMERA
- 42 N/A
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLOCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELEC. DRAWINGS
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- 50 PROVIDE CORE DRILL HOLE FOR MECHANICAL PIPINGS SEE MECH. DRAWINGS.
- 51 SAW CUT EXISTING GYPSUM BOARD CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE) RUN SPRINKLER MAIN ABOVE CEILING 1/2" RECESSED & CONCEALED SPRINKLER HEADS. PATCH TO MATCH EXISTING.
- 52 EXISTING ACOUSTICAL CEILING TO BE REMOVED AND REPLACED TO RECEIVE NEW SPRINKLERS.

1 SEVENTH FLOOR DEMOLITION PLAN
SCALE: 1/8" = 1'-0"

KEYPLAN



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NJ License No. AI 12541

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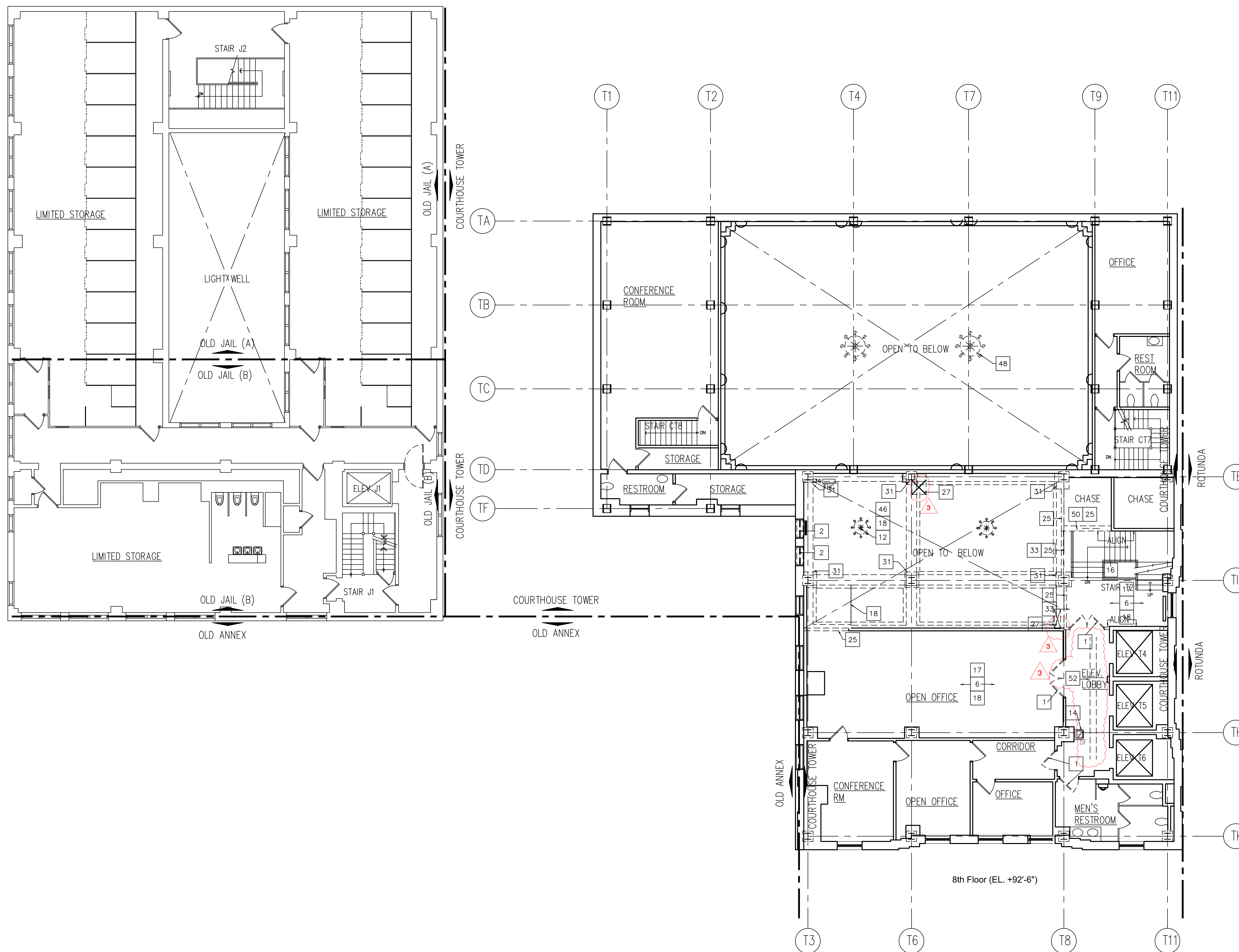


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SEVENTH FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						BT
10.30.15	95% SUBMISSION	KD	FM						NJN
05.31.17	100% SUBMISSION	MC	FM						2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 32 OF: 160
11.6.17	ADDENDUM #3	MC	FM						DWG NO

D.107

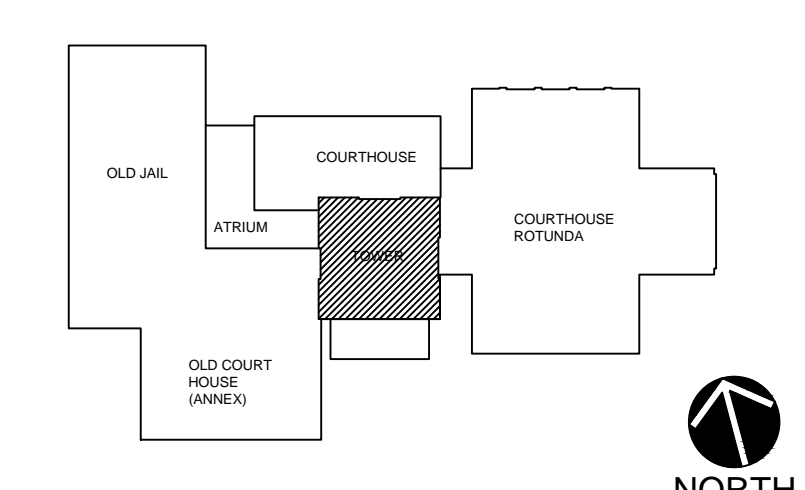


DEMOLITION KEYNOTES

- 1] REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2] REMOVE EXISTING WINDOW SYSTEM.
- 3] PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4] REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5] LINE UP EXISTING STAIR ENCLOSURES ABOVE.
- 6] REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7] SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8] RELOCATE EXISTING FIRE ALARM
- 9] DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELEC. DWGS.
- 10] REMOVE EXIST. LOW PARTITION DIVIDER.
- 11] REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12] RELOCATE EXIST. DIFFUSERS. MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13] REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BENCH.
- 14] REMOVE EXIST. WATER COOLER.
- 15] EXIST. COLUMN TO REMAIN.
- 16] EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
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- 39] REROUTE EXISTING WIRE MANAGEMENT
- 40] RELOCATE EXISTING SCONCE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41] RELOCATE EXISTING CAMERA
- 42] N/A
- 43] REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44] REMOVE EXISTING FIRE RATED GLAZING.
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1 EIGHTH FLOOR DEMOLITION PLAN
 0.108 SCALE: 1/8" = 1'-0"

KEYPLAN



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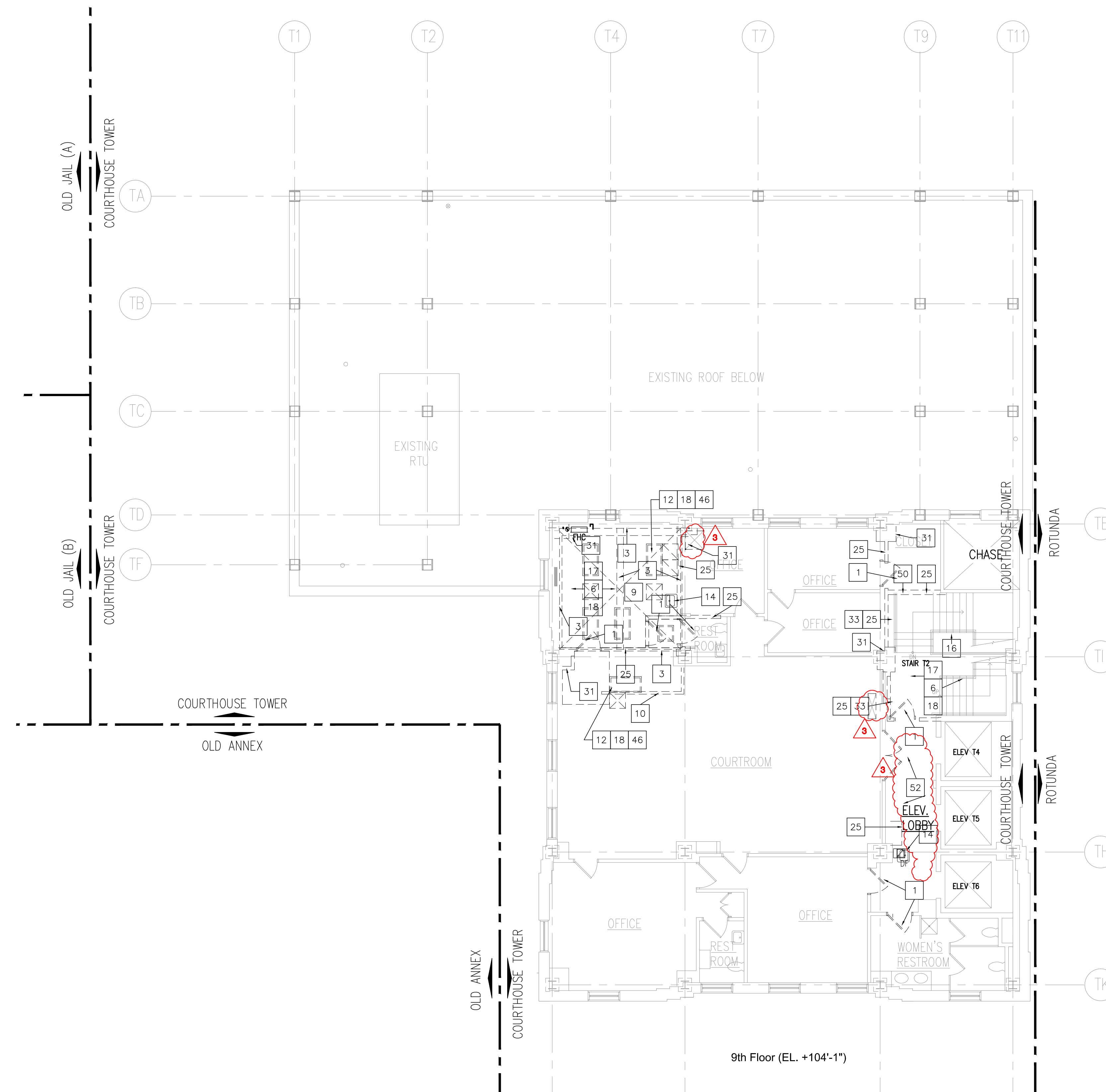
PROJECT: UC COURTHOUSE
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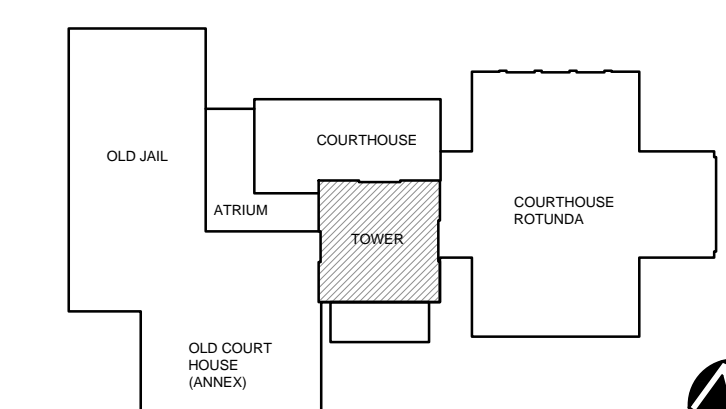
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- 3 PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE UP EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10 REMOVED EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
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- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS.
- 27 PROVIDE FLOOR OPENING FOR NEW DUCT OPENINGS; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNLOGGED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM.
- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTROOM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF.
- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH. REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCENE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.

- 41 RELOCATE EXISTING CAMERA
- 42 N/A
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
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- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47 REMOVE, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACoustICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
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- 49 EXISTING AIR HANDLING UNIT TO BE RELOCATED. PROVIDE NEW SUPPORTS ON EXISTING STRUCTURAL. REFER TO MEP DWGS.
- 50 PROVIDE CORE DRILL HOLE FOR MECHANICAL PIPINGS SEE MECH DRAWINGS.
- 51 SAW CUT EXISTING GYPSUM BOARD CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE) RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH TO MATCH EXISTING.
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1 NINTH FLOOR DEMOLITION PLAN
SCALE: 1/8"=1'-0"

KEYPLAN



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PROJECT:

**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

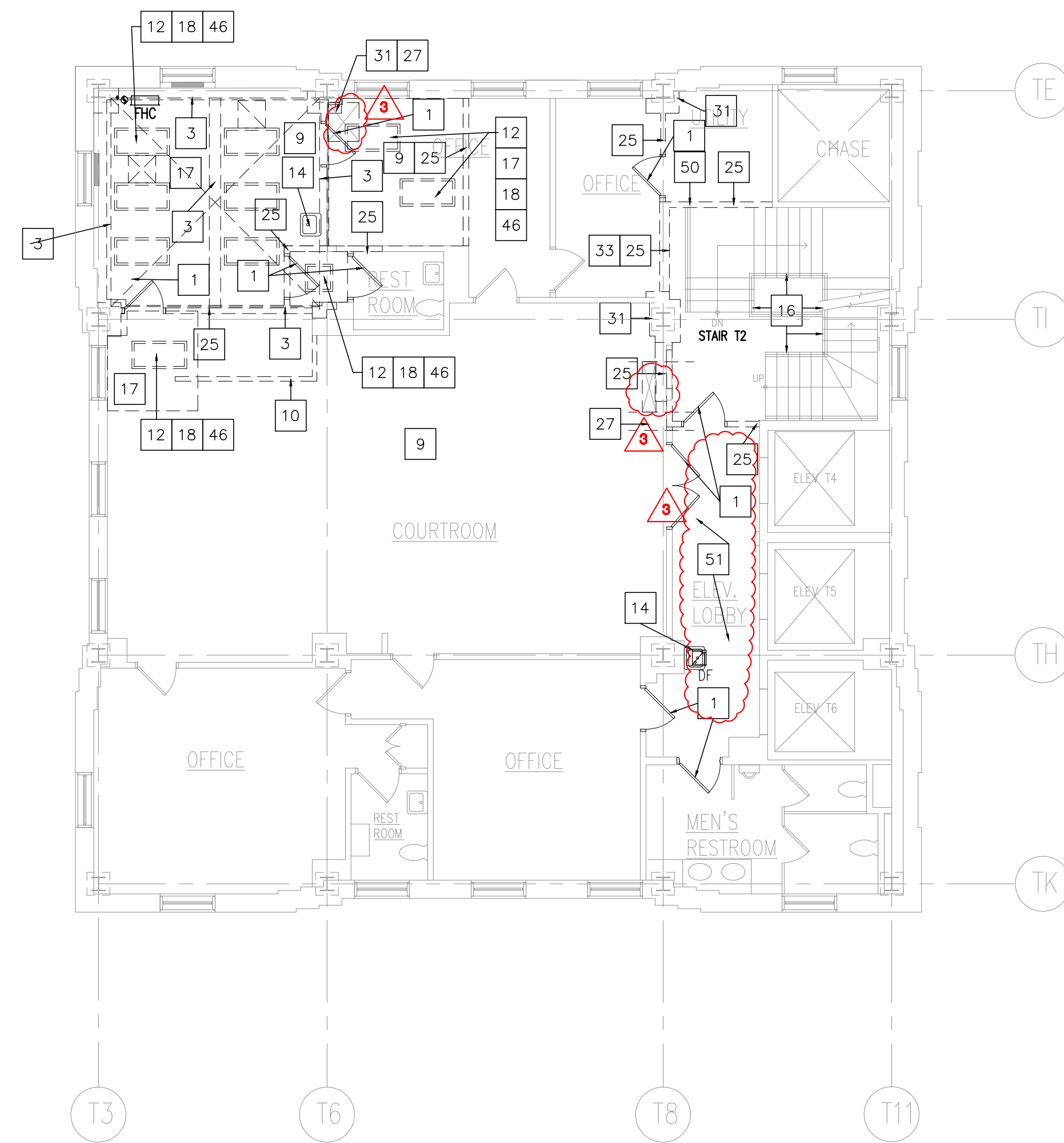
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NINTH FLOOR DEMOLITION PLAN

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05.31.17	100% SUBMISSION	MC	FM						
08.30.17	ISSUED FOR BID	MC	FM						
11.6.17	ADDENDUM#3	MC	FM						

DRAWN BY	BT
CHKD BY	NJN
JOB NO	2141151
SHEET:	34 OF: 160
DWG NO	

D.109



1 TENTH FLOOR DEMOLITION PLAN
SCALE: 1/8"=1'-0"



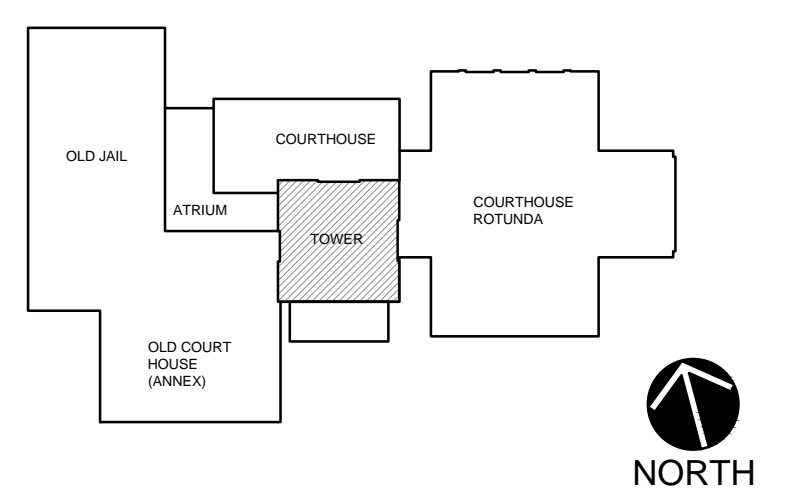
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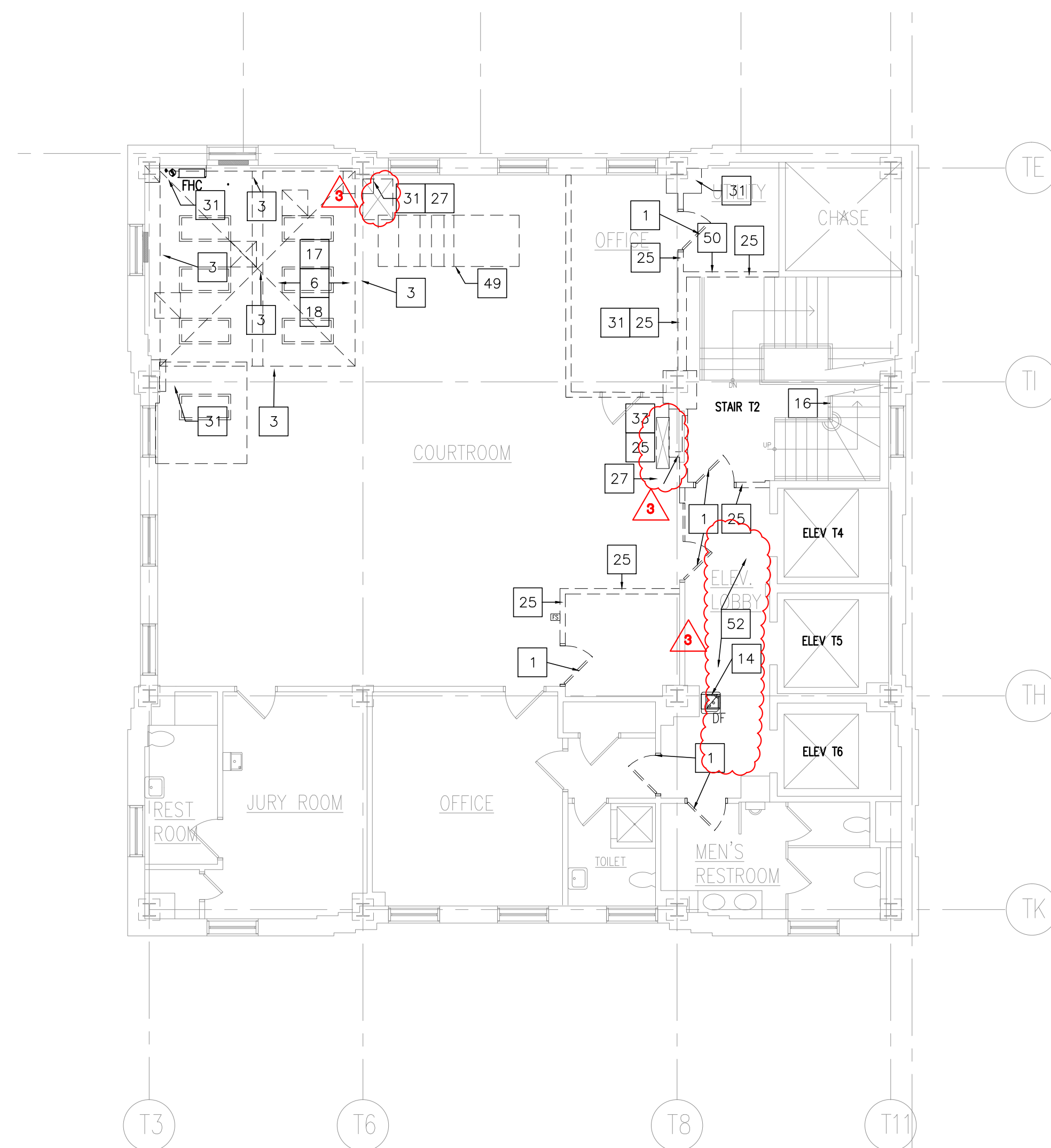
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0088 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

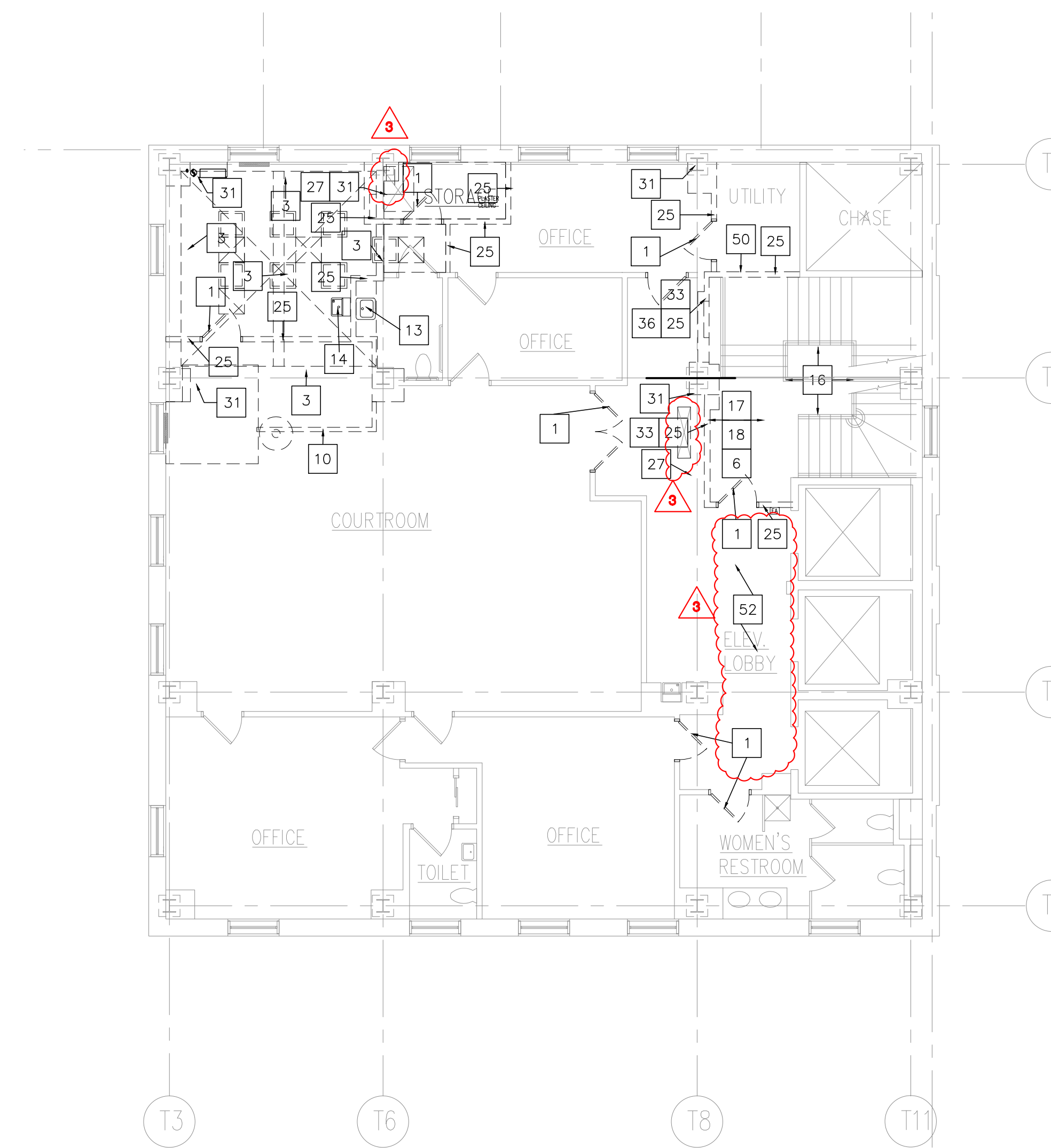
SHEET CONTENTS:
TENTH & ELEVENTH FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
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05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 35 OF: 160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

D.110



1 TWELFTH FLOOR DEMOLITION PLAN
SCALE: 1/4"=1'-0"

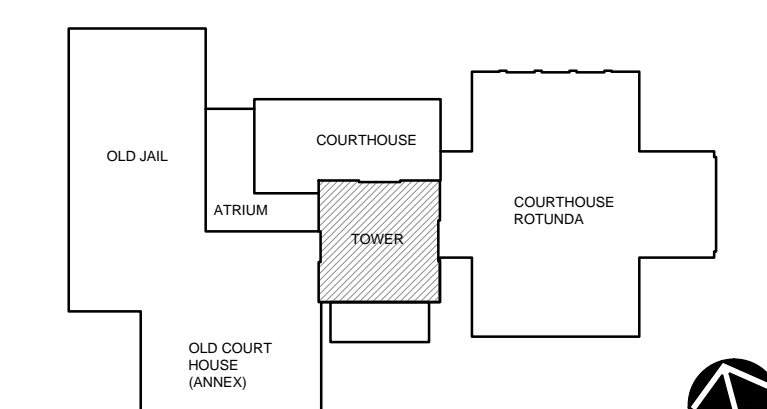


2 THIRTEENTH FLOOR DEMOLITION PLAN
SCALE: 1/4"=1'-0"

DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
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- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELEC. DWGS.
- 10 REMOVE EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS. MODIFY AND RECONFIGURE EXIST. DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
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TWELFTH & THIRTEENTH FLOOR DEMOLITION PLAN

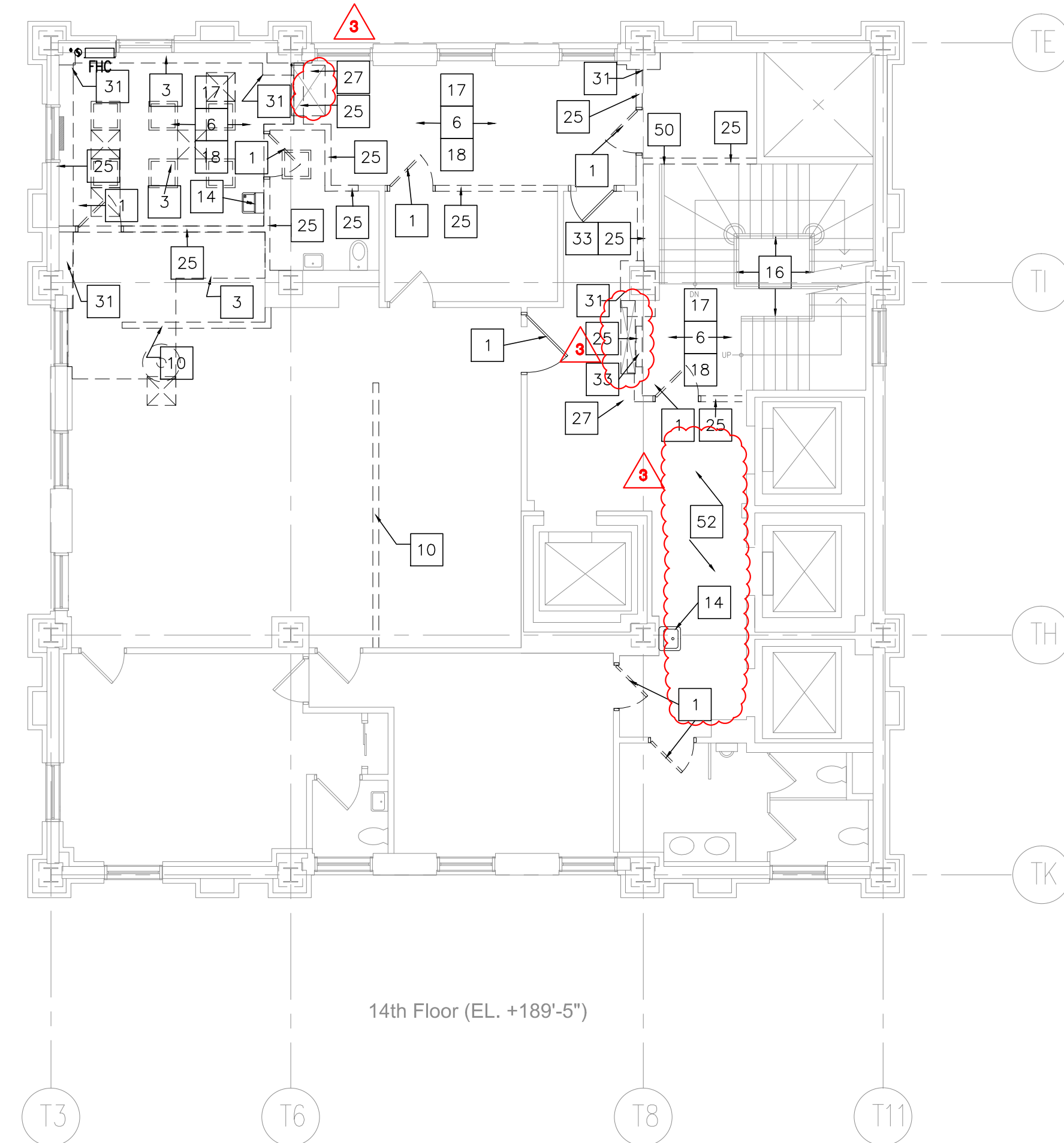
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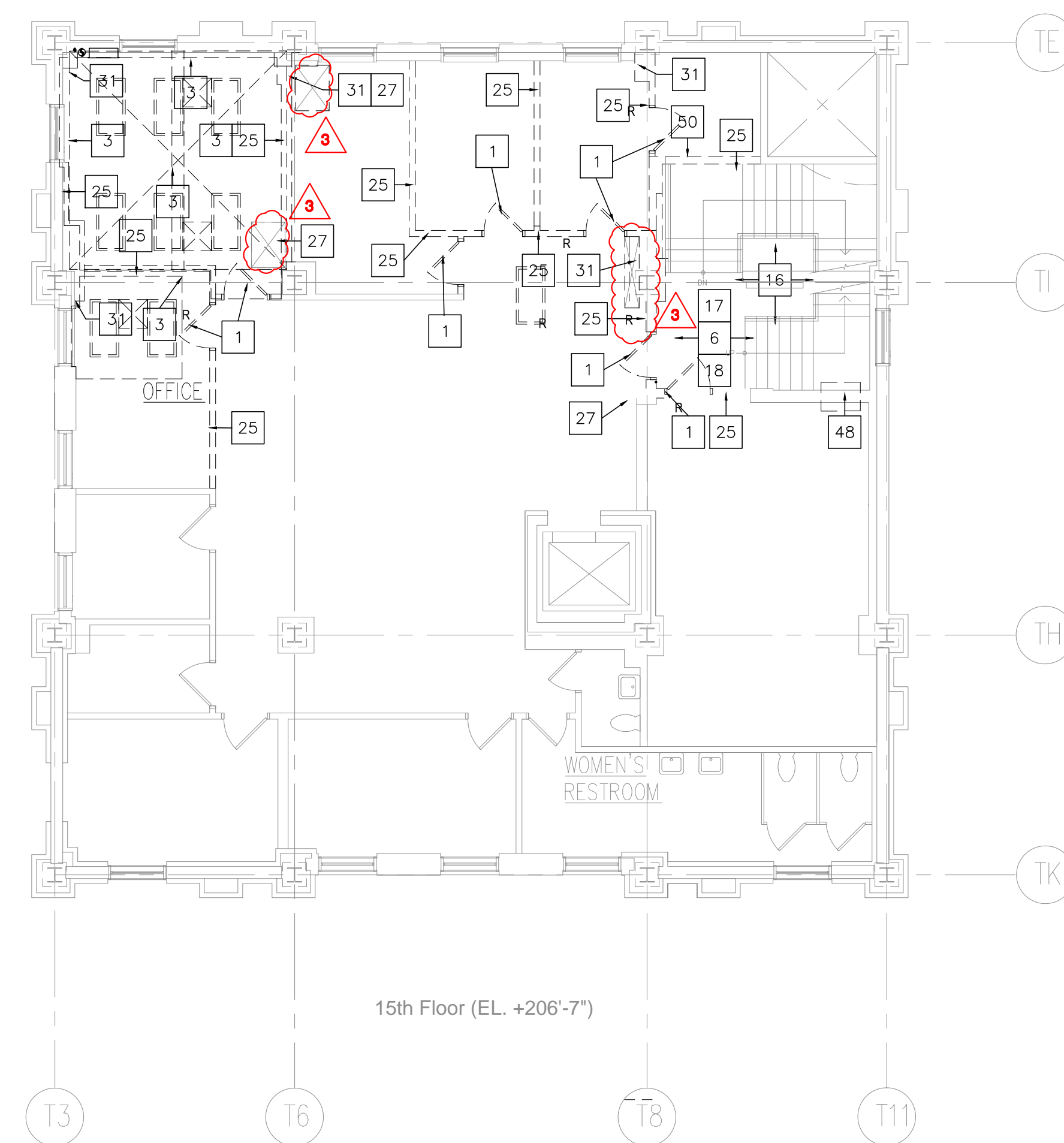
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- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10 REMOVE EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR. SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVE EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES & ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23 EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24 RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS.
- 27 PROVIDE FLOOR OPENING FOR NEW DUCT OPENINGS; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNCLOGGED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTRM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWGS. INFILL PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF.
- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS. SEE MECH'L DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCENIC LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.

- 41 RELOCATE EXISTING CAMERA
- 42 N/A
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLOCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS. REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47 REMOVED, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACOUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 48 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.
- 49 EXISTING AIR HANDLING UNIT TO BE RELOCATED. PROVIDE NEW SUPPORTS ON EXISTING STRUCTURAL. REFER TO MEP DWGS.
- 50 PROVIDE CORE DRILL HOLE FOR MECHANICAL PIPINGS SEE MECH DRAWINGS.
- 51 SAW CUT EXISTING GYPSUM BOARD CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE) RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH TO MATCH EXISTING.
- 52 EXISTING ACOUSTICAL CEILING TO BE REMOVED AND REPLACED TO RECEIVE NEW SPRINKLERS.

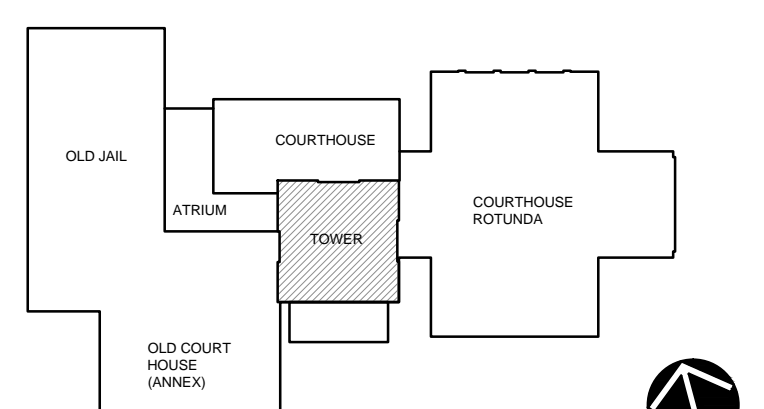


1 FOURTEENTH FLOOR DEMOLITION PLAN
SCALE: 1/8"=1'-0"



2 FIFTEENTH FLOOR DEMOLITION PLAN
SCALE: 1/8"=1'-0"

KEYPLAN



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PROJECT:

UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

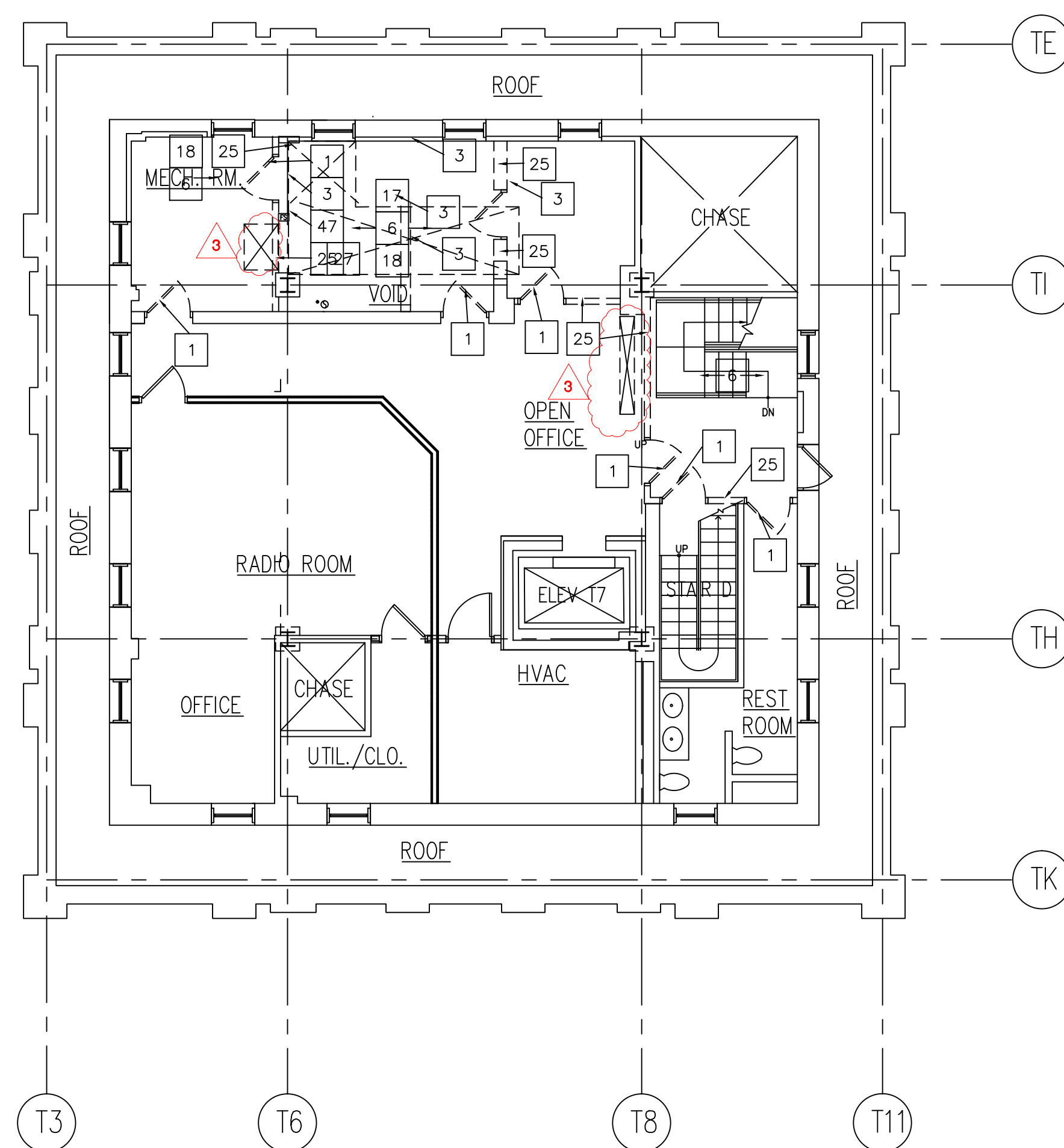
SHEET CONTENTS:

FOURTEENTH & FIFTEENTH FLOOR DEMOLITION PLAN

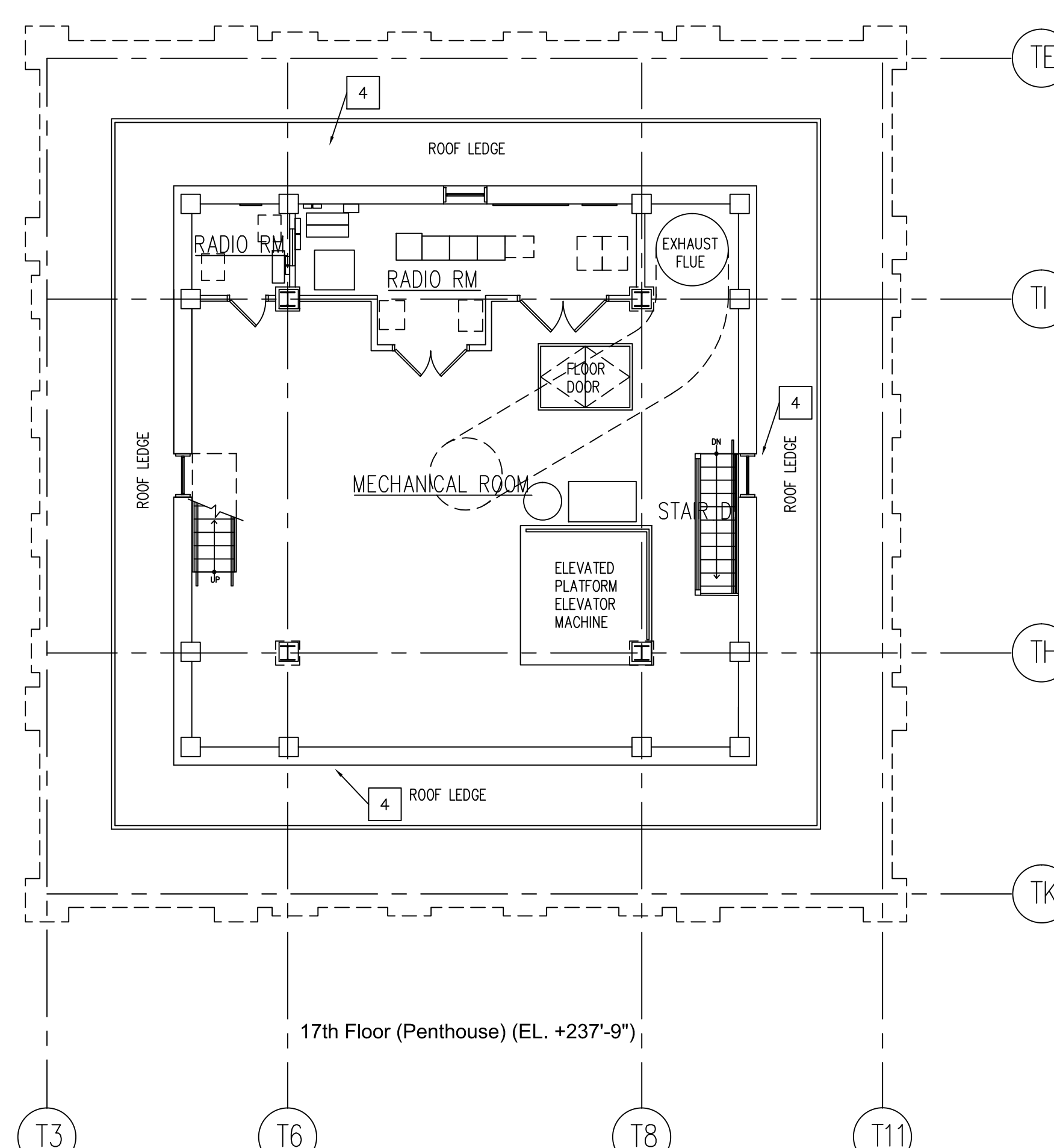
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10.30.15	95% SUBMISSION	KD	FM						
05.31.17	100% SUBMISSION	MC	FM						
08.30.17	ISSUED FOR BID	MC	FM						
11.6.17	ADDENDUM#3	MC	FM						

DRAWN BY	BT
CHKD BY	NJN
JOB NO	2141151
SHEET:	37 OF: 160
DWG NO	

D.112



1 SIXTEENTH FLOOR DEMOLITION PLAN
SCALE: 1/8"=1'-0"



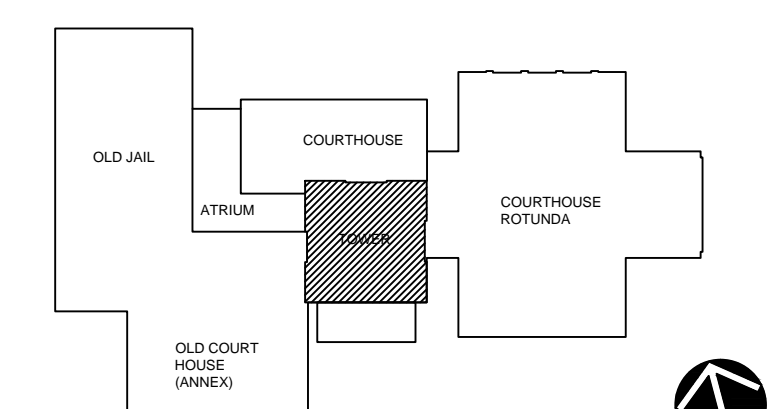
2 PENTHOUSE FLOOR DEMOLITION PLAN
SCALE: 1/8"=1'-0"

DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXISTING WINDOW SYSTEM.
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR. CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE UP EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10 REMOVE EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS. MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DIACIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVE EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
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- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23 EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
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- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS.
- 27 PROVIDE FLOOR OPENING FOR NEW DUCT OPENINGS. CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
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- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCENIC LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.

- 41 RELOCATE EXISTING CAMERA
- 42 N/A
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLOCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47 REMOVE, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACCUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 48 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.
- 49 EXISTING AIR HANDLING UNIT TO BE RELOCATED. PROVIDE NEW SUPPORTS ON EXISTING STRUCTURAL. REFER TO MEP DWGS.
- 50 PROVIDE CORE DRILL HOLE FOR MECHANICAL PIPINGS SEE MECH DRAWINGS.
- 51 SAW CUT EXISTING GYPSUM BOARD CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE) RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH TO MATCH EXISTING.
- 52 EXISTING ACCUSTICAL CEILING TO BE REMOVED AND REPLACED TO RECEIVE NEW SPRINKLERS.

KEYPLAN



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PROJECT:

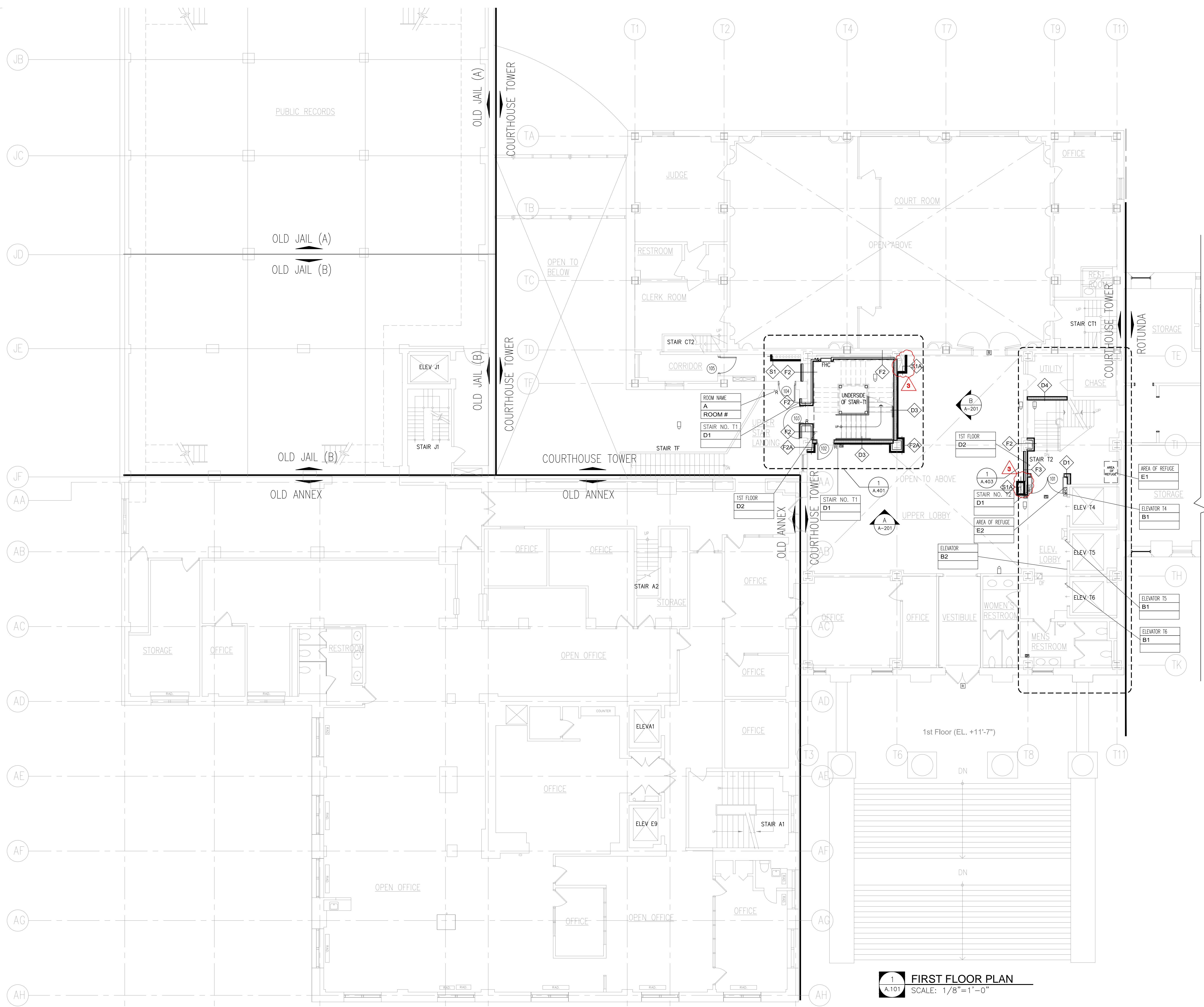
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

SIXTEENTH & PENTHOUSE FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	BT
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	NUN
05.31.17	100% SUBMISSION	MC	FM					JOB NO.	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	38 OF:160
11.6.17	ADDENDUM#3	MC	FM					DWG NO	

D.113



- ### GENERAL NOTES
- NEW 2HR RATED WALL
 - REPLACE EXISTING DOOR & REVERSE SWING.
 - INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING EQUIREMENTS. REFER TO PARTITION TYPE S1A
 - ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
 - CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
 - NEW STEEL STAIR, RAILINGS AND PLATFORM.
 - N.A
 - NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
 - NEW MECH'L. DUCTS OPENING-REFER TO A.401 THRU A4.06 AND MECHANICAL DWGS.
 - COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
 - N.A
 - PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
 - NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
 - DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC. TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
 - GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

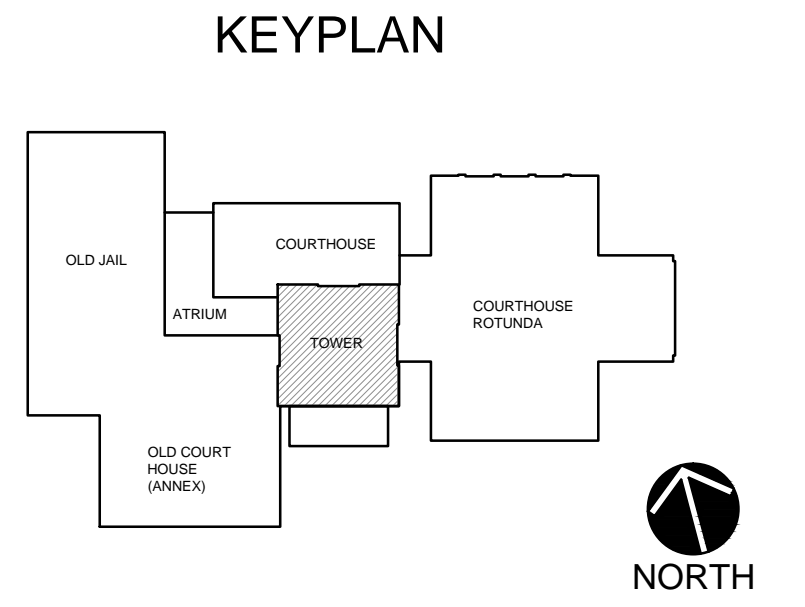
LEGEND

	ROOM ID SIGN
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W-1	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
#	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
📹	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

1 FIRST FLOOR PLAN
SCALE: 1/8"=1'-0"



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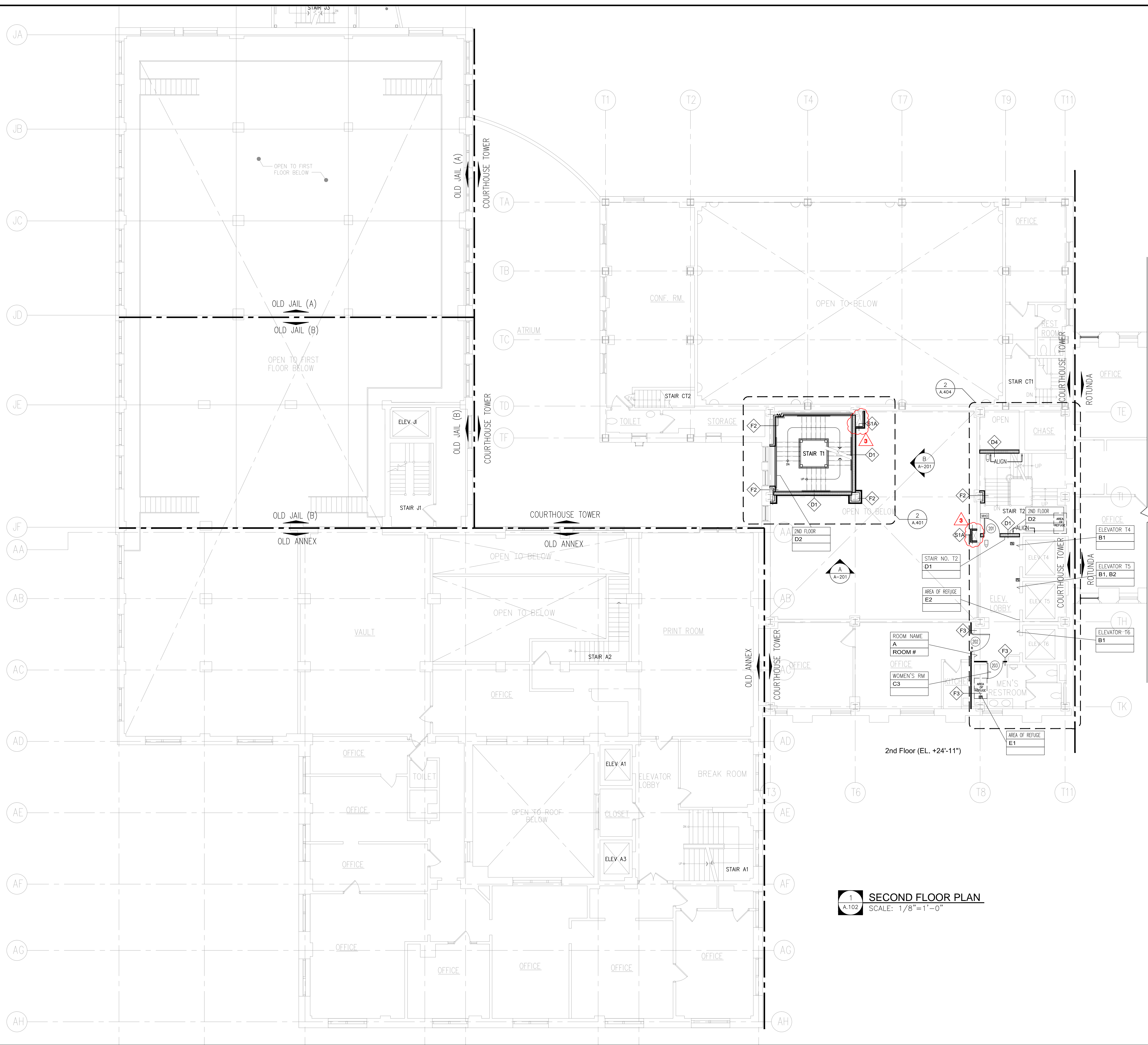


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FIRST FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 41 OF: 160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

A.101

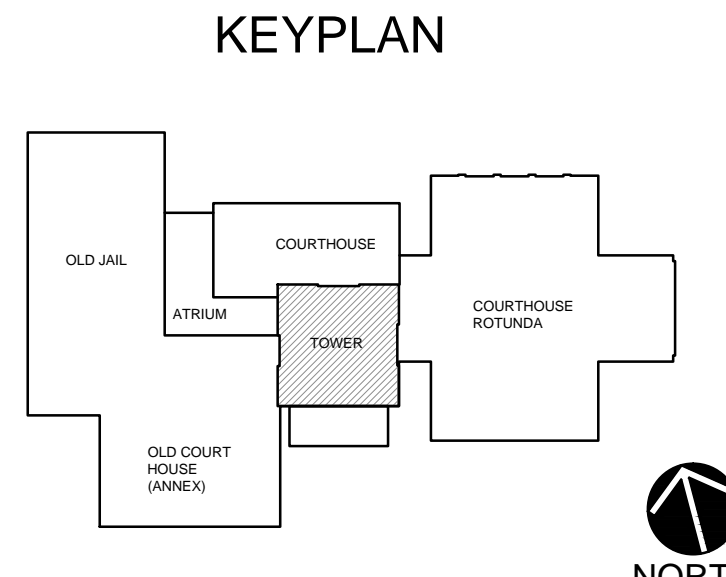


1
A.102 **SECOND FLOOR PLAN**
SCALE: 1/8"=1'-0"

- GENERAL NOTES**
- NEW 2HR RATED WALL
 - REPLACE EXISTING DOOR & REVERSE SWING.
 - INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
 - ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
 - CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHED TO MATCH ADJACENT SURFACES TO MAINTAIN FIRE RATING REQUIREMENTS.
 - NEW STEEL STAIR, RAILINGS AND PLATFORM.
 - NA
 - NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
 - NEW MECH'L DUCTS OPENING-REFER TO A.401 THRU A4.06 AND MECHANICAL DWGS.
 - COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
 - NA
 - PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
 - NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
 - DIAGRAMATIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
 - GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND	
	ROOM ID SIGN
A	ROOM #
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS	
#	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
CC	SECURITY VIDEO CAMERA
R	CARD READER
RK	CARD READER AND KEY PAD
MH	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH



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NJ License No. AI 14394

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1094 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0098 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

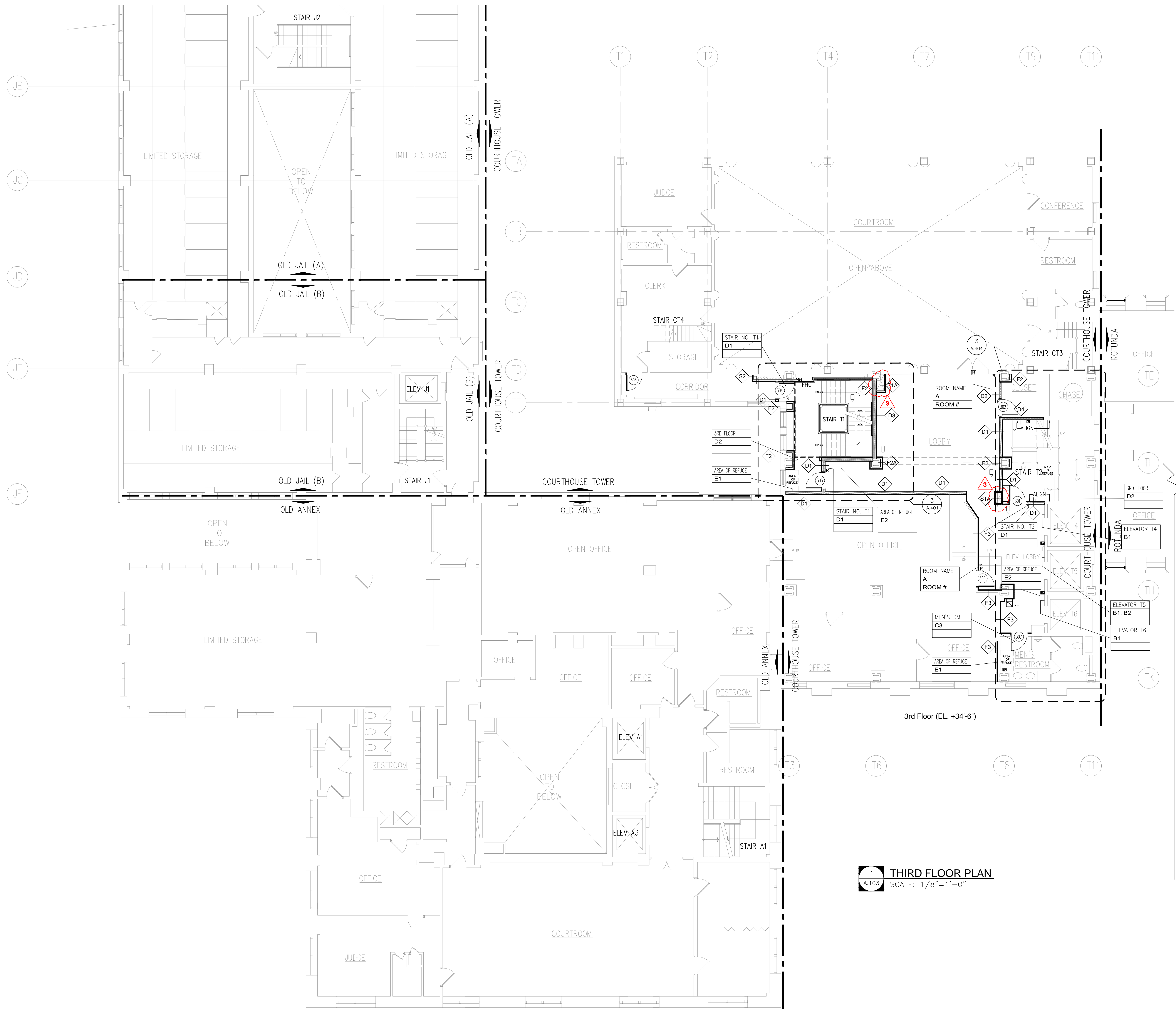
PROJECT:
**UC COURTHOUSE
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2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
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10.30.15	95% SUBMISSION	KD	FM						
05.31.17	100% SUBMISSION	MC	FM						
08.30.17	ISSUED FOR BID	MC	FM						
11.6.17	ADDENDUM#3	MC	FM						

DRAWN BY	
CHKD BY	NJN
JOB NO	2141151
SHEET:	42 OF 160
DWG NO	

A.102



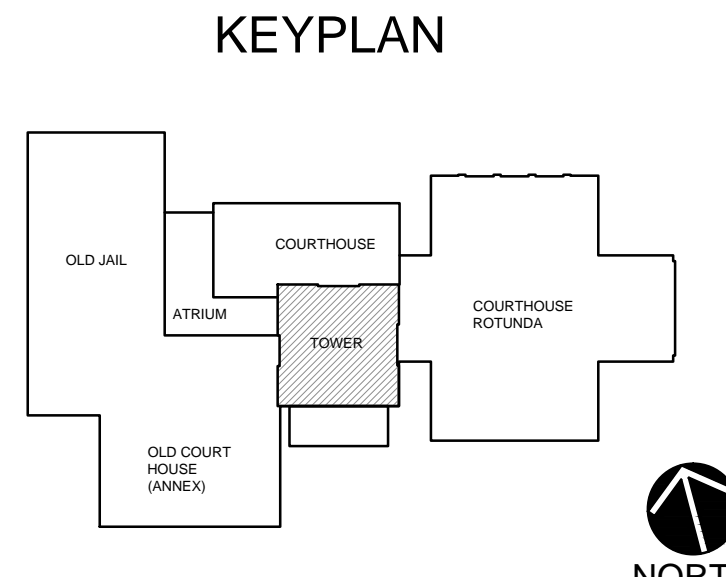
GENERAL NOTES

1. NEW 2HR RATED WALL
2. REPLACE EXISTING DOOR & REVERSE SWING.
3. INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHED TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
7. N.A
8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
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12. PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
13. NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
14. DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC. TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND	
	ROOM ID SIGN
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS	
#	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
CV	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

1 THIRD FLOOR PLAN
SCALE: 1/8"=1'-0"



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NJ License No. AI 12541

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NJ License No. AI 12118

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NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

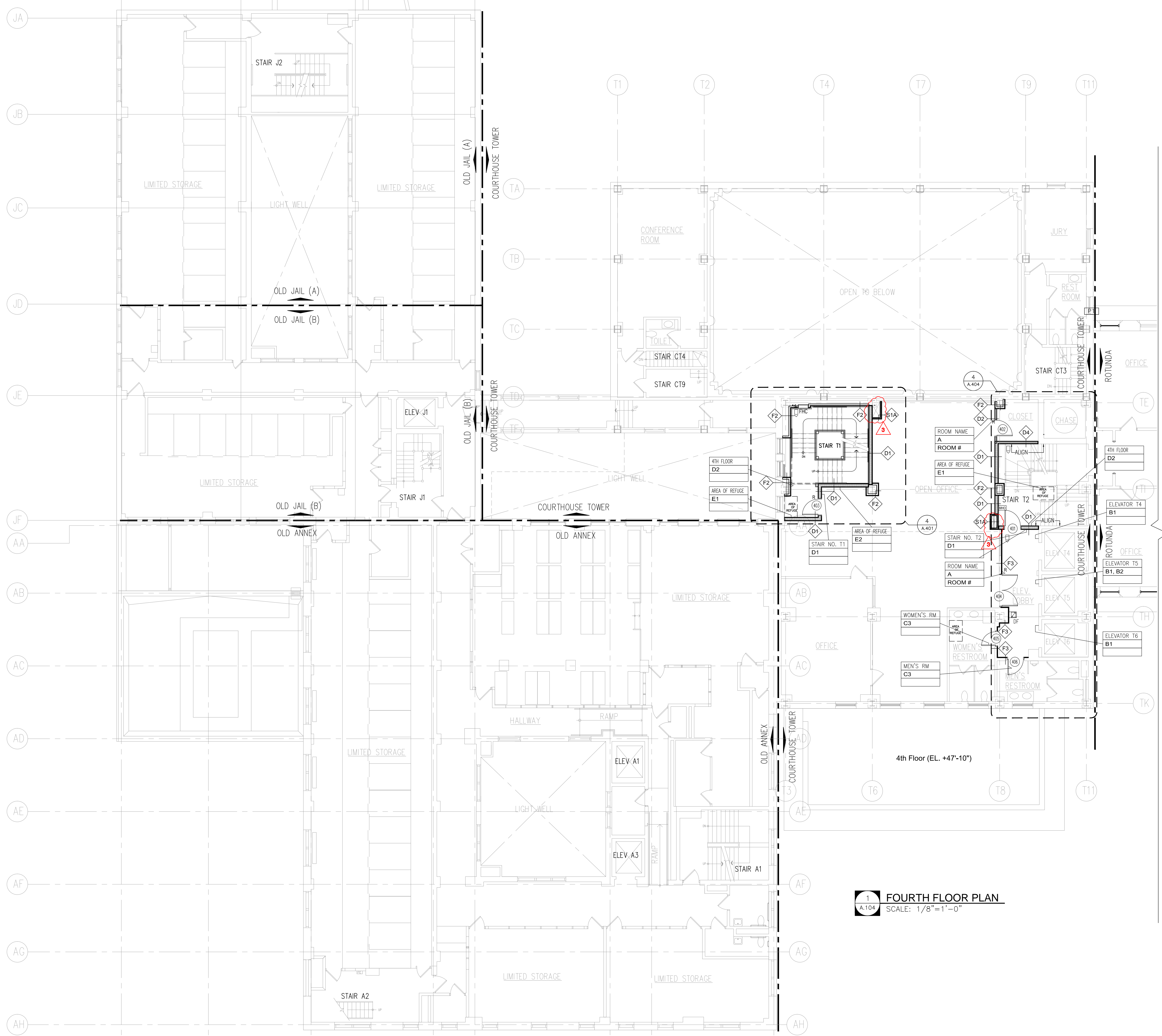


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
THIRD FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	10-10-15 AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 43 OF: 160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

A.103



GENERAL NOTES

1. NEW 2HR RATED WALL.
2. REPLACE EXISTING DOOR & REVERSE SWING.
3. INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A.
4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
7. N/A
8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
9. NEW MECH'L DUCTS OPENING-REFER TO A-401 THRU A-406 AND MECHANICAL DWGS.
10. COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
11. N/A
12. PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
13. NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
14. DIAGRAMATIC EGRESS STAIR REQUIRED BY CODE, GC, TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND

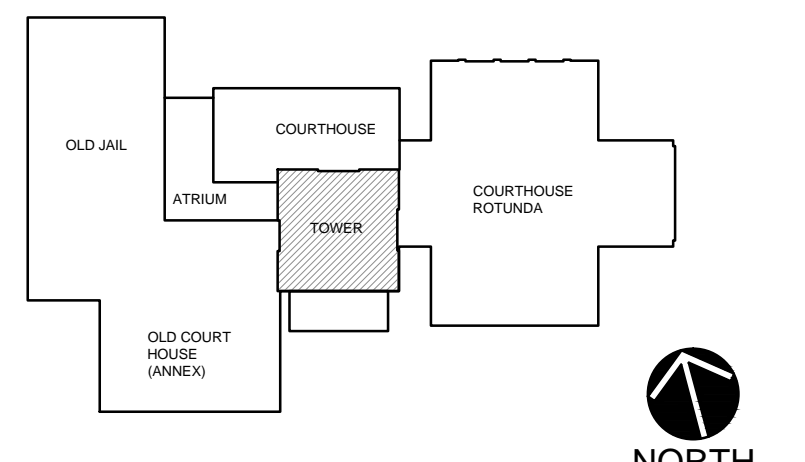
	ROOM ID SIGN
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

Ⓢ	CONSTRUCTION KEYNOTES REFER TO DWG.
Ⓜ	WINDOW TAG, REFER TO DWG. A301 FOR WINDOW SCHEDULE.
Ⓝ	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
📹	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

1 FOURTH FLOOR PLAN
A.104 SCALE: 1/8"=1'-0"

KEYPLAN



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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



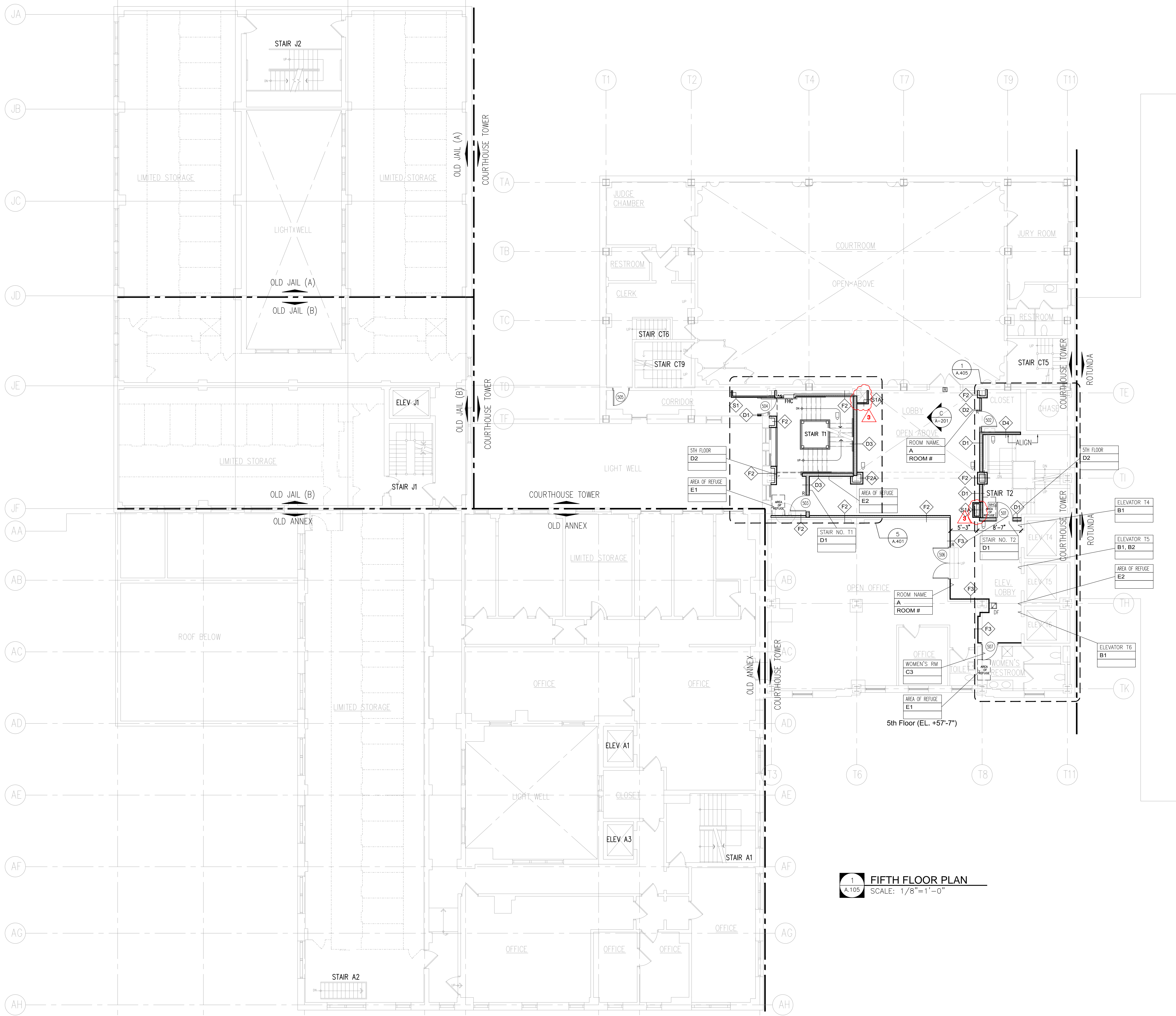
PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FOURTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	10-10-15
04.02.15	DD SUBMISSION	KD	FM					AS SHOWN	
10.30.15	95% SUBMISSION	KD	FM						
05.31.17	100% SUBMISSION	MC	FM						
08.30.17	ISSUED FOR BID	MC	FM						
11.6.17	ADDENDUM#3	MC	FM						

DRAWN BY: BT
CHKD BY: NJN
JOB NO: 2141151
SHEET: 44 OF 160
DWG NO:

A.104



GENERAL NOTES

1. NEW 2HR RATED WALL.
2. REPLACE EXISTING DOOR & REVERSE SWING.
3. INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHED TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
7. N.A.
8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
9. NEW MECH'L DUCTS OPENING-REFER TO A.401 THRU A.406 AND MECHANICAL DWGS.
10. COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
11. N.A.
12. PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
13. NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
14. DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

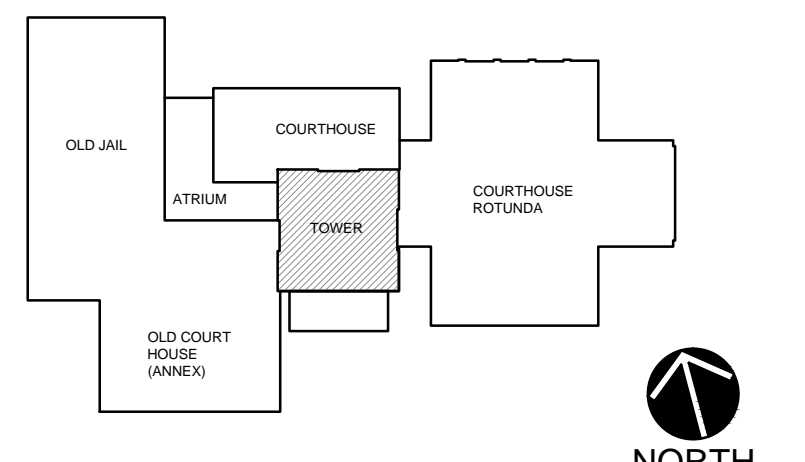
LEGEND

	ROOM ID SIGN
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

##	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
CV	SECURITY VIDEO CAMERA
R	CARD READER
RK	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

KEYPLAN



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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, CAP
NJ License No. AI 14394

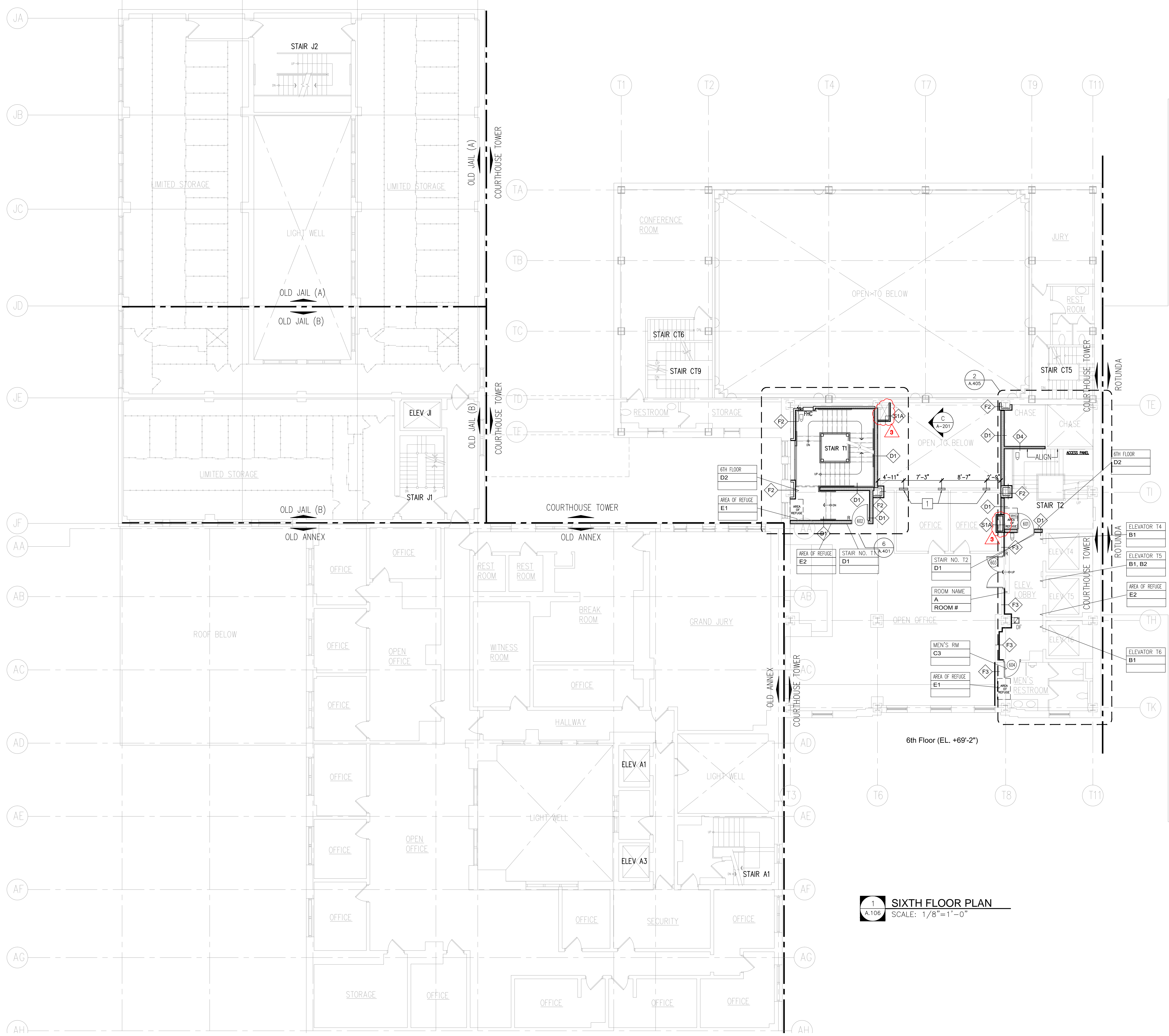
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0098 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FIFTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 45 OF: 160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

A.105



GENERAL NOTES

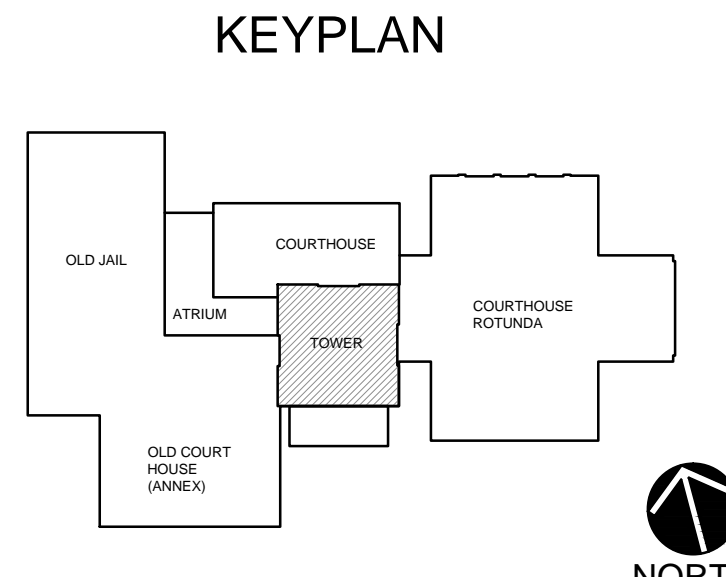
1. NEW 2HR RATED WALL
2. REPLACE EXISTING DOOR & REVERSE SWING.
3. INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL, UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
7. N.A.
8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
9. NEW MECH'L. DUCTS OPENING-REFER TO A 401 THRU A 406 AND MECHANICAL DWGS.
10. COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
11. N.A.
12. PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
13. NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
14. DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC. TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND	
ROOM ID SIGN	A
ELEVATOR ID SIGN	B1
RESTROOM ID SIGN	C
STAIR/EXIT ID SIGN	D
AREA OF REFUGE ID SIGN	E
CHASE ACCESS ID SIGN	F

SYMBOLS	
#	CONSTRUCTION KEYNOTES REFER TO DWG.
#	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
#	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
📹	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

CONSTRUCTION KEY NOTES:

1 PROVIDE NEW WALL OPENING FOR NEW MECH. GRILLES, REFER TO M-406.



1 SIXTH FLOOR PLAN
SCALE: 1/8"=1'-0"

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MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

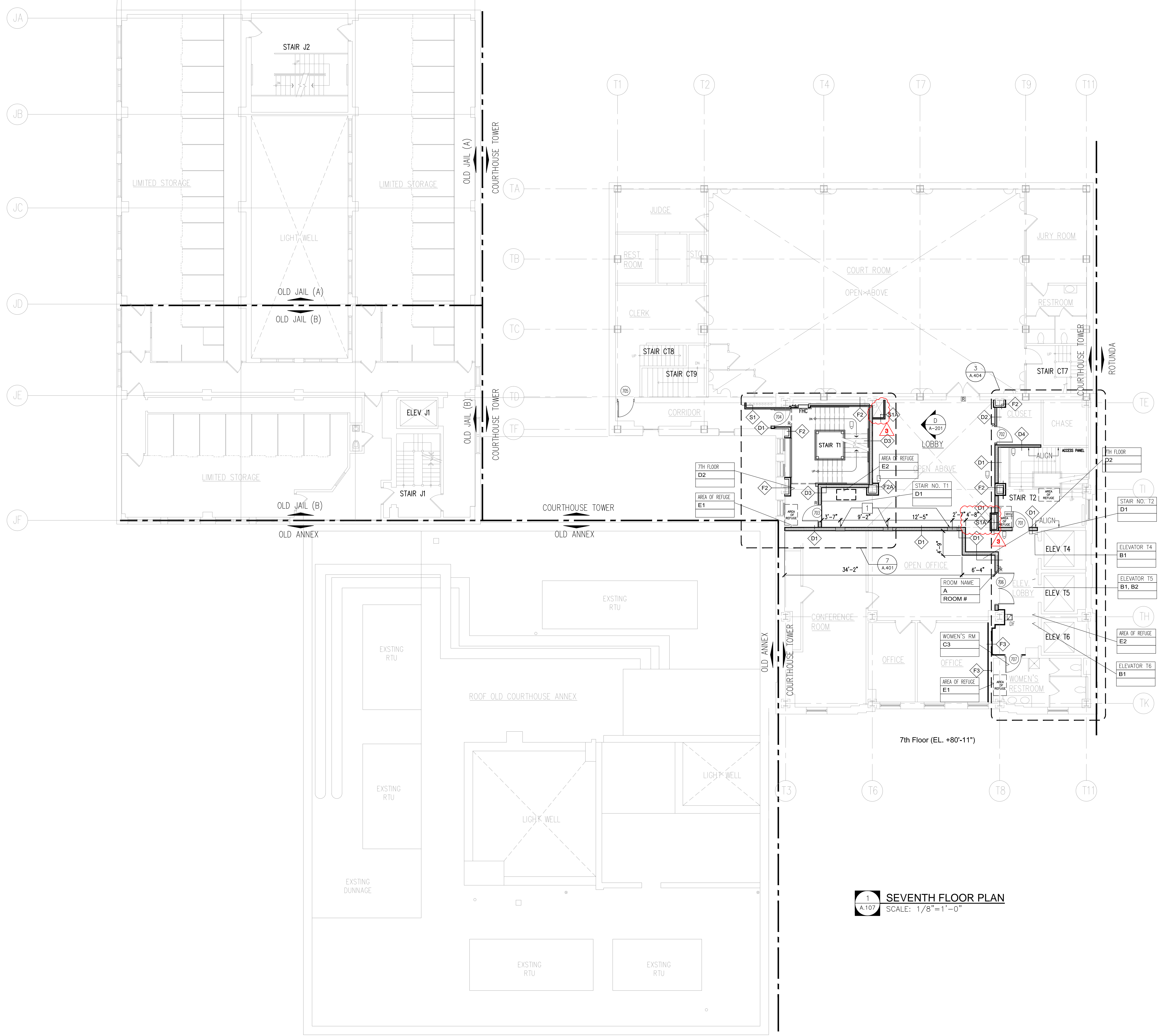


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SIXTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	BT
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	NJN
05.31.17	100% SUBMISSION	MC	FM					JOB NO	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	46 OF: 160
11.6.17	ADDENDUM#3	MC	FM					DWG NO	

A.106



1
A.107
SEVENTH FLOOR PLAN
SCALE: 1/8"=1'-0"

GENERAL NOTES

1. NEW 2HR RATED WALL
2. REPLACE EXISTING DOOR & REVERSE SWING.
3. INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
7. N.A
8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
9. NEW MECH'L DUCTS OPENING-REFER TO A-401 THRU A-06 AND MECHANICAL DWGS.
10. COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
11. N.A
12. PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
13. NEW LOUVER W/ REMOVABLE PANEL REFER TO A301.
14. DIAGRAMATIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

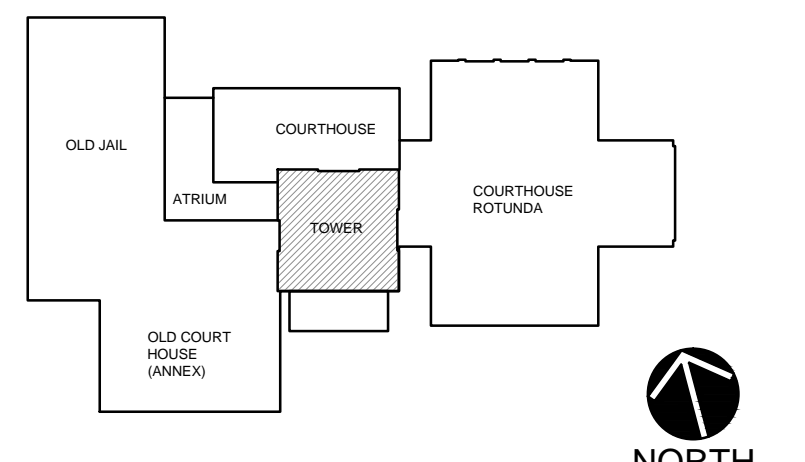
LEGEND	
	ROOM ID SIGN
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS	
#	CONSTRUCTION KEYNOTES REFER TO DWG.
W-#	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
#	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
📹	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

CONSTRUCTION KEY NOTES:

1 PROVIDE NEW WALL OPENING FOR NEW MECH. GRILLES, REFER TO M-407.

KEYPLAN



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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

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NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
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CERTIFICATE OF AUTHORIZATION AC-438

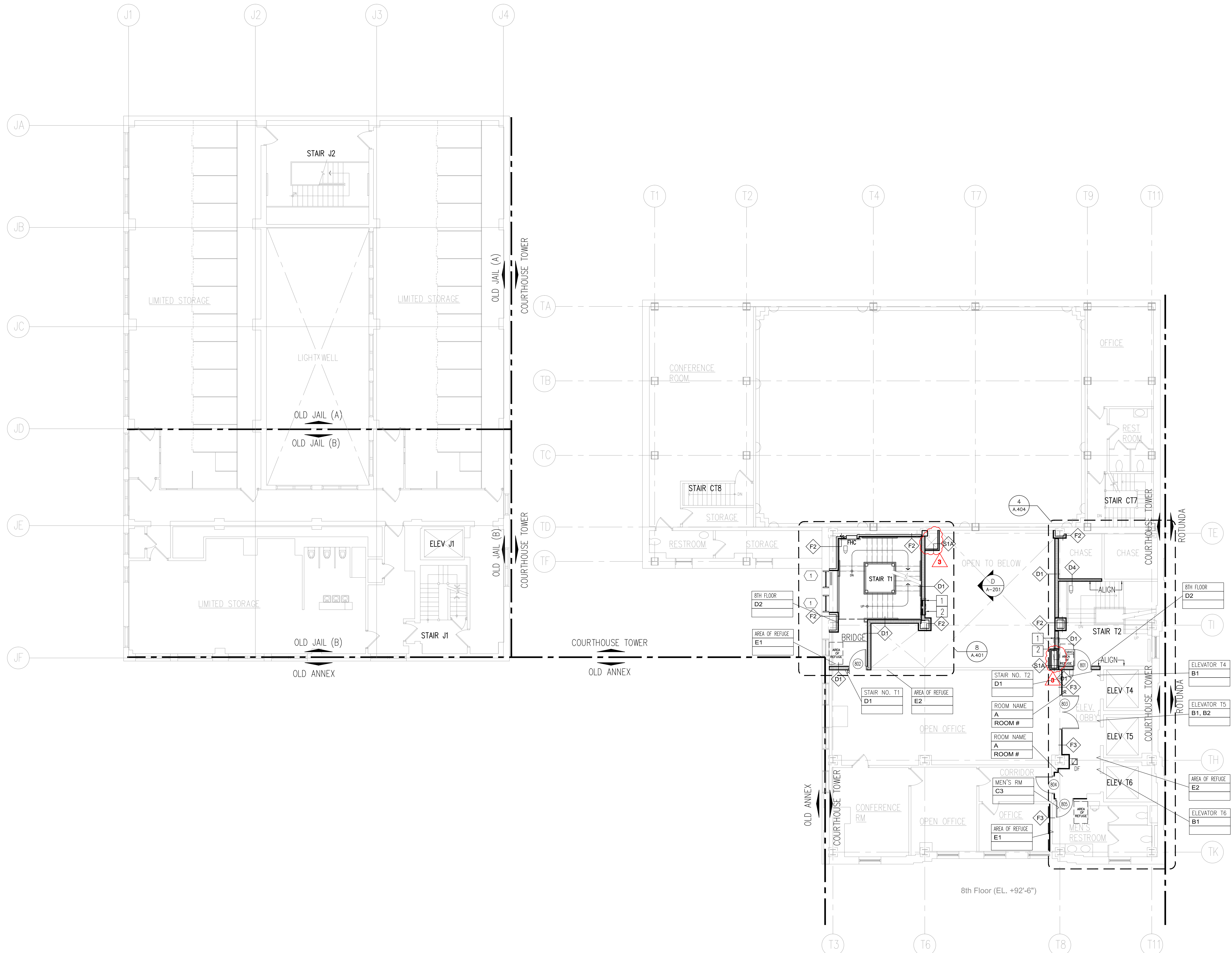
PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SEVENTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						
10.30.15	95% SUBMISSION	KD	FM						
05.31.17	100% SUBMISSION	MC	FM						
08.30.17	ISSUED FOR BID	MC	FM						
11.6.17	ADDENDUM#3	MC	FM						

DRAWN BY: BT
CHKD BY: NJN
JOB NO: 2141151
SHEET: 47 OF: 160
DWG NO:

A.107



GENERAL NOTES

1. NEW 2HR RATED WALL.
2. REPLACE EXISTING DOOR & REVERSE SWING.
3. INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE STA
4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
7. N.A.
8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
9. NEW MECH'L. DUCTS OPENING-REFER TO A.401 THRU A4.06 AND MECHANICAL DWGS.
10. COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
11. N.A.
12. PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
13. NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
14. DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND

ROOM ID SIGN
A
RM. #
A
B
C
D
E
F

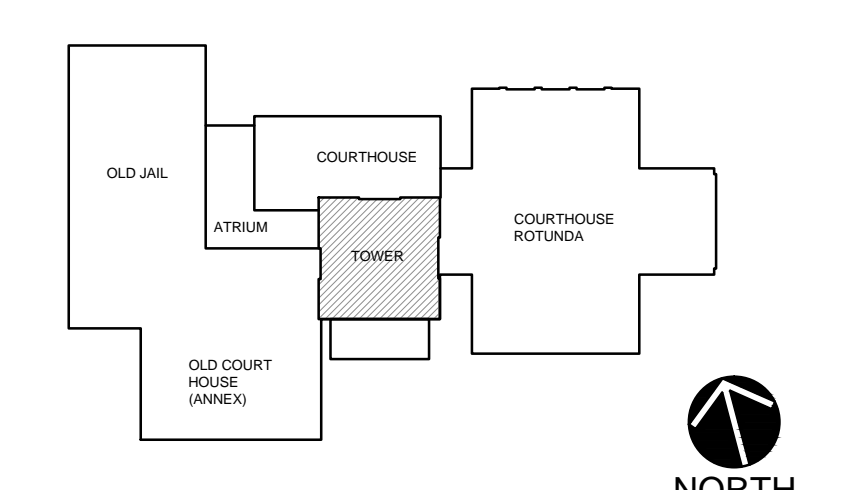
SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
CV	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

CONSTRUCTION KEY NOTES:

- 1 COORDINATE & PROVIDE NEW OPENING FOR NEW 48"x24" RG-2. REFER TO M-408.
- 2 PROVIDE NEW OPENING FOR 32"x16" RETURN GRILLE W/ RELIEF DAMPER. REFER TO M-408.

KEYPLAN



1 EIGHTH FLOOR PLAN
SCALE: 1/8"=1'-0"

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MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

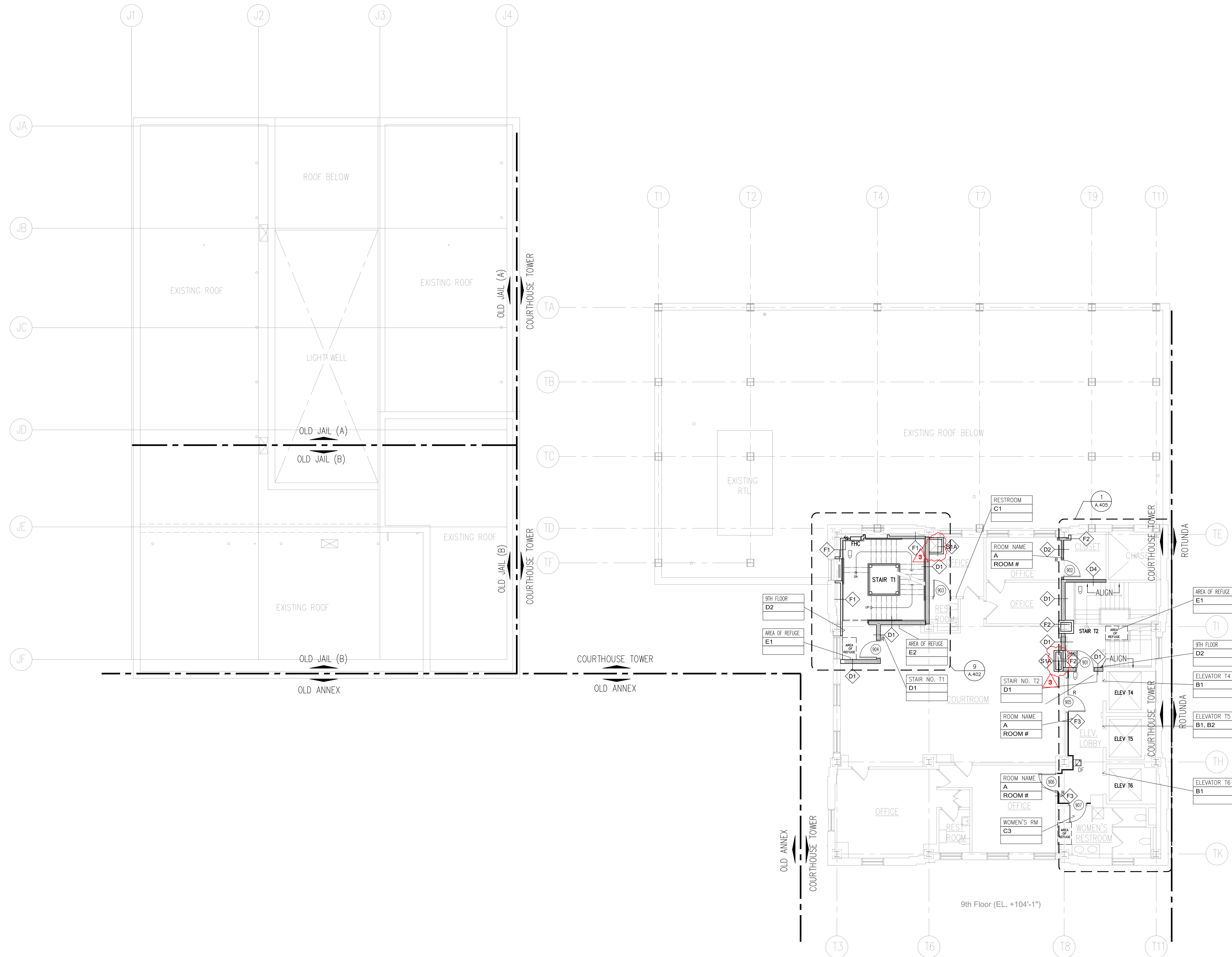
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ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 29 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0098 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
EIGHTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	BT
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	NJN
05.31.17	100% SUBMISSION	MC	FM					JOB NO	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	48 OF: 160
11.6.17	ADDENDUM#3	MC	FM					DWG NO	

A.108



GENERAL NOTES

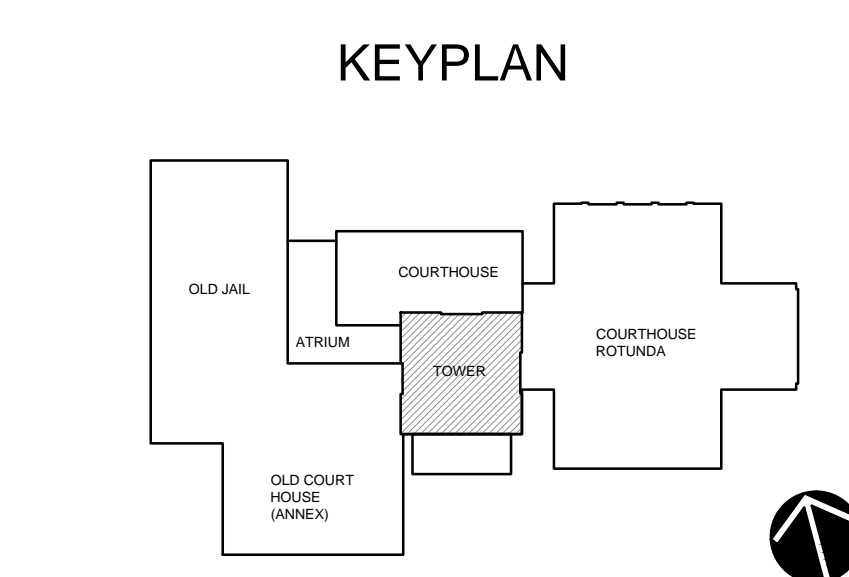
1. NEW 2HR RATED WALL.
2. REPLACE EXISTING DOOR & REVERSE SWING.
3. INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING EQUIREMENTS. REFER TO PARTITION TYPE S1A
4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED, & FINISHED TO MATCH ADJACENT SURFACES TO MAINTAIN FIRE RATING REQUIREMENTS.
6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
7. NA
8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
9. NEW MECH'L. DUCTS OPENING-REFER TO A-401 THRU A4.06 AND MECHANICAL DWGS.
10. COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
11. NA
12. PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
13. NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
14. DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC. TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND

ROOM ID SIGN	ROOM #
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

##	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
CC	SECURITY VIDEO CAMERA
R	CARD READER
CR	CARD READER AND KEY PAD
MHC	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH



1 NINTH FLOOR PLAN
SCALE: 1/8"=1'-0"

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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

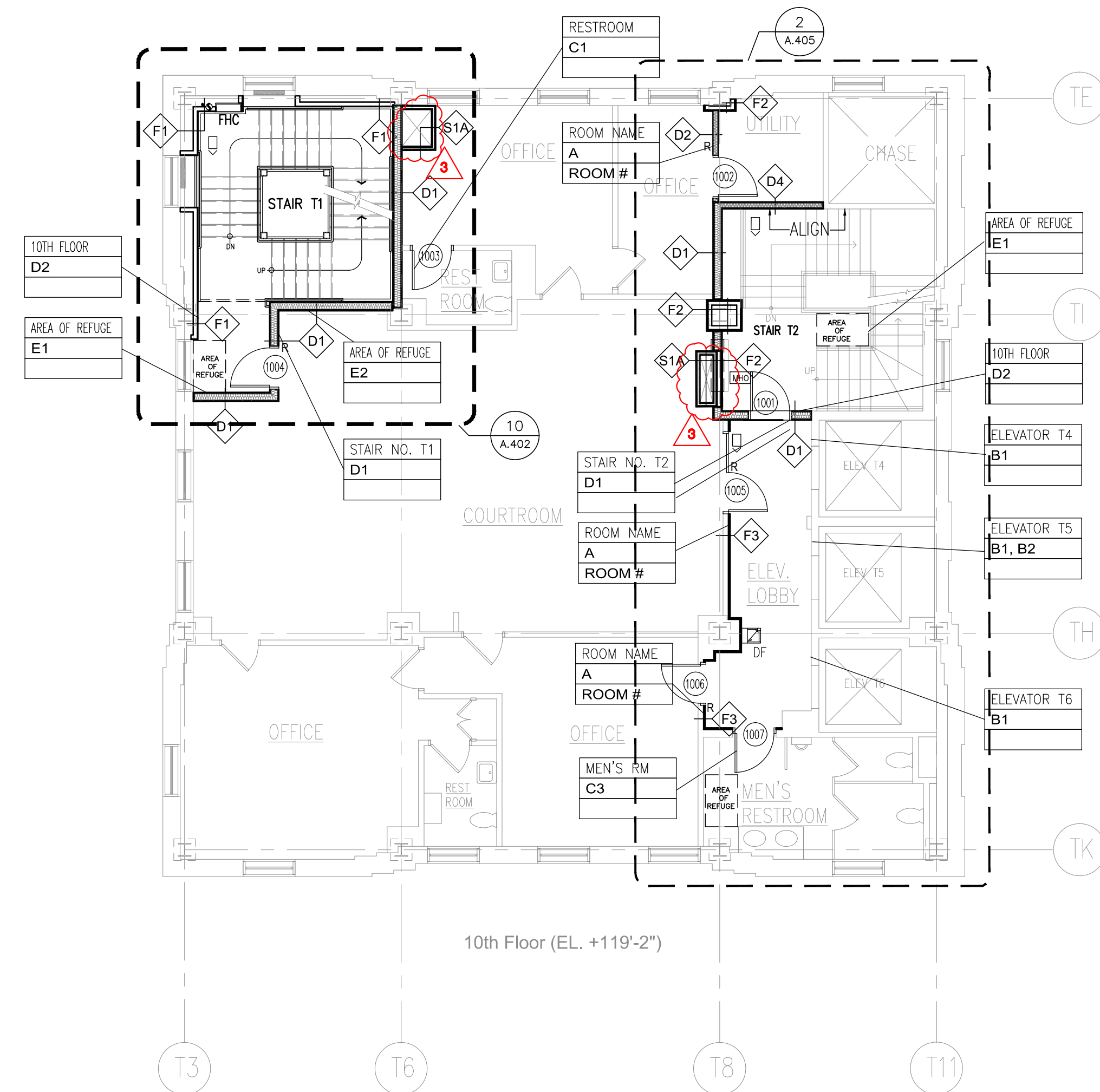


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

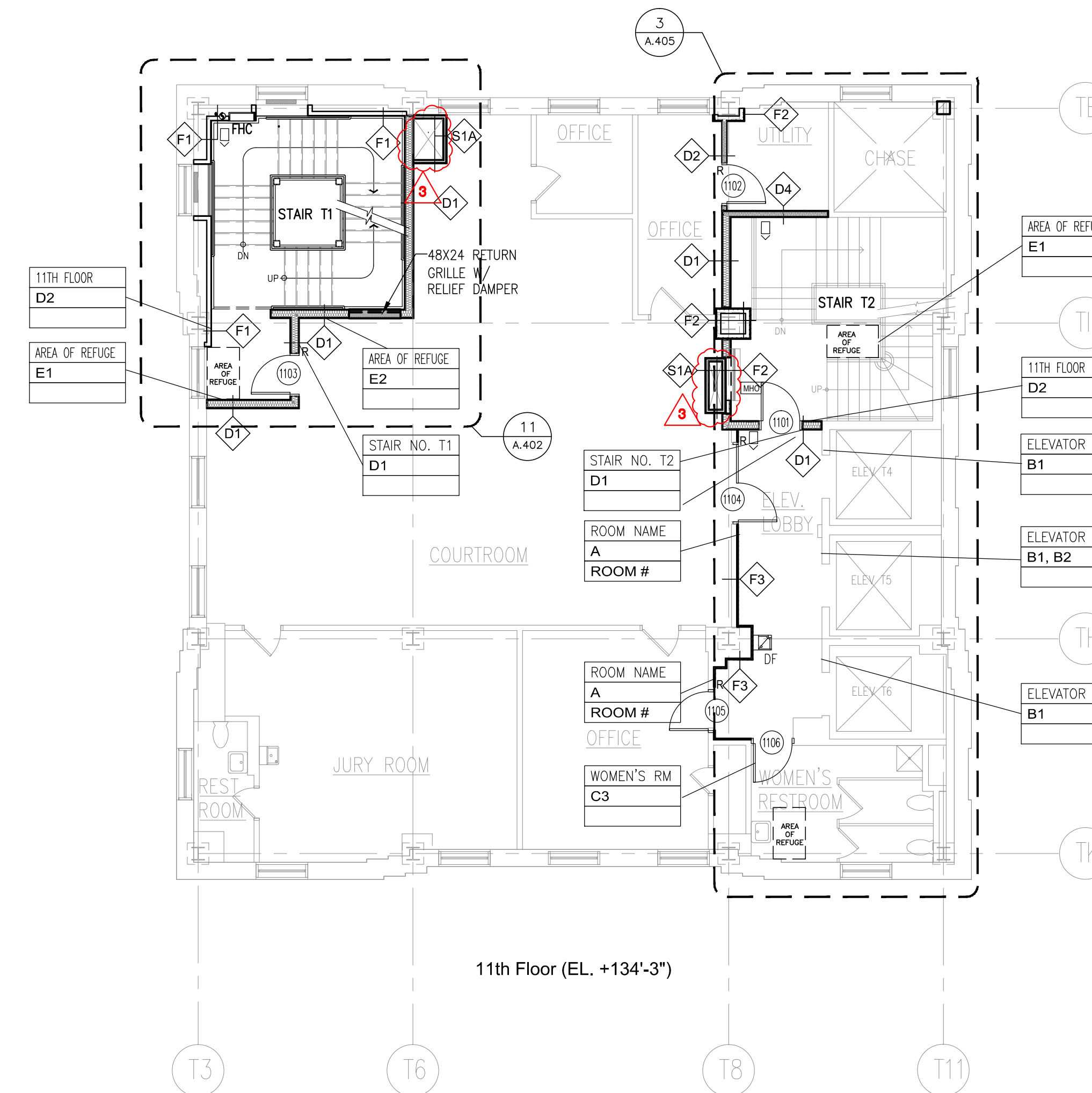
SHEET CONTENTS:
NINTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 49 OF: 160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

A.109



1 TENTH FLOOR PLAN
SCALE: 1/8"=1'-0"



2 ELEVENTH FLOOR PLAN
SCALE: 1/8"=1'-0"

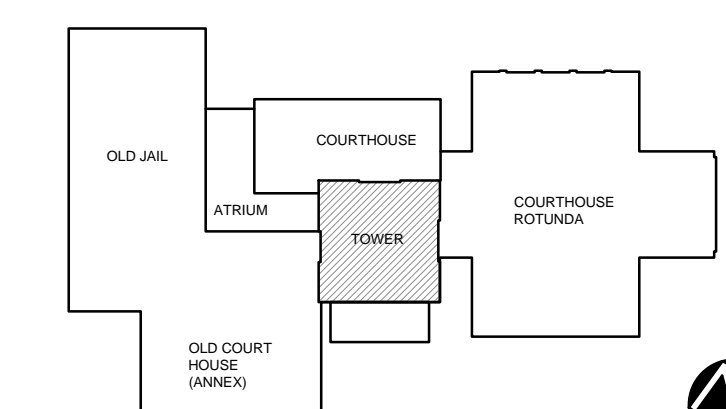
GENERAL NOTES

1. NEW 2HR RATED WALL.
2. REPLACE EXISTING DOOR & REVERSE SWING.
3. INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING EQUIVALENTS. REFER TO PARTITION TYPE S14.
4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENINGS IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENINGS SHALL BE PATCHED, REPAIRED & FINISHED TO MATCH ADJACENT SURFACES TO MAINTAIN FIRE RATING REQUIREMENTS.
6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
7. N/A
8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
9. NEW MECH'L DUCTS OPENING-REFER TO A-401 THRU A-406 AND MECHANICAL DWGS.
10. COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
11. N/A
12. PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
13. NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
14. DIAGRAMATIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND	
	ROOM ID SIGN
A	ROOM #
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS	
##	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
CC	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHC	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

KEYPLAN



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NJ License No. AI 16160

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PROJECT:

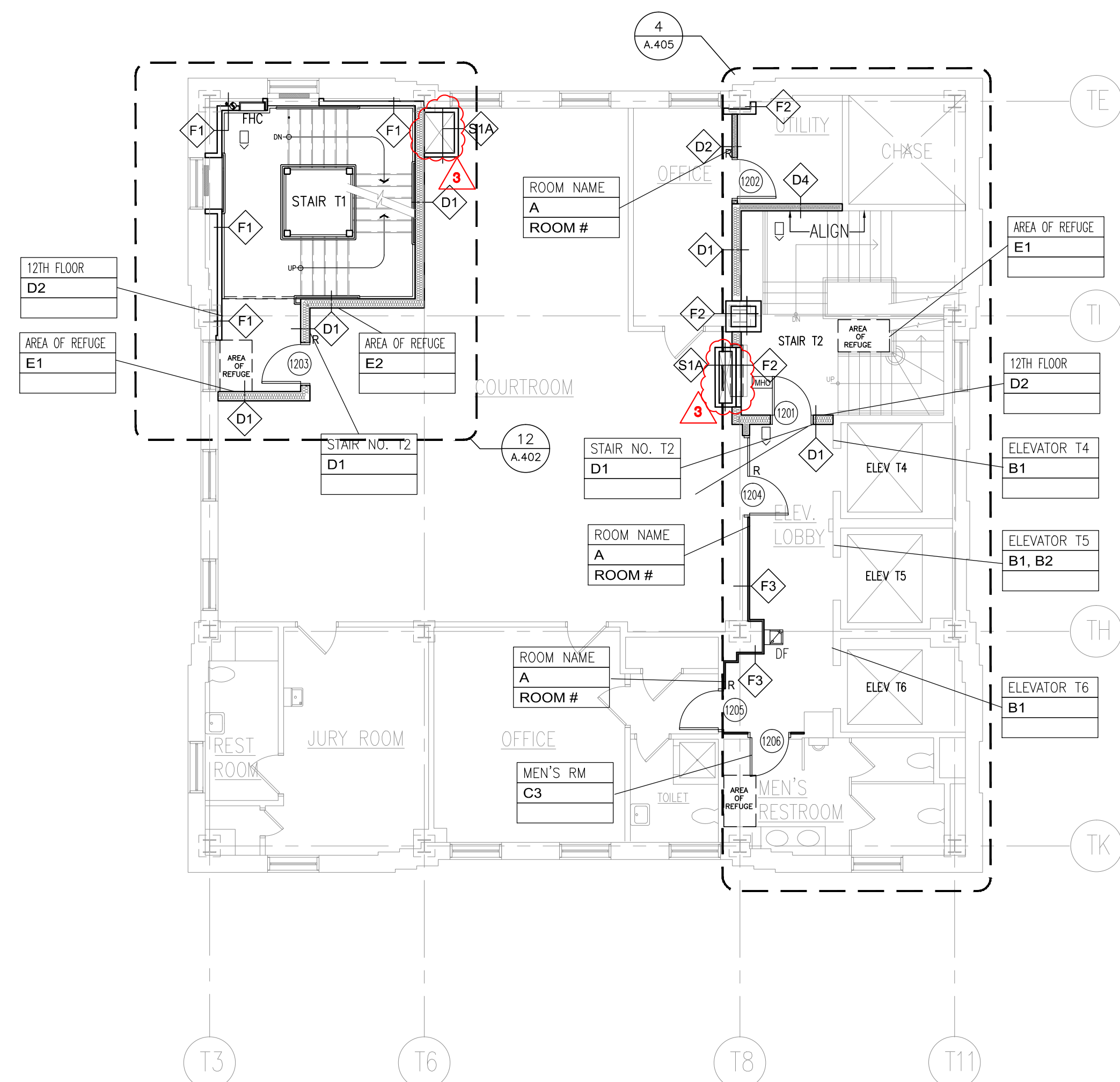
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

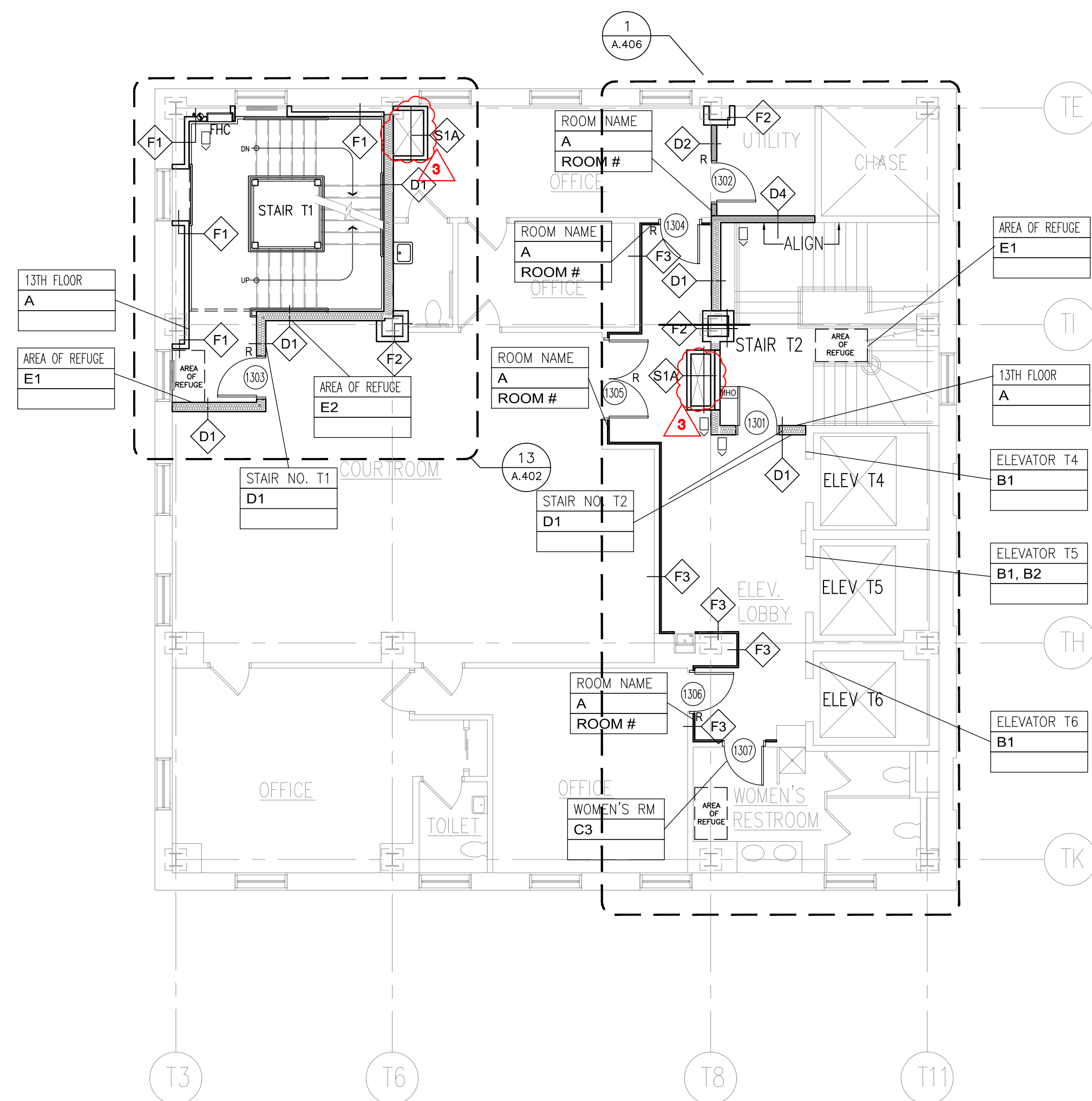
TENTH & ELEVENTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 50 OF: 160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

A.110



1 TWELFTH FLOOR PLAN
SCALE: 1/8"=1'-0"



2 THIRTEENTH FLOOR PLAN
SCALE: 1/8"=1'-0"

CONSTRUCTION KEYNOTES
GENERAL NOTES

1. NEW 2HR RATED WALL
2. REPLACE EXISTING DOOR & REVERSE SWING.
3. INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING EQUIREMENTS. REFER TO PARTITION TYPE STA
4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENINGS IN WALL UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENINGS SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACES TO MAINTAIN FIRE RATING REQUIREMENTS.
6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
7. N/A
8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
9. NEW MECH'L DUCTS OPENING-REFER TO A-401 THRU A-08 AND MECHANICAL DWGS.
10. COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
11. N/A
12. PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
13. NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
14. DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

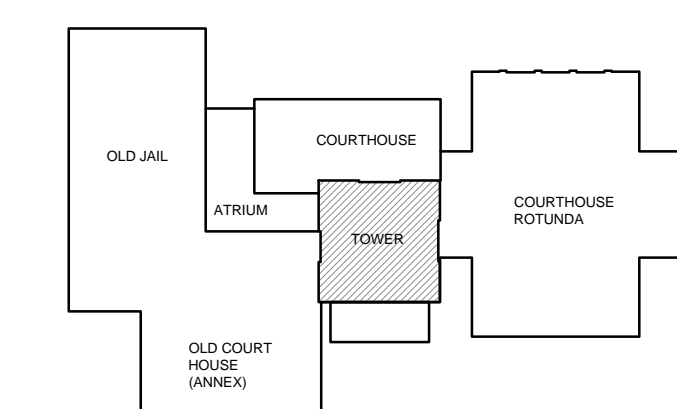
LEGEND

	ROOM ID SIGN
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
CV	SECURITY VIDEO CAMERA
R	CARD READER
RK	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

KEYPLAN



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NJ License No. AI 16160

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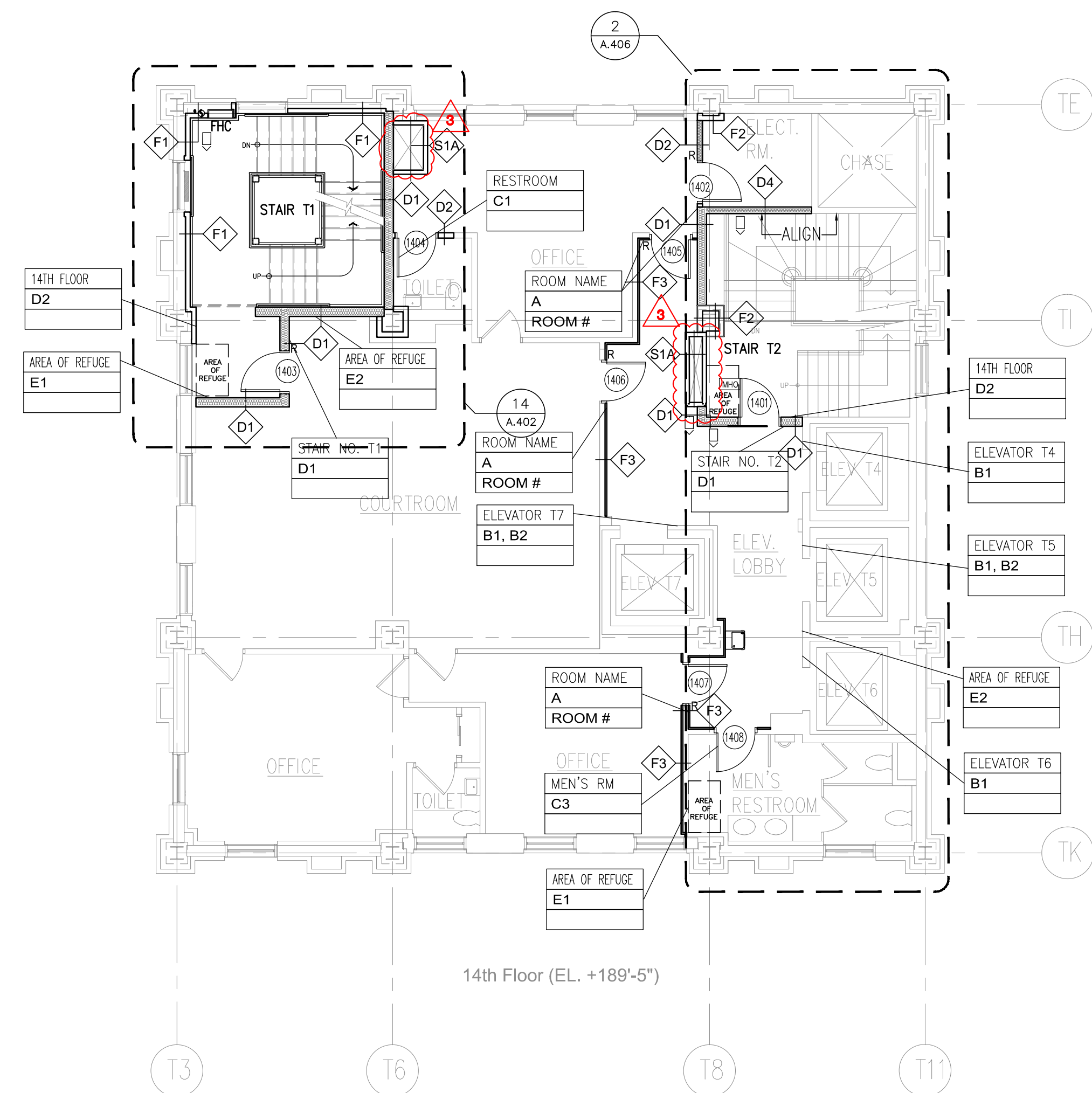
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

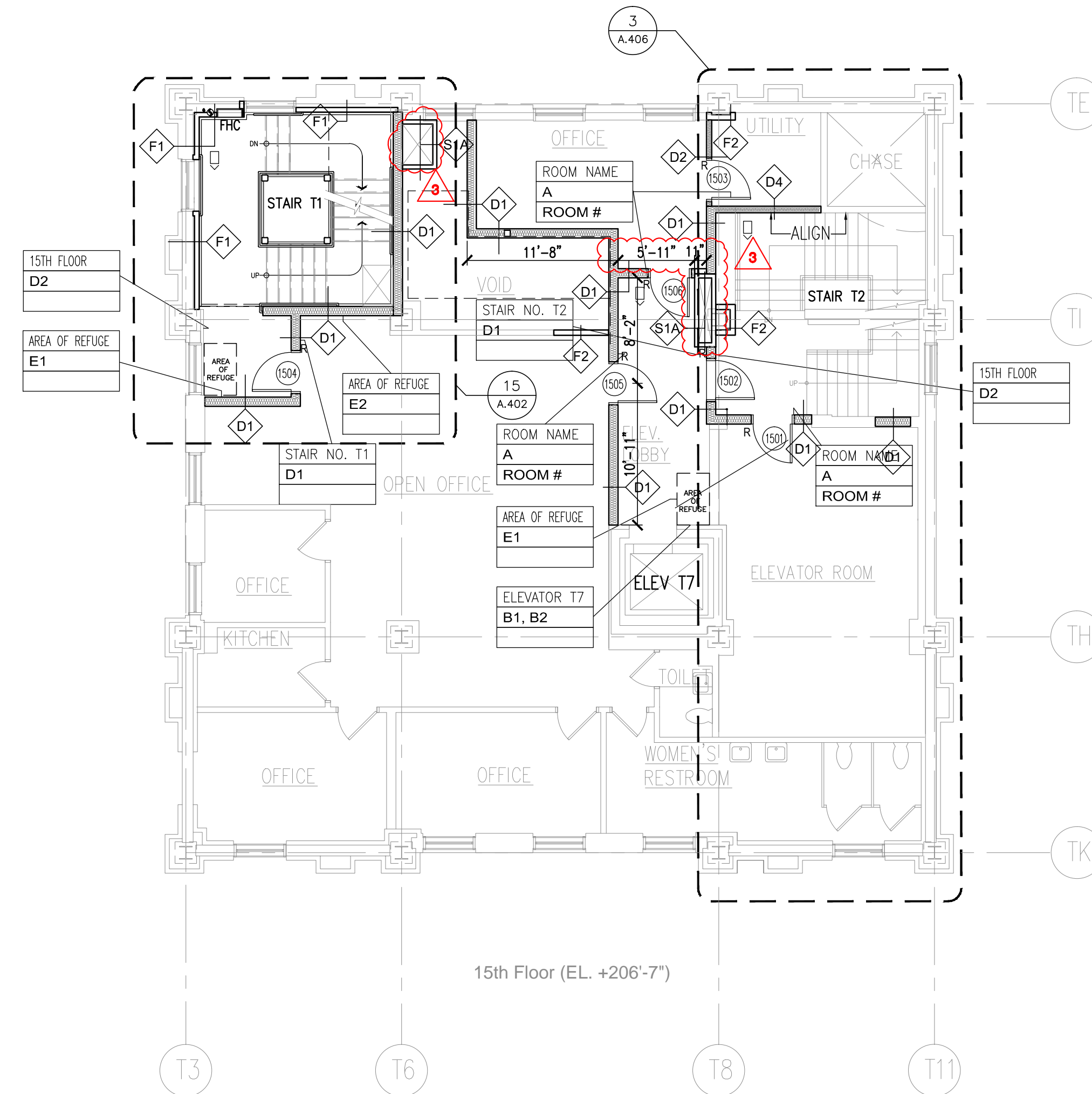
TWELFTH & THIRTEENTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 51 OF: 160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

A.111



1 FOURTEENTH FLOOR PLAN
SCALE: 1/8"=1'-0"



2 FIFTEENTH FLOOR PLAN
SCALE: 1/8"=1'-0"

GENERAL NOTES

1. NEW 2HR RATED WALL.
2. REPLACE EXISTING DOOR & REVERSE SWING.
3. INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A.
4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENINGS IN WALL UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENINGS SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACES TO MAINTAIN FIRE RATING REQUIREMENTS.
6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
7. NA.
8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
9. NEW MECH'L DUCTS OPENING-REFER TO A-401 THRU A-408 AND MECHANICAL DWGS.
10. COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT.
11. NA.
12. PATCH COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REFER TO MEP DWGS.
13. NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
14. DIAGRAMATIC EXPRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

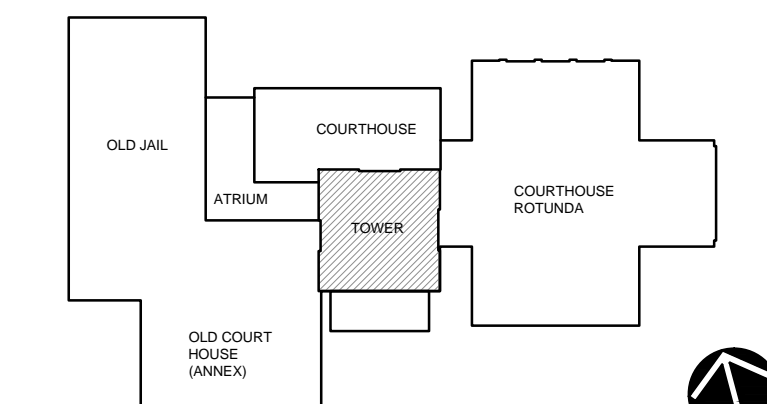
LEGEND

A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

##	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
CV	SECURITY VIDEO CAMERA
R	CARD READER
RK	CARD READER AND KEY PAD
MHC	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

KEYPLAN



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NJ License No. AI 14394

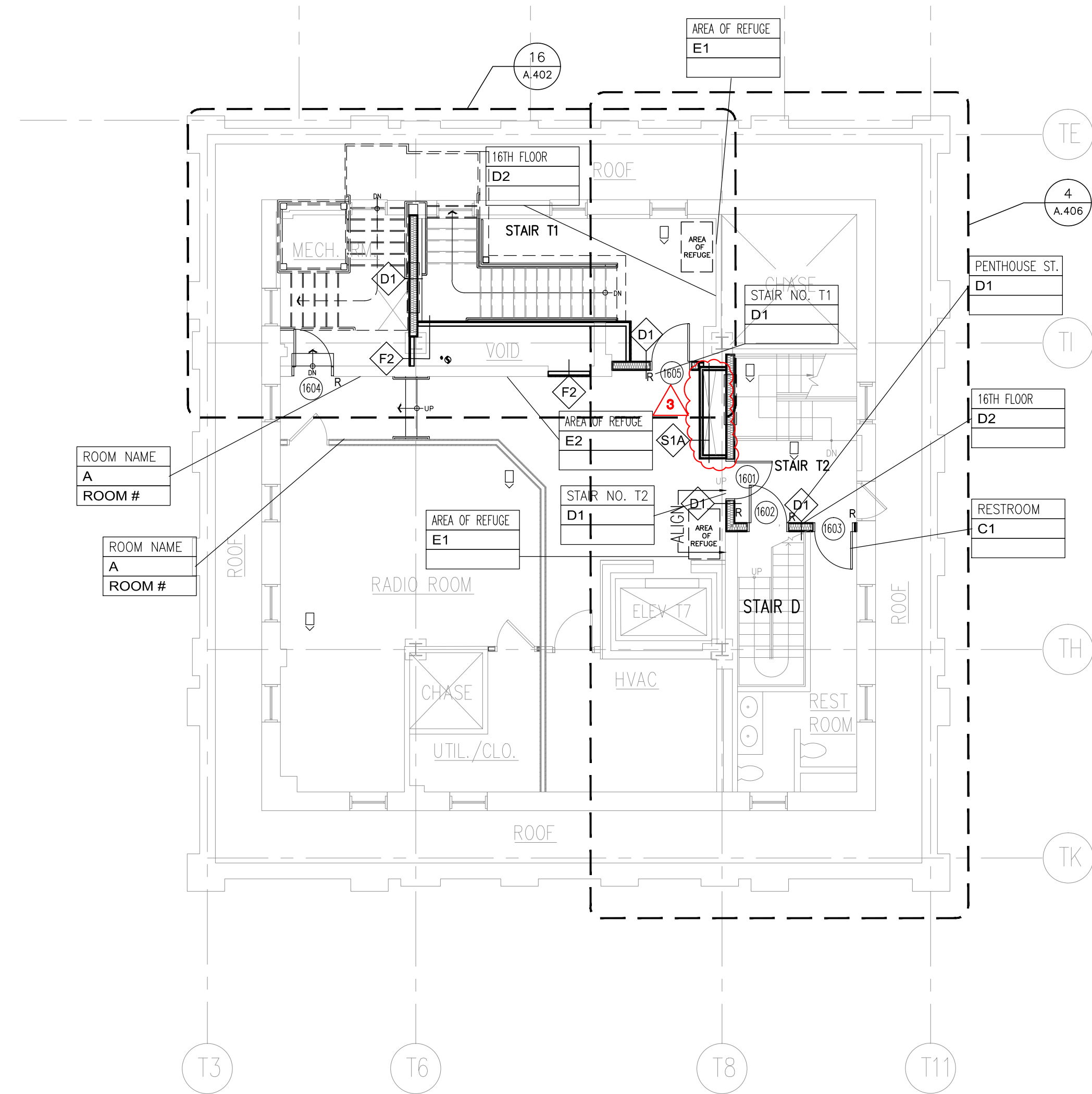


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

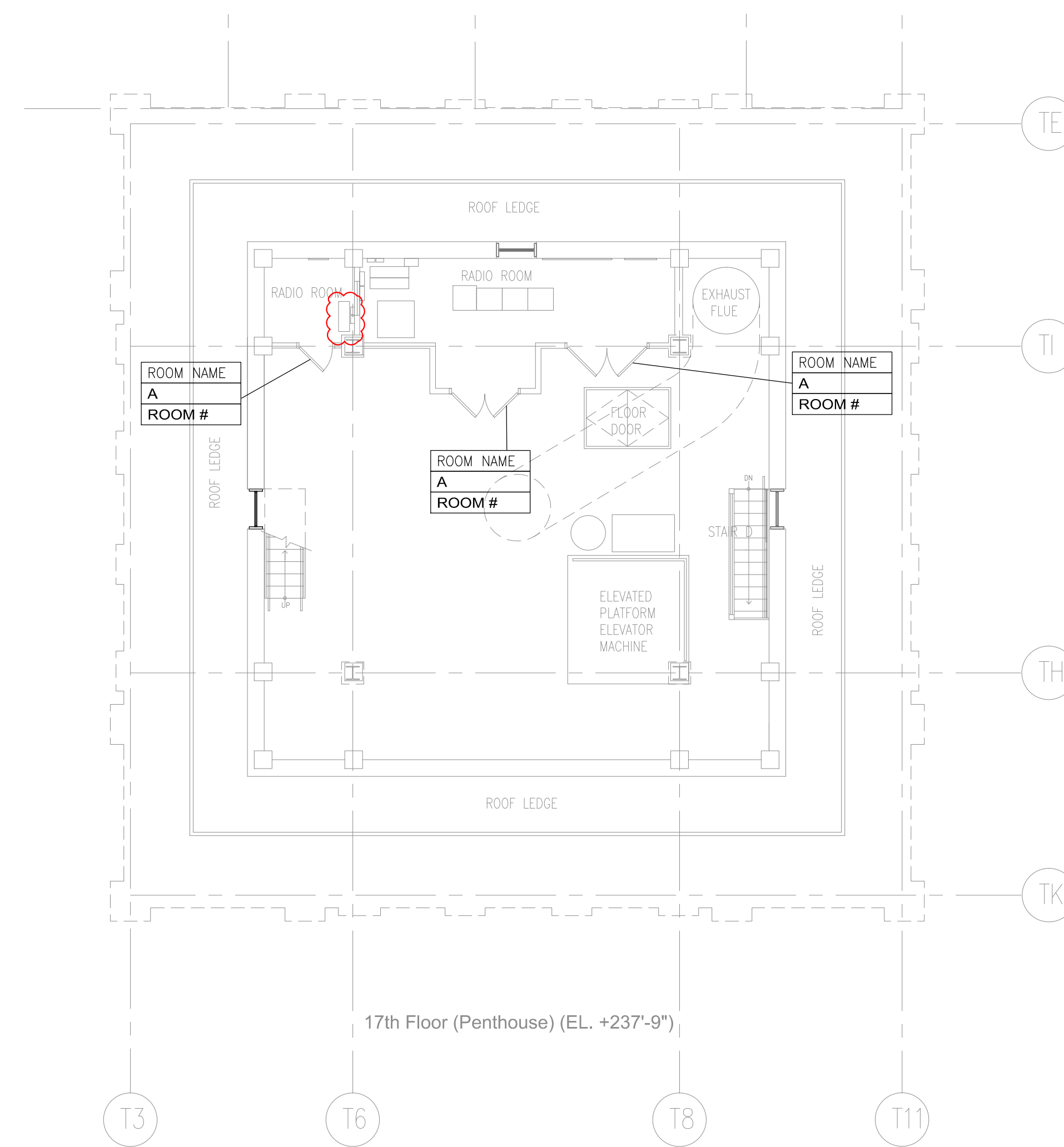
SHEET CONTENTS:
FOURTEENTH & FIFTEENTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	BT
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	NJN
05.31.17	100% SUBMISSION	MC	FM					JOB NO	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	52 OF 160
11.6.17	ADDENDUM#3	MC	FM					DWG NO	

A.112



1 SIXTEENTH FLOOR PLAN
SCALE: 1/8"=1'-0"



2 PENTHOUSE FLOOR PLAN
SCALE: 1/8"=1'-0"

CONSTRUCTION KEYNOTES

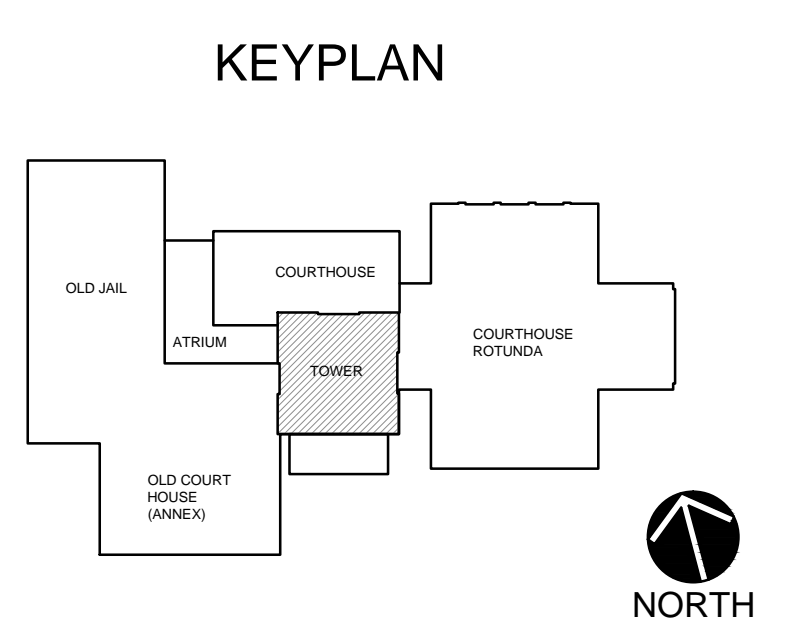
- GENERAL NOTES
1. REPLACE EXISTING DOOR & REVERSE SWING.
 2. REPLACE EXISTING DOOR & REVERSE SWING.
 3. REPLACE EXISTING DOOR & REVERSE SWING.
 4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
 5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENINGS IN WALL UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENINGS SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACES TO MAINTAIN FIRE RATING REQUIREMENTS.
 6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
 7. N/A
 8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
 9. NEW MECH'L DUCTS OPENING-REFER TO A.401 THRU A.406 AND MECHANICAL DWGS
 10. COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
 11. N/A
 12. PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REFER TO MEP DWGS.
 13. NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
 14. DIAGRAMIC EXPRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
 15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND

ROOM ID SIGN	A	ROOM #
ELEVATOR ID SIGN	B	
RESTROOM ID SIGN	C	
STAIR/EXIT ID SIGN	D	
AREA OF REFUGE ID SIGN	E	
CHASE ACCESS ID SIGN	F	

SYMBOLS

CONSTRUCTION KEYNOTES REFER TO DWG.	
WINDOW TAG REFER TO DWG. A301 FOR WINDOW SCHEDULE.	
DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.	
SECURITY VIDEO CAMERA	
CARD READER	
CARD READER AND KEY PAD	
MAGNETIC CARD HOLDER	
DOOR POSITIONS SWITCH	



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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

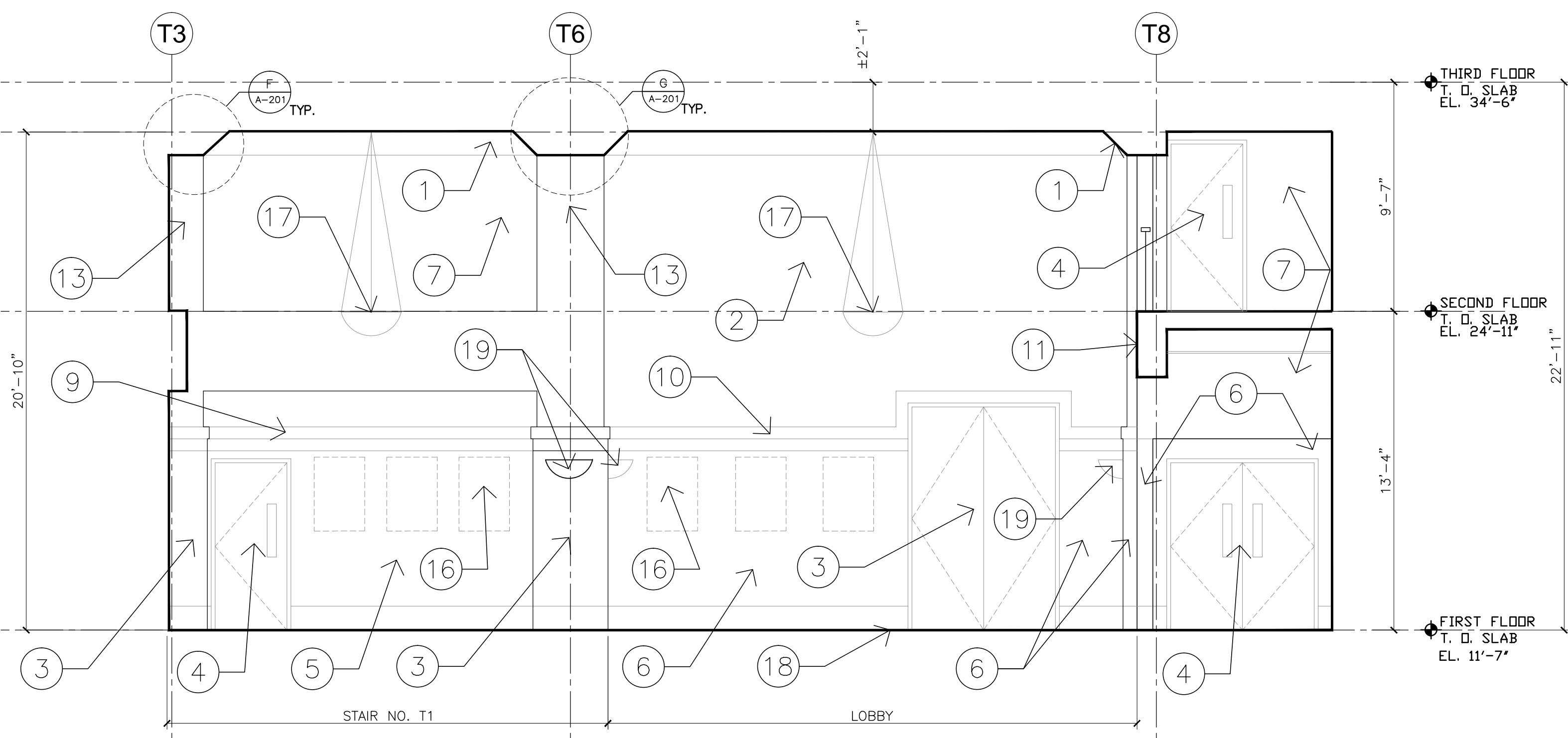
SHEET CONTENTS:
SIXTEENTH & PENTHOUSE FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	BT
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	NJN
05.31.17	100% SUBMISSION	MC	FM					JOB NO	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	53 OF: 160
11.6.17	ADDENDUM#3	MC	FM					DWG NO	

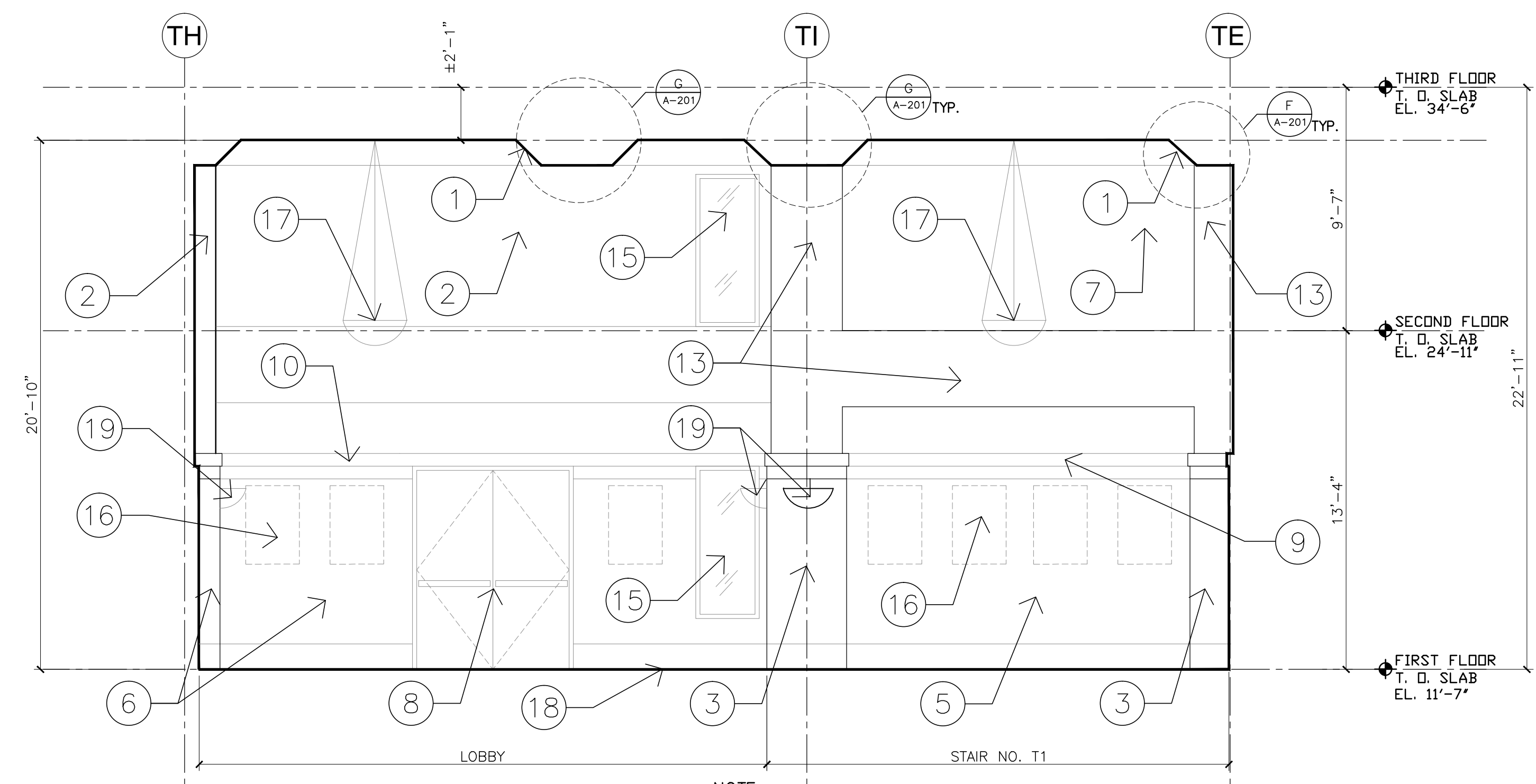
A.113

KEYNOTES THIS DRAWING

- 1 EXISTING CORNICE & TRIMS
- 2 EXISTING GYP. BD. WALL PAINTED FIN.
- 3 EXISTING BRONZE DOORS & FRAMES TO REMAIN
- 4 NEW HOLLOW METAL EXIT DOOR & FRAMES SEE DOOR SCHEDULE
- 5 NEW MARBLE PANELS, BASE & TRIMS
- 6 EXISTING MARBLE PANELS, BASE & TRIMS
- 7 NEW GYP. BD. WALL PAINTED FIN.
- 8 EXISTING ENTRANCE DOORS TO REMAIN
- 9 NEW WIRE MANAGEMENT TYP.
- 10 EXISTING WIRE MANAGEMENT TO REMAIN
- 11 EXISTING FASCIA & TRIMS
- 12 EXISTING PLASTER CEILING PAINTED FIN.
- 13 NEW GYP. BD. COLUMN & BEAM COVERS TYP.
- 14 NEW MARBLE PANEL COLUMN COVERS TYP.
- 15 EXISTING FIRE RATED GLAZING TO REMAIN
- 16 REINSTALL EXISTING JUDGES PAINTINGS
- 17 EXISTING CHANDELIER LIGHTING TO REMAIN
- 18 EXISTING TERRAZZO FLOOR TO REMAIN
- 19 EXISTING SCNCE LIGHTING TO REMAIN & THOSE AFFECTED TO BE RELOCATED SEE ELEC. DWGS.

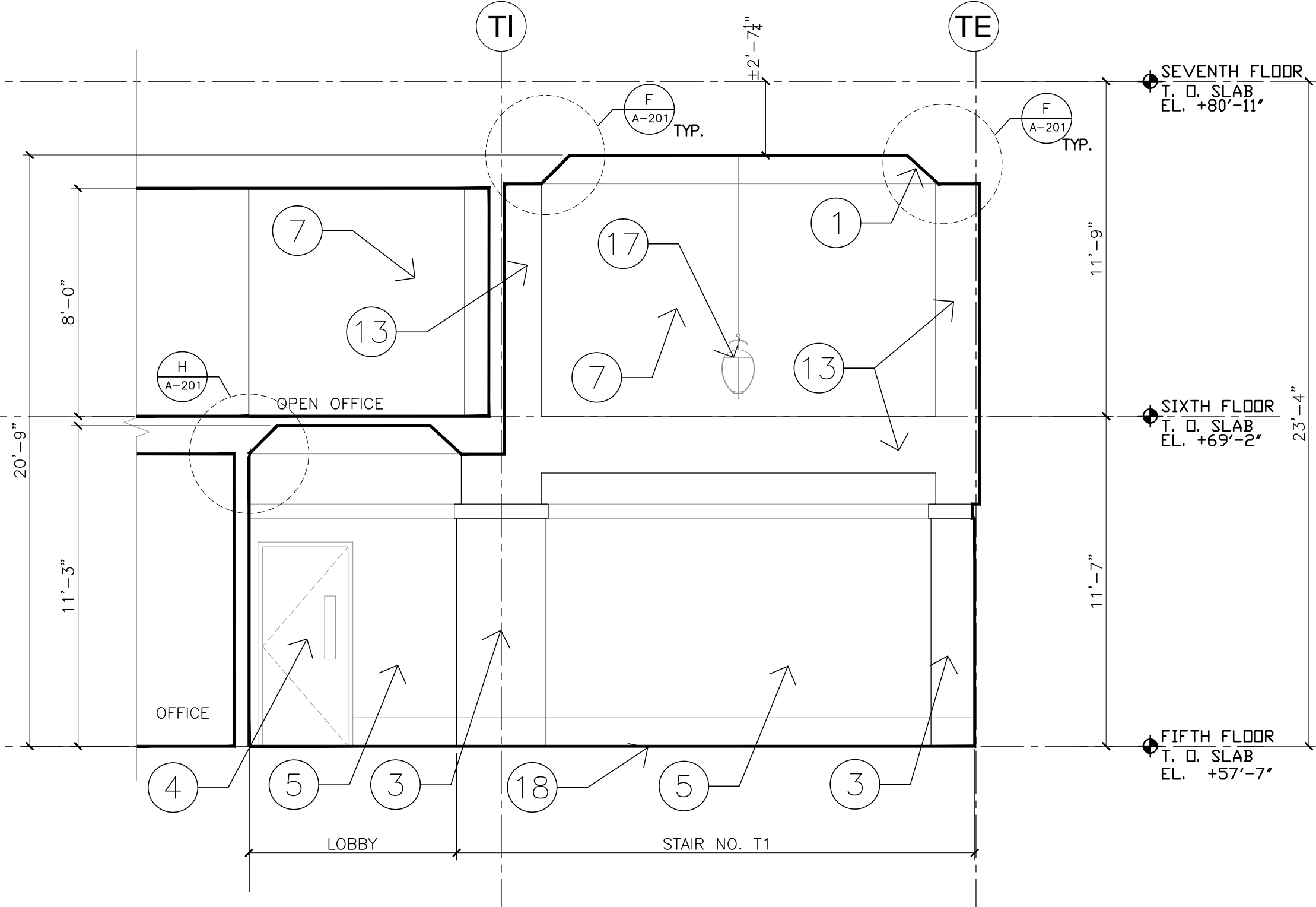


1ST & 2ND INTERIOR ELEVATION
SCALE: 1/4"=1'-0"

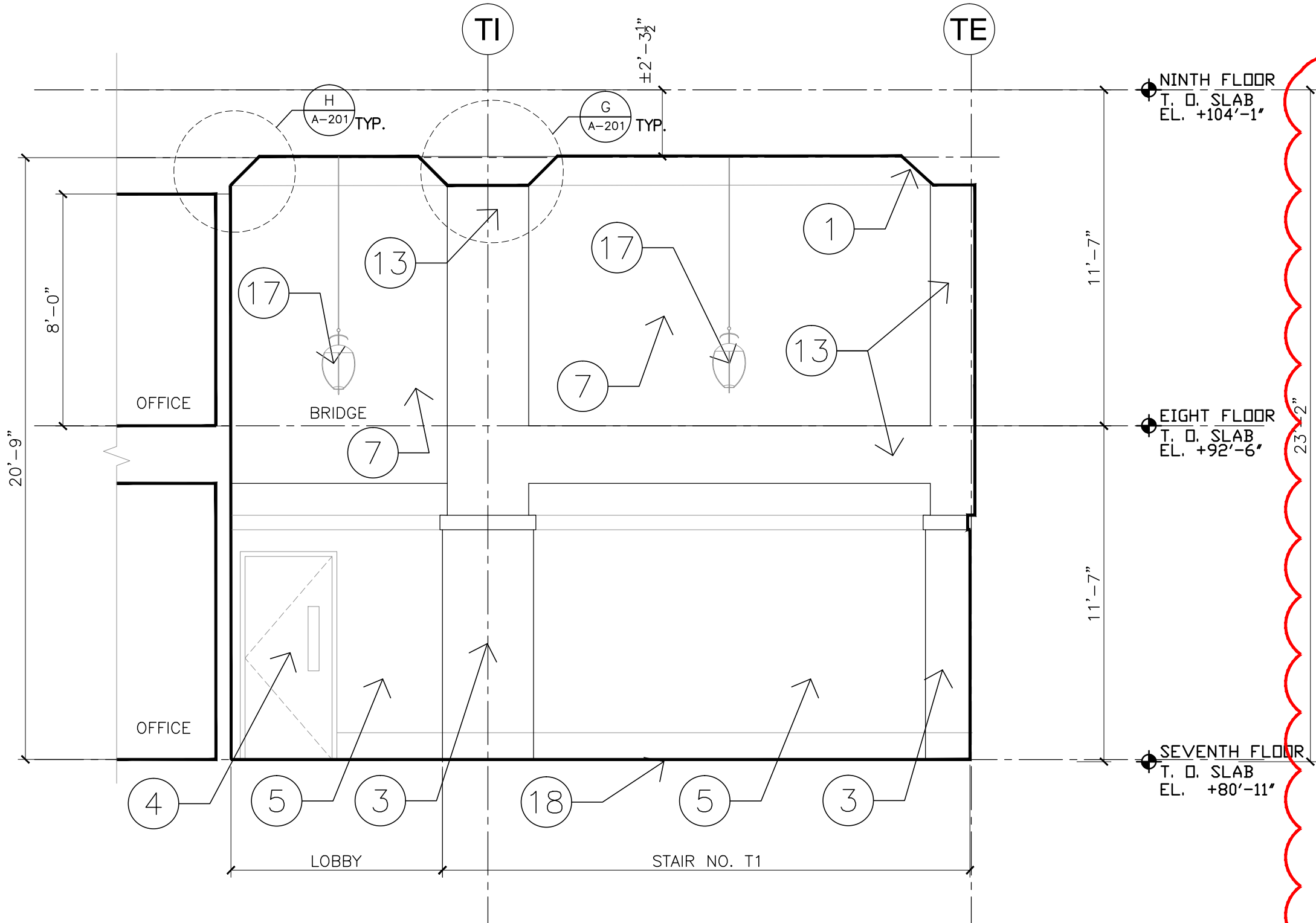


1ST & 2ND INTERIOR ELEVATION
SCALE: 1/4"=1'-0"

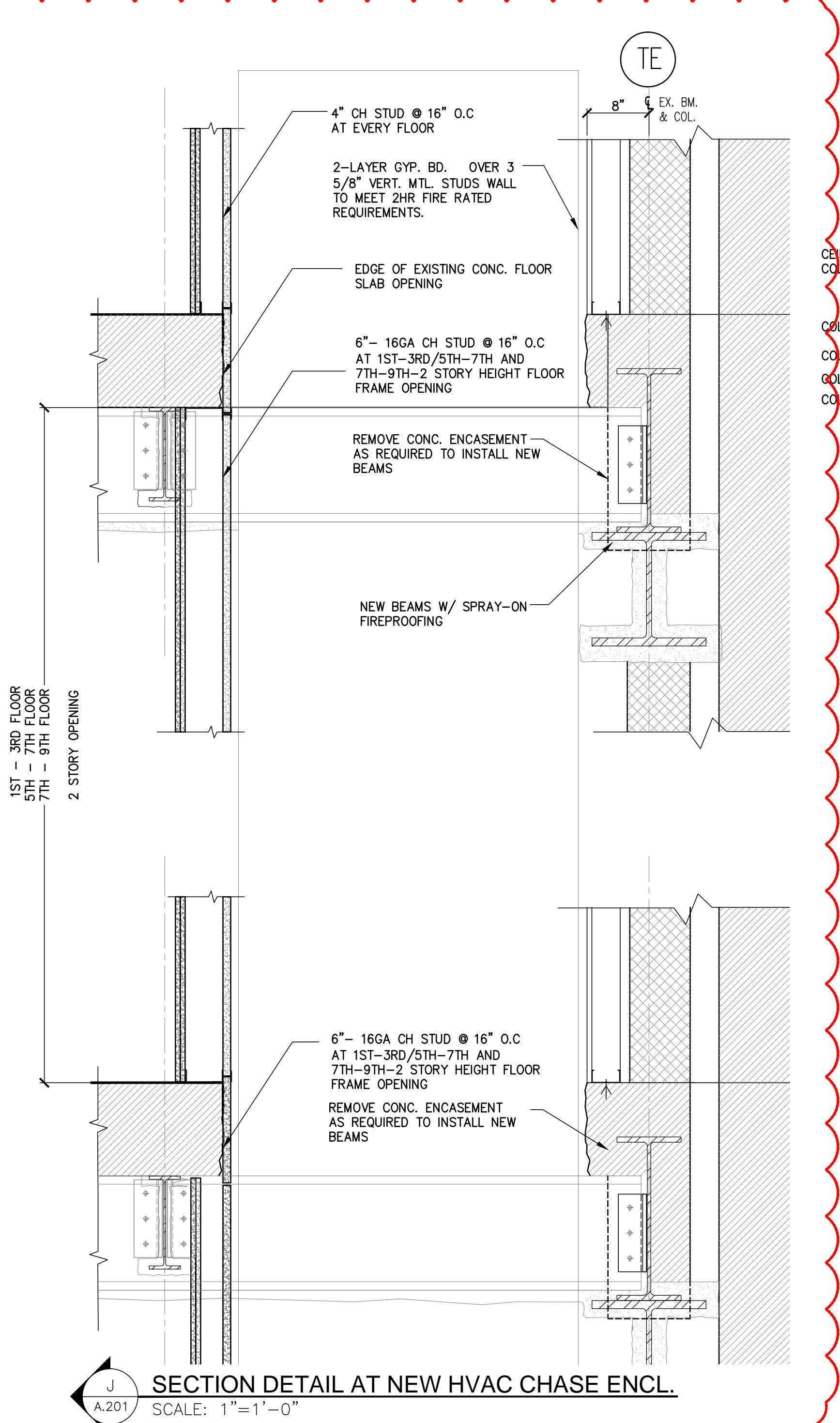
- NOTE:**
1. CONTRACTOR TO PHOTOGRAPH AND FULLY DOCUMENT SIZE, SHAPE AND COLOR OF ALL EXISTING CONDITIONS AT ALL CEILING TRIM AND CORNICE BEFORE REMOVAL.
 2. CONTRACTOR TO SUBMIT DETAILED SHOP DRAWINGS OF NEW CORNICE TO MATCH EXISTING IN SIZE, SHAPE AND COLOR.
 3. CONTRACTOR TO COORDINATE INSTALLATION OF NEW CEILING/CORNICE WITH FIRE SUPPRESSION INSTALLATION.



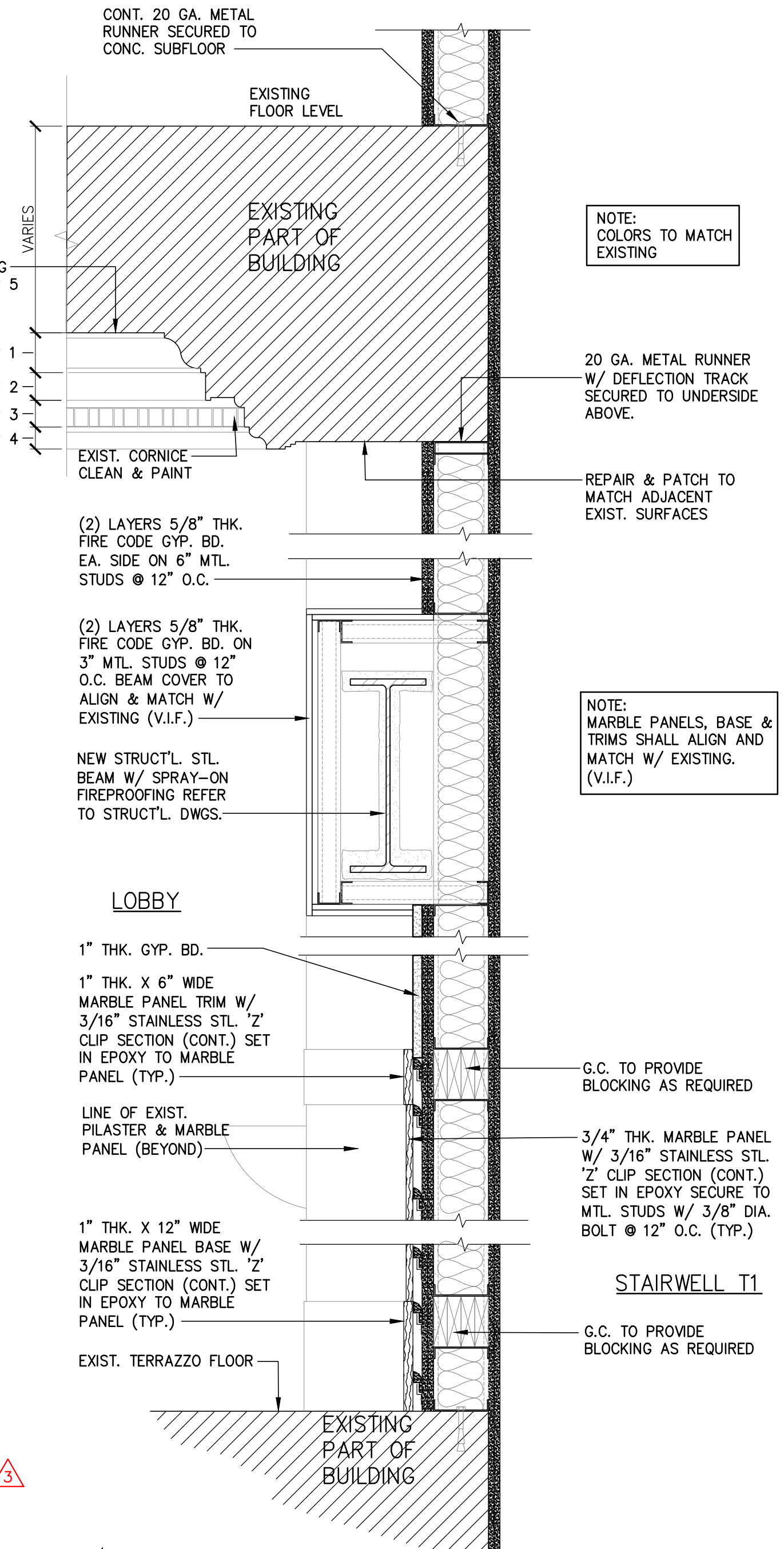
5TH & 6TH INTERIOR ELEVATION
SCALE: 1/4"=1'-0"



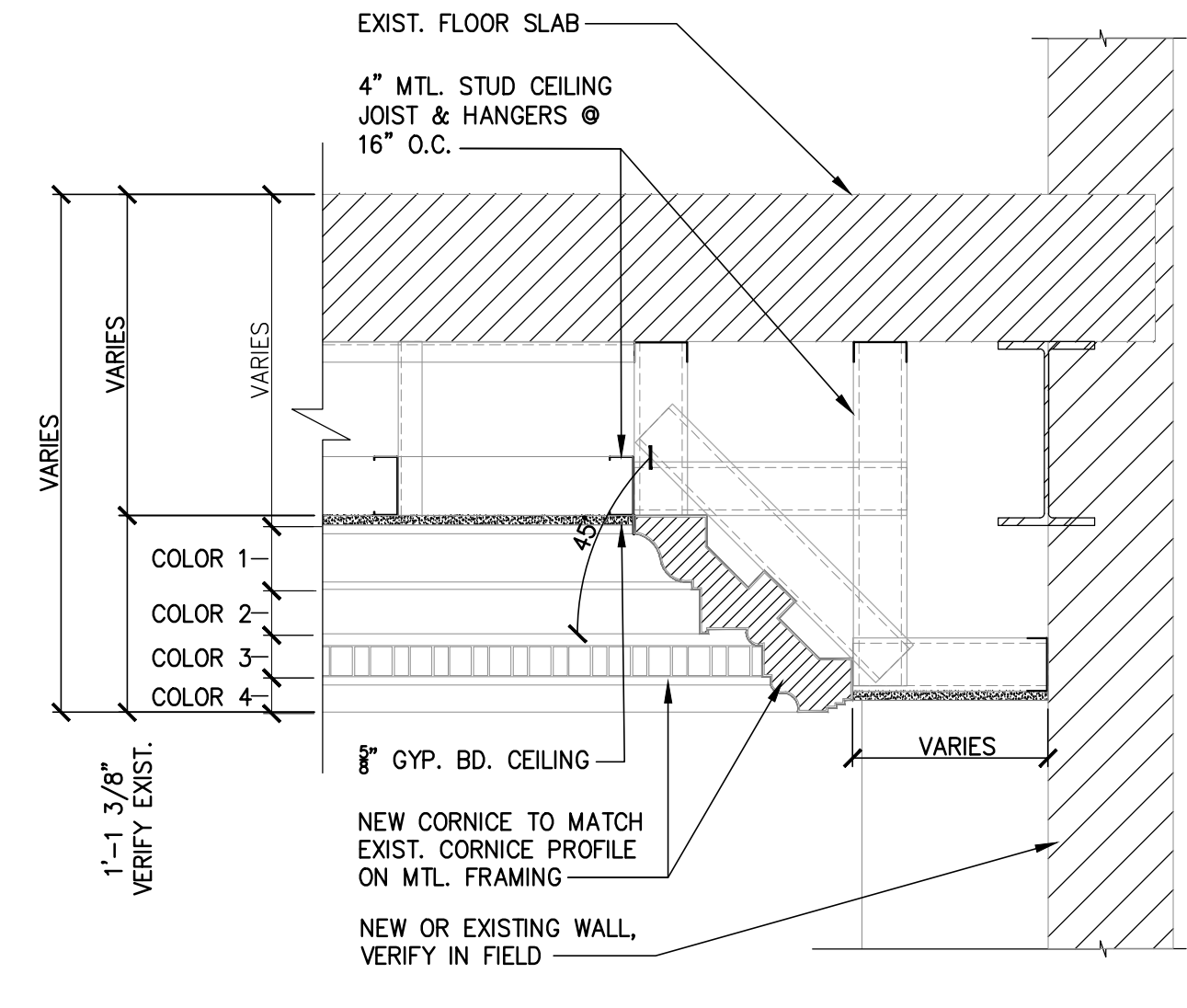
7TH & 8TH INTERIOR ELEVATION
SCALE: 1/4"=1'-0"



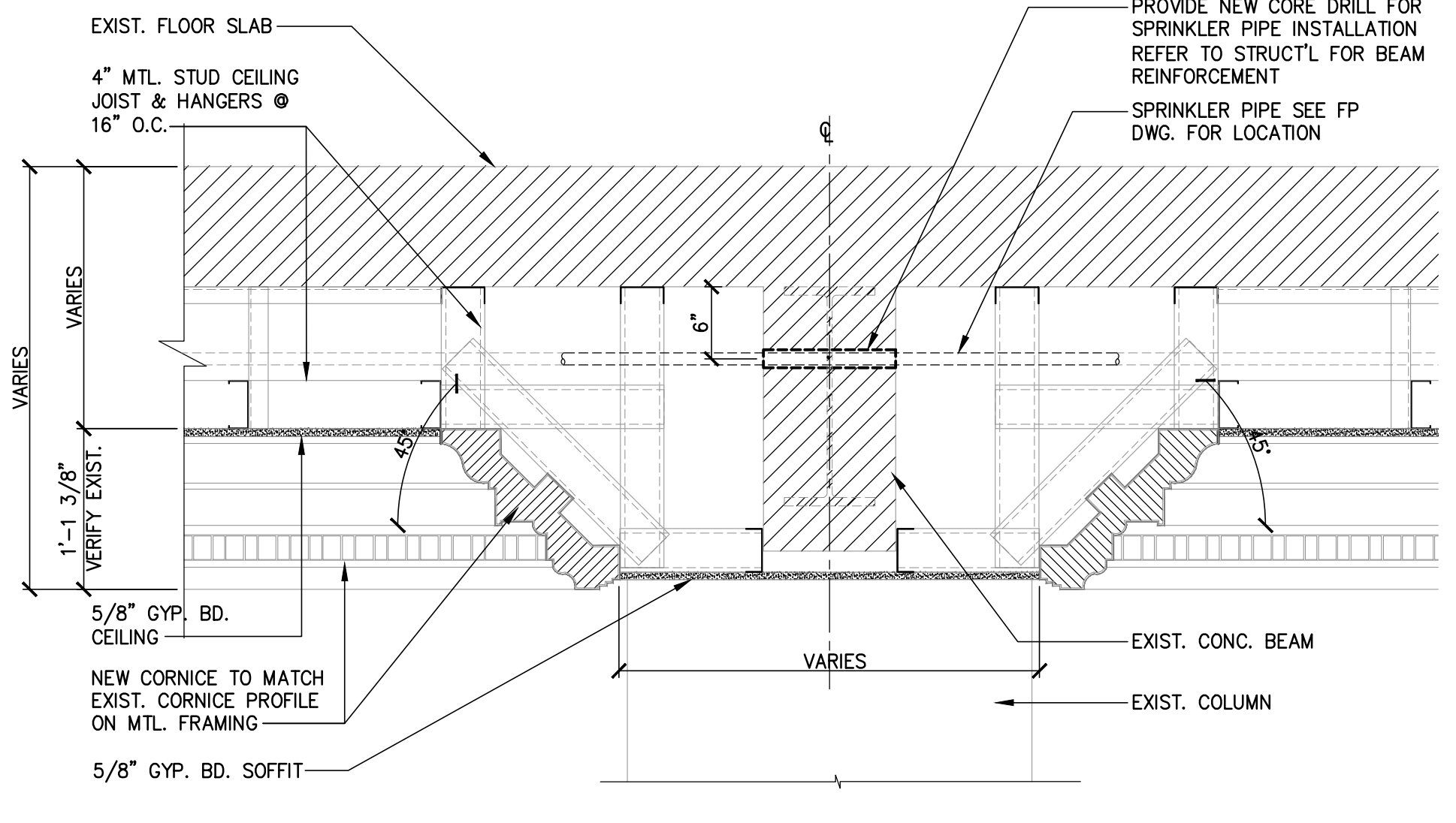
SECTION DETAIL AT NEW HVAC CHASE ENCL.
SCALE: 1"=1'-0"



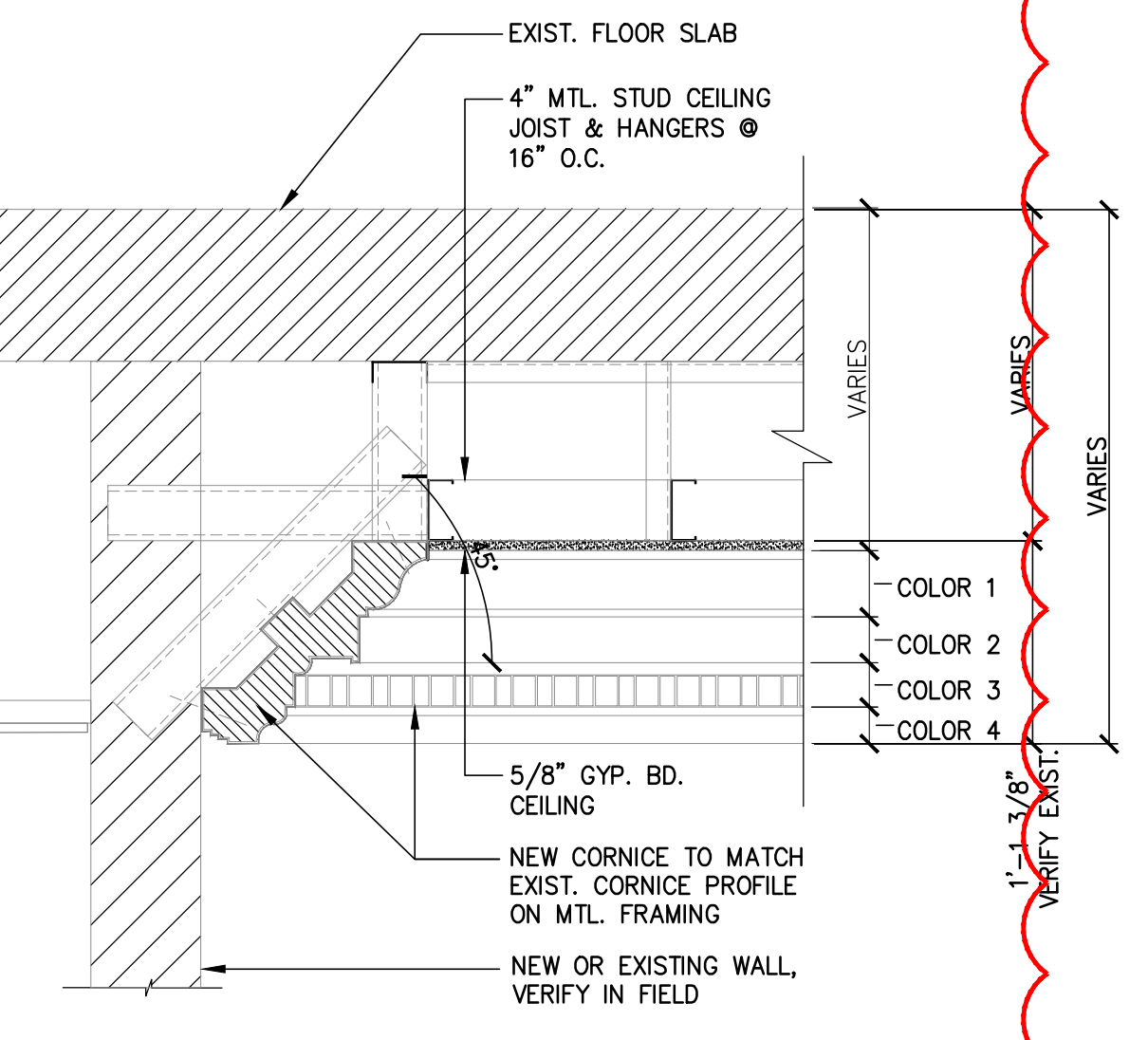
TYP. SECTION DETAIL AT NEW WALL
SCALE: 1"=1'-0"



TYP. CEILING CORNICE DETAIL
SCALE: 1"=1'-0"



TYP. CEILING CORNICE DETAIL
SCALE: 1"=1'-0"



TYP. CEILING CORNICE DETAIL
SCALE: 1"=1'-0"

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NJ License No. AI 16160

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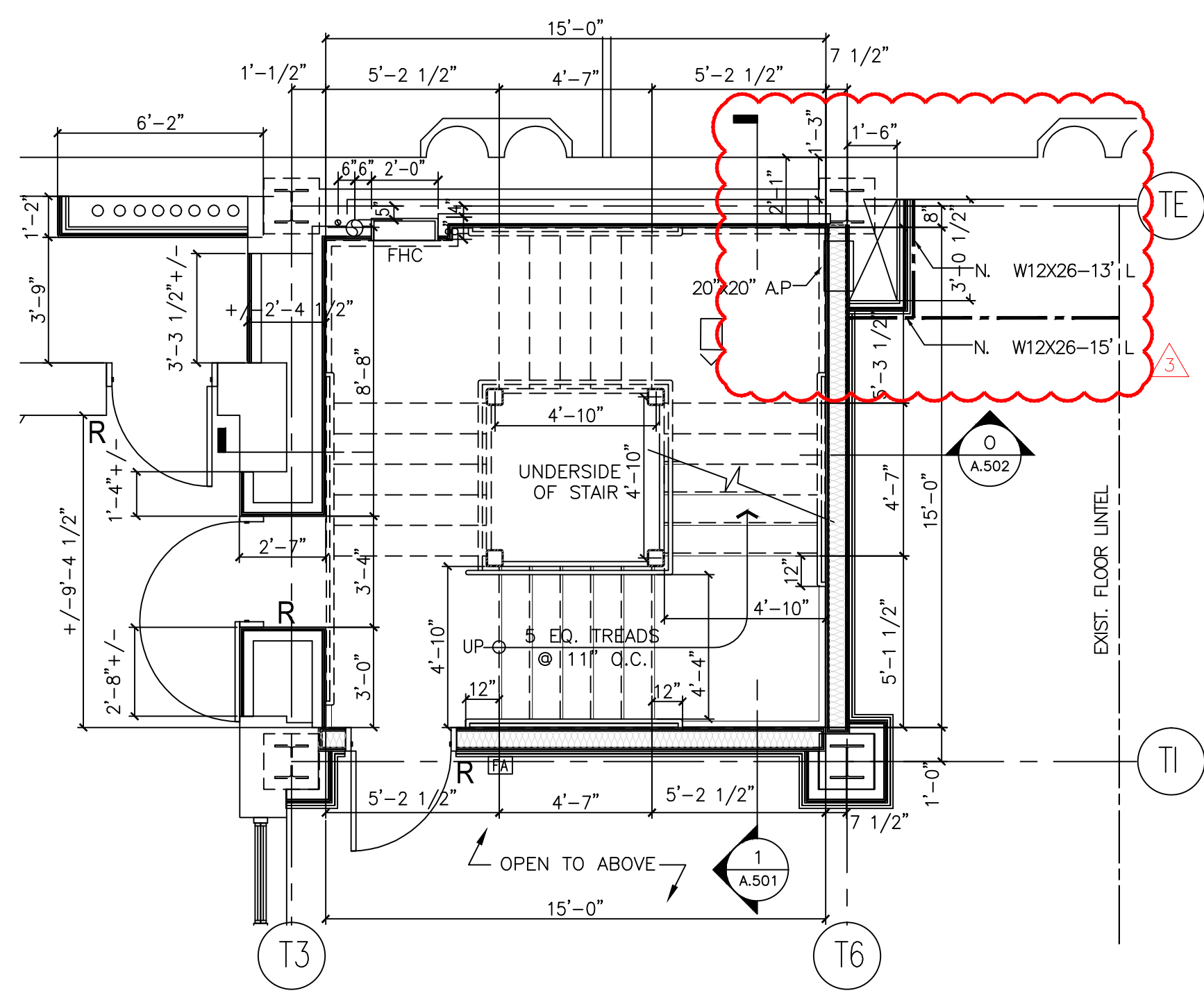
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ARCHITECTURE - PLANNING - INTERIOR DESIGN
1004 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.378.0000 FAX: 973.379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

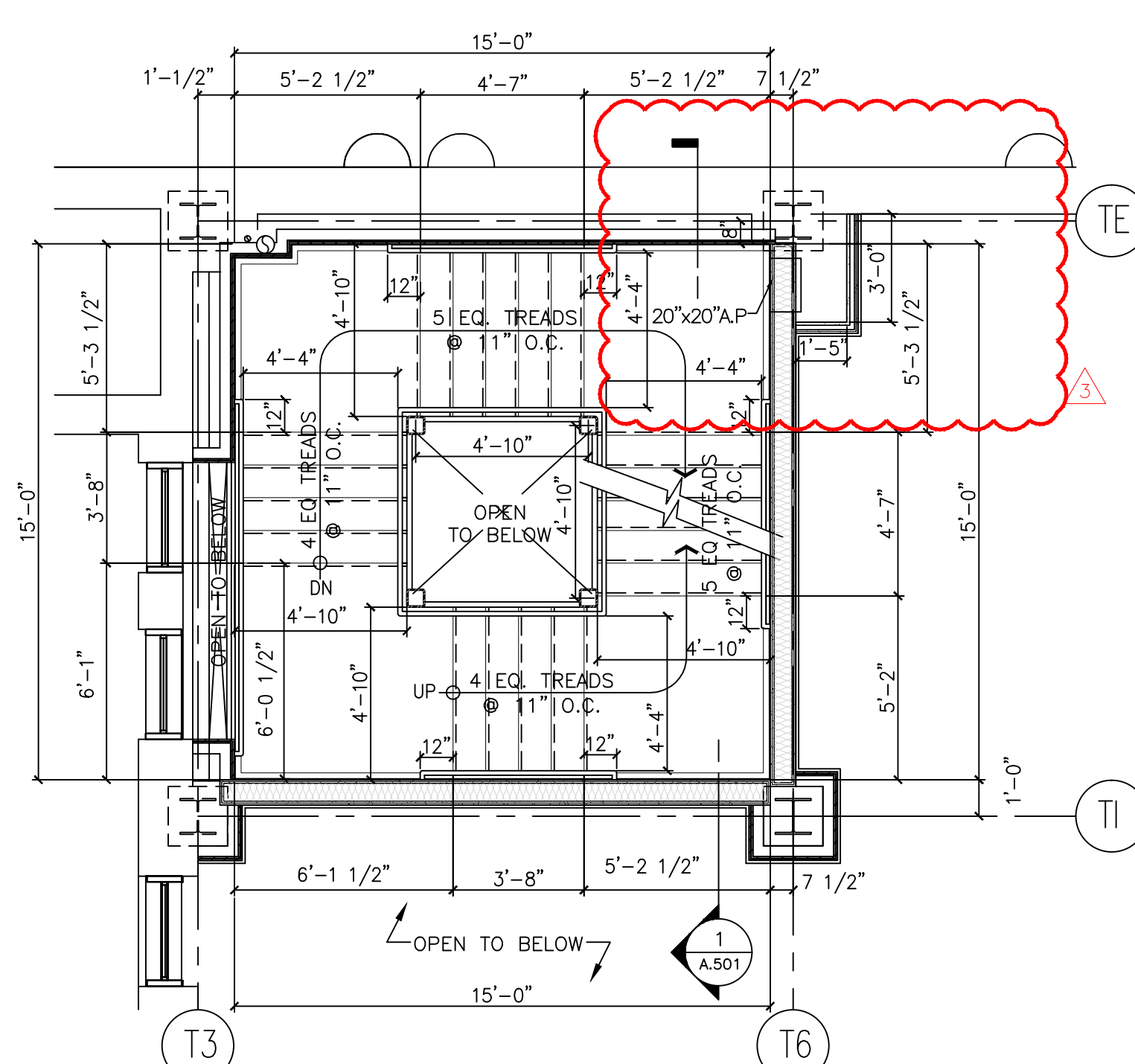
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DATE	DESCRIPTION	BY	CHKD
04.02.19	ADD SUBMISSION	KD	FM
10.30.19	95% SUBMISSION	KD	FM
05.31.17	100% SUBMISSION	MC	FM
08.30.17	ISSUED FOR BID	MC	FM
11.6.17	ADDENDUM#3	MC	FM

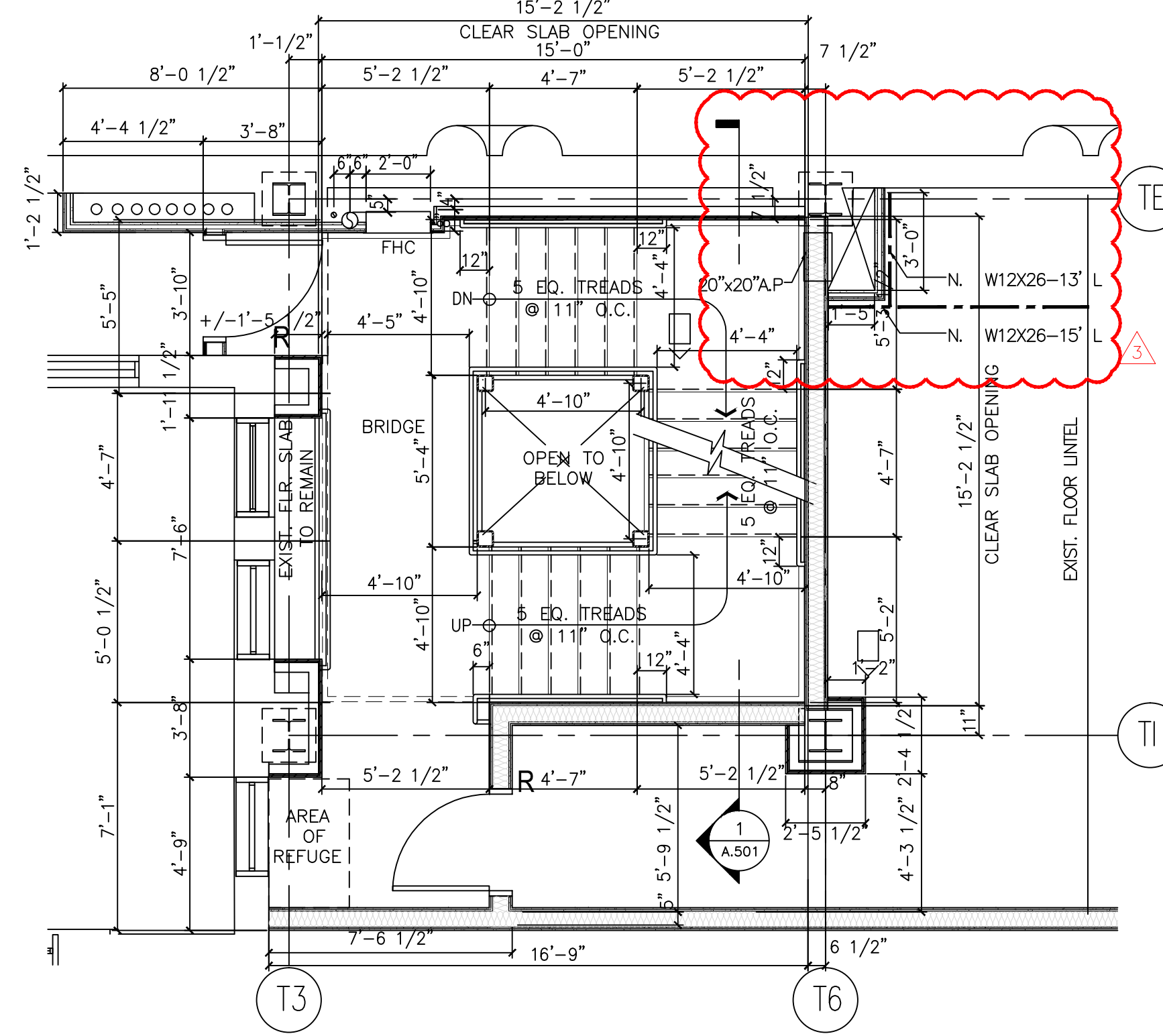
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	DRAWN BY		BT
	CHKD BY		NJN
	JOB NO		2141151
	SHEET:		54 OF: 160
	DWG NO		



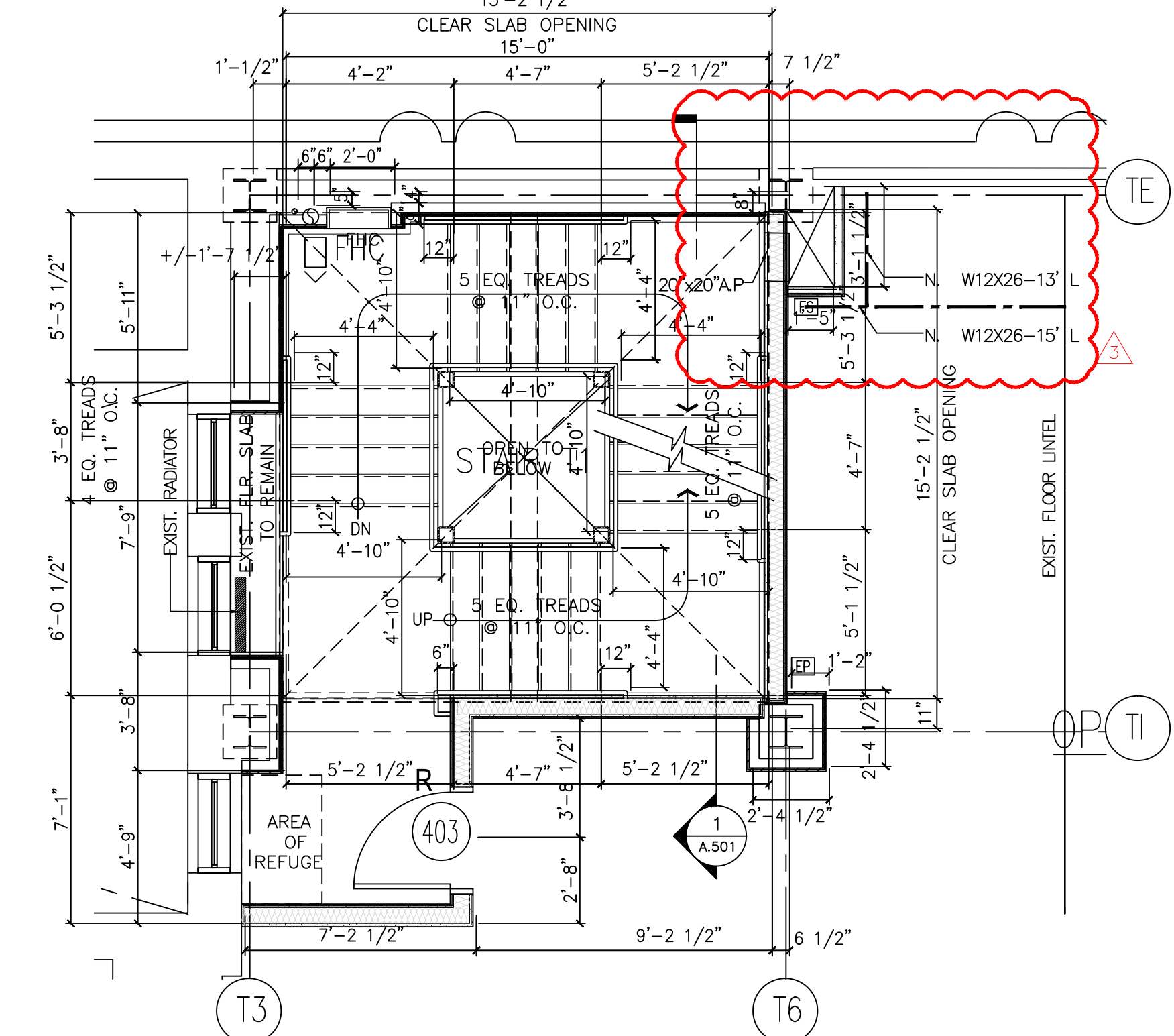
1 1ST FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



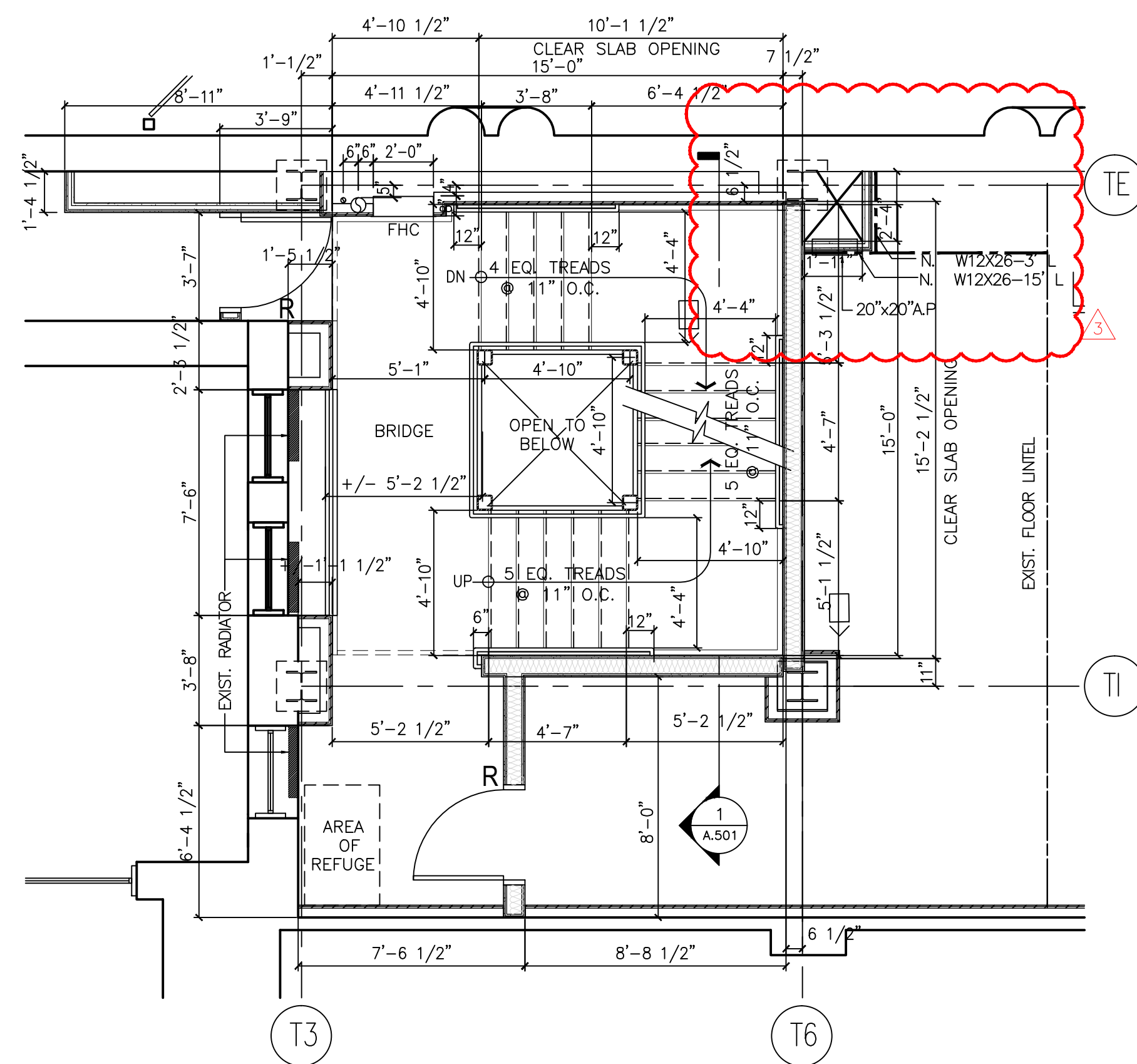
2 2ND FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



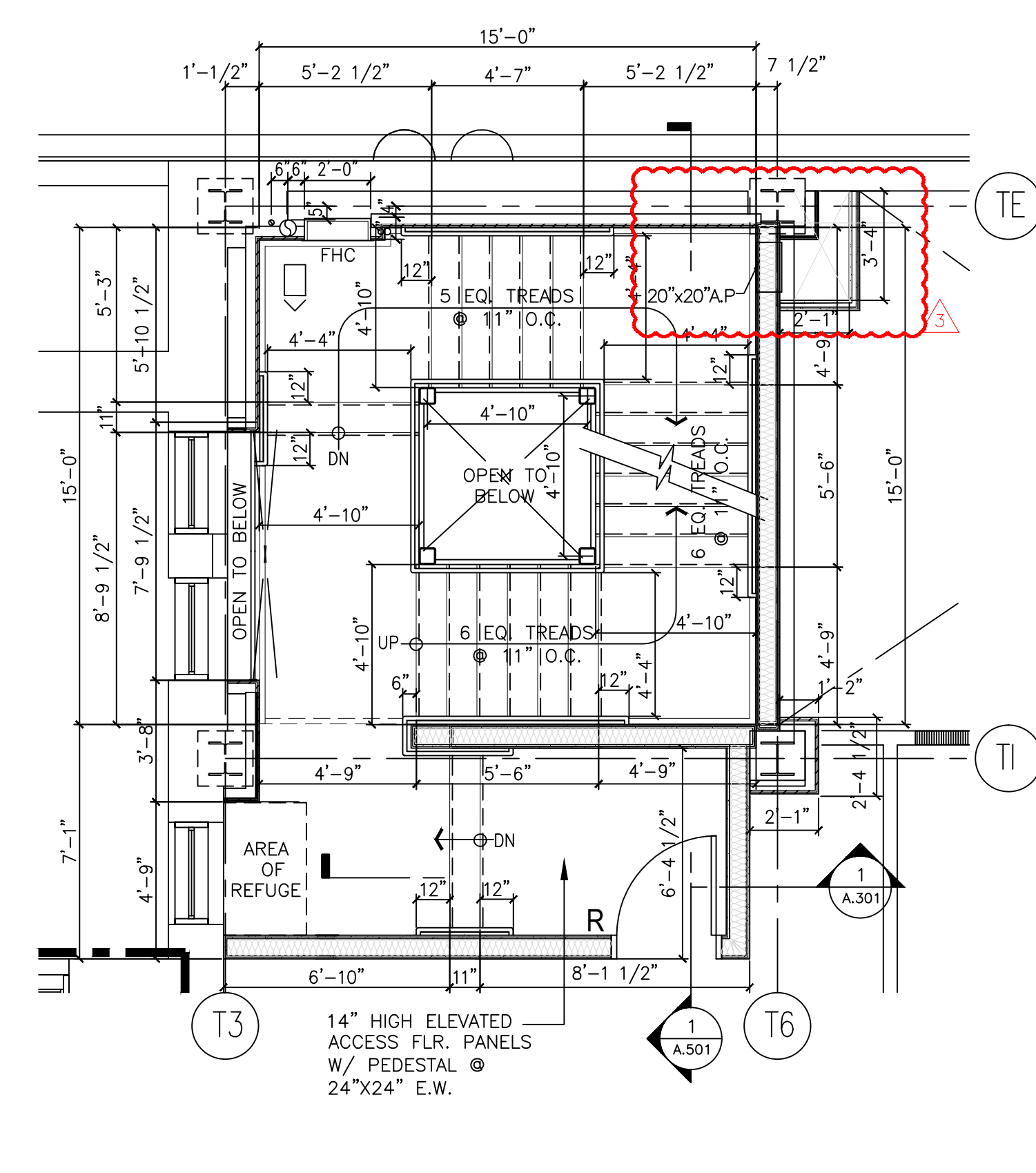
3 3RD FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



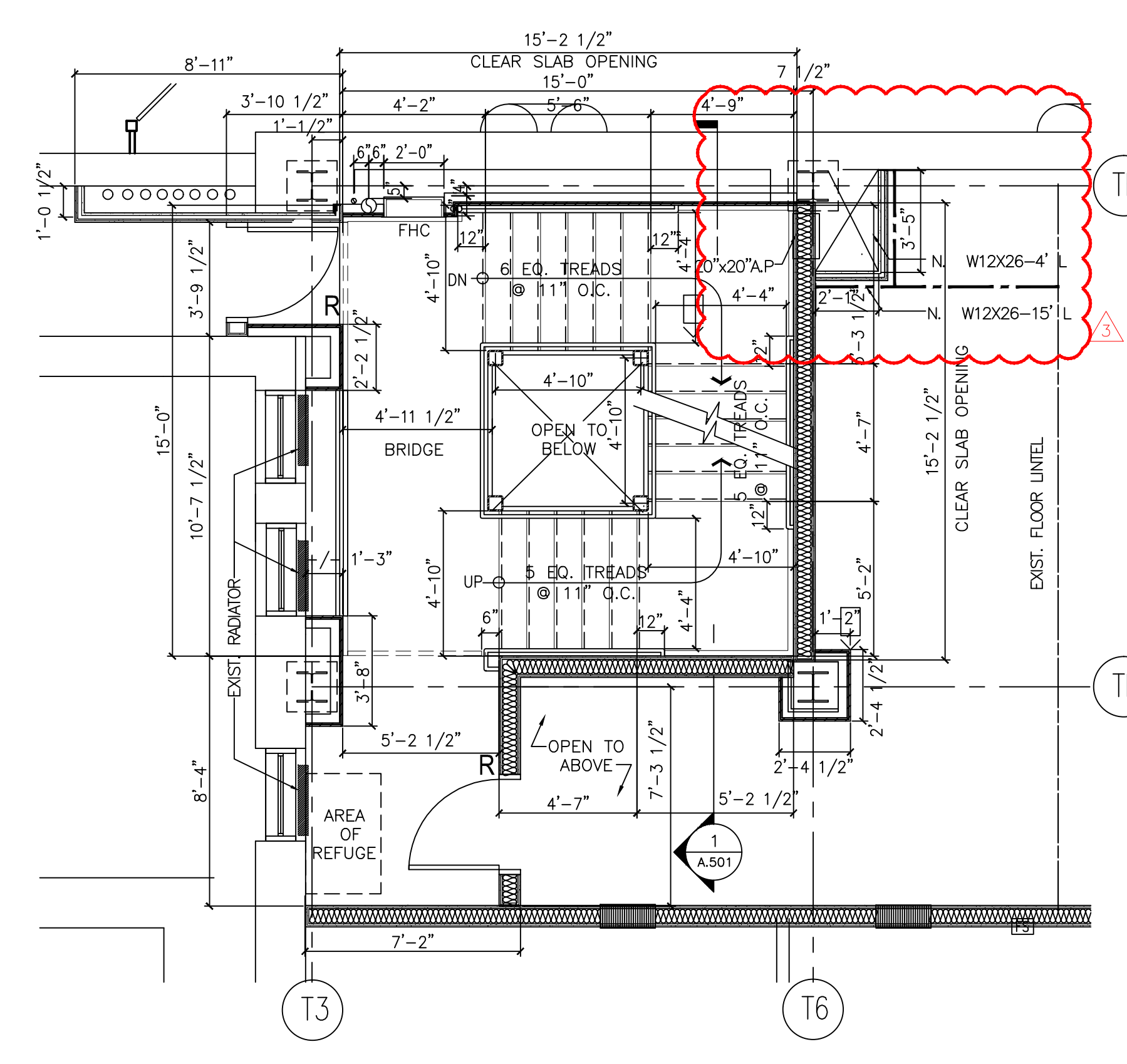
4 4TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



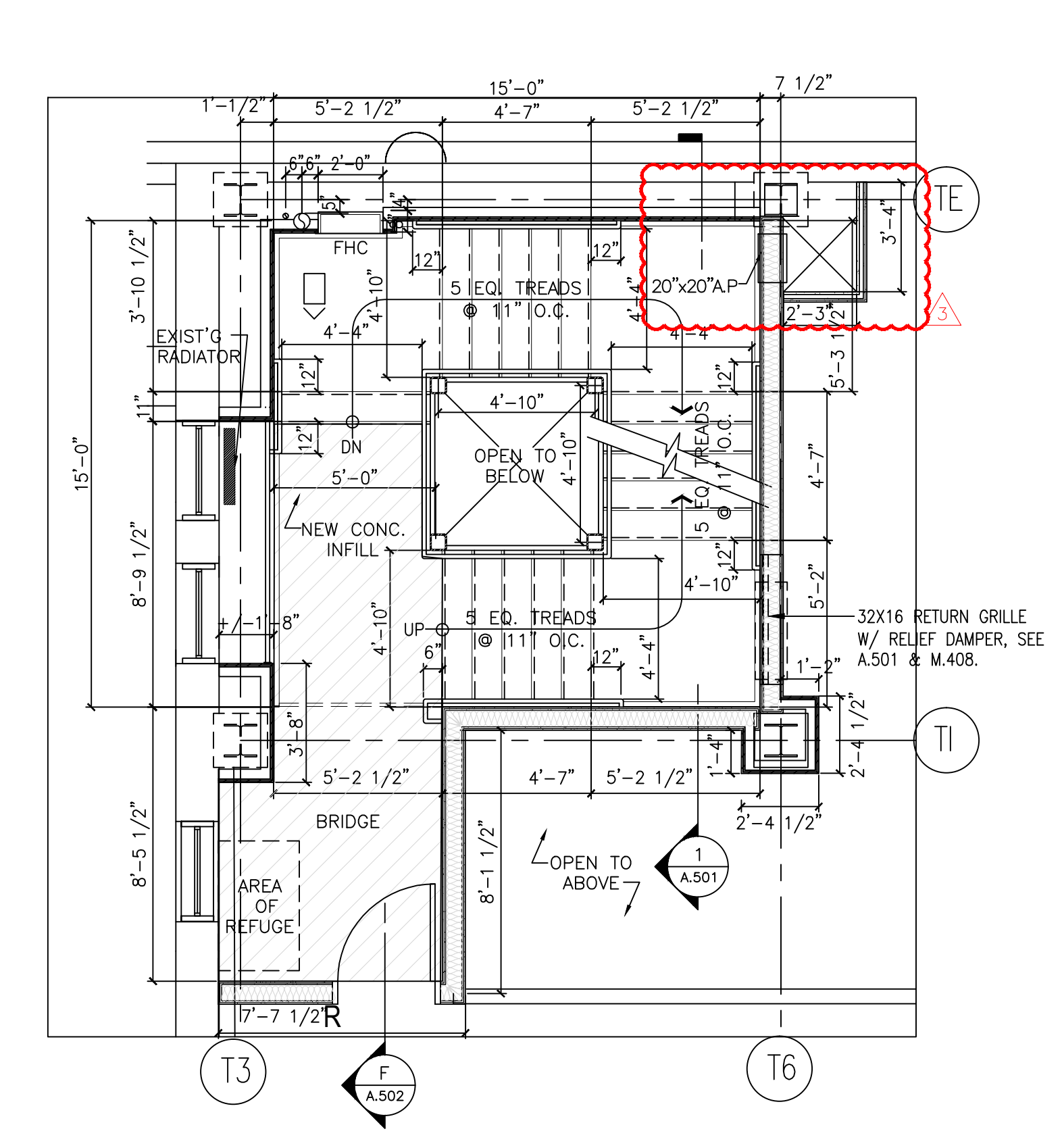
5 5TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



6 6TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"

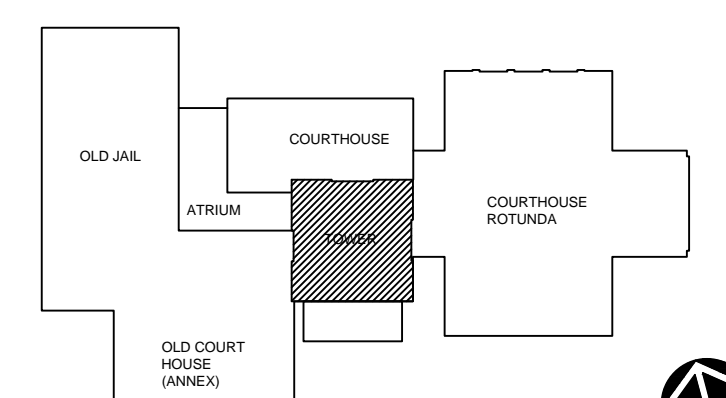


7 7TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



8 8TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"

KEYPLAN



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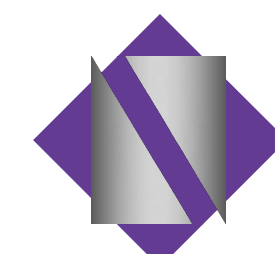
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CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

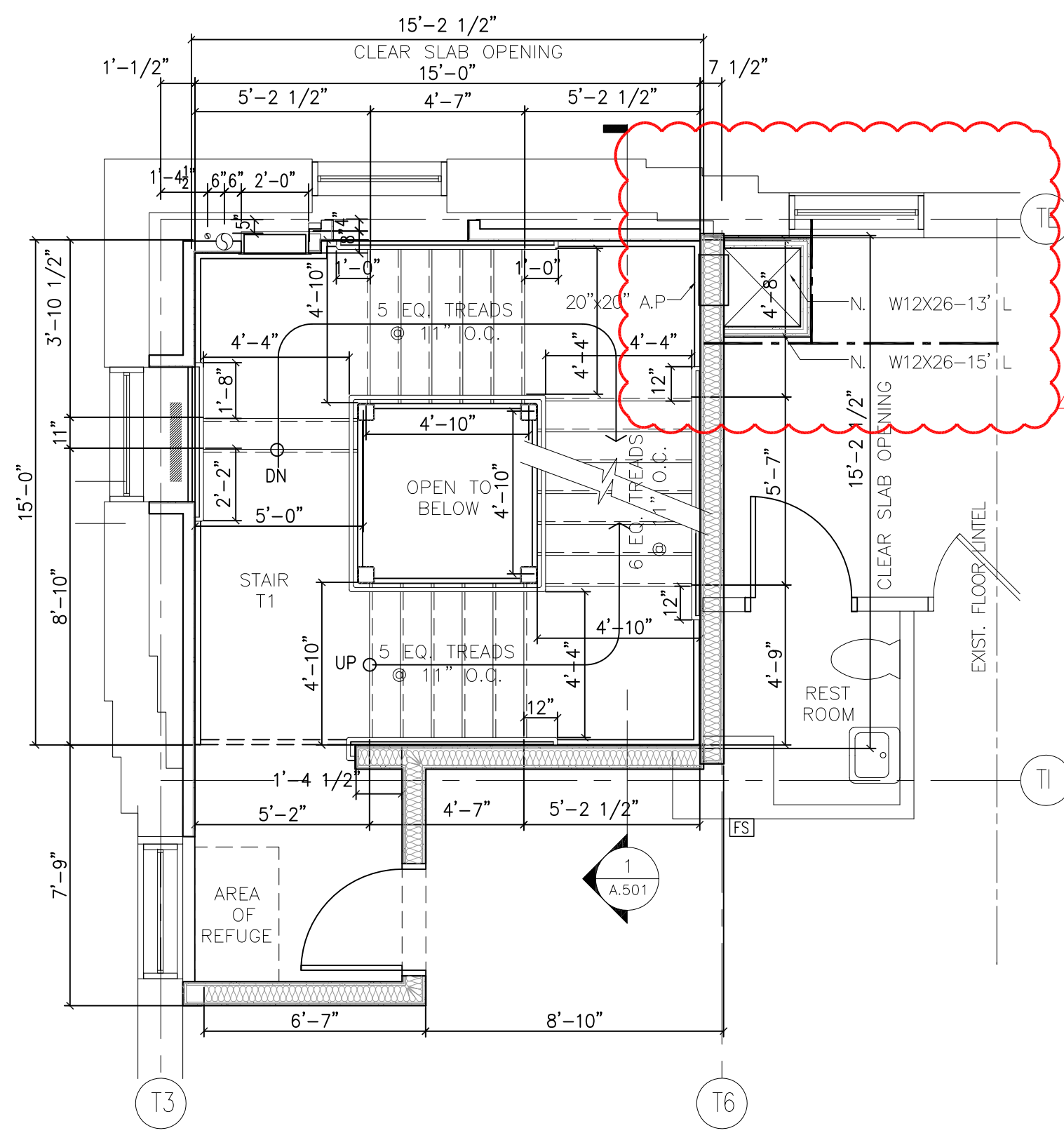
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

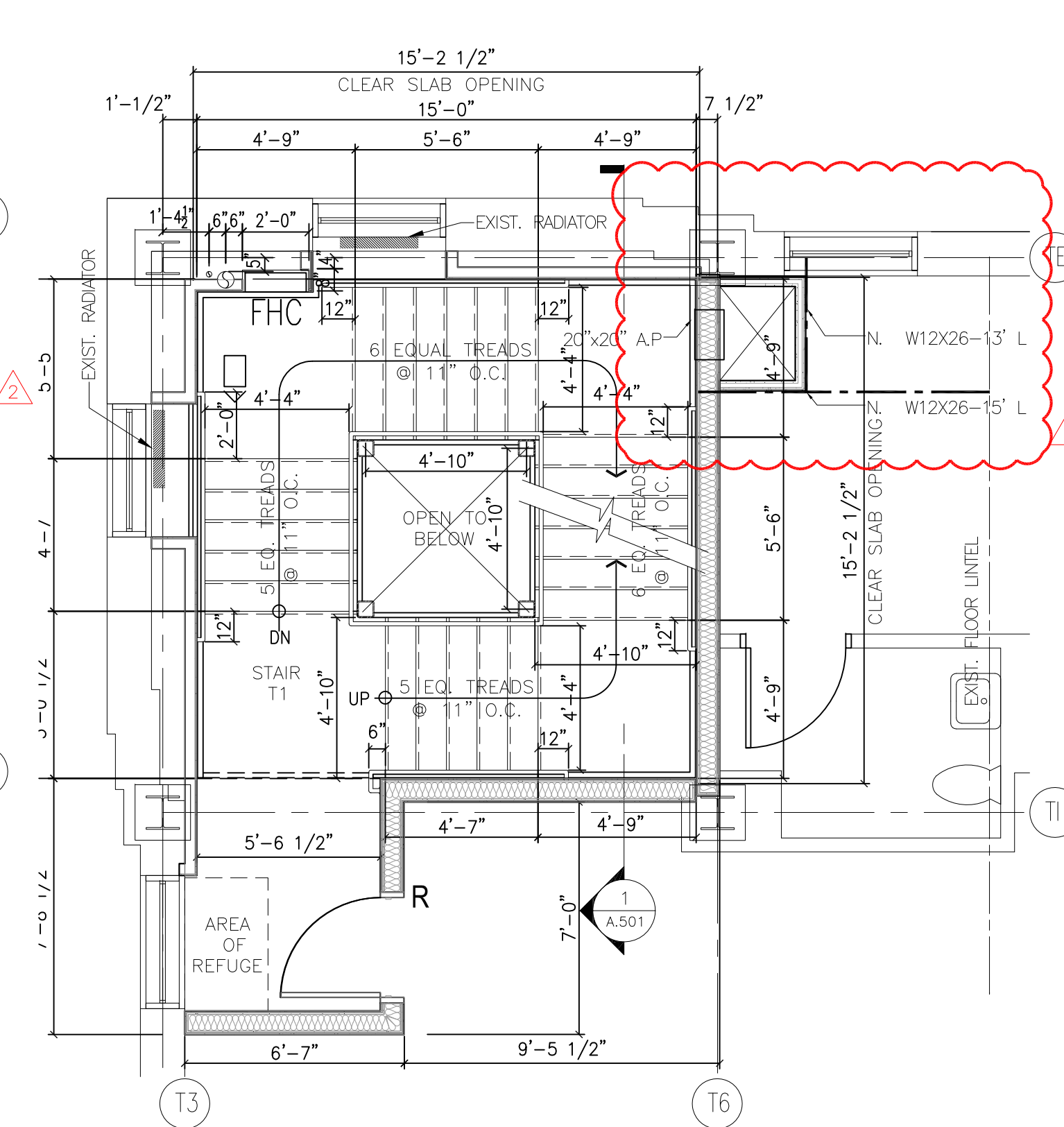
ENLARGED STAIR PLANS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 56 OF:160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

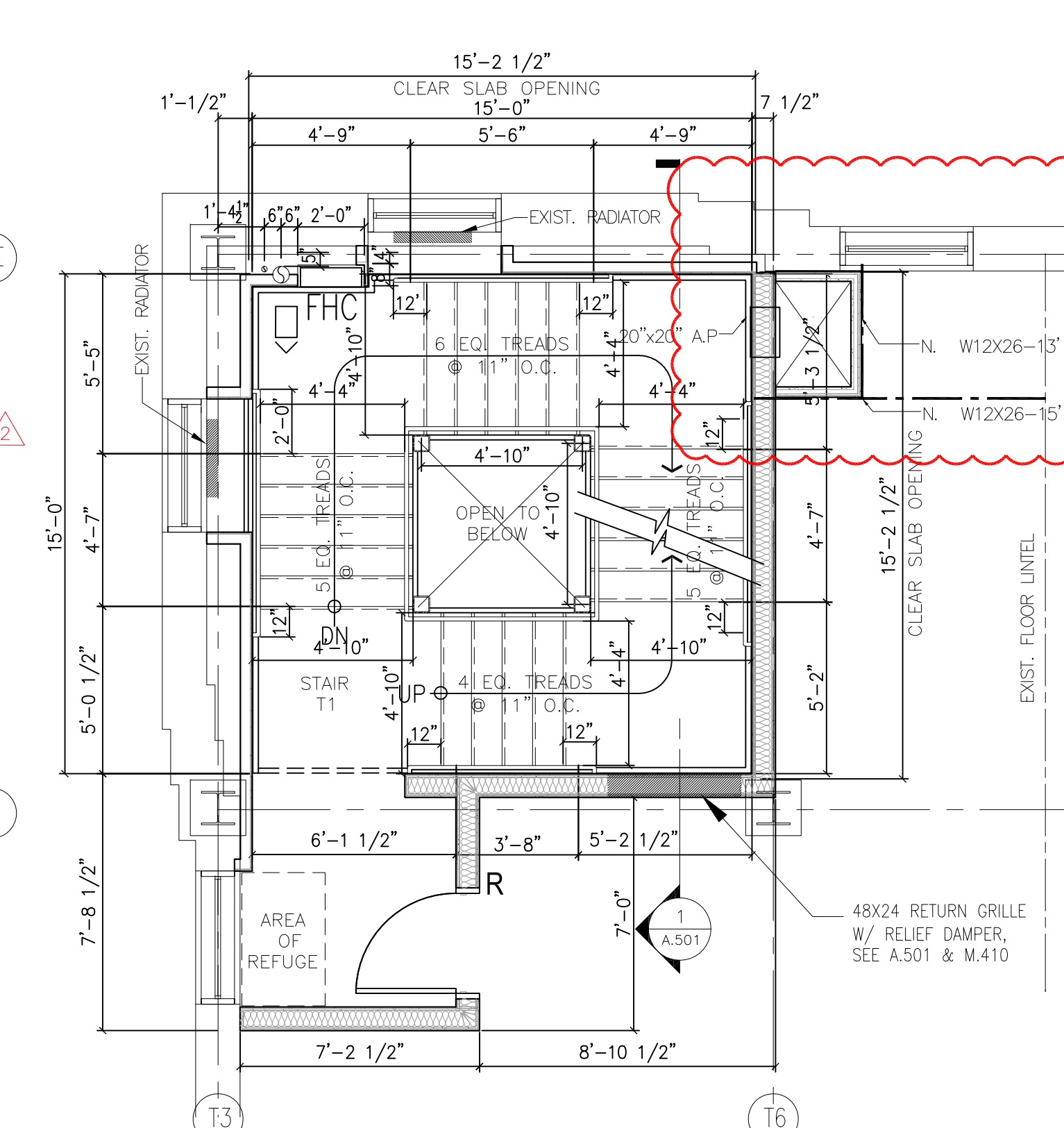
A.401



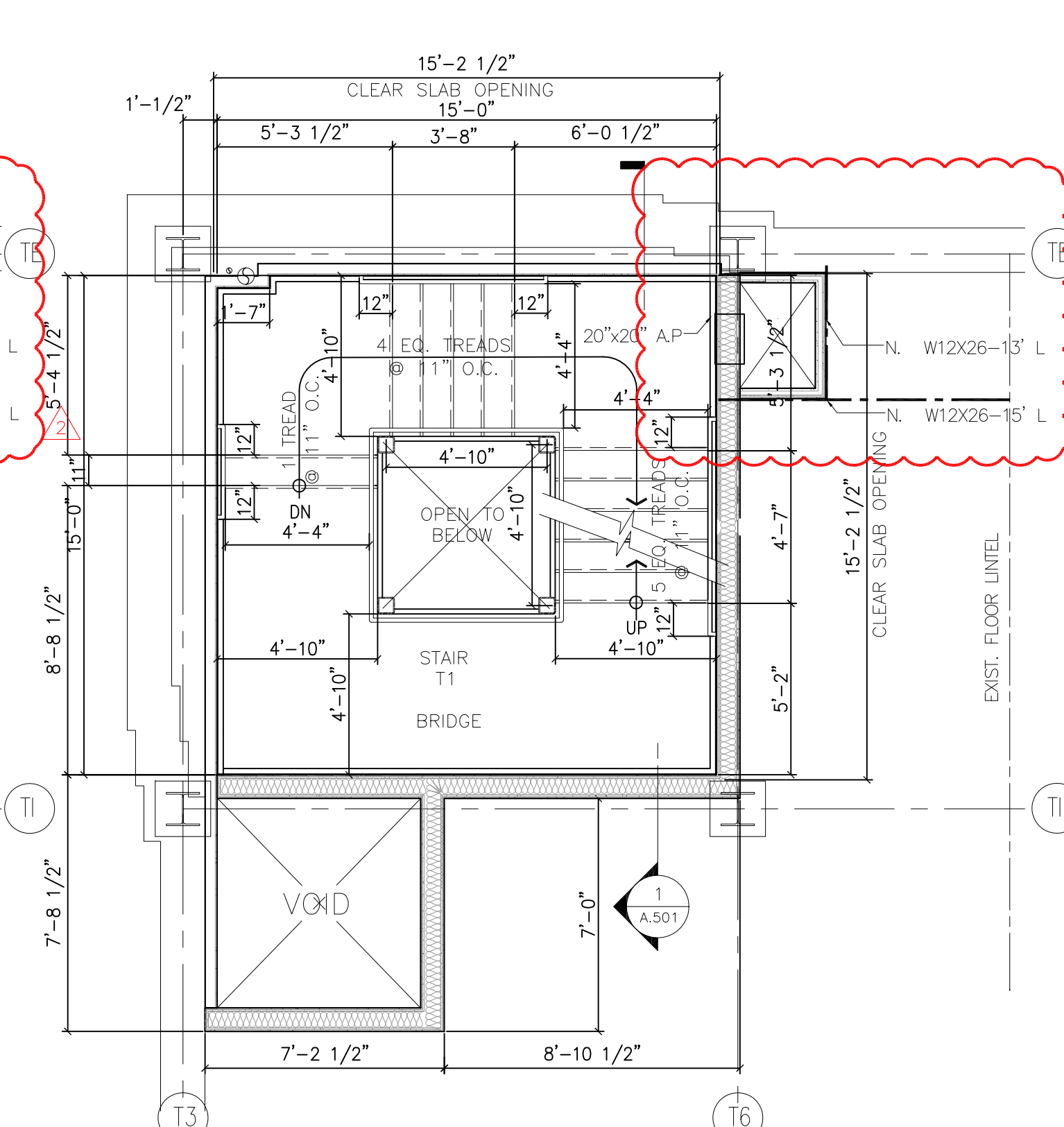
9
A.402
9TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



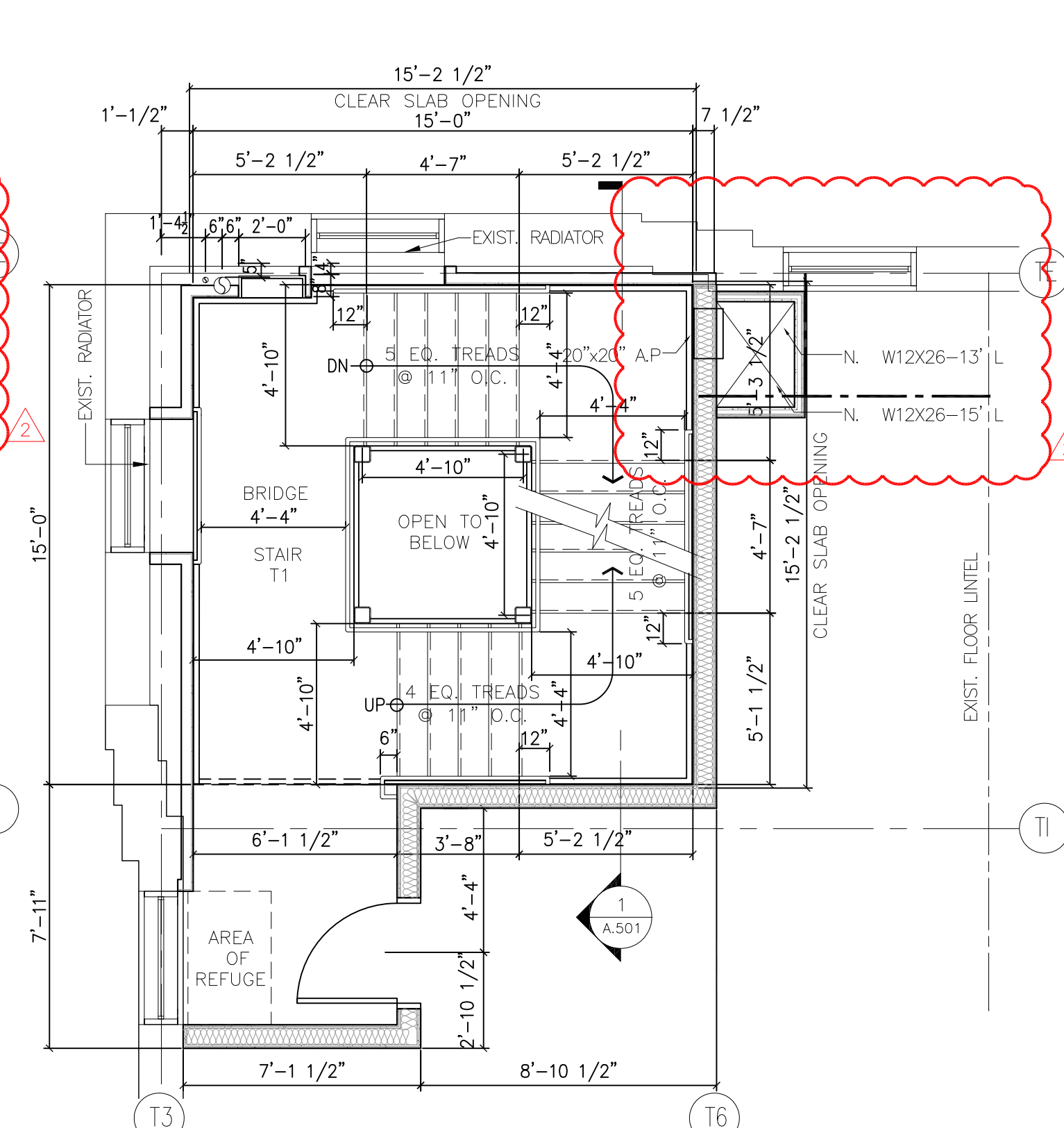
10
A.402
10TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



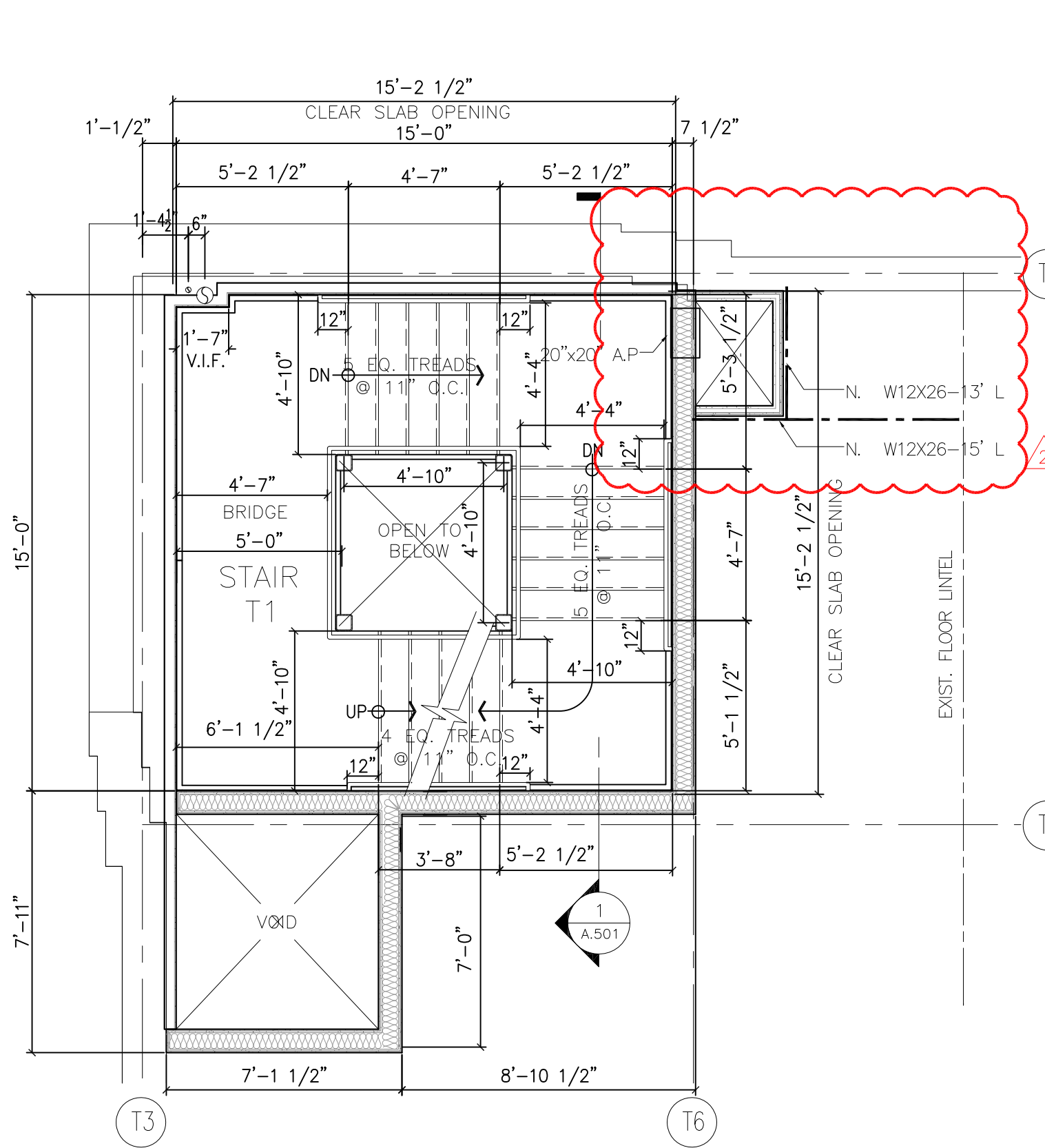
11
A.402
11TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



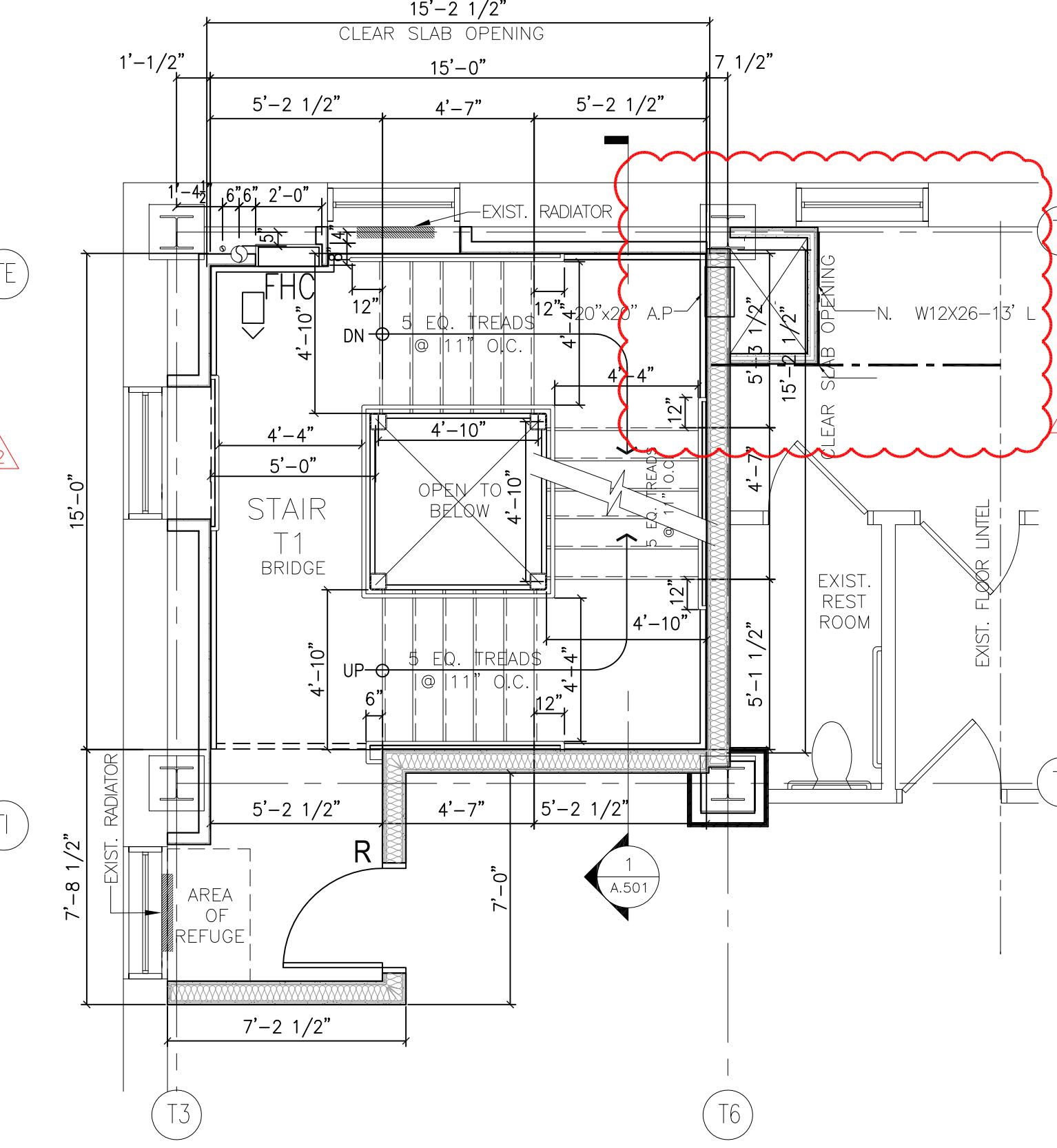
11.1
A.402
11TH & 12TH INTERMEDIATE FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



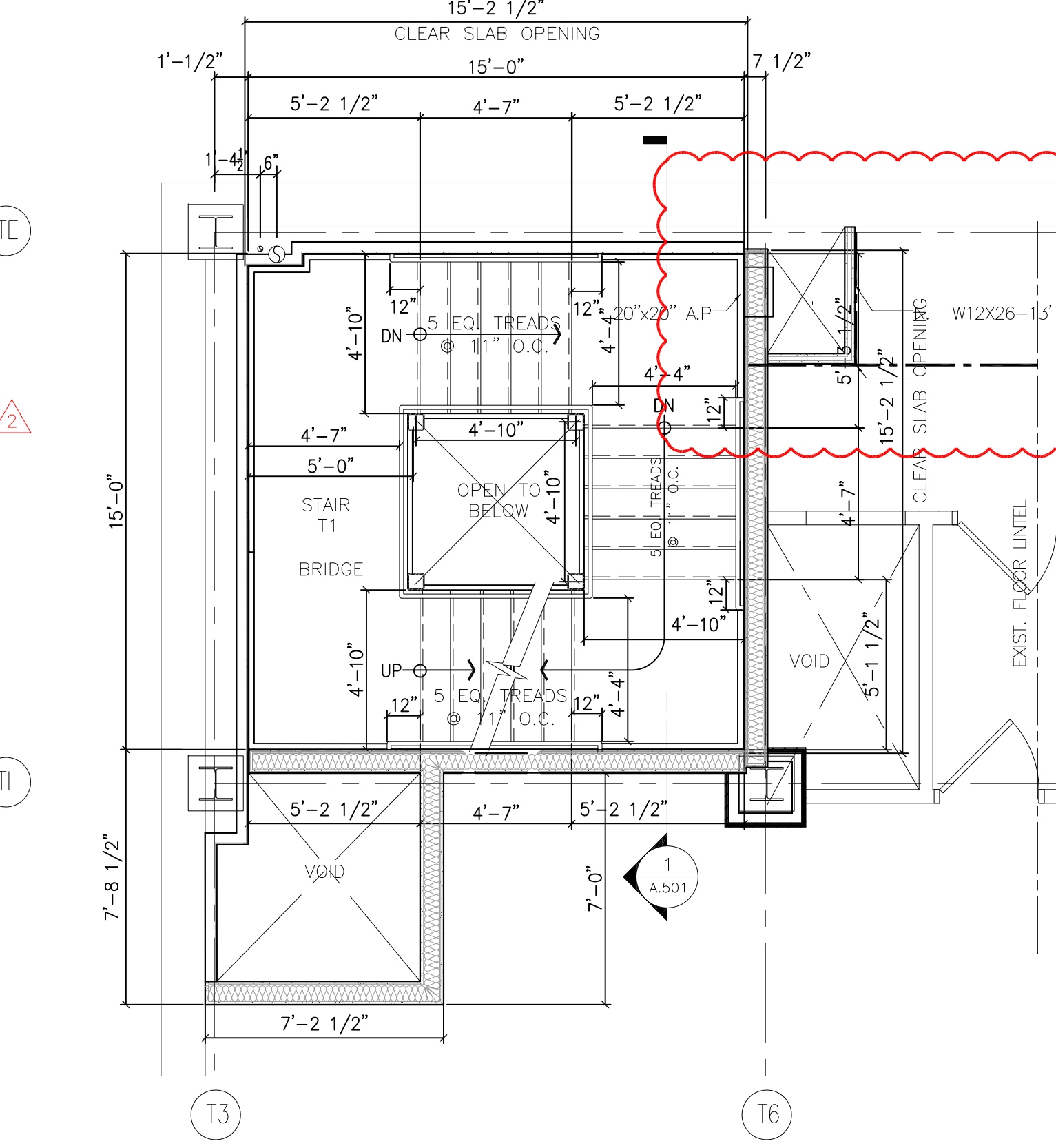
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A.402
12TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



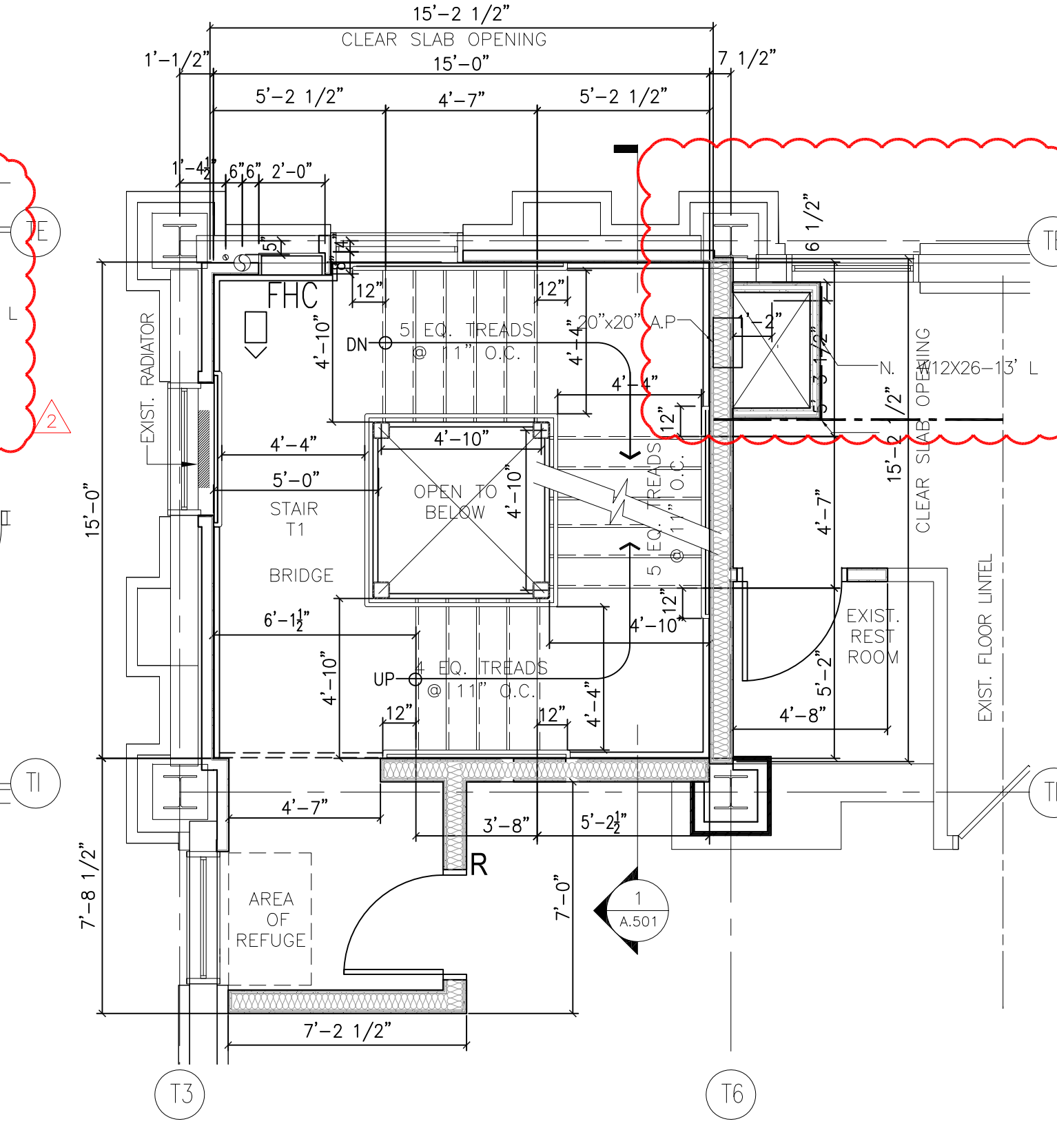
12.1
A.402
12TH & 13TH INTERMEDIATE FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



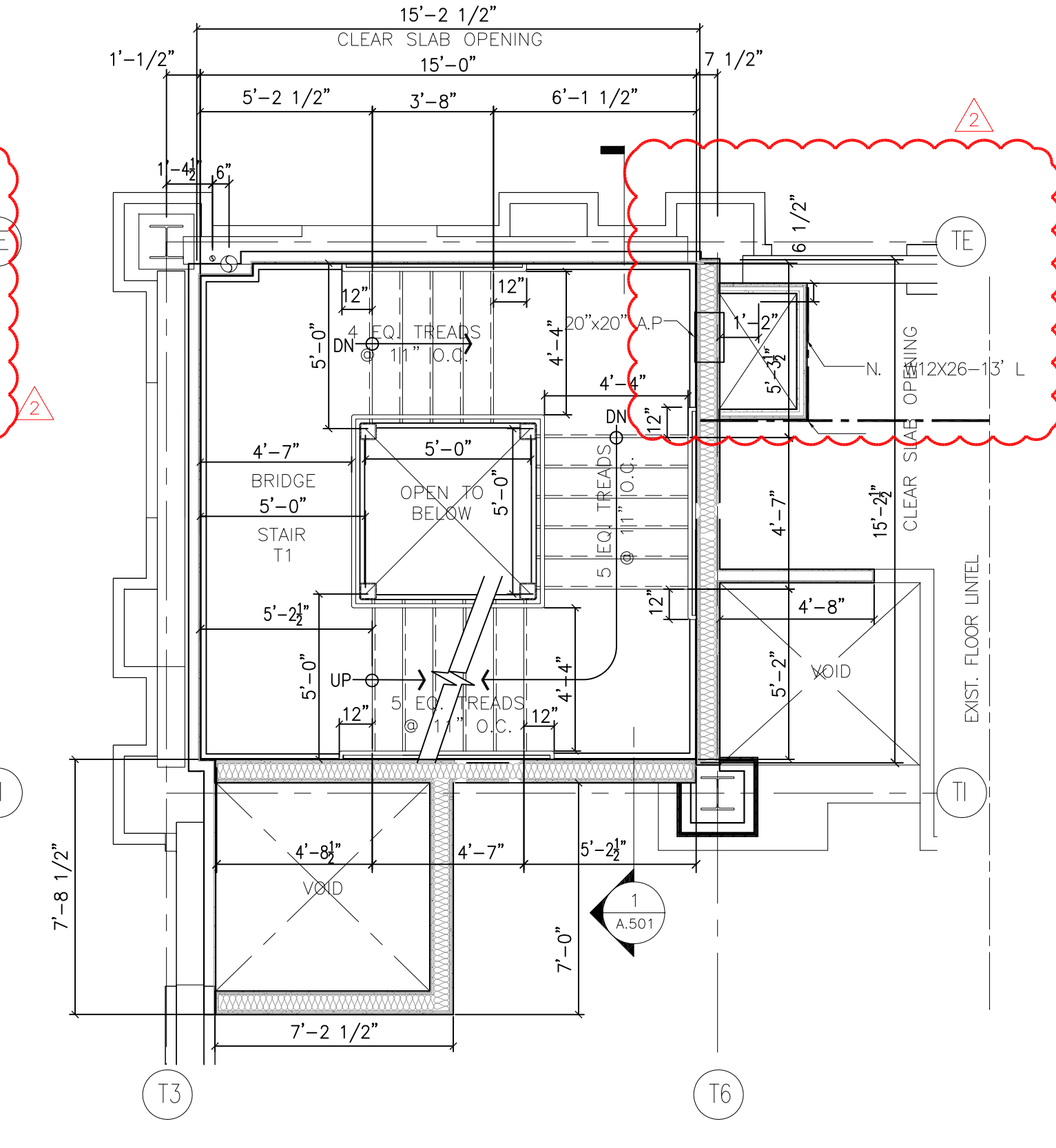
13
A.402
13TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



13.1
A.402
13TH & 14TH INTERMEDIATE FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"

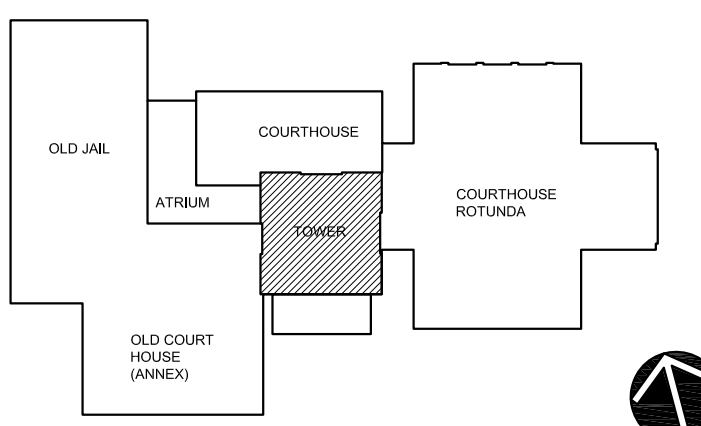


14
A.402
14TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



14.1
A.402
14TH & 15TH INTERMEDIATE FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"

KEYPLAN

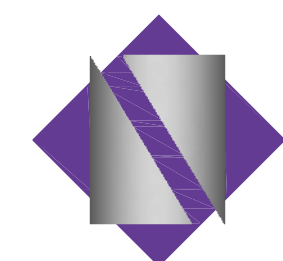


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CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

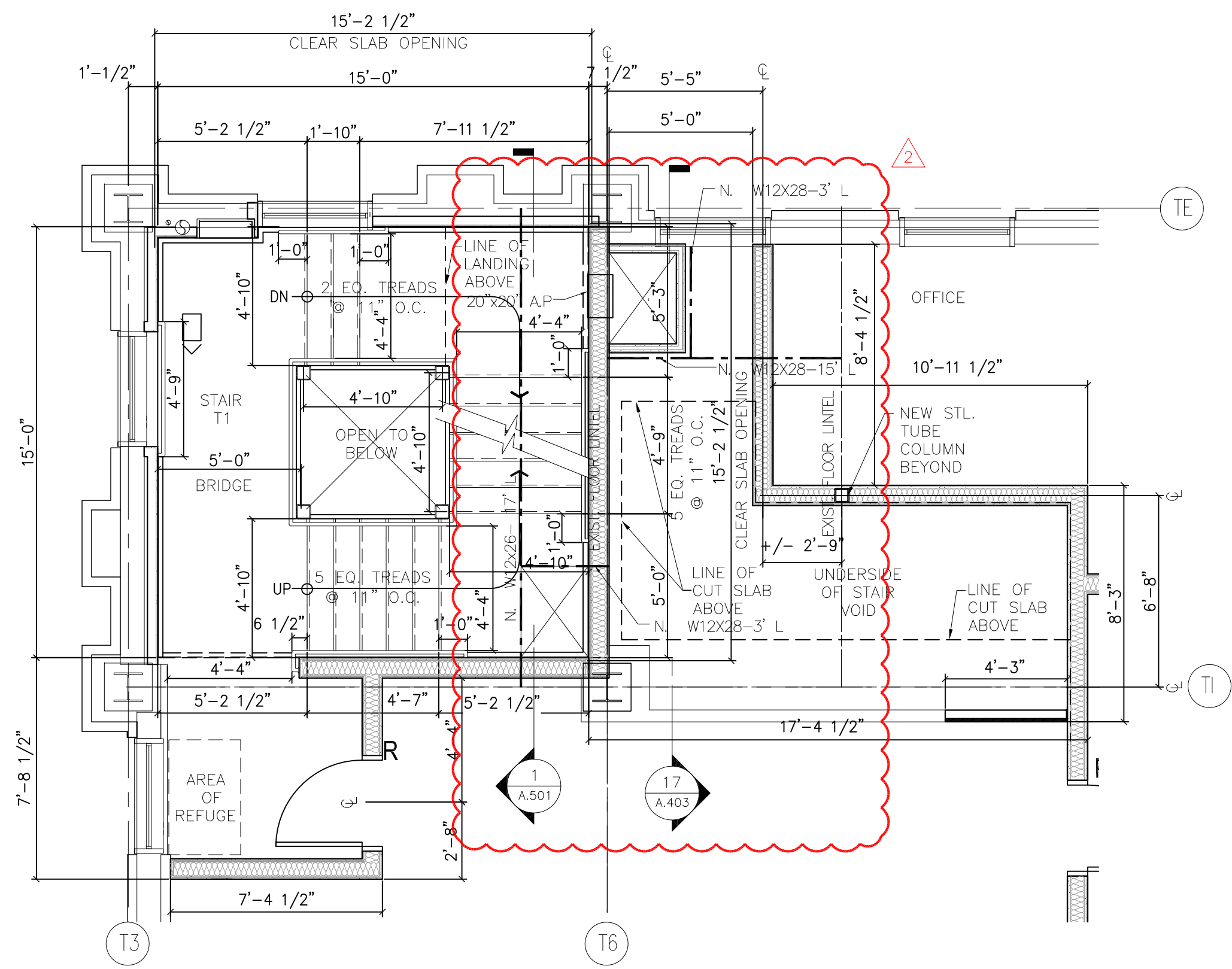
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

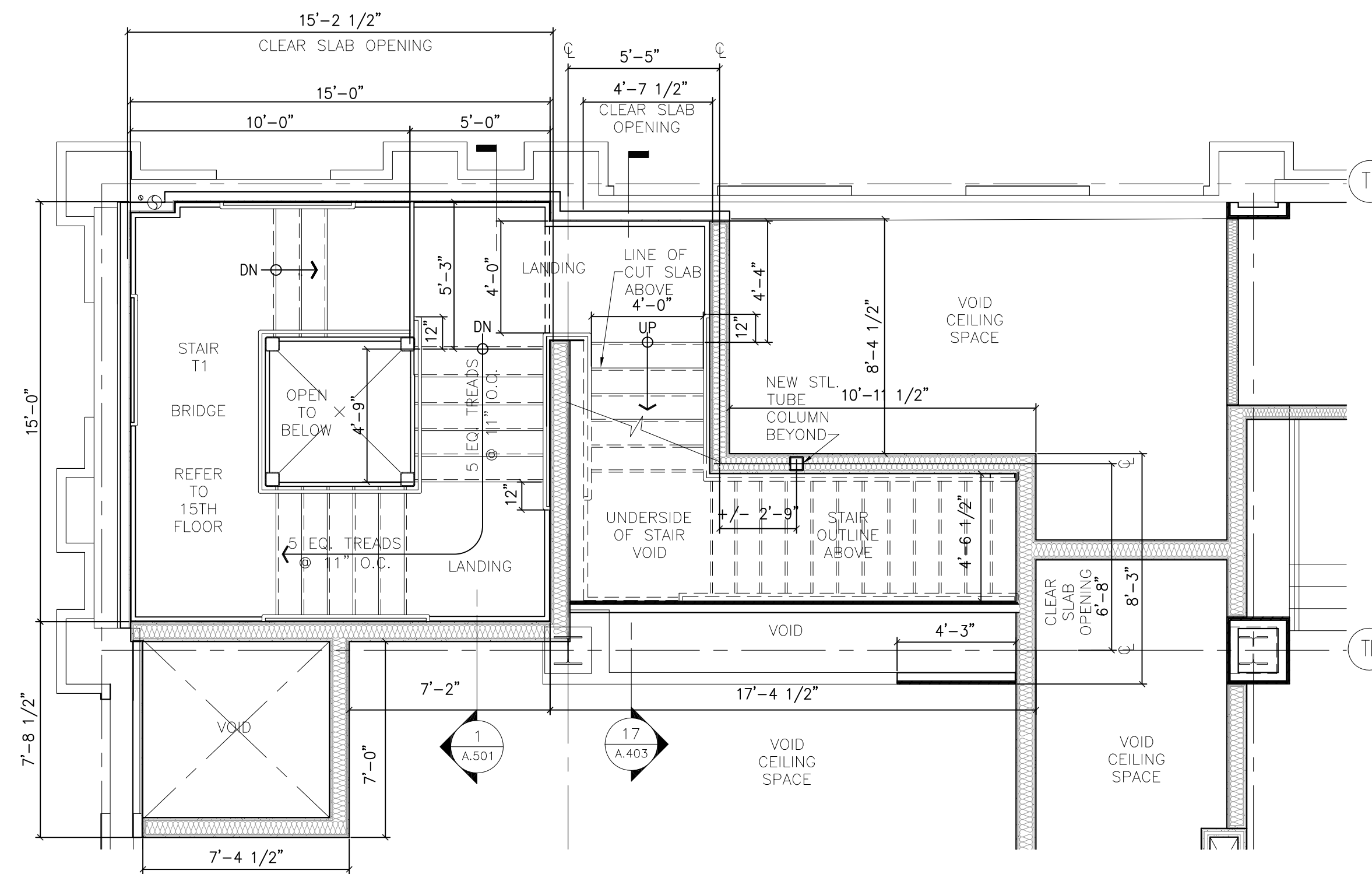
ENLARGED STAIR PLANS

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						
10.30.15	95% SUBMISSION	KD	FM						
05.31.17	100% SUBMISSION	MC	FM						
08.30.17	ISSUED FOR BID	MC	FM						
11.1.17	ADDENDUM #2	MC	FM						

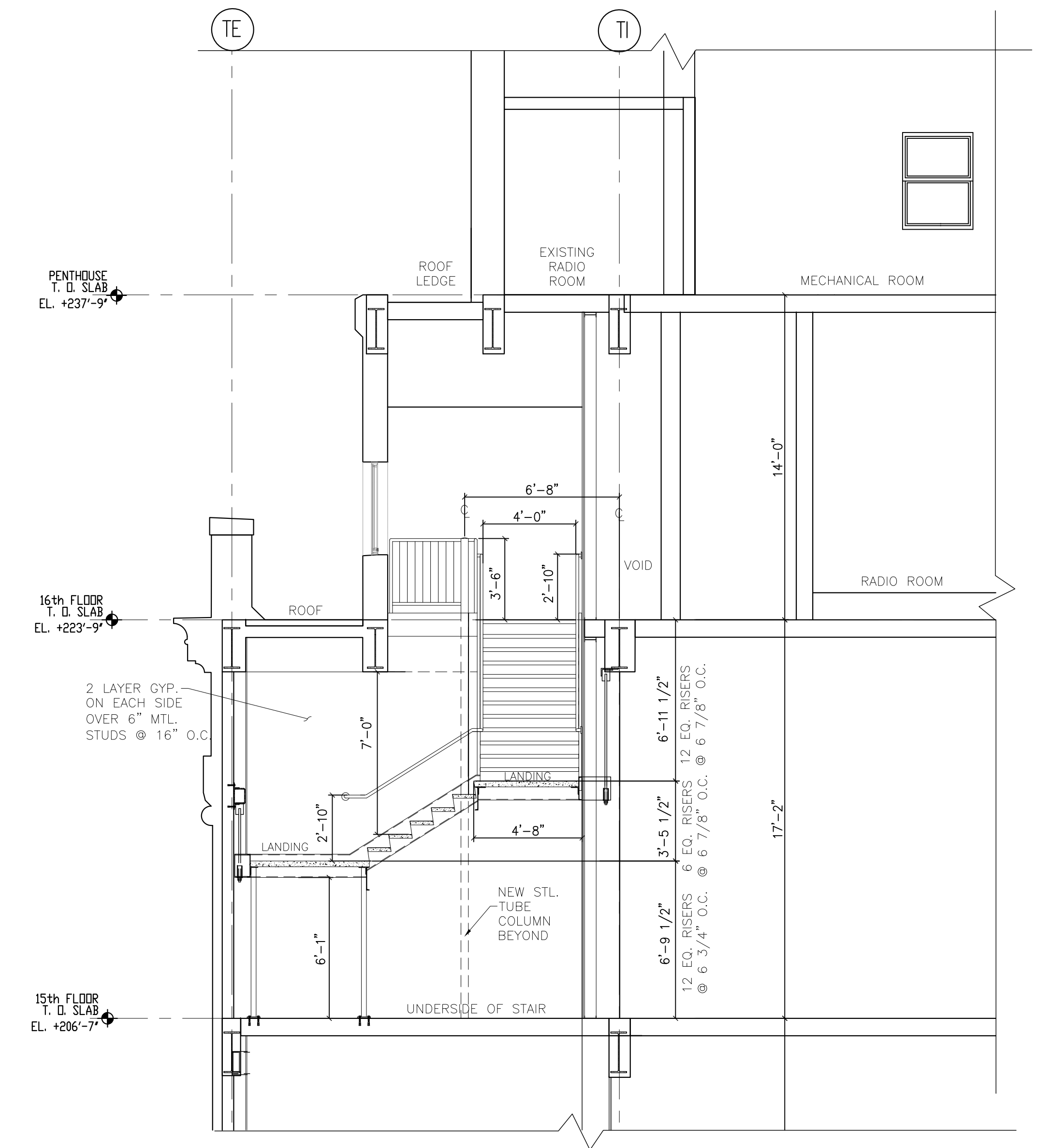
A.402



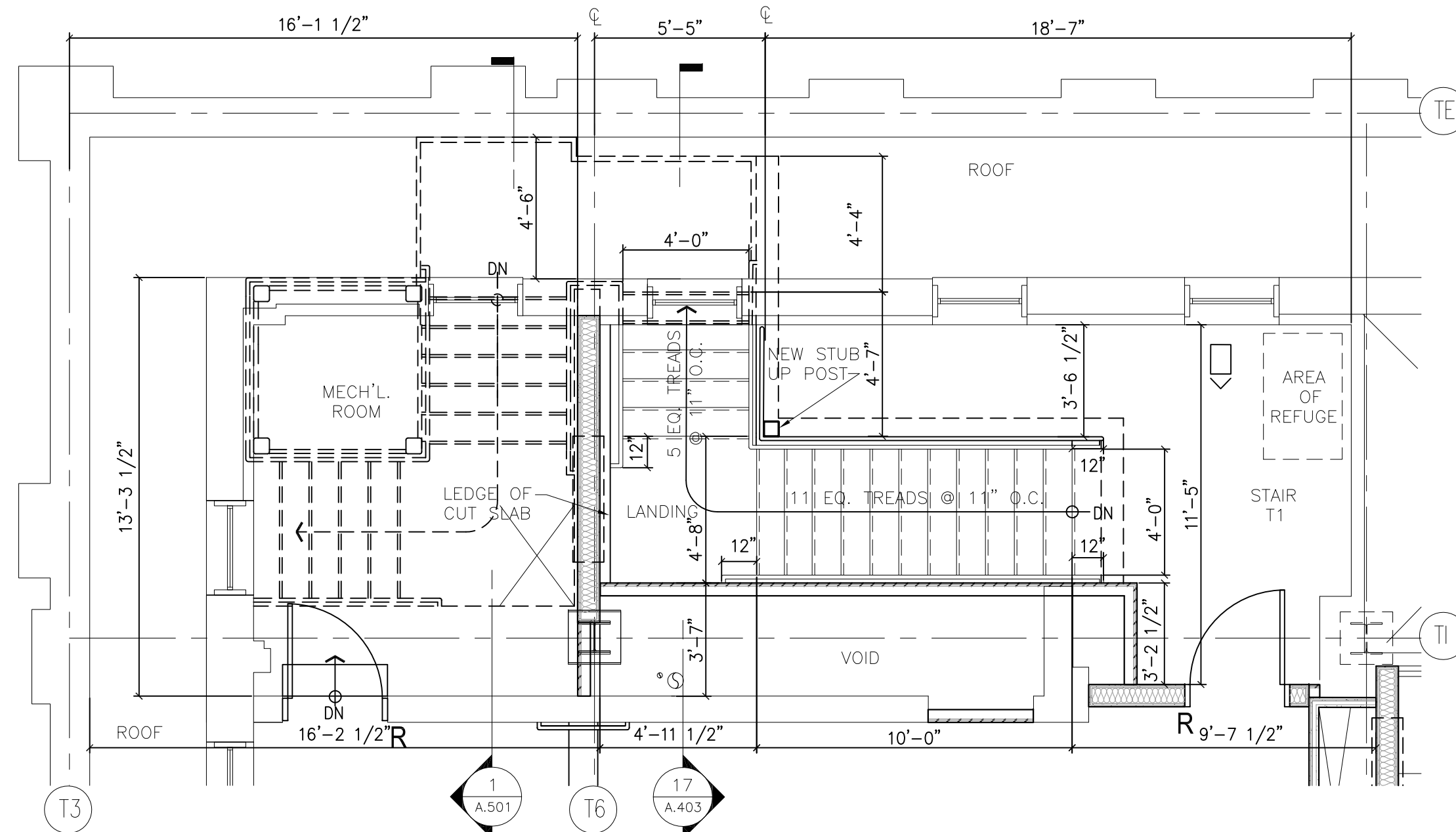
15
A.403 15TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



15.1
A.403 15TH & 16TH INTERMEDIATE FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"

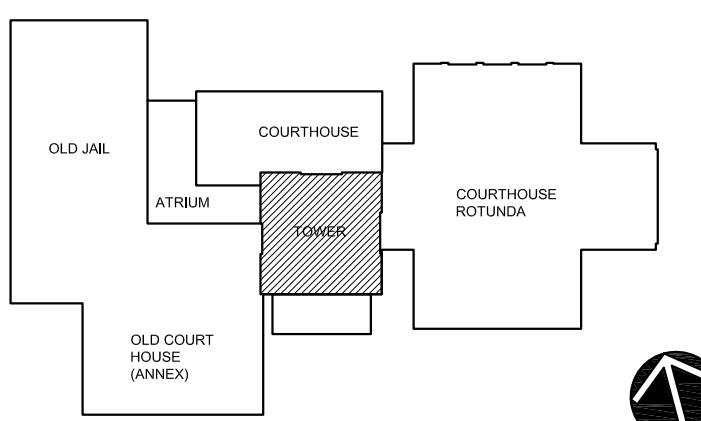


17
A.403 DETAIL STAIR SECTION @ 15TH & 16TH FLOOR
SCALE: 1/4"=1'-0"



16
A.402 16TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"

KEYPLAN

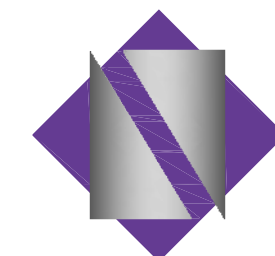


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CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

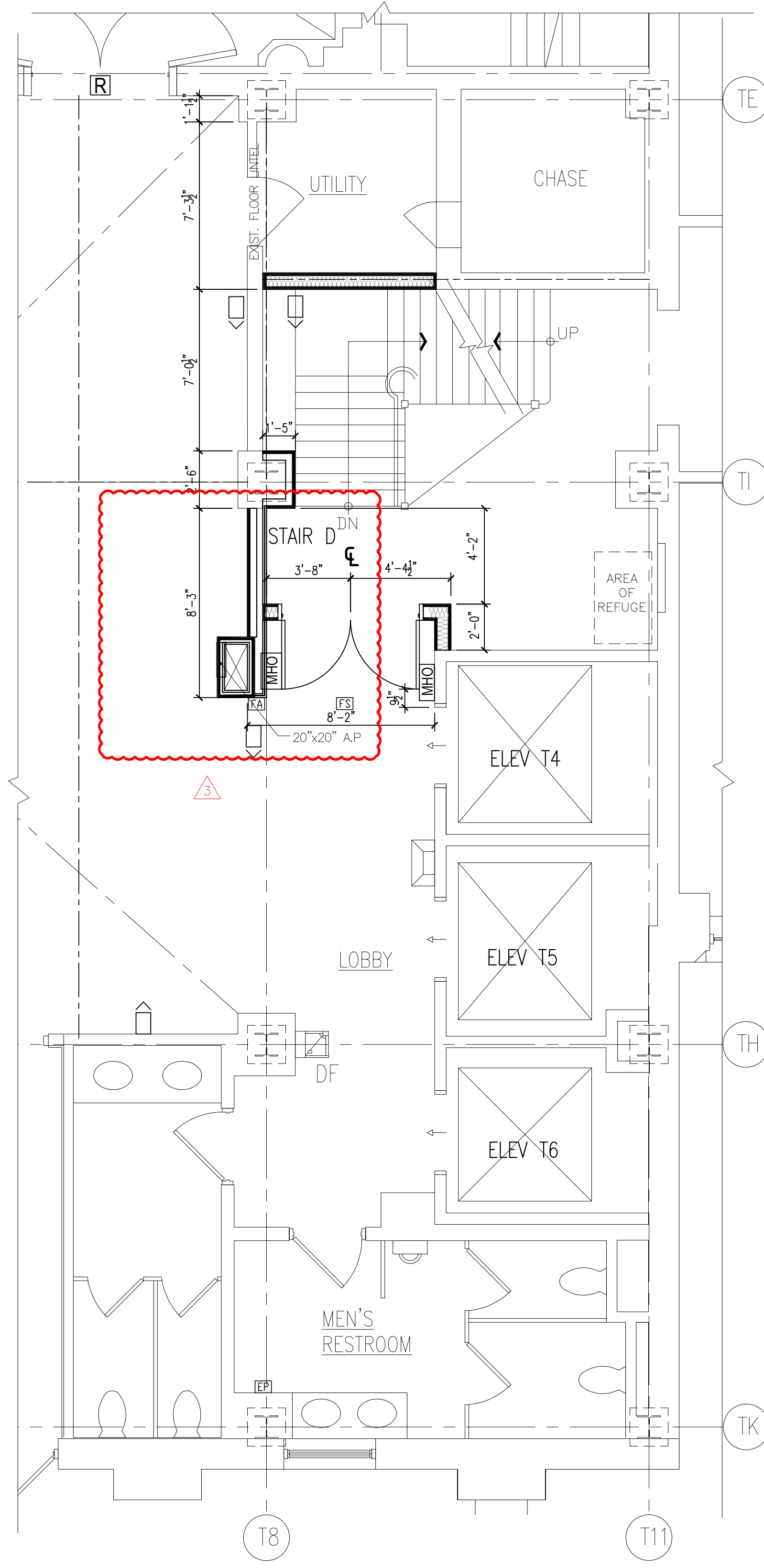
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ENLARGED PLANS & DETAIL SECTION OF STAIR

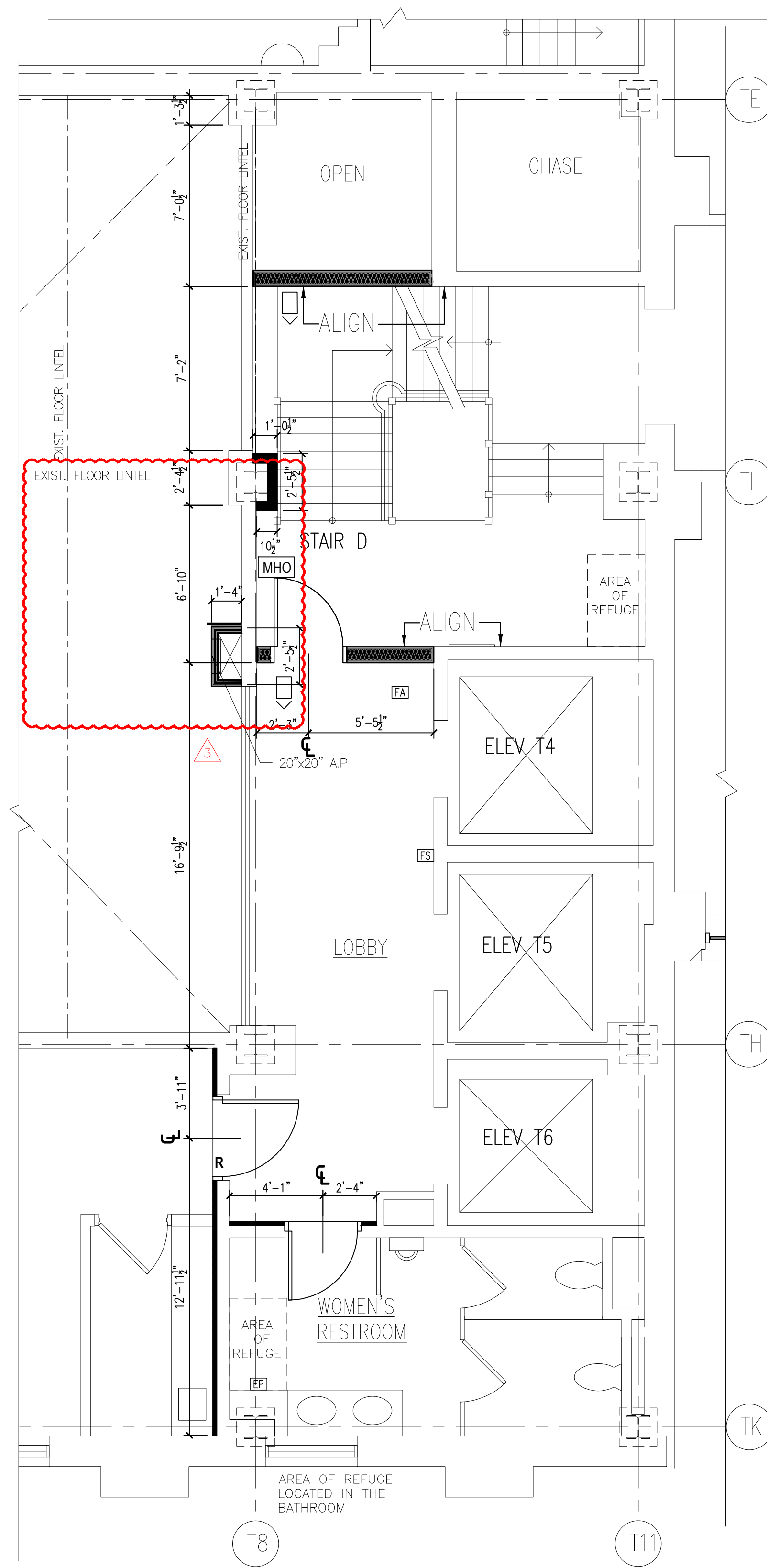
SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						
10.30.15	95% SUBMISSION	KD	FM						
05.31.17	100% SUBMISSION	MC	FM						
08.30.17	ISSUED FOR BID	MC	FM						
11.1.17	ADDENDUM #2	MC	FM						

JOB NO 2141151
SHEET: 58 OF 160
DWG NO

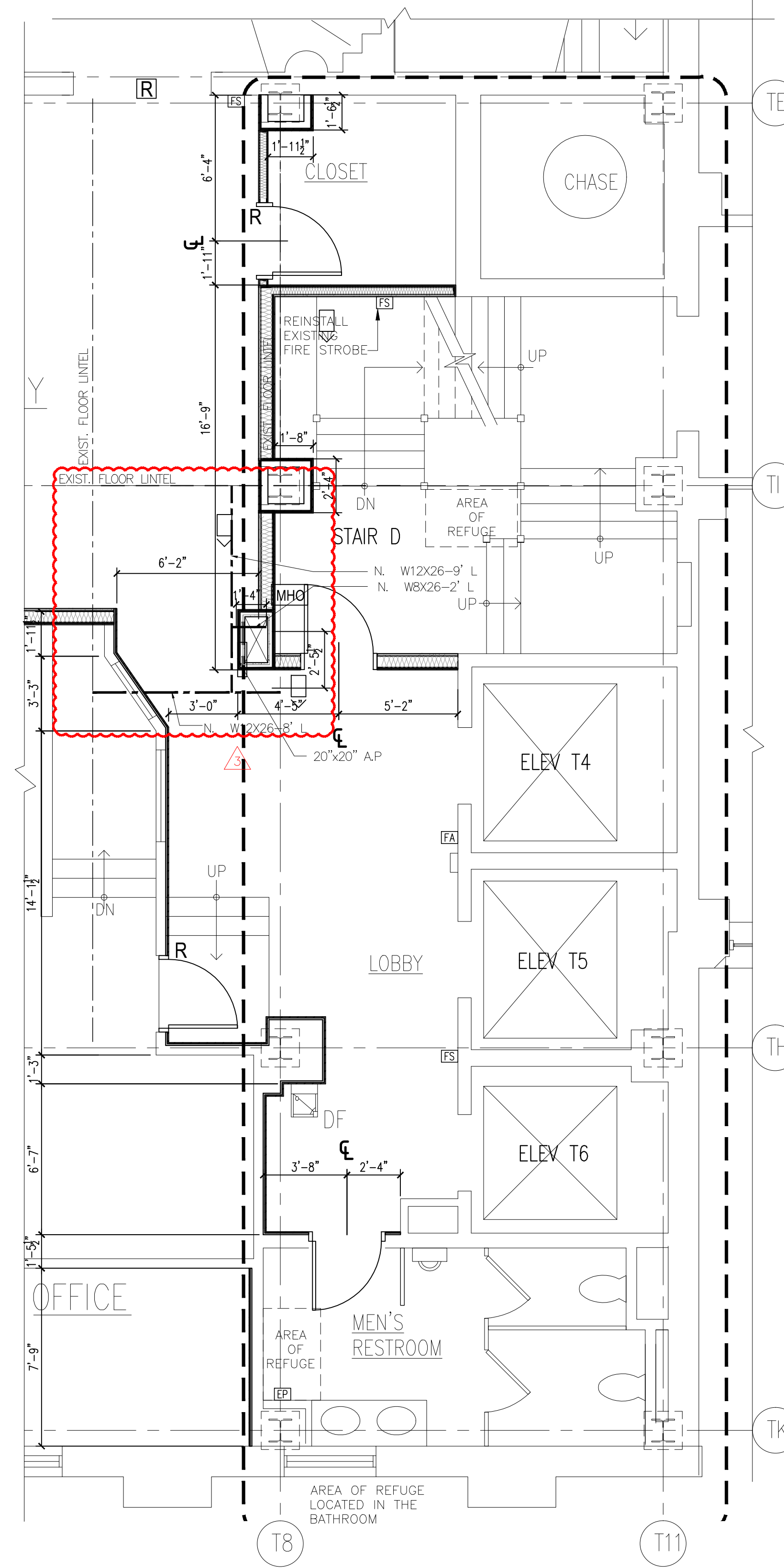
A.403



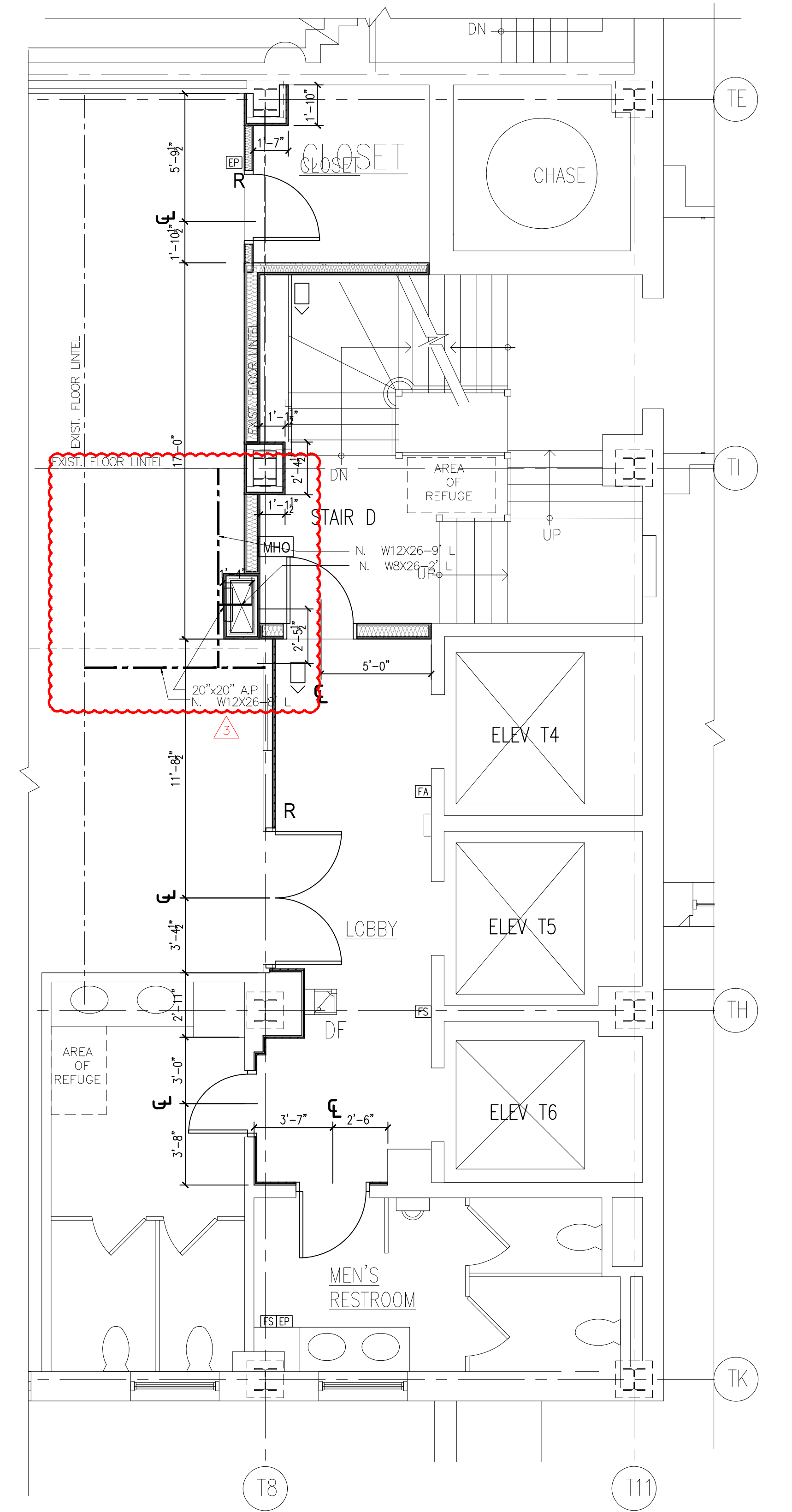
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SCALE: 1/4"=1'-0"



2 2ND FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"

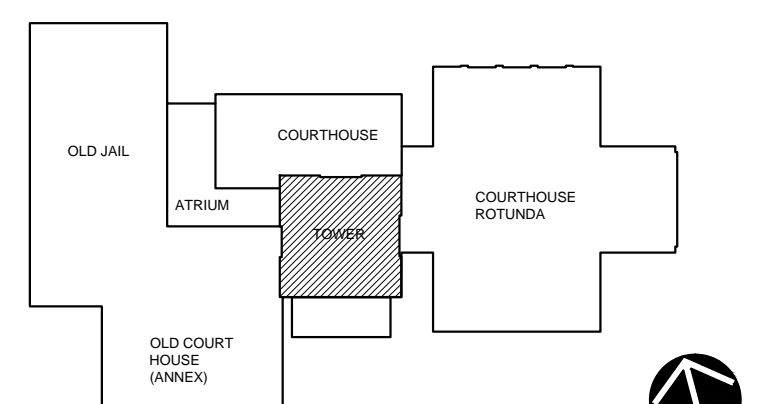


3 3RD FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"



4 4TH FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"

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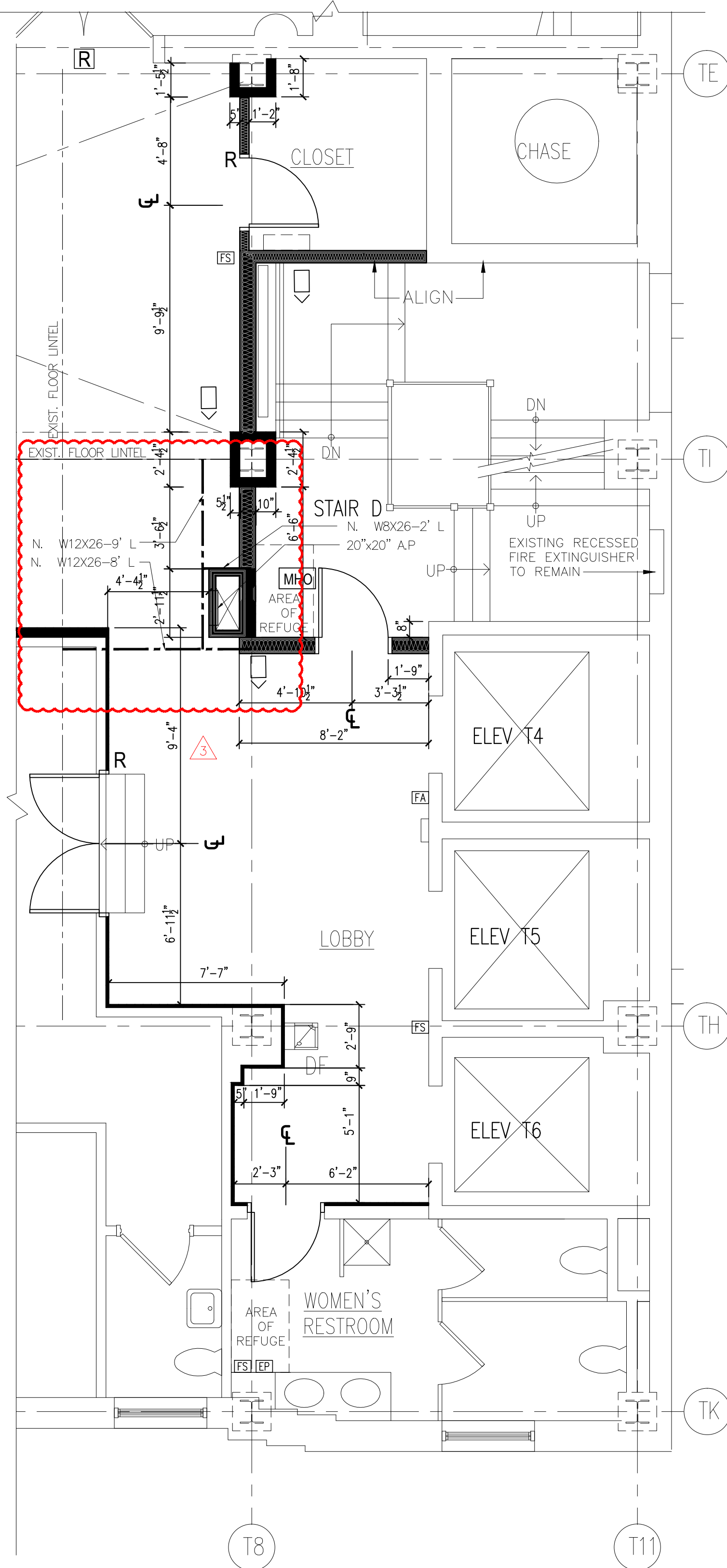
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

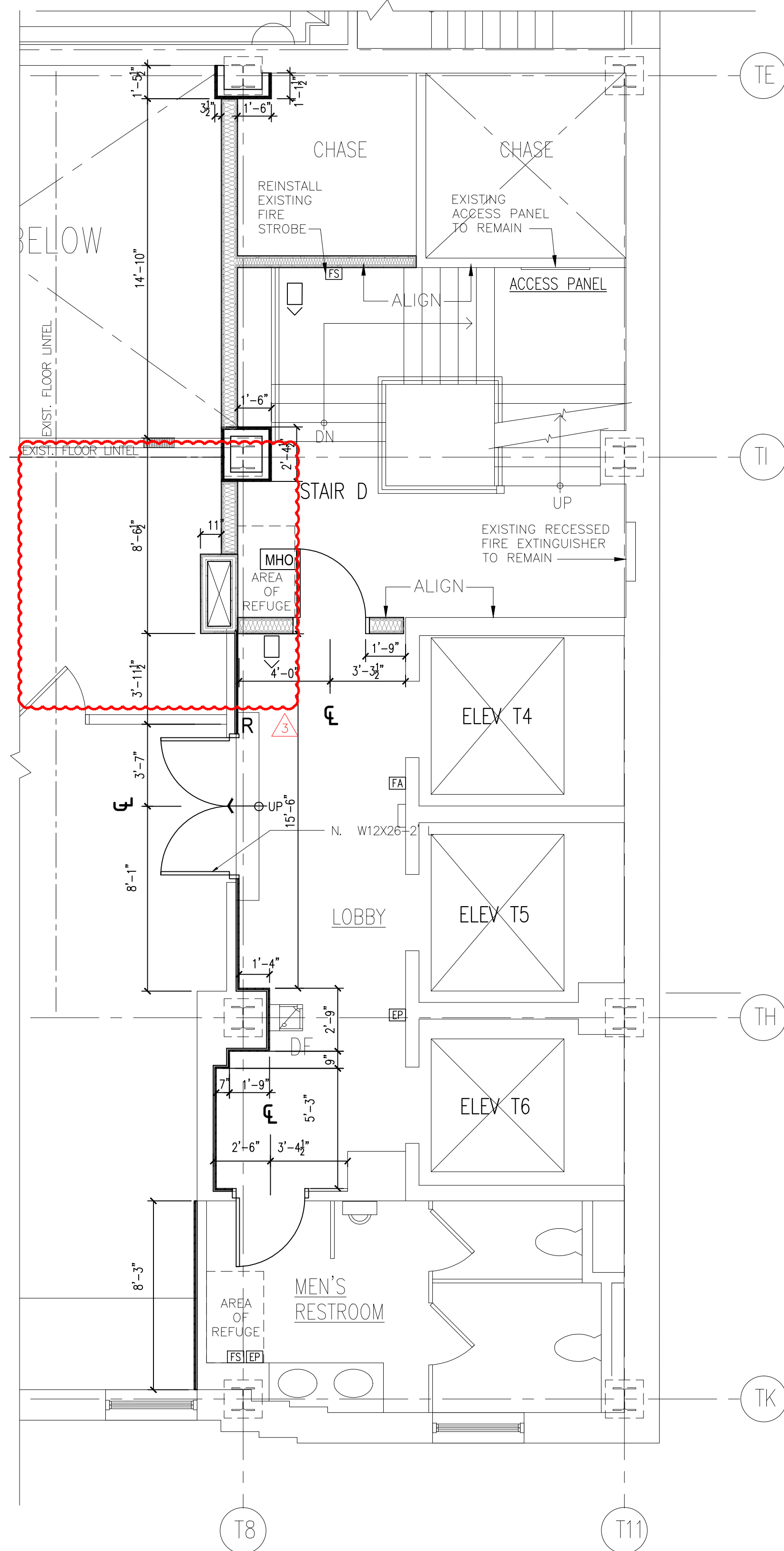
ENLARGED FIRST THRU FOURTH FLOOR STAIR PLANS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 59 OF: 160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

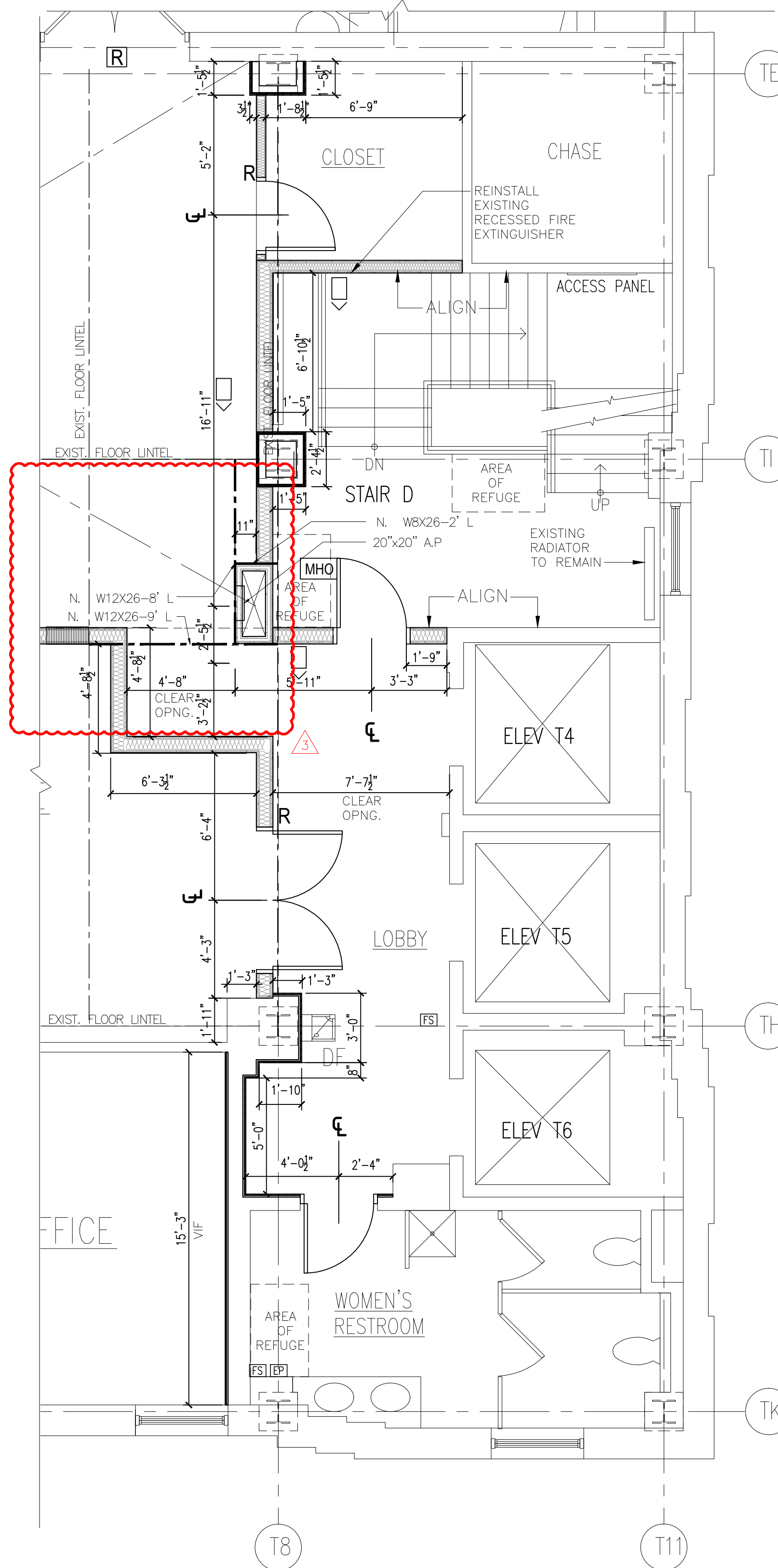
A.404



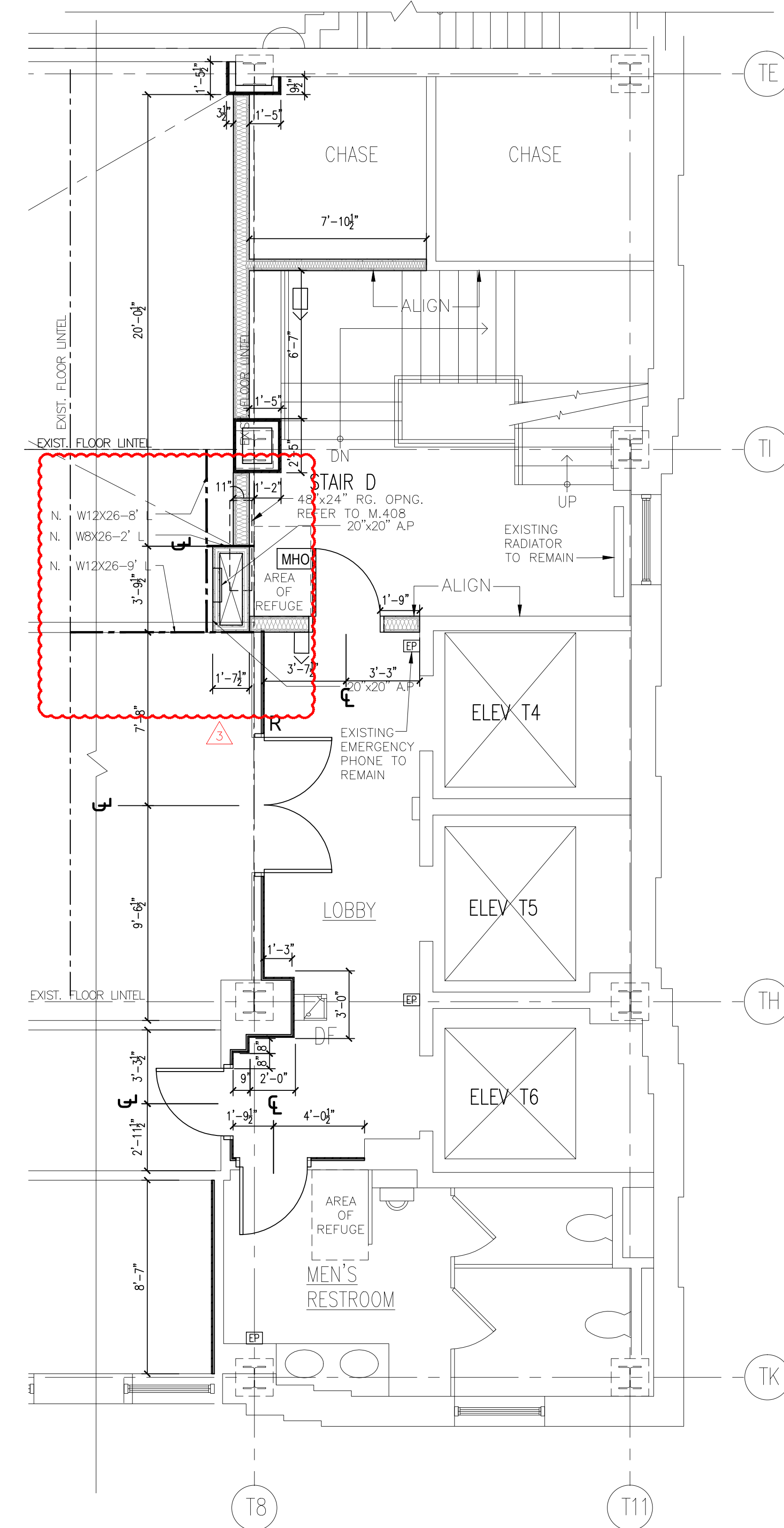
1 5TH FLOOR STAIR PLAN
A.405 SCALE: 1/4"=1'-0"



2 6TH FLOOR STAIR PLAN
A.405 SCALE: 1/4"=1'-0"

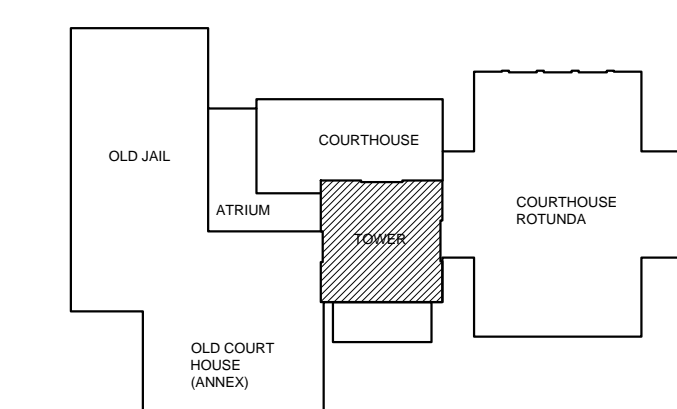


3 7TH FLOOR STAIR PLAN
A.405 SCALE: 1/4"=1'-0"



4 8TH FLOOR STAIR PLAN
A.405 SCALE: 1/4"=1'-0"

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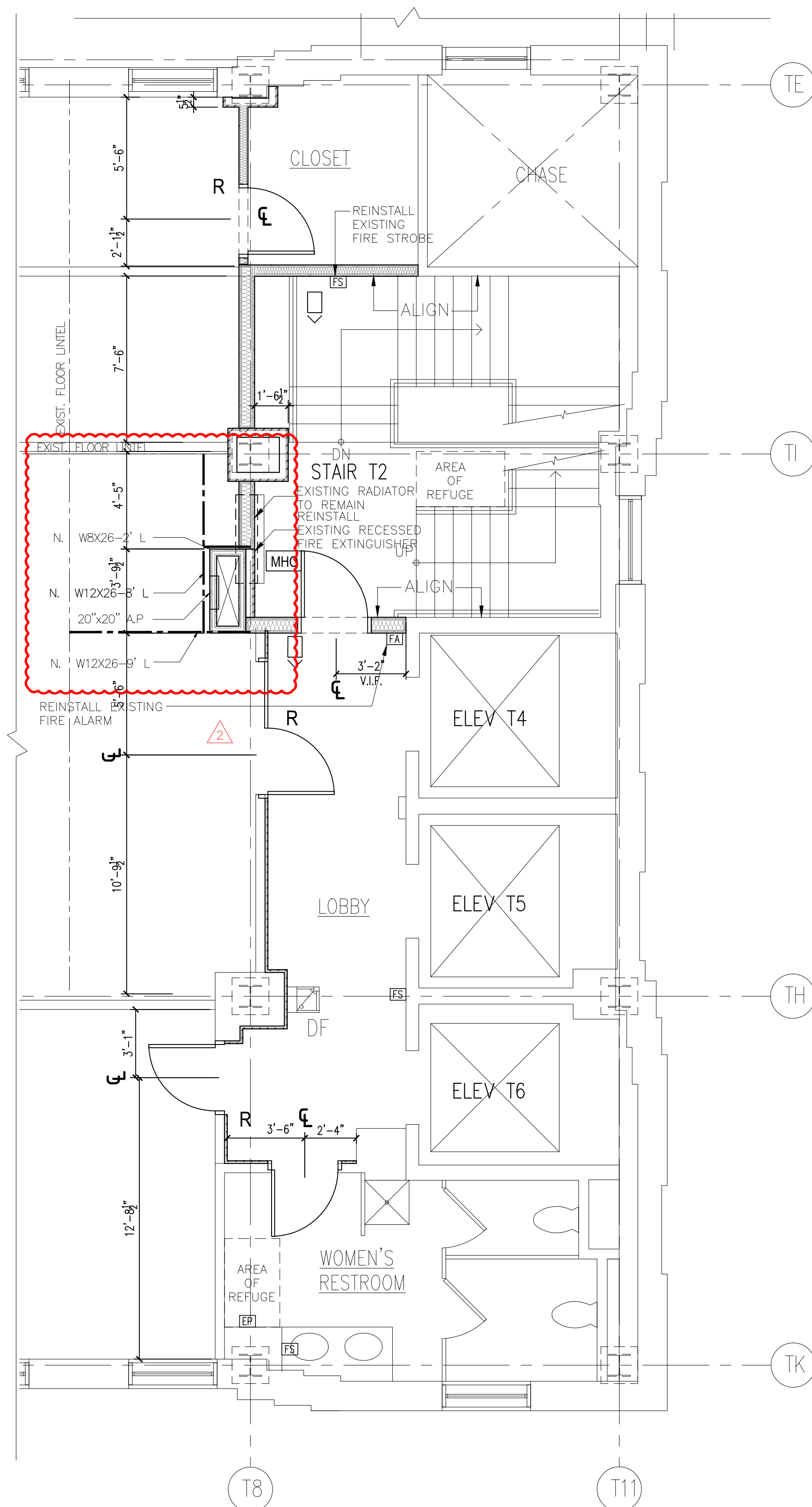
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

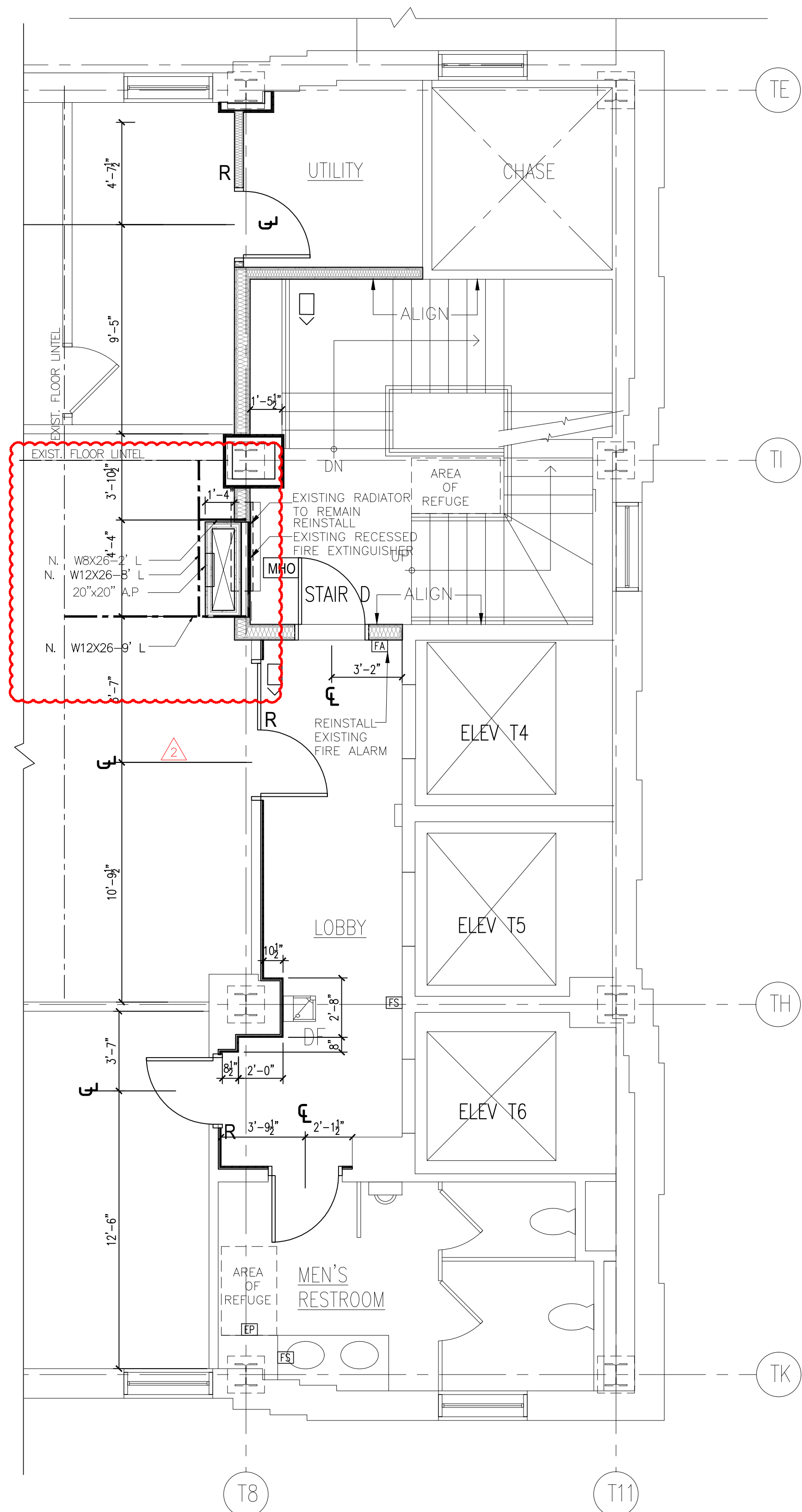
ENLARGED FIFTH THRU EIGHTH STAIR PLANS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 60 OF: 160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

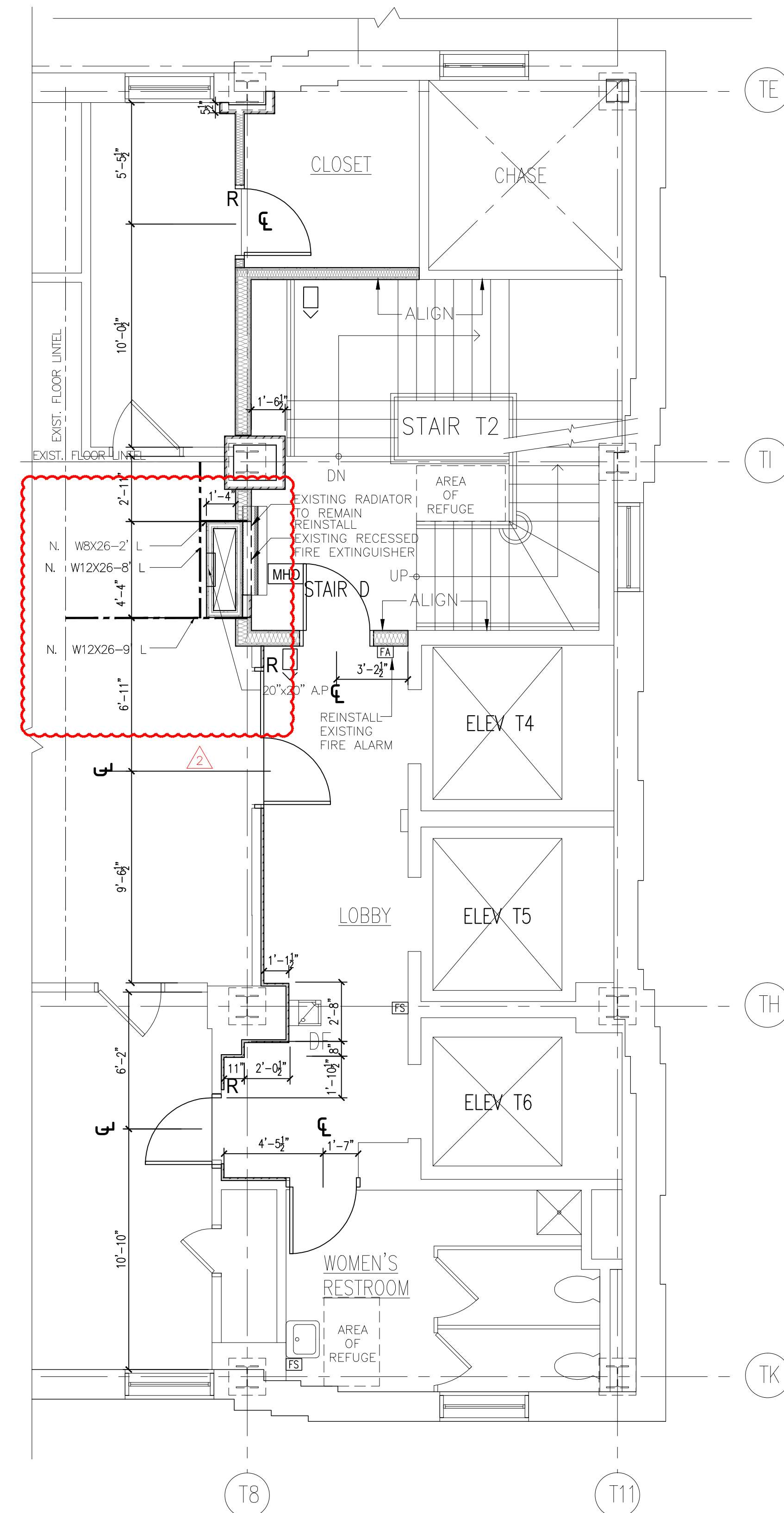
A.405



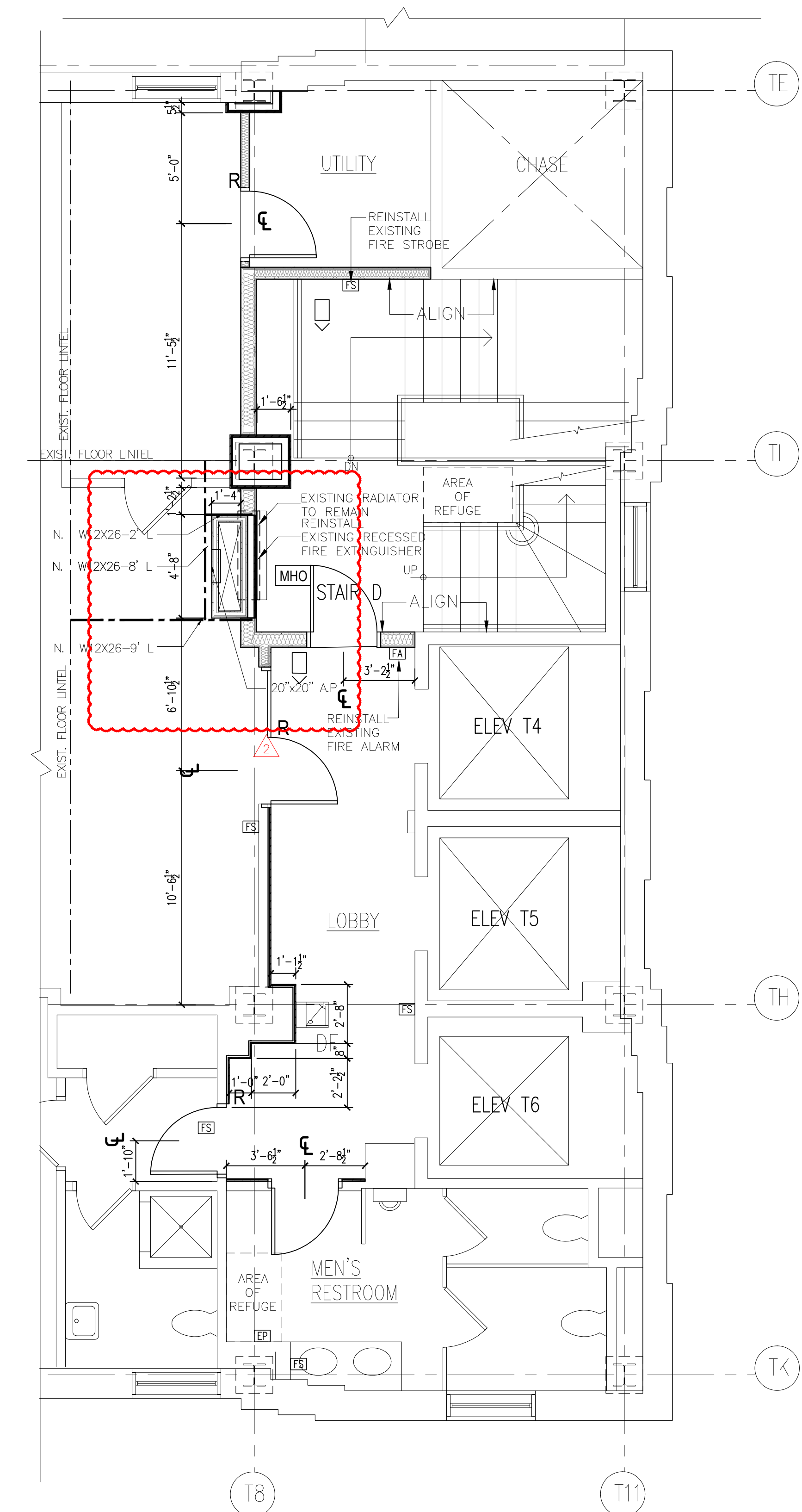
1 9TH FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"



2 10TH FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"

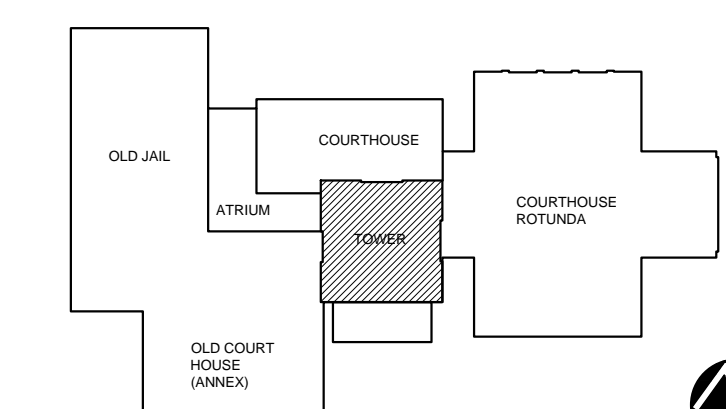


3 11TH FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"



4 12TH FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"

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PROJECT:

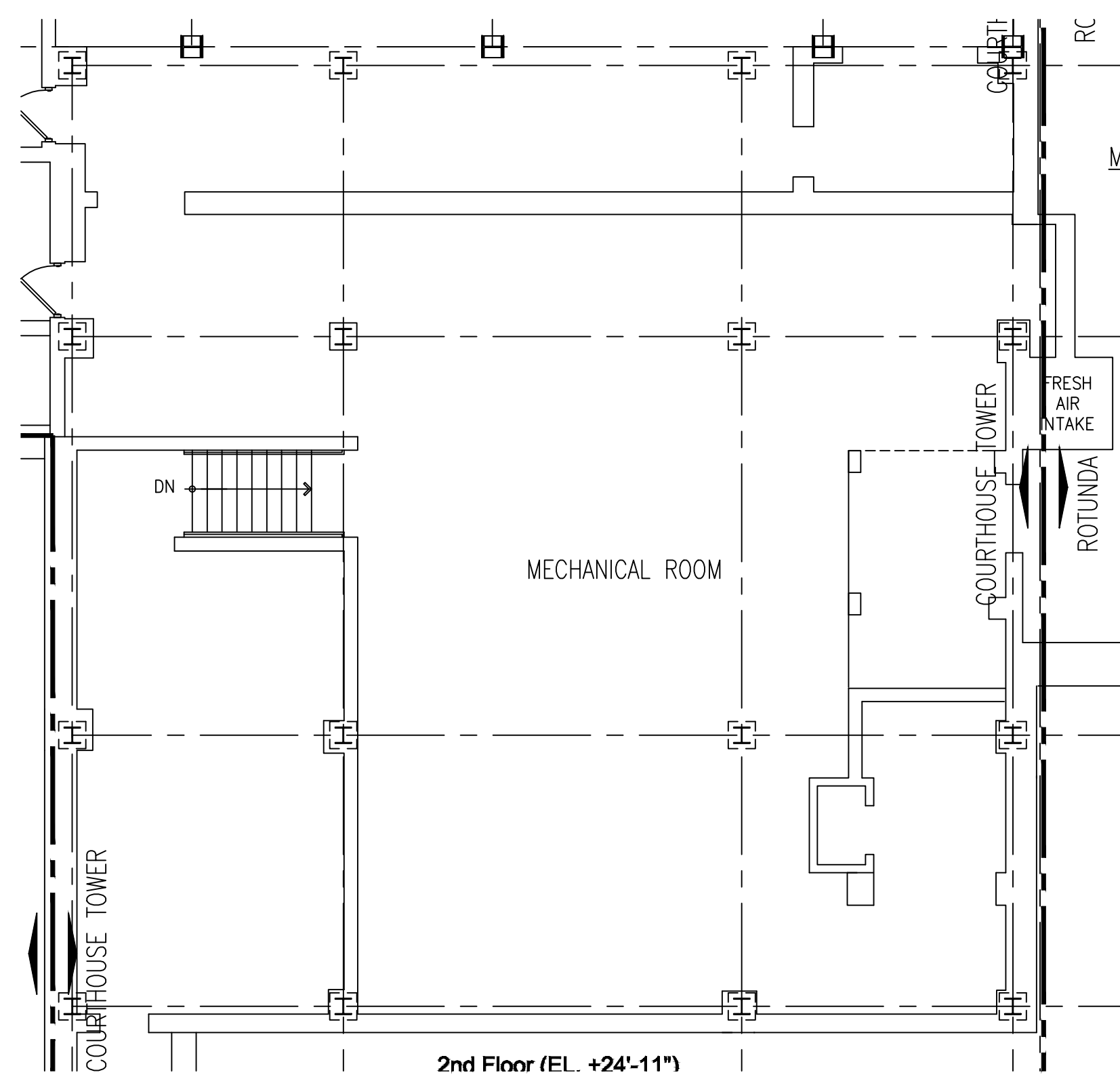
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ENLARGED NINTH THRU TWELFTH STAIR PLANS

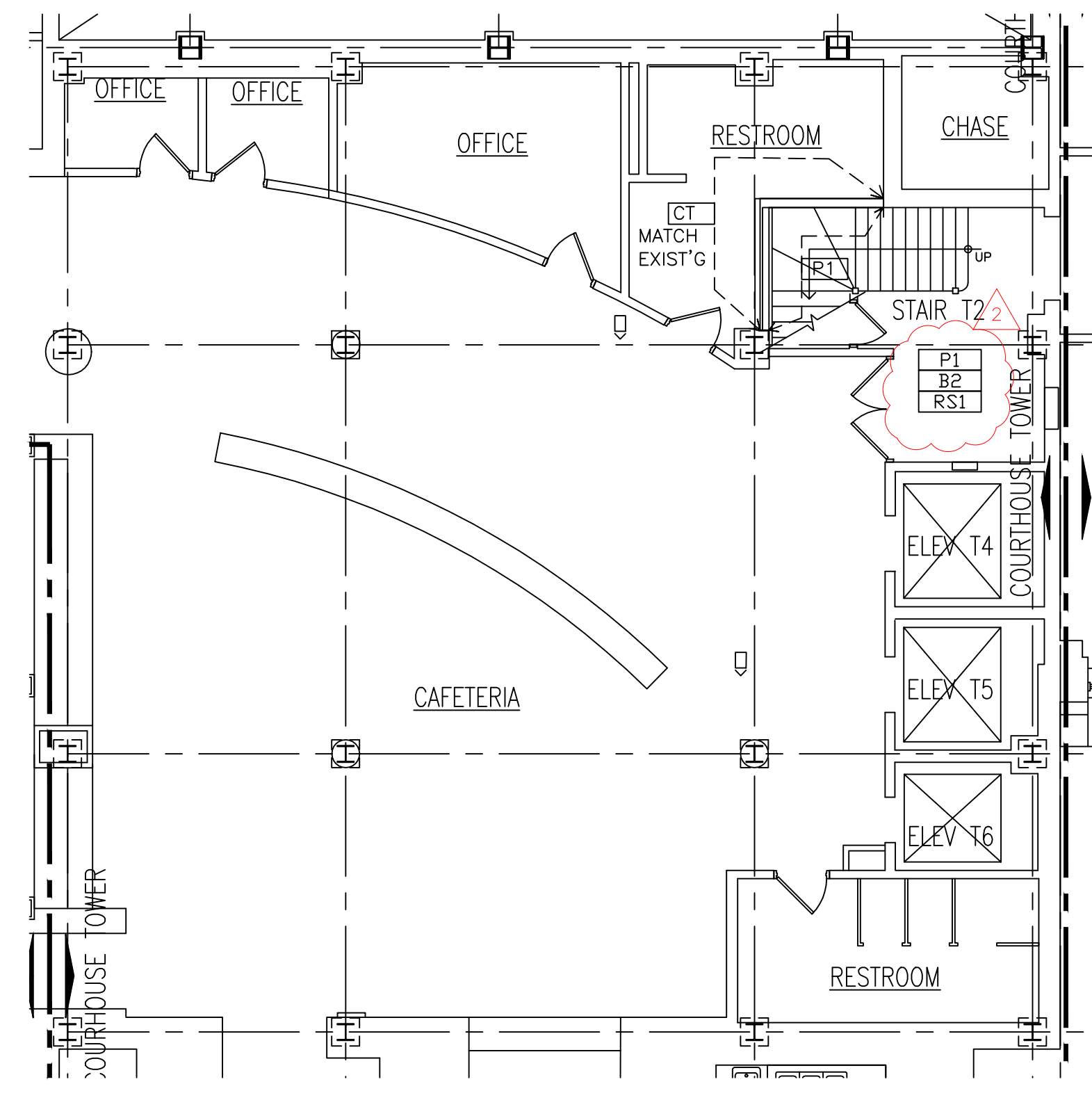
SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 61 OF: 160
11.6.17	ADDENDUM #3	MC	FM						DWG NO

A.406



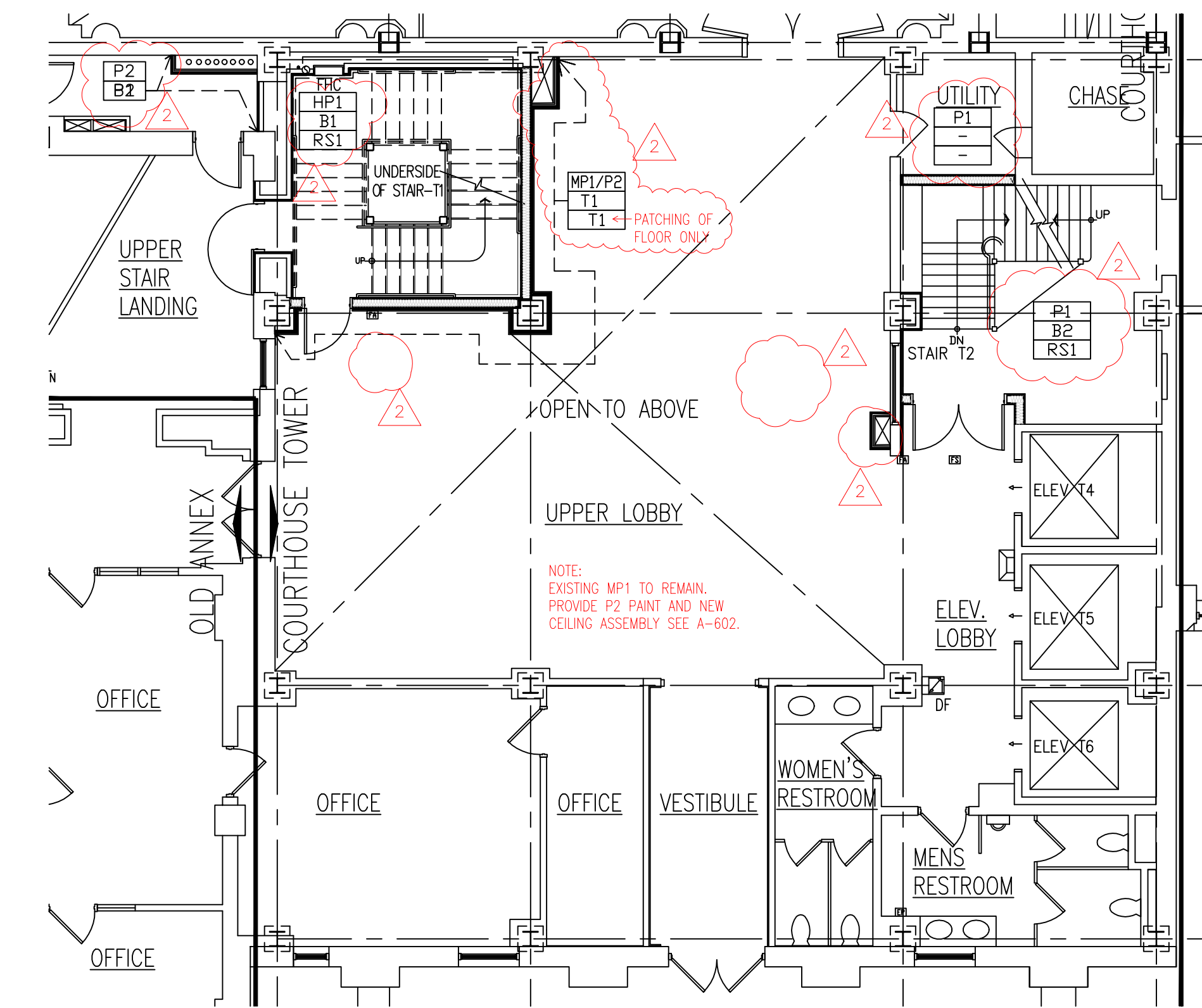
1 BASEMENT FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

NO WORK AT BASEMENT LEVEL.



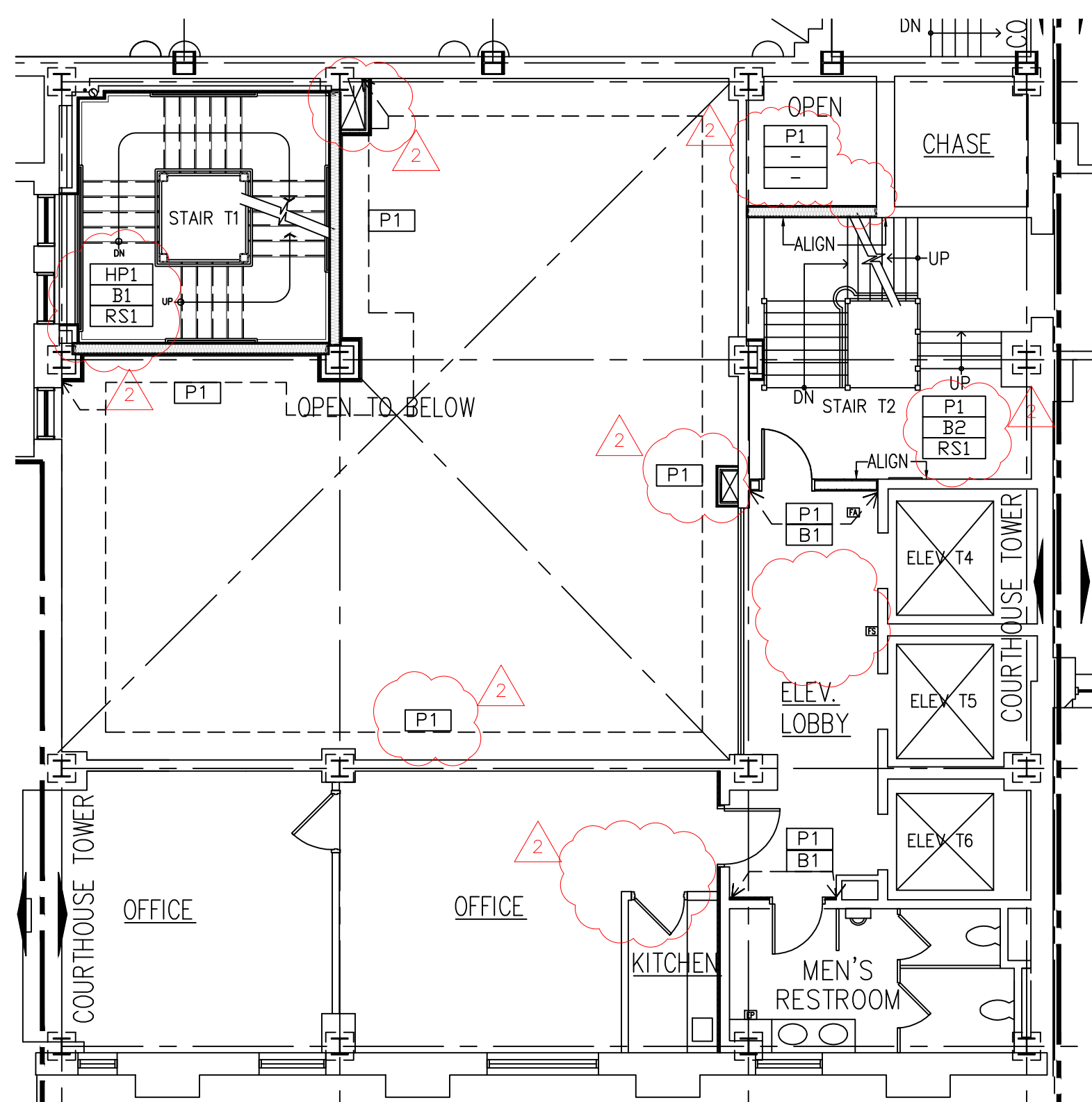
2 GROUND FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



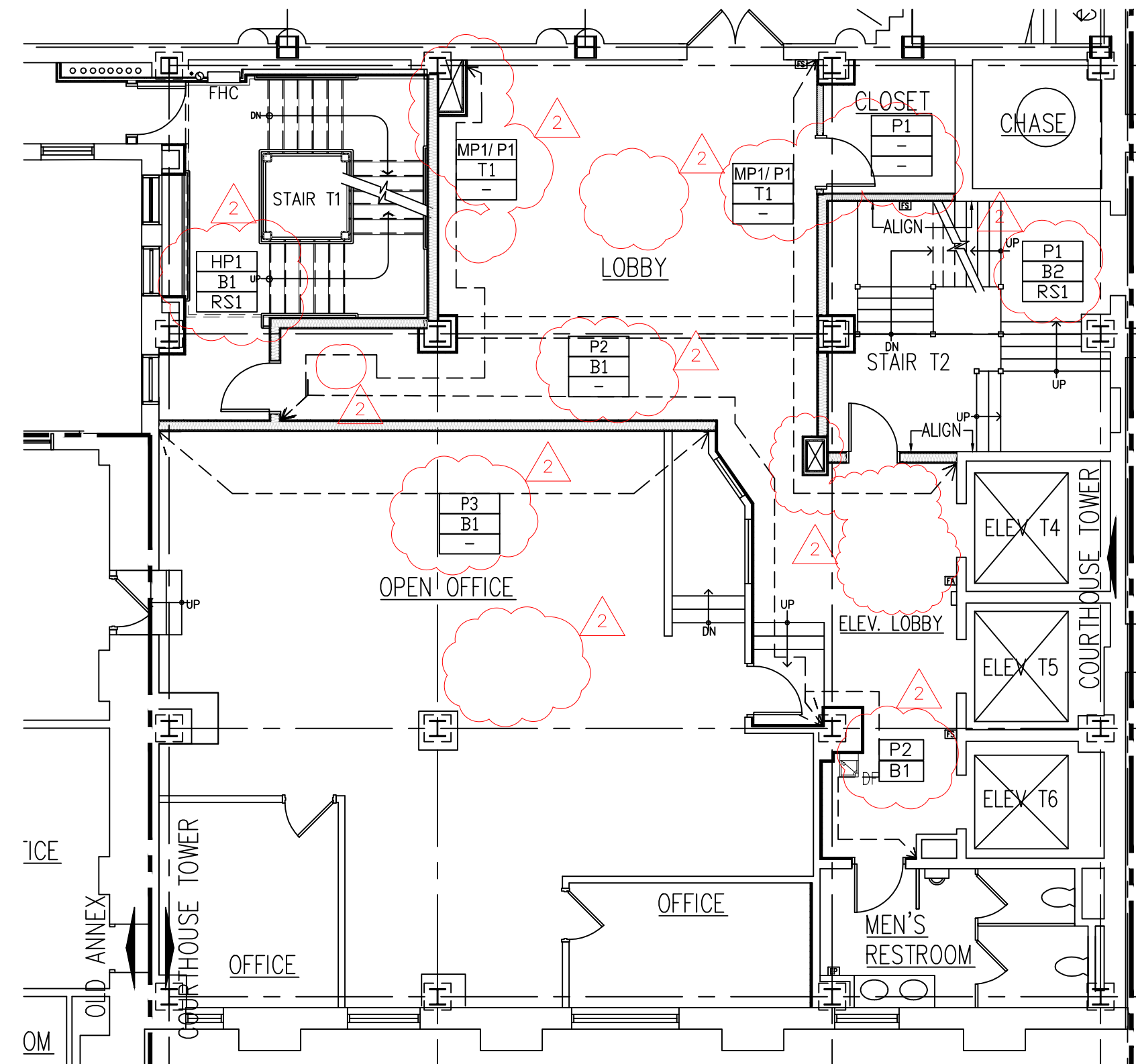
3 FIRST FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



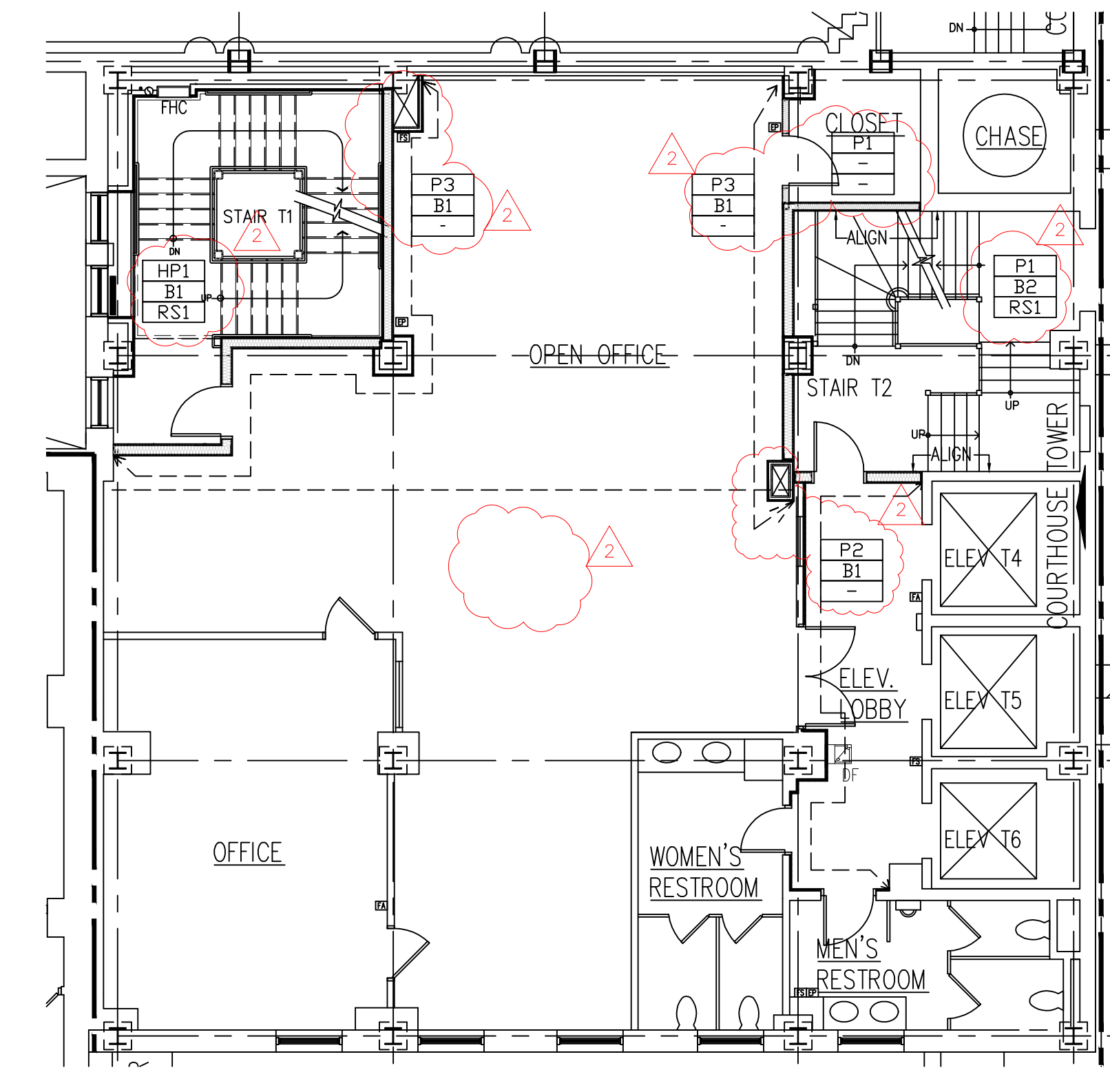
4 SECOND FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



5 THIRD FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



6 FOURTH FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH

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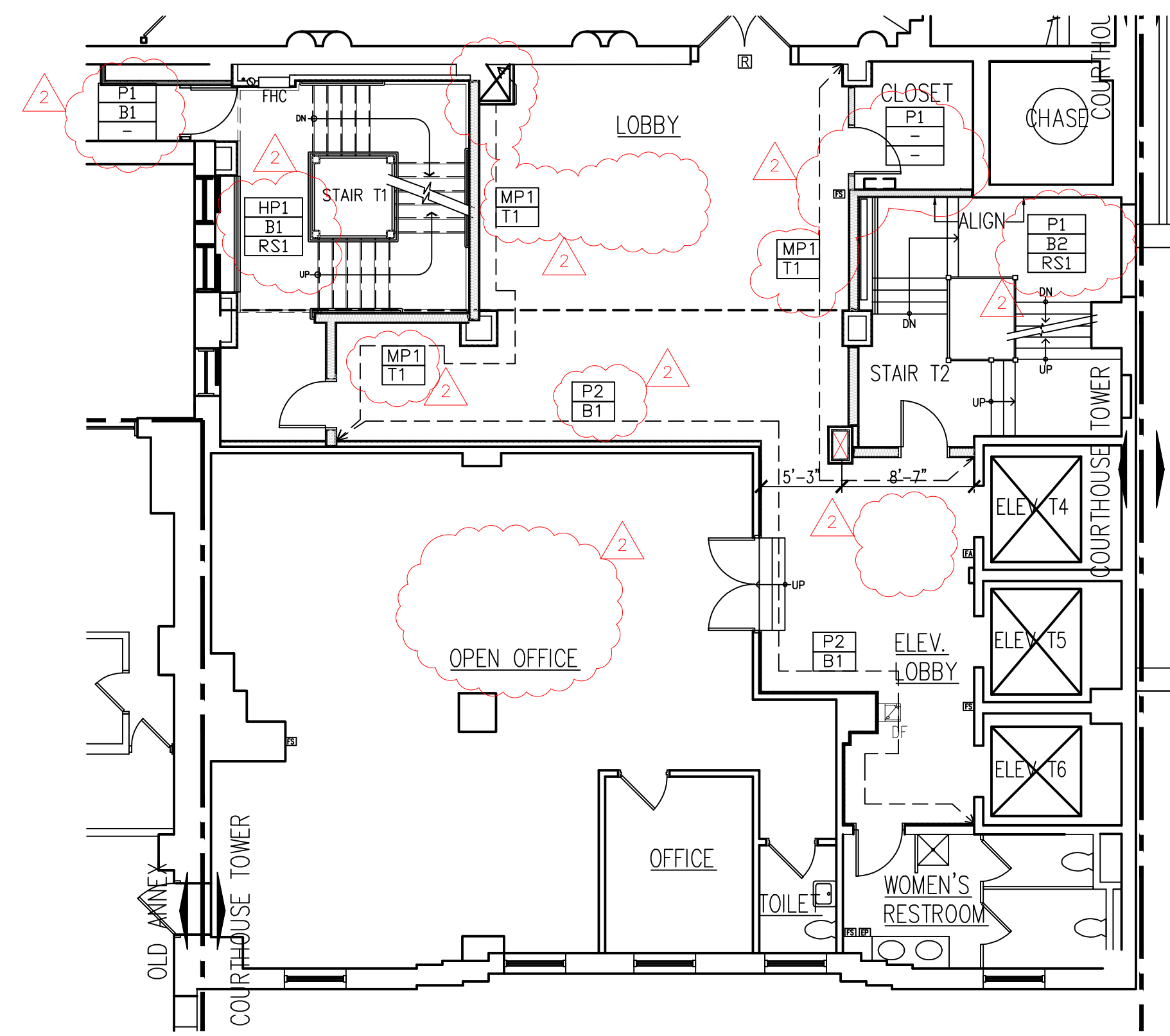


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**BASEMENT, GROUND, FIRST, SECOND, THIRD &
FOURTH FLOOR FINISH PLAN**

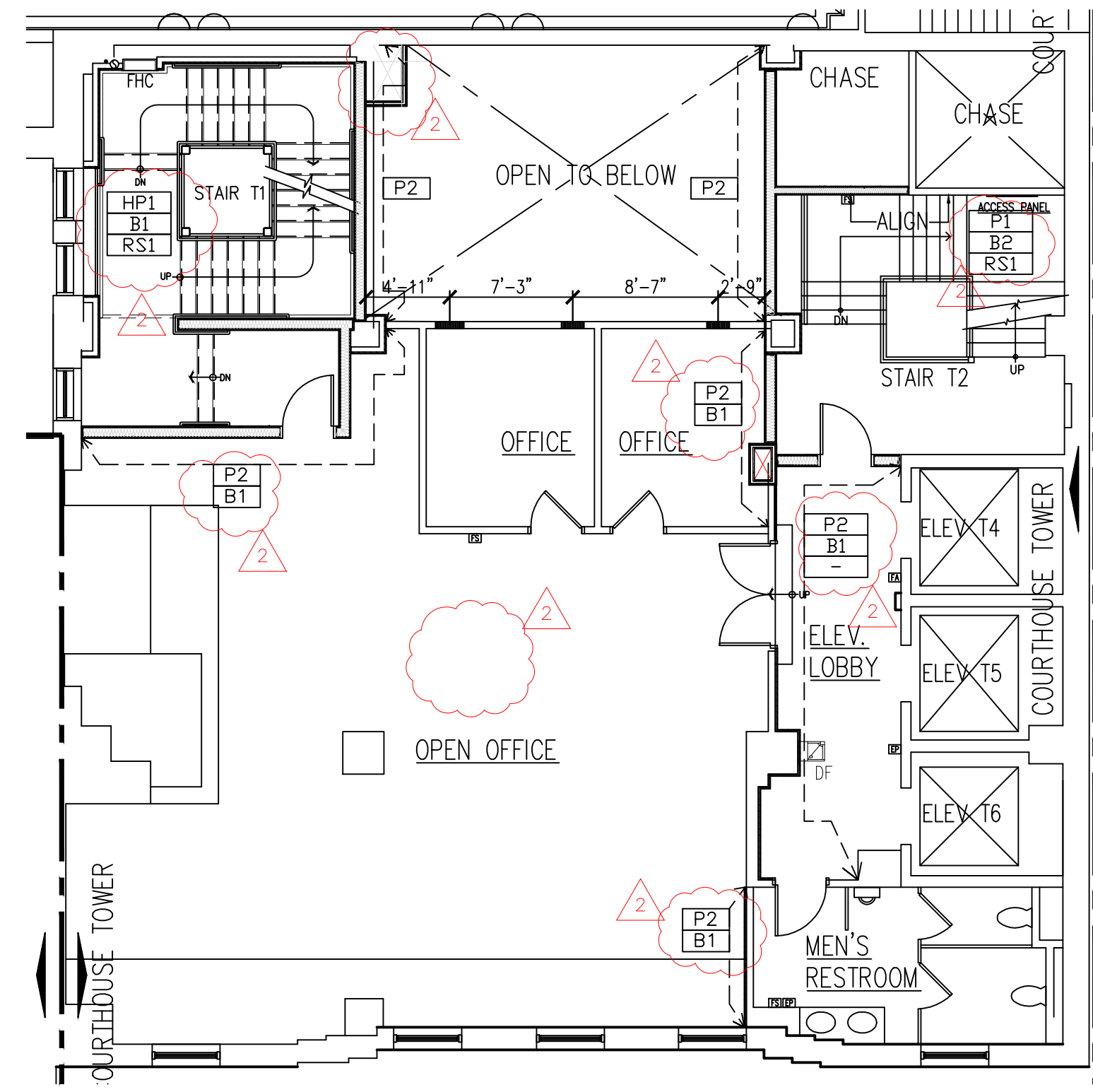
SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	WTJ
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	NJN
05.31.17	100% SUBMISSION	MC	FM					JOB NO	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	80 OF:160
11.17	ADDENDUM#2	MC	FM					DWG NO	

A.701



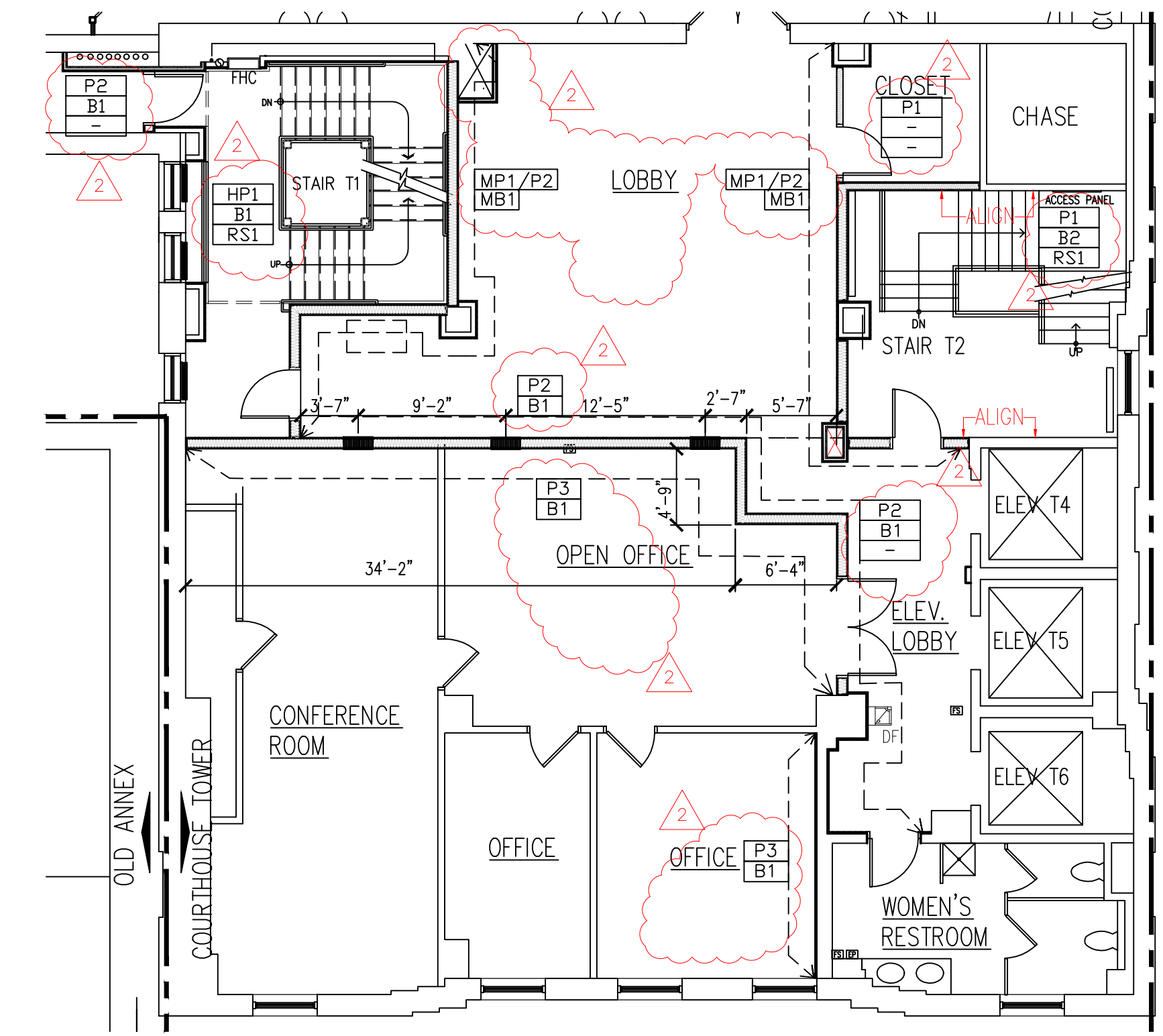
1 FIFTH FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



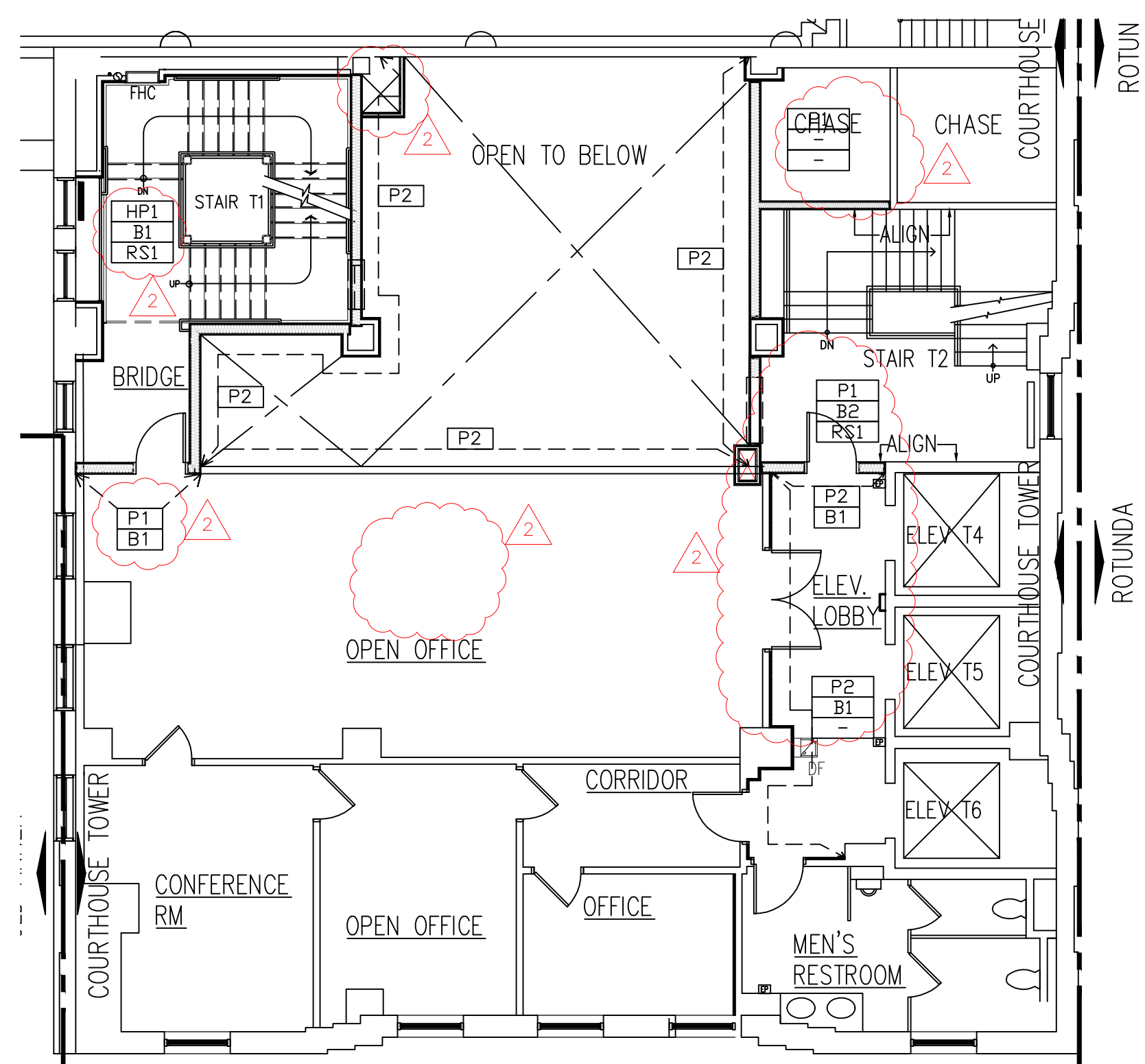
2 SIXTH FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



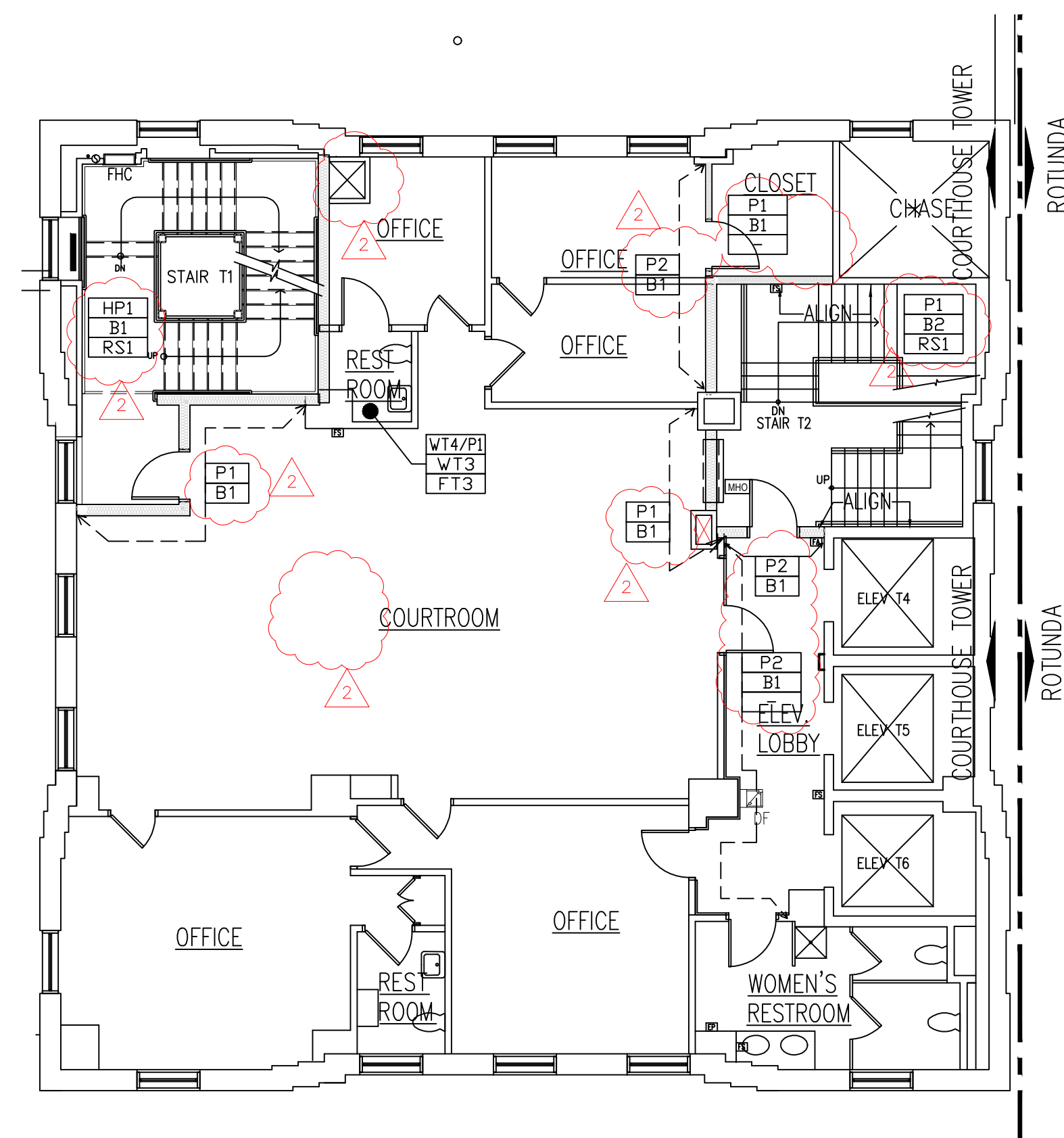
3 SEVENTH FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



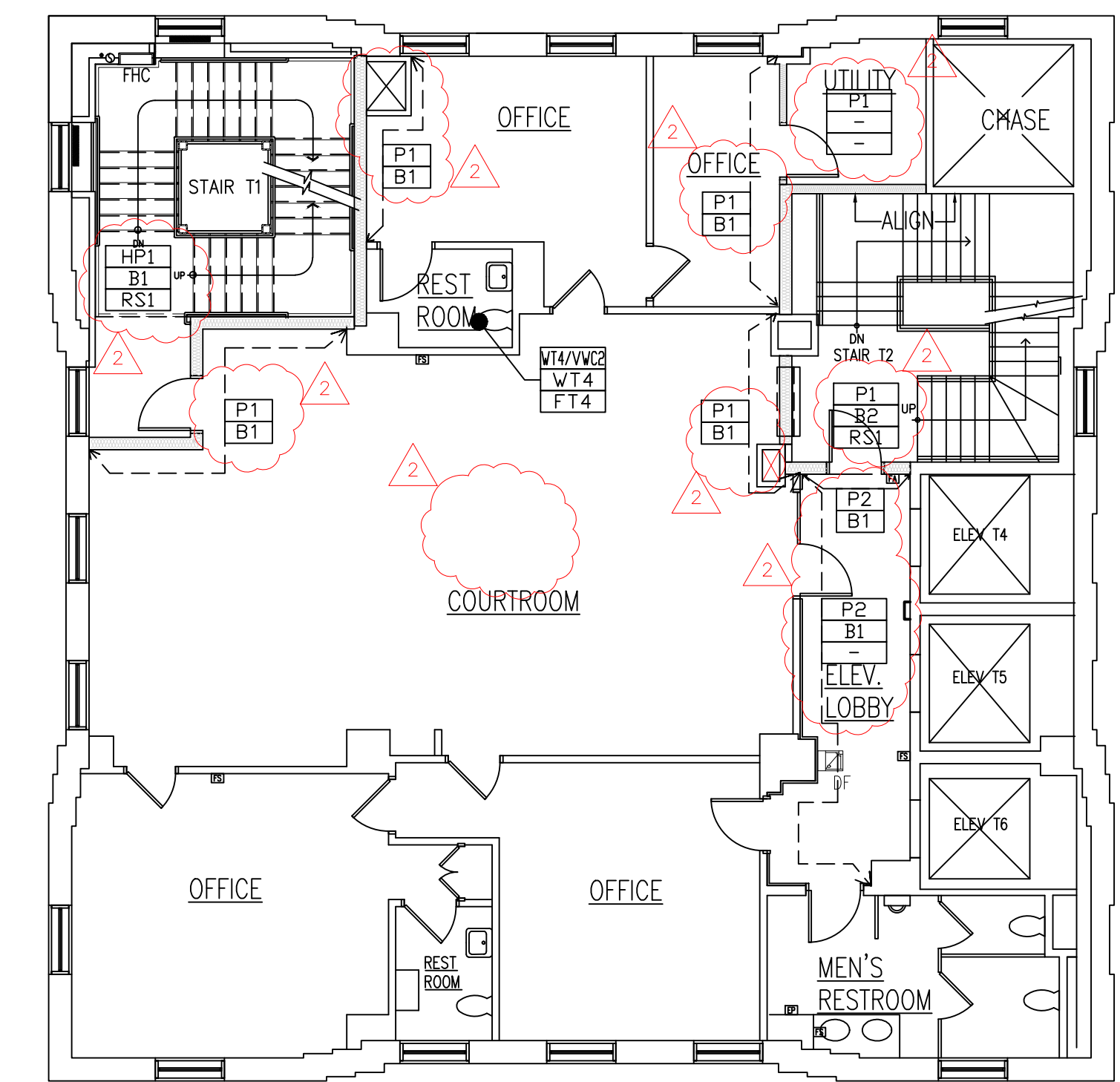
4 EIGHTH FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



5 NINTH FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



6 TENTH FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH

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PROJECT:

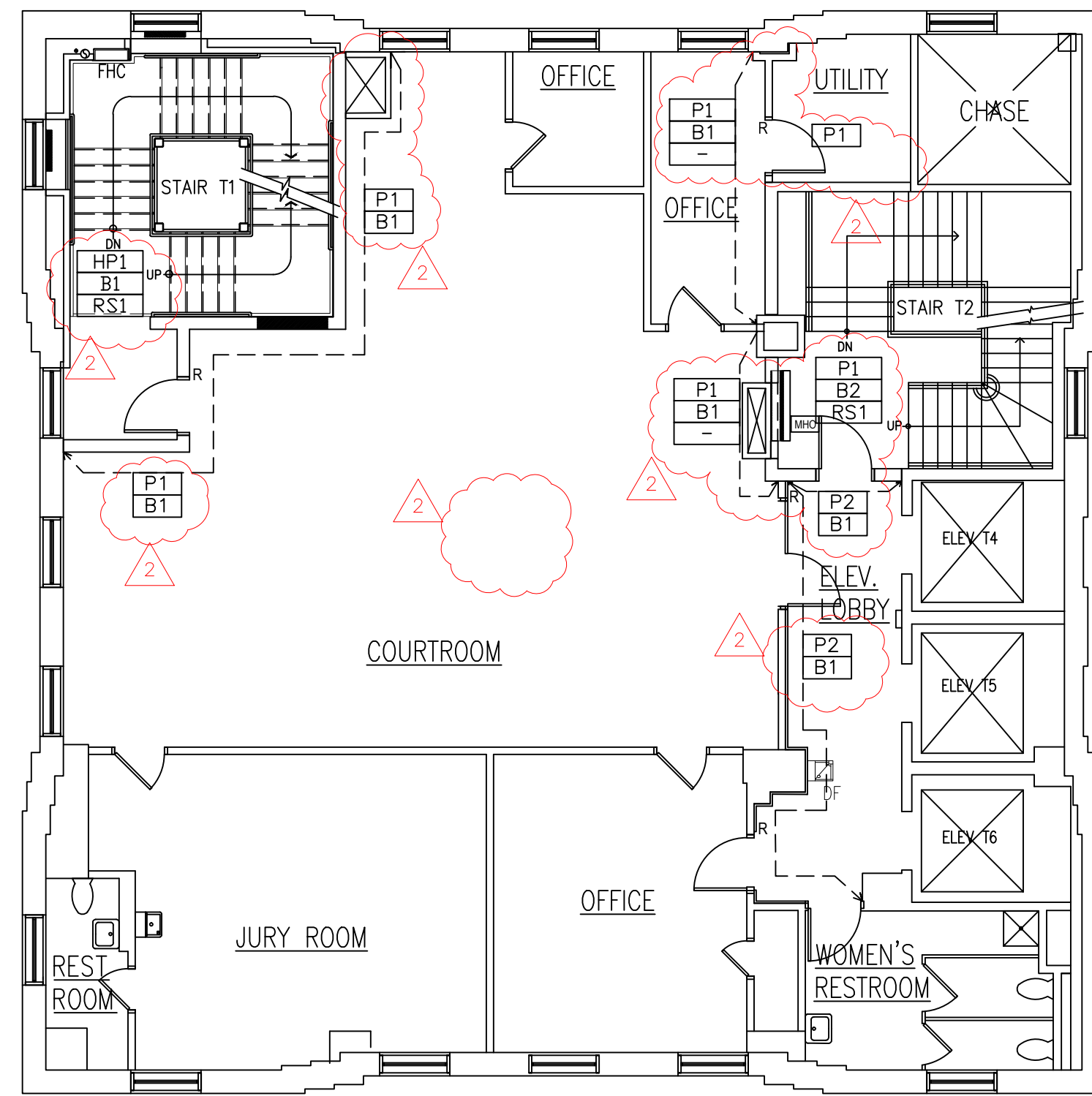
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

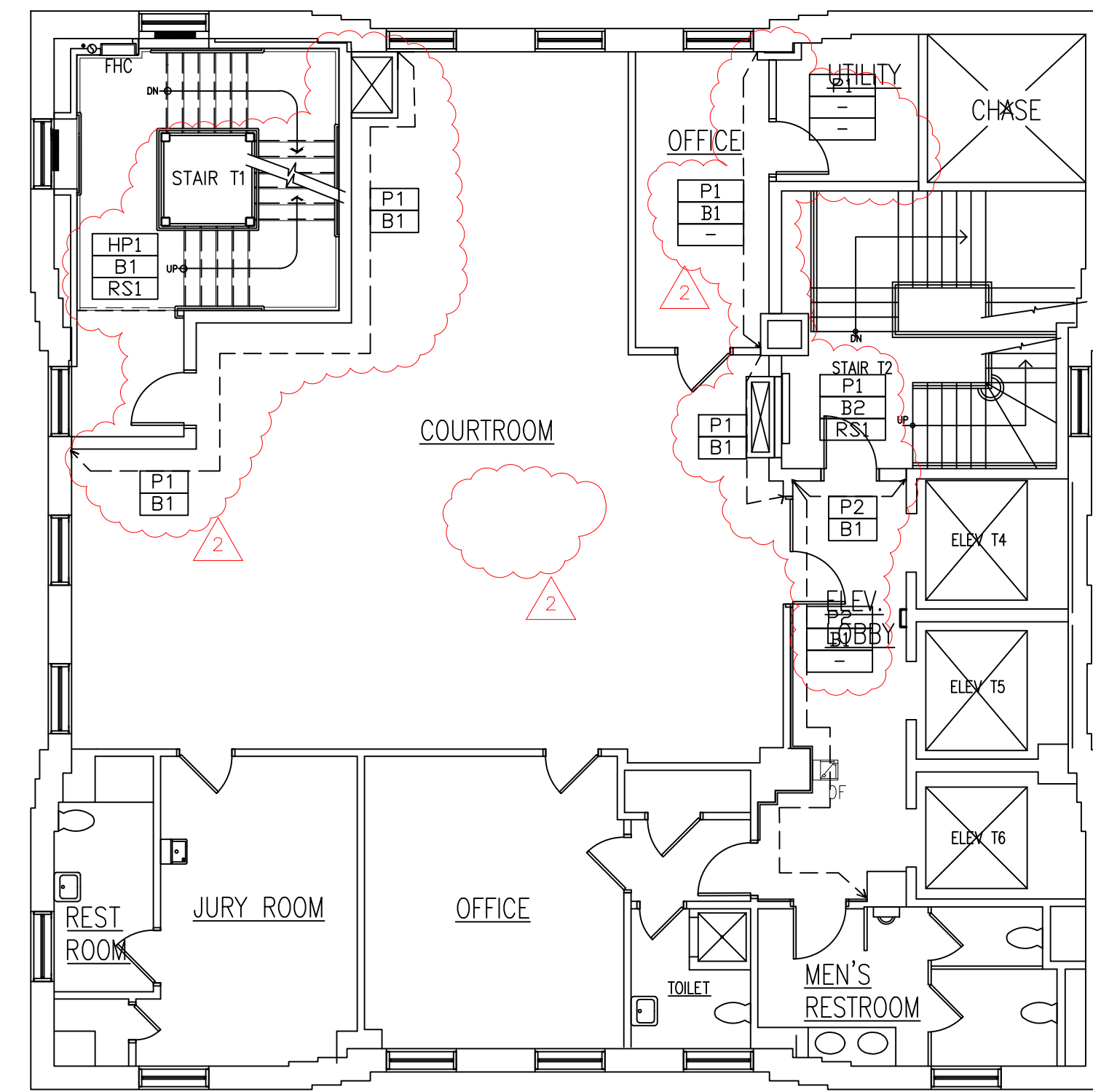
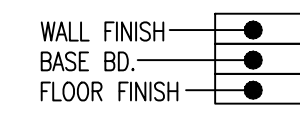
**FIFTH, SIXTH, SEVENTH, EIGHTH, NINTH
& TENTH FLOOR FINISH PLAN**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	WTJ
10.30.15	95% SUBMISSION	KD	FM					CRKD BY	NJN
05.31.17	100% SUBMISSION	MC	FM					JOB NO	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	81 OF:160
11.17	ADDENDUM#2	MC	FM					DWG NO	

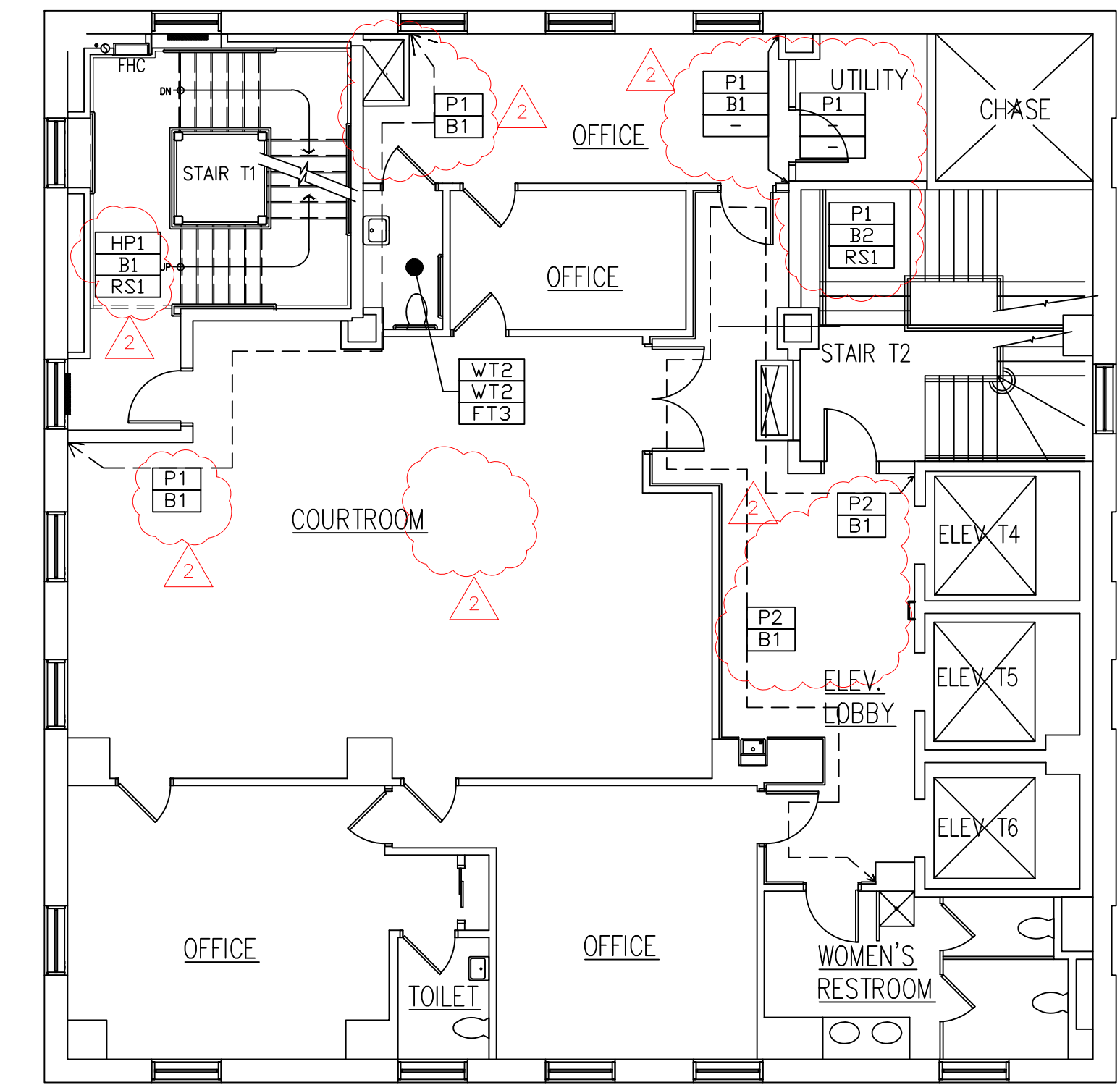
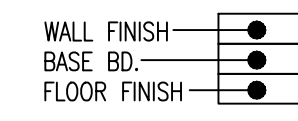
A.702



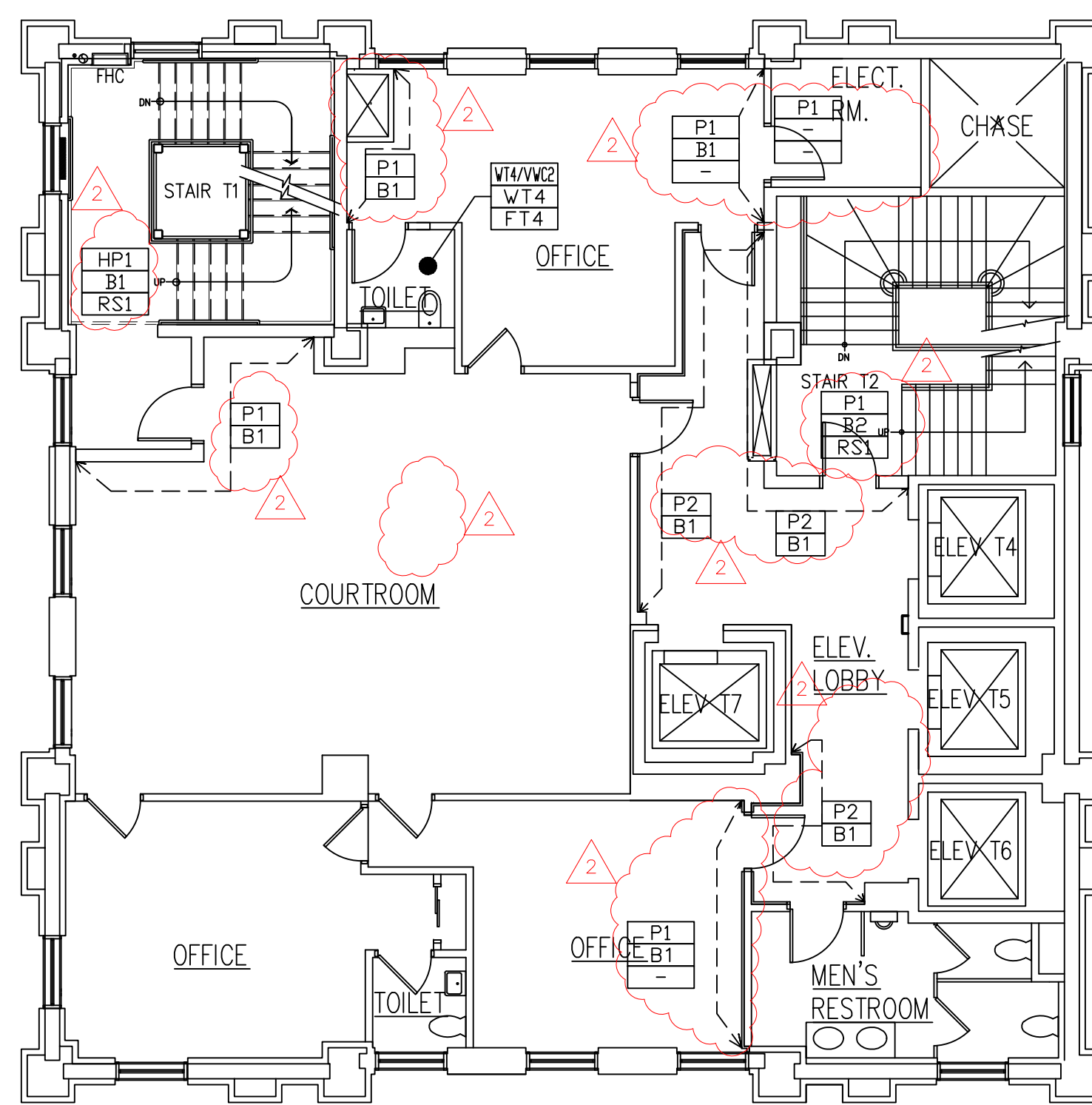
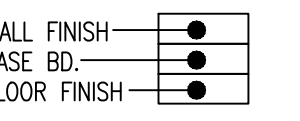
1 ELEVENTH FLOOR FINISH PLAN
A.703 SCALE: 1/8"=1'-0"



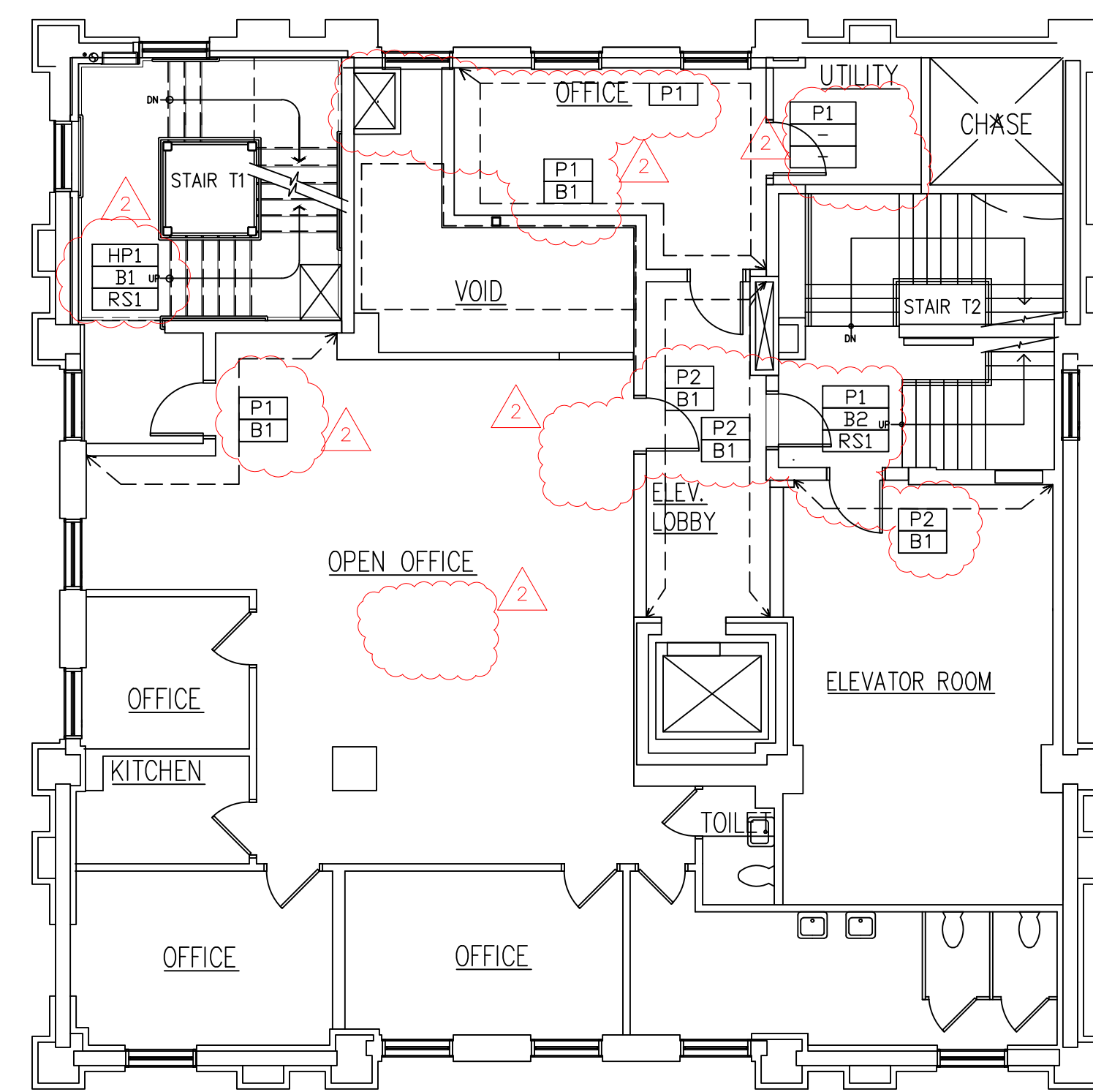
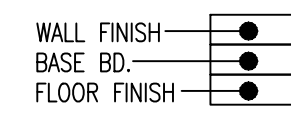
2 TWELFTH FLOOR FINISH PLAN
A.703 SCALE: 1/8"=1'-0"



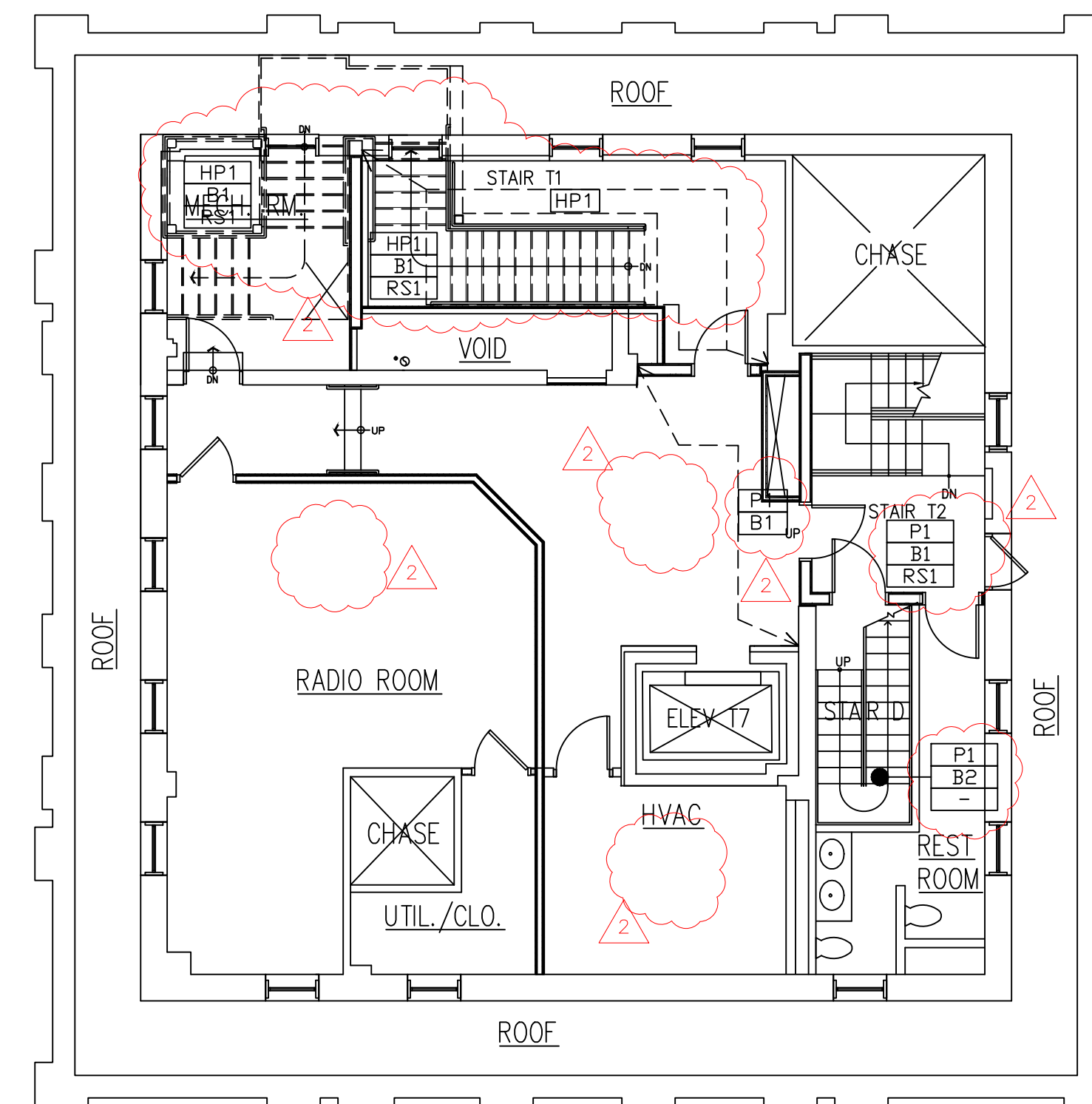
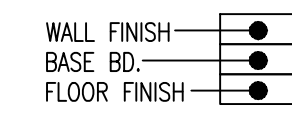
3 THIRTEENTH FLOOR FINISH PLAN
A.703 SCALE: 1/8"=1'-0"



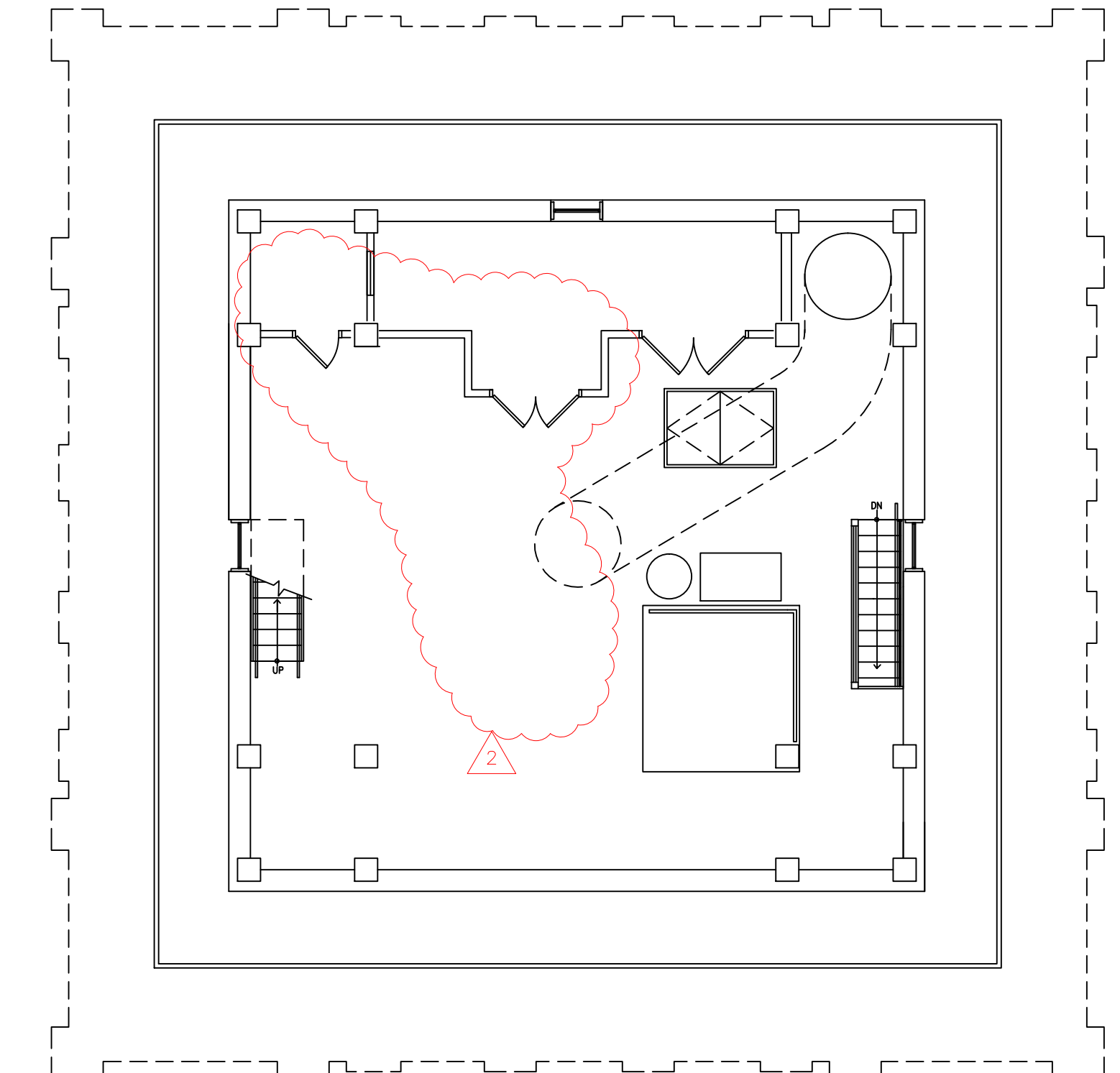
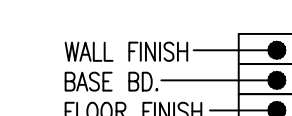
4 FOURTEENTH FLOOR FINISH PLAN
A.703 SCALE: 1/8"=1'-0"



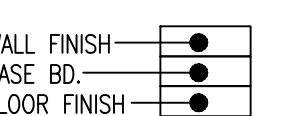
5 FIFTEENTH FLOOR FINISH PLAN
A.703 SCALE: 1/8"=1'-0"



6 SIXTEENTH FLOOR FINISH PLAN
A.703 SCALE: 1/8"=1'-0"



7 PENTHOUSE FLOOR FINISH PLAN
A.703 SCALE: 1/8"=1'-0"



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PROJECT:

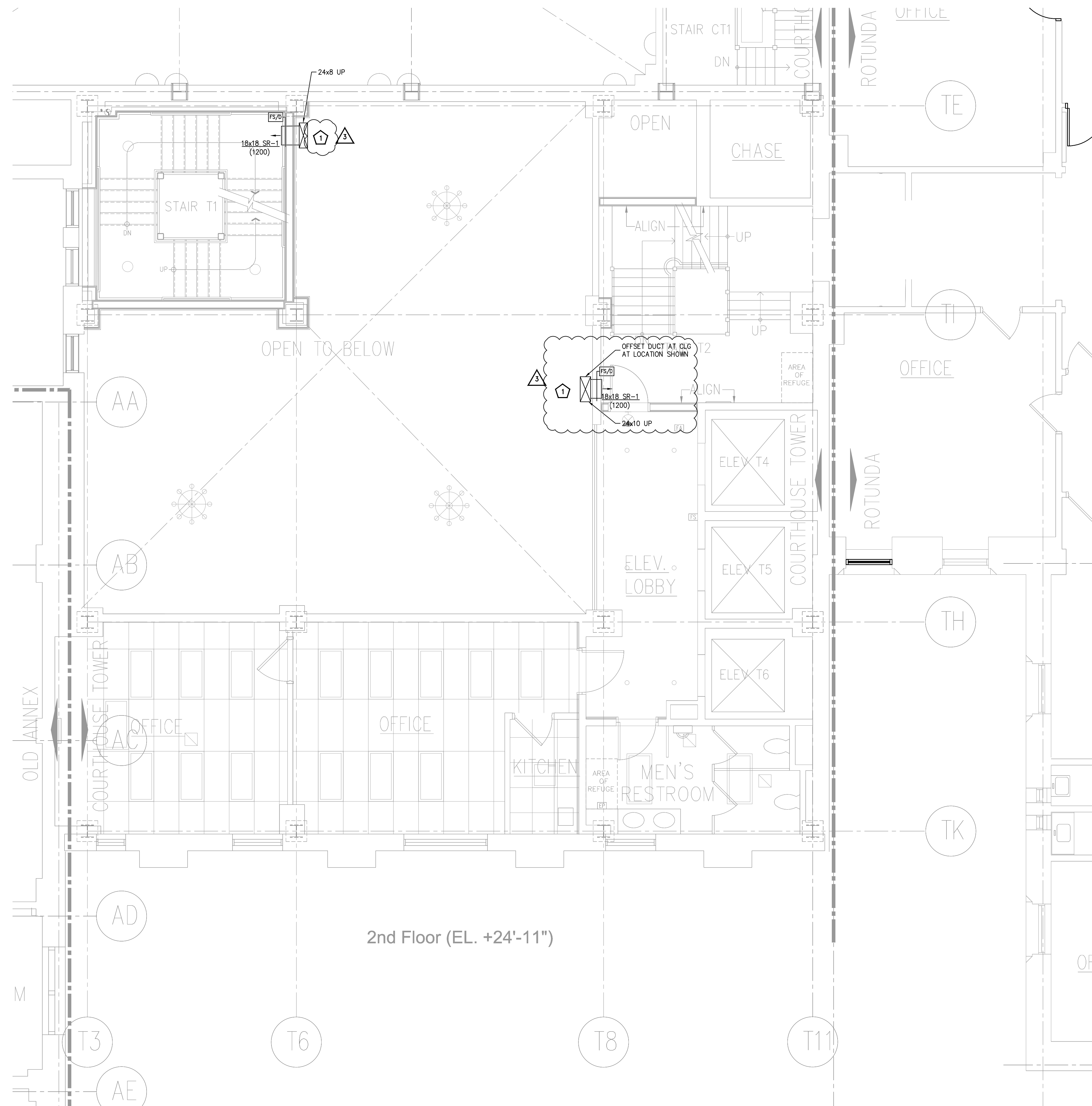
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELEVENTH, TWELFTH, THIRTEENTH,
FOURTEENTH, FIFTEENTH, SIXTEENTH,
& PENTHOUSE FLOOR FINISH PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						WTJ
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 82 OF: 160
11.6.17	ADDENDUM#3	MC	FM						DWG NO

A.703



SECOND FLOOR - HVAC PLAN
SCALE: 1/4"=1'-0"

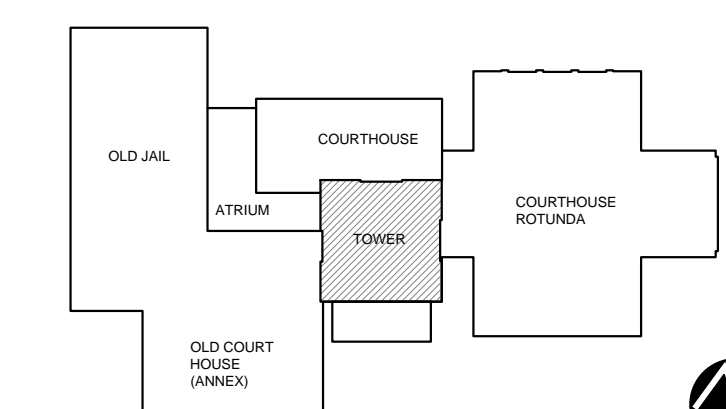
KEYED NEW WORK NOTES:

- 1. COORDINATE FINAL ROUTING OF DUCT AND ANY OFFSETS REQUIRED WITH ARCHITECTURAL SHAFTS AND STRUCTURAL SUPPORT BEAMS. PROVIDE MECHANICAL FRAMING AND SUPPORTS AS REQUIRED.

DRAWING NOTES:

- 1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
- 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

KEYPLAN



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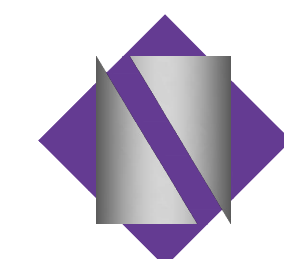
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NJ License No. 364887



NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-378-0088 FAX: 973-378-1981
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

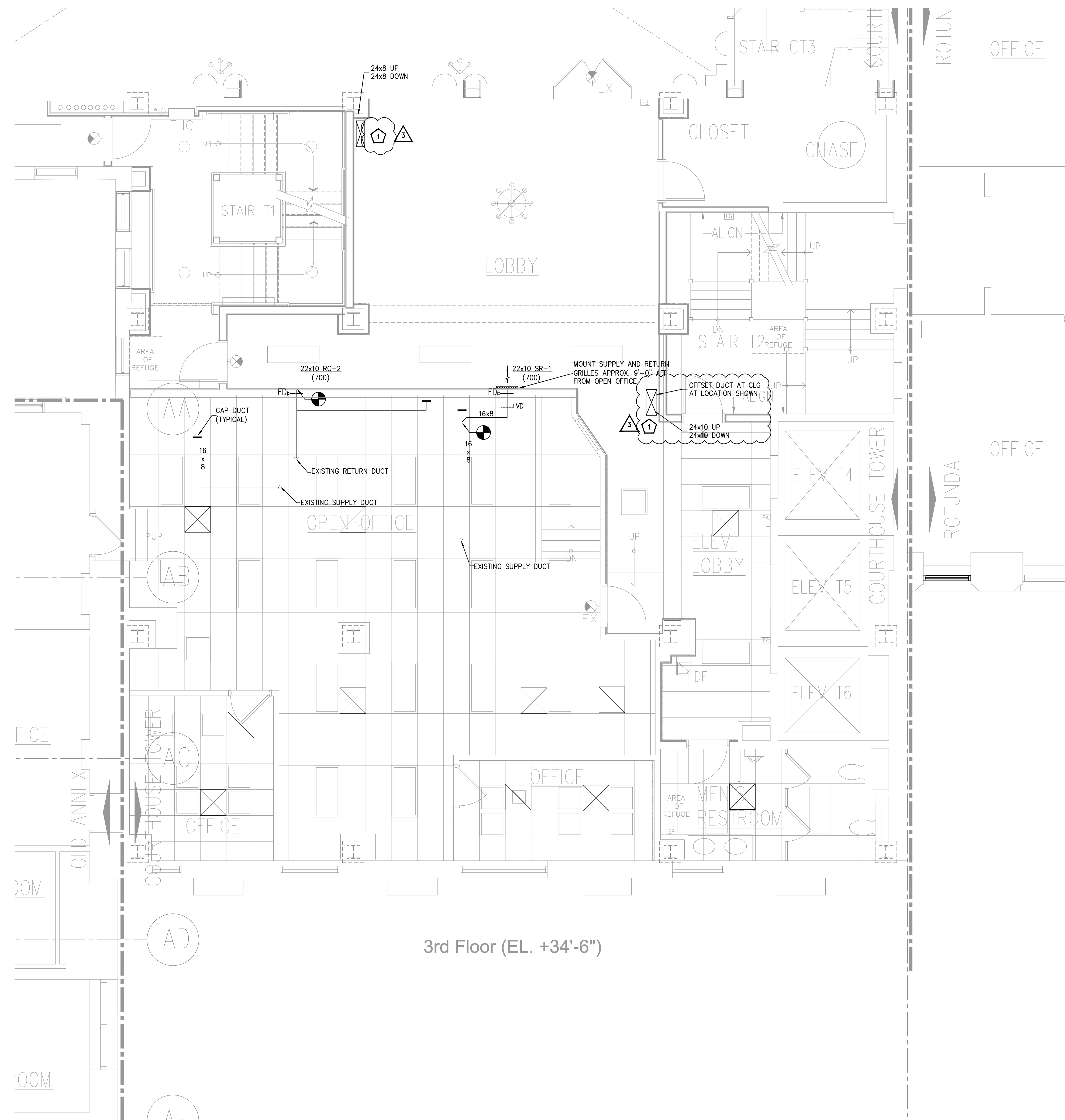
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**MECHANICAL - HVAC PLAN
SECOND FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: _ OF: 160
11.1.17	ADDENDUM#3	MC	FM						DWG NO

M.402



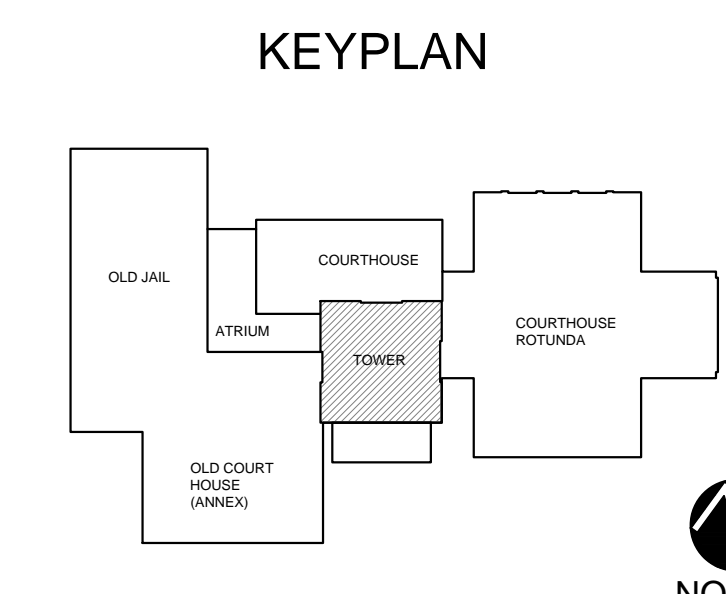
3rd Floor (EL. +34'-6")

THIRD FLOOR - HVAC PLAN
SCALE: 1/4"=1'-0"

KEYED NEW WORK NOTES:

1. COORDINATE FINAL ROUTING OF DUCT AND ANY OFFSETS REQUIRED WITH ARCHITECTURAL SHAFTS AND STRUCTURAL SUPPORT BEAMS. PROVIDE MECHANICAL FRAMING AND SUPPORTS AS REQUIRED.

- DRAWING NOTES:**
- REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
 - ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
 - CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
 - ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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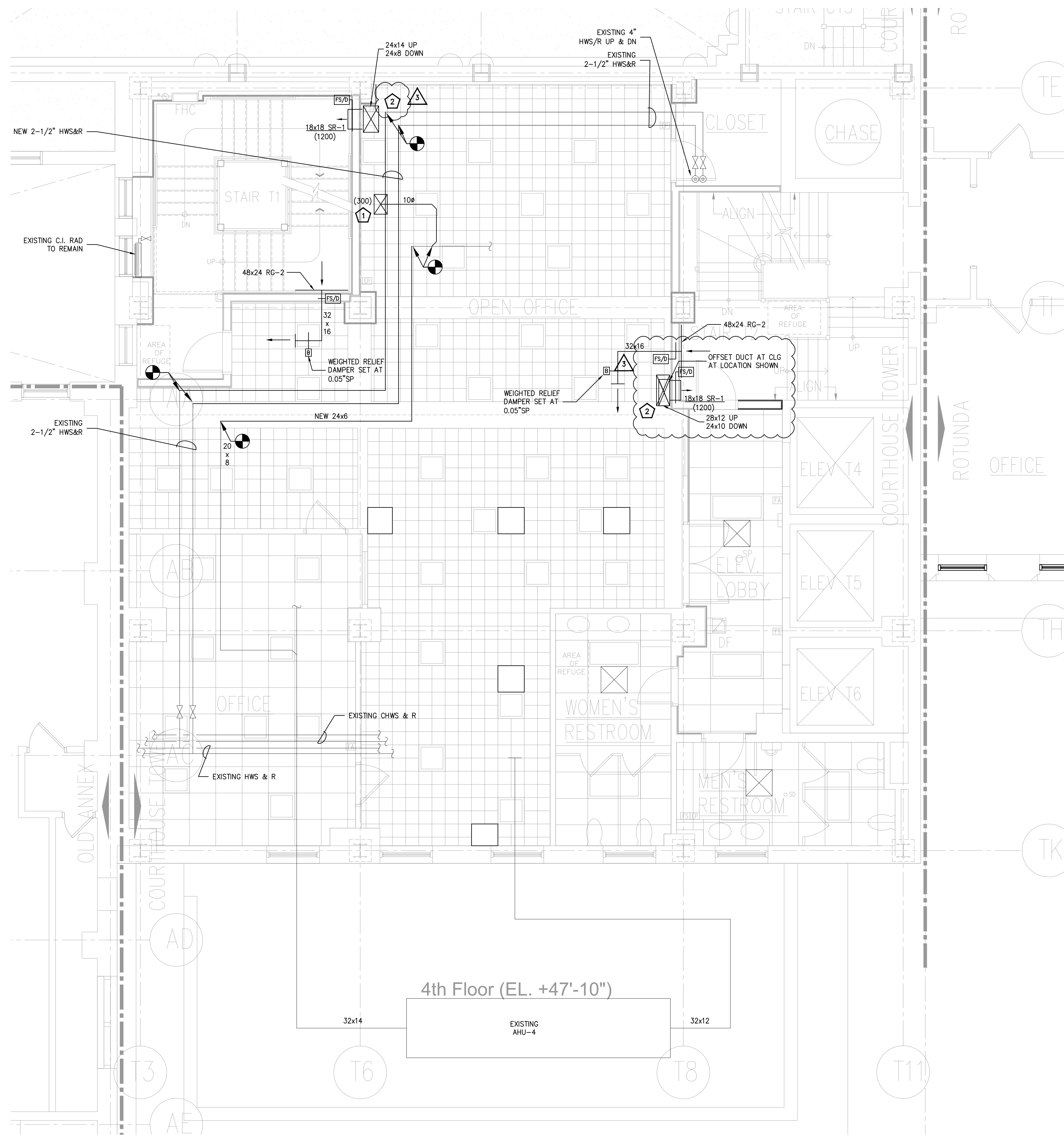


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - HVAC PLAN
THIRD FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: _ OF: 160
11.1.17	ADDENDUM#3	MC	FM						DWG NO

M.403



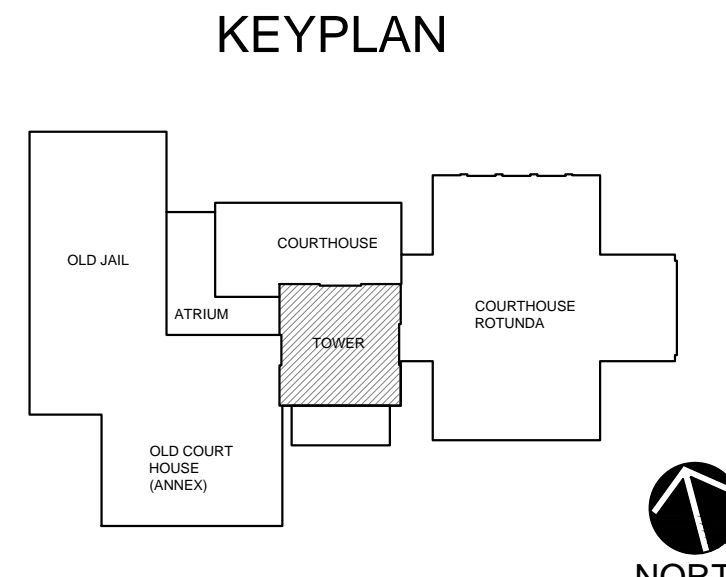
FOURTH FLOOR - HVAC PLAN
SCALE: 1/4"=1'-0"

KEYED NEW WORK NOTES:

- 1 REBALANCE EXISTING AIR DEVICE TO CFM SHOWN.
- 2 COORDINATE FINAL ROUTING OF DUCT AND ANY OFFSETS REQUIRED WITH ARCHITECTURAL SHAFTS AND STRUCTURAL SUPPORT BEAMS. PROVIDE MECHANICAL FRAMING AND SUPPORTS AS REQUIRED.

DRAWING NOTES:

- 1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
- 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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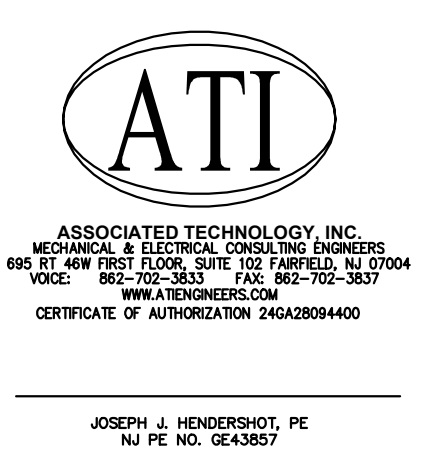
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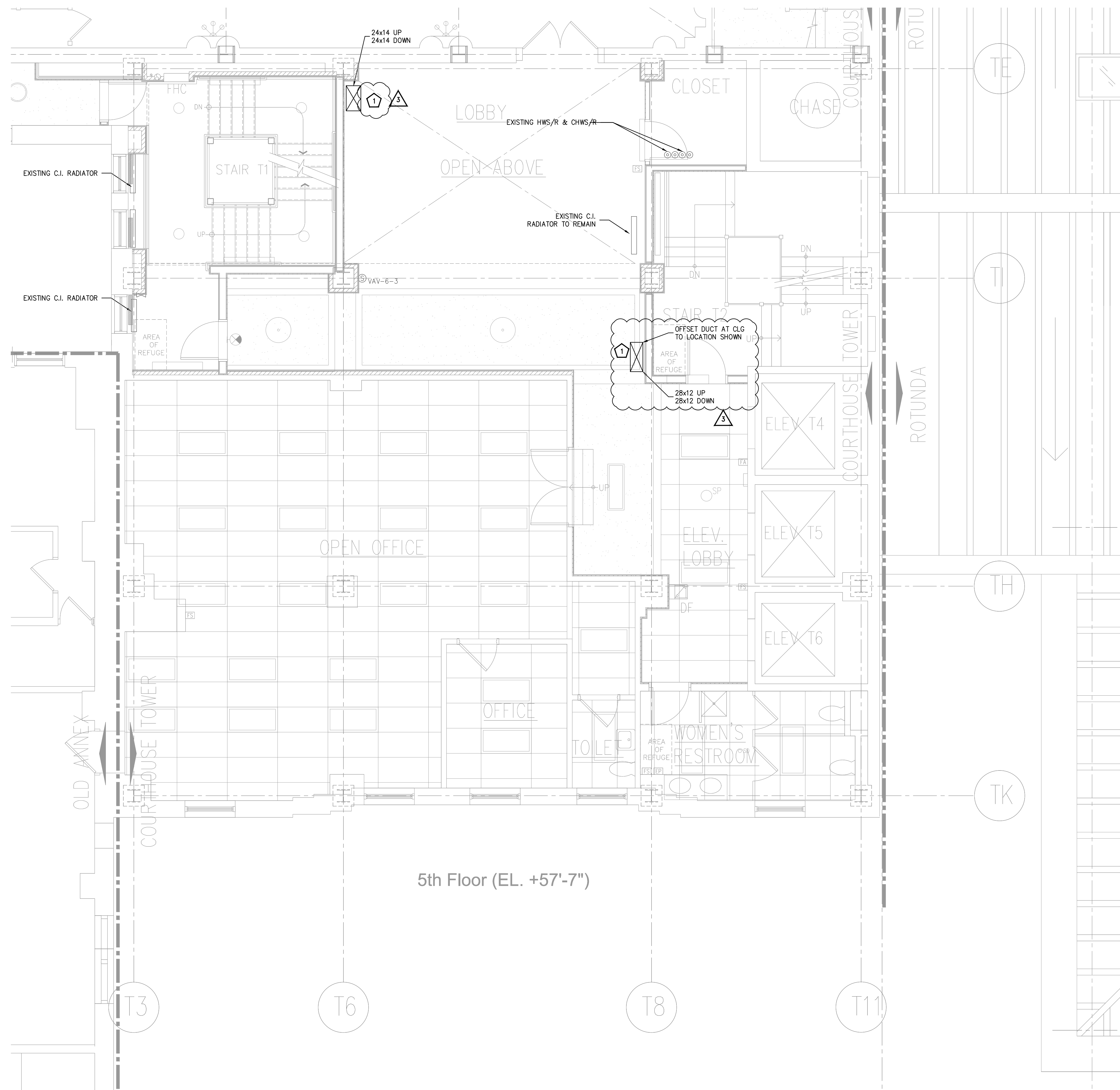


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - HVAC PLAN
FOURTH FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: _ OF: 160
11.1.17	ADDENDUM#3	MC	FM						DWG NO

M.404



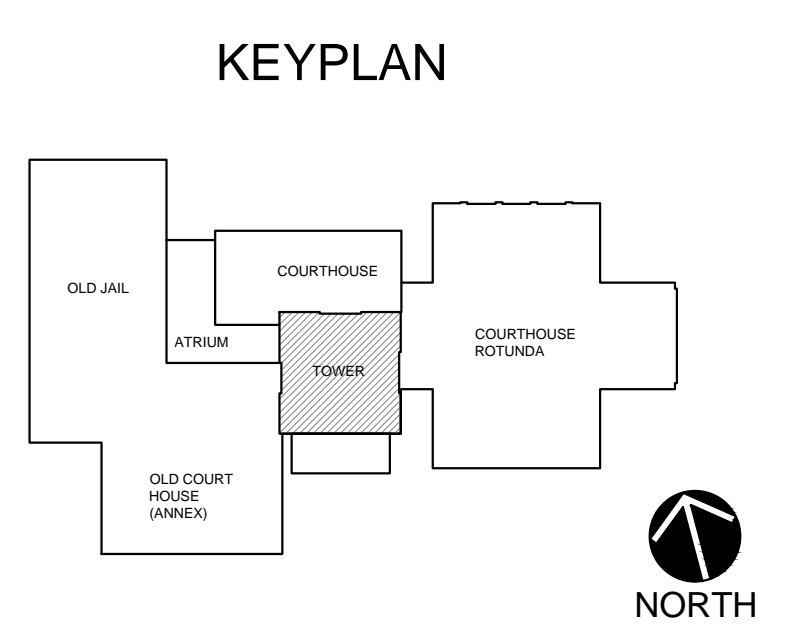
5th Floor (EL. +57'-7")

FIFTH FLOOR - HVAC PLAN
SCALE: 1/8"=1'-0"

KEYED NEW WORK NOTES:

1. COORDINATE FINAL ROUTING OF DUCT AND ANY OFFSETS REQUIRED WITH ARCHITECTURAL SHAFTS AND STRUCTURAL SUPPORT BEAMS. PROVIDE MECHANICAL FRAMING AND SUPPORTS AS REQUIRED.

- DRAWING NOTES:**
- REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
 - ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
 - CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
 - ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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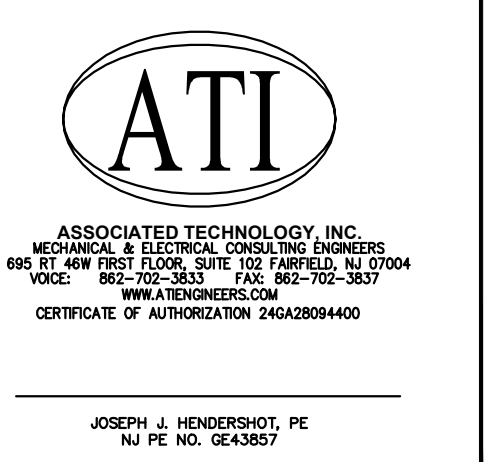
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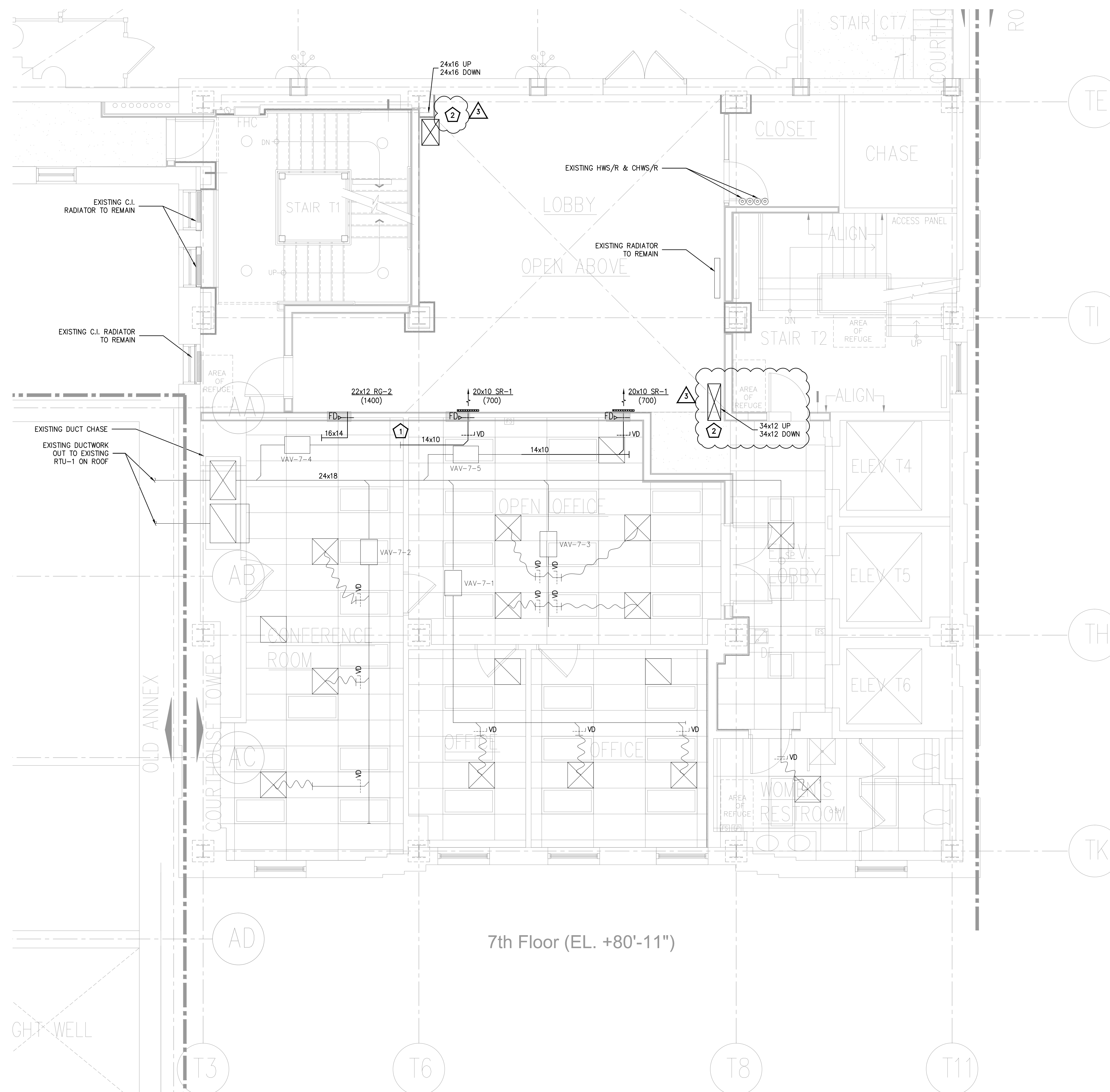


PROJECT: UC COURTHOUSE INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
MECHANICAL - HVAC PLAN
FIFTH FLOOR

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY
05.31.17	100% SUBMISSION	MC	FM						JOB NO. 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: _ OF: 160
11.1.17	ADDENDUM#3	MC	FM						DWG NO

M.405



7th Floor (EL. +80'-11")

SEVENTH FLOOR - HVAC PLAN

SCALE: 1/4"=1'-0"

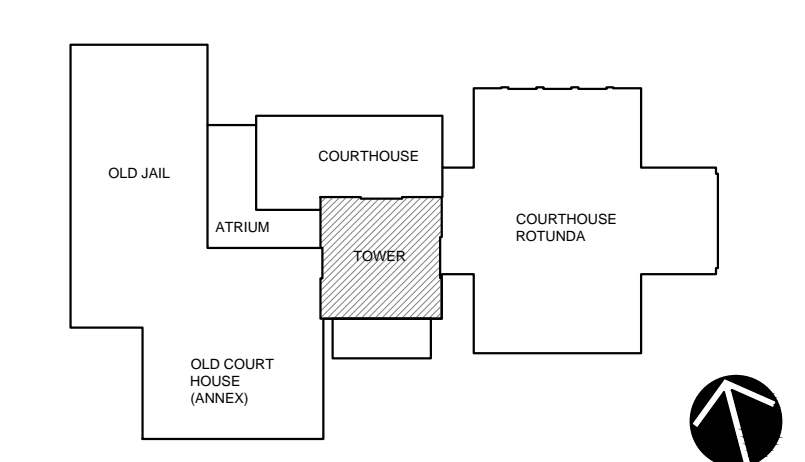
KEYED NEW WORK NOTES:

- 1. EXTEND EXISTING DUCTWORK.
- 2. COORDINATE FINAL ROUTING OF DUCT AND ANY OFFSETS REQUIRED WITH ARCHITECTURAL SHAFTS AND STRUCTURAL SUPPORT BEAMS. PROVIDE MECHANICAL FRAMING AND SUPPORTS AS REQUIRED.

DRAWING NOTES:

- 1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
- 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

KEYPLAN



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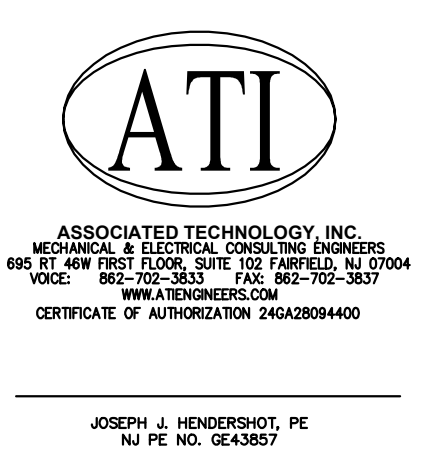
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FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

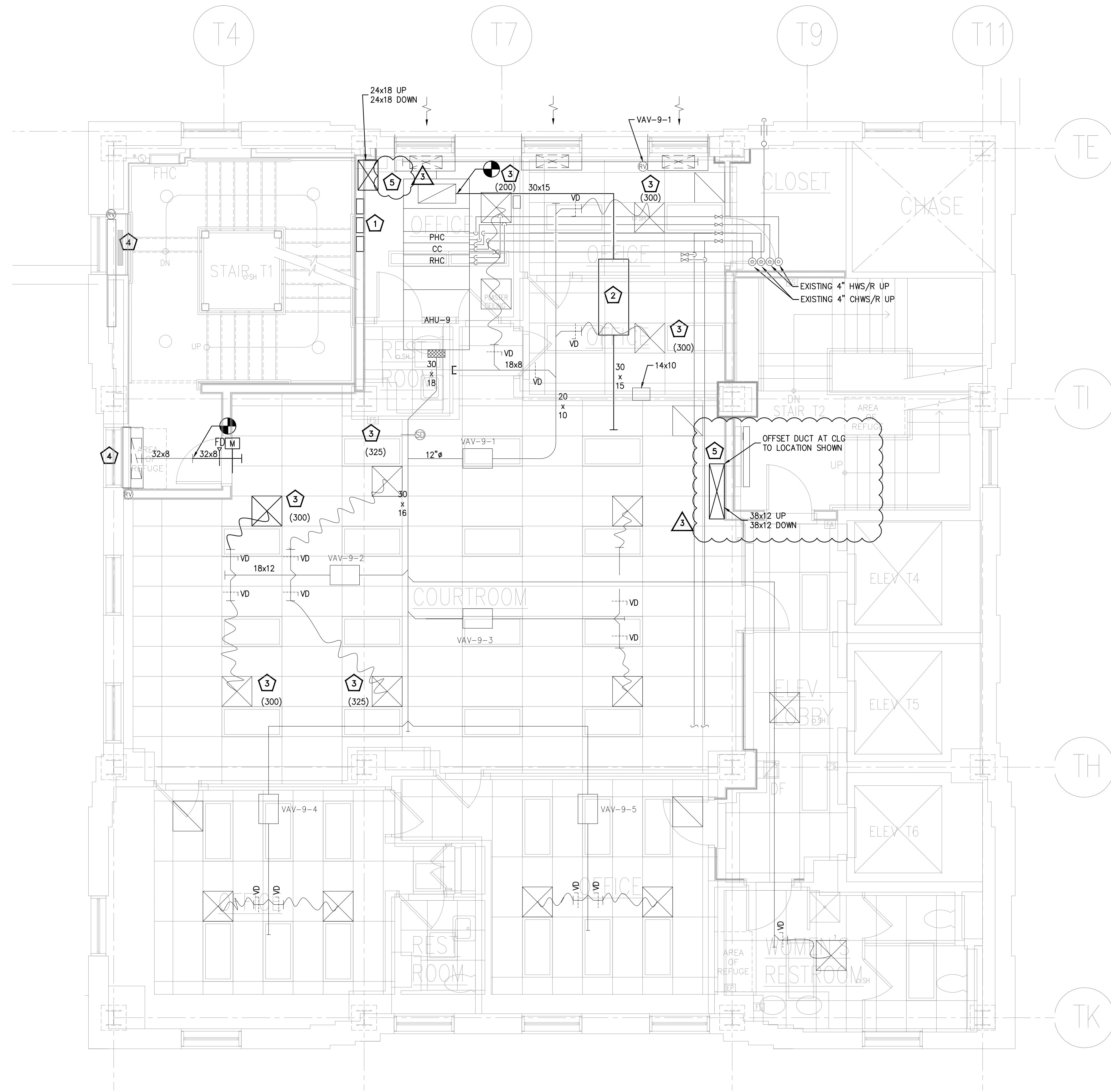


PROJECT: UC COURTHOUSE INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
MECHANICAL - HVAC PLAN
SEVENTH FLOOR

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: _ OF: 160
11.1.17	ADDENDUM#3	MC	FM						DWG NO

M.407



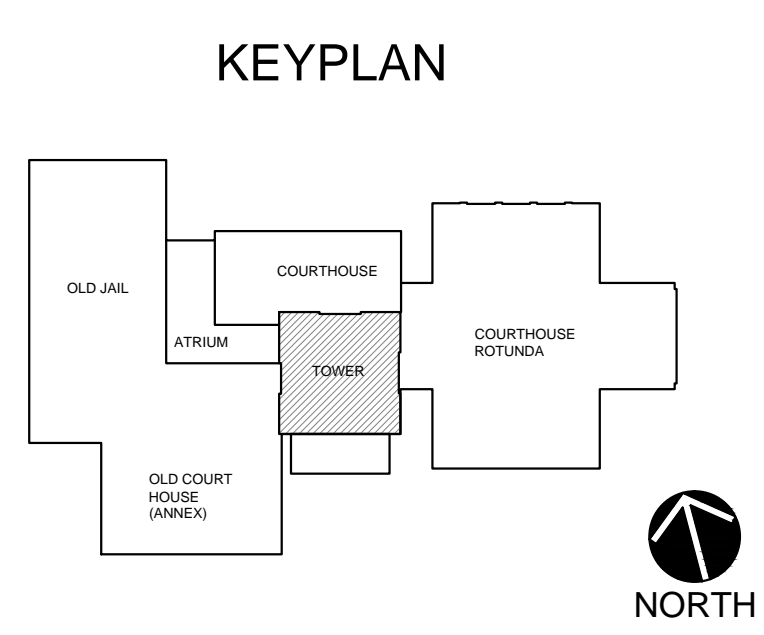
NINTH FLOOR - HVAC PLAN
SCALE: 1/4"=1'-0"

KEYED NEW WORK NOTES:

- 1 RELOCATED CONTROL PANELS, EXTEND CONTROL WIRING AS REQUIRED. COORDINATE WITH ELECTRICAL CONTRACTOR FOR ANY POWER WIRING.
- 2 RELOCATED DUCT SILENCER.
- 3 RELOCATED AIR DEVICE, RE-BALANCE TO CFM VALUE SHOWN.
- 4 PROVIDE NEW RADIATOR CONTROL VALVE, DANFOSS RA2000 ACTUATOR OR EQUAL.
- 5 COORDINATE FINAL ROUTING OF DUCT AND ANY OFFSETS REQUIRED WITH ARCHITECTURAL SHAFTS AND STRUCTURAL SUPPORT BEAMS. PROVIDE MECHANICAL FRAMING AND SUPPORTS AS REQUIRED.

DRAWING NOTES:

- 1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
- 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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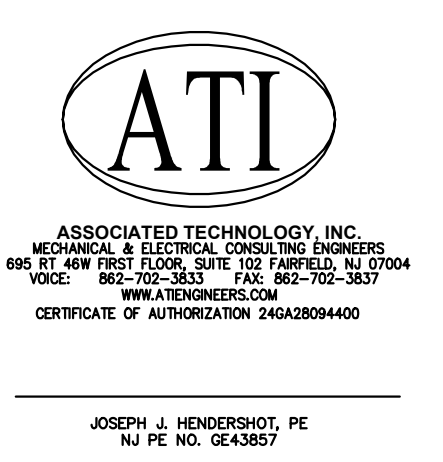
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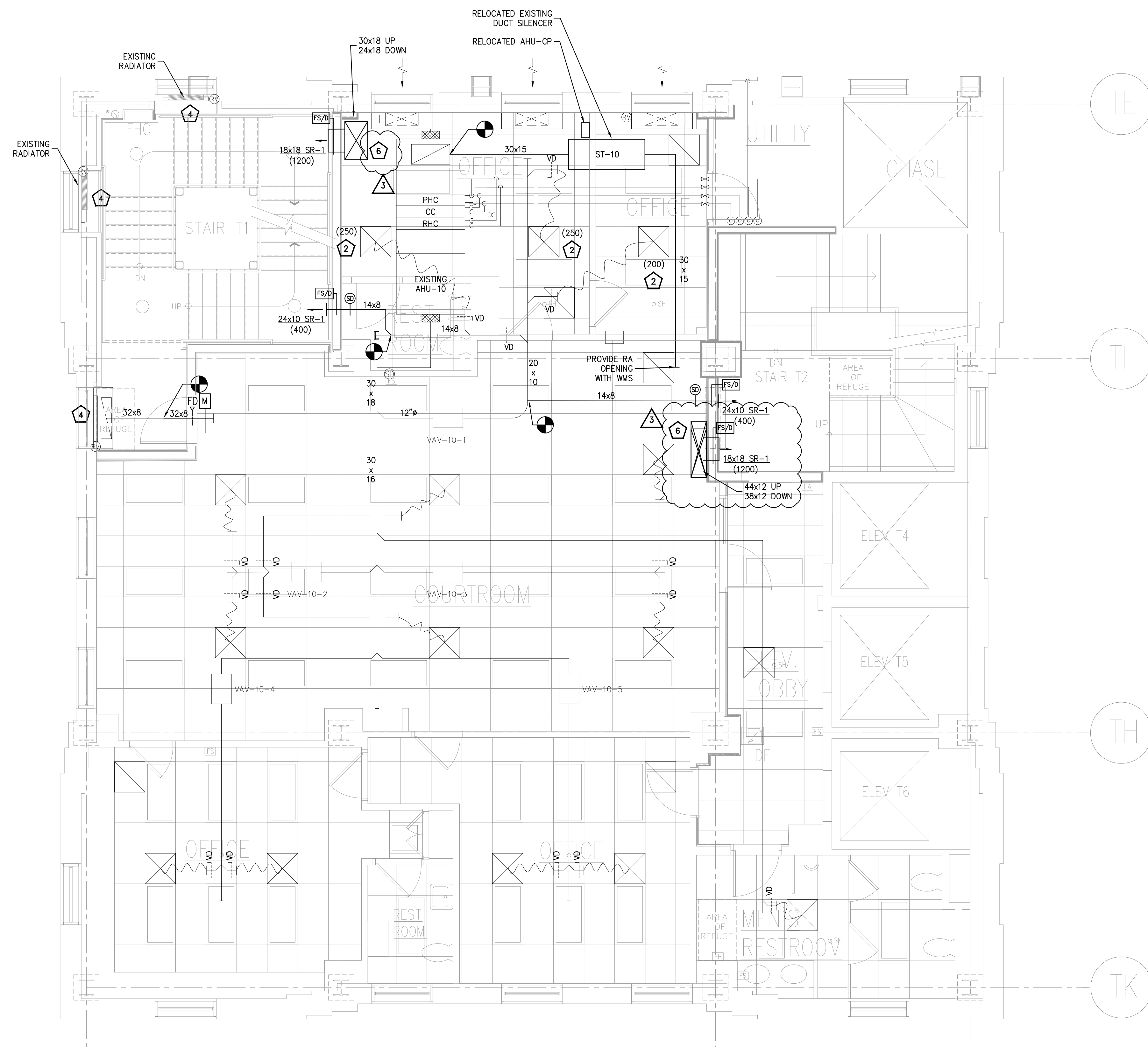
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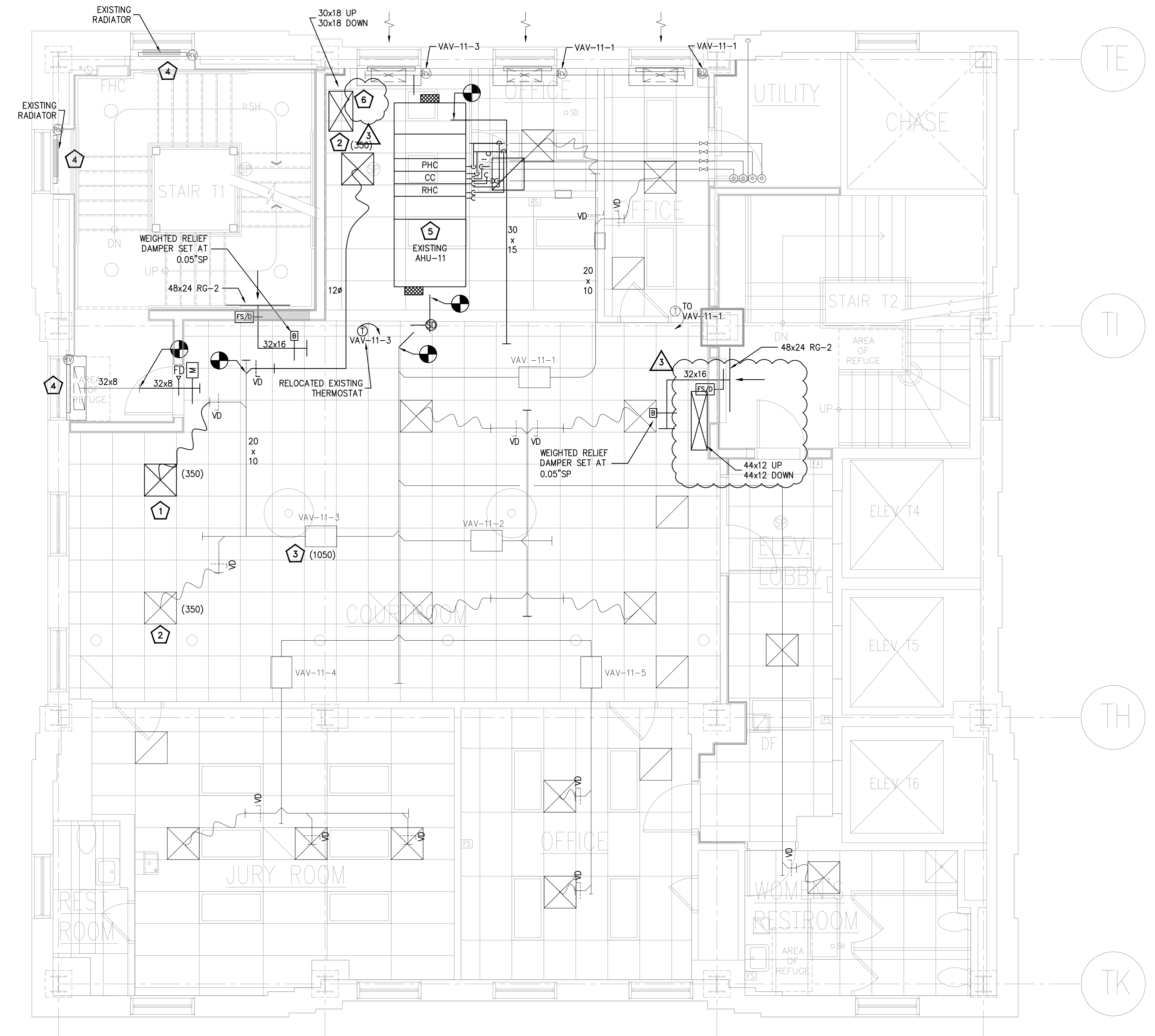
PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - HVAC PLAN
NINTH FLOOR**

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	10-10-15
04.02.15	DD SUBMISSION	KD	FM						AS SHOWN
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08.30.17	ISSUED FOR BID	MC	FM						JOB NO 2141151
11.1.17	ADDENDUM#3	MC	FM						SHEET: _ OF: 160
									DWG NO
									M.409



TENTH FLOOR - HVAC PLAN
SCALE: 1/8"=1'-0"



ELEVENTH FLOOR - HVAC PLAN
SCALE: 1/8"=1'-0"

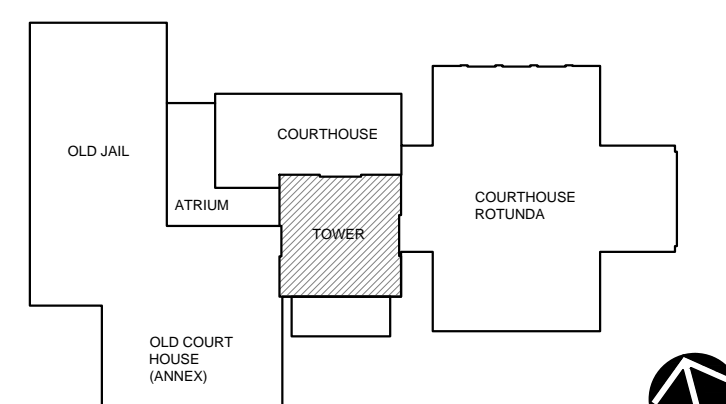
KEYED NEW WORK NOTES:

- 1 RELOCATED EXISTING AIR DEVICE. REBALANCE TO CFM VALUE SHOWN.
- 2 REBALANCE EXISTING AIR DEVICE TO CFM VALUE SHOWN.
- 3 REBALANCE EXISTING VAV BOX TO CFM VALUE SHOWN.
- 4 PROVIDE NEW RADIATOR CONTROL VALVE, DANFOSS RA2000 ACTUATOR OR EQUAL.
- 5 RELOCATED AIR HANDLING UNIT.
- 6 COORDINATE FINAL ROUTING OF DUCT AND ANY OFFSETS REQUIRED WITH ARCHITECTURAL SHAFTS AND STRUCTURAL SUPPORT BEAMS. PROVIDE MECHANICAL FRAMING AND SUPPORTS AS REQUIRED.

DRAWING NOTES:

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KEYPLAN



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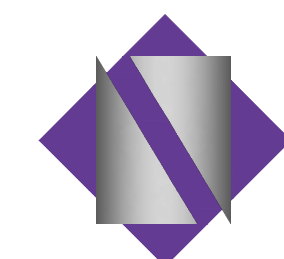
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NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



ASSOCIATED TECHNOLOGY INC.
MECHANICAL, ELECTRICAL, PLUMBING ENGINEERS
415 ALLEN DRIVE, SUITE 200, FORT LINDEN, NJ 07036
PHONE: 908-336-3333 FAX: 908-336-3837
WWW.ATITECHNICAL.COM
CERTIFICATE OF AUTHORIZATION #A00000000

JOSEPH J. HENDERSON, PE
NJ License No. 360887



NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-376-0088 FAX: 973-376-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

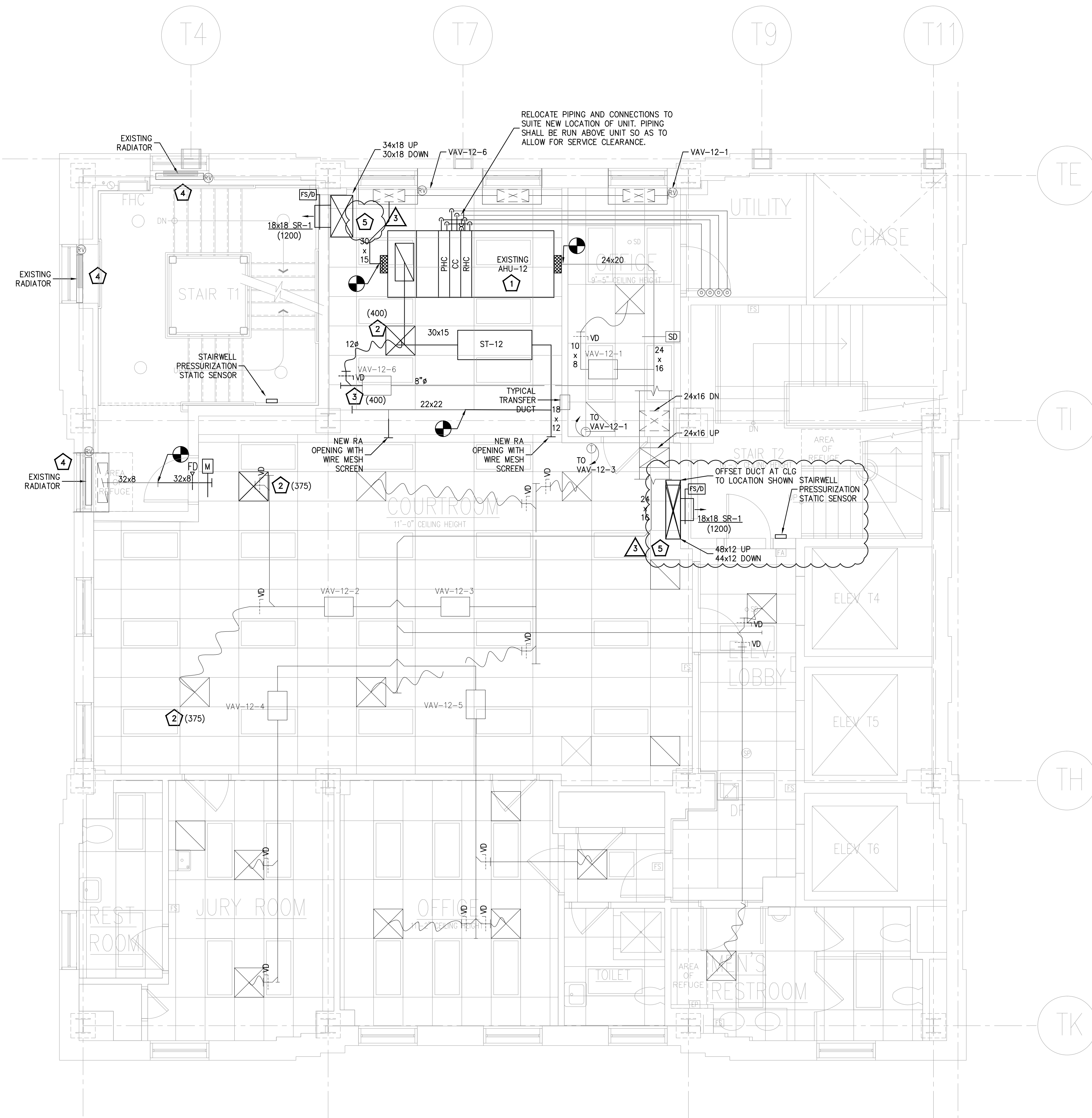
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

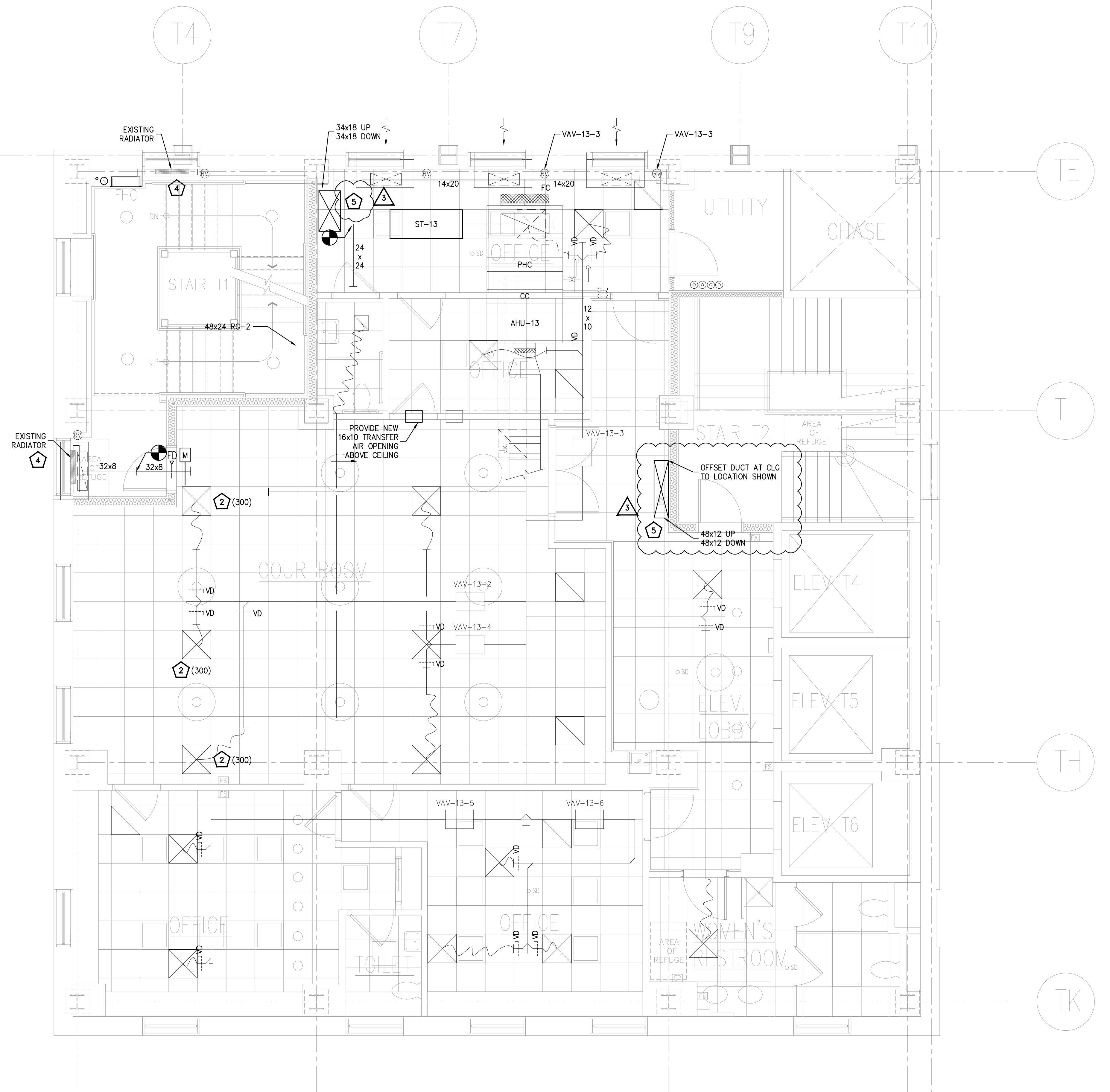
**MECHANICAL - HVAC PLAN
TENTH & ELEVENTH FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
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11.1.17	ADDENDUM#3	MC	FM						DWG NO

M.410



TWELFTH FLOOR - HVAC PLAN
SCALE: 1/4"=1'-0"



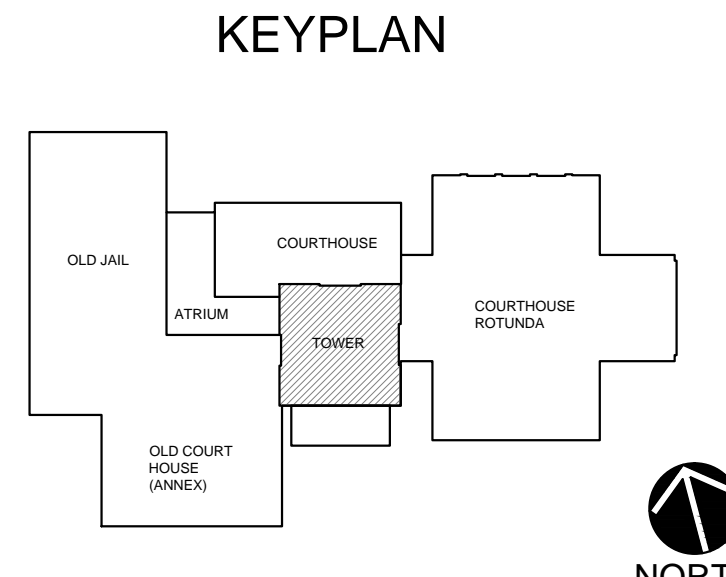
THIRTEENTH FLOOR - HVAC PLAN
SCALE: 1/4"=1'-0"

KEYED NEW WORK NOTES:

- 1 RELOCATED AIR HANDLING UNIT.
- 2 REBALANCE EXISTING AIR DEVICE TO CFM VALUE SHOWN ON DRAWING.
- 3 REBALANCE EXISTING VAV BOX TO CFM VALUE SHOWN ON DRAWING.
- 4 PROVIDE NEW RADIATOR CONTROL VALVE, DAMPER, BAZOOKA ACTUATOR OR EQUAL.
- 5 COORDINATE FINAL ROUTING OF DUCT AND ANY OFFSETS REQUIRED WITH ARCHITECTURAL SHAFTS AND STRUCTURAL SUPPORT BEAMS. PROVIDE MECHANICAL FRAMING AND SUPPORTS AS REQUIRED.

DRAWING NOTES:

- 1 REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2 ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3 CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
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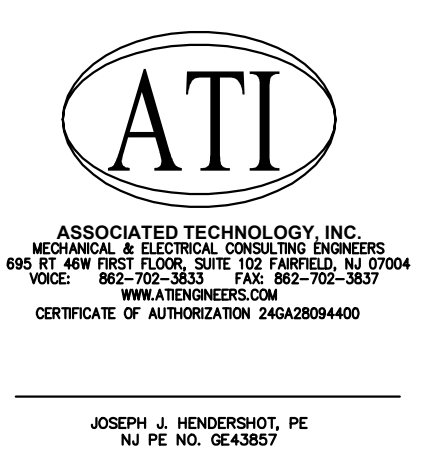
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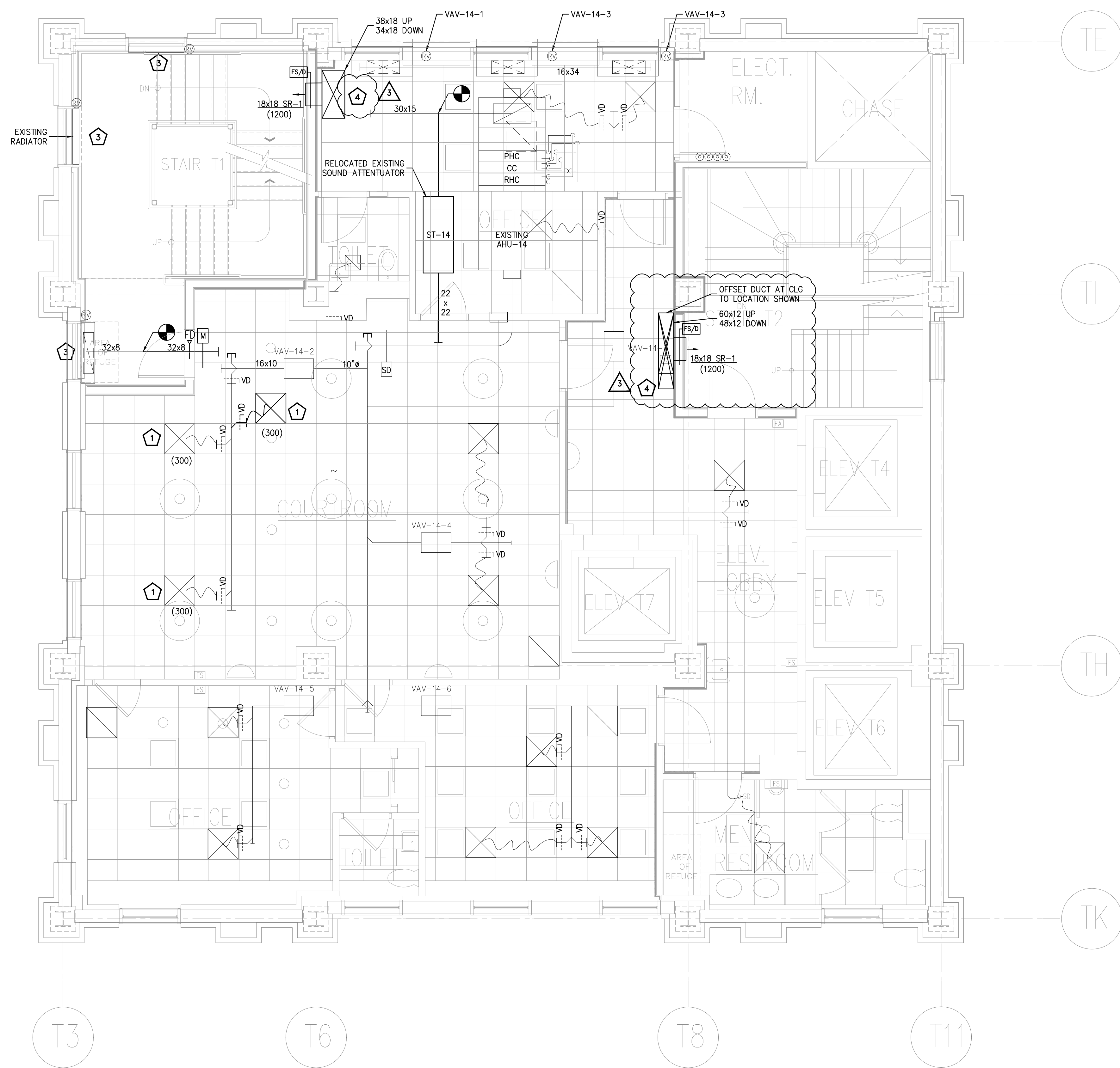


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
MECHANICAL - HVAC PLAN
TWELFTH & THIRTEENTH FLOOR

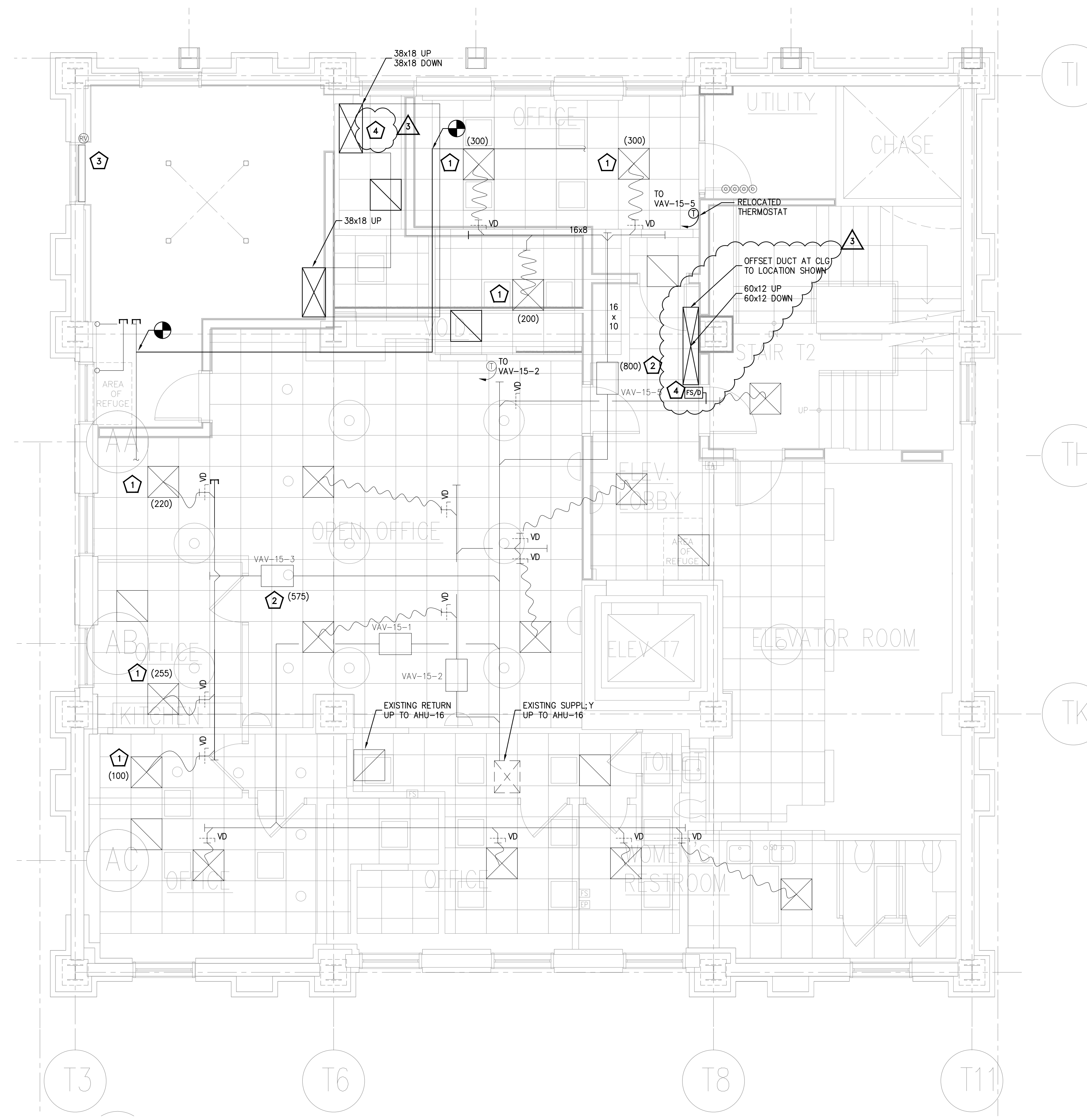
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11.1.17	ADDENDUM#3	MC	FM						DWG NO

M.411



FOURTEENTH FLOOR - HVAC PLAN

SCALE: 1/4"=1'-0"



FIFTEENTH FLOOR - HVAC PLAN

SCALE: 1/4"=1'-0"

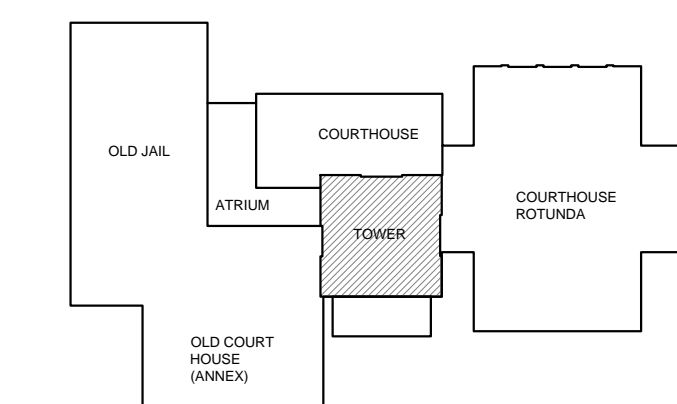
KEYED NEW WORK NOTES:

- 1 REBALANCE EXISTING AIR DEVICE TO CFM SHOWN ON DRAWING.
- 2 REBALANCE EXISTING VAV BOX TO VALUE SHOWN ON DRAWING.
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DRAWING NOTES:

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- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
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KEYPLAN



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PROJECT:

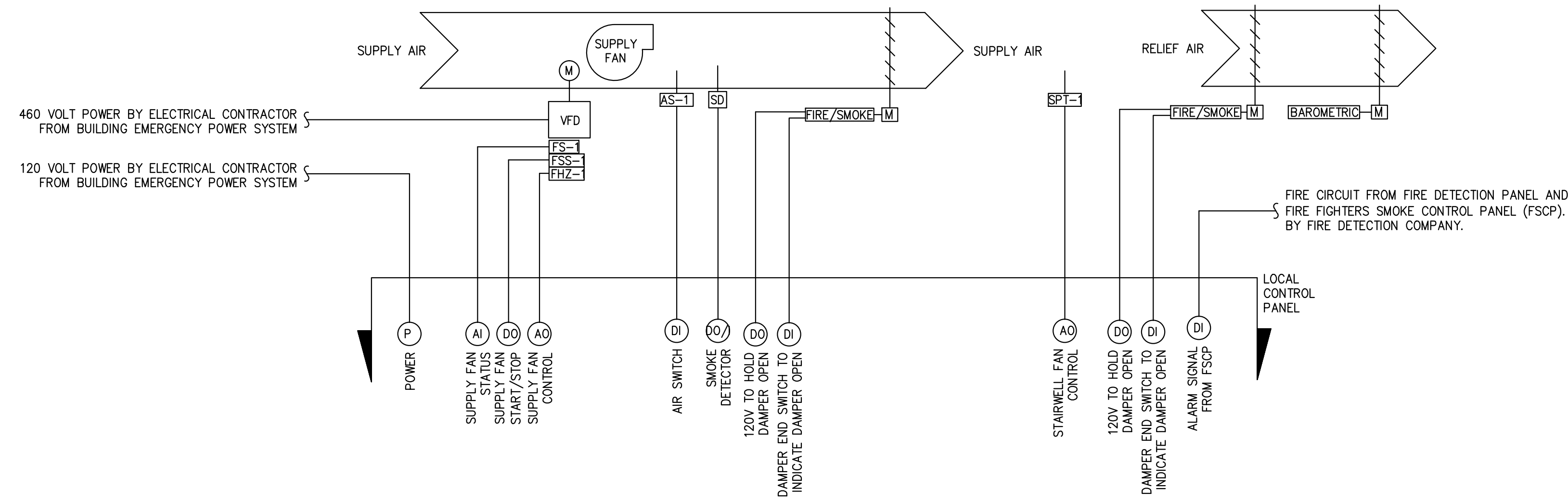
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**MECHANICAL - HVAC PLAN
FOURTEENTH & FIFTEENTH FLOORS**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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11.1.17	ADDENDUM#3	MC	FM						DWG NO

M.412



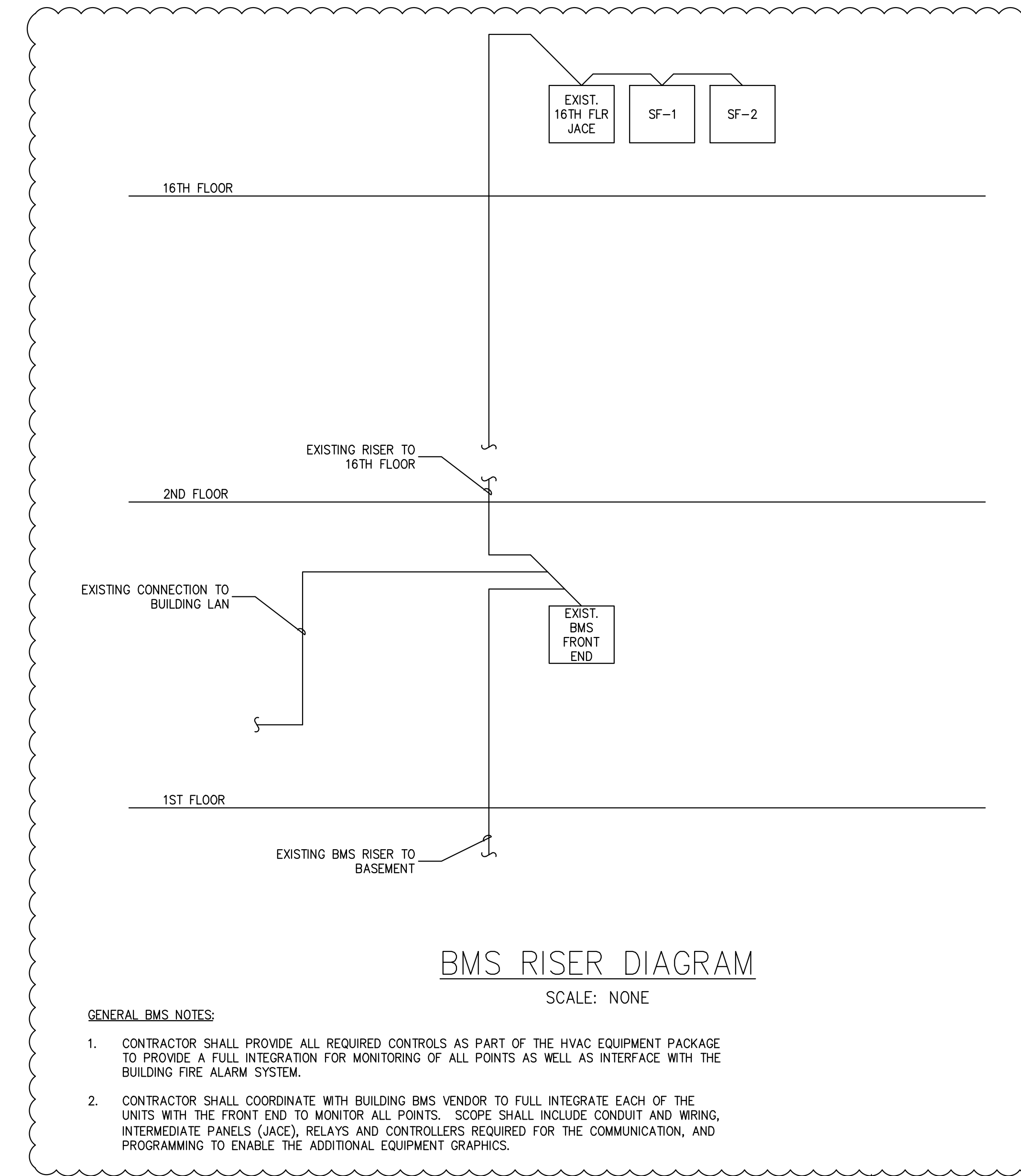
- NOTES:
- REFER TO SEQUENCE OF OPERATION.
 - MECHANICAL CONTRACTOR SHALL PROVIDE A CONTROL PANEL SUBMITTAL FOR APPROVAL TO THE ENGINEER. CONTRACTOR IS RESPONSIBLE TO COORDINATE CONTROLS WITH THE FIRE DETECTION CONTRACTOR AND ELECTRICAL CONTRACTOR PRIOR TO PANEL FABRICATION.
 - CONTROL PANEL SHALL INCLUDE SWITCHES, SENSOR OR DEVICES AS REQUIRED TO PROVIDE A PROOF OF OPERATION THAT SHALL BE RELATED BACK TO THE FSSPL.
 - BAROMETRIC DAMPER SHALL BE SET TO .15"WC
 - ALL PARTS MATERIAL, CONTROL WIRING, ETC. SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR. POWER WIRING SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
 - CONTROLS ARRANGEMENT, SET UP AND ALL TESTING SHALL ADHERE TO THE LATEST VERSION OF THE NFPA CODE SECTION 92A.

STAIRWELL PRESSURIZATION SYSTEM OPERATION:

- THE STARWELL PRESSURIZATION SYSTEM IS DESIGNED TO MAINTAIN 0.10 INWC WITHIN THE STARWELL WITH ALL DOORS CLOSED AND THE FAN OPERATING. THIS IS ABOVE THE MINIMUM REQUIRED 0.05 INWC REQUIREMENTS PER NFPA 92.
- THE .10INWC WILL INCREASE THE PRESSURE IN THE STARWELL WHICH WILL REQUIRE A MAXIMUM FORCE OF 20 LB TO OPEN THE EXIT DOORS. THIS IS BASED ON A DOOR CLOSURE DEVICE THAT REQUIRES A 15LB FORCE TO OPEN THE DOOR. CONTRACTOR SHALL INSPECT AND ENSURE THAT ALL DOOR CLOSURES ARE RATED AT OR BELOW THE 15LB FORCE OPENING REQUIREMENT.
- FANS SHALL BE INDEXED TO OPERATE VIA THE BUILDING FIRE ALARM SYSTEM. THE FIRE ALARM COMPANY SHALL PROVIDE CONTROL CIRCUITS TO INDEX THE FANS. ONCE THE FANS ARE ENERGIZED THEY WILL PROVIDE THE REQUIRED AIRFLOW TO MAINTAIN THE PRESSURE WITHIN THE STARWELL. THE FANS ARE PROVIDED WITH VFD DRIVES THEY WILL SPEED UP AND DOWN TO MAINTAIN THE PRESSURE SET POINT OF .10INWC. STARWELL PRESSURE WILL BE MONITORED BY STATIC PRESSURE SENSORS LOCATED IN THE STARWELLS.
- RELIEF VENTS WITH FIRE/SMOKE AND BAROMETRIC DAMPERS ARE LOCATED ON THE FIRST AND SEVENTH FLOORS OF THE STARWELLS THAT WILL BE UTILIZED TO RELIEVE ANY EXCESS PRESSURE DURING THE MODULATION OF THE FAN SPEEDS. THESE DEVICES ARE PROVIDED TO ENSURE THAT THE MAXIMUM DIFFERENTIAL PRESSURE IS NOT EXCEEDED WHICH CAN CAUSE DIFFICULTIES IN OPENING THE EXIT DOORS. ONCE THE FANS ARE ENERGIZED THE FIRE/SMOKE DAMPERS SHALL BE DRIVEN INTO THE FULL OPEN POSITION EXPOSING THE BAROMETRIC DAMPER. THE BAROMETRIC DAMPERS SHALL BE SET TO MAINTAIN .15INWC. IF THE PRESSURE IN THE STARWELL EXCEEDS THIS VALUE THE BAROMETRIC DAMPERS SHALL OPEN TO RELIEVE THIS EXCESS AIR UNTIL THE FANS MODULATE THE FAN SPEED.
- AS DOORS ARE OPENED AND CLOSED THE PRESSURE IN THE STARWELLS WILL CHANGE AND PRESSURE VARIATIONS ARE TO BE EXPECTED. HOWEVER, DURING TIMES WHEN THE DOORS ARE OPEN THE MINIMUM PRESSURE SETTING WILL NOT BE MAINTAINED. THE FANS WILL SPEED UP TO PROVIDE ADDITIONAL AIR AND SHALL PROVIDE DIRECTIONAL AIRFLOW THROUGH ALL OF THE OPEN DOORS THUS PREVENTING SMOKE FROM ENTERING THE STARWELL.
- ONCE THE FIRE/SMOKE CONDITION IS REMEDIED THE FIRE ALARM PANEL SHALL BE RESET TO NORMAL CONDITION. WHEN THE ALARM PANEL IS CLEARED THE SIGNAL TO THE FANS SHALL BE REMOVED AND THE FANS SHALL BE DE-ENERGIZED. THE FIRE SMOKE DAMPERS SHALL RETURN TO THE FULLY CLOSED POSITION.

SPECIAL TESTING NOTES:

- THE CONTRACTOR SHALL CLOSELY COORDINATE THE STARWELL PRESSURIZATION SYSTEM WITH THE FIRE ALARM CONTRACTOR AND SHALL COORDINATE ALL EFFORTS WITH THE AUTHORITY HAVING JURISDICTION (AHJ). CONTRACTOR SHALL PROVIDE ALL FIELD TESTING AND ADJUSTING REQUIRED TO MEET DESIGN INTENT AND REQUIREMENTS OF THE AHJ. THIS SYSTEM IS BASED ON THEORETICAL VALUES AND MUST BE FIELD ADJUSTED TO MEET THE REQUIREMENTS OF THE ACTUAL INSTALLED SYSTEM AND DESIGN INTENT. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE FIELD TIME TO MAKE CHANGES TO THE FANS AND ADJUSTMENTS TO THE SYSTEM TO ENSURE SYSTEM IS COMPLETE AND MEETS THE DESIGN INTENT BASED ON ACTUAL FIELD CONDITIONS. AT A MINIMUM THE CONTRACTOR SHALL:
- COORDINATE SYSTEM WITH BOTH THE FIRE ALARM COMPANY AND THE AHJ
 - PROVIDE A TESTING SCHEDULE AND REQUIREMENTS WITH THE FIRE ALARM CONTRACTOR AND AHJ
 - PERFORM A PRE INSPECTION TEST TO ENSURE PROPER OPERATION INCLUDE ALL AIR AND PRESSURE MEASUREMENTS AS REQUIRED.
 - PROVIDE ADJUSTMENTS AS REQUIRED TO ADAPT SYSTEM TO EXISTING BUILDING CONDITIONS.
 - PROVIDE A OPERATIONAL TESTING OF THE ENTIRE SYSTEM TO ENSURE ALL COMPONENTS OPERATE SUFFICIENTLY DURING THE FAN ACTIVATION:
 - WHEN ALL EXIT DOORS ARE CLOSED
 - WHEN EXIT DOORS ARE OPEN
 - WITH OPERATION OF RELIEF VENTS
 - ON THE CHANGE FROM DOORS OPEN TO DOORS CLOSED
 - ENSURE DOORS OPENING FORCES ARE MEASURED DURING ALL SEQUENCE TO ENSURE AT NO TIME AN OPENING HAZARD EXISTS.
 - PROVIDE AND ACCEPTANCE TEST TO BE PERFORMED WITH THE AHJ.
 - PROVIDE ANY REQUIREMENTS AS SET FORTH BY THE AHJ



BMS RISER DIAGRAM
SCALE: NONE

GENERAL BMS NOTES:

- CONTRACTOR SHALL PROVIDE ALL REQUIRED CONTROLS AS PART OF THE HVAC EQUIPMENT PACKAGE TO PROVIDE A FULL INTEGRATION FOR MONITORING OF ALL POINTS AS WELL AS INTERFACE WITH THE BUILDING FIRE ALARM SYSTEM.
- CONTRACTOR SHALL COORDINATE WITH BUILDING BMS VENDOR TO FULL INTEGRATE EACH OF THE UNITS WITH THE FRONT END TO MONITOR ALL POINTS. SCOPE SHALL INCLUDE CONDUIT AND WIRING, INTERMEDIATE PANELS (JACE), RELAYS AND CONTROLLERS REQUIRED FOR THE COMMUNICATION, AND PROGRAMMING TO ENABLE THE ADDITIONAL EQUIPMENT GRAPHICS.

CONTROL DIAGRAM ABBREVIATIONS	
SYMBOL	DESCRIPTION
	COMBINATION DISCONNECT MAGNETIC STARTER
	SWITCH
	BREAKGLASS STATION
	DIGITAL OUTPUT
	DIGITAL INPUT
	ANALOGUE INPUT
	ANALOG OUTPUT
	NORMALLY CLOSED
	NORMALLY OPEN
	LOCAL CENTRAL PANEL
	RECEIVER CONTROLLER
	TIME CLOCK
	START/STOP
	AVERAGING TUBE
	FIRE ALARM SIGNAL SHUTDOWN HARD WIRED BY
	SMOKE PURGE PANEL
	LEVEL SWITCH
	POSITION SWITCH
	CURRENT TRANSDUCER
	CURRENT ELEMENT
	TEMPERATURE ELEMENT
	TEMPERATURE SWITCH WITH AUTO RESET
	PRESSURE ELEMENT
	PRESSURE SWITCH HIGH
	PRESSURE SWITCH LOW
	ALARM
	RELAY
	MOTOR CONTROLLER
	OUTSIDE AIR DRY BULB TEMPERATURE
	PILOT LIGHT (RED)
	FLOW SWITCH

STAIRWELL PRESSURIZATION CONTROL DIAGRAM (TYP 2)
SCALE: NONE

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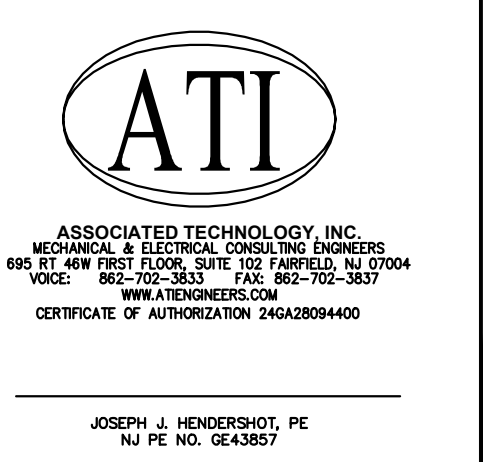
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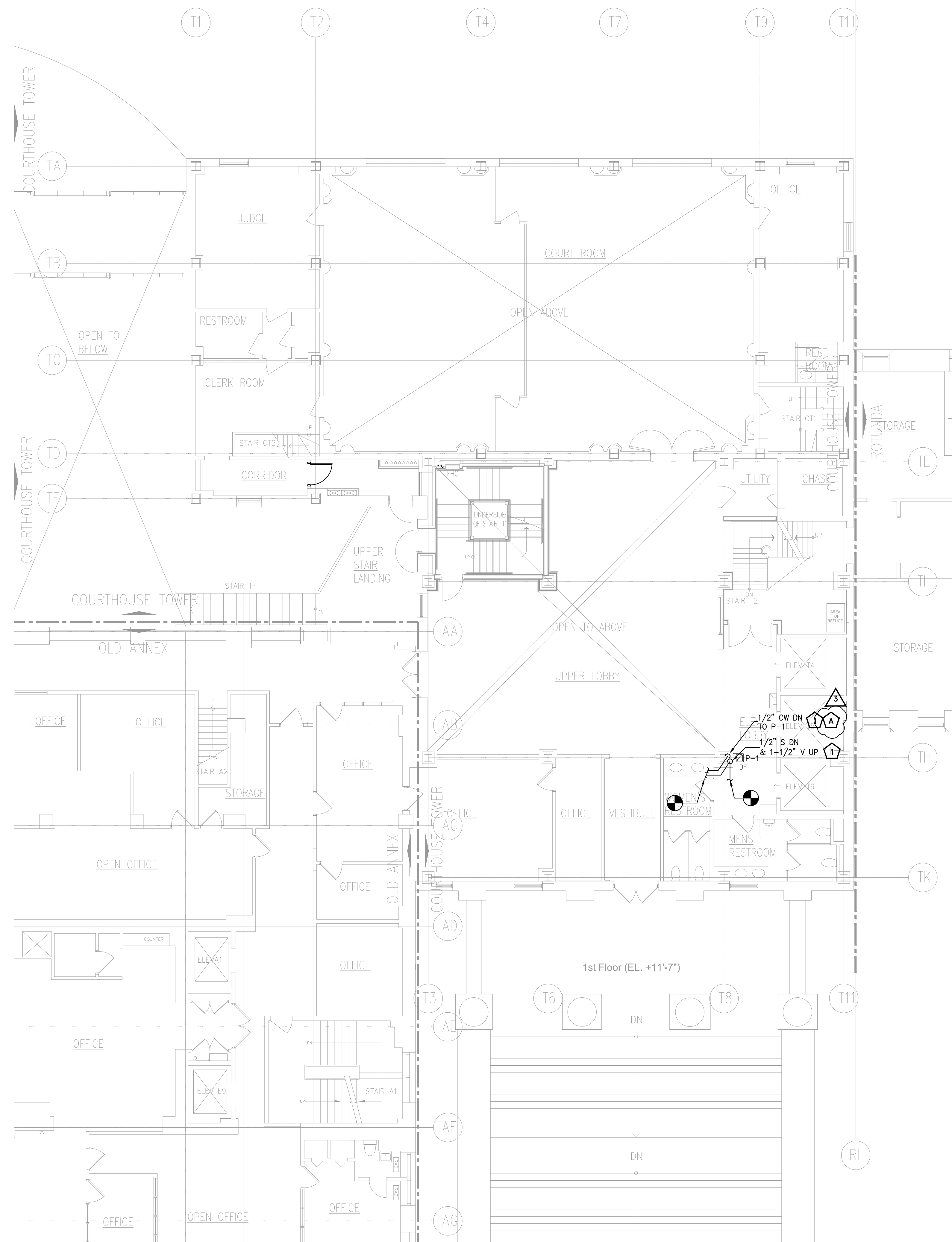


PROJECT:
**UC COURTHOUSE
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SHEET CONTENTS:
MECHANICAL - CONTROL DIAGRAM

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11.1.17	ADDENDUM#3	MC	FM						DWG NO

M.701



FIRST FLOOR - PIPING PLAN

SCALE: 1/8"=1'-0"

KEYED NEW WORK NOTES:

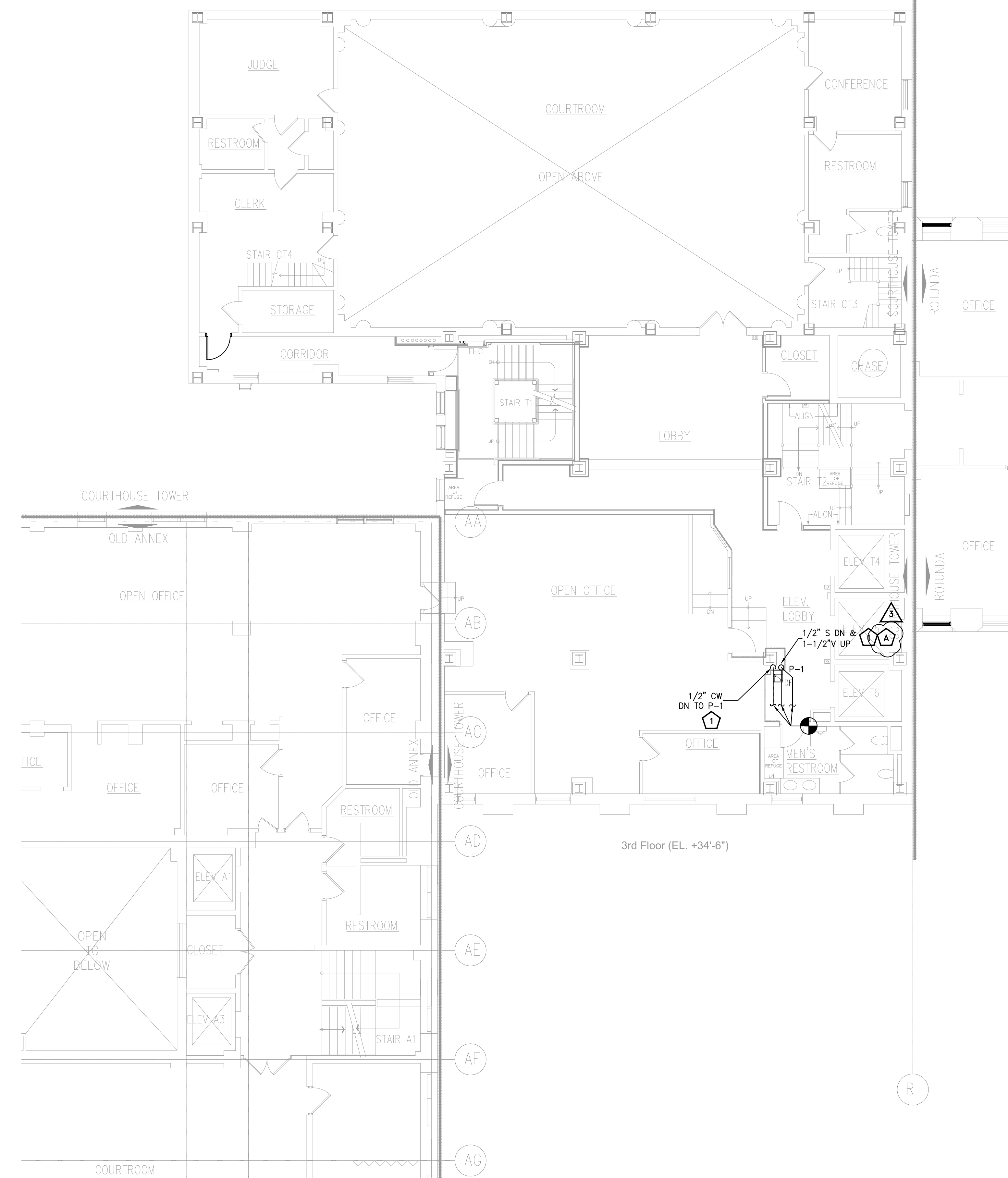
1 SANITARY PIPING SHALL CONNECT TO EXISTING PIPING IN CEILING BELOW. COLD WATER AND VENT TO CONNECT TO EXISTING IN CEILING ABOVE. CONTRACTOR TO REVIEW ALL SITE CONDITIONS AND DETERMINE FINAL TIE-IN LOCATIONS. CONTRACTOR TO BASE BID ACCORDINGLY. CONTRACTOR TO CORE DRILL FLOOR AND WALLS AS REQUIRED.

DRAWING NOTES:

1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.

KEYED DEMOLITION WORK NOTES:

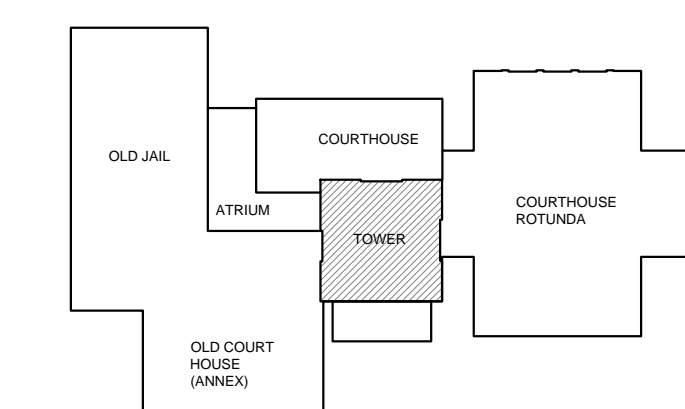
1 REMOVE EXISTING DRINKING FOUNTAIN, CUT LINES BACK TO RISERS AND PREPARE FOR RECONNECTION OF NEW FIXTURE.



THIRD FLOOR - PIPING PLAN

SCALE: 1/8"=1'-0"

KEYPLAN



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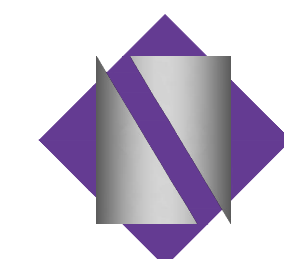
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NJ License No. AI 16160

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NJ License No. AI 14394



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MEMBERSHIP & LICENSED CONSULTING ENGINEERS
415 4th Ave. 10th Floor, New York, NY 10014
Voice: 212-312-3111 Fax: 212-312-3114
www.associatedtech.com

JOSEPH J. HENDERSON, PE
NJ License No. 36087



NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1004 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-376-0098 FAX: 973-376-1981
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

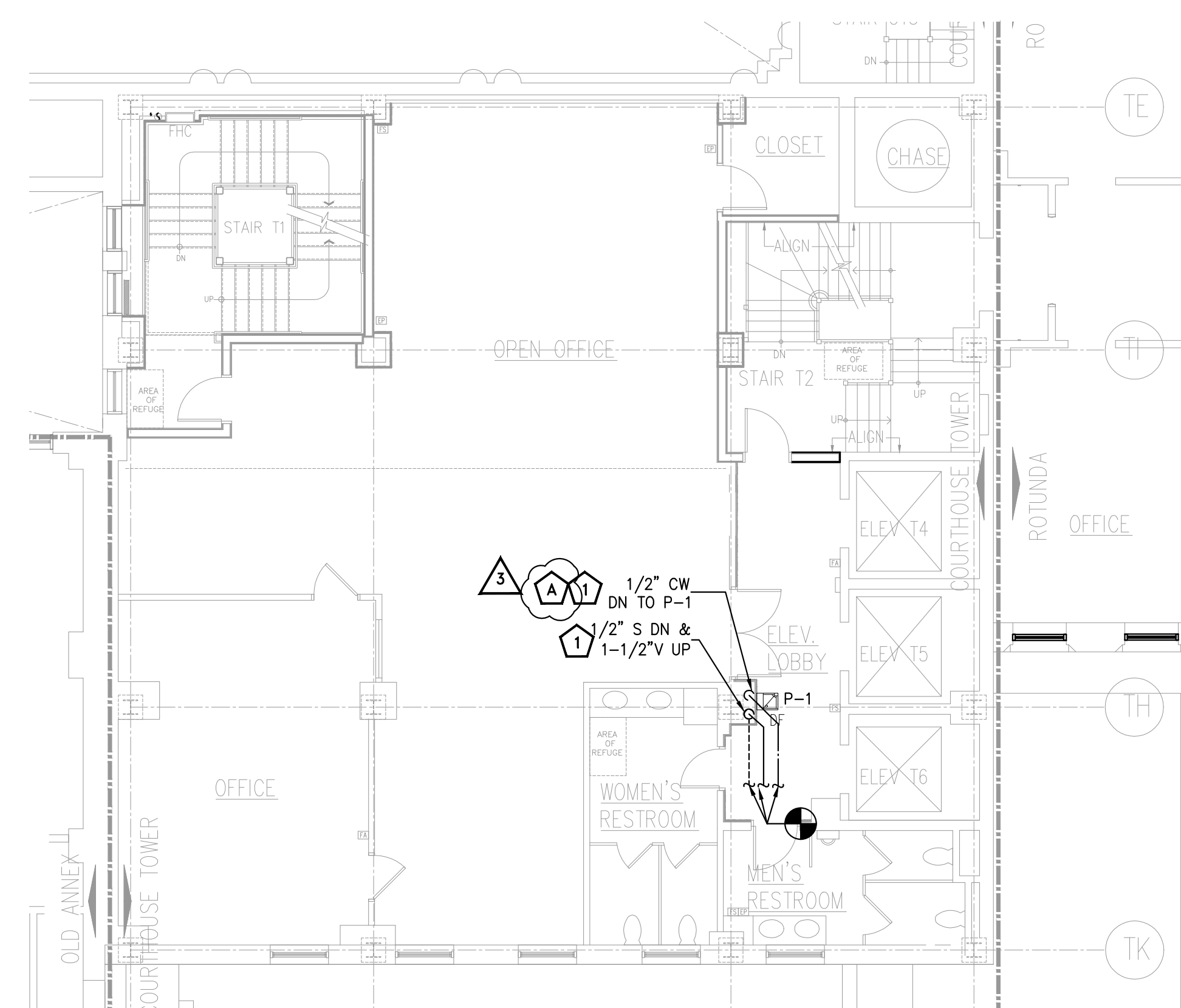
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

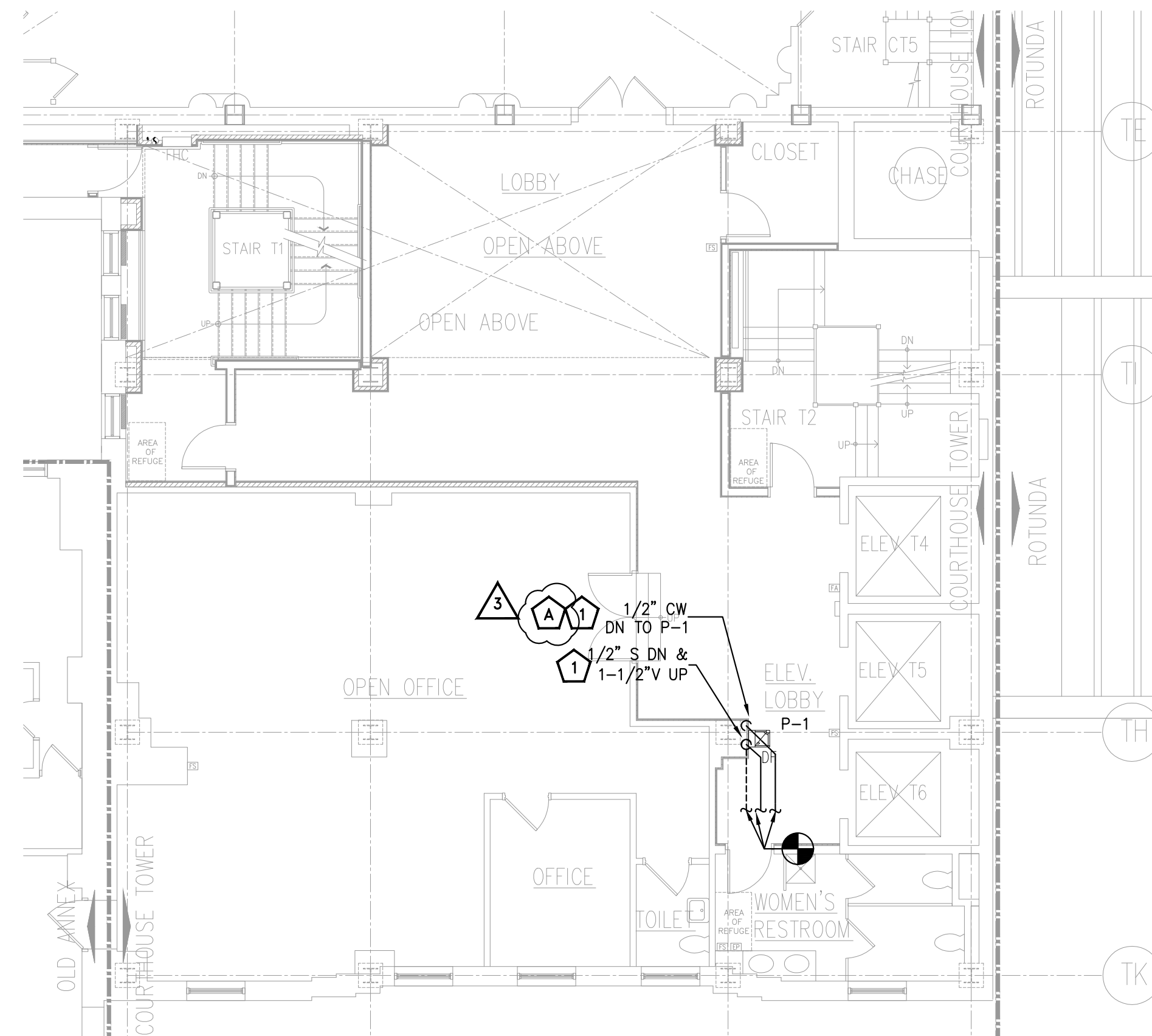
PLUMBING - PIPING PLAN
FIRST & THIRD FLOOR

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: _ OF: 160
11.1.17	ADDENDUM#3	MC	FM						DWG NO

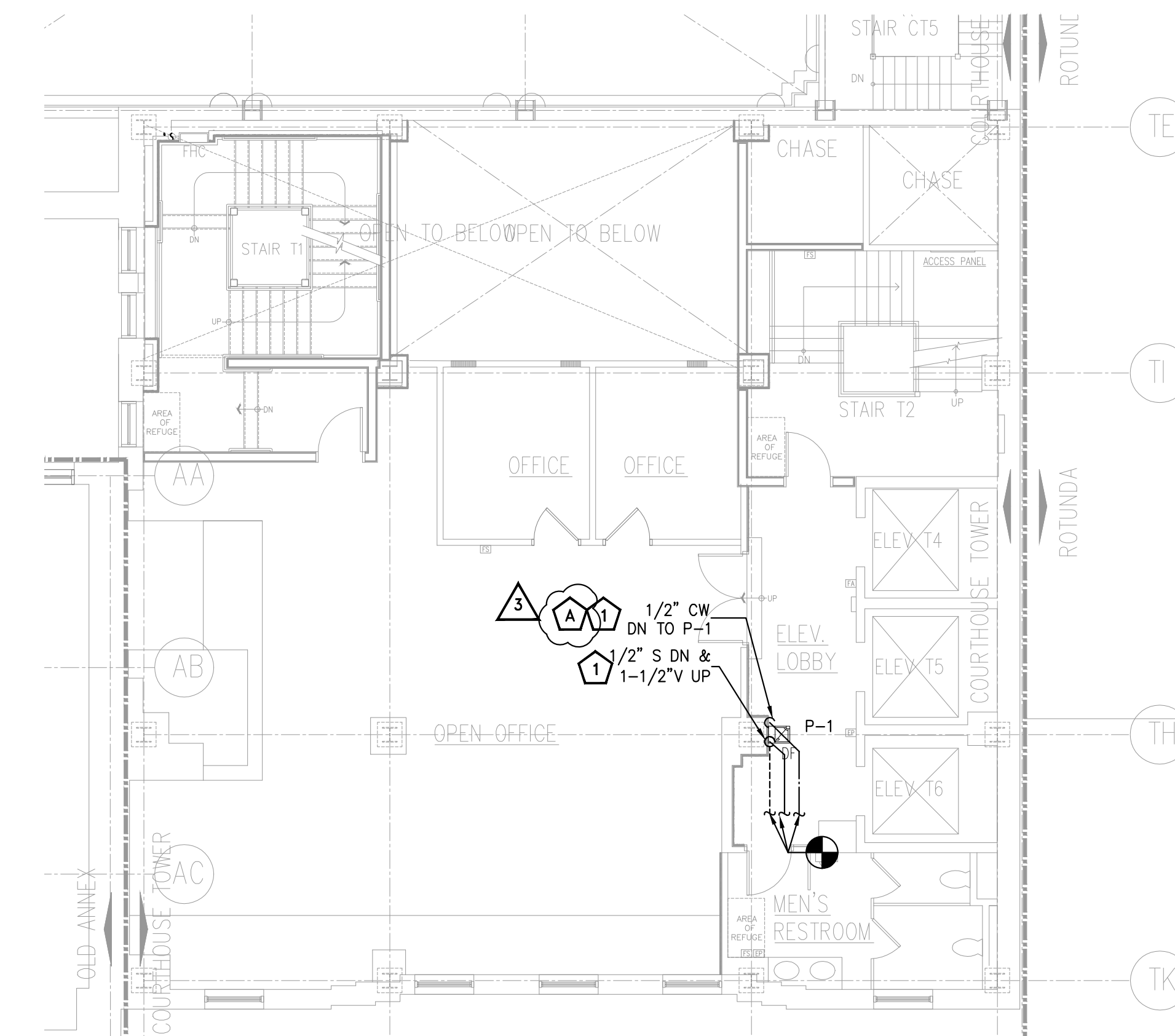
P.301



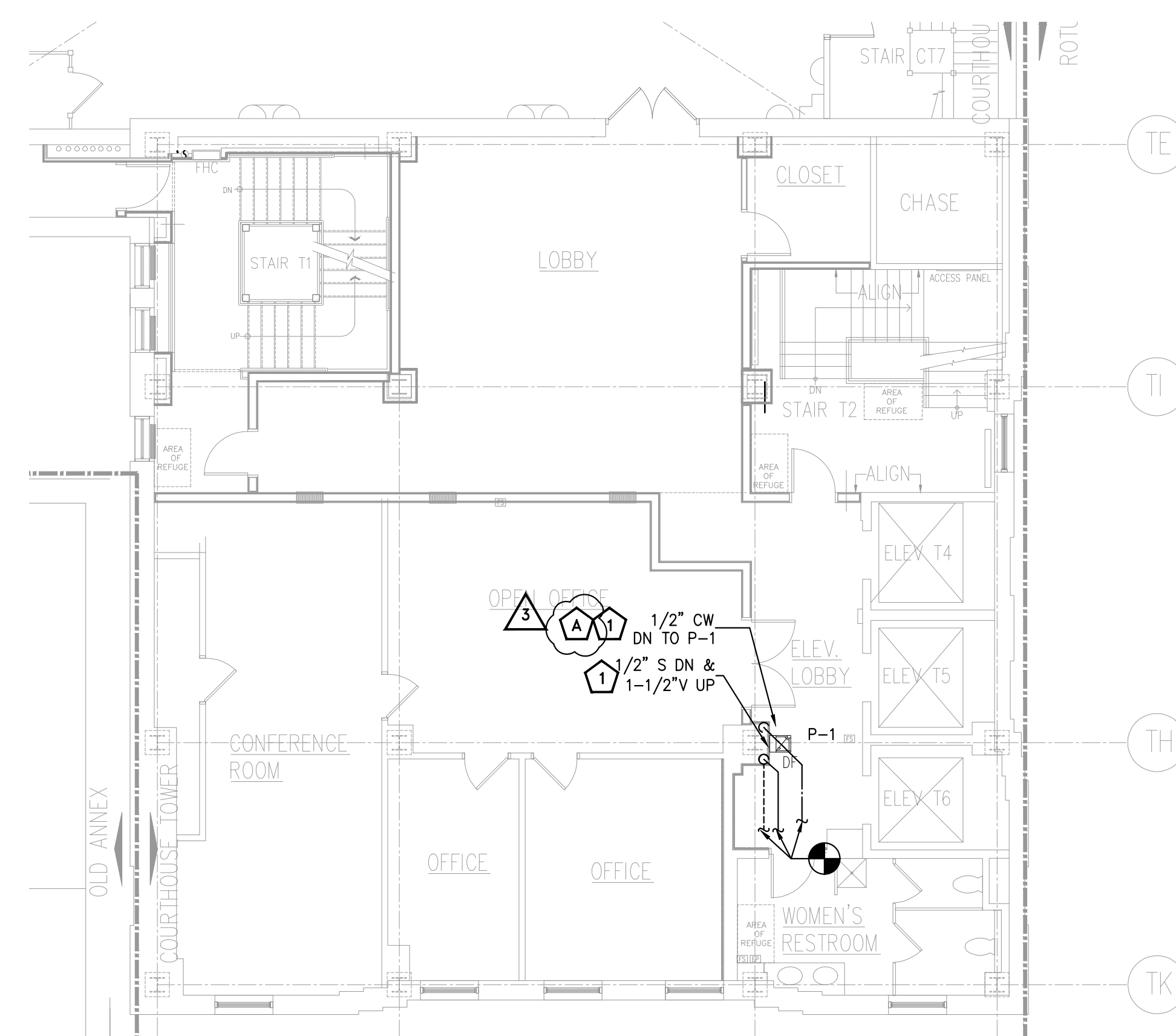
PIPING PLAN – FOURTH FLOOR
SCALE: 1/8"=1'-0"



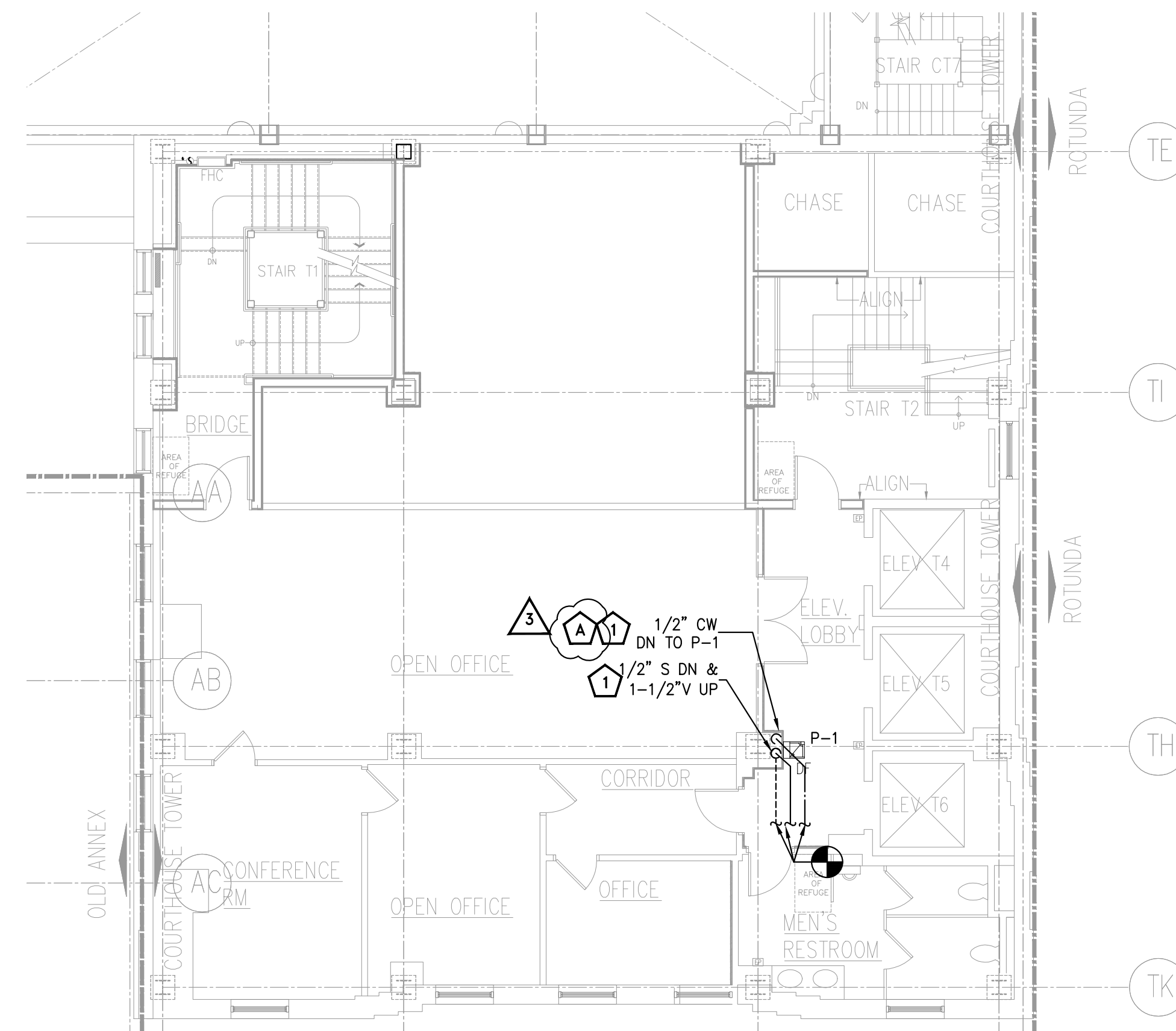
PIPING PLAN – FIFTH FLOOR
SCALE: 1/8"=1'-0"



PIPING PLAN – SIXTH FLOOR
SCALE: 1/8"=1'-0"



PIPING PLAN – SEVENTH FLOOR
SCALE: 1/8"=1'-0"



PIPING PLAN – EIGHTH FLOOR
SCALE: 1/8"=1'-0"

KEYED NEW WORK NOTES:

- 1. SANITARY PIPING SHALL CONNECT TO EXISTING PIPING IN CEILING BELOW. COLD WATER AND VENT TO CONNECT TO EXISTING PIPING IN CEILING ABOVE. CONTRACTOR TO REVIEW ALL SITE CONDITIONS AND DETERMINE FINAL TIE-IN LOCATIONS. CONTRACTOR TO BASE BID ACCORDINGLY. CONTRACTOR TO CORE DRILL FLOOR AND WALLS AS REQUIRED.

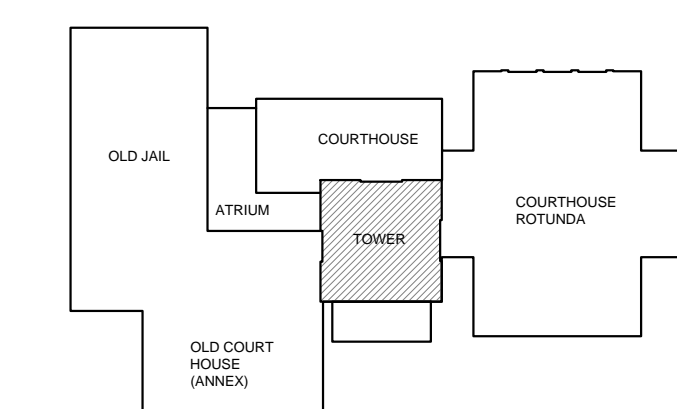
DRAWING NOTES:

- 1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.
- 2. CONTRACTOR SHALL CORE DRILL WALL AND FLOORS AS REQUIRED.

KEYED DEMOLITION NOTES:

- 1. REMOVE EXISTING DRINKING FOUNTAIN, CUT LINES BACK TO RISERS AND PREPARE FOR RECONNECTION OF NEW FIXTURE.

KEYPLAN



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MARK E. BESS, AIA, NCARB
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ASSOCIATED TECHNOLOGY, INC.
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440 ST. ANNE STREET, SUITE 200, NEWARK, NJ 07102
TEL: 973-376-0088 FAX: 973-376-1061
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION #A438468

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NJ License No. 364887



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ARCHITECTURE - PLANNING - INTERIOR DESIGN
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PROJECT:

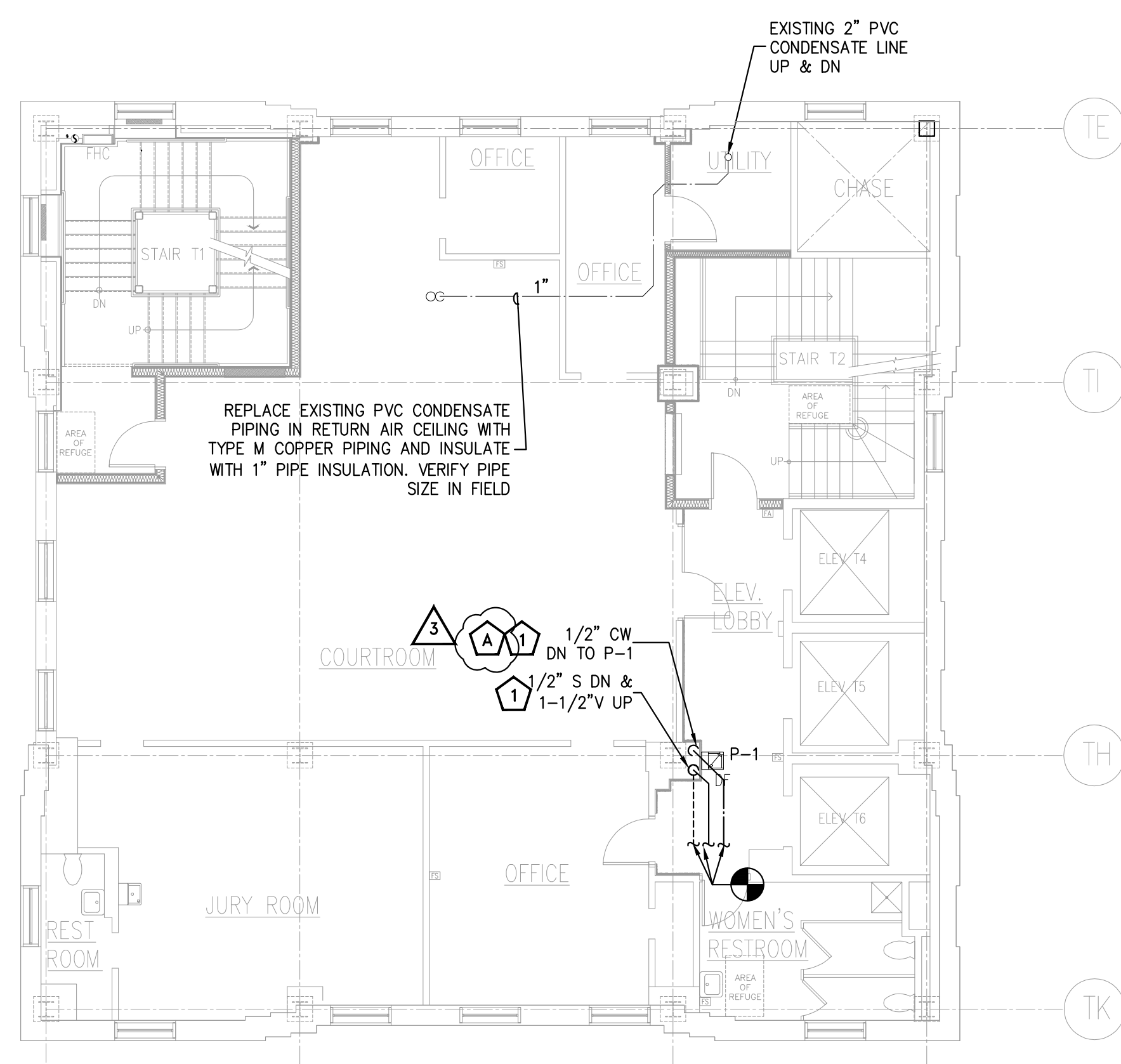
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SHEET CONTENTS:

PLUMBING - PIPING PLANS
FOURTH THRU EIGHTH FLOORS

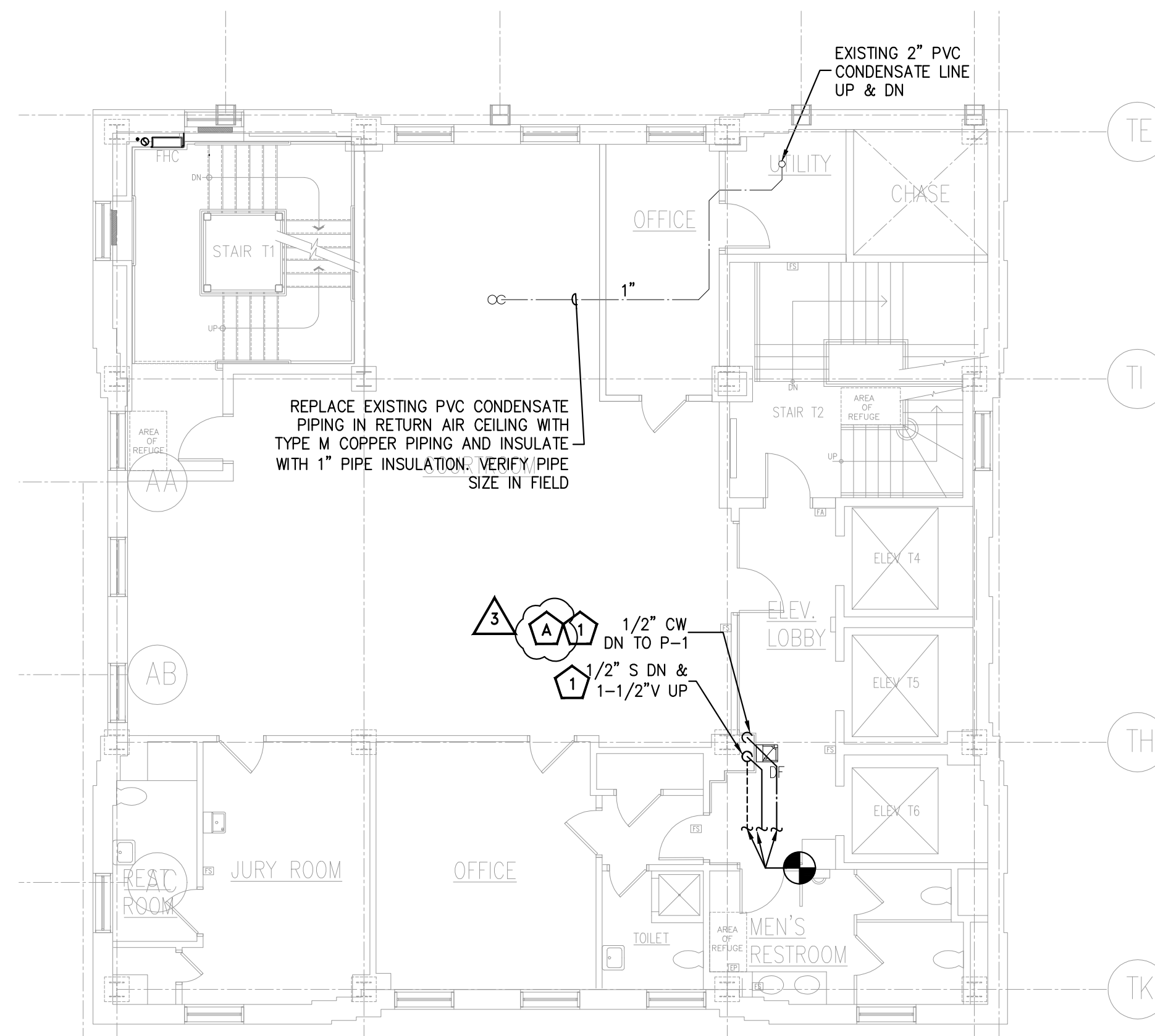
SUBMISSIONS				REVISIONS				DATE	10-10-15
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10.30.15	95% SUBMISSION	KD	FM						CHKD BY
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: _ OF: 160
11.1.17	ADDENDUM#3	MC	FM						DWG NO

P.302



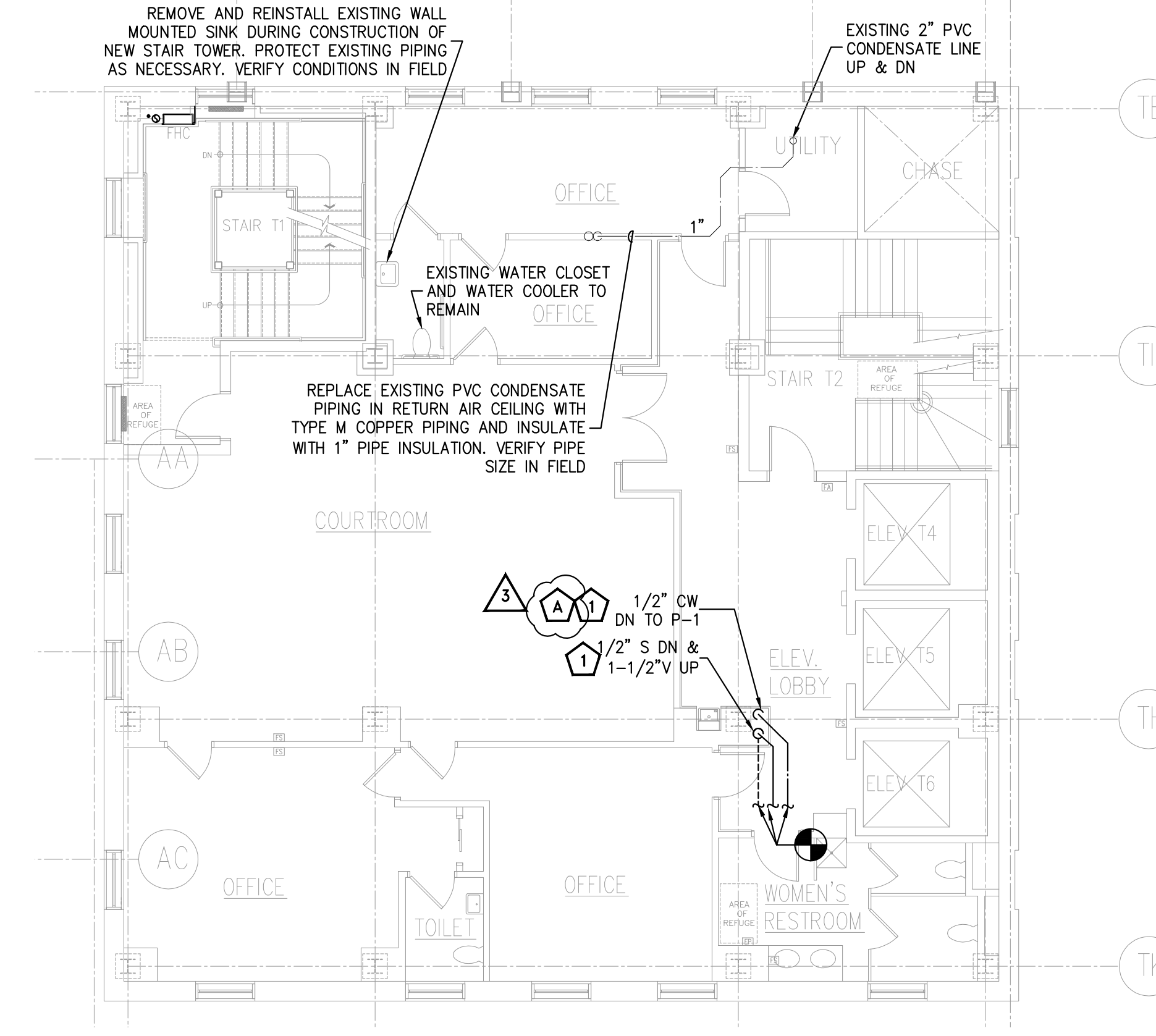
PIPING PLAN - ELEVENTH FLOOR

SCALE: 1/8"=1'-0"



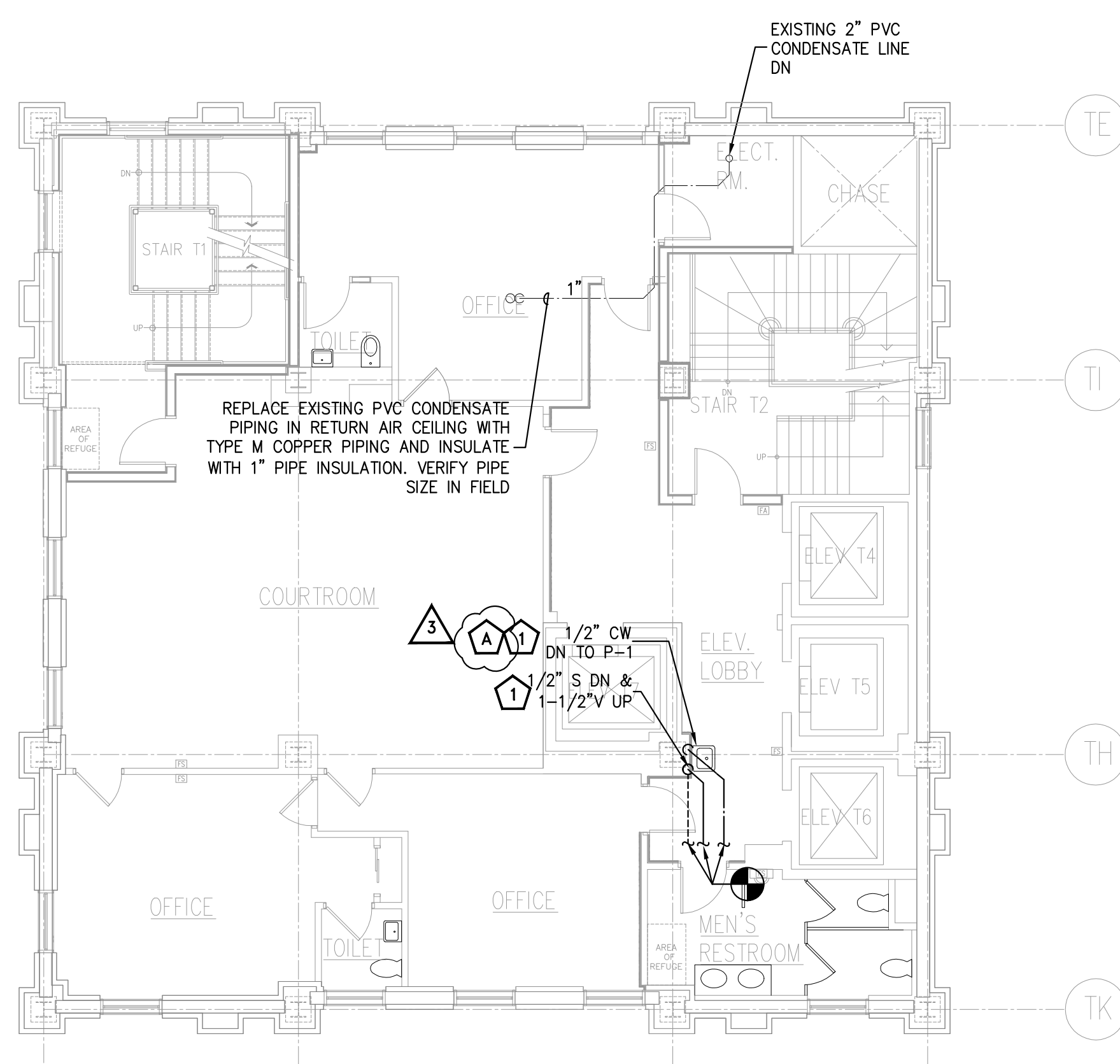
PIPING PLAN - TWELFTH FLOOR

SCALE: 1/8"=1'-0"



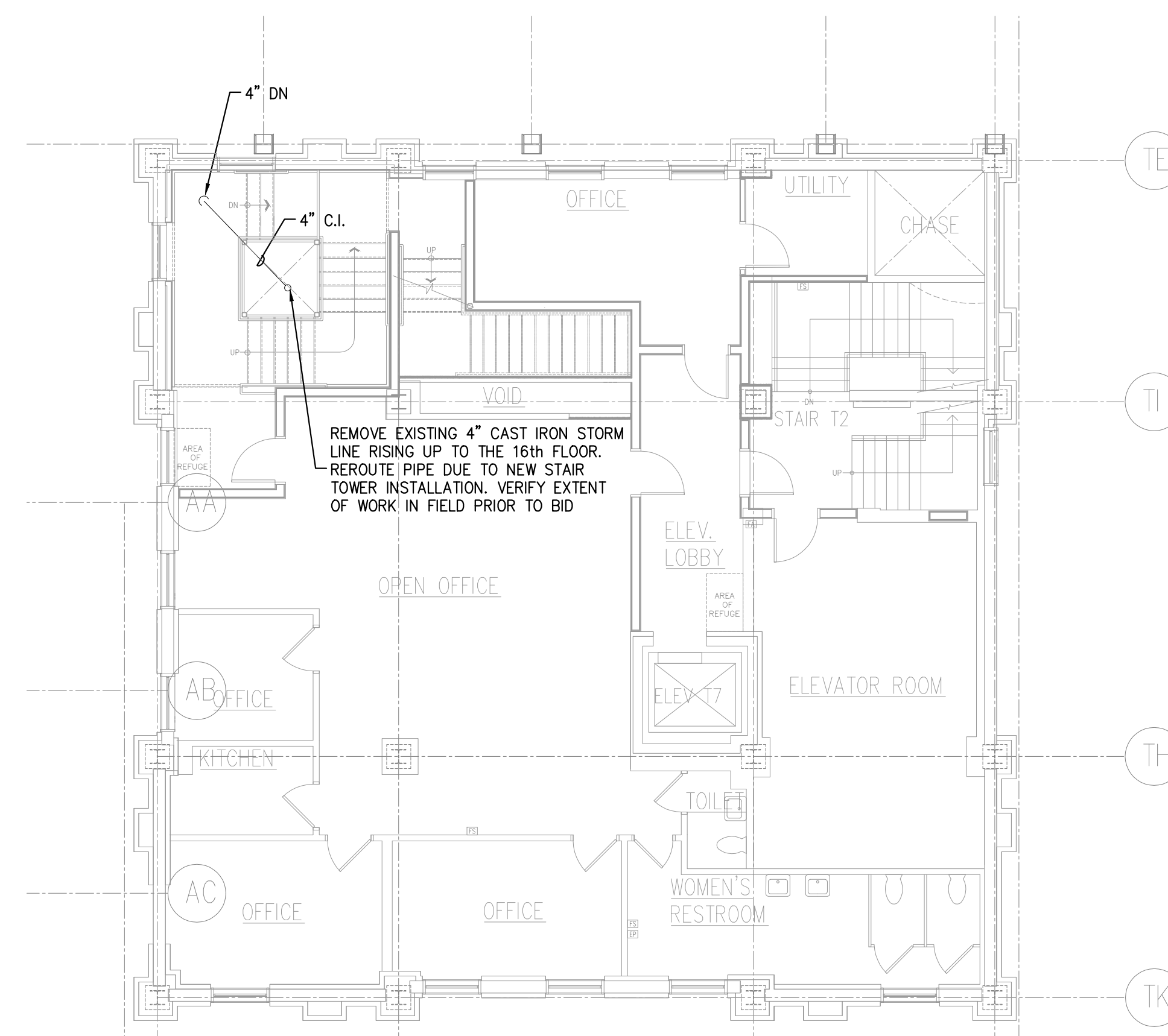
PIPING PLAN - THIRTEENTH FLOOR

SCALE: 1/8"=1'-0"



PIPING PLAN - FOURTEENTH FLOOR

SCALE: 1/8"=1'-0"



PIPING PLAN - FIFTEENTH FLOOR

SCALE: 1/8"=1'-0"

KEYED NEW WORK NOTES:

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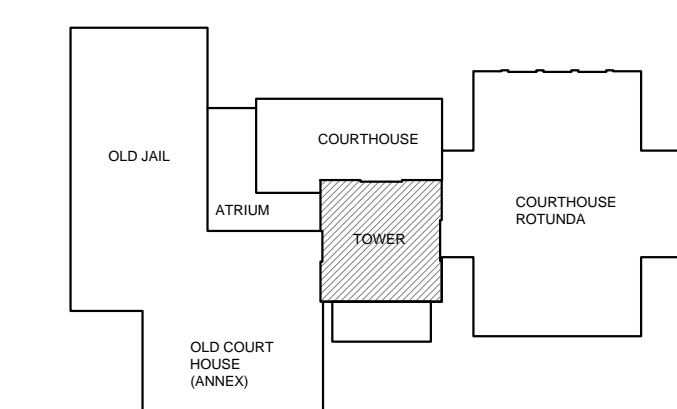
KEYED DEMOLITION NOTES:

- A REMOVE EXISTING DRINKING FOUNTAIN, CUT LINES BACK TO RISERS AND PREPARE FOR RECONNECTION OF NEW FIXTURE.

DRAWING NOTES:

- 1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.

KEYPLAN



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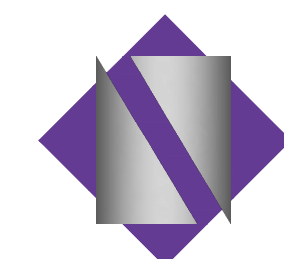
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MEMBERSHIP & LICENSED CONSULTING ENGINEERS
440 2ND FLOOR, 1000 3RD ST, NEW JERSEY 07102
TEL: 973-376-0098 FAX: 973-376-3837
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION #A44000000

JOSEPH J. HENDERSON, PE
NJ License No. 360887



NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 20 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.376.0098 FAX: 973.376.1981
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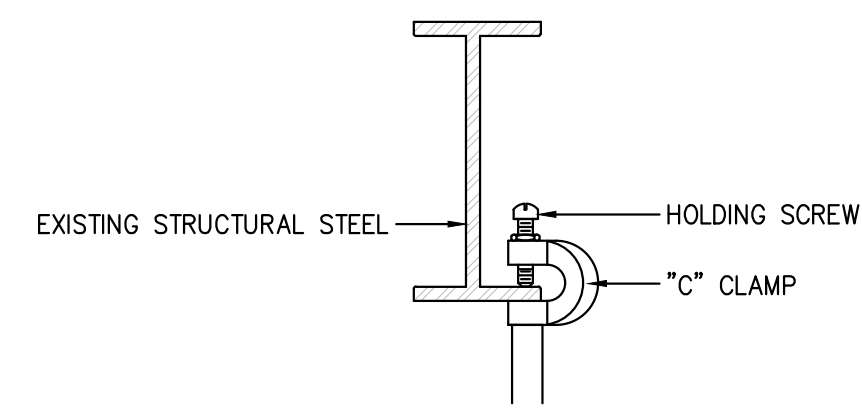
**UC COURTHOUSE
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2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

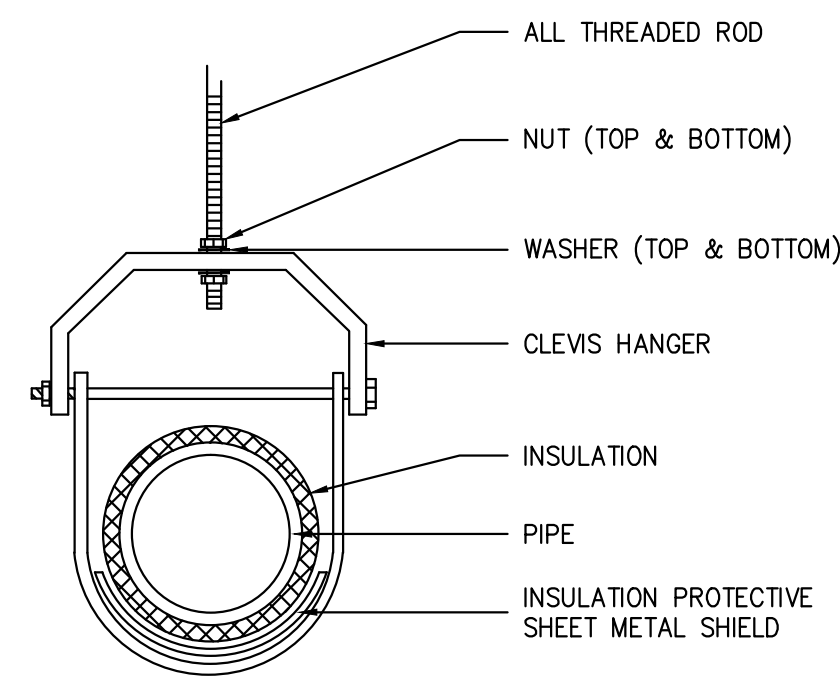
PLUMBING - PIPING PLANS
ELEVENTH THRU FIFTEENTH FLOORS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% SUBMISSION	KD	FM						CHKD BY
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: _ OF: 160
11.1.17	ADDENDUM#3	MC	FM						DWG NO

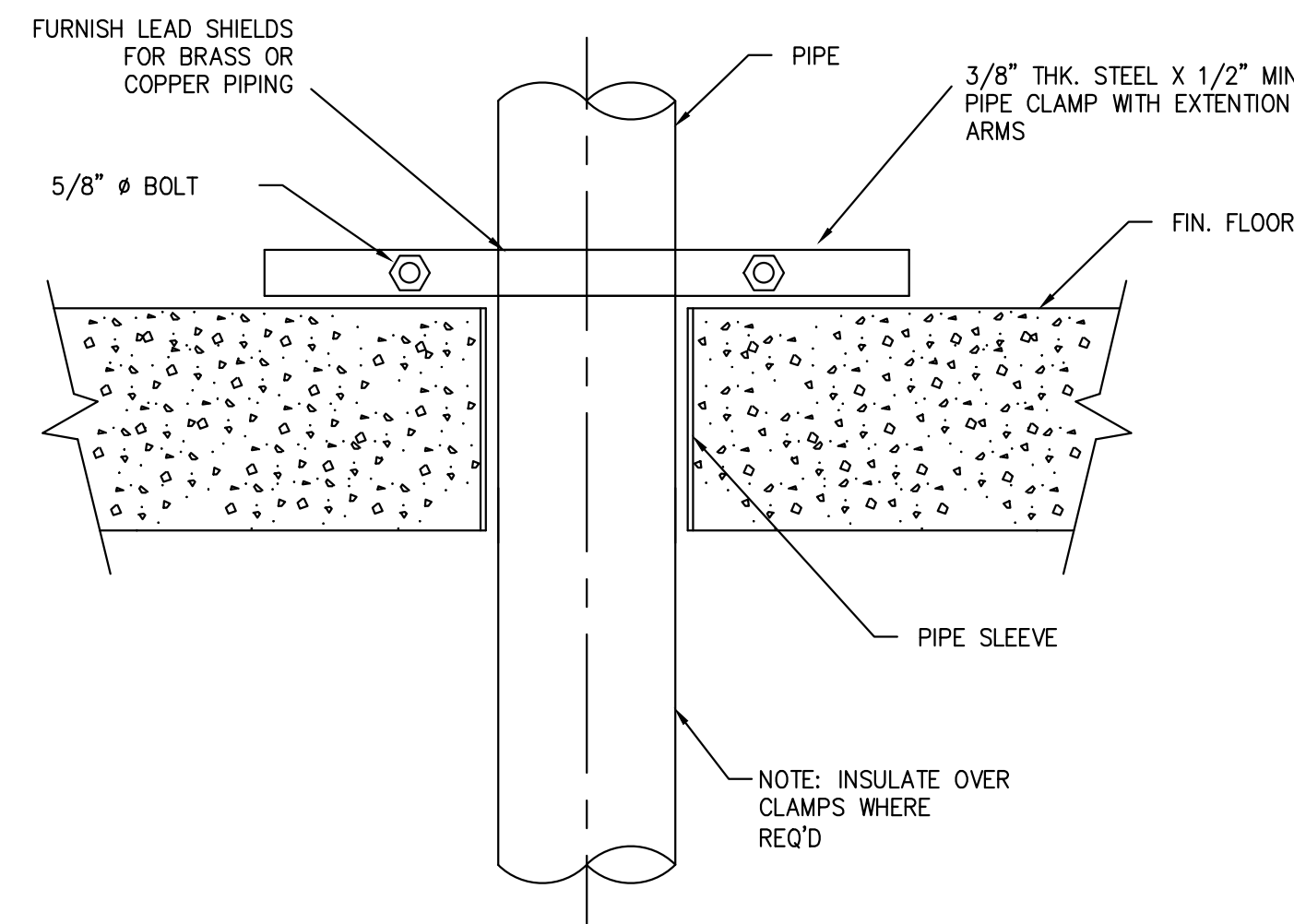
P.304



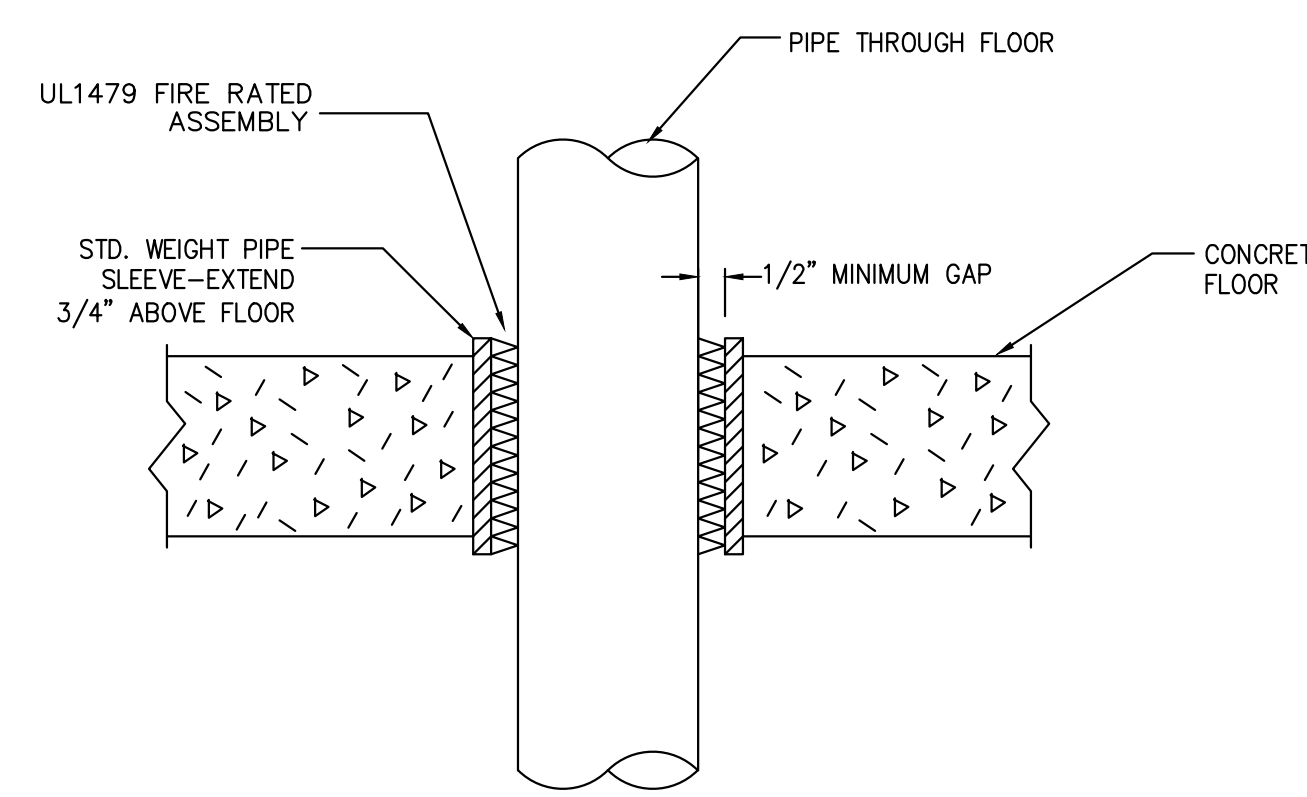
TYPICAL DETAIL CLAMP HANGER
SCALE: NONE



TYPICAL CLEVIS HANGER DETAIL
SCALE: NONE



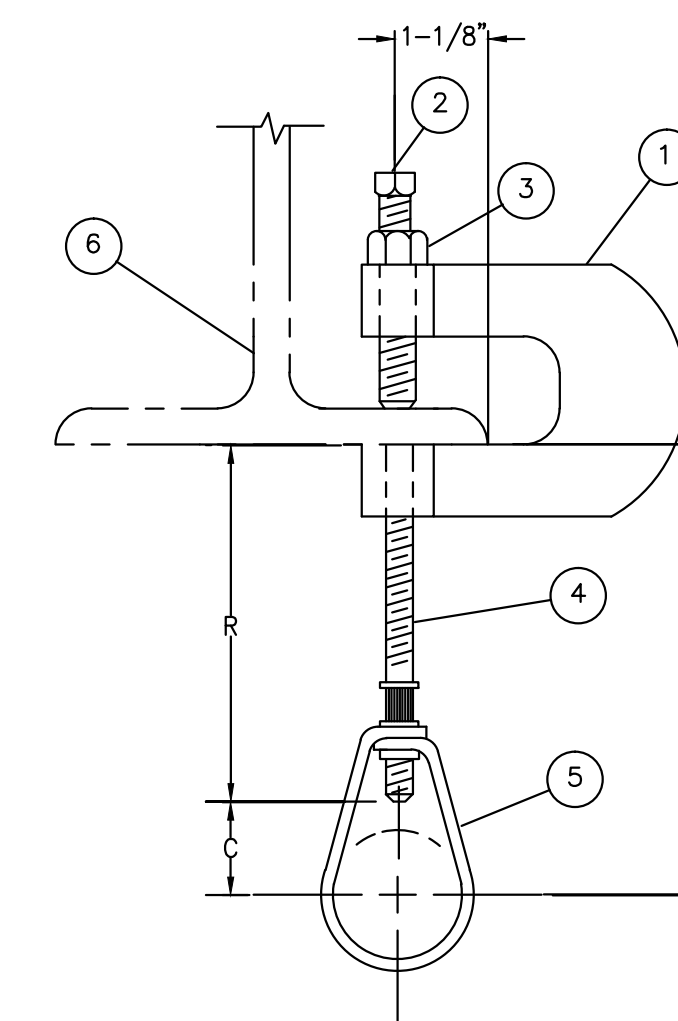
PIPE RISER SUPPORT DETAIL
SCALE: NONE



PIPE SLEEVE THROUGH FLOOR DETAIL
SCALE: NONE

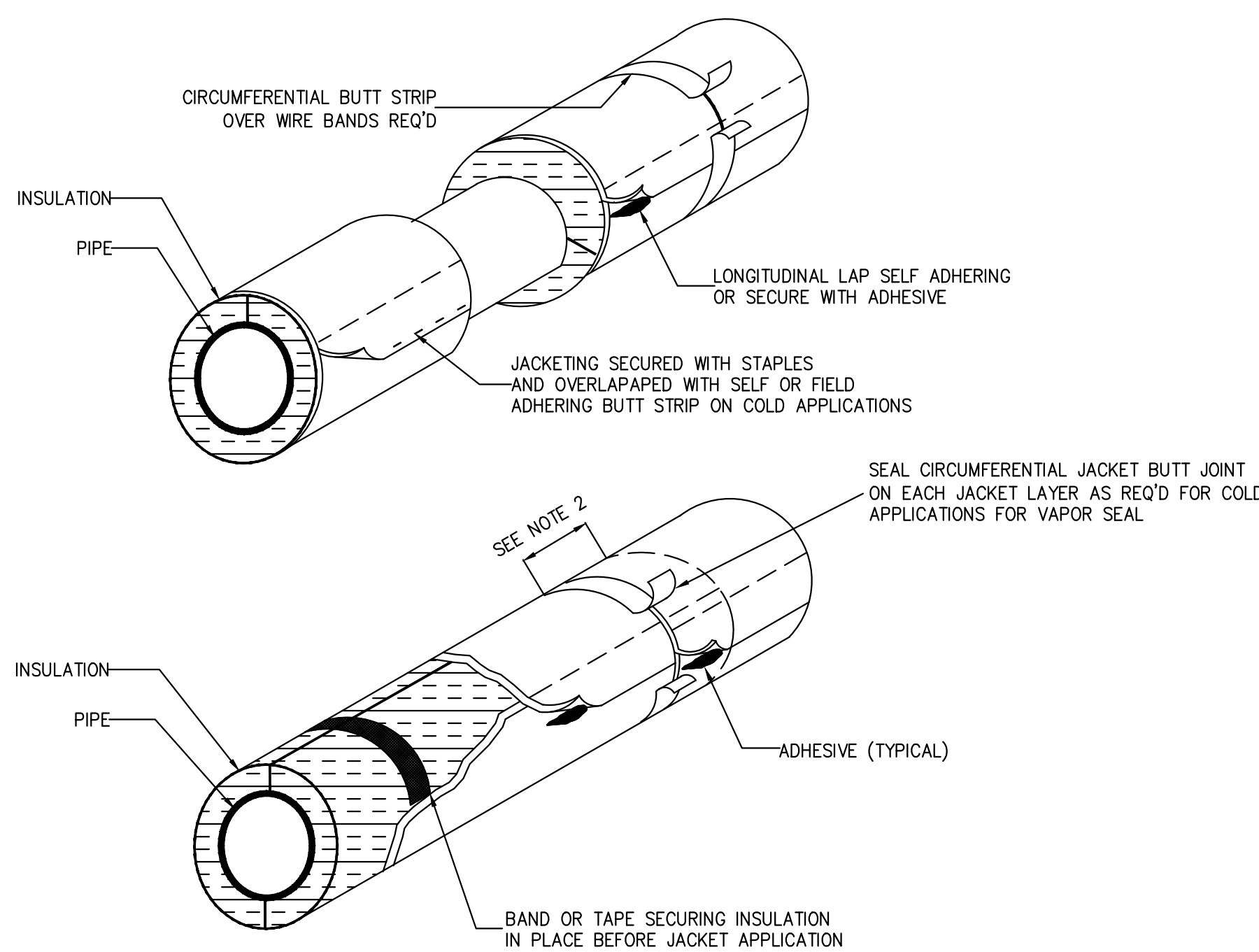
DESIGN DATA FOR C-CLAMP HANGER

Nominal Pipe Size	Minimum A Dimension inches	Hanger Takeout inches	Rod Diameter inches
1/2	3 1/2	-1 1/4	3/8
3/4	3 1/2	-1 1/4	3/8
1	3 1/2	-1 1/4	3/8
1 1/4	3 3/4	-1 1/2	3/8
1 1/2	4	-1 1/2	3/8
2	4 1/4	-1 3/4	3/8
2 1/2	5	-2 1/4	3/8
3	5 1/2	-2 1/2	3/8
4	6	-3	3/8



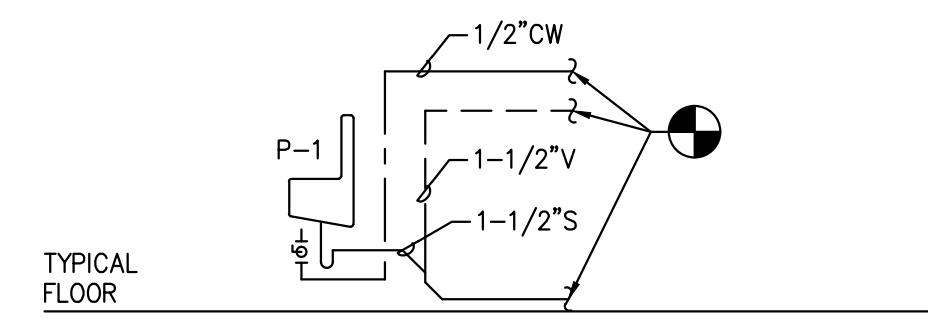
STANDARD C-CLAMP PIPE HANGER
SCALE: NONE

- Components:
1. C-Clamp
 2. Set Screw
 3. Lock Nut
 4. Hanger Rod
 5. Adjustable Hanger Ring
 6. Steel Beam or Bar Joist



- NOTES:
1. LONGITUDINAL JACKETING SEAMS POSITIONED AT 3 OR 9 O'CLOCK ONLY W/TOP LAP FACING DOWN FOR WEATHER PROOFING
 2. OVERLAP JACKETING A MIN OF 1-1/2"

FACTORY AND FIELD APPLIED NON-METALLIC PIPE JACKETING
SCALE: NONE



- NOTES:
1. WATER FOUNTAINS ON EACH FLOOR SHALL BE CONNECTED TO THE BUILDING'S EXISTING PLUMBING SYSTEMS AT THE LOCAL TOILET ROOMS.
 2. CONTRACTOR SHALL INSPECT SITE CONDITIONS AND DETERMINE FINAL TIE IN LOCATIONS AND BASE BID ACCORDINGLY. CONTRACTOR SHALL CORE DRILL FLOORS AND WALLS AS NEEDED.

RISER DIAGRAM
SCALE: NONE

PLUMBING FIXTURE CONNECTION SCHEDULE

MARK	P-1
FIXTURE	DRINKING FOUNTAIN
MANUFACTURER	ELKAY
CATALOG NUMBER	LZSBWSLP
MOUNTING	WALL
WASTE SIZE	3"
VENT SIZE	2"
COLD WATER SIZE	1/2"
HOT WATER SIZE	-
DRAINAGE FIXTURE UNITS (DFU)	0.5
SUPPLY FIXTURE UNITS (SFU)	0.5
ACCESSORIES AND REMARKS	EZH2O BOTTLE FILLING STATION & SINGLE ADA COOLER, FILTERED, 8GPH, BOTTLE FILLER SENSOR, ELECTRONIC FRONT & SIDE BUBBLER, VISUAL FILTER MONITOR, LAMINAR FLOW, REAL DRAIN, LIGHT GRAY GRANITE, HANDS FREE, VISUAL FILTER MONITOR, AUTOMATIC FILTER STATUS RESET, ANTIMICROBIAL.

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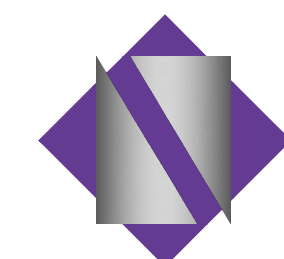
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PHONE: 212-312-3111 FAX: 212-312-3112
WWW.ATIARCHITECTS.COM

JOSEPH J. HENDERSON, PE
NJ License No. 360887



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ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0081 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

PLUMBING
DETAILS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY
05.31.17	100% SUBMISSION	MC	FM						JOB NO. 2141151
06.03.17	BUSINESS PROPOSALS	MC	FM						SHEET: _ OF: 160
11.1.17	ADDENDUM #3	MC	FM						DWG NO

P.801

GENERAL FIRE PROTECTION NOTES:

- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE INTERNATIONAL FIRE CODE (IFC), NFPA-13, NEW JERSEY UNIFORM CONSTRUCTION CODE, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
- PROVIDE A COMPLETE OPERABLE SYSTEM INSTALLED IN A WORKMANLIKE MANNER. OUTLINE DESCRIPTION AND EQUIPMENT DOES NOT LIMIT CONTRACTOR'S LIABILITY FOR THE INSTALLATION OF A COMPLETE OPERABLE SYSTEM.
- CONTRACTOR SHALL VISIT THE EXISTING UNION COUNTY COURTHOUSE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK PRIOR TO BID. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO. BID DOCUMENTS SHALL BE BASED ON ACTUAL FIELD CONDITIONS.
- CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
- CONTRACTOR SHALL NOT FASTEN ANY EQUIPMENT AND MATERIAL FROM DECKING. CONTRACTOR SHALL SUPPORT PIPING AND MATERIAL FROM BEAMS. IF NECESSARY, CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT STEEL ON METAL TO ATTACH TO BEAMS.
- FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATER-TIGHT.
- THE WORK INDICATED ON THESE DRAWINGS IS DIAGRAMMATIC AND IS INTENDED TO SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND DESIGN INTENT. CONTRACTOR MAY MAKE FIELD CHANGES TO THE DESIGN DOCUMENTS ONLY WHEN REQUESTING AND RECEIVING APPROVAL FROM THE ENGINEER. CONTRACTOR FIELD CHANGES SHALL NOT RESULT IN ANY ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL WARRANT ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
- CONTRACTOR SHALL PROVIDE PROTECTION FOR THE OWNER AND CONSTRUCTION WORKERS IN AND AROUND THE CONSTRUCTION AREA. ADEQUATE BARRIERS SHALL BE PROVIDED TO EXERCISE CONTROL OF SAFE INGRESS AND EGRESS OF PREMISES. FIRE EXITS SHALL AT NO TIME BE BLOCKED.
- ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
- CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
- WHERE INFORMATION IN DIFFERENT PARTS OF THE CONTRACT DOCUMENTS ARE INTERPRETED BY THE CONTRACTOR TO BE DUPLICATED, THE CONTRACTOR SHALL OBTAIN A WRITTEN APPROVAL OF HIS INTERPRETATION FROM THE ENGINEER BEFORE DELETING THE SCOPE OR WORK HE INTERPRETS AS BEING A DUPLICATION. IN THE ABSENCE OF SUCH WRITTEN APPROVAL, THE CONTRACTOR SHALL NOT EXCLUDE ANY ITEM SHOWN IN DIFFERENT PARTS OF THE CONTRACT. FOR EITHER CONTRACTOR'S INTERPRETATION OF DUPLICATION OR CONTRADICTION AS INDICATED ABOVE, THE OWNER'S DETERMINATION SHALL BE FINAL AND SHALL NOT ENTITLE THE CONTRACTOR TO ANY ADDITIONAL COMPENSATION.
- FURNISH AND INSTALL FIRE PROTECTION SYSTEMS AS REQUIRED BY NFPA-13 STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS NFPA-14 STANDARD FOR THE INSTALLATION OF A CLASS ONE STANDPIPE AND HOSE SYSTEMS, AND NFPA-25 STANDARD FOR THE INSPECTION, TESTING, AND MAINTENANCE OF WATER-BASE FIRE PROTECTION SYSTEMS.
- IN GENERAL THE SPRINKLER SYSTEM WILL CONSIST OF RELOCATING OVERHEAD PIPING, BRANCHES AND SPRINKLER HEADS AS NECESSARY TO MAKE A COMPLETE WORKING FIRE PROTECTION SYSTEM.
- SPRINKLER PIPING SHALL BE INSTALLED ABOVE LIGHTS AND SHALL BE AS HIGH AS POSSIBLE. ABOVE HUNG CEILING AND SOFFIT UNLESS OTHERWISE NOTED.
- THE SYSTEM SHALL BE HYDRAULICALLY CALCULATED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER WITH FIRE PROTECTION BACKGROUND AND REGISTERED IN THE STATE OF THE PROJECT. THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS AND HYDRAULIC CALCULATIONS TO BOTH THE ENGINEER AND THE AUTHORITY HAVING JURISDICTION.
- THE CONTRACTOR SHALL PROVIDE ALL NECESSARY FACILITIES, WATER OR COMPRESSED AIR, GAUGES, AND OTHER MEASURING DEVICES, PUMPS AND LABOR AS REQUIRED FOR TESTING.
- SPRINKLER HEADS IN FINISHED CEILING AREAS SHALL BE CONCEALED TYPE WITH WHITE COVER PLATE AND LOCATED IN THE CENTER OF TILES. ROOMS WITHOUT HUNG CEILING SHALL HAVE UPRIGHT HEADS UNLESS INDICATED OTHERWISE.
- SPRINKLERS AND FITTINGS SHALL BE UL LISTED AND FACTORY MUTUAL APPROVED.
- ALL PIPING SHALL BE LABELED IN COLOR CODE IN ACCORDANCE WITH APPLICABLE ANSI REQUIREMENTS. VALVE TAGS SHALL BE FURNISHED AND ATTACHED BY BRASS LINE CHAIN TO EACH VALVE. NUMBER AND LOCATIONS SHALL BE ACCURATELY MARKED ON THE OWNER'S SET OF RECORD DRAWINGS.
- THE SPRINKLER CONTRACTOR CAN USE THE MOST RECENT FIRE PUMP DATA TEST AS A REFERENCE ONLY. THE SPRINKLER CONTRACTOR SHALL PROVIDE THEIR OWN TEST DATA TO CONFIRM THE ADEQUACY OF THE EXISTING FIRE PUMP. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

FIRE PROTECTION PHASING NOTES:

- CONTRACTOR SHALL PROVIDE CONSTRUCTION PHASING AS REQUIRED IN ACCORDANCE WITH PHASING PLAN DEVELOPED BY THE CONSTRUCTION MANAGER AND ARCHITECT. REFER TO RELEVANT DOCUMENTATION REQUIRED AS PART OF THIS PROJECT APPROACH AND BASE BID ACCORDINGLY.
- PROVIDE ALL PENETRATIONS, SUPPORT, FIRE STOPPING, CONTROL VALVES, PIPING, FLOW AND TAMPER SWITCHES, RELAYS, BY-PASS ASSEMBLIES, ETC. AS REQUIRED TO ACHIEVE THE PROJECT PHASING. PROVIDE ALL CONTROLS AND FIRE ALARM INTERCONNECTION WORK REQUIRED FOR INDIVIDUAL COMPONENTS IN PHASE TO BE COMPLETED. WORK SHALL INCLUDE ANY TEMPORARY POWER AND CONTROL CIRCUITING
- COORDINATE ALL PHASING WITH OWNER'S CONSTRUCTION MANAGER, COUNTY FACILITIES GROUPS, AND ARCHITECT.
- PROJECT PHASING SHALL NOT DISTURB THE NORMAL OPERATIONS OF THE BUILDING. COORDINATE OUT OF HOURS WORK AS REQUIRED TO MAINTAIN OPERATIONS.
- ANY TESTING OR MUNICIPAL APPROVALS REQUIRED FOR PHASED WORK IN ORDER TO PROCEED TO THE NEXT PHASE OF WORK SHALL BE INCLUDED IN THE COST FOR PHASING.

FIRE PROTECTION SPECIFICATION NOTES:

- CONTRACTOR SHALL NOTE THAT THE PROJECT DESIGN ALSO INCLUDES A BOOK SPECIFICATION. REFER TO ALL DIVISION 0 & 1 SECTIONS FOR GENERAL REQUIREMENTS AND DIVISION 21 FOR FIRE PROTECTION TECHNICAL REQUIREMENTS.
- CONTRACTOR SHALL COORDINATE WITH OTHER SPECIFICATION SECTIONS THAT AFFECT THE FIRE PROTECTION SCOPE OF WORK AND BASE BID ACCORDINGLY.

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ASSOCIATED TECHNOLOGY INC.
MEMBERSHIP & TECHNICAL CONSULTING SERVICES
410 4th Ave. 7th Floor, Suite 702, Jersey City, NJ 07310
TEL: 201-529-3633 FAX: 201-529-3637
WWW.ATIENGINEERING.COM
CERTIFICATE OF AUTHORIZATION #240400000

JOSEPH J. HENDERSON, PE
NJ Lic. No. 36489



GENERAL NOTES:

- RELOCATED SPRINKLER HEADS SHALL BE REPLACED WITH NEW HEADS MATCHING THE DESIGN CRITERIA AND THE EXISTING HEADS.
- PIPING AND JOINT CONNECTION SHALL BE AS EXISTING.

SYSTEM DESIGN CRITERIA	
CLASSIFICATION	LIGHT HAZARD - OFFICES
DENSITY	0.1 GPM / 1500 SQ. FT. (NOTE 1)
TEMP. OF HEADS	ORDINARY TEMP.
PROTECTION AREA	225 SQ.FT. (HYDRAULICALLY CALCULATED)

NOTES:
1. SPRINKLER SPACING AND PROTECTION AREA SHALL BE PER THE REQUIREMENTS OF NFPA 13 AND AUTHORITIES HAVING JURISDICTION.

SYSTEM DESIGN CRITERIA BASEMENT	
CLASSIFICATION	ORDINARY HAZARD
DENSITY	0.15 GPM / 2500 SQ. FT. (NOTE 1)
TEMP. OF HEADS	ORDINARY TEMP.
PROTECTION AREA	130 SQ.FT. (HYDRAULICALLY CALCULATED)

NOTES:
1. SPRINKLER SPACING AND PROTECTION AREA SHALL BE PER THE REQUIREMENTS OF NFPA 13 AND AUTHORITIES HAVING JURISDICTION.

ABBREVIATIONS & SYMBOLS

SYMBOL	ABBREVIATION	DESCRIPTION
	SP	SPRINKLER PIPING
	P/SP	PREACTION PIPING
		ELECTRIC HEAT TRACED PIPING
	F	FIRE PIPING
	FSP	FIRE STANDPIPE PIPING
	DR	DRAIN PIPING
	CSP	COMBINED STANDPIPE
	OS&Y	OUTSIDE STEM & YOKE CONTROL
	FS	WATER FLOW SWITCH
		SIAMESE CONNECTION
		CAPPED END
	CV	CHECK VALVE
		SHUT OF CONTROL
	T/D	FIRE DEPARTMENT TEST AND DRAIN ASSEMBLY
	FDCN	2-1/2" FIRE DEPARTMENT CONTROL VALVE
	AV	ALARM CHECK VALVE
		LOW POINT AUXILIARY
		UPRIGHT TYPE SPRINKLER HEAD
		PENDANT TYPE SPRINKLER HEAD
		SIDEWALL SPRINKLER HEAD
		OPEN TYPE SPRINKLER HEAD
		SPRINKLER HEAD AND/OR PIPING BELOW DUCTWORK
	ABD	AUTOMATIC BALL DRIP
	BFP	BACK FLOW PREVENTER
	CVB	CURB VALVE IN BOX
	DCDA	DOUBLE CHECK DET. ASSEMBLY VALVE
	FCVA	FLOOR CONTROL VALVE ASSEMBLY
	FP	FIRE PUMP
	LH	LIGHT HAZARD
	OH-1	ORDINARY HAZARD GROUP 1
	OH-2	ORDINARY HAZARD GROUP 2
	MR	MOP RECEPTOR
	P.L	PROPERTY LINE
	RPZ	REDUCED PRESSURE ZONE BACK FLOW PREVENTER
	S.SK	SERVICE SINK
	TS	TAMPER SWITCH
	JP	JOCKEY PUMP

PROJECT:

UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

FIRE PROTECTION
GENERAL NOTES, SYMBOLS & ABBREVIATIONS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: _ OF: 160
11.1.17	ADDENDUM#3	MC	FM						DWG NO

FP.101



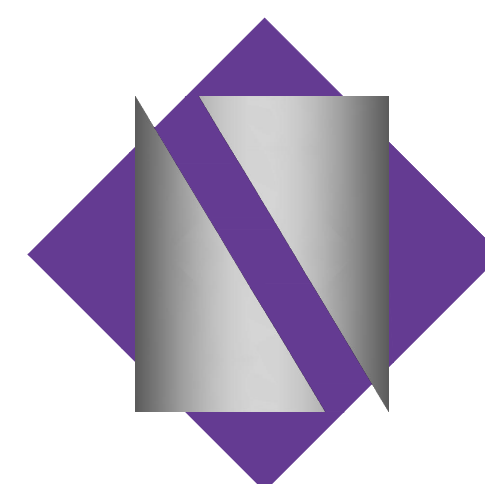
UNION COUNTY COURTHOUSE FIRE SUPPRESSION ROTUNDA BLDG.

2 BROAD STREET, ELIZABETH TOWN PLAZA
ELIZABETH, NJ 07202

TM
ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365
NEW JERSEY BOARD OF
PROFESSIONAL ENGINEERS AND
LAND SURVEYORS
CERTIFICATE OF AUTHORIZATION
24GA27987500



ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2860 FAX: 973-286-2864
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

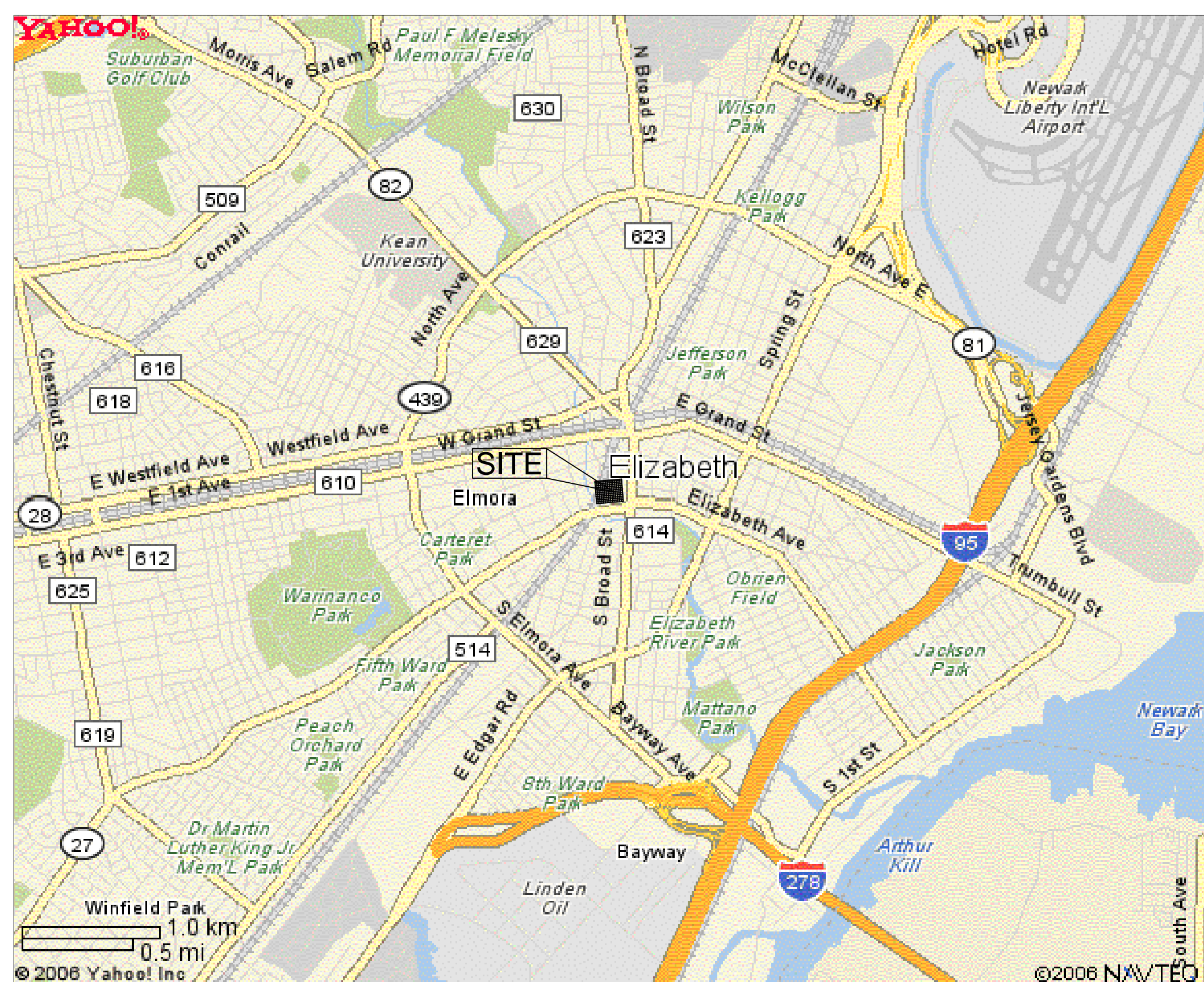


NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-379-1066 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

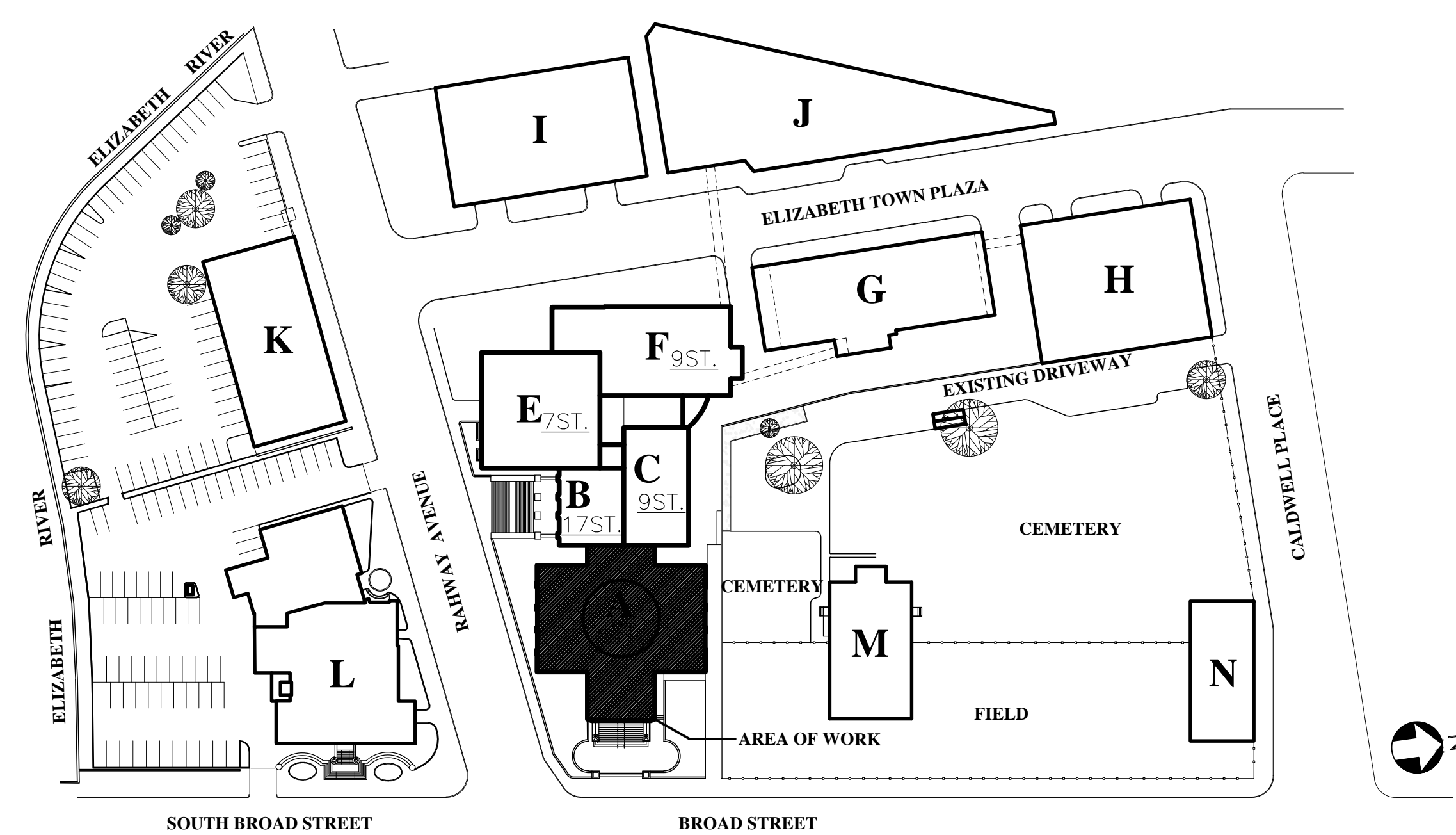
O'DONNELL & NACCARATO
STRUCTURAL ENGINEERS
1160 Route 22 West, 2nd Floor, Mountainside, New Jersey 07092
o 908.379.2911 d 908.379.2911 x210 m 908.377.0938
e ppanzarino@o-n.com w o-n.com

ISSUED FOR BID
SEPTEMBER 7, 2017

LOCATION MAP



SITE PLAN

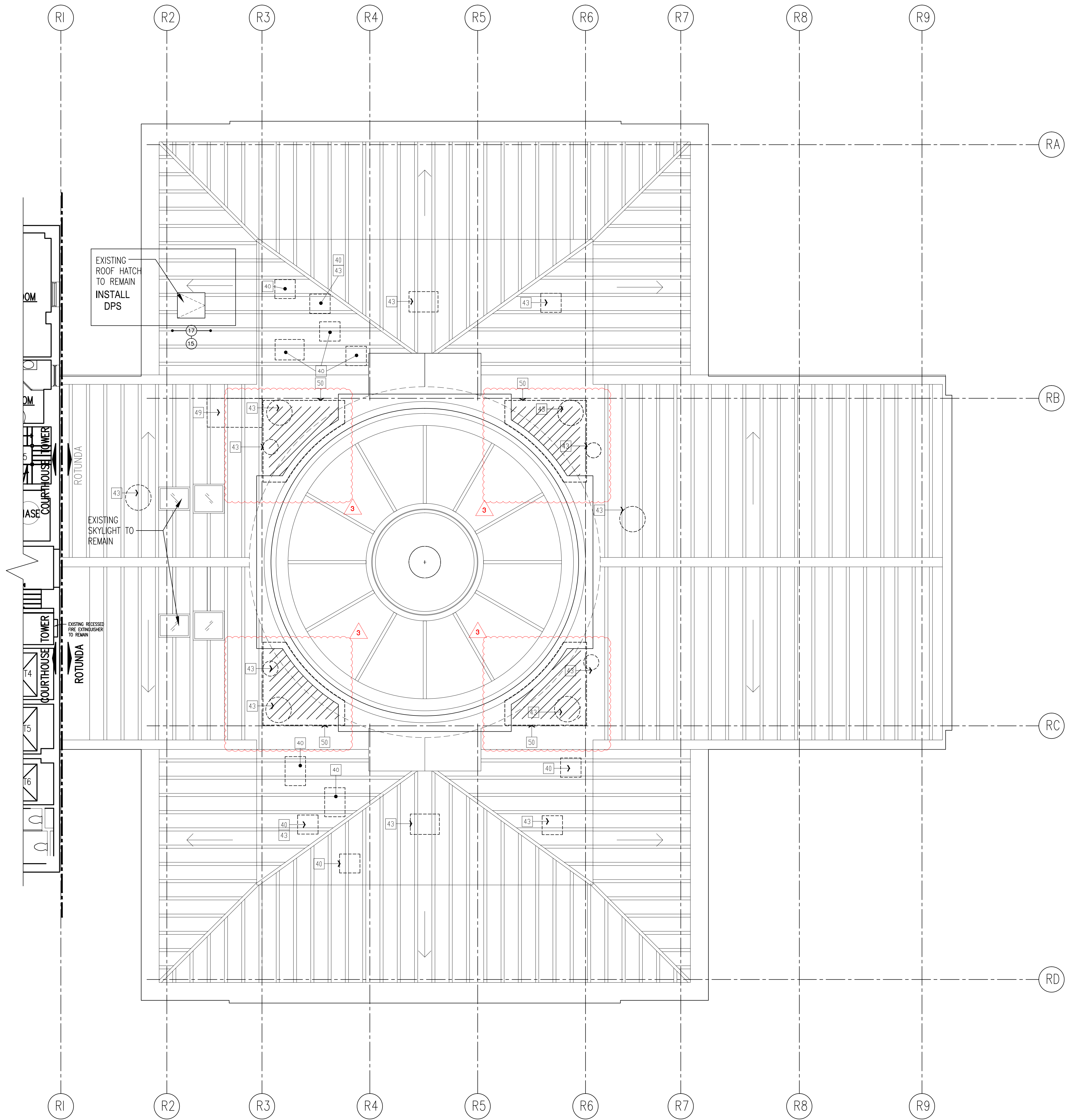


- LEGEND
- A. COURT HOUSE ROTUNDA
 - B. TOWER COURT HOUSE
 - C. OLD COURT HOUSE
 - D. OMITTED
 - E. OLD COURT HOUSE ANNEX
 - F. OLD COURT HOUSE JAIL
 - G. NEW COURT HOUSE ANNEX
 - H. PARKING GARAGE / DETENTION CENTER
 - I. ADMINISTRATION
 - J. RALPH ORISCHELLO CORRECTIONAL FACILITY
 - K. JUSTICE FACILITY
 - L. PUBLIC LIBRARY
 - M. FIRST PRESBYN. CHURCH
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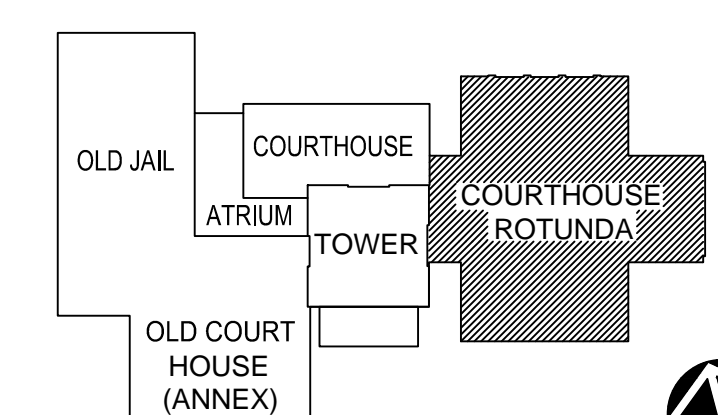




DEMOLITION KEYNOTES

- 1 REMOVE EXIST. DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXIST. WINDOW SYSTEM. PREPARE OPENING FOR INFILL / NEW INTAKE METAL LOUVER (SEE MECH'L PLAN)
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 10 EXIST. ROOF ACCESS LADDER TO REMAIN
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 SAW-CUT EXISTING SLAB FOR NEW DUCT CHASE, REFER TO MECHANICAL DWG.
- 2A RELOCATE EXISTING PIPING, AND ELECTRICAL WIRING TO NEW LOCATION REFER TO ELECTRICAL DRAWINGS.
- 15 EXIST. COLUMN TO REMAIN. CONTRACTOR SHALL USE EXTREME CARE NEAR STRUCTURE.
- 16 EXIST STAIR, RAILS AND GUARDS TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE LIGHTING FIXTURES @ DESIGNATED AREAS, SEE RCP AND ELECTRICAL DWGS.
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECT./MECH./PLUMBING UNIT TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 22 EXISTING STRUCTURE TO REMAIN, TYP. UNLESS OTHERWISE NOTED.
- 23 EXISTING WALL SYSTEM TO REMAIN, TYP.
- 24 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWG'S
- 32 EXISTING DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 PARTIAL WALL TO BE REMOVED & TO RECEIVE NEW WALL ASSEMBLY.
- 36 REMOVE EXISTING WOOD RAMP
- 38 EXISTING MECH./ ELECT./ PLUMBING EQUIPMENT TO BE REMOVED OR RELOCATED. REFER TO MEP DWG'S FOR LOCATION.
- 39 REPLACE EXISTING DOUBLE DOOR AND ITS ASSEMBLY, PREPARE TO RECEIVE NEW DOOR & WALL INFILL.
- 40 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWGS. INFILL, PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF.
- 41 RELOCATE EXISTING PIPE OBSTRUCTING EGRESS
- 42 REMOVE EXISTING EXTERIOR WINDOW, PREPARE TO RECEIVE NEW EXIT DOOR.
- 43 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
- 44 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 45 REMOVE EXISTING STEEL STAIR INSIDE EXISTING CHASE.
- 46 SAW CUT PLASTER CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE). RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH PLASTER TO MATCH EXISTING.
- 47 REMOVE PLASTER CEILING TO ALLOW INSTALLATION OF SPRINKLER HEADS FROM ATTIC SPACE ABOVE, TYP.
- 48 REPAIR DAMAGE CEILING & WALL FINISH TO MATCH EXISTING
- 49 REPAIR EXISTING ROOFING SYSTEM WHERE LEAKAGE IS COMING FROM ROOFING TO MATCH EXISTING.
- 50 REMOVE EXISTING ROOFING ASSEMBLY. (EXISTING SKYLIGHT FRAMING AND MEMBRANE ROOFING).

KEYPLAN



1 ROOF DEMOLITION PLAN
D.105 1/8" = 1'-0"

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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

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PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ROOF DEMOLITION PLAN

SUBMISSIONS

DATE	DESCRIPTION	BY	CHKD
09.25.15	95% CD SUBMIT	KD	FM
10.30.15	95% CD UPDATES	KD	FM
05.31.17	100% CD SUBMIT	MMC	FJM
08.30.17	ISSUED FOR BID	MC	FM

REVISIONS

DATE	DESCRIPTION	BY	CHKD

DATE	SCALE
05-31-17	AS SHOWN
	DRWN BY WTJ
	CHKD BY NJN
	JOB NO 2141152
	SHEET: 17 OF: 118
	DWG. NO

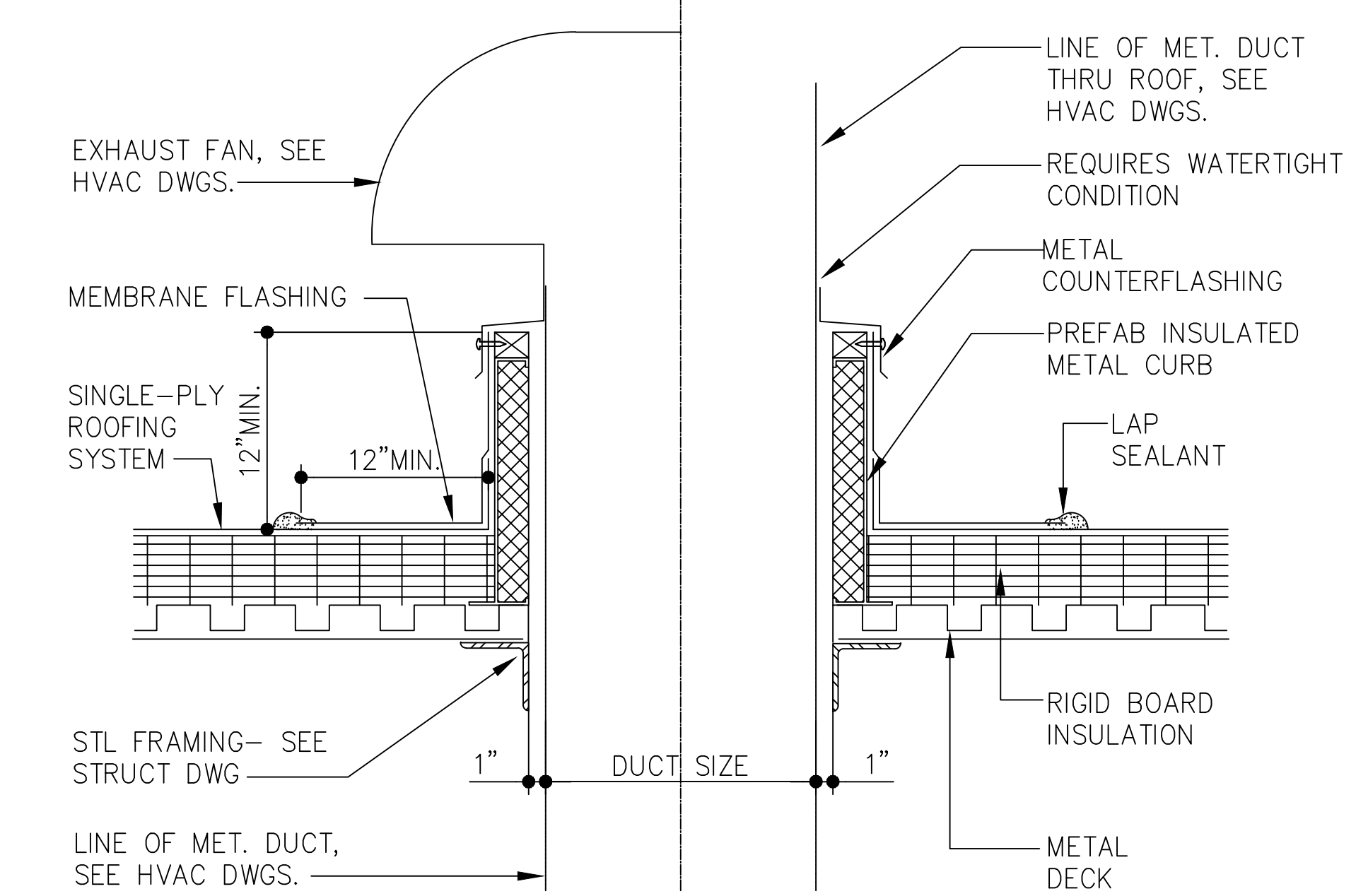
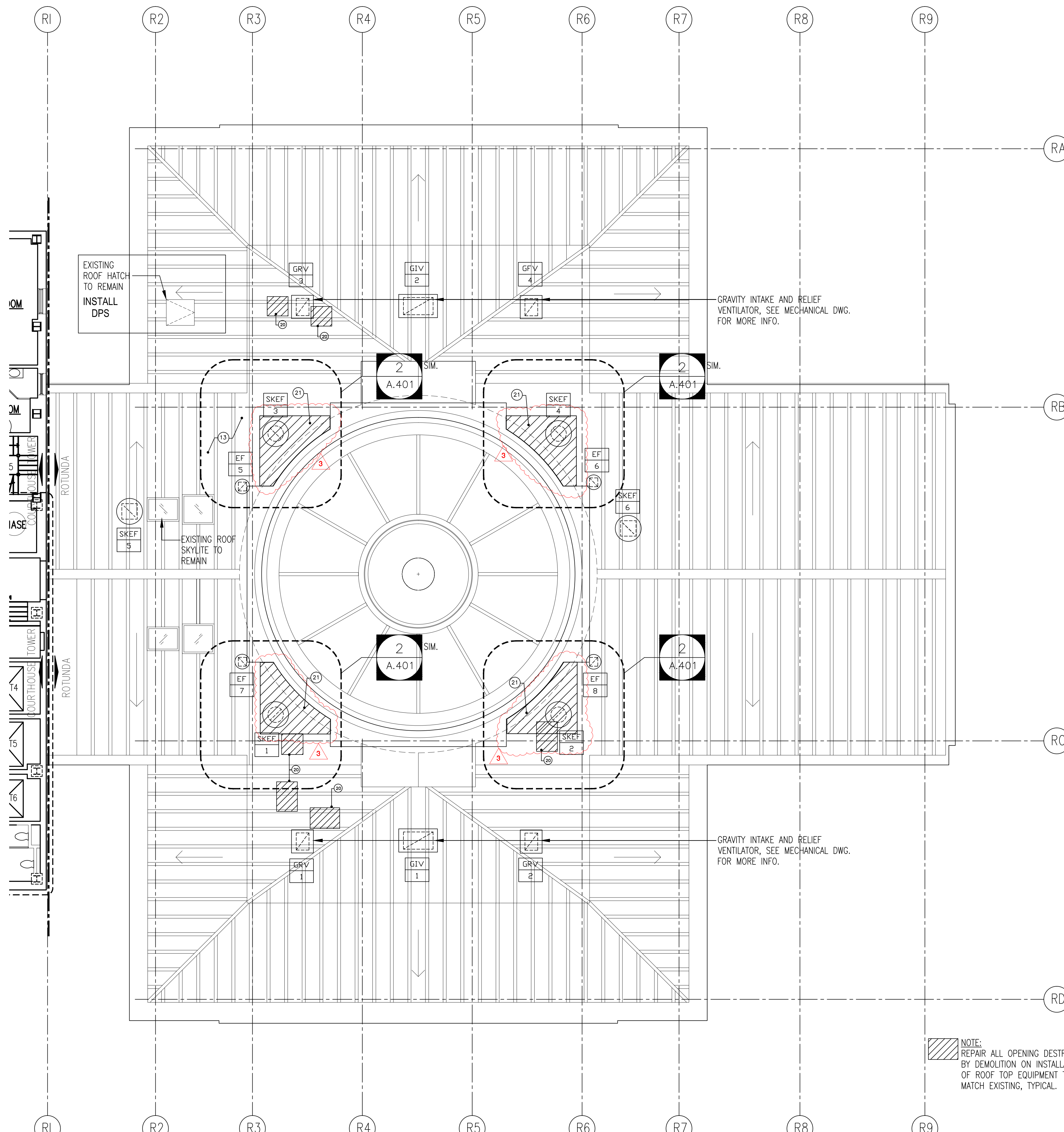
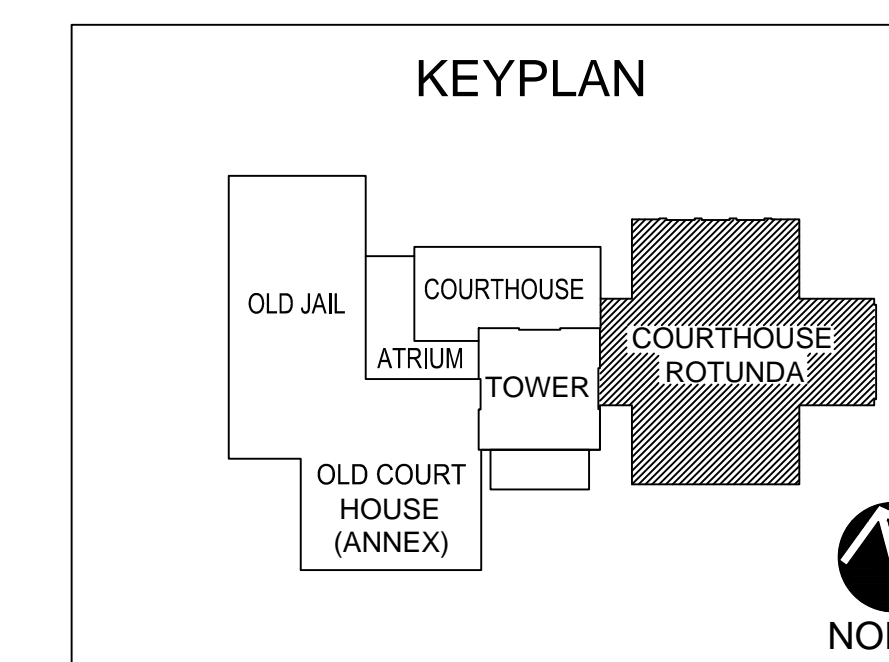
D.105

CONSTRUCTION KEYNOTES

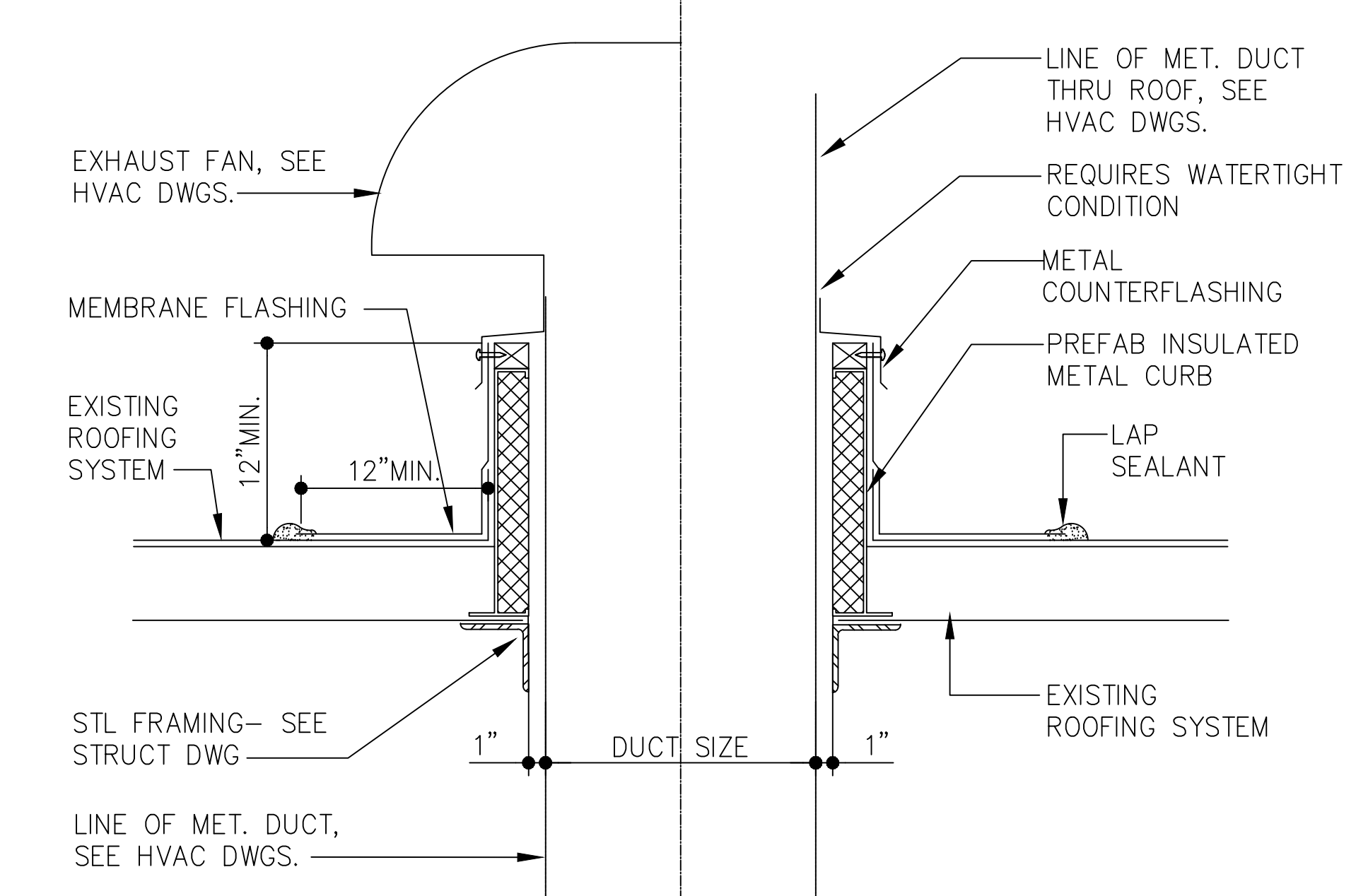
- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENINGS IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS. REFER TO DWGS. A103, A301 & M400G.
- 9 NEW MECH'L. DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.
- 16 CLIENT TO RELOCATE ALL STORAGE FILES & SHELVING PRIOR TO START OF CONSTRUCTION.
- 17 OVERALL WINDOW SIZE IS 36"x60". MECHANICAL CLEARANCE FOR L-1&L-2 IS 30"x40". PROVIDE BLANK PLATE AROUND NEW LOUVER.
- 18 REMOVE SOFFIT FOR INSTALLATION SPRINKLERS & MECHANICAL DUCTS.
- 19 NEW OPENING IN WALL FOR L-1 LOUVER, 36"x24". REFER TO M400G.
- 20 REPAIR EXISTING ROOFING SYSTEM WHERE LEAKAGE IS OCCURRING. NEW ROOFING TO MATCH EXISTING.
- 21 PROVIDE NEW ROOF ASSEMBLY (ROOF FRAMING JOIST WITH METAL DECK & METAL PANEL TO BE ENGINEERED BY ROOF MANUFACTURER).

LEGEND	
	ROOM ID SIGN
	ELEVATOR ID SIGN
	RESTROOM ID SIGN
	STAIR/EXIT ID SIGN
	AREA OF REFUGE ID SIGN
	CHASE ACCESS ID SIGN

SYMBOLS	
	CONSTRUCTION KEYNOTES REFER TO DWG.
	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
	SECURITY VIDEO CAMERA
	CARD READER
	CARD READER AND KEY PAD
	MAGNETIC CARD HOLDER
	DOOR POSITIONS SWITCH



2 EXHAUST FAN DETAIL @ NEW ROOFING
A.105 SCALE: 1'-0"=1'-0"



3 EXHAUST FAN DETAIL @ EXIST. ROOFING
A.105 SCALE: 1'-0"=1'-0"

NOTE:
REPAIR ALL OPENING DESTROYED BY DEMOLITION ON INSTALLATION OF ROOF TOP EQUIPMENT TO MATCH EXISTING, TYPICAL.

1 ROOF CONSTRUCTION PLAN
A.105 1/8" = 1'-0"

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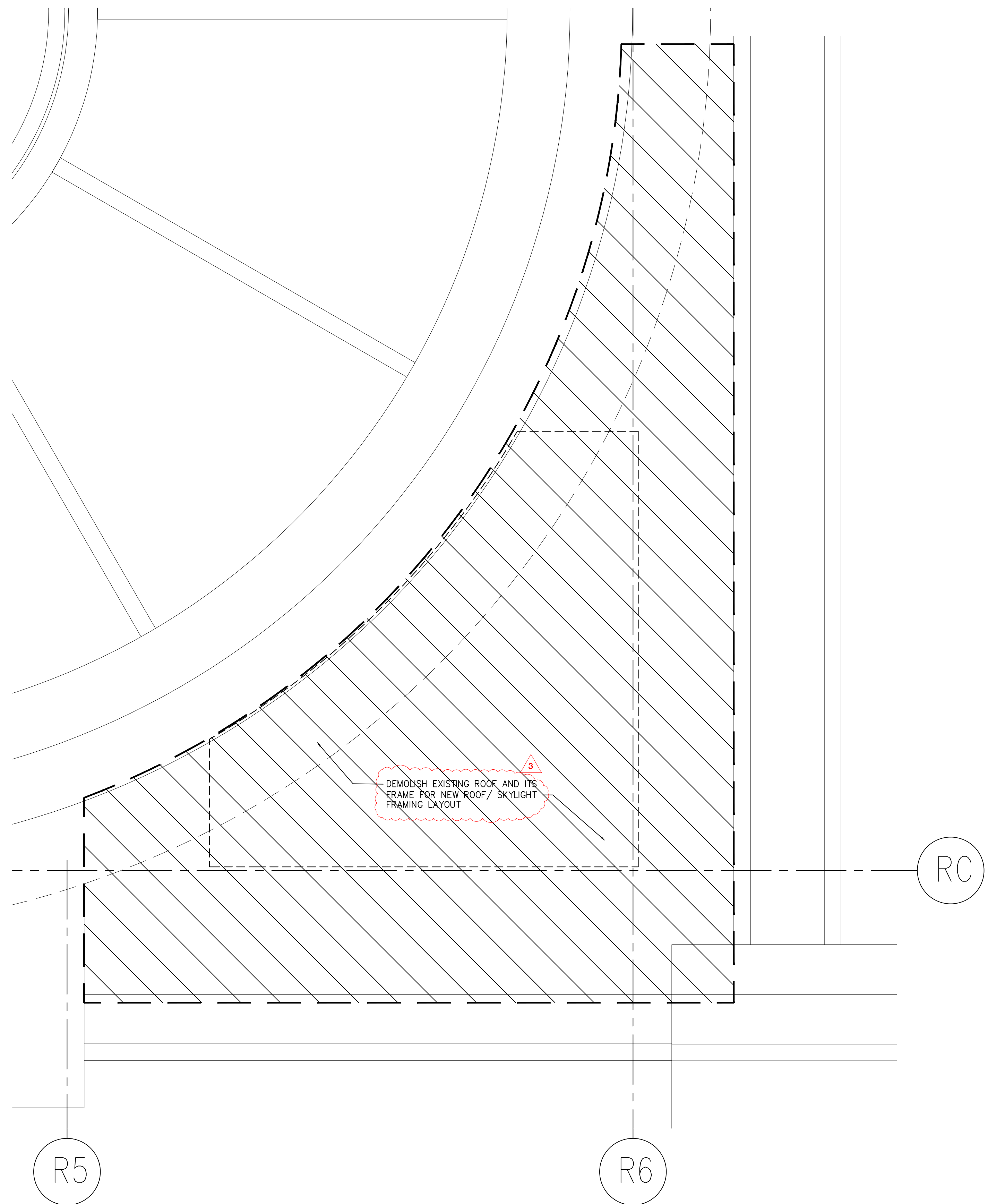
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-379-0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:
UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

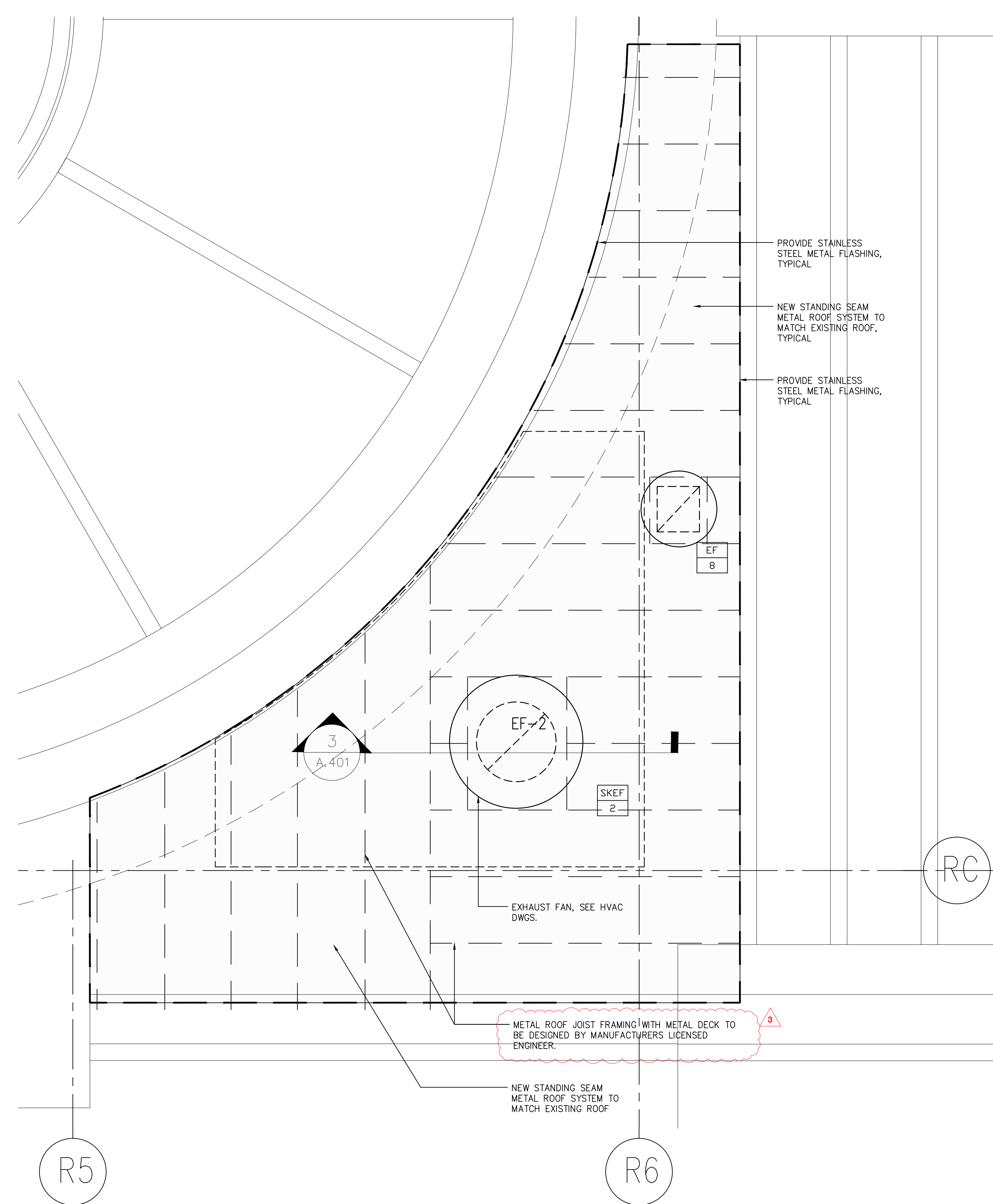
SHEET CONTENTS:
ROOF CONSTRUCTION PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	24 OF: 118
								DWG. NO	

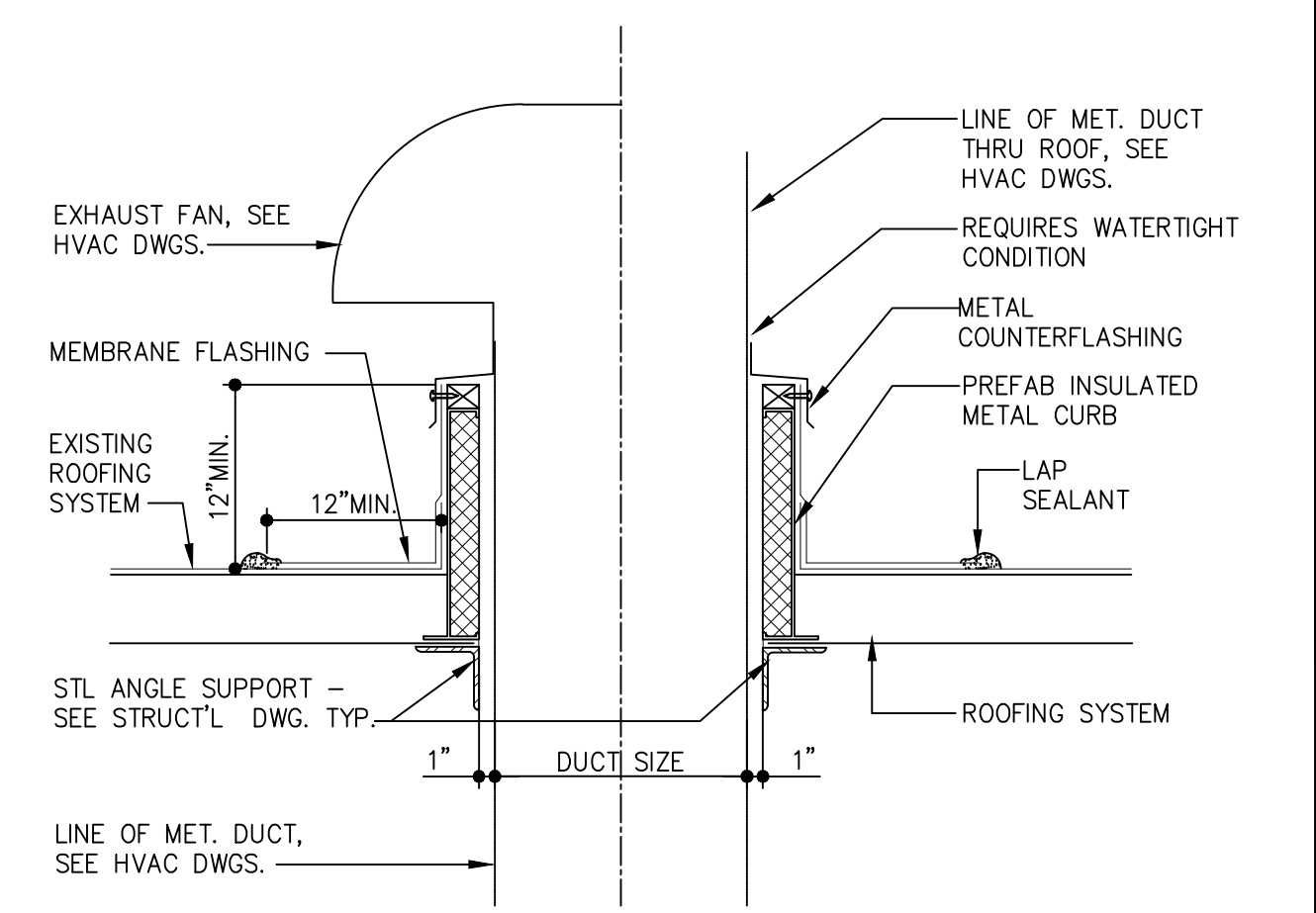
A.105



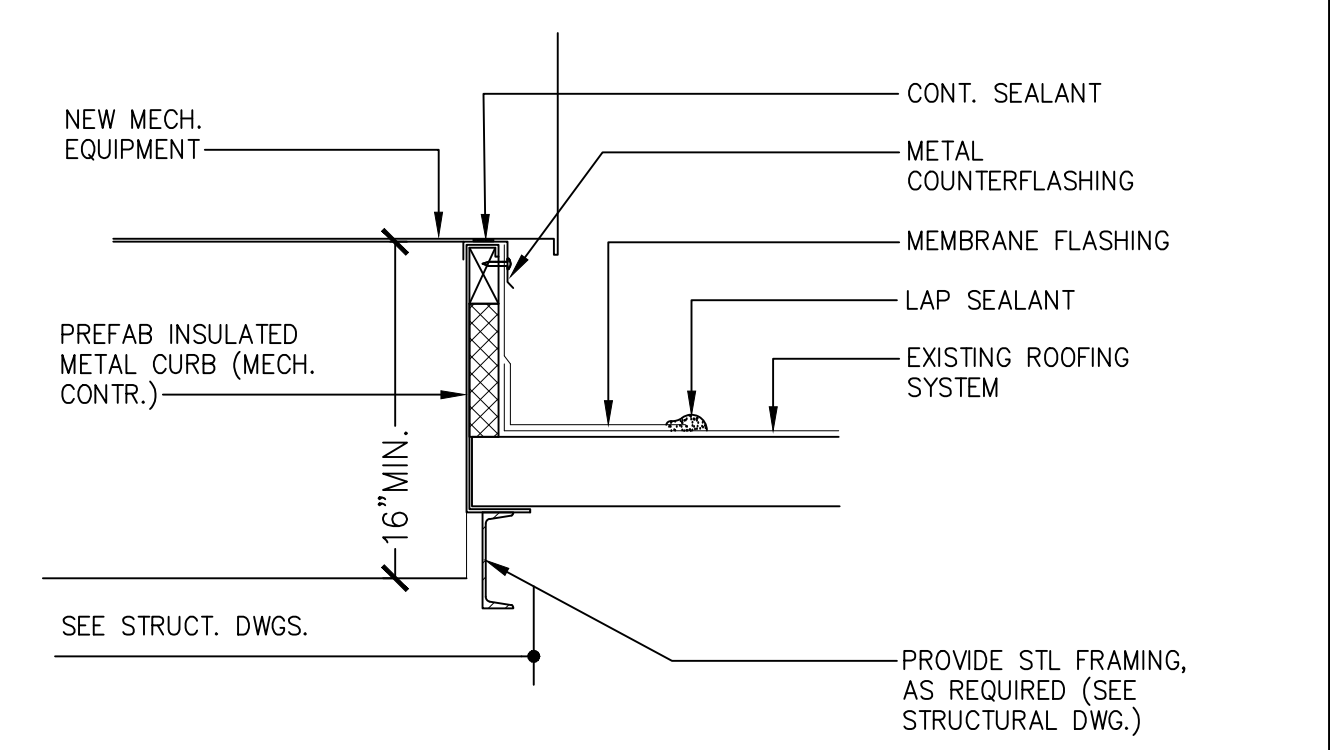
1 PARTIAL ROOF DEMO PLAN
A.401 1/2" = 1'-0"



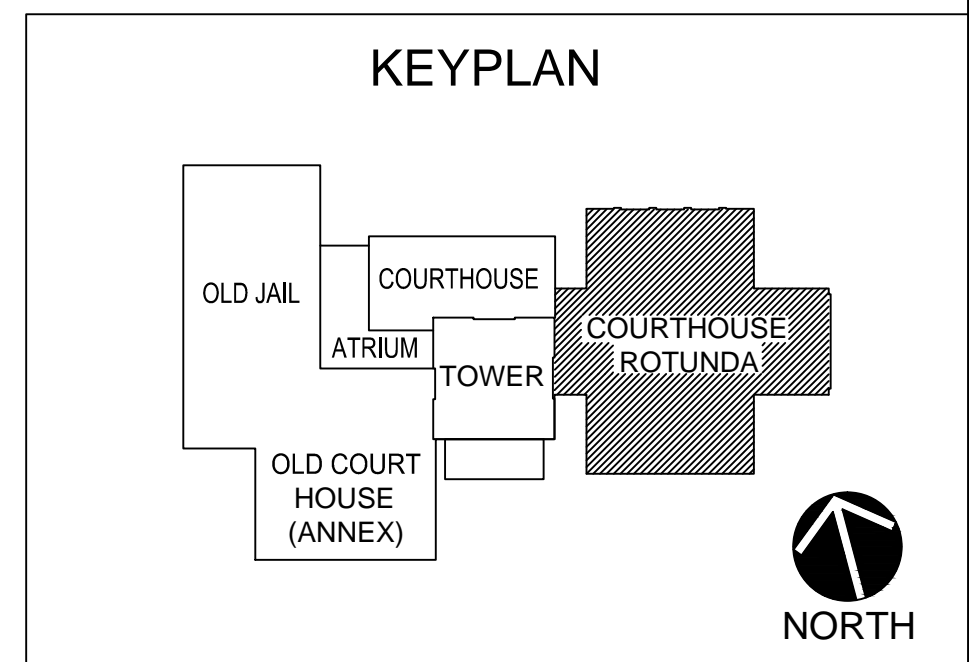
2 PARTIAL ROOF CONSTRUCTION PLAN
A.401 1/2" = 1'-0"



SEE ROOF PLAN FOR LOCATIONS OF EQUIPMENTS
3 TYP. ROOF OPENING DETAIL
A.401 SCALE: 1"=1'-0"



4 ROOF OPENING DETAIL
A.401 SCALE: 1"=1'-0"



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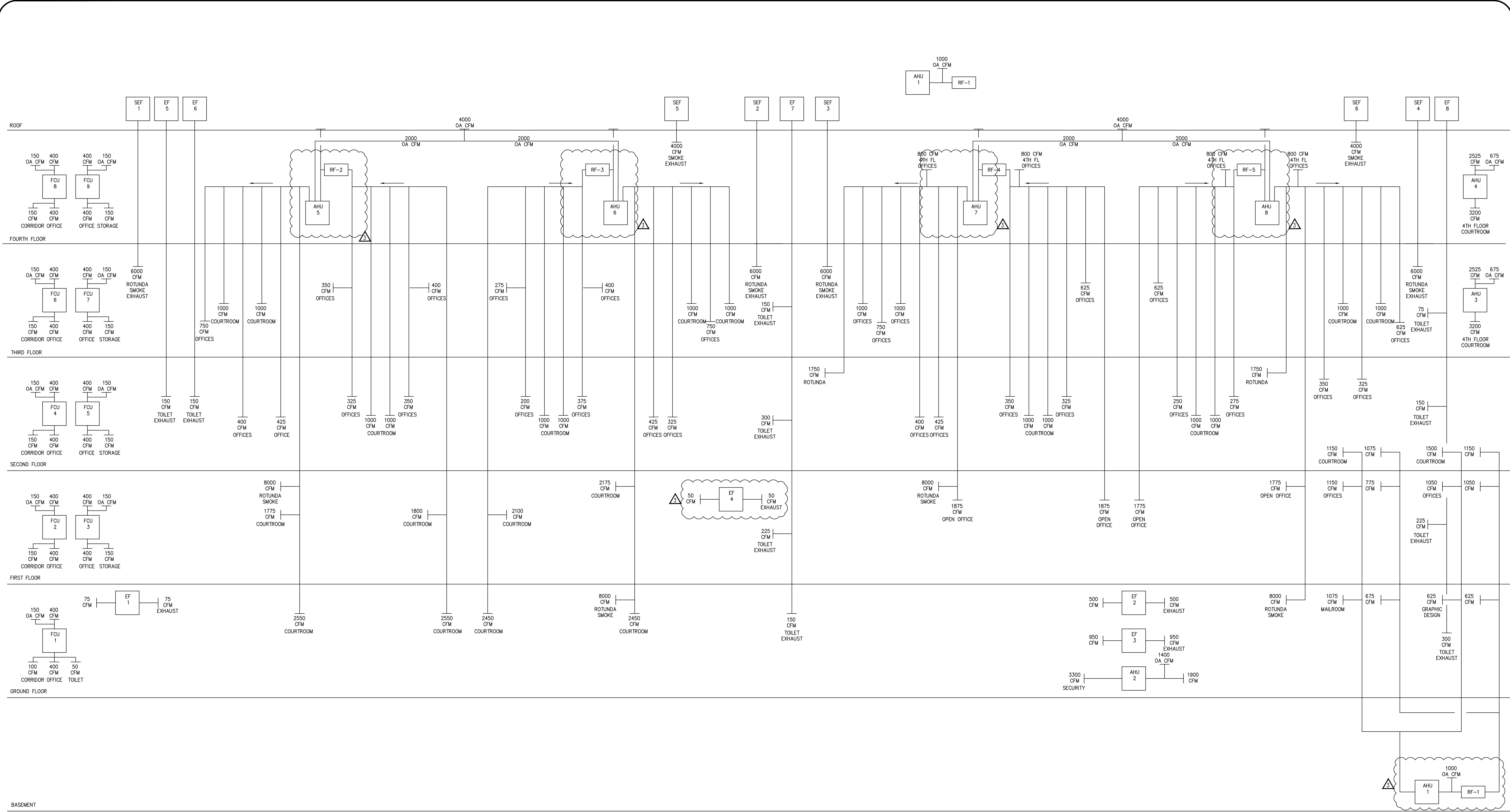


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
PARTIAL ROOF DETAILS

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	26 OF: 118
								DWG. NO	

A.401



AIR FLOW DIAGRAM
NOT TO SCALE

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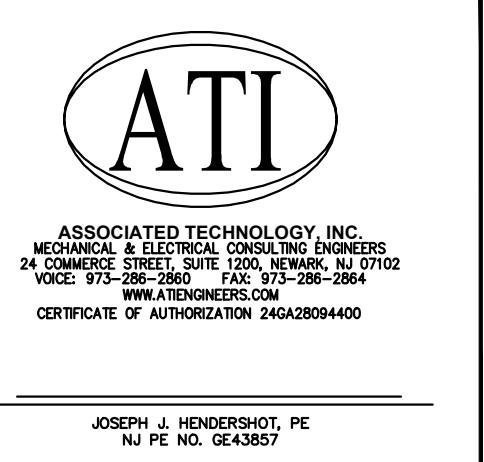
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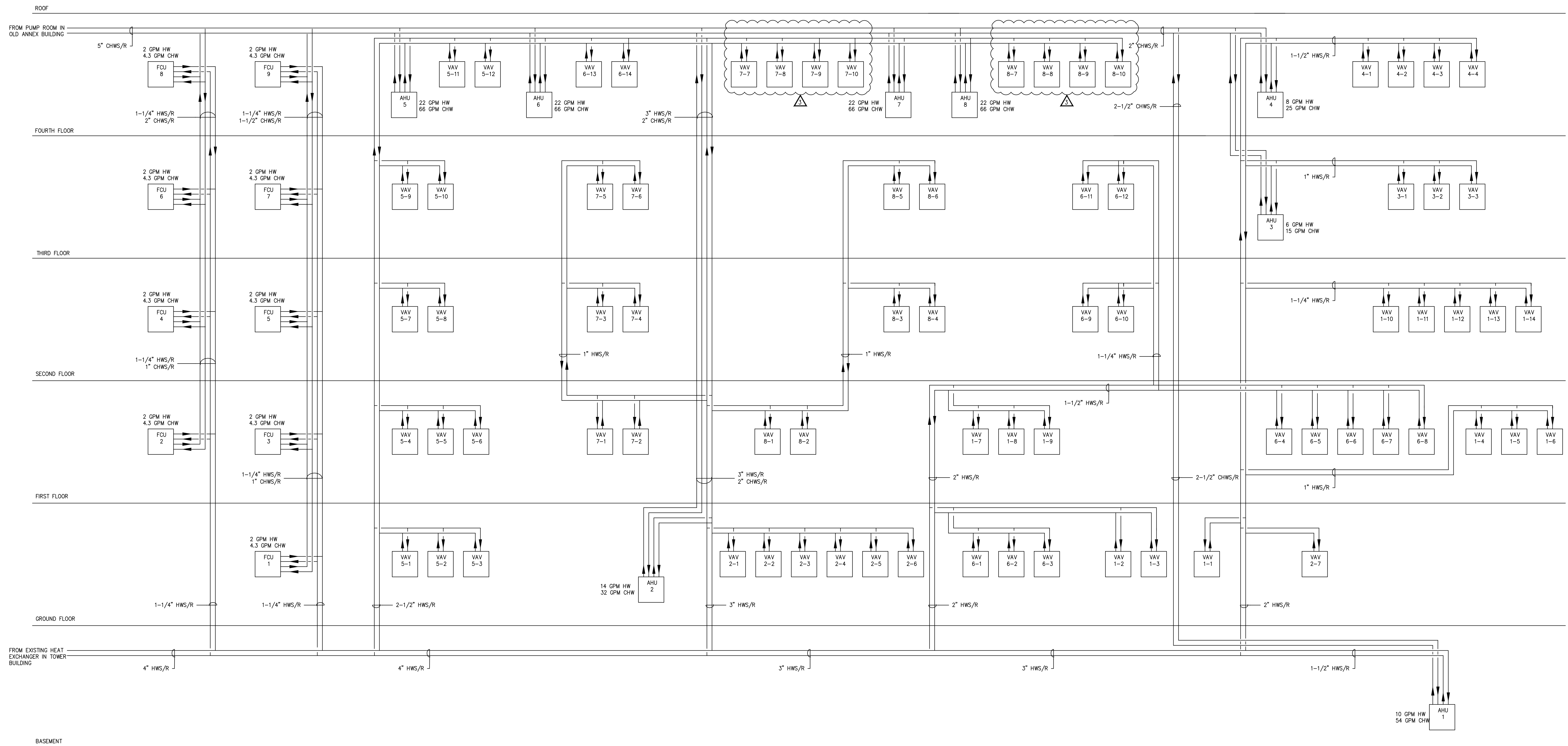
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PROJECT: **UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL
AIR FLOW DIAGRAM**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
11.1.17	ADDENDUM #3	MC	FM					JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	M.301



WATER FLOW DIAGRAM
NOT TO SCALE

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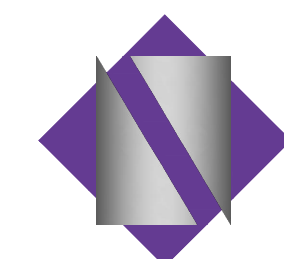
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ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL ENGINEERING
24 CHARLES STREET, SUITE 200, NEWARK, NJ 07102
PHONE: 973-279-2888 FAX: 973-279-2884
WWW.ATITECHNICAL.COM

JOSEPH J. HENDERSON, P.E.
NJ PE NO. 363857



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-379-0088 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

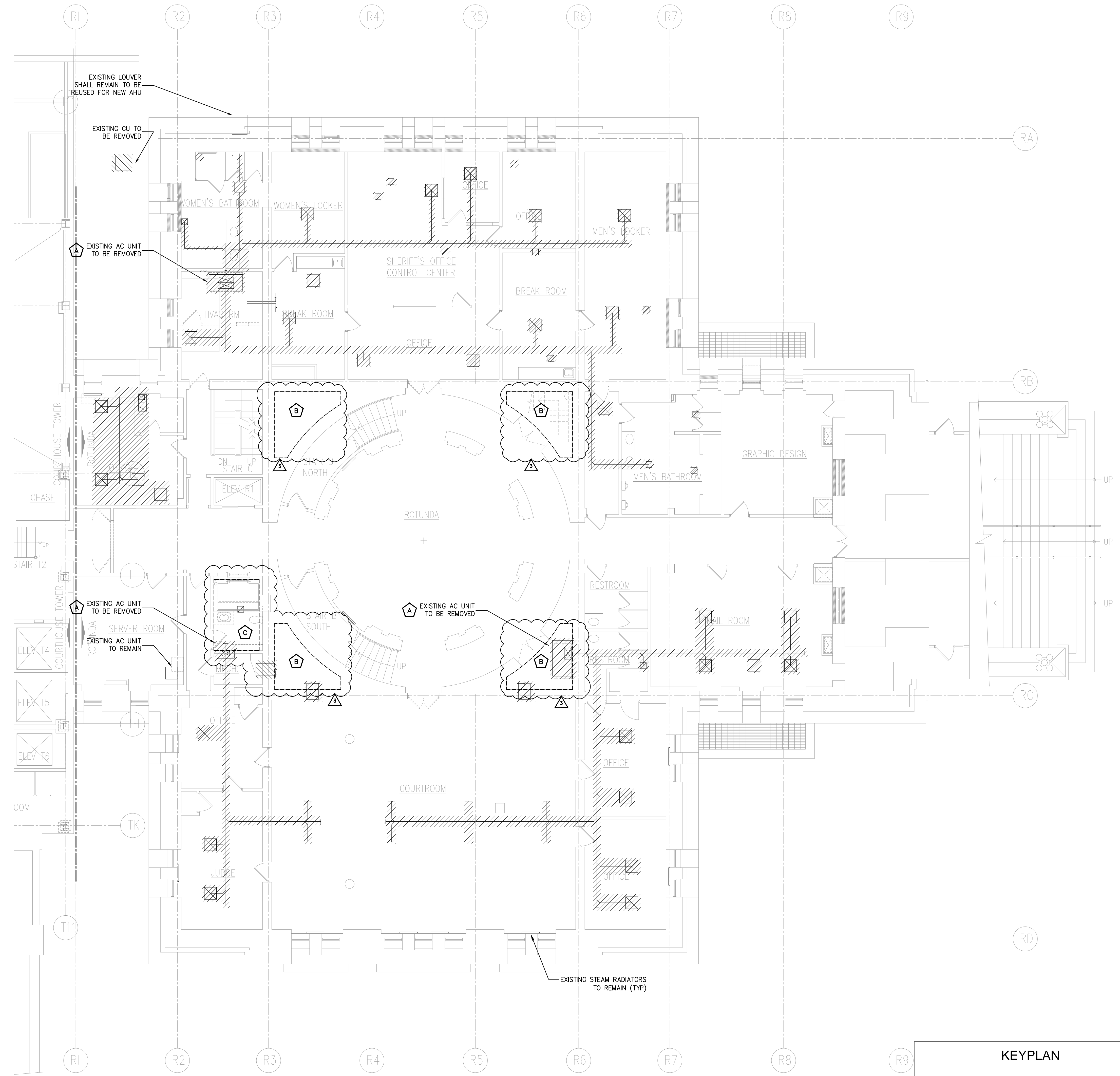
UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL
WATER FLOW DIAGRAM

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
11.1.17	ADDENDUM #3	MC	FM					JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

M.302

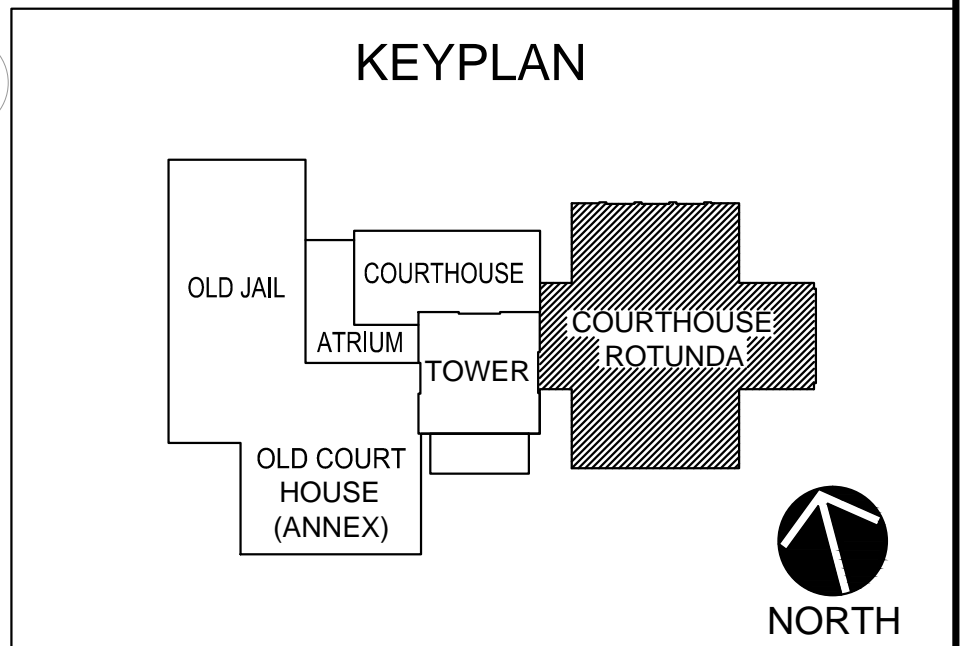


KEYED DEMOLITION WORK NOTES:

- A** REMOVE EXISTING HVAC UNIT ALONG WITH REMOTE OUTDOOR CONDENSING UNIT, PIPING, CONTROLS, SUPPLY/RETURN DUCTWORK, ETC. COORDINATE WITH ELECTRICAL CONTRACTOR FOR REMOVAL OF POWER WIRING, DISCONNECTS, ETC.
- B** CONTRACTOR TO RELOCATE EXISTING MECHANICAL DUCTWORK, PIPING AND CONTROLS AS REQUIRE TO FACILITATE NEW EQUIPMENT INSTALLATION AND ARCHITECTURAL RENOVATIONS.
- C** CONTRACTOR SHALL REMOVE EXISTING MECHANICAL SYSTEMS BACK TO WORK BOUNDARY TO PREPARE FOR PROPOSED ARCHITECTURAL RENOVATIONS TO ELEVATOR AND RESTROOMS.

DRAWING NOTES:

1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.



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NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

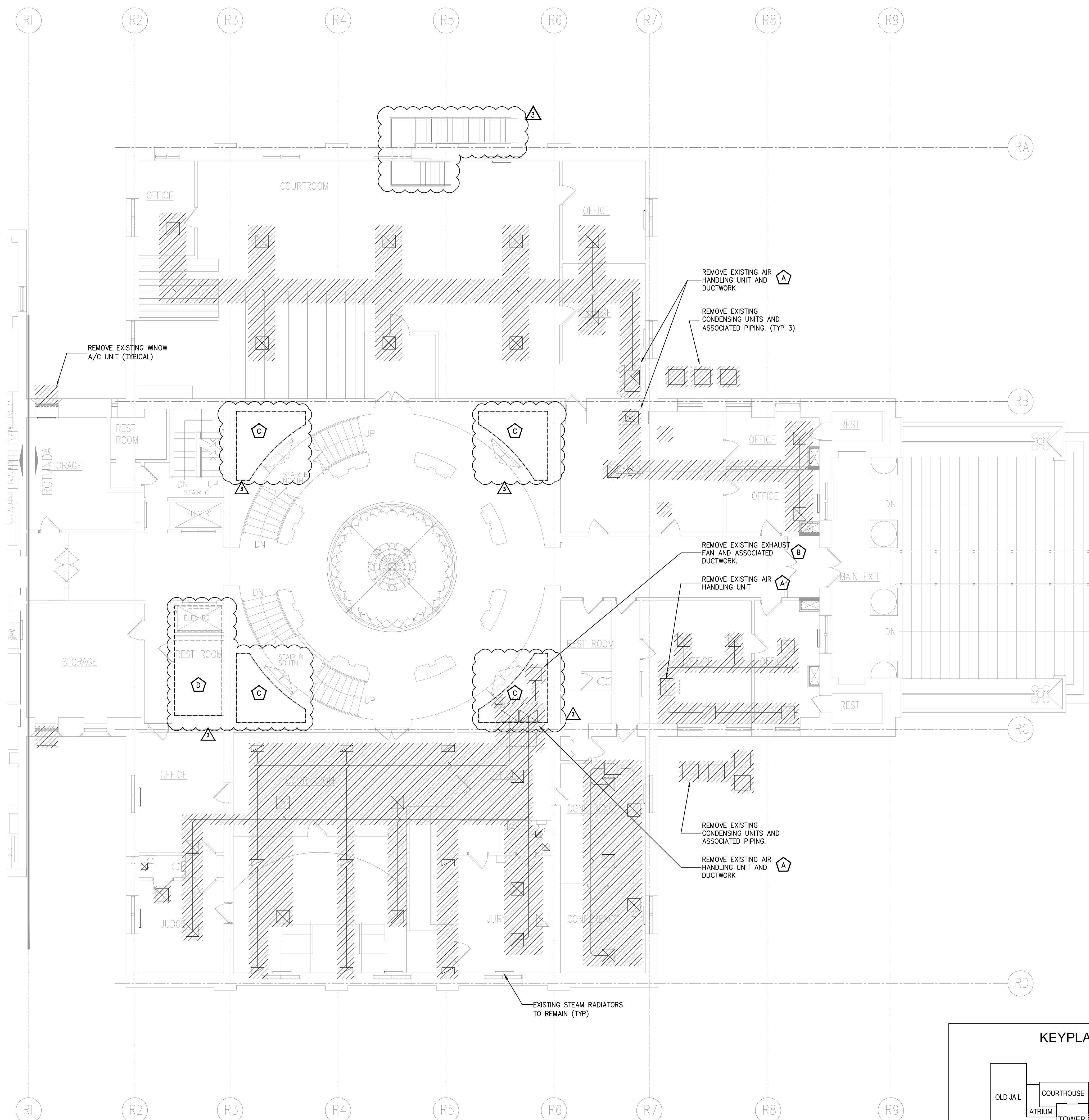


PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
MECHANICAL - DEMOLITION PLAN GROUND FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
11.1.17	ADDENDUM #3	MC	FM					JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

DM.400G

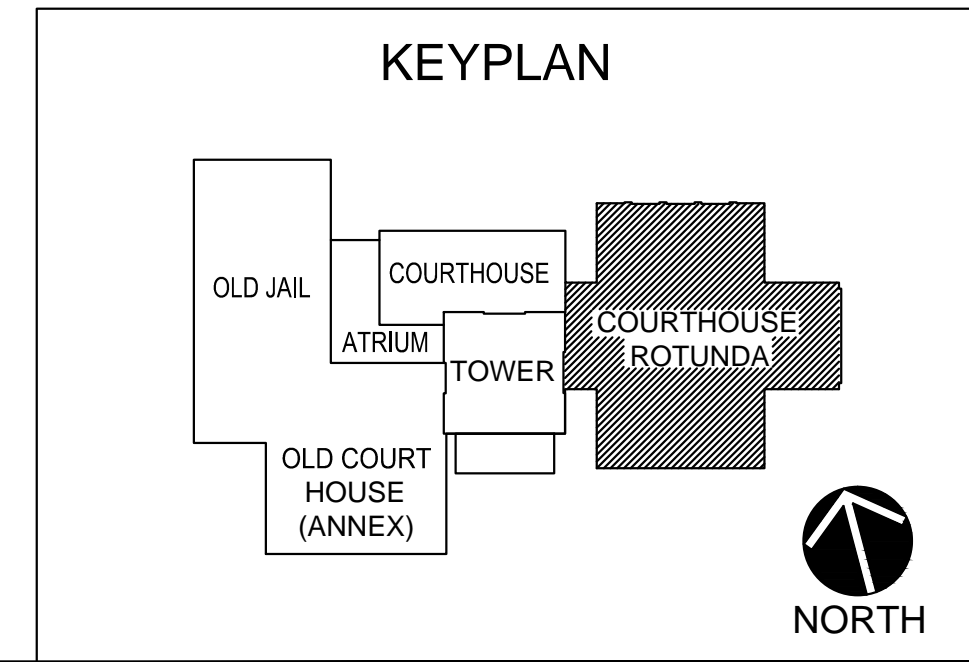


KEYED DEMOLITION WORK NOTES:

- A** REMOVE EXISTING HVAC UNIT ALONG WITH REMOTE OUTDOOR CONDENSING UNIT, PIPING, CONTROLS, SUPPLY/RETURN DUCTWORK, ETC. COORDINATE WITH ELECTRICAL CONTRACTOR FOR REMOVAL OF POWER WIRING, DISCONNECTS, ETC.
- B** REMOVE EXHAUST EXHAUST FAN AND DUCTWORK. ROOF OPENING SHALL BE REPAIRED.
- C** CONTRACTOR TO RELOCATE EXISTING MECHANICAL DUCTWORK, PIPING AND CONTROLS AS REQUIRE TO FACILITATE NEW EQUIPMENT INSTALLATION AND ARCHITECTURAL RENOVATIONS.
- D** CONTRACTOR SHALL REMOVE EXISTING MECHANICAL SYSTEMS BACK TO WORK BOUNDARY TO PREPARE FOR PROPOSED ARCHITECTURAL RENOVATIONS TO ELEVATOR AND RESTROOMS.

DRAWING NOTES:

- 1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.



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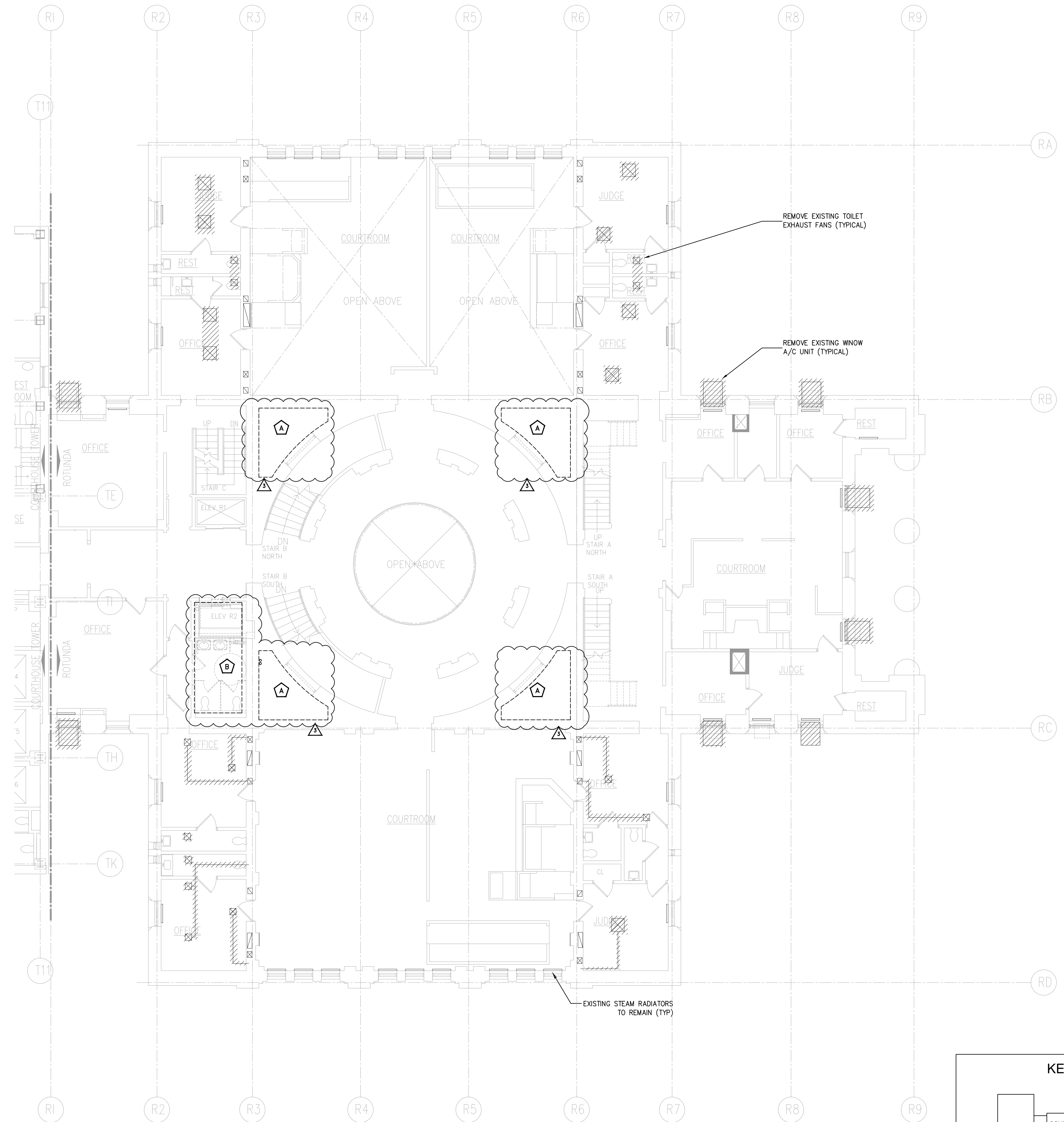
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PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
MECHANICAL - DEMOLITION PLAN FIRST FLOOR

SUBMISSIONS					REVISIONS					DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD		DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"	
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY	RB	
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY	NJN	
11.17	ADDENDUM #3	MC	FM						JOB NO	2141152	
									SHEET:	_ OF:	
									DWG. NO	DM.401	

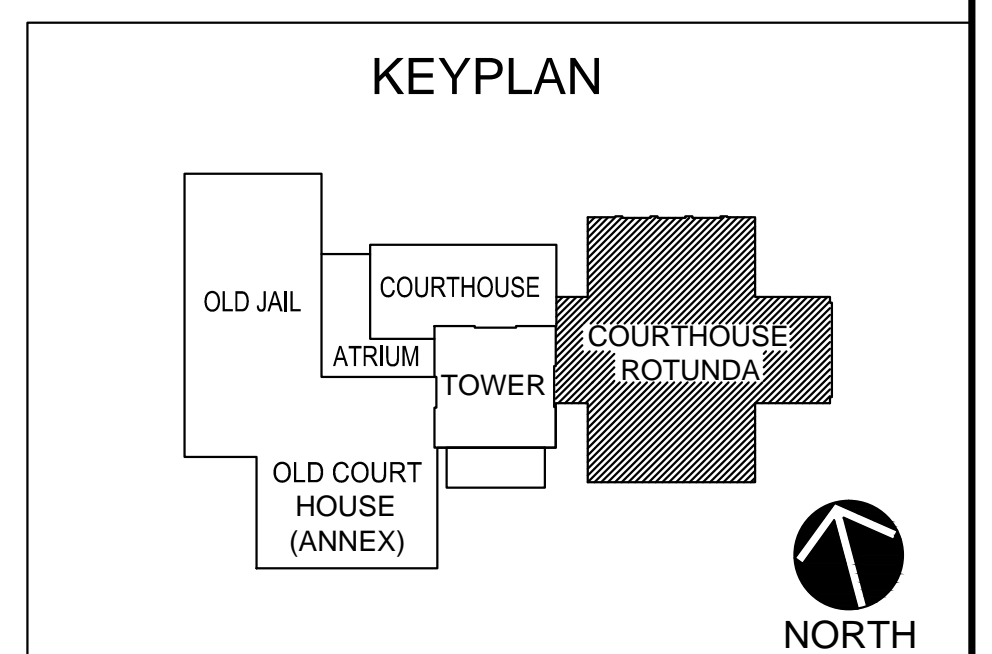


KEYED DEMOLITION WORK NOTES:

- A** CONTRACTOR TO RELOCATE EXISTING MECHANICAL DUCTWORK, PIPING AND CONTROLS AS REQUIRE TO FACILITATE NEW EQUIPMENT INSTALLATION AND ARCHITECTURAL RENOVATIONS.
- B** CONTRACTOR SHALL REMOVE EXISTING MECHANICAL SYSTEMS BACK TO WORK BOUNDARY TO PREPARE FOR PROPOSED ARCHITECTURAL RENOVATIONS TO ELEVATOR AND RESTROOMS.

DRAWING NOTES:

1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.



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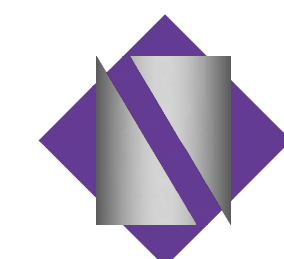
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NJ License No. AI 14394



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MECHANICAL & ELECTRICAL CONSULTING BUSINESS
24 CLAWSON STREET, SUITE 100, NEWARK, NJ 07102
PHONE: 973-276-2888 FAX: 973-276-2844
WWW.ATITECHNICAL.COM

JOSEPH J. HENDERSON, PE
NJ PE NO. 363887



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.376.0098 FAX: 973.376.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

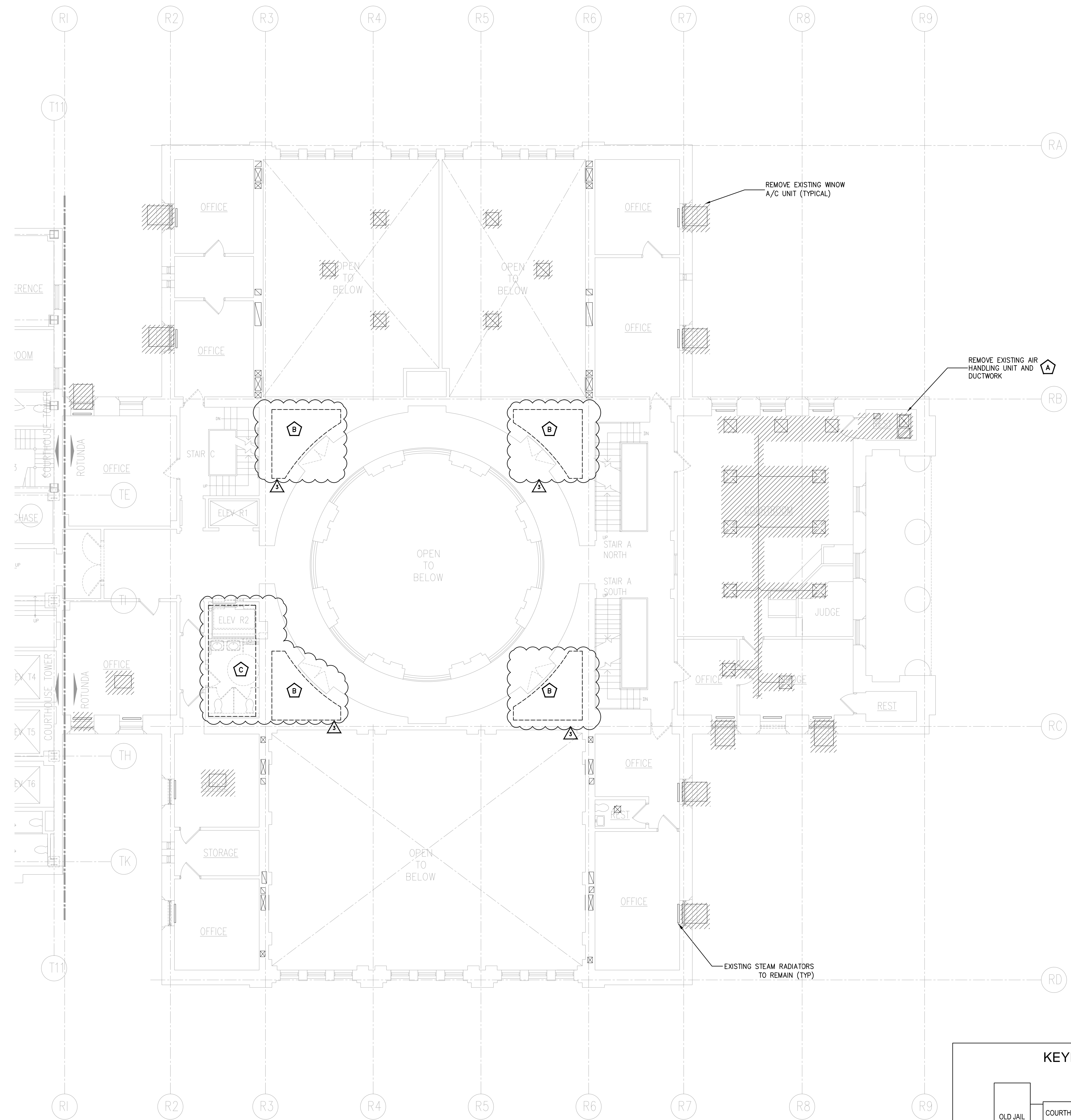
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**MECHANICAL - DEMOLITION PLAN
SECOND FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
11.1.17	ADDENDUM#3	MC	FM					JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

DM.402

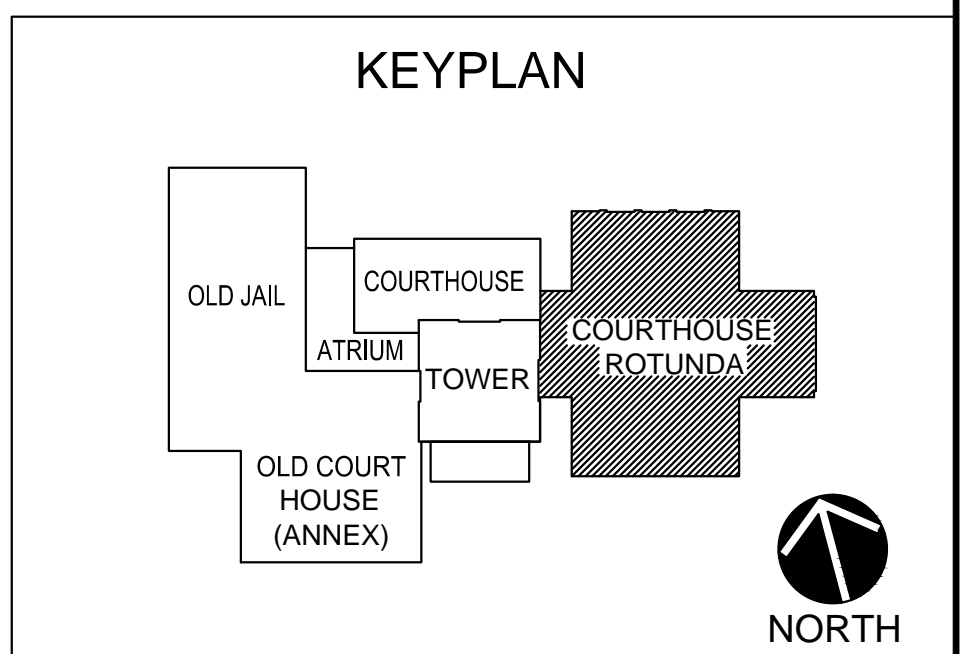


KEYED DEMOLITION WORK NOTES:

- A** REMOVE EXISTING HVAC UNIT ALONG WITH REMOTE OUTDOOR CONDENSING UNIT, PIPING, CONTROLS, SUPPLY/RETURN DUCTWORK, ETC. COORDINATE WITH ELECTRICAL CONTRACTOR FOR REMOVAL OF POWER WIRING, DISCONNECTS, ETC.
- B** CONTRACTOR TO RELOCATE EXISTING MECHANICAL DUCTWORK, PIPING AND CONTROLS AS REQUIRE TO FACILITATE NEW EQUIPMENT INSTALLATION AND ARCHITECTURAL RENOVATIONS.
- C** CONTRACTOR SHALL REMOVE EXISTING MECHANICAL SYSTEMS BACK TO WORK BOUNDARY TO PREPARE FOR PROPOSED ARCHITECTURAL RENOVATIONS TO ELEVATOR AND RESTROOMS.

DRAWING NOTES:

1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.



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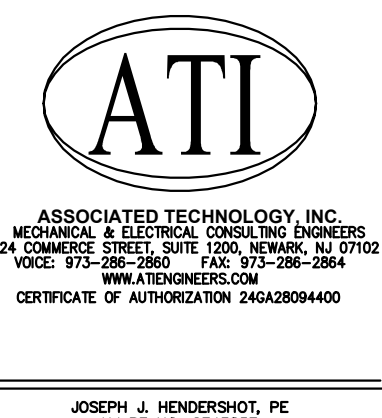
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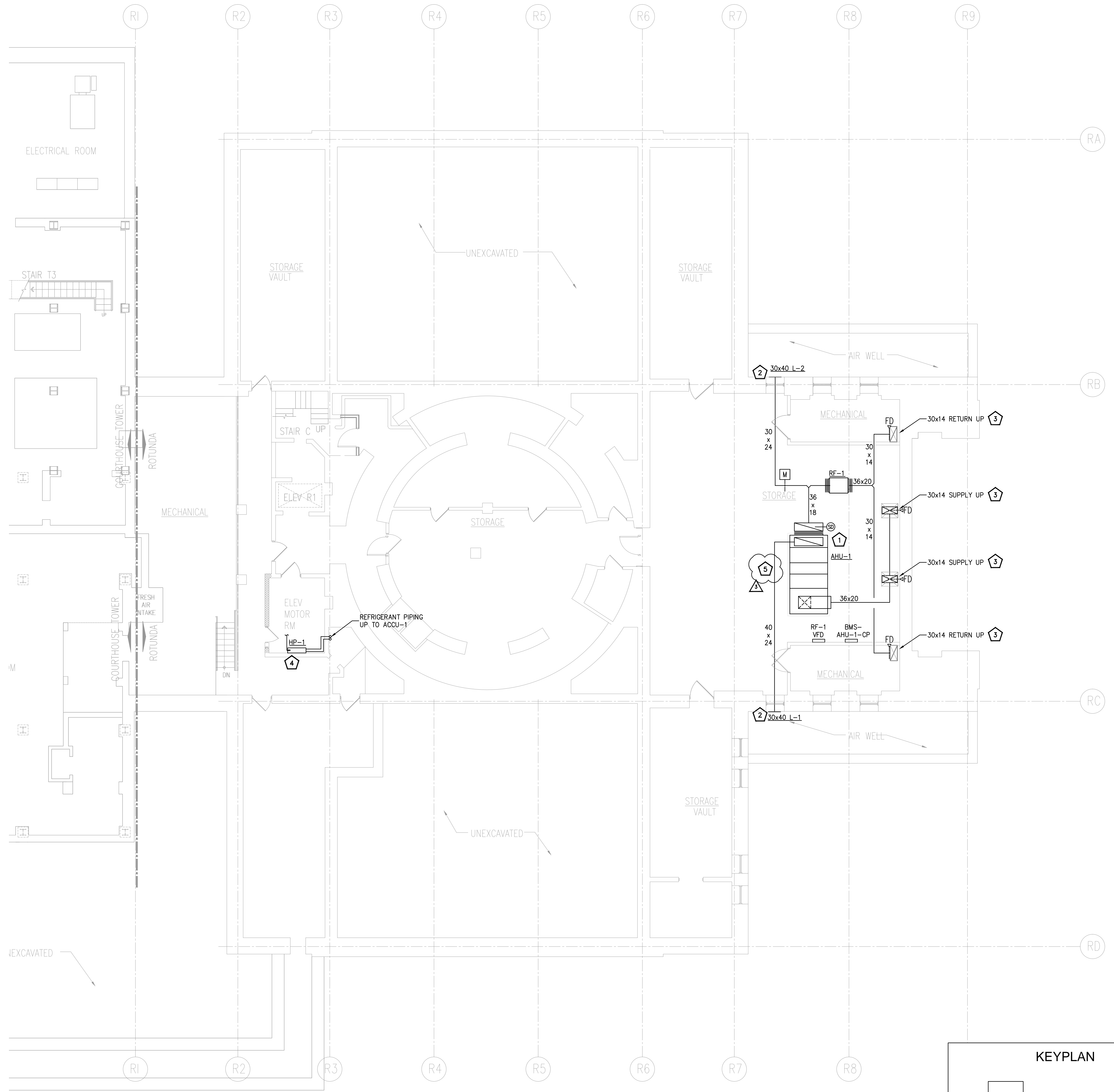


PROJECT: **UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - DEMOLITION PLAN
THIRD FLOOR**

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	09-25-15
09.25.15	95% CD SUBMIT	KD	FM					1/8"=1'-0"	
09.07.17	ISSUED FOR BID	KD	FM					DRWN BY	RB
11.1.17	ADDENDUM#3	MC	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

DM.403

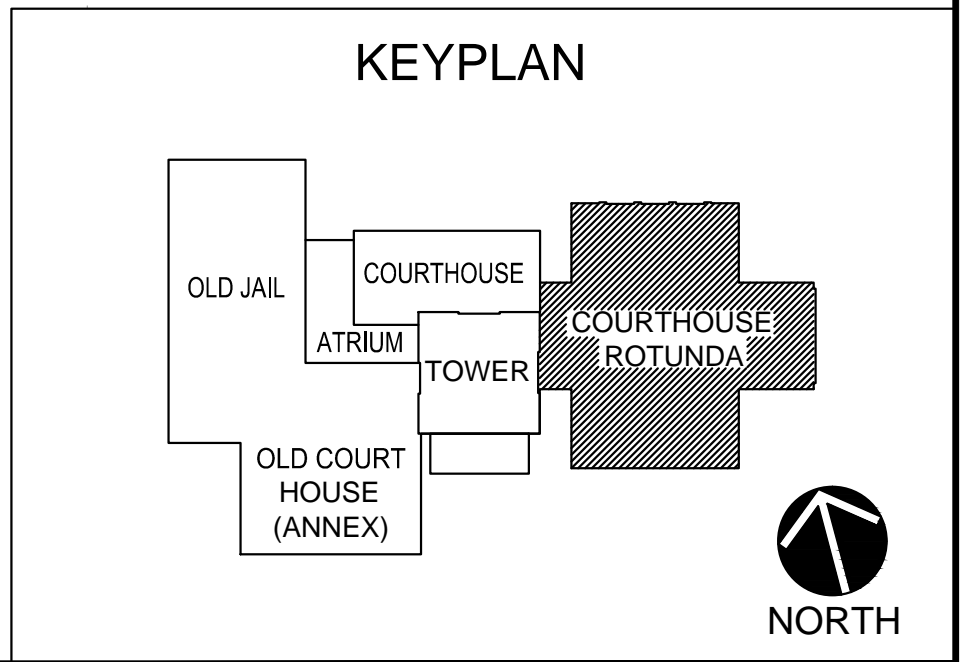


KEYED NEW WORK NOTES:

- 1 MOUNT NEW HVAC UNIT ON 4" HIGH CONCRETE PAD, APPROXIMATE DIMENSION 154"x90". CONCRETE PAD BY GENERAL CONTRACTOR.
- 2 NEW LOUVER SHALL BE INSTALLED IN EXISTING WINDOW FRAME. COORDINATE WITH ARCHITECT.
- 3 CONTRACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR AS TO SAW CUTTING OF THE FLOOR AS REQUIRED.
- 4 WALL MOUNTED HEAT PUMP UNIT. PROVIDE 1/4" LIQUID & 1/2" SUCTION LINES UP TO ACCU-1 ON GRADE. PIPING SHALL BE CONCEALED IN WALL. PROVIDE 1/2" CONDENSATE LINE TO FLOOR DRAIN. FINAL UNIT LOCATION SHALL BE COORDINATED IN THE FIELD. DO NOT MOUNT UNIT ABOVE ANY ELEVATOR EQUIPMENT.
- 5 HVAC UNIT SHALL BE PACKAGED IN AN MODULAR ARRANGEMENT SO THAT UNIT CAN BE RIGGED THROUGH A 3 FEET DOOR WAY AND FIELD ASSEMBLED IN PLACE. BASE BID FOR INSTALLATION AND EQUIPMENT SELECTION ACCORDINGLY.

DRAWING NOTES:

- 1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
- 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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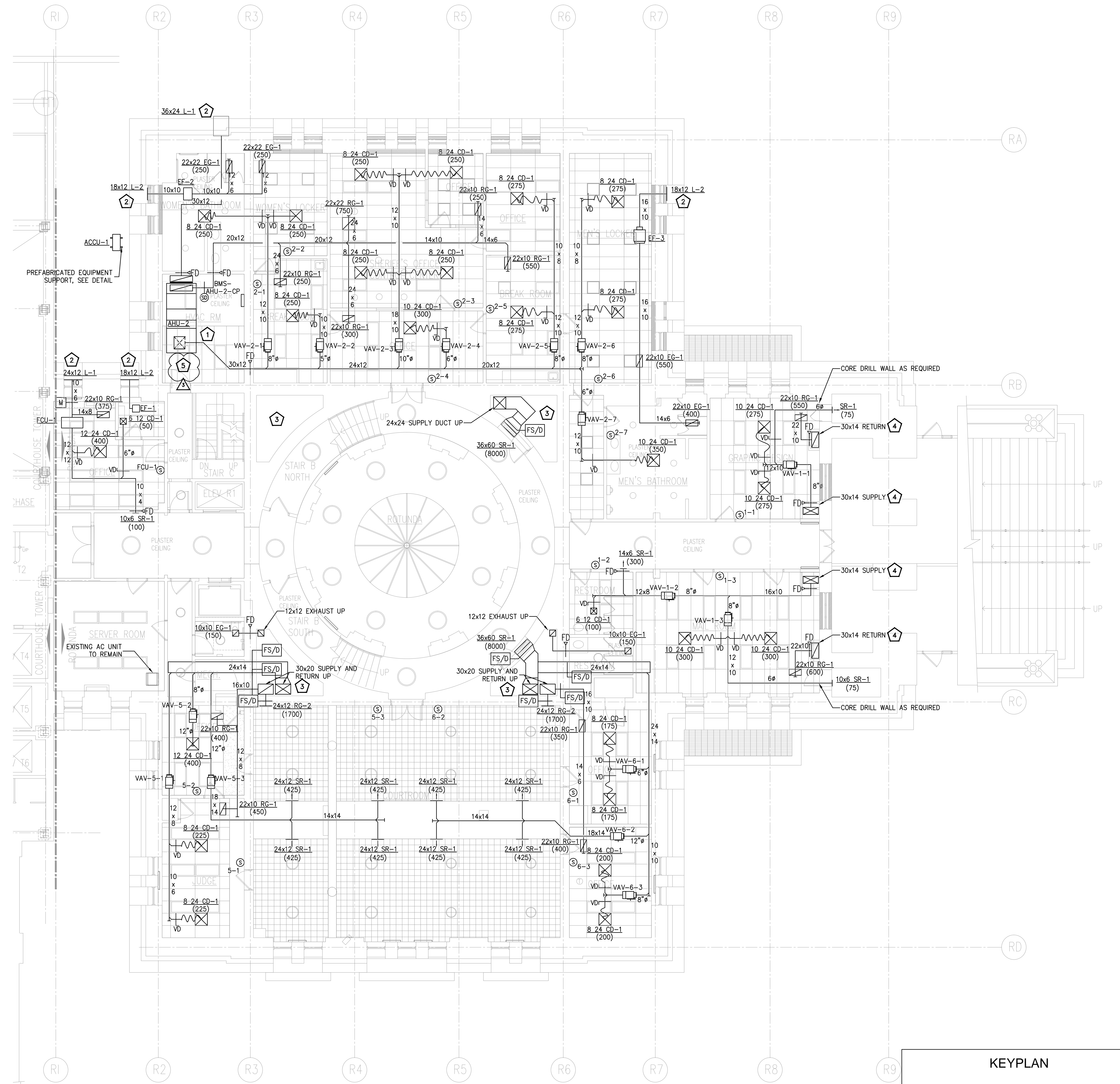


PROJECT:
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - HVAC PLAN
BASEMENT FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
11.1.17	ADDENDUM #3	MC	FM					JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

M.400B

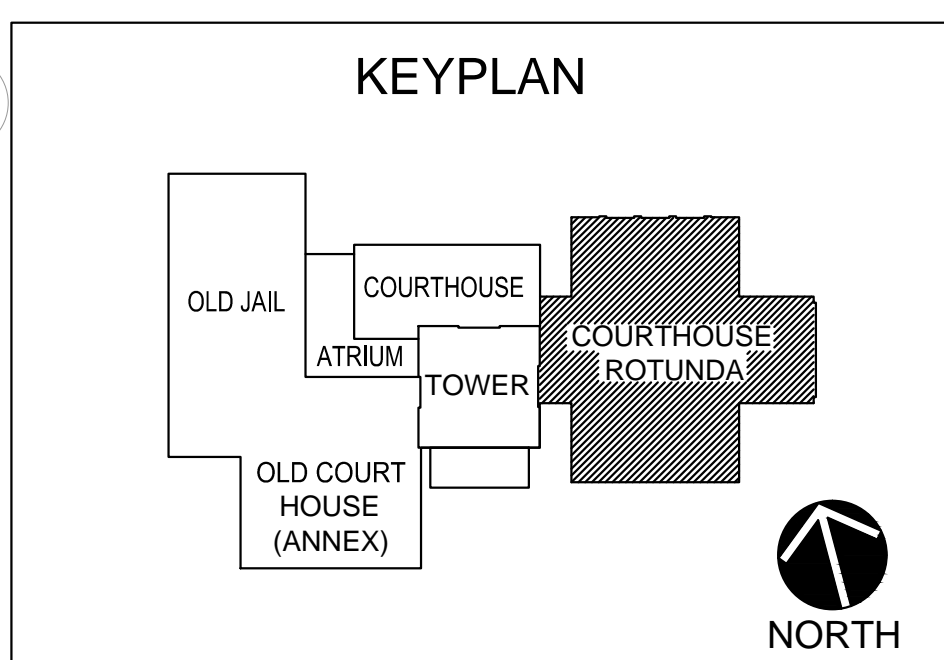


KEYED NEW WORK NOTES:

- 1 MOUNT NEW HVAC UNIT ON 4" HIGH CONCRETE PAD, APPROXIMATE DIMENSIONS 144"x74". CONCRETE PAD BY GENERAL CONTRACTOR.
- 2 NEW LOUVER SHALL BE INSTALLED IN EXISTING WINDOW FRAME. COORDINATE WITH ARCHITECT.
- 3 ALL WORK IN SHAFT AREAS SHALL BE COORDINATED WITH ALL EXISTING UTILITIES AND CONDITIONS. COORDINATE ALL SAW CUTTING AND CORE DRILLING OF SHAFT WALLS/FLOORS WITH GENERAL CONTRACTOR. GENERAL CONTRACTOR SHALL PROVIDE SCAFFOLDING IN SHAFT AREAS AS REQUIRED TO PERFORM WORK SAFELY.
- 4 CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR FOR SAW CUTTING OF FLOOR AS REQUIRED.
- 5 HVAC UNIT SHALL BE PACKAGED IN AN MODULAR ARRANGEMENT SO THAT UNIT CAN BE RIGGED THROUGH A 3 FEET DOOR WAY AND FIELD ASSEMBLED IN PLACE. BASE BID FOR INSTALLATION AND EQUIPMENT SELECTION ACCORDINGLY.

DRAWING NOTES:

1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

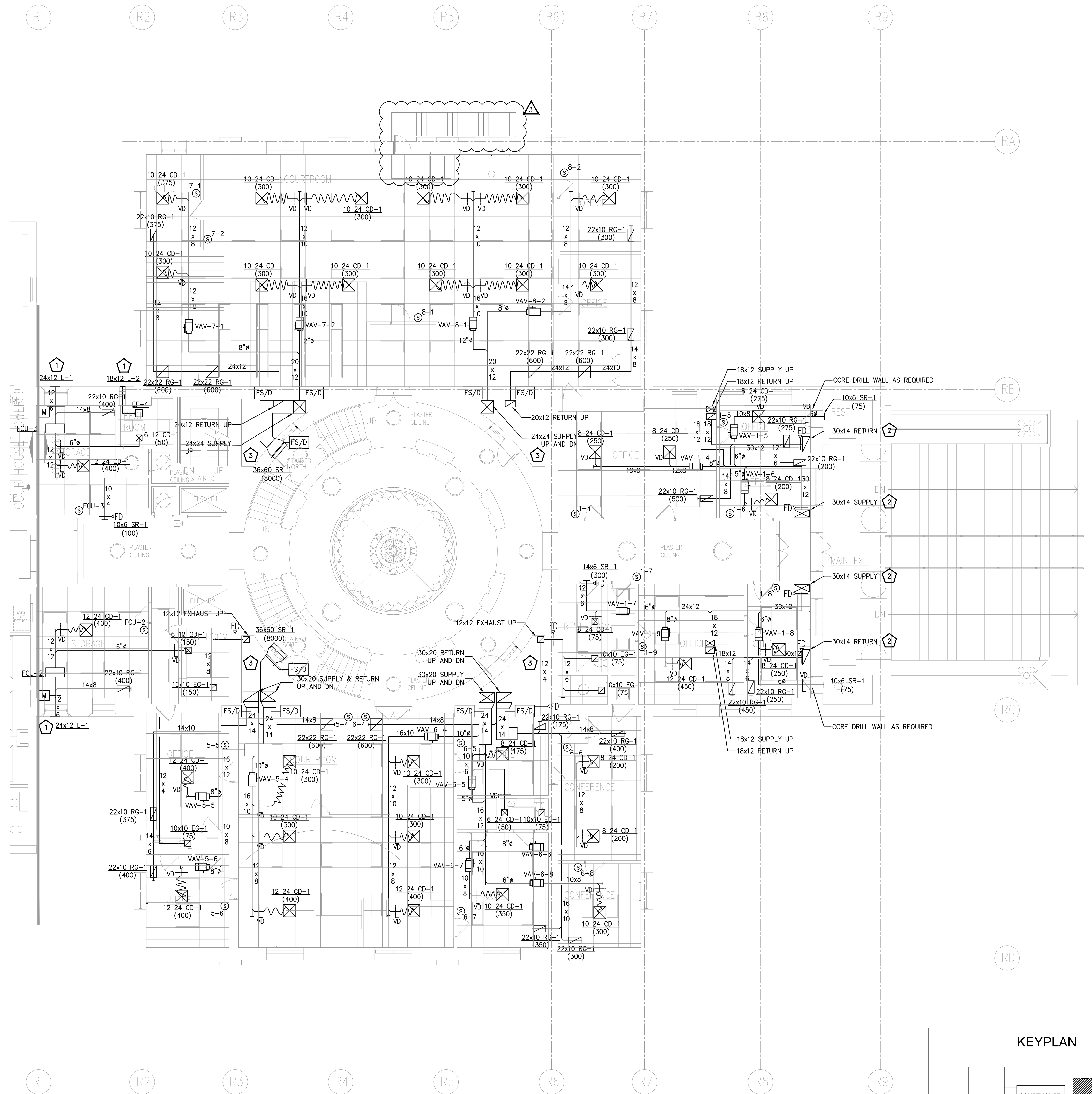
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - HVAC PLAN
GROUND FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RJ
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
11.1.17	ADDENDUM #3	MC	FM					JOB NO	2141152
								SHEET:	OF:
								DWG. NO	M.400G

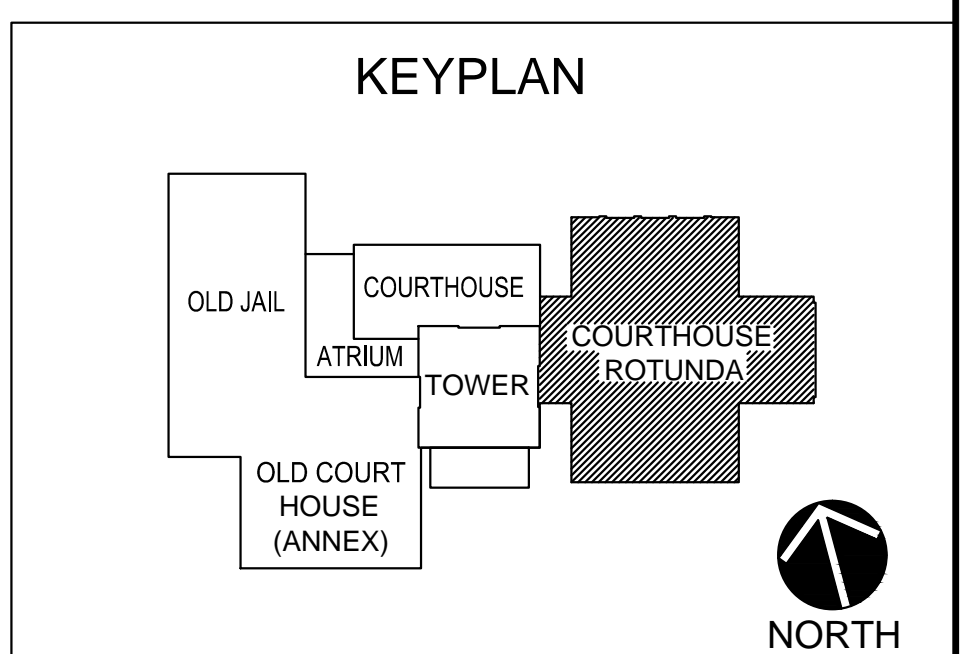


KEYED NEW WORK NOTES:

- ① NEW LOUVER SHALL BE INSTALLED IN EXISTING WINDOW FRAME. COORDINATE WITH ARCHITECT.
- ② CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR FOR SAW CUTTING OF FLOOR AS REQUIRED.
- ③ ALL WORK IN SHAFT AREAS SHALL BE COORDINATED WITH ALL EXISTING UTILITIES AND CONDITIONS. COORDINATE ALL SAW CUTTING AND CORE DRILLING OF SHAFT WALLS/FLOORS WITH GENERAL CONTRACTOR. GENERAL CONTRACTOR SHALL PROVIDE SCAFFOLDING IN SHAFT AREAS AS REQUIRED TO PERFORM WORK SAFELY.

DRAWING NOTES:

- 1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
- 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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NJ License No. AI 12118

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NJ License No. AI 16160

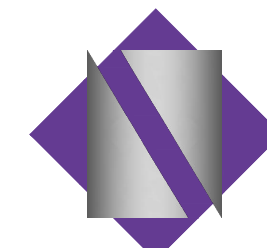
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MECHANICAL & ELECTRICAL ENGINEERING
24 CAMDEN PLACE, SUITE 100, PHILADELPHIA, PA 19106
TEL: 215-261-2888 FAX: 215-261-2844
WWW.ATIENGINEERING.COM

JOSEPH J. HENDERSON, PE
NJ Lic. No. 364087



NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-379-0008 FAX: 973-379-1061
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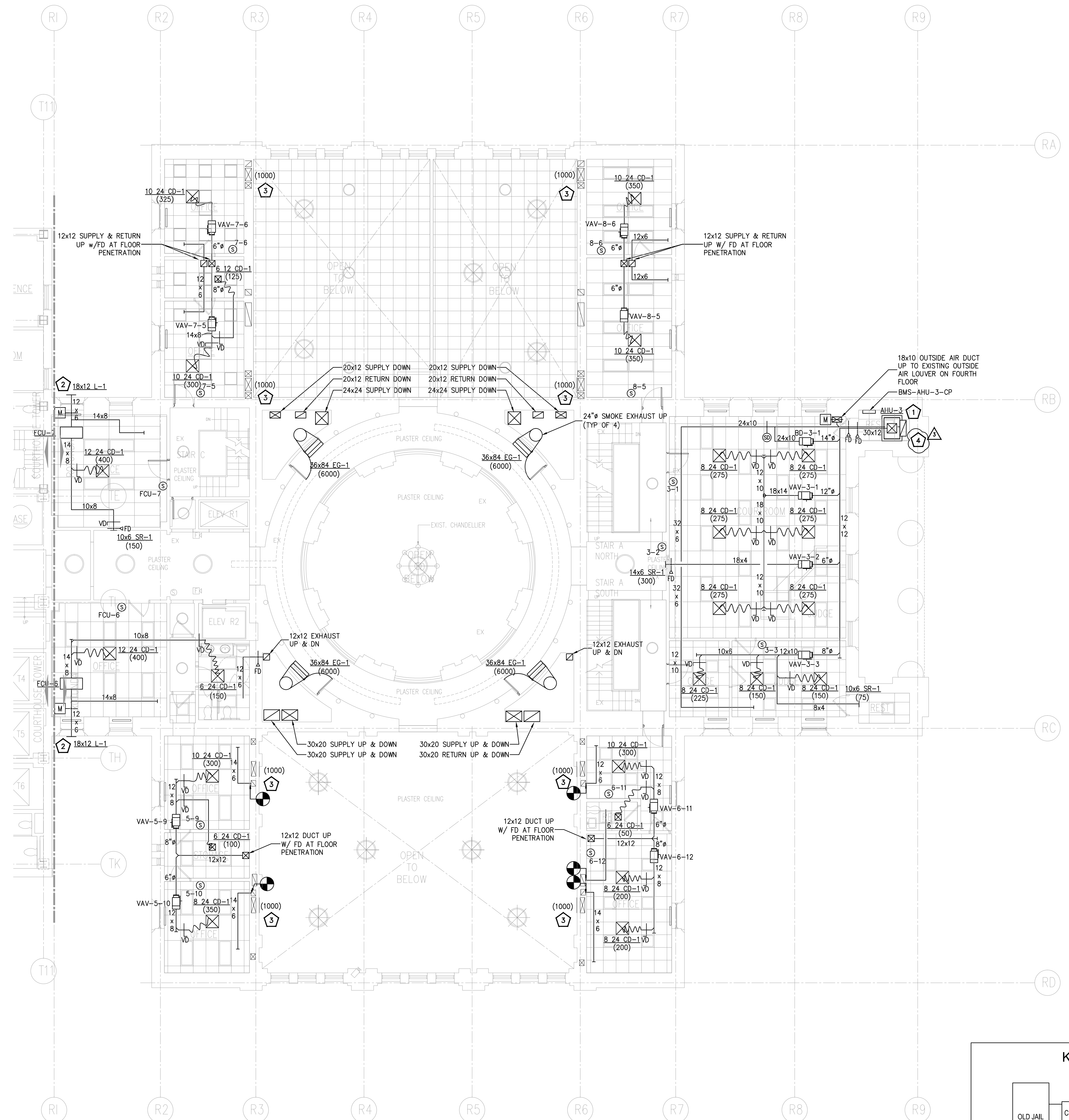
PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**MECHANICAL - HVAC PLAN
FIRST FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
11.17	ADDENDUM #3	MC	FM					JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	M.401

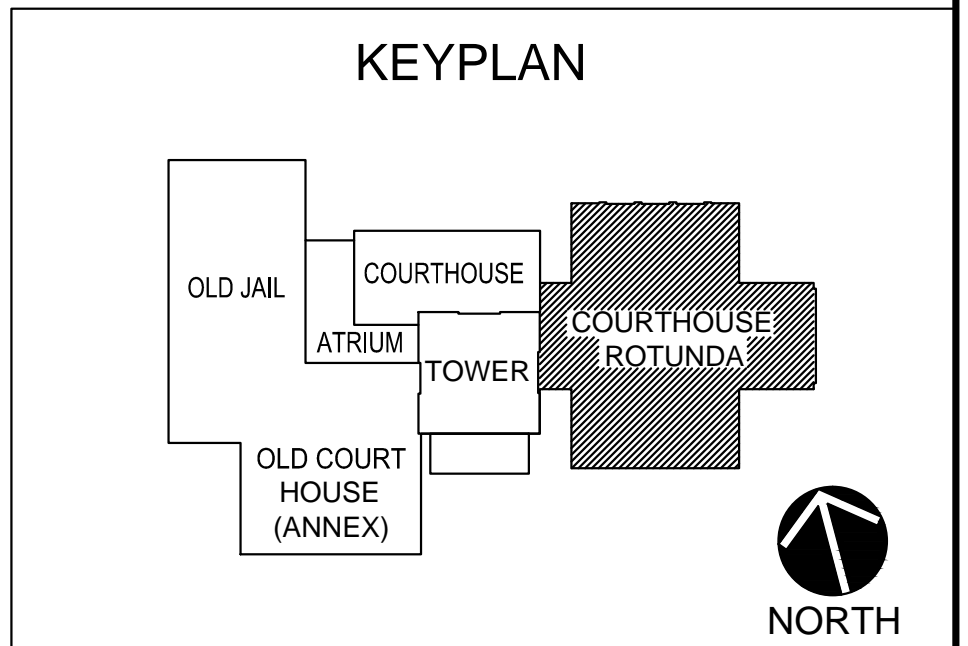


KEYED NEW WORK NOTES:

- 1 MOUNT NEW HVAC UNIT ON 4" HIGH CONCRETE PAD
- 2 NEW LOUVER SHALL BE INSTALLED IN EXISTING WINDOW FRAME. COORDINATE WITH ARCHITECT.
- 3 REBALANCE EXISTING AIR DEVICE TO CFM VALUE SHOWN.
- 4 HVAC UNIT SHALL BE PACKAGED IN AN MODULAR ARRANGEMENT SO THAT UNIT CAN BE RIGGED THROUGH A 3 FEET DOOR WAY AND FIELD ASSEMBLED IN PLACE. BASE BID FOR INSTALLATION AND EQUIPMENT SELECTION ACCORDINGLY.

DRAWING NOTES:

- 1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
- 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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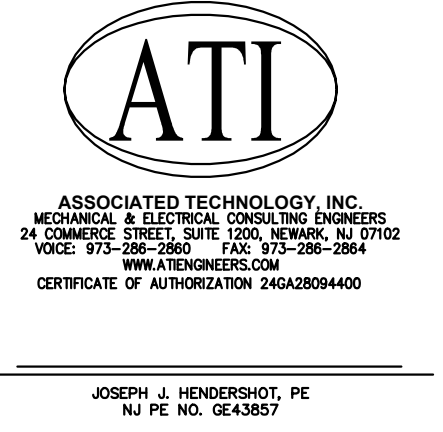
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MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

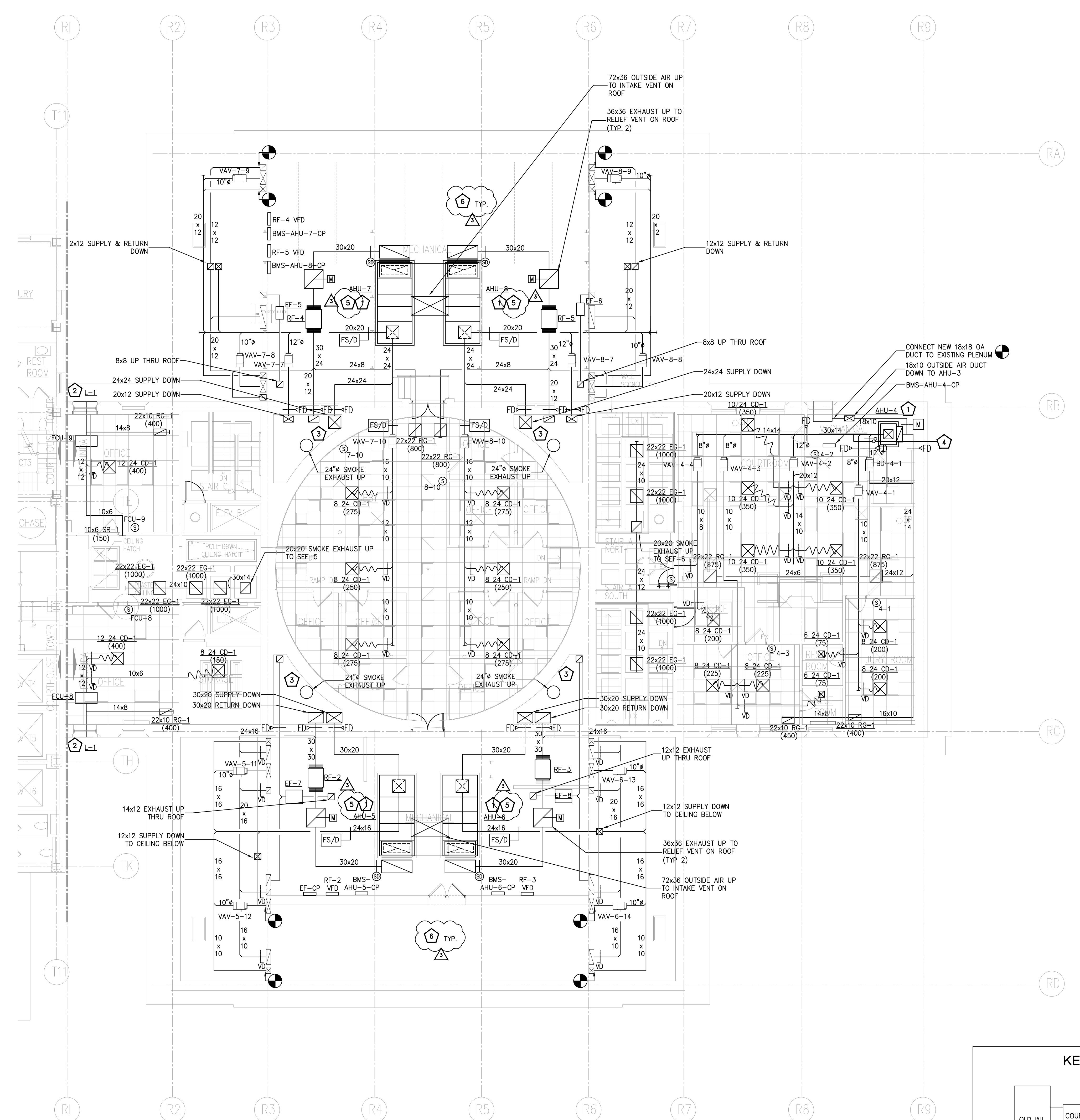
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PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

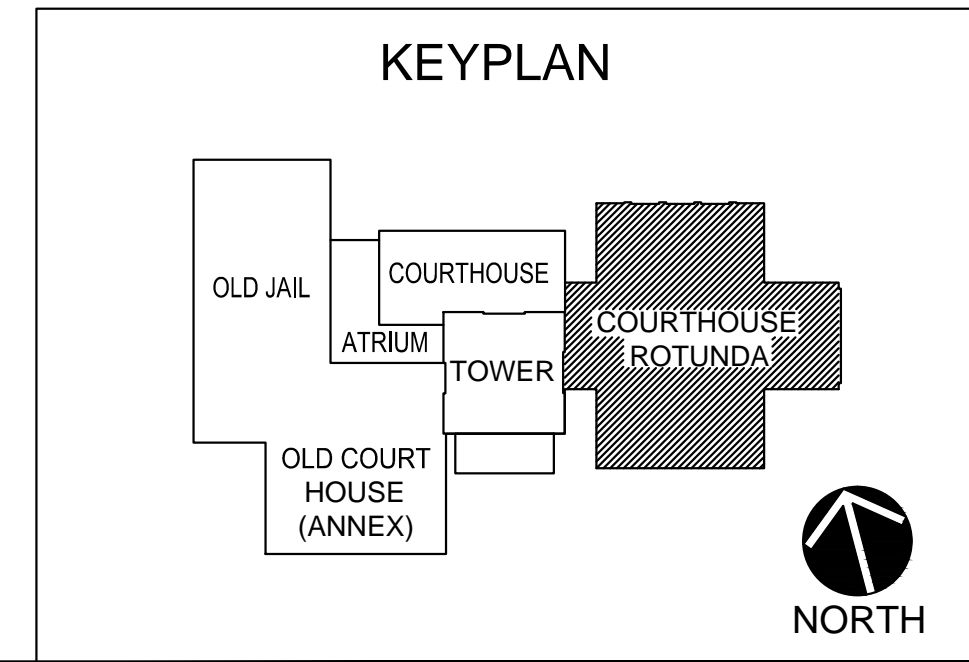
SHEET CONTENTS:
**MECHANICAL - HVAC PLAN
THIRD FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
09.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RJ
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
11.1.17	ADDENDUM #3	MC	FM					JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	M.403



- KEYED NEW WORK NOTES:**
- 1 MOUNT NEW HVAC UNIT ON 4" HIGH CONCRETE PAD, TO BE PROVIDED BY GENERAL CONTRACTOR.
 - 2 NEW LOUVER SHALL BE INSTALLED IN EXISTING WINDOW FRAME. COORDINATE WITH ARCHITECT.
 - 3 COORDINATE NEW DUCTWORK WITH EXISTING PIPING LOCATED AT WALLS OF SHAFT. RELOCATE AND ADJUST PIPING AS REQUIRED TO ACCOMMODATE NEW DUCTWORK.
 - 4 3/4" PIPE TO EXISTING FLOOR DRAIN FROM AHU-4, 1/2" PUMPED CONDENSATE DN TO CP-2 ON 3rd FLOOR SERVING AHU-3.
 - 5 HVAC UNIT SHALL BE PACKAGED IN A MODULAR ARRANGEMENT SO THAT UNIT CAN BE RIGGED THROUGH A 3 FEET DOOR WAY AND FIELD ASSEMBLED IN PLACE. BASE BID FOR INSTALLATION AND EQUIPMENT SELECTION ACCORDINGLY.
 - 6 ARCHITECTURAL DRAWINGS INDICATE TO PROVIDE FIRE SPRAY COATING ON STRUCTURAL BEAMS. COORDINATE MECHANICAL SUPPORT TO MAINTAIN RATINGS.

- DRAWING NOTES:**
1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



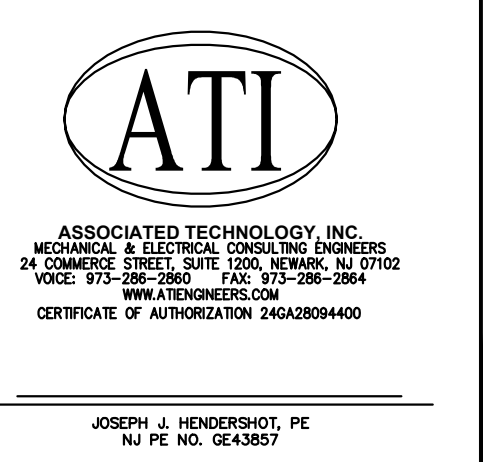
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NJ License No. AI 14394

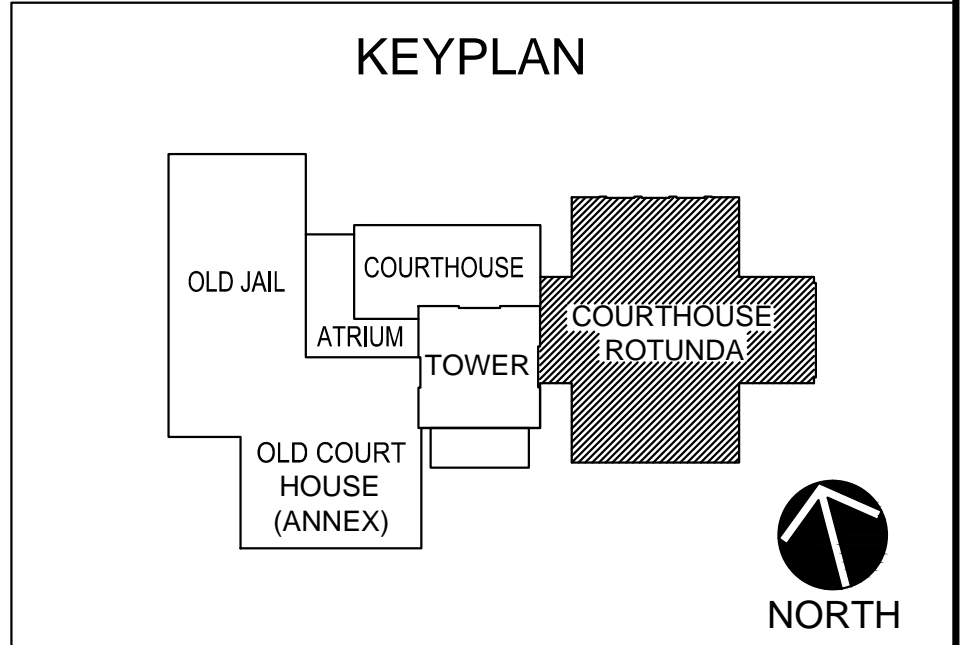
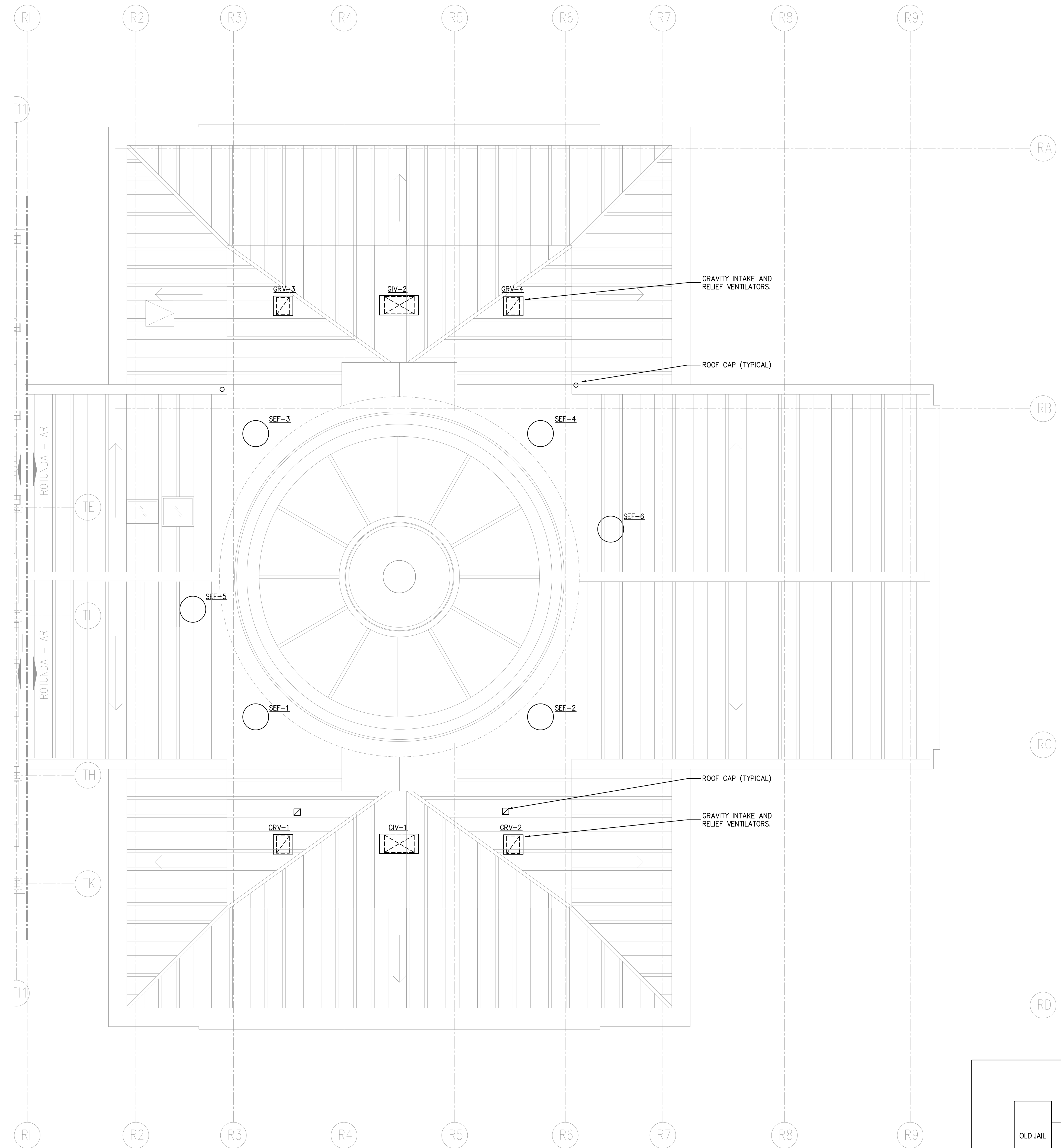


PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
MECHANICAL - HVAC PLAN FOURTH FLOOR

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	09-25-15
09.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RJ
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
11.17	ADDENDUM #3	MC	FM					JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

M.404



DRAWING NOTES:

1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

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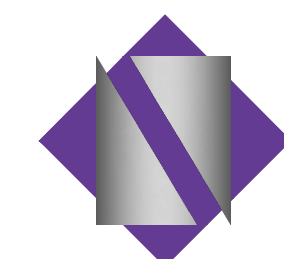
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ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 CLAWSON STREET, SUITE 200, NEWARK, NJ 07102
PHONE: 973-261-2888 FAX: 973-261-2884
WWW.ATITECHNOLOGY.COM

JOSEPH J. HENDERSON, PE
NJ License No. 363887



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.376.0088 FAX: 973.376.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

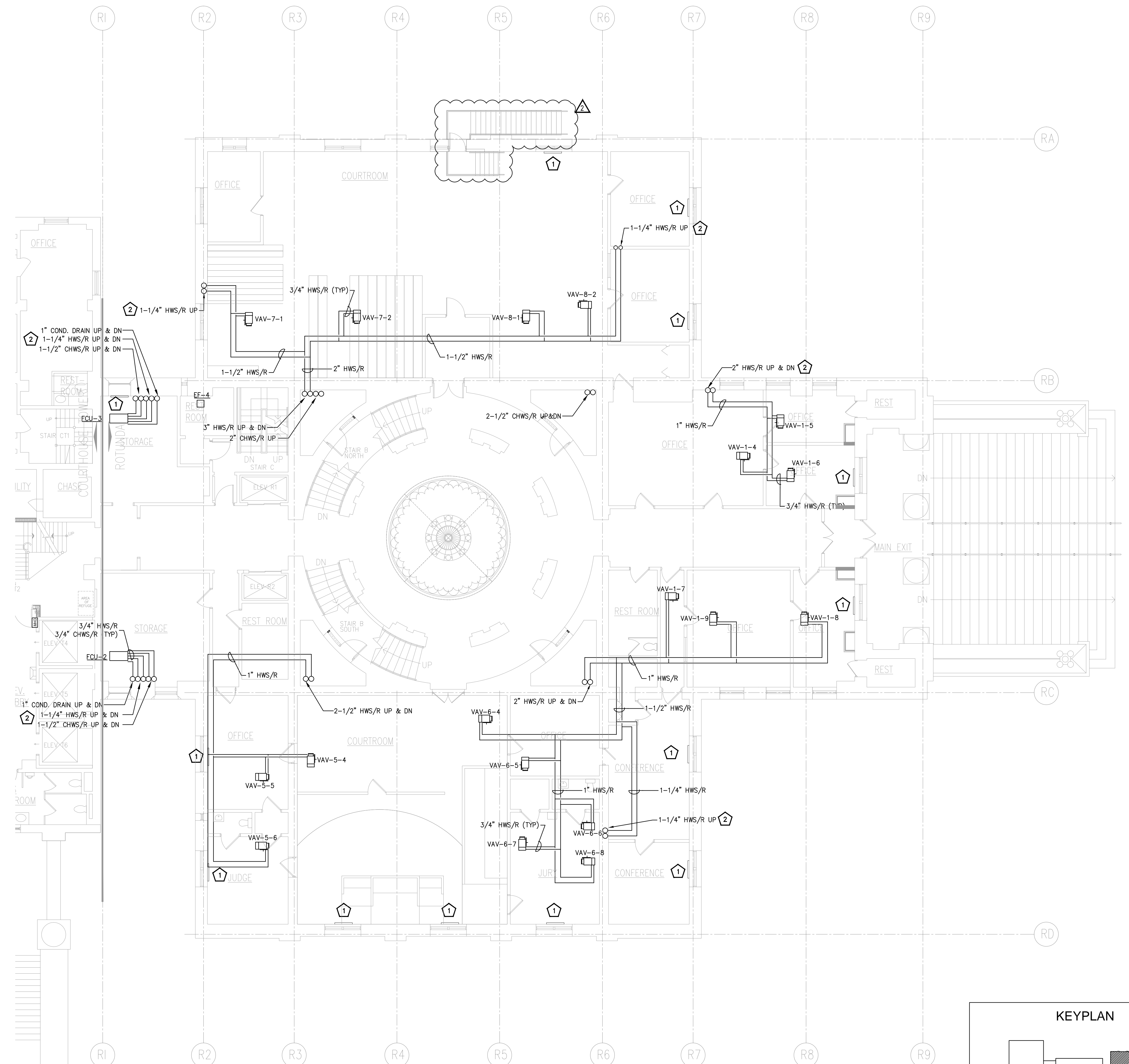
**UC COURTHOUSE
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2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**MECHANICAL - HVAC PLAN
ROOF**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
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09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
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M.405

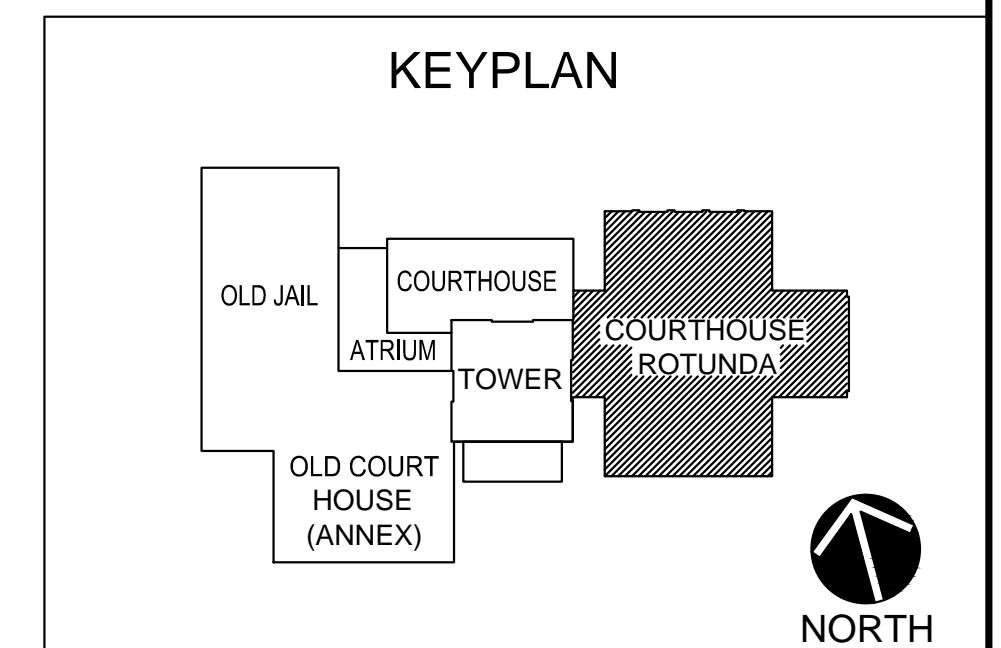


KEYED NEW WORK NOTES:

- 1. CONTRACTOR TO PROVIDE OR REPLACE WITH NEW STEAM RADIATOR VALVE BODY AND ACTUATOR. SEE DETAIL DWG. M.802.
- 2. CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR CORE DRILLING OF FLOORS FOR NEW PIPING.

DRAWING NOTES:

- 1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
- 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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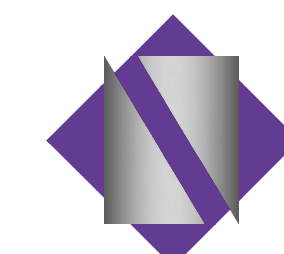
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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



JOSEPH J. HENDERSON, PE
NJ Lic. No. 940367



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINVIEW, NEW JERSEY 07092
TEL: 973-379-1081 FAX: 973-379-1081
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

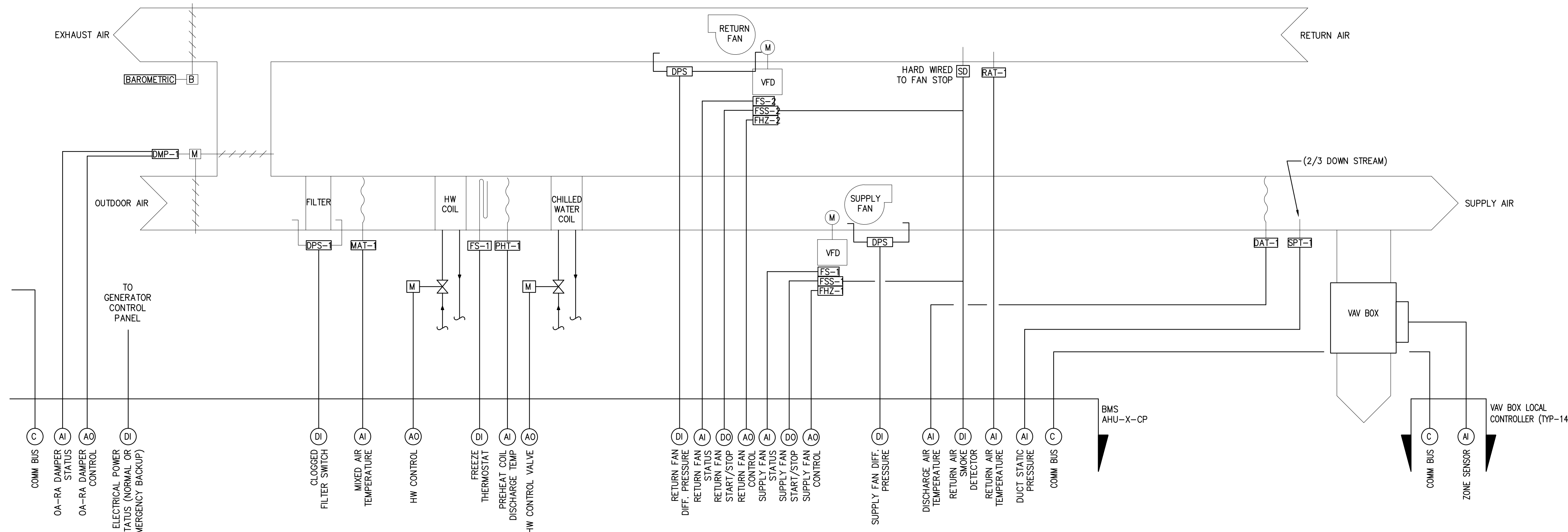
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL - PIPING PLAN
FIRST FLOOR

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
9.25.15	95% CD SUBMIT	KD	FM					09-25-15
09.07.17	ISSUED FOR BID	KD	FM					1/8"=1'-0"
11.17	ADDENDUM #3	MC	FM					DRWN BY RB
								CHKD BY NJN
								JOB NO 2141152
								SHEET: _ OF:
								DWG. NO

M.501



TYPICAL SEQUENCE OF OPERATION

TIME SCHEDULES

THE TIME SCHEDULES SHALL BE PROGRAMMED THROUGH THE MAIN FRONT END OPERATOR STATION AND STORED IN THE INDIVIDUAL CONTROLLERS. TIME SCHEDULES SHALL BE COORDINATED WITH THE BUILDING OWNER AT COMPLETION OF THE PROJECT, OR AS LISTED IN THE GENERAL BUILDING SEQUENCE OF OPERATION SCHEDULES.

SYSTEM DE-ENERGIZED

WHEN THE SYSTEM IS DE-ENERGIZED, THE OUTDOOR AIR AND EXHAUST DAMPERS SHALL CLOSE, THE RETURN AIR DAMPER SHALL OPEN, THE SUPPLY AND RETURN AIR FANS SHALL BE DE-ENERGIZED.

SYSTEM ENERGIZED

WHEN THE SYSTEM IS ENERGIZED, THE OUTDOOR AIR DAMPER SHALL OPEN TO ITS MINIMUM VENTILATION POSITION, AND THE RETURN AIR DAMPER SHALL OPEN TO ITS MINIMUM VENTILATION POSITION. THE SUPPLY AIR FAN SHALL START AND MAINTAIN THE REQUIRED AIRFLOW TO MAINTAIN A SLIGHT POSITIVE PRESSURE (0.01" WC) WITHIN THE BUILDING.

DISCHARGE AIR TEMPERATURE CONTROL
 THE AHU SHALL MAINTAIN CONSTANT DISCHARGE AIR TEMPERATURE AS DICTATED BY THE DISCHARGE AIR TEMPERATURE SETPOINT. THE CHILLED WATER CONTROL VALVE SHALL BE MODULATED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE. THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET BASED ON THE DISCHARGE AIR TEMPERATURE RESET SCHEDULE LISTED IN THE GENERAL BUILDING SEQUENCE OF OPERATION AND SCHEDULES.

FREEZE PROTECTION
 A RETURN AIR DUCT MOUNTED SENSOR SHALL MONITOR THE RETURN AIR TEMPERATURE. THE BMS SHALL RESET SUPPLY TEMPERATURE TO PROVIDE ADEQUATE COOLING.

ECONOMIZER MODE
 WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE 55°F, CHILLED WATER SHALL BE PROVIDED FOR COOLING. WHEN THE OUTDOOR AIR TEMPERATURE IS AT OR BELOW 55°F, THE OUTDOOR AIR DAMPER SHALL BE MODULATED OPEN TO PROVIDE FREE COOLING. AS THE OUTDOOR AIR DAMPER MODULATES OPEN, THE RETURN AIR DAMPER SHALL CORRESPONDINGLY MODULATE TOWARD ITS CLOSED POSITION. THE LOCAL CONTROLS SHALL LIMIT THE MIXED AIR TEMPERATURE FROM FALLING BELOW 52°F.

SPACE TEMPERATURE CONTROL
 THE SPACE TEMPERATURE FOR EACH ZONE IS CONTROLLED BY THE VARIABLE AIR VOLUME (VAV) BOXES WHICH HAVE THEIR INDIVIDUAL TEMPERATURE SENSORS.

UNOCCUPIED MODE
 THE DAYS AND TIMES GOVERNING THIS MODE OF OPERATION SHALL BE DICTATED BY THE OWNER AND PROGRAMMED INTO THE BMS SYSTEM.

ALARMS
 ALARMS SHALL BE GENERATED THROUGH THE BMS SYSTEM AND SHALL INCLUDE:
 1. SUPPLY FAN FAILURE
 2. RETURN FAN FAILURE
 3. SUPPLY TEMP TOO HIGH
 4. SUPPLY AIR TEMP TOO LOW
 5. RETURN AIR TOO HIGH
 6. UNABLE TO MAINTAIN STATIC PRESSURE
 7. MIXED AIR TEMP TOO LOW
 8. FREEZE PROTECTION THERMOSTAT ACTIVATED
 9. VFD FAILURE
 10. SMOKE DETECTOR ACTIVATED

SHALL MOVE TO ITS FULLY CLOSED POSITION, THE SUPPLY FAN AND RETURN FAN SHALL BE DE-ENERGIZED AND THE VAV BOXES SHALL MOVE TO THEIR FULLY OPEN POSITION.

IF DURING THE UNOCCUPIED MODE THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING TEMPERATURE SETPOINT THE UNIT SHALL START AND THE COOLING COIL VALVE SHALL MOVE TO THE OPEN POSITION TO MAINTAIN THE DISCHARGE AIR TEMPERATURE CONTROL SETPOINT TO PROVIDE COOLING FOR THE SPACE. ONCE THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED SPACE TEMPERATURE SETPOINT, THE UNIT SHALL RETURN TO THE UNOCCUPIED MODE.

MORNING WARM UP
 IF THE RETURN AIR TEMPERATURE IS BELOW THE MORNING WARM UP SETPOINT WHEN THE UNIT IS INITIATED TO BEGIN THE OCCUPIED MODE THE UNIT SHALL ENTER THE MORNING WARM UP MODE. THE OUTDOOR AIR DAMPER SHALL REMAIN IN THE CLOSED POSITION. THE COOLING COIL VALVE WILL REMAIN CLOSED AND THE UNIT WILL CONTINUE TO OPERATE WITH THE FANS ONLY. ONCE THE RETURN AIR TEMPERATURE RISES ABOVE THE MORNING WARM UP SETPOINT, THE UNIT WILL ENTER THE OCCUPIED MODE.

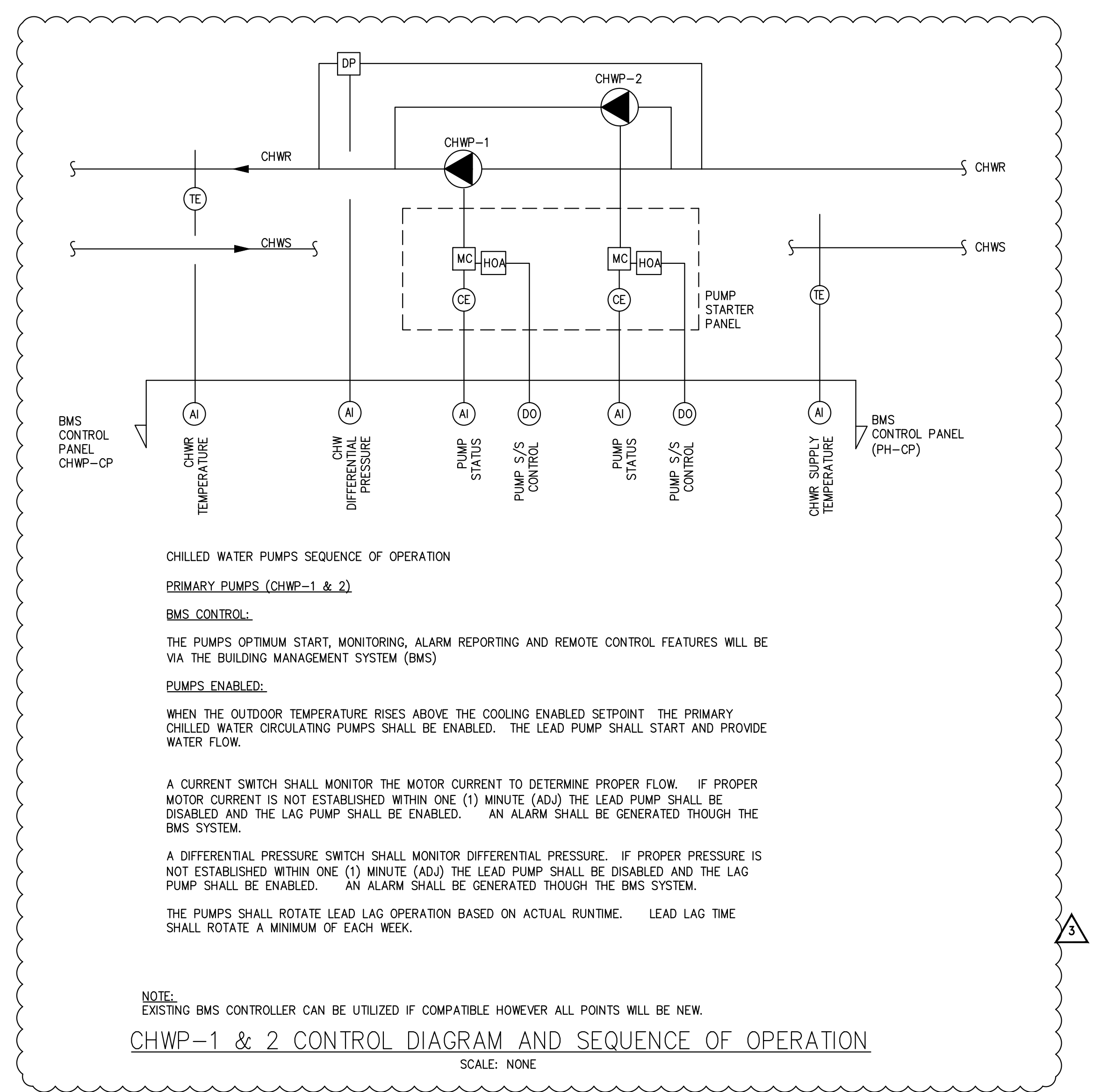
SETPOINTS
 1. DISCHARGE AIR TEMPERATURE SETPOINT 55°F (ADJ)
 2. SUPPLY STATIC PRESSURE 1" WC (ADJ)
 3. MORNING WARM UP MODE SETPOINT 74°F (ADJ)
 4. OCCUPIED COOLING SETPOINT 74°F (ADJ)
 5. OCCUPIED HEATING SETPOINT 70°F (ADJ)
 6. UNOCCUPIED COOLING SETPOINT 80°F (ADJ)
 7. UNOCCUPIED HEATING SETPOINT 65°F (ADJ)

SMOKE DETECTOR
 UPON INDICATION OF SMOKE THE UNIT SHALL BE USED FOR THE SMOKE PURGE SYSTEM. THE UNIT SHALL PROVIDE 100% OUTSIDE AIR AND THE RETURN FAN SHALL DE-ENERGIZE. REFER TO SMOKE PURGE CONTROL DIAGRAM. THE UNIT SHALL REMAIN IN THIS STATE UNTIL IT IS MANUALLY RESET FOR NORMAL OPERATION.

FREEZE PROTECTION
 UPON DETECTION OF A FREEZING POTENTIAL, THE FREEZE PROTECTION THERMOSTAT SHALL SHUT DOWN THE UNIT. BOTH SUPPLY AND RETURN FANS SHALL BE DE-ENERGIZED. THE OUTSIDE AIR DAMPER SHALL RETURN TO ITS FULLY CLOSED POSITION. THE RETURN AIR DAMPER SHALL RETURN TO THE FULLY OPEN POSITION. THE HOT WATER COIL VALVE SHALL OPEN TO ITS FULLY OPEN POSITION. THE UNIT SHALL REMAIN IN THIS STATE UNTIL THE FREEZE PROTECTION THERMOSTAT IS MANUALLY RESET.

ALARMS
 ALARMS SHALL BE GENERATED THROUGH THE BMS SYSTEM AND SHALL INCLUDE:
 1. SUPPLY FAN FAILURE
 2. RETURN FAN FAILURE
 3. SUPPLY TEMP TOO HIGH
 4. SUPPLY AIR TEMP TOO LOW
 5. RETURN AIR TOO HIGH
 6. UNABLE TO MAINTAIN STATIC PRESSURE
 7. MIXED AIR TEMP TOO LOW
 8. FREEZE PROTECTION THERMOSTAT ACTIVATED
 9. VFD FAILURE
 10. SMOKE DETECTOR ACTIVATED

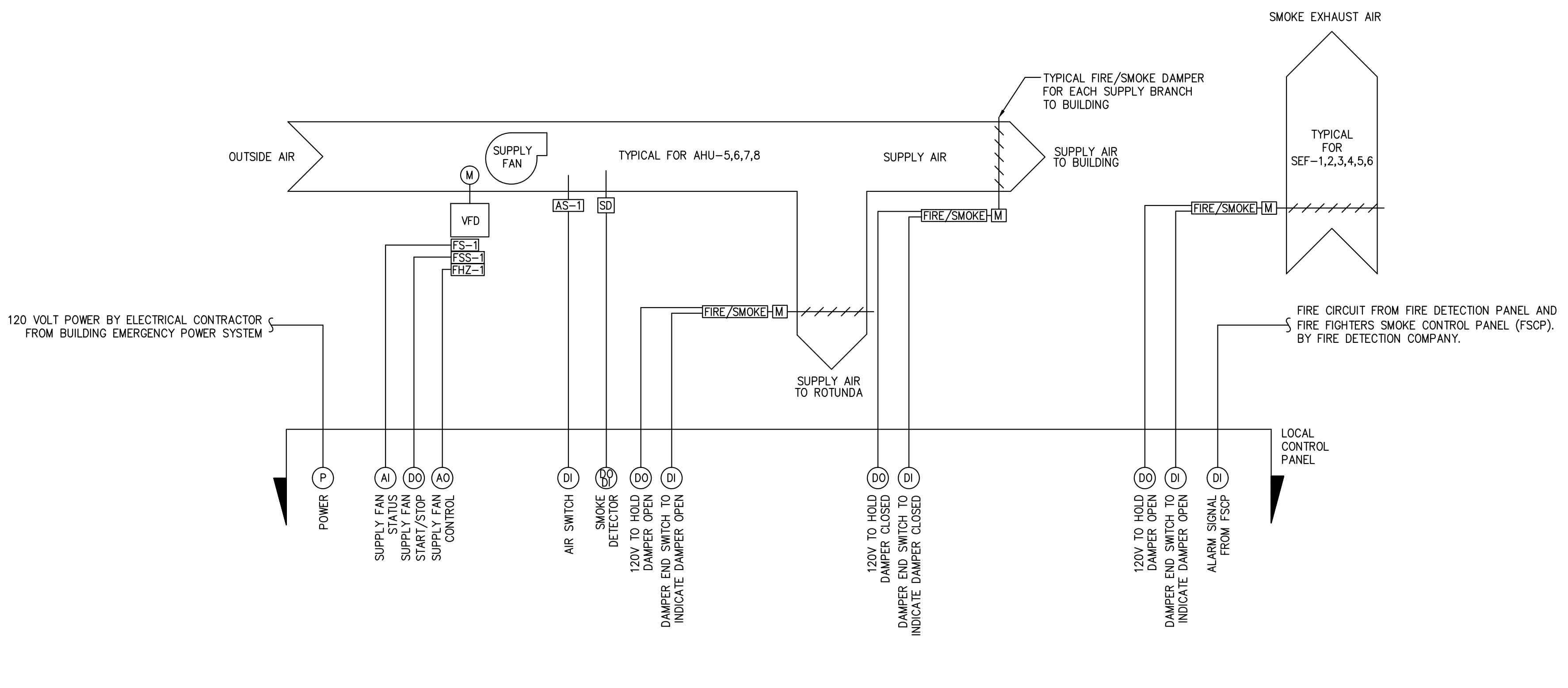
**AIR HANDLING UNIT (AHU-5,6,7,8)
 CONTROL DIAGRAM AND SEQUENCE OF OPERATION**
 NOT TO SCALE



CHILLED WATER PUMPS SEQUENCE OF OPERATION
PRIMARY PUMPS (CHWP-1 & 2)
BMS CONTROL:
 THE PUMPS OPTIMUM START, MONITORING, ALARM REPORTING AND REMOTE CONTROL FEATURES WILL BE VIA THE BUILDING MANAGEMENT SYSTEM (BMS)
PUMPS ENABLED:
 WHEN THE OUTDOOR TEMPERATURE RISES ABOVE THE COOLING ENABLED SETPOINT THE PRIMARY CHILLED WATER CIRCULATING PUMPS SHALL BE ENABLED. THE LEAD PUMP SHALL START AND PROVIDE WATER FLOW.
 A CURRENT SWITCH SHALL MONITOR THE MOTOR CURRENT TO DETERMINE PROPER FLOW. IF PROPER MOTOR CURRENT IS NOT ESTABLISHED WITHIN ONE (1) MINUTE (ADJ) THE LEAD PUMP SHALL BE DISABLED AND THE LAG PUMP SHALL BE ENABLED. AN ALARM SHALL BE GENERATED THROUGH THE BMS SYSTEM.
 A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR DIFFERENTIAL PRESSURE. IF PROPER PRESSURE IS NOT ESTABLISHED WITHIN ONE (1) MINUTE (ADJ) THE LEAD PUMP SHALL BE DISABLED AND THE LAG PUMP SHALL BE ENABLED. AN ALARM SHALL BE GENERATED THROUGH THE BMS SYSTEM.
 THE PUMPS SHALL ROTATE LEAD LAG OPERATION BASED ON ACTUAL RUNTIME. LEAD LAG TIME SHALL ROTATE A MINIMUM OF EACH WEEK.

NOTE:
 EXISTING BMS CONTROLLER CAN BE UTILIZED IF COMPATIBLE HOWEVER ALL POINTS WILL BE NEW.

CHWP-1 & 2 CONTROL DIAGRAM AND SEQUENCE OF OPERATION
 SCALE: NONE



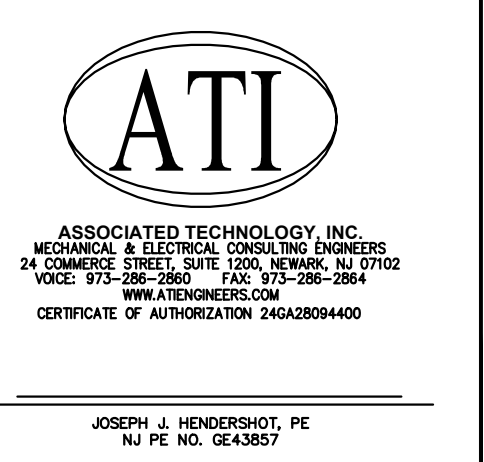
NOTES:
 1. MECHANICAL CONTRACTOR SHALL PROVIDE A CONTROL PANEL SUBMITTAL FOR APPROVAL TO THE ENGINEER. CONTRACTOR IS RESPONSIBLE TO COORDINATE CONTROLS WITH THE FIRE DETECTION CONTRACTOR AND ELECTRICAL CONTRACTOR PRIOR TO PANEL FABRICATION
 2. CONTROL PANEL SHALL INCLUDE SWITCHES, SENSOR OR DEVICES AS REQUIRED TO PROVIDE A PROOF OF OPERATION THAT SHALL BE RELAYED BACK TO THE FSCPL
 3. ALL PARTS MATERIAL, CONTROL WIRING, ETC. SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR. POWER WIRING SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
 4. CONTROLS ARRANGEMENT, SET UP AND ALL TESTING SHALL ADHERE TO THE LATEST VERSION OF THE NFPA CODE SECTION 92A

SEQUENCE OF OPERATION:
 1. ONCE THE FIRE ALARM PANEL IS INDEXED FOR A SMOKE PURGE CONDITION, AHU-5,6,7,8 SHALL ENERGIZE ITS SUPPLY FAN.
 2. THE FIRE/SMOKE DAMPERS AT THE ROTUNDA SUPPLY GRILLES SHALL OPEN. ALL OTHER FIRE/SMOKE DAMPERS AT THE SUPPLY DUCTS SHALL CLOSE. RETURN DUCT DAMPERS SHALL ALSO CLOSE.
 3. THE SMOKE EXHAUST FANS (SEF-1,2,3,4,5,6) SHALL ENERGIZE.

SMOKE PURGE CONTROL DIAGRAM
 NOT TO SCALE

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 NJ License No. AI 12118
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 LAURENCE K. UHER, AIA, LEED, AP
 NJ License No. AI 14394



PROJECT:
 UC COURTHOUSE
 FIRE SUPPRESSION (ROTUNDA)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
 MECHANICAL - CONTROL DIAGRAMS
 (SHEET 3)

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
9.25.15	95% CD SUBMIT	KD	FM					09-25-15
09.07.17	ISSUED FOR BID	KD	FM					AS SHOWN
11.17	ADDENDUM #3	MC	FM					DRWN BY RB
								CHKD BY NJN
								JOB NO 2141152
								SHEET: _ OF:
								DWG. NO

M.703

KEYED WORK NOTES:

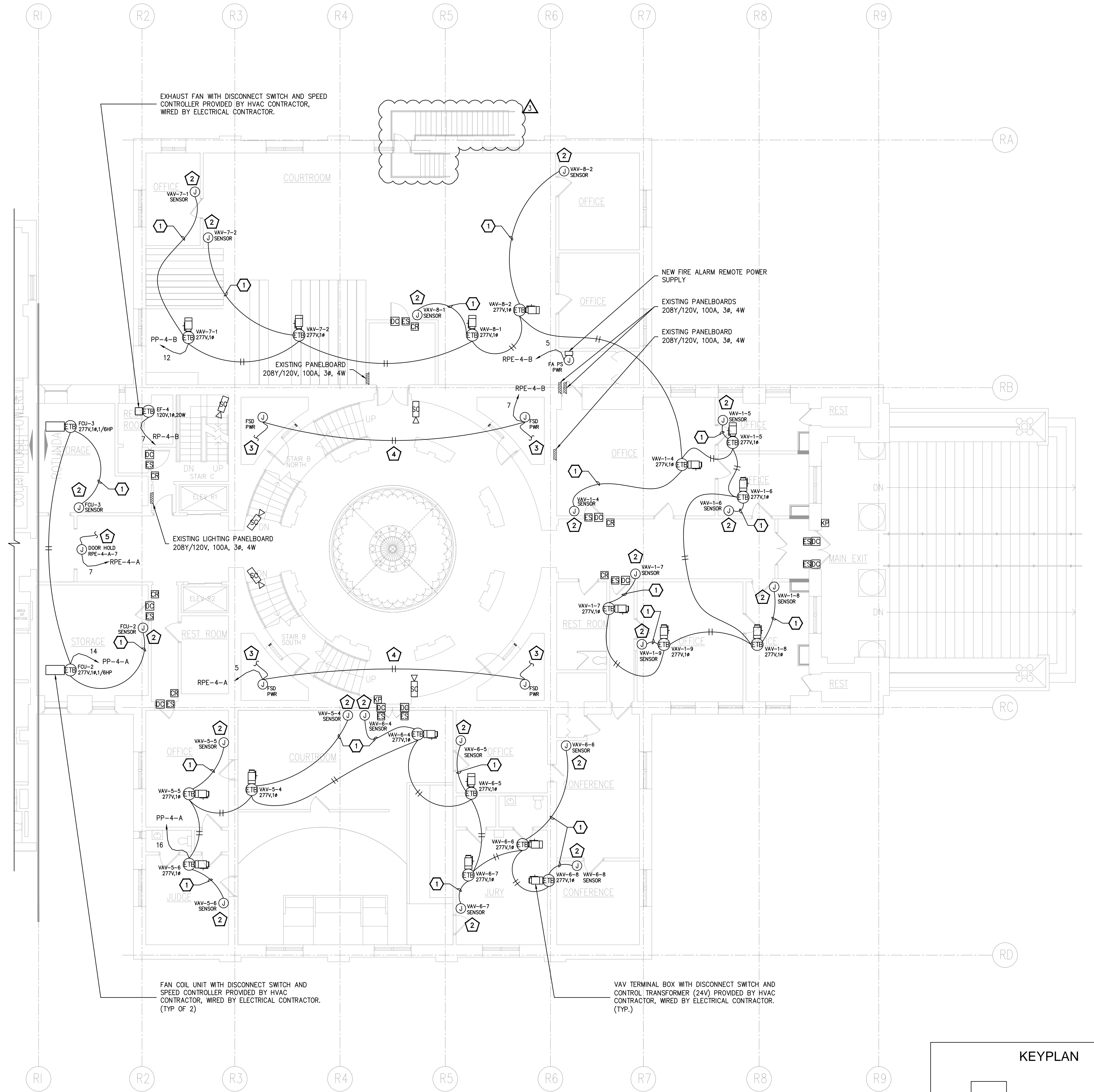
- ① PROVIDE LINE POWER FOR NEW AHU. COORDINATE FINAL MCA AND MOP REQUIREMENTS WITH MECHANICAL CONTRACTOR SELECTIONS.
- ② PROVIDE A ROUGH-IN JUNCTION BOX AND CONDUIT FOR EACH THERMOSTAT/SENSOR UNIT AS REQUIRED. VERIFY FINAL PROVISIONS AND EQUIPMENT LOCATIONS WITH THE APPLICABLE TRADE CONTRACTOR(S) AS REQUIRED.
- ③ PROVIDE EMERGENCY CIRCUIT FOR FIRE SMOKE DAMPERS. FEED FROM INDICATED PANEL WITH A BREAKER EQUIPPED WITH A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULES FOR OTHER REQUIREMENTS. COORDINATE QUANTITY OF DAMPERS WITH HVAC AND FIRE ALARM PLANS.
- ④ PRIOR TO COMMENCING ANY INSTALLATION WORK INSIDE THE COURTHOUSE ROTUNDA, OBTAIN APPROVAL FROM THE ARCHITECT AND OWNER OF THE PROPOSED CONDUIT ROUTING AND DEVICE INSTALLATION AND ENSURE COMPLIANCE WITH THE REGISTERED NJ HISTORIC PRESERVATION OFFICE FOR THE SPACE.
- ⑤ PROVIDE EMERGENCY CIRCUIT FOR MAGNETIC LOCK DOOR HOLDERS. FEED FROM INDICATED PANEL WITH A BREAKER EQUIPPED WITH A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULES FOR OTHER REQUIREMENTS. COORDINATE QUANTITY OF DEVICES WITH FIRE ALARM PLANS.

CABLE AND CONDUIT:

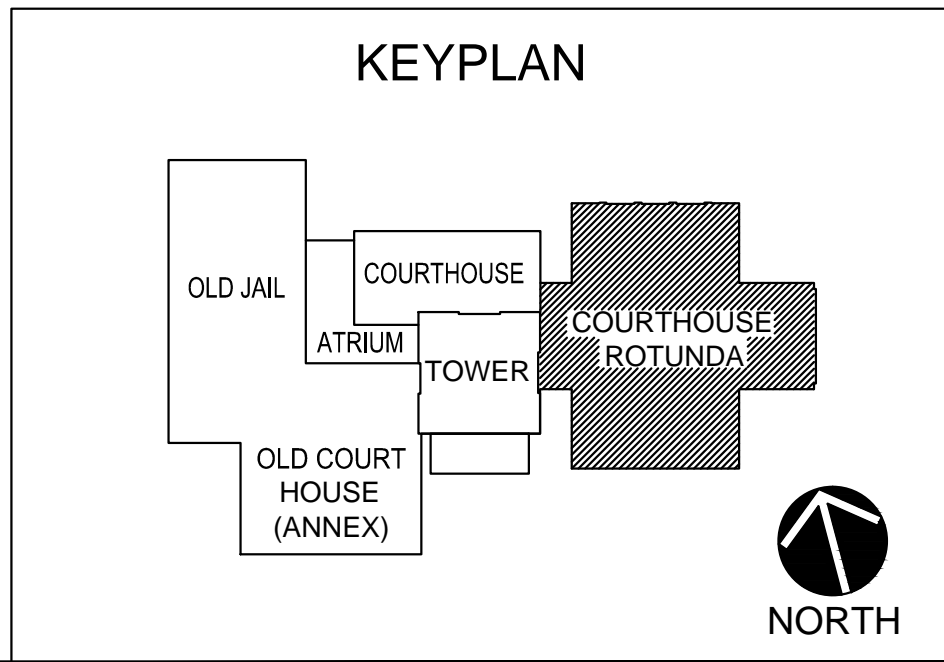
- ① 3/4" C AND DRAGLINE (CONDUIT ONLY)

DRAWING NOTES:

- 1. CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
- 2. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
- 3. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
- 4. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
- 5. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
- 6. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
- 7. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
- 8. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
- 9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
- 10. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS MARKED ACCORDINGLY.
- 11. PROVIDE INSULATED GROUNDING CONDUCTORS AS REQUIRED FOR ALL EQUIPMENT, LIGHTING FIXTURES, AND RECEPTACLES ETC. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN IN ALL ILLUSTRATED WIRING DESIGNATIONS.
- 12. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
- 13. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9 RESPECTIVELY.
- 14. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
- 15. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
- 16. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
- 17. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
- 18. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



FIRST FLOOR - POWER PLAN
SCALE: 1/8"=1'-0"



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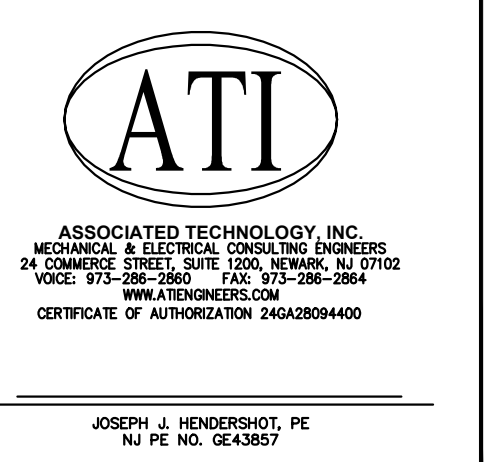
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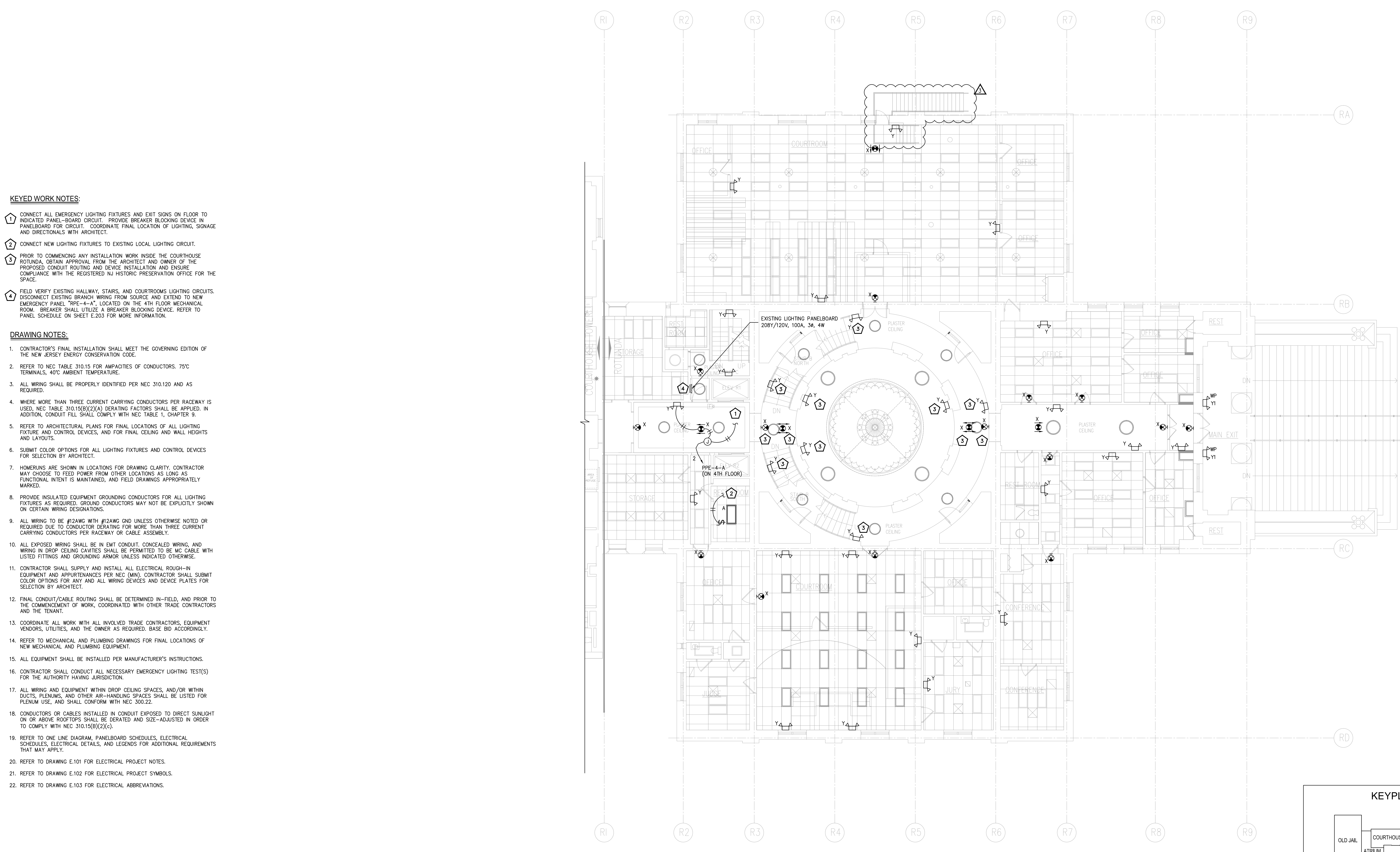
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - POWER PLAN FIRST FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
11.1.17	ADDENDUM#3	MC	FM					JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	E.301



KEYED WORK NOTES:

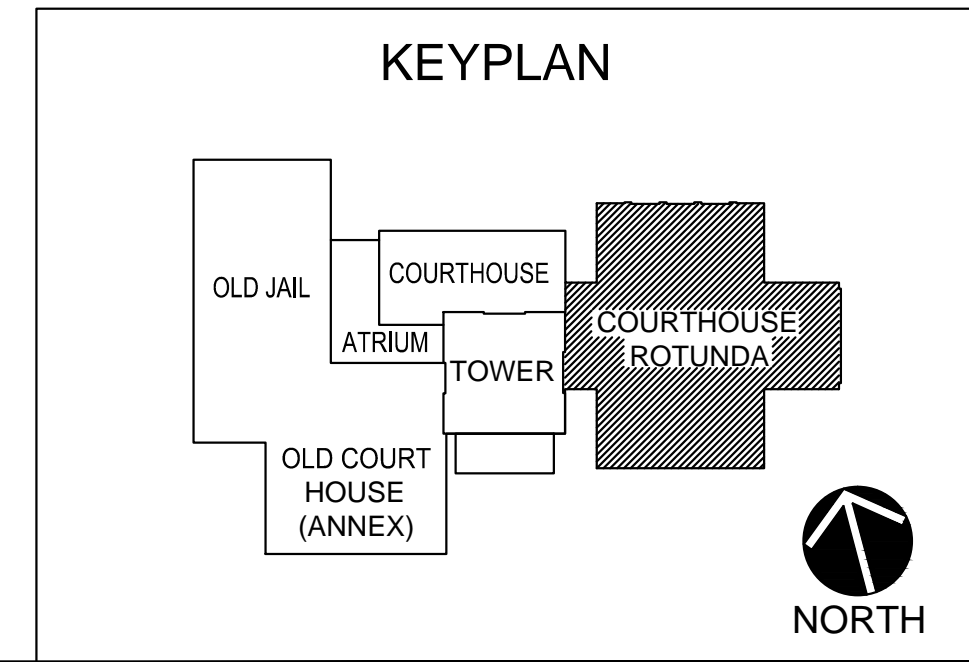
1. CONNECT ALL EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ON FLOOR TO INDICATED PANEL-BOARD CIRCUIT. PROVIDE BREAKER BLOCKING DEVICE IN PANELBOARD FOR CIRCUIT. COORDINATE FINAL LOCATION OF LIGHTING, SIGNAGE AND DIRECTIONALS WITH ARCHITECT.
2. CONNECT NEW LIGHTING FIXTURES TO EXISTING LOCAL LIGHTING CIRCUIT.
3. PRIOR TO COMMENCING ANY INSTALLATION WORK INSIDE THE COURTHOUSE ROTUNDA, OBTAIN APPROVAL FROM THE ARCHITECT AND OWNER OF THE PROPOSED CONDUIT ROUTING AND DEVICE INSTALLATION AND ENSURE COMPLIANCE WITH THE REGISTERED NJ HISTORIC PRESERVATION OFFICE FOR THE SPACE.
4. FIELD VERIFY EXISTING HALLWAY, STAIRS, AND COURTROOMS LIGHTING CIRCUITS. DISCONNECT EXISTING BRANCH WIRING FROM SOURCE AND EXTEND TO NEW EMERGENCY PANEL "RPE-4-A", LOCATED ON THE 4TH FLOOR MECHANICAL ROOM. BREAKER SHALL UTILIZE A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULE ON SHEET E.203 FOR MORE INFORMATION.

DRAWING NOTES:

1. CONTRACTOR'S FINAL INSTALLATION SHALL MEET THE GOVERNING EDITION OF THE NEW JERSEY ENERGY CONSERVATION CODE.
2. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
3. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
4. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9.
5. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LIGHTING FIXTURE AND CONTROL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
6. SUBMIT COLOR OPTIONS FOR ALL LIGHTING FIXTURES AND CONTROL DEVICES FOR SELECTION BY ARCHITECT.
7. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS APPROPRIATELY MARKED.
8. PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTORS FOR ALL LIGHTING FIXTURES AS REQUIRED. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN ON CERTAIN WIRING DESIGNATIONS.
9. ALL WIRING TO BE #12AWG WITH #12AWG GND UNLESS OTHERWISE NOTED OR REQUIRED DUE TO CONDUCTOR DERATING FOR MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY OR CABLE ASSEMBLY.
10. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
11. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MN). CONTRACTOR SHALL SUBMIT COLOR OPTIONS FOR ANY AND ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
12. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE TENANT.
13. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
14. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR FINAL LOCATIONS OF NEW MECHANICAL AND PLUMBING EQUIPMENT.
15. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
16. CONTRACTOR SHALL CONDUCT ALL NECESSARY EMERGENCY LIGHTING TEST(S) FOR THE AUTHORITY HAVING JURISDICTION.
17. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PREMIUM USE, AND SHALL CONFORM WITH NEC 300.22.
18. CONDUCTORS OR CABLES INSTALLED IN CONDUIT EXPOSED TO DIRECT SUNLIGHT ON OR ABOVE ROOFTOPS SHALL BE DERATED AND SIZE-ADJUSTED IN ORDER TO COMPLY WITH NEC 310.15(B)(2)(c).
19. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS, AND LEGENDS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
20. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
21. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
22. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.

FIRST FLOOR – LIGHTING PLAN

SCALE: 1/8"=1'-0"



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LAURENCE K. UHER, AIA, LEED, AP
 NJ License No. AI 14394



PROJECT:

**UC COURTHOUSE
 FIRE SUPPRESSION (ROTUNDA)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**ELECTRICAL - LIGHTING PLAN
 FIRST FLOOR**

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
11.1.17	ADDENDUM#3	MC	FM					JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

E.401

GENERAL PLUMBING NOTES:

- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE NATIONAL STANDARD PLUMBING CODE (NSPC), NEW JERSEY UNIFORM CONSTRUCTION CODE, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
- PROVIDE A COMPLETE OPERABLE SYSTEM INSTALLED IN A WORKMANLIKE MANNER. OUTLINE DESCRIPTION AND EQUIPMENT DOES NOT LIMIT CONTRACTOR'S LIABILITY FOR THE INSTALLATION OF A COMPLETE OPERABLE SYSTEM.
- CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
- CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
- CONTRACTOR SHALL NOT FASTEN ANY EQUIPMENT AND MATERIAL FROM ROOF DECKING. CONTRACTOR SHALL SUPPORT EQUIPMENT AND MATERIAL FROM BEAMS. IF NECESSARY, CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT STEEL ON METAL TO ATTACH TO BEAMS.
- FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
- THE WORK INDICATED ON THESE DRAWINGS IS DIAGRAMMATIC AND IS INTENDED TO SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND DESIGN INTENT. CONTRACTOR MAY MAKE FIELD CHANGES TO THE DESIGN DOCUMENTS ONLY WHEN REQUESTING AND RECEIVING APPROVAL FROM THE ENGINEER. CONTRACTOR FIELD CHANGES SHALL NOT RESULT IN ANY ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL WARRANT ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
- CONTRACTOR SHALL PROVIDE PROTECTION FOR THE OWNER AND CONSTRUCTION WORKERS IN AND AROUND THE CONSTRUCTION AREA. ADEQUATE BARRIERS SHALL BE PROVIDED TO EXERCISE CONTROL OF SAFE INGRESS AND EGRESS OF PREMISES. FIRE EXITS SHALL AT NO TIME BE BLOCKED.
- ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
- CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
- WHERE INFORMATION IN DIFFERENT PARTS OF THE CONTRACT DOCUMENTS ARE INTERPRETED BY THE CONTRACTOR TO BE DUPLICATED, THE CONTRACTOR SHALL OBTAIN A WRITTEN APPROVAL OF HIS INTERPRETATION FROM THE ENGINEER BEFORE DELETING THE SCOPE OR WORK HE INTERPRETS AS BEING A DUPLICATION. IN THE ABSENCE OF SUCH WRITTEN APPROVAL, THE CONTRACTOR SHALL NOT EXCLUDE ANY ITEM SHOWN IN DIFFERENT PARTS OF THE CONTRACT, FOR EITHER CONTRACTOR'S INTERPRETATION OF DUPLICATION OR CONSTRUCTION AS INDICATED ABOVE. THE OWNER'S DETERMINATION SHALL BE FINAL AND SHALL NOT ENTITLE THE CONTRACTOR TO ANY ADDITIONAL COMPENSATION.
- THE CONTRACTOR SHALL PROVIDE NEW PLUMBING FIXTURES, PIPING, INSULATION, VALVES, AND APPURTENANCES AS SHOWN ON THE DRAWINGS AND AS REQUIRED FOR A COMPLETE WORKING SYSTEM.
- DURING CONSTRUCTION ALL OPEN ENDS OF EXISTING PIPING SHALL BE PLUGGED AND CAPPED WITH PLASTIC OR METAL CAPS TO KEEP DIRT OUT OF THE SYSTEM.
- NO DEAD ENDS SHALL BE LEFT ON ANY DRAINAGE PIPING UPON COMPLETION OF WORK.
- NEW SHUT-OFF VALVES SHALL BE PROVIDED AS REQUIRED TO ISOLATE DIFFERENT AREAS OF THE PLUMBING VALVES AS REQUIRED FOR IMPLEMENTATION OF PROJECT SCOPE.
- VENT PIPE SHALL BE GRADED TO DRAIN OUT ALL MOISTURE AND PREVENT SCALE ACCUMULATION.
- ALL VALVES AND SPECIALTIES SHALL BE SO PLACED AS TO PERMIT EASY OPERATION AND ACCESS.
- THE CONTRACTOR SHALL INSULATE ALL HOT AND COLD DOMESTIC WATER PIPING AFTER TESTING THE SYSTEM.
- BEFORE BEING PLACED INTO SERVICE ALL POTABLE WATER PIPING SHALL BE CLEANED, FLUSHED, AND DISINFECTED.
- ALL ACOUSTIC CEILING MATERIALS DISTURBED BY THIS CONSTRUCTION SHALL BE REPLACED WITH NEW.
- WHEN THE NEW EQUIPMENT IS INSTALLED BY OTHERS, THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL NEW APPROPRIATE ROUGHING AND MAKING FINAL CONNECTIONS SUCH AS COLD WATER, HOT WATER, VENTS, GAS, ETC.
- INSTALL PIPE TO UNIFORM PITCHES BETWEEN POINTS FOR WHICH ELEVATIONS ARE ESTABLISHED OR SHALL BE VERIFIED BY USE OF LEVEL OR OTHER APPROVED METHOD. PIPE INVERT SHALL BE ADJUSTED BY THE ADDITION OR SUBTRACTION OF FILL BEDDING AND NOT BY WEDGING OR BLOCKING.
- ALL BRACKETS, PLATES, CHANNELS, ETC. SHALL BE GALVANIZED UNLESS OTHERWISE NOTED.
- PROVIDE DRAIN CLEANOUTS ON ALL DRAIN LINES SHOWN ON DRAWINGS AND AS REQUIRED BY LOCAL JURISDICTION.
- PROVIDE VALVED AND CAPPED CONNECTIONS AT ALL LOW POINTS IN PIPING SYSTEMS REQUIRED FOR DRAINING SYSTEM.
- ALL WATER PIPES LOCATED OUTSIDE THE HEATED STRUCTURE, LESS THAN 4' BELOW GRADE, AND/OR SUBJECT TO FREEZING SHALL BE INSULATED AND HEAT TRACED. COORDINATE REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
- ALL GALVANIZED PARTS SHALL BE PAINTED BY THE PLUMBING CONTRACTOR.
- CHANGES IN DIRECTION IN DRAINAGE PIPING SHALL BE MADE WITH APPROPRIATE USE OF 45° WYES, LONG SNEEPS, QUARTER, SIXTH, EIGHTH, OR SIXTEENTH BENDS.
- BELOW GROUND SANITARY PIPING SHALL BE EXTRA HEAVY CAST IRON PIPE. ABOVE GROUND, SANITARY, AND VENT PIPING SHALL BE FABRICATED WITH STANDARD WEIGHT CAST IRON NO HUB PIPE WITH NEOPRENE GASKETS AND STAINLESS STEEL CLAMP-AND-SHIELD ASSEMBLIES.

PLUMBING PHASING NOTES:

- CONTRACTOR SHALL PROVIDE CONSTRUCTION PHASING AS REQUIRED IN ACCORDANCE WITH PHASING PLAN DEVELOPED BY THE CONSTRUCTION MANAGER AND ARCHITECT. REFER TO RELEVANT DOCUMENTATION REQUIRED AS PART OF THIS PROJECT APPROACH AND BASE BID ACCORDINGLY.
- PROVIDE ALL PIPING, PENETRATIONS, SUPPORTS, FIRE STOPPING, VALVES, ETC. AS REQUIRED TO ACHIEVE THE PROJECT PHASING. PROVIDE ALL CONTROLS AND FIRE ALARM INTERCONNECTION WORK REQUIRED TO ACHIEVE DESIGN SEQUENCES FOR INDIVIDUAL COMPONENTS IN PHASE TO BE COMPLETED. WORK SHALL INCLUDE ANY TEMPORARY POWER AND CONTROL CIRCUITING.
- COORDINATE ALL PHASING WITH OWNER'S CONSTRUCTION MANAGER, COUNTY FACILITIES GROUPS, AND ARCHITECT.
- PROJECT PHASING SHALL NOT DISTURB THE NORMAL OPERATIONS OF THE BUILDING. COORDINATE OUT OF HOURS WORK AS REQUIRED TO MAINTAIN OPERATIONS.
- ANY TESTING OR MUNICIPAL APPROVALS REQUIRED FOR PHASED WORK IN ORDER TO PROCEED TO THE NEXT PHASE OF WORK SHALL BE INCLUDED IN THE COST FOR PHASING.

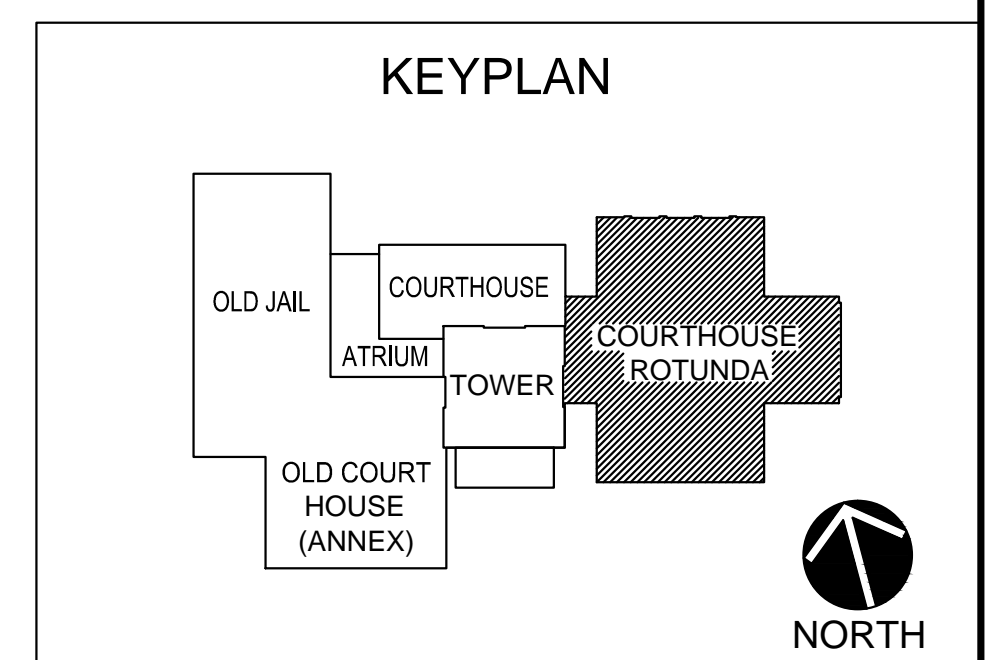
PLUMBING SPECIFICATION NOTES:

- CONTRACTOR SHALL NOTE THAT THE PROJECT DESIGN ALSO INCLUDES A BOOK SPECIFICATION. REFER TO ALL DIVISION 0 & 1 SECTIONS FOR GENERAL REQUIREMENTS AND DIVISION 22 FOR PLUMBING TECHNICAL REQUIREMENTS.
- CONTRACTOR SHALL COORDINATE WITH OTHER SPECIFICATION SECTIONS THAT AFFECT THE PLUMBING SCOPE OF WORK AND BASE BID ACCORDINGLY.

PLUMBING DEMOLITION NOTES:

- CONTRACTOR SHALL REMOVE ALL EXISTING PLUMBING SYSTEMS, PIPING, VALVES, CONTROL SYSTEMS, AND SUPPORTS ON THE PROJECT INCLUSIVELY TO THE POINT OF CONNECTION ON THE RISER STACKS. PLUMBING SYSTEMS SHALL BE DEFINED AS WASTE, DOMESTIC WATER, VENT, AND GAS PIPING. ALL DEMOLISHED EQUIPMENT SHALL BE REMOVED OFFSITE AND DISPOSED OF IN A SAFE AND LAWFUL MANNER.
- CONTRACTOR SHALL VISIT THE SITE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AS WELL AS THE MEANS AND METHODS OF THE WORK. FAILURE TO DO SO WILL NOT QUALIFY FOR LATER CLAIMS DUE TO THE SCOPE OF WORK REQUIRED.
- PROTECT ALL EXISTING SPACES AND SURFACES WHILE PERFORMING THE CONTRACT SCOPE OF WORK. CONTRACTOR SHALL PATCH, PAINT, AND REPAIR ANY EXISTING OR NEW SURFACES DAMAGED DURING THE COURSE OF WORK TO THE EXISTING CONDITIONS OR BETTER.
- CONTRACTOR SHALL CAP EXISTING PIPES NOT TO BE DEMOLISHED FLUSH WITH EXISTING SURFACES. SEAL OPENING AIR TIGHT.
- REMOVE GAS PIPING CONNECTION FROM HVAC EQUIPMENT AND KITCHEN EQUIPMENT (IF REQUIRED) BACK TO METER TO FACILITATE DEMOLITION OF EQUIPMENT BY OTHER TRADES. COORDINATE WITH OTHER TRADES.
- COORDINATE ALL DEMOLITION WORK WITH THE GENERAL CONTRACTOR OR OWNER'S REPRESENTATIVE BEFORE PROCEEDING WITH WORK.

3



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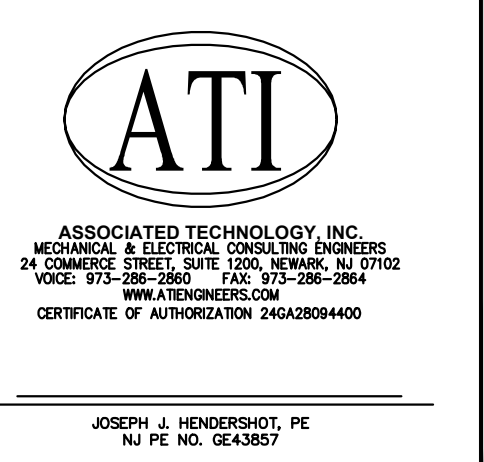
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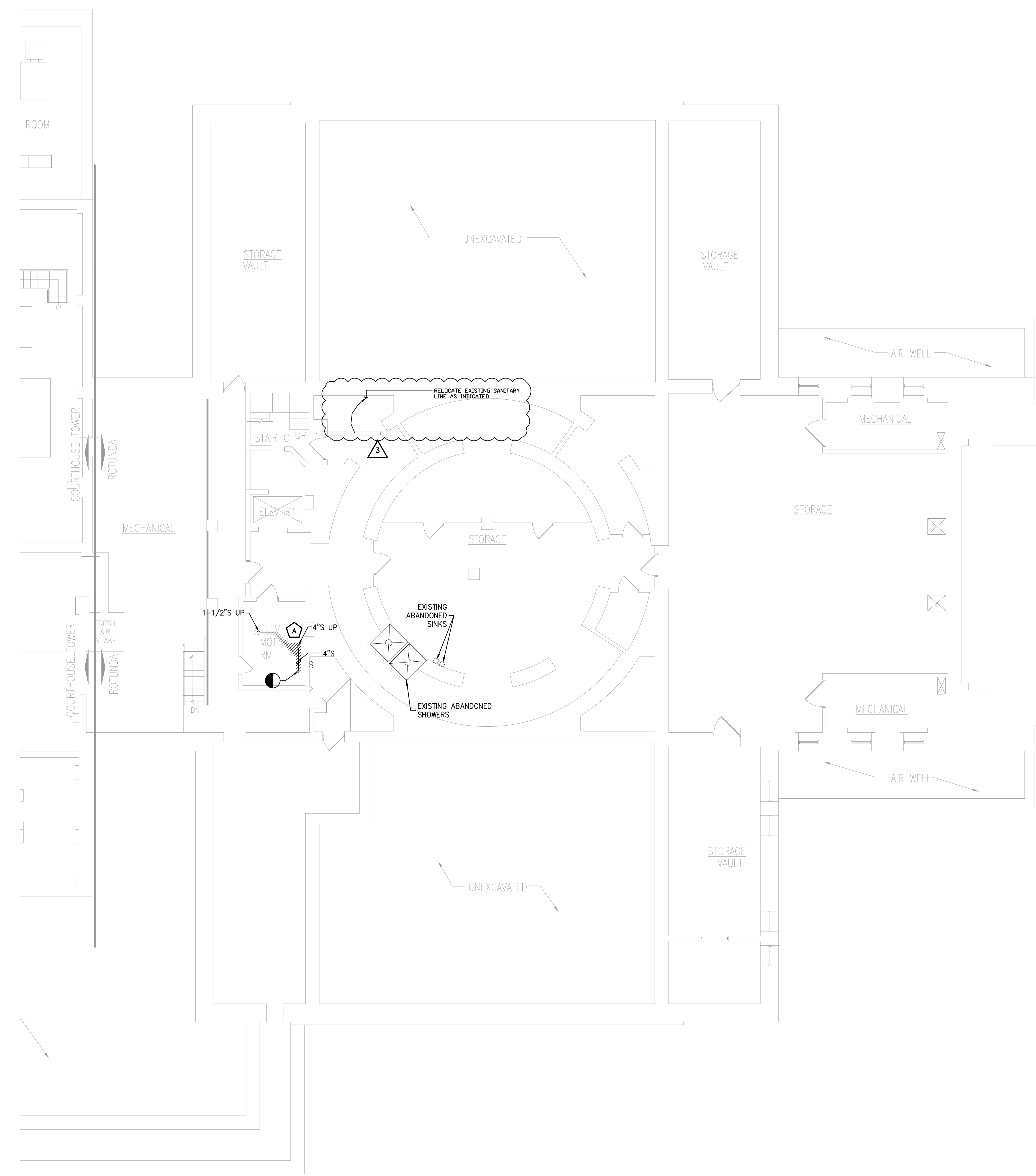
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PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
PLUMBING GENERAL NOTES

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
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								SHEET:	_ OF:
								DWG. NO	P.101



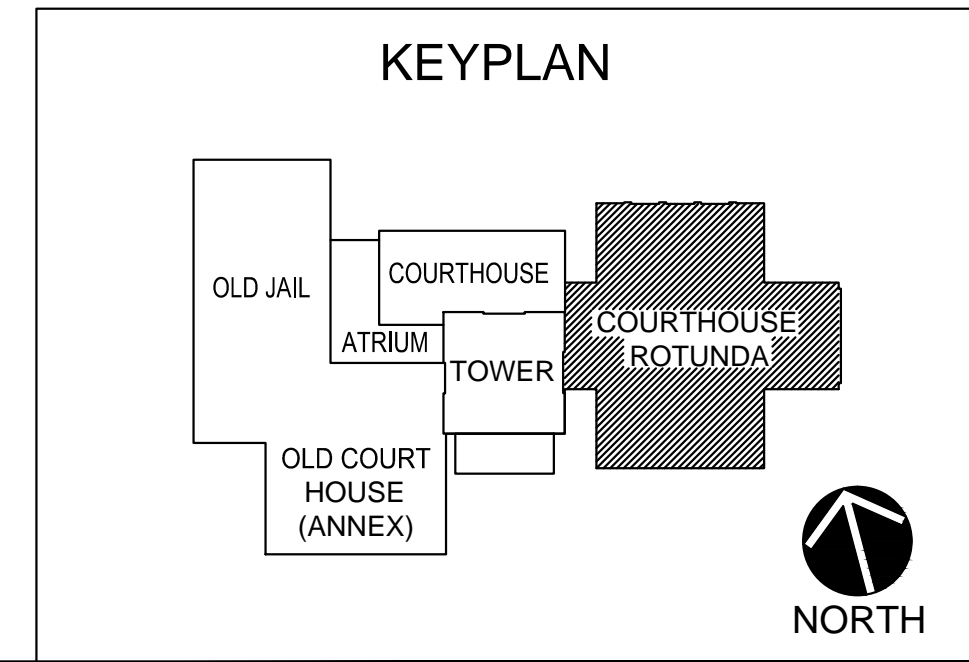
KEYED DEMOLITION WORK NOTES:

△ REMOVE EXISTING 4" S AND 1-1/2" LINES SERVING PLUMBING FIXTURES ON THE GROUND FLOOR ABOVE.

DRAWING NOTES:

1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.

DEMOLITION PLAN - BASEMENT
SCALE: 1/8"=1'-0"



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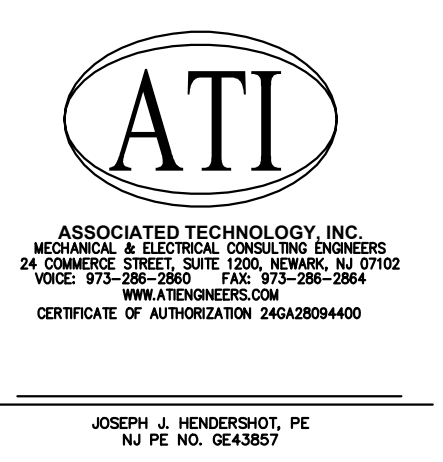
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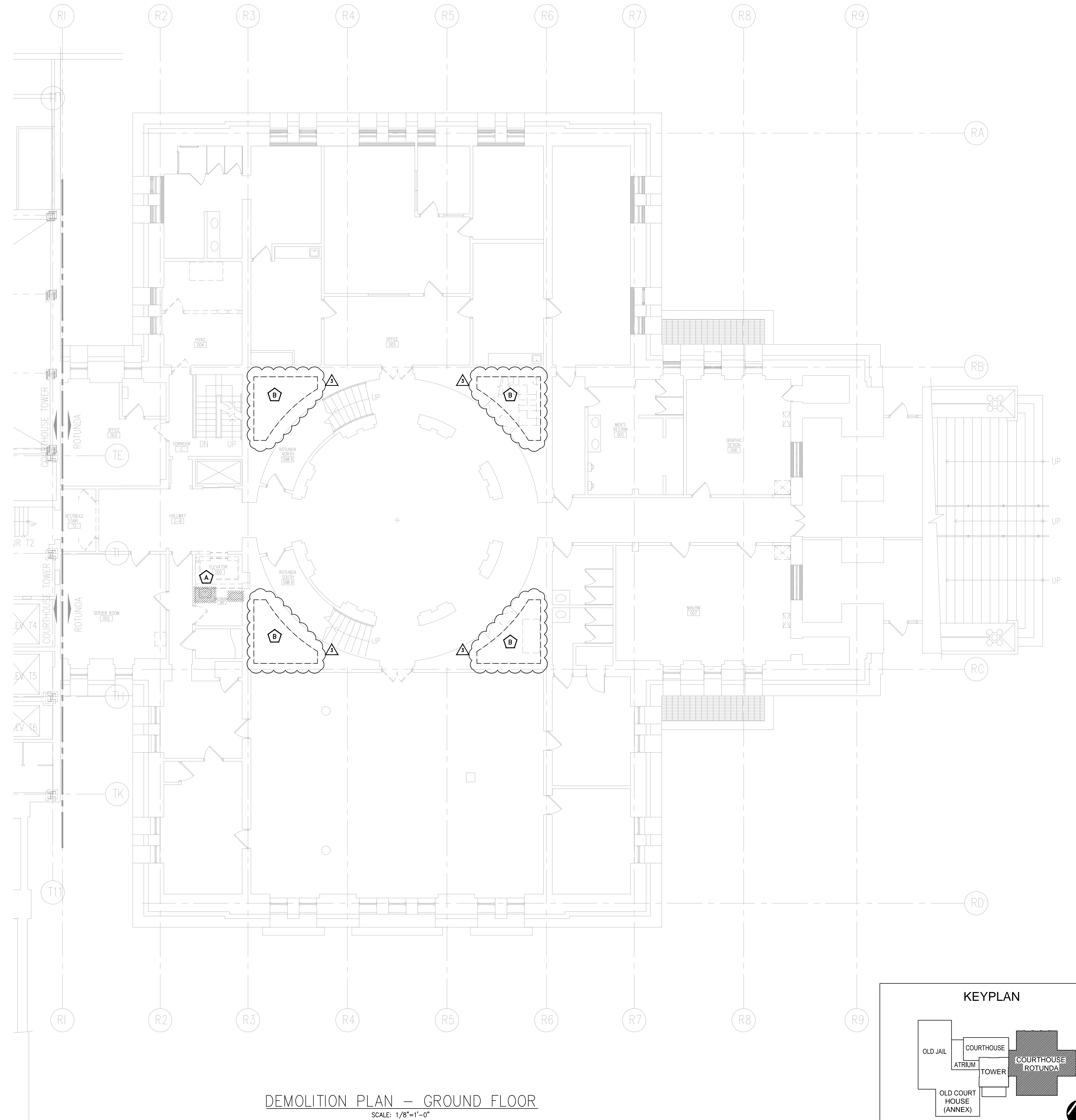


PROJECT:
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

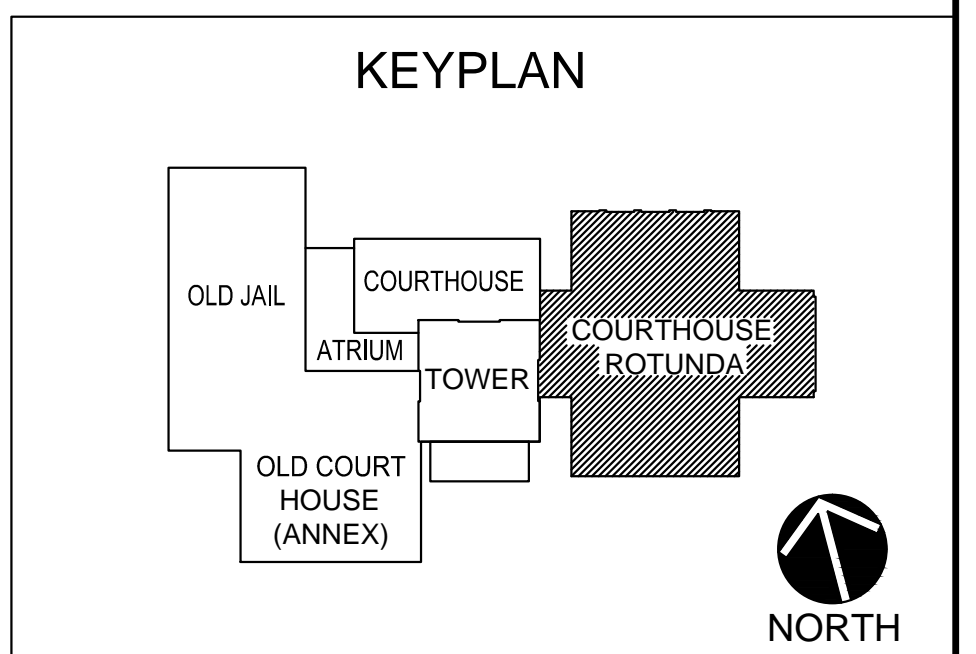
SHEET CONTENTS:
**PLUMBING - DEMOLITION PIPING PLAN
BASEMENT**

SUBMISSIONS				REVISIONS				DATE	09-25-15
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9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
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11.1.17	ADDENDUM #3	MC	FM					JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

DP.300B



DEMOLITION PLAN - GROUND FLOOR
SCALE: 1/8"=1'-0"



KEYED DEMOLITION WORK NOTES:

- A** REMOVE WATER CLOSET AND LAVATORY. MODIFY SANITARY, VENT, CW & HW PIPING TO ACCOMMODATE NEW ELEVATOR CMU WALL AND LOCATIONS OF NEW WATER CLOSET AND LAVATORY. SEE DWG. P-300G.
- B** CONTRACTOR SHALL RELOCATE EXISTING PLUMBING PIPING AS REQUIRED TO FACILITATE NEW EQUIPMENT INSTALLATION AND ARCHITECTURAL RENOVATIONS.

DRAWING NOTES:

1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.

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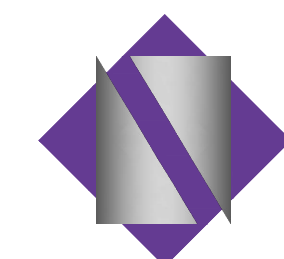
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NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING BUSINESS
24 CLAMPEL STREET, SUITE 200, MOUNTAIN SIDE, NJ 07093
VOICE: 973-379-2888 FAX: 973-379-2844
WWW.ATITECHNICAL.COM
CERTIFICATE OF AUTHORIZATION: 24A00000040

JOSEPH J. HENDERSON, PE
NJ PE NO. 963887



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAIN SIDE, NEW JERSEY 07092
TEL: 973-379-0081 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

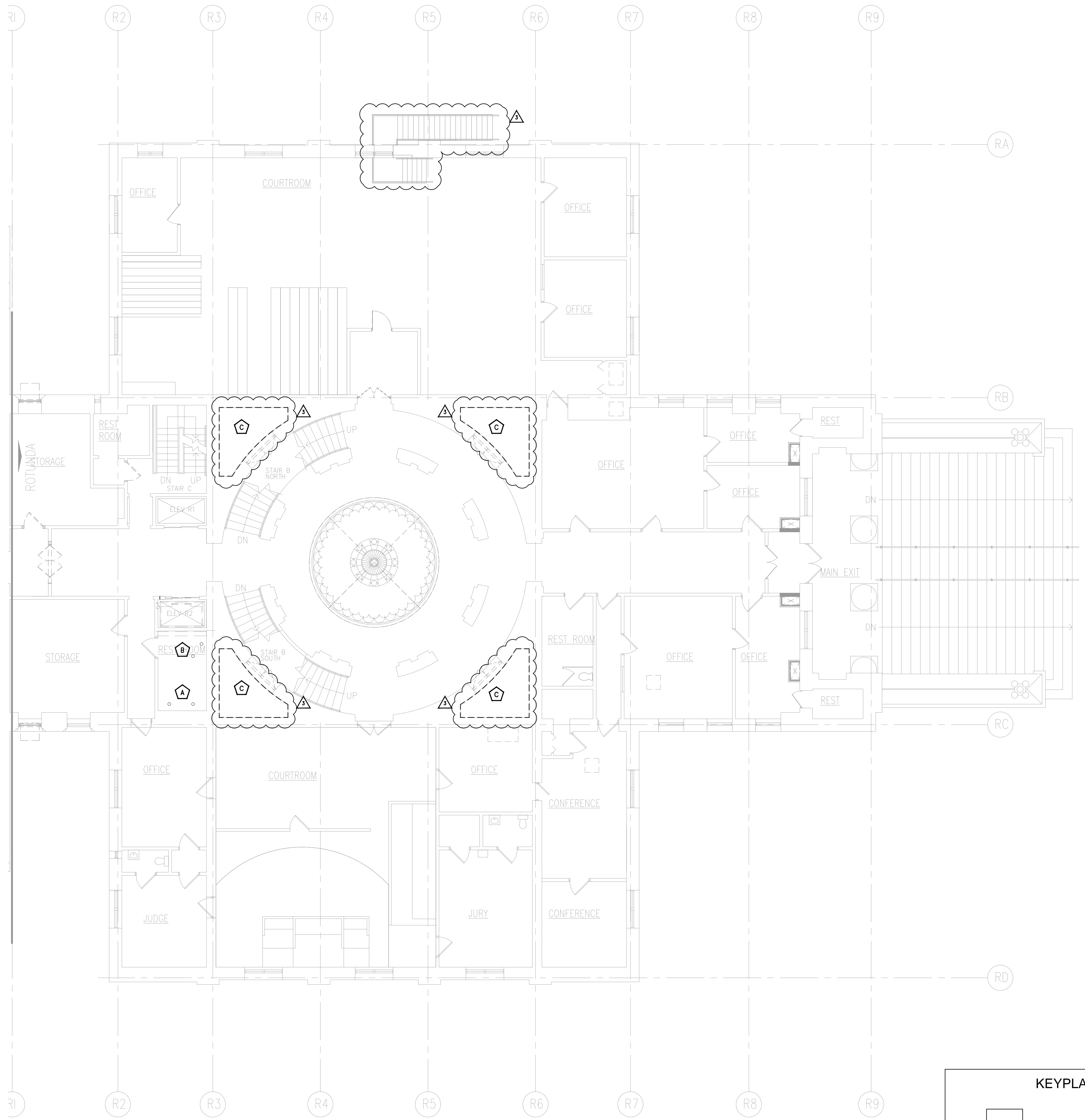
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**PLUMBING - DEMOLITION PIPING PLAN
GROUND FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
11.1.17	ADDENDUM #3	MC	FM					JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

DP.300G

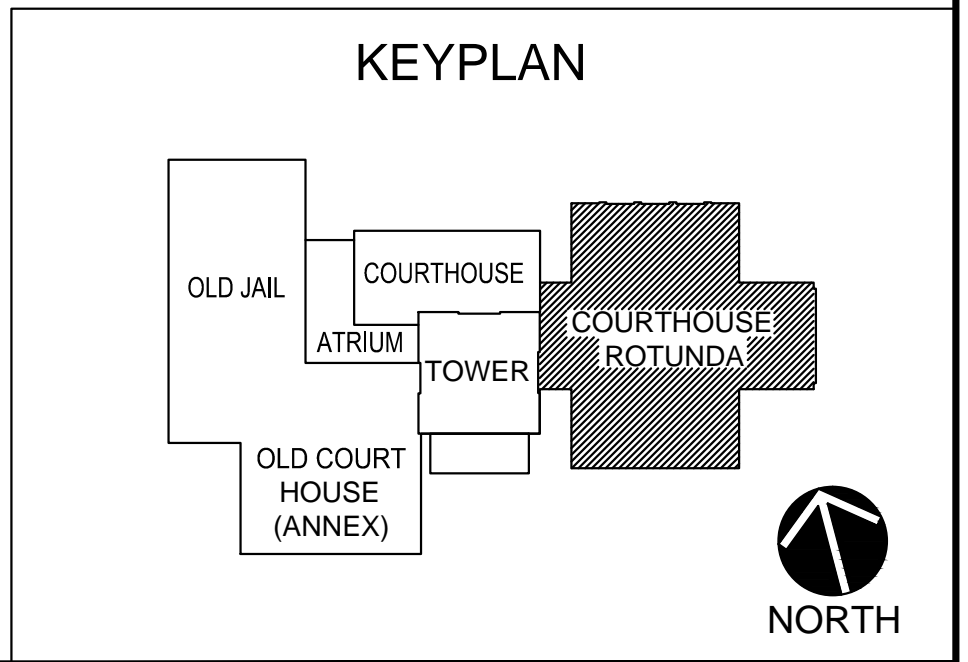


KEYED DEMOLITION WORK NOTES:

- A** EXISTING 4" SANITARY LINES UP TO WC.
- B** EXISTING 3" SANITARY UP TO FLOOR DRAIN & 2" SANITARY UP TO URINAL TO BE REMOVED AND PIPING MODIFIED TO ACCOMMODATE THE NEW ADA ELEVATOR INSTALLATION.
- C** CONTRACTOR SHALL RELOCATE EXISTING PLUMBING PIPING AS REQUIRED TO FACILITATE NEW EQUIPMENT INSTALLATION AND ARCHITECTURAL RENOVATIONS.

DRAWING NOTES:

- 1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.



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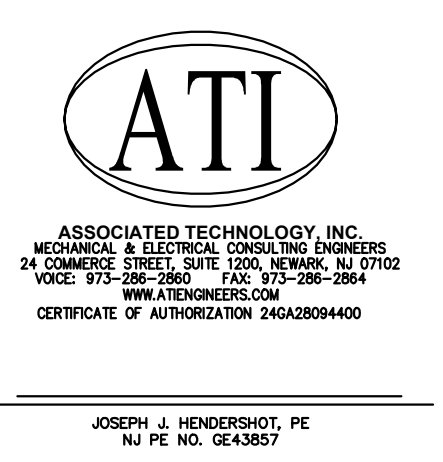
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LAURENCE K. UHER, AIA, LEED, AP
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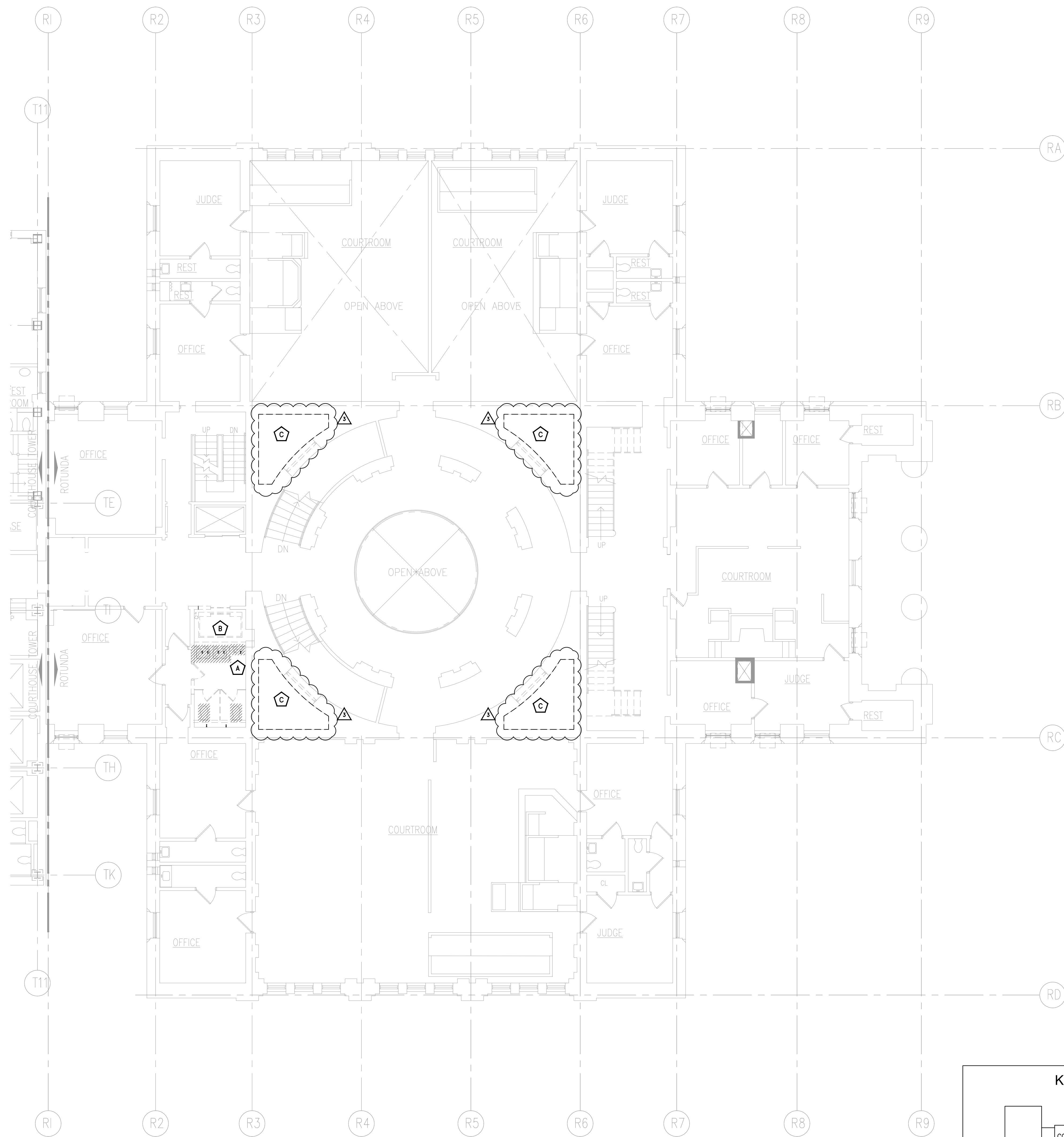


PROJECT: **UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**PLUMBING - DEMOLITION PIPING PLAN
FIRST FLOOR**

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
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								SHEET:	_ OF:
								DWG. NO	

DP.301

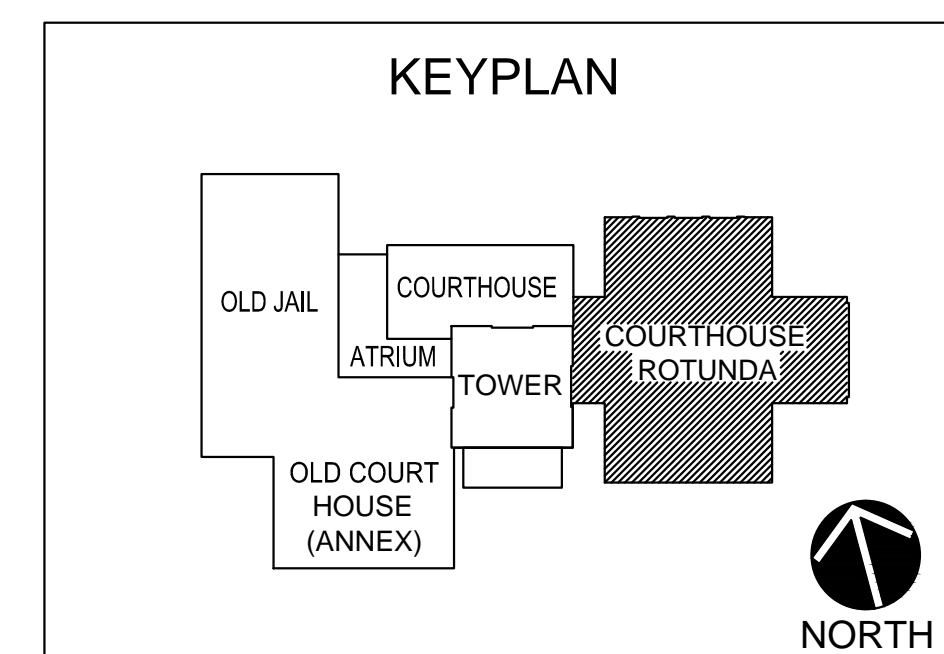


KEYED DEMOLITION WORK NOTES:

- A** REMOVE EXISTING PLUMBING FIXTURES, SUPPORTS AND CHAIR CARRIES. PREPARE SANITARY, VENT, CW & HW PIPING FOR CONNECTIONS TO NEW FIXTURES. SEE DWG P.302 FOR NEW WORK.
- B** REMOVE SANITARY, VENT, CW & HW RISERS THAT WILL INTERFERE WITH THE INSTALLATION OF THE PROPOSED ELEVATOR. SEE DWG P.302 FOR NEW WORK.
- C** CONTRACTOR SHALL RELOCATE EXISTING PLUMBING PIPING AS REQUIRED TO FACILITATE NEW EQUIPMENT INSTALLATION AND ARCHITECTURAL RENOVATIONS.

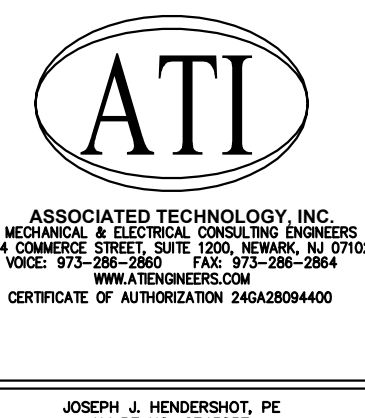
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 NJ License No. AI 16160
 LAURENCE K. UHER, AIA, LEED, AP
 NJ License No. AI 14394



PROJECT:

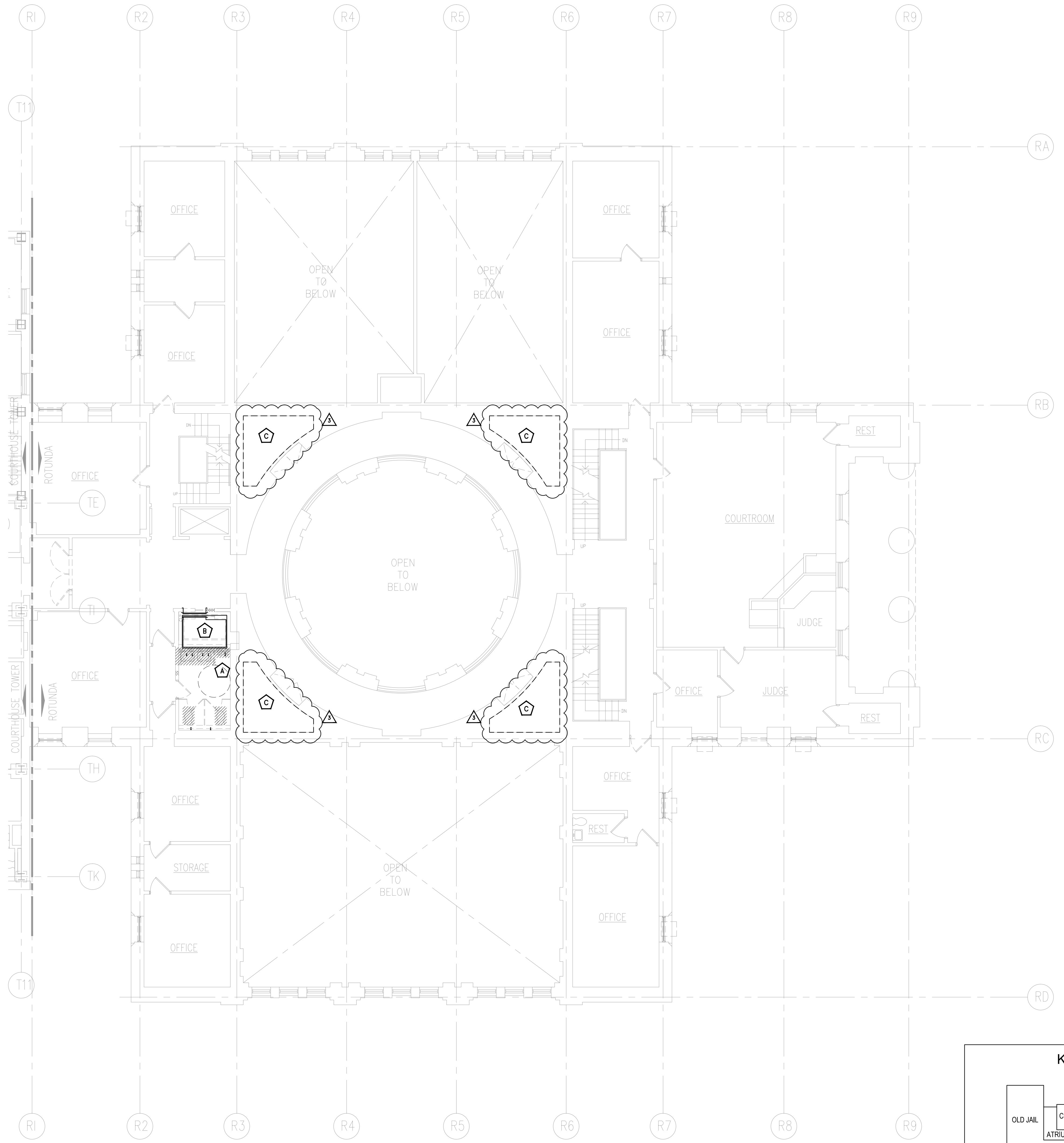
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SHEET CONTENTS:

PLUMBING - DEMOLITION PIPING PLAN
 SECOND FLOOR

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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11.1.17	ADDENDUM #3	MC	FM						JOB NO 2141152
									SHEET: _ OF:
									DWG. NO

DP.302

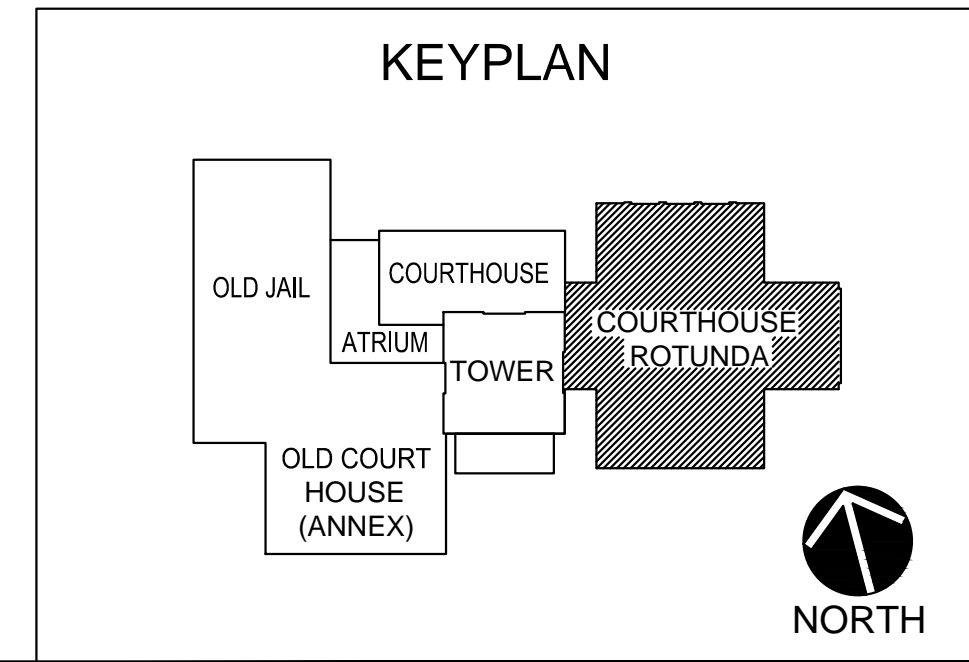


KEYED DEMOLITION WORK NOTES:

- A** REMOVE EXISTING PLUMBING FIXTURES, SUPPORTS AND CHAIR CARRIES. PREPARE SANITARY, VENT, CW & HW PIPING FOR CONNECTIONS TO NEW FIXTURES. SEE DWG P.302 FOR NEW WORK.
- B** REMOVE SANITARY, VENT, CW & HW RISERS THAT WILL INTERFERE WITH THE INSTALLATION OF THE PROPOSED ELEVATOR. SEE DWG P.302 FOR NEW WORK.
- C** CONTRACTOR SHALL RELOCATE EXISTING PLUMBING PIPING AS REQUIRED TO FACILITATE NEW EQUIPMENT INSTALLATION AND ARCHITECTURAL RENOVATIONS.

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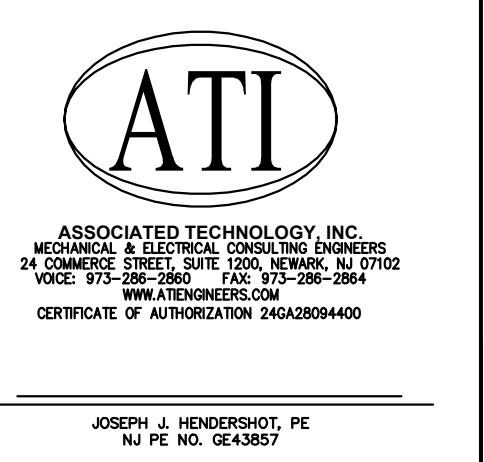
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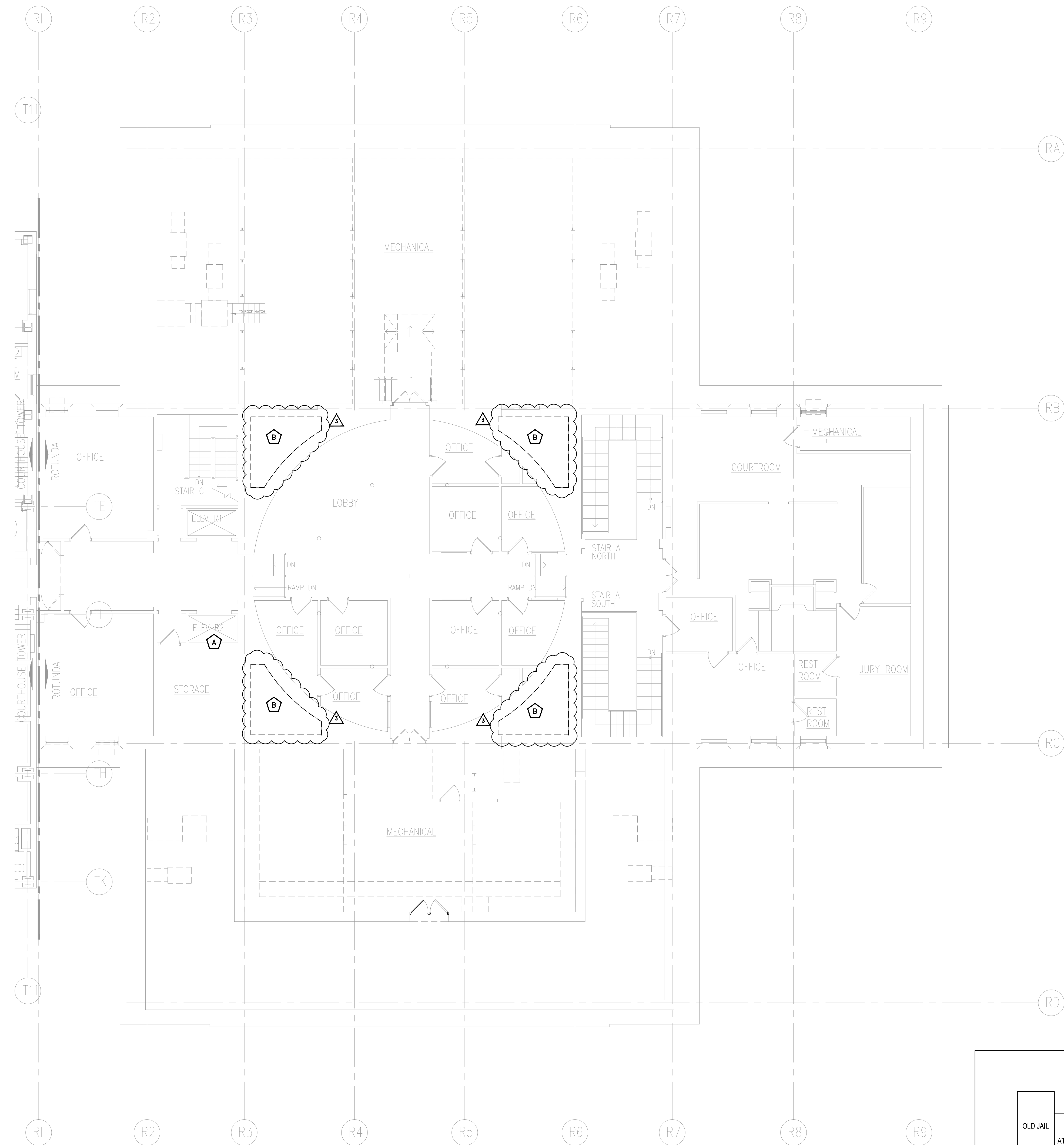


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
PLUMBING - DEMOLITION PIPING PLAN
THIRD FLOOR

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
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								SHEET:	_ OF:
								DWG. NO	

DP.303

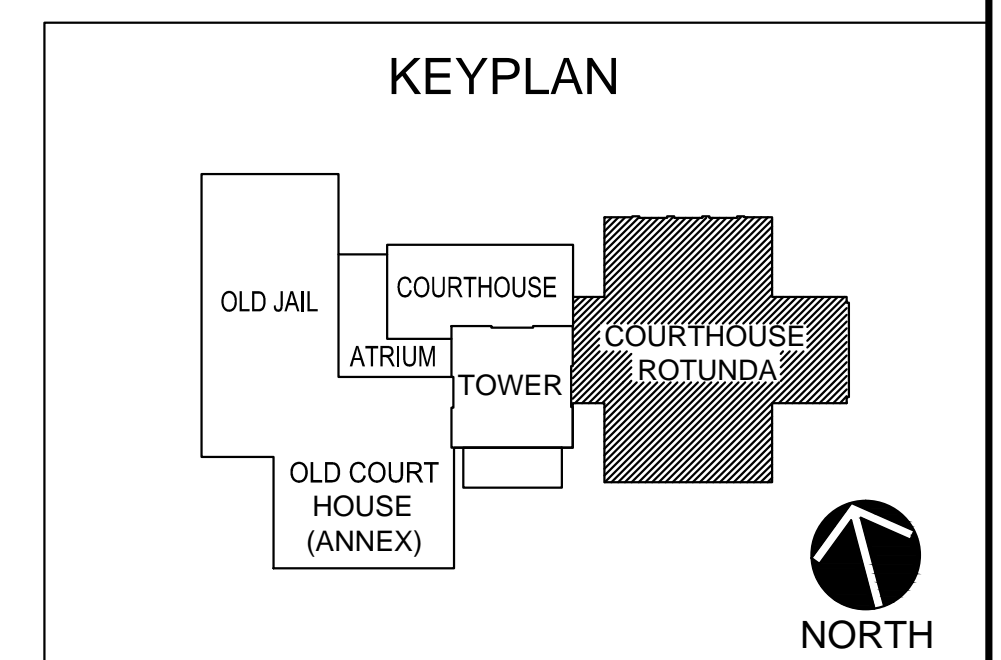


KEYED DEMOLITION WORK NOTES:

- A** REMOVE VENT PIPING THAT WILL INTERFERE WITH THE INSTALLATION OF THE PROPOSED ELEVATOR. SEE DWG P.302 FOR NEW WORK.
- B** CONTRACTOR SHALL RELOCATE EXISTING PLUMBING PIPING AS REQUIRED TO FACILITATE NEW EQUIPMENT INSTALLATION AND ARCHITECTURAL RENOVATIONS.

DRAWING NOTES:

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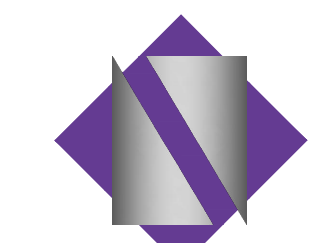
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NJ License No. AI 14394

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ASSOCIATED TECHNOLOGY INC.
MECHANICAL & ELECTRICAL ENGINEERING
24 CLAMORE STREET, SUITE 200, MOUNTAIN SIDE, NJ 07093
PHONE: 973-279-2800 FAX: 973-279-2844
WWW.ATITECHNOLOGY.COM

JOSEPH J. HENDERSON, PE
NJ PE NO. 363087



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAIN SIDE, NEW JERSEY 07092
TEL: 973-279-0081 FAX: 973-279-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**PLUMBING - DEMOLITION PIPING PLAN
THIRD FLOOR**

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								DWG. NO	

DP.304

GENERAL FIRE PROTECTION NOTES:

- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE INTERNATIONAL FIRE CODE (IFC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), NEW JERSEY UNIFORM CONSTRUCTION CODE, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
- PROVIDE A COMPLETE OPERABLE SYSTEM INSTALLED IN A WORKMANLIKE MANNER. OUTLINE DESCRIPTION AND EQUIPMENT DOES NOT LIMIT CONTRACTOR'S LIABILITY FOR THE INSTALLATION OF A COMPLETE OPERABLE SYSTEM.
- CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
- CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
- CONTRACTOR SHALL NOT FASTEN ANY EQUIPMENT AND MATERIAL FROM ROOF DECKING. CONTRACTOR SHALL SUPPORT EQUIPMENT AND MATERIAL FROM BEAMS. IF NECESSARY, CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT STEEL ON METAL TO ATTACH TO BEAMS.
- FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
- THE WORK INDICATED ON THESE DRAWINGS IS DIAGRAMMATIC AND IS INTENDED TO SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND DESIGN INTENT. CONTRACTOR MAY MAKE FIELD CHANGES TO THE DESIGN DOCUMENTS ONLY WHEN REQUESTING AND RECEIVING APPROVAL FROM THE ENGINEER. CONTRACTOR FIELD CHANGES SHALL NOT RESULT IN ANY ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL WARRANT ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
- CONTRACTOR SHALL PROVIDE PROTECTION FOR THE OWNER AND CONSTRUCTION WORKERS IN AND AROUND THE CONSTRUCTION AREA. ADEQUATE BARRIERS SHALL BE PROVIDED TO EXERCISE CONTROL OF SAFE INGRESS AND EGRESS OF PREMISES. FIRE EXITS SHALL AT NO TIME BE BLOCKED.
- ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
- CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
- WHERE INFORMATION IN DIFFERENT PARTS OF THE CONTRACT DOCUMENTS ARE INTERPRETED BY THE CONTRACTOR TO BE DUPLICATED, THE CONTRACTOR SHALL OBTAIN A WRITTEN APPROVAL OF HIS INTERPRETATION FROM THE ENGINEER BEFORE DELETING THE SCOPE OR WORK HE INTERPRETS AS BEING A DUPLICATION. IN THE ABSENCE OF SUCH WRITTEN APPROVAL, THE CONTRACTOR SHALL NOT EXCLUDE ANY ITEM SHOWN IN DIFFERENT PARTS OF THE CONTRACT. FOR EITHER CONTRACTOR'S INTERPRETATION OF DUPLICATION OR CONTRADICTION AS INDICATED ABOVE, THE OWNER'S DETERMINATION SHALL BE FINAL AND SHALL NOT ENTITLE THE CONTRACTOR TO ANY ADDITIONAL COMPENSATION.
- FURNISH AND INSTALL FIRE PROTECTION SYSTEMS AS REQUIRED BY NFPA-13 FOR THE INSTALLATION OF SPRINKLER SYSTEMS, NFPA-14 FOR THE INSTALLATION OF STANDPIPE AND HOSE SYSTEMS, AND NFPA-25 STANDARD FOR THE INSPECTION, TESTING, AND MAINTENANCE OF WATER-BASE FIRE PROTECTION SYSTEMS.
- THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL FLOW, PRESSURE SWITCHES, ALARM VALVES. IN ADDITION, THIS CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR TO ENSURE THAT ALL THE EQUIPMENT PROVIDED IS COMPATIBLE AND MEETS REQUIREMENTS OF AVAILABLE SERVICES AND NATIONAL ELECTRICAL CODE.
- IN GENERAL, THE EXISTING SPRINKLER SYSTEM SHALL BE MODIFIED AS REQUIRED AND AS INDICATED ON THE PLANS. PROVIDE ALL ADDITIONAL PIPING, BRANCHES, SPRINKLER HEADS, DRAINS, INSPECTION CONNECTIONS AND ALL OTHER APPURTENANCES NECESSARY TO MAKE A COMPLETE WORKING FIRE PROTECTION SYSTEM.
- EXPOSED SPRINKLER PIPING SHALL BE INSTALLED TO CLEAR OBSTRUCTIONS SUCH AS LIGHTS, EQUIPMENT, STEEL BEAMS, ETC.
- THE EXISTING SYSTEM SHALL BE HYDRAULICALLY CALCULATED, TO ASSURE THE EXISTING PIPE SIZES WERE PROPERLY SIZED AND SIGNED AND SEALED BY A PROFESSIONAL ENGINEER WITH FIRE PROTECTION BACKGROUND AND REGISTERED IN THE STATE OF THE PROJECT.
- THE CONTRACTOR SHALL PROVIDE ALL NECESSARY FACILITIES, WATER OR COMPRESSED AIR, GAUGES, AND OTHER MEASURING DEVICES, PUMPS AND LABOR AS REQUIRED FOR TESTING.
- NEW SPRINKLER HEADS IN FINISHED AREAS WITH CEILINGS SHALL BE QUICK RESPONSE PENDANT HEADS. EXPOSED AREAS IN THE STAIRWELLS SHALL BE QUICK RESPONSE SIDE WALL OR UPRIGHT HEADS.
- SPRINKLERS AND FITTINGS SHALL BE UL LISTED AND FACTORY MUTUAL APPROVED.
- ALL PIPING SHALL BE LABELED IN COLOR CODE IN ACCORDANCE WITH APPLICABLE ANSI REQUIREMENTS. VALVE TAGS SHALL BE FURNISHED AND ATTACHED BY BRASS LINE CHAIN TO EACH VALVE. NUMBER AND LOCATIONS SHALL BE ACCURATELY MARKED ON THE OWNER'S SET OF RECORD DRAWINGS.
- SPRINKLER CONTRACTOR SHALL OBTAIN NEW WATERFLOW DATA (IN WRITING) PRIOR TO START OF DESIGN WORK. THE NEW TEST SHALL BE CONDUCTED ADJACENT TO THIS PROPERTY.
- ALL HYDRAULIC CALCULATIONS SHALL INCLUDE A MINIMUM "CUSHION" (GAP) OF 10% (OF EXISTING PSI AT REQUIRED FLOW) BETWEEN REQUIRED AND AVAILABLE WATER SUPPLY.
- AREA OF SPRINKLER OPERATION SELECTED FOR HYDRAULIC CALCULATION SHALL BE THE MINIMUMS LISTED BELOW AND THE MOST HYDRAULICALLY DEMANDING, AND CANNOT INCLUDE ANY UNSPRINKLERED AREAS.
- RESULTS OF EACH CALCULATION SHALL BE PLOTTED ON GRAPH, ALONG WITH WATER SUPPLY INFORMATION.
- HYDRAULIC SUMMARY DATA SHALL BE INCLUDED ON SHOP DRAWINGS, INCLUDING PSI & GPM REQUIRED AND PSI AVAILABLE AT REQUIRED GPM.
- USE OF LINE SPACING OFF WALL IN EXCESS OF 7'-6" (AS NOTED IN EXCEPTIONS IN NFPA 13) IS NOT PERMITTED.
- FINISHED CEILING AREAS TO HAVE CONCEALED PIPING AND SPRINKLER HEADS. SPRINKLER HEADS TO BE SYMMETRICAL AND LINE-UP WITH ADJACENT CEILING FIXTURES AND LIGHTS. SPRINKLER HEADS SHALL BE CENTERED IN TILES WHERE APPLICABLE.
- ALL WET PIPING SHALL BE BLACK STEEL. ALL EXPOSED PIPING IN PUBLIC SPACES SHALL BE PAINTED. CUSTOM COLOR TO BE SELECTED BY ARCHITECT.
- IF FIRE PUMP IS REQUIRED PROVIDE ALTERNATE BID TO INCLUDE ALL WORK TO INSTALL FIRE PUMP.
- SPRINKLER SYSTEMS SHALL BE HYDRAULICALLY CALCULATE BASED ON THE FOLLOWING CRITERIA.
- LOCATION OF SPRINKLER HEADS TO BE COORDINATED WITH ARCHITECT ANY HISTORICAL LOCATIONS.

HAZARD CLASS	HYDRAULIC DESIGN DENSITY	MAX. SPACING PER SPRINKLER HEAD	HOSE ALLOWANCE	SYSTEM TYPE
LIGHT OFFICES & PUBIC SPACES	0.10 GPM/SQ. FT. OVER THE MOST REMOTE 1500 SQ. FT.	225 SQ. FT.	250 GPM	WET AND DRY
ORDINARY STORAGE, EQUIPMENT ROOMS	0.15 GPM/SQ. FT. OVER THE MOST REMOTE 1500 SQ. FT.	130 SQ. FT.	250 GPM	WET AND DRY

NOTES:

- SPRINKLER SPACING AND PROTECTION AREA SHALL BE PER THE REQUIREMENTS OF NFPA 13 AND AUTHORITIES HAVING JURISDICTION.
- SPRINKLER HEADS SHALL BE LOCATED IN CENTER OF ACOUSTIC CEILING TILES WHERE POSSIBLE.
- RECESSED CONCEALED SPRINKLER HEADS SHALL BE RELIABLE MODEL FP WITH MODEL 64A COVER PLATE WITH OFF WHITE FINISH SPRINKLER HEAD TO HAVE WHITE POLYESTER COATED FINISH AND WHITE PAINTED ESCUTCHEON.
- UPRIGHT SPRINKLER HEADS SHALL BE RELIABLE MODEL FIFR
- RECESSED SIDE WALL EXTENDED COVERAGE SPRINKLER HEADS SHALL BE RELIABLE MODEL FIFR WITH EC-9HSW DEFLECTOR. FINISH TO BE OFF WHITE SATIN WITH OFF WHITE ESCUTCHEON.

FIRE PROTECTION PHASING NOTES:

- CONTRACTOR SHALL PROVIDE CONSTRUCTION PHASING AS REQUIRED IN ACCORDANCE WITH PHASING PLAN DEVELOPED BY THE CONSTRUCTION MANAGER AND ARCHITECT. REFER TO RELEVANT DOCUMENTATION REQUIRED AS PART OF THIS PROJECT APPROACH AND BASE BID ACCORDINGLY.
- PROVIDE ALL PENETRATIONS, SUPPORT, FIRE STOPPING, CONTROL VALVES, PIPING, FLOW AND TAMPER SWITCHES, RELAYS, BY-PASS ASSEMBLIES, ETC. AS REQUIRED TO ACHIEVE THE PROJECT PHASING. PROVIDE ALL CONTROLS AND FIRE ALARM INTERCONNECTION WORK REQUIRED FOR INDIVIDUAL COMPONENTS IN PHASE TO BE COMPLETED. WORK SHALL INCLUDE ANY TEMPORARY POWER AND CONTROL CIRCUITING.
- COORDINATE ALL PHASING WITH OWNER'S CONSTRUCTION MANAGER, COUNTY FACILITIES GROUPS, AND ARCHITECT.
- PROJECT PHASING SHALL NOT DISTURB THE NORMAL OPERATIONS OF THE BUILDING. COORDINATE OUT OF HOURS WORK AS REQUIRED TO MAINTAIN OPERATIONS.
- ANY TESTING OR MUNICIPAL APPROVALS REQUIRED FOR PHASED WORK IN ORDER TO PROCEED TO THE NEXT PHASE OF WORK SHALL BE INCLUDED IN THE COST FOR PHASING.

FIRE PROTECTION SPECIFICATION NOTES:

- CONTRACTOR SHALL NOTE THAT THE PROJECT DESIGN ALSO INCLUDES A BOOK SPECIFICATION. REFER TO ALL DIVISION 0 & 1 SECTIONS FOR GENERAL REQUIREMENTS AND DIVISION 21 FOR FIRE PROTECTION TECHNICAL REQUIREMENTS.
- CONTRACTOR SHALL COORDINATE WITH OTHER SPECIFICATION SECTIONS THAT AFFECT THE FIRE PROTECTION SCOPE OF WORK AND BASE BID ACCORDINGLY.

ABBREVIATIONS & SYMBOLS

SYMBOL	ABBREVIATION	DESCRIPTION
	SP	SPRINKLER PIPING
	P/SP	PREACTION PIPING
		ELECTRIC HEAT TRACED PIPING
	F	FIRE PIPING
	FSP	FIRE STANDPIPE PIPING
	DR	DRAIN PIPING
	CSP	COMBINED STANDPIPE
	OS&Y	OUTSIDE STEM & YOKE CONTROL
	FS	WATER FLOW SWITCH
		SIAMESE CONNECTION
		CAPPED END
	CV	CHECK VALVE
		SHUT OF CONTROL
	T/D	FIRE DEPARTMENT TEST AND DRAIN ASSEMBLY
	FDCV	2-1/2" FIRE DEPARTMENT CONTROL VALVE
	AV	ALARM CHECK VALVE
		LOW POINT AUXILIARY DRAIN
		UPRIGHT TYPE SPRINKLER HEAD
		PENDANT TYPE SPRINKLER HEAD
		SIDEWALL SPRINKLER HEAD
		OPEN TYPE SPRINKLER HEAD
		SPRINKLER HEAD AND/OR PIPING BELOW DUCTWORK
	ABD	AUTOMATIC BALL DRIP
	BFP	BACK FLOW PREVENTER
	CVB	CURB VALVE IN BOX
	DCDA	DOUBLE CHECK DET. ASSEMBLY VALVE
	FCVA	FLOOR CONTROL VALVE ASSEMBLY
	FP	FIRE PUMP
	LH	LIGHT HAZARD
	OH-1	ORDINARY HAZARD GROUP 1
	OH-2	ORDINARY HAZARD GROUP 2
	MR	MOP RECEPTOR
	P.L	PROPERTY LINE
	RPZ	REDUCED PRESSURE ZONE BACK FLOW PREVENTER
	S.SK	SERVICE SINK
	TS	TAMPER SWITCH
	JP	JOCKEY PUMP

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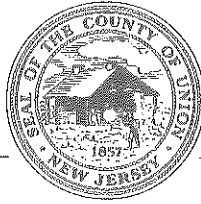
PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**FIRE PROTECTION
GENERAL NOTES, SYMBOLS & ABBREVIATIONS**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY NJB
11.1.17	ADDENDUM#3	MC	FM						JOB NO 2141152
									SHEET: _ OF:
									DWG. NO FP.101



COUNTY OF UNION

DEPARTMENT OF ENGINEERING, PUBLIC WORKS & FACILITIES MANAGEMENT
Joseph A. Graziano Sr., Director

**BOARD OF
CHOSEN FREEHOLDERS**

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ROBERT E. BARRY, ESQ.
County Counsel

JAMES E. PELLETIERE, RMC
Clerk of the Board

THOMAS O. MINEO, P.E.
*County Engineer,
Director, Division of
Engineering*

MEMO TO: TO ALL PROSPECTIVE BIDDERS

FROM: Thomas O. Mineo, P.E.
County Engineer

DATE: November 3, 2017

**RE: ADDENDUM NUMBER 2
BA#56-2017 - UNION COUNTY COURTHOUSE FIRE CODE
UPGRADES PHASE C1 ROTUNDA AND
PHASE C2 TOWER (INTERNAL STAIR)
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
UNION COUNTY ENGINEERING PROJECT #2010-033C**

Attached is Addendum Number 2 dated November 3, 2017.

Bidder's Name: _____

ACKNOWLEDGMENT OF ADDENDUM

ADDENDUM NUMBER 2 – November 3, 2017

COUNTY OF UNION

**UNION COUNTY COURTHOUSE FIRE CODE UPGRADES
PHASE C1 ROTUNDA AND PHASE C2 TOWER (INTERNAL
STAIR)**

CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
(Name of Construction /Public Works Project)

BA#56-2017

UC ENGINEERING PROJECT # 2010-033C

(Project or Bid Number)

Pursuant to N.J.S.A. 40A:11-23.1a., the undersigned bidder, hereby acknowledges receipt of the following notices, revisions, or addenda to the bid advertisement, specifications or bid documents. By indicating date of receipt, bidder acknowledges the submitted bid takes into account the provisions of the notice, revision or addendum. Note that the County of Union's record of notice to bidders shall take precedence and that failure to include provisions of changes in a bid proposal may be subject for rejection of the bid.

Local Unit Reference Number or Title of Addendum/Revision	How Received (mail, fax, pick- up, etc.)	Date Received
<u>ADDENDUM NUMBER 2:</u> • Addendum Number 2: (3 pages)		

ACKNOWLEDGMENT BY BIDDER:

NAME OF BIDDER: _____

ORIGINAL SIGNATURE: _____

PRINTED NAME AND TITLE: _____

DATE: _____

ADDENDUM NUMBER 2
NOVEMBER 3, 2017

**BA#56-2017 – UNION COUNTY COURTHOUSE FIRE CODE UPGRADES
PHASE C1 ROTUNDA AND PHASE C2 TOWER (INTERNAL STAIR)
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
UNION COUNTY ENGINEERING PROJECT NUMBER 2010-033C**

This Addendum is issued for the purpose of amending certain requirements of the contract documents as noted hereinafter and to answer questions submitted by the bidders, which are hereby made part of and incorporated in full force as part of the contract documents.

Bidders must acknowledge receipt of this Addendum and submit with original bid submission packet. *(Copy of Acknowledgement of Addendum Number 2 dated November 3, 2017 is attached).* **Failure to acknowledge receipt of this Addendum may result in bid rejection.**

A. Changes to the Project Manual:

1. NO CHANGE - Sealed bids will be received by the Director of the Division of Purchasing, or her designee, at the County of Union New Jersey on **November 21, 2017**, at 10:30 a.m., prevailing time, in the 6th Floor Freeholder Conference Room, Union County Administration Building, 10 Elizabethtown Plaza, Elizabeth, New Jersey 07202.
2. Revised Disclosure of Investment Activities in Iran Form (See Attachment)
3. Correct mislabeled specification footing (Spec 055000 Metal Fabrication) for Specification 087100 Door Hardware, the correct specification footing shall read Specification Section 087100 Door Hardware.

B. Changes to the Project Drawings for the Union County Courthouse Internal Stair (Tower):

1. Demolition Drawings - Revise Demolition Keynotes, Delete Item # 42 – CM to coordinate w/ Owner the removal storage & relocation Existing Wall Portraits. The Owner, UC will remove and store Wall Portraits.
2. Clarification to Scope of Work for Historical Lobby Areas (1st Floor-Upper Lobby, 3rd Floor-Lobby, 5th Floor-Lobby & 7th Floor- Lobby) in front of Ceremonial Court Rooms. The Design Intent is to construct a second means of egress stair, to provide Automatic Fire Suppression System. The Existing Historical Ceiling will be removed on its entirety to install the new Egress Stair & Fire Sprinklers and a new hard ceiling with all Historical Elements will be constructed an exact replica (cornices, dentil, trim, corbel & color) as indicated on the Construction Documents.
3. Clarification to Reflected Ceiling – Existing Ceiling Type Legend – Note #1 & #6 – the GC to Remove & Re-install Ceiling Grid and ACT Tiles due to installation of Automatic Sprinkler System.

4. Clarification to drawing # A.610 Eleventh RCP – Delete Tag #8 – Note #8 is not listed under Existing Ceiling Type Legend.

C. Responses to RFI's received:

- Q.1 The list of Demolition Contractors approved by the State with the DPMC C021 Classification, required by the bid documents, includes contactors suited for large scale building demolition and not the select building demolition required by this project. The inclusion of this classification requirement will severely limit the contractors available to bid this project, if any. Please review this classification and advice.
- R.1 The demolition scope of work for this project includes, but is not limited to, the removal of structural steel beams and floor slabs within the footprint of the new stairwell in the Courthouse Tower. This work is considered to be of significant and sizeable scale, and was a contributing factor for selecting DPMC C021 as a required classification. This classification requirement will remain.
- Q.2 The bid documents list DPMC C024 as a required classification for contractors performing historic restoration. Please clarify the scope of work included under this classification.
- R.2 This project received approval from the State of New Jersey Department of Environmental Protection Natural & Historical Resources Historic Preservation Office (SHPO) on July 29th, 2015. All work specified in the Construction documents that will disturb or impact the Historical Significant Areas will have to be restored to the current condition the following areas are considered Historical:

UC Courthouse Fire Suppression (Rotunda)

- Rotunda Atrium Ground Floor
- Rotunda Atrium 1st Floor – (1) Court Room
- Rotunda Atrium 2nd Floor – (3) Court Rooms
- Rotunda Atrium 3rd Floor

UC Courthouse Internal Stair (Tower)

- 1st Floor Upper Ceremonial Lobby – Ceremonial Court Room.
- 3rd Floor Ceremonial Lobby – Ceremonial Court Room
- 5th Floor Ceremonial Lobby – Ceremonial Court Room
- 7th Floor Ceremonial Lobby – Ceremonial Court Room

Refer to Item B.2 on this Addendum #2 for Scope of Work Historical Lobby Areas on the Tower

- Q.3 The project specifications list Access Flooring, spec section 096900, however, I see no reference on the drawings to indicate there is actually access flooring required for this project. Can you please confirm if access flooring is required for this bid or if it is left over from a previous phase or is it included for reference only/included by accident.
- R.3 No Access Flooring (Spec Section 096900) is required for this project.

- Q.4 Due to the complexity of this project we respectfully request a (2) week bid extension. Please advise.
- R.4 No bid extension will be considered. This Project was advertised on September 7th 2017 with Bids Due on November 21th, 2017.
- Q.5 Please provide phasing drawings to coincide with phasing narrative issued in spec section 011000-2. This would help get a better understanding of the project for all bidders and sub-contractors bidding.
- R.5 No Phasing Drawings will be provided, comply with specification Section 01100 – Summary.
- Q.6 Please provide the information for the Fire alarm vendor. The specifications call for Simplex, but Simplex says they are not the Fire Alarm vendor.
- R.6 The Fire Alarm Vendor for the building is DavEd Fire Systems, Inc. Their contact number is 201-342-7800.

Attachments:

1. Revised Disclosure of Investment Activities in Iran Form (***Please complete and submit with bid packet***)
2. Copy of Acknowledgement of Addendum Number 2 dated November 3, 2017. (***Failure to acknowledge receipt of this Addendum may result in bid rejection***)

END OF ADDENDUM NUMBER 2

COUNTY OF UNION NEW JERSEY
Division of Purchasing
DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN FORM

Solicitation Number: _____

Vendor/Bidder: _____

PART 1

CERTIFICATION

VENDOR/BIDDER MUST COMPLETE PART 1 BY CHECKING ONE OF THE BOXES
FAILURE TO CHECK ONE OF THE BOXES WILL RENDER THE PROPOSAL NON-RESPONSIVE

Pursuant to Public Law 2012, c. 25, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete the certification below to attest, under penalty of perjury, that neither the person nor entity, nor any of its parents, subsidiaries, or affiliates, is identified on the State of New Jersey, Department of the Treasury's Chapter 25 list as a person or entity engaged in investment activities in Iran. The Chapter 25 list is found on the Department's website at <http://www.state.nj.us/treasury/pdf/Chapter25List.pdf>. Vendors/Bidders must review this list prior to completing the below certification. **Failure to complete the certification will render a Vendor's/Bidder's proposal non-responsive.** If the Director of the Division of Purchase and Property finds a person or entity to be in violation of the law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

CHECK THE APPROPRIATE BOX

A. I certify, pursuant to Public Law 2012, c.25, that neither the Vendor/Bidder listed above nor any of its parents, subsidiaries, or affiliates is listed on the N.J. Department of Treasury's list of entities determined to be engaged in prohibited activities in Iran pursuant to P.L. 2012, c. 25 ("Chapter 25 List"). Disregard Part 2 and complete and sign the Certification below.

OR

B. I am unable to certify as above because the Vendor/Bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the Department's Chapter 25 list. I will provide a detailed, accurate and precise description of the activities in Part 2 below and sign and complete the Certification below. Failure to provide such information will result in the proposal being rendered as non-responsive and appropriate penalties, fines and/or sanctions will be assessed as provided by law.

PART 2

PLEASE PROVIDE ADDITIONAL INFORMATION RELATED TO INVESTMENT ACTIVITIES IN IRAN

If you checked Box "B" above, provide a detailed, accurate and precise description of the activities of the Vendor/Bidder, or one of its parents, subsidiaries or affiliates, engaged in investment activities in Iran by completing the information below.

ENTITY NAME: _____
RELATIONSHIP TO VENDOR/BIDDER: _____
DESCRIPTION OF ACTIVITIES: _____
DURATION OF ENGAGEMENT: _____
ANTICIPATED CESSATION DATE: _____
VENDOR/BIDDER CONTACT NAME: _____
VENDOR/BIDDER CONTACT PHONE#: _____

Attach Additional Sheets If Necessary

CERTIFICATION

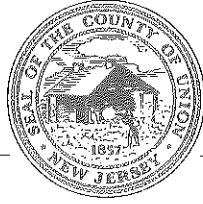
I, the undersigned, certify that I am authorized to execute this certification on behalf of the Vendor/Bidder, that the foregoing information and any attachments hereto, to the best of my knowledge are true and complete. I acknowledge that the County of Union, New Jersey is relying on the information contained herein, and that the Vendor/Bidder is under a continuing obligation from the date of this certification through the completion of any contract(s) with the County of Union to notify the County of Union in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification. If I do so, I will be subject to criminal prosecution under the law, and it will constitute a material breach of my agreement(s) with the County of Union, permitting the County of Union to declare any contract(s) resulting from this certification void and unenforceable.

Signature

Date

Print Name and Title

Revised 10/19/17



COUNTY OF UNION

DEPARTMENT OF ENGINEERING, PUBLIC WORKS & FACILITIES MANAGEMENT

Joseph A. Graziano Sr., Director

**BOARD OF
CHOSEN FREEHOLDERS**

BRUCE H. BERGEN
Chairman

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County Counsel

JAMES E. PELLETTIERE, RMC
Clerk of the Board

THOMAS O. MINEO, P.E.
*County Engineer,
Director, Division of
Engineering*

MEMO TO: TO ALL PROSPECTIVE BIDDERS

FROM: Thomas O. Mineo, P.E.
County Engineer

DATE: October 11, 2017

**RE: ADDENDUM NUMBER 1
BA#56-2017 - UNION COUNTY COURTHOUSE FIRE CODE
UPGRADES PHASE C1 ROTUNDA AND
PHASE C2 TOWER (INTERNAL STAIR)
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
UNION COUNTY ENGINEERING PROJECT #2010-033C**

Attached is Addendum Number 1 dated October 11, 2017.

Bidder's Name: _____

ACKNOWLEDGMENT OF ADDENDUM
ADDENDUM NUMBER 1 – OCTOBER 11, 2017
COUNTY OF UNION

UNION COUNTY COURTHOUSE FIRE CODE UPGRADES
PHASE C1 ROTUNDA AND PHASE C2 TOWER (INTERNAL
STAIR)
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
(Name of Construction /Public Works Project)

BA#56-2017
UC ENGINEERING PROJECT # 2010-033C

(Project or Bid Number)

Pursuant to N.J.S.A. 40A:11-23.1a., the undersigned bidder, hereby acknowledges receipt of the following notices, revisions, or addenda to the bid advertisement, specifications or bid documents. By indicating date of receipt, bidder acknowledges the submitted bid takes into account the provisions of the notice, revision or addendum. Note that the County of Union's record of notice to bidders shall take precedence and that failure to include provisions of changes in a bid proposal may be subject for rejection of the bid.

Local Unit Reference Number or Title of Addendum/Revision	How Received (mail, fax, pick- up, etc.)	Date Received
<u>ADDENDUM NUMBER 1:</u> • Addendum Number 1: (2 pages)		

ACKNOWLEDGMENT BY BIDDER:

NAME OF BIDDER: _____

ORIGINAL SIGNATURE: _____

PRINTED NAME AND TITLE: _____

DATE: _____

ADDENDUM NUMBER 1

OCTOBER 11, 2017

**BA#56-2017 – UNION COUNTY COURTHOUSE FIRE CODE UPGRADES
PHASE C1 ROTUNDA AND PHASE C2 TOWER (INTERNAL STAIR)
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
UNION COUNTY ENGINEERING PROJECT NUMBER 2010-033C**

This Addendum is issued for the purpose of amending certain requirements of the contract documents as noted hereinafter and answer questions submitted by the bidders, and hereby made part of and incorporated in full force as part of the contract documents.

Bidders must acknowledge receipt of this Addendum and submit with original bid submission packet. (*Copy of Acknowledgement of Addendum Number 1 dated October 11, 2017 is attached*). **Failure to acknowledge receipt of this Addendum may result in bid rejection.**

A. Changes to the Project Manual:

1. Sealed bids will be received by the Director of the Division of Purchasing, or her designee, at the County of Union New Jersey on **November 21, 2017**, at 10:30 a.m., prevailing time, in the 6th Floor Freeholder Conference Room, Union County Administration Building, 10 Elizabeth, New Jersey.
2. Additional contractor walkthroughs will be held on the following dates, all contractors are to meet at the lobby located at 2 Broad Street, Elizabeth, New Jersey 07202 :
 - a. Tuesday: October 17, 2017 from 4:30 pm – 6:00 pm
 - b. Wednesday: November 1, 2017 from 4:30 pm – 6:00 pm
3. Last day to receive RFI's: Friday, November 3, 2017
4. Last day to issue an Addendum: Wednesday, November 8, 2017
5. Delete Technical Specification - Section 011200 – Liquidated Damages and Replace with the attached Revised Technical Specification - Section 011200 – Liquidated Damages dated October 11, 2017.

B. Changes to the Project Drawings for the Union County Courthouse Internal Stair (Tower):

1. Revision to Drawing A-113, Detail 1 / A-113 the reference tag 16 on A.402 is incorrect; it shall read 16 / A-403.
2. Revision to Drawing A-403, 16th Floor Enlarged Stair plan is tag incorrectly; the tag shall read 16 /A-403.
3. Clarification to Drawing A-605 the new Gypsum Wallboard ceiling shall be a historical replica of the existing ornamental ceiling with trim molding cornices as indicated in Details shown in Drawing A-201.

C. Responses to RFI's received:

- Q.1 Are the quantities for ACM removal listed to be the only amount we are to include in our bid?
- R.1 *Yes, These quantities are anticipated to be the estimated amount of ACM to be removed as part of this project and are the only amount to be included in your bid.*
- Q.2 How will any additional or fewer quantities be handled? We suggest a unit cost be provided for differences in project amount listed.
- R.2 *We do not anticipate a significant percentage of difference in the amounts presented. No addition/deduction of fee is anticipated as is relates to the asbestos abatement. No unit costs to be utilized.*

D. Attachments:

1. Revised Technical Specification - Section 011200 – Liquidated Damages dated October 11, 2017 (2 Pages)
2. Copy of the Mandatory Pre-Bid Meeting Transcript dated September 21, 2017 is for information purposes only. (34 pages) **Addendum dates supersedes any dates referred in the transcript.**
3. Copy of the Mandatory Pre-Bid Meeting Sign-In Sheet dated September 21, 2017. (3 pages)
4. Copy of Acknowledgement of Addendum Number 1 dated October 11, 2017. **(Failure to acknowledge receipt of this Addendum may result in bid rejection).**

END OF ADDENDUM NUMBER 1

ADDENDUM NUMBER 1 ISSUED OCTOBER 11, 2017
BA#56-2017 - Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower (Internal Stair)
City of Elizabeth, County of Union, New Jersey
Union County Engineering Project Number 2010-033C

REVISED SECTION 011200- LIQUIDATED DAMAGES

PART 1 GENERAL

1.1 TIME AND PERFORMANCE OF THE ESSENCE; BASIS AND REASONABLENESS OF LIQUIDATED DAMAGES

A. Time is of the essence of this Contract. By submitting its Bid hereunder, the CONTRACTOR expressly acknowledges that the OWNER will suffer substantial damages by reason of the CONTRACTOR's non-performance and/or untimely performance. The CONTRACTOR further acknowledges by submission of a Bid hereunder that by reason of the effect of Events of Default in the achievement of any or all Milestones by the CONTRACTOR, the fact of damage to the OWNER by reason of such Events of Default is ascertainable but the precise monetary amount of said damage is not susceptible to ready calculation, and that the amounts set forth in this Section are fair and reasonable.

B. The OWNER has calculated the amount of liquidated damages by taking into account the approximate costs to the OWNER by reason of delay caused by the CONTRACTOR's delay-related Events of Default including scheduling, logistics, personnel and equipment costs; other costs related to delay in the achievement of the Work; and incremental administrative, staff, engineering, consulting, and other costs related to all of the above and the individual and cumulative effects of said Events of Default upon the OWNER's operations.

C. The liquidated damages set forth in this Section shall be deemed reasonable compensation to the OWNER for its loss and damage solely due to delay and shall not be deemed a penalty.

1.2 LIQUIDATED DAMAGES FOR DELAY

A. If the CONTRACTOR fails to meet any of Milestones as set forth due to any Event of Default, the CONTRACTOR shall be liable to and shall pay the OWNER Liquidated Damages in the following amounts, each of which shall be payable in the amounts indicated per calendar day of delay in the achievement of same:

Milestone Date	Requirement	Liquidated Damages
1,063 Calendar days (35 Months) from Notice to Proceed	Substantial Completion Rotunda – 16 months Tower – 19 months	\$ 1,000.00/day for each phase

ADDENDUM NUMBER 1 ISSUED OCTOBER 11, 2017
BA#56-2017 - Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower (Internal Stair)
City of Elizabeth, County of Union, New Jersey
Union County Engineering Project Number 2010-033C

1.3 OWNER'S RIGHT TO WITHHOLD AND FORGIVE; LIMITATION ON AMOUNT OF LIQUIDATED DAMAGES FOR DELAY

A. The OWNER may withhold Liquidated Damages from any monies that may otherwise be due from the OWNER to the CONTRACTOR. Should the aggregate of liquidated damages due the OWNER at any time be greater than the sum otherwise due the CONTRACTOR, the CONTRACTOR shall pay the difference to the OWNER upon demand.

B. Disputes with respect to the amount of Liquidated Damages due at any time, shall be subject to the dispute resolution provisions of the Contract Documents.

PART 2 — PRODUCTS (NOT USED)

PART 3 — EXECUTION (NOT USED)

END OF SECTION 011200

PRE-BID MEETING

IN THE MATTER OF: UNION COUNTY * SEPTEMBER 21, 2017
COURTHOUSE COMPLEX, COUNTY OF *
UNION, ELIZABETH, NEW JERSEY, *
FIRE CODE UPGRADES - PHASE C1 *
ROTUNDA AND PHASE C2 TOWER *
(INTERNAL STAIR) UNION COUNTY *
PROJECT #2010-033C *

- - - - - *

SCHULMAN, WIEGMANN & ASSOCIATES

CERTIFIED COURT REPORTERS

216 STELTON ROAD

SUITE C-1

PISCATAWAY, NEW JERSEY 08854

732-752-7800

1 T R A N S C R I P T of the stenographic
2 notes of the proceedings in the above-entitled
3 matter as taken by and before LATITISA RUSSELL, CCR
4 #30XI00234100, RPR and Notary Public of the State
5 of New Jersey, held at the Elizabeth Court House, 2
6 Broad Street, Building Facilities Conference Room,
7 Elizabeth, New Jersey, September 21, 2017
8 commencing at 4:30 p.m.

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1 A P P E A R A N C E S :

2

3 Troy Marzziotti, MAST Construction

4 Ryan T. Jones, MAST Construction

5 Sean Edmonds, MAST Construction

6 Francisco Melendez, Netta Architects

7 Kevin Burns, TM Associates

8 Dan Schaffer TM Associates.

9 Rose Comas, First Deputy Counsel

10 Joseph Hendershot

11 Laura Scutari

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MR. MARZZIOTTI: Good afternoon,

everybody. This is the prebid meeting for the phase

C1 rotunda and C2 tower internal stair upgrades.

There is a sign-in sheet going around. Please sign

the sign-in sheet. This is a mandatory prebid

meeting, so we need your signature on the sign-in

sheet.

I'm going to start briefly with

introductions and people will introduce themselves and

we'll go over -- I put a little agenda together and

then we'll do a walk-through of the site.

MAST Construction was hired by the

County of Union's construction manager. My name Troy

Marzziotti from MAST Construction. This is Sean

Edmonds from MAST Construction and Ryan Jones from

MAST Construction. The architect is Netta Architects,

Francisco Melendez. The environmental engineer is TM

Associates, which Kevin Burns and Dan Schaffer (ph).

MEP is ATI. He's running late and the structural

engineer is O'Donnell Naccarato. Again, this is

County of Union. We're here with Rose -- do you want

to introduce yourself?

MS. COMAS: Yes. I'm First Deputy

County Counsel Rose Comas. I will be working with and

1 I have been working with the design team from the
2 creation of this project several years back and I'll
3 be involved in the bidding process along with Laura
4 Scutari, who is our QPA director of purchasing over
5 there and also, Charlie Chirafesi. He is our director
6 of facilities and Matt Ferraro from our division of
7 engineering. So that's the county team pretty much
8 that's going to be working with the successful bidder
9 contractor, as well as with our construction manager.

10 MR. MARZZIOTTI: As far as the bid
11 process is concerned, I want to make sure everybody is
12 aware that the plans and specifications are available
13 for download on the county's website. I think it's
14 www.ucnj.org/bid-specs. So you download the -- no
15 more picking up hard copies. You download the forms
16 there and all the plans and specifications are on the
17 website.

18 Pay careful attention to the completion
19 of your bid form. Every bid form has to be completed.
20 Otherwise, the bid will be rejected. When you put
21 your number in, there is a contingency allowance and a
22 third-party inspection allowance. What that is, that
23 is line item on your schedule of values that the owner
24 could use as a drawdown for any potential changes that
25 the owner would like to make. It's called an

1 allowance drawdown. So if your bid is a million
2 dollars, make sure you include 675,000 and 25,000 and
3 it would make it a \$1,700,000.

4 Anybody coming in late, please sign the
5 sign-in sheet. This is a very complex project and I'm
6 going to go through the scope of work, the summary.
7 There is a lot of phasing in the project. It's an
8 occupied building right now. The rotunda is going to
9 be semi-occupied when we do the work in there and the
10 stair tower will be an occupied building. We'll go
11 through various phases when we get to it to discuss
12 what we're proposing for the bid specs of how the
13 project has to be done.

14 Due to complexity of the project and
15 being it's an occupied building with courts right now,
16 there is going to be two additional walk-throughs that
17 you can bring your subcontractors to. It's not going
18 to be you calling up the county, you calling up the
19 construction manager, saying, look, can I bring this
20 guy here? I want to show him that. We can't
21 accommodate that with everybody. It will be posted, I
22 guess, on the website as a first addendum when we're
23 going to have the two additional walk-throughs. One
24 will probably be in two weeks and probably another
25 week after that, just so you can get your contractors

1 lined up, you want to walk it through. We'll walk
2 through today, but if you want you bring your
3 subcontractors and if you want to wait, we'll do one a
4 little bit later towards the end, so if you have some
5 questions out there, you can see and when you submit
6 them and we'll go through that way.

7 Again, the walk-through is going to be
8 done at 4:30 starting here. So the building will
9 basically, be unoccupied. The sheriff's department
10 will let us into the areas that we need to.

11 As far as RFIs regarding the bid
12 process, Union County has this -- obviously, when we
13 walk through the building now, I'm going to be
14 answering questions. Please, any question that I ask,
15 the answer, whatever legal term has to be, please
16 submit it in writing to tmineo@ucnj.org. Otherwise,
17 you can't rely on the information. Again, I'm not
18 going to walk through and you say, what's behind that
19 door? And I'm not going to say, I can't say anything.
20 That's a courtroom. You're going to say, are there
21 sprinklers in there? I'm going to say, yes. If
22 you're unsure of it, you have to put it in writing.

23 MS. COMAS: We have a court reporter
24 here and she's, basically, typing down everything
25 that's being said. You will get a handout of the

1 minutes from this meeting as part of the addenda that
2 is attached later on. That is only for the purpose of
3 information. If you have a specific RFI, we ask that
4 you submit it according to the bid specifications, so
5 that we have the opportunity to discuss it internally
6 and provide you with a response that will become part
7 of the contract.

8 The purpose of this walk-through and
9 this meeting is to familiarize you with the project
10 and obviously, if you're doing a walk-through, like,
11 Troy said, if you see something, it's easier to ask
12 the question right there when you're there for the
13 ease of doing the walk-through. But at the end of the
14 day, you only should rely on any of the written
15 answers that are provided to you and we'll have the
16 ability then to review those questions later on and
17 give you a full official answer.

18 MR. MARZZIOTTI: The stenographer is
19 not going to come to the walk-through with us.
20 Regarding RFIs, everything has to be written, e-mailed
21 to the county engineer. It's Tom Mineo. The e-mail
22 address is T-M-I-N-E-O --

23 MS. COMAS: I'm sorry. I think it goes
24 through the purchasing division.

25 MS. SCUTARI: They go to purchasing.

1 Whatever the specs say.

2 MR. MARZZIOTTI: That's what the specs
3 say. That's what we went through with Darlene.

4 MS. SCUTARI: Okay. Go ahead.

5 MS. COMAS: Sorry.

6 MR. MARZZIOTTI: tmineo@ucnj.org.

7 MR. EDMONDS: It's on the general
8 specs, too, on the front end.

9 MR. MARZZIOTTI: It's in the
10 specifications when you see it in the bid package.
11 Questions e-mailed to the county engineer, he will
12 review it and basically, give it out to the architect,
13 engineer, construction manager, attorney for responses
14 and the all responses will be posted as an addendum on
15 the website.

16 If you work backwards with the
17 specifications, all bids are going to be opened
18 November 16, 2017 at 10:30 a.m. and it's the
19 Freeholders conference room?

20 MS. COMAS: Yes, and little bit about
21 that, please note November, we should be okay
22 weather-wise. Parking in this area is extremely
23 challenging. As our security procedures, you have to
24 go through a magnetometer. You have to go through a
25 metal detector and the bids are open sharp and once

1 they are open, we cannot receive anymore bids. So we
2 use the official clock and when the time comes, the
3 doors are closed and you can no longer come in. So
4 please be very attentive that either have someone drop
5 off the person to make sure they get into the building
6 on time because you're standing online and let's say
7 there is a sheriff's sale or something going on and
8 you have to stand online because you have to get, you
9 know, the sticker and you have to sign in. You have
10 to provide credentials to the sheriff's department and
11 all that takes time. So I don't -- we're not going to
12 hear the excuse of, well, I was on line. You know,
13 the size of this project, you should plan ahead. I
14 mean, really.

15 MR. MARZZIOTTI: I agree. So going
16 with that, the last days for RFIs will be October 31,
17 2017 and last day the addendum will be issued or
18 posted on the website will be November 2, 2017. The
19 last addendum will be issued on November 2, 2017.

20 I want to bring it to everybody's
21 attention that in the bid package that this job is
22 under a project labor agreement. The contractor will
23 have to sign the project labor agreement as required.

24 MS. COMAS: And also with that project
25 labor agreement there are letters of assent that you

1 have to secure from your subcontractors and that
2 becomes a part of the PLA.

3 MR. MARZZIOTTI: Now we're getting into
4 the scope of work of the project. This project is
5 broken down into two main buildings, two main phases,
6 but there are many sub-phases in each project. It's a
7 rotunda building and then a stair tower building.
8 Work has to be done in the rotunda in the phase
9 sequence as detailed in the specifications in the
10 summary to be completed, turned over before work can
11 start in the stair tower building.

12 I will go through the phases and the
13 summary. The scope of work, basically, for the
14 rotunda is and it's not limited to, but it's asbestos
15 abatement, smoke evacuation system, fire suppression
16 and sprinkler, fire alarm, signage, fire rated egress
17 doors, HVAC system, elevator upgrade for ADA
18 compliance, bathroom renovations and we're putting in
19 back boxes, conduit pull strings for future card
20 access and security cameras that will be installed by
21 a separate contractor from the county.

22 Stair tower has same the thing,
23 asbestos abatement, fire suppression sprinkler, fire
24 alarm upgrades, signage, fire rated doors. There is a
25 new central control communications system. There is

1 also the enclosure of the existing staircase that's
2 there in the stair tower and the biggest thing is that
3 there is a new internal stair tower that is going to
4 be constructed inside the building. This is all stuff
5 that has to be addressed for fire code violations that
6 we have to address for the DCA and that's why we have
7 to do this work and also, included is the back boxes,
8 conduit pull strings, camera indoor access. The
9 biggest difference between both projects is the
10 internal stair that has to be done in the stair tower
11 building.

12 So we said that there is two main
13 phases, which is the rotunda and the stair tower,
14 there's many sub-phases that are listed in the summary
15 that I have to go through and I'll go over it a little
16 bit here.

17 As far as schedule, the overall
18 schedule for the project, now this includes from
19 notice to proceed to substantial completion on the
20 final phase of the project is about 1,063 calendar
21 days. It's about 35 months. We estimated the rotunda
22 would be 16 months and the stair tower would be 19
23 months. That also includes the time in between where
24 it's necessary to move courtrooms around, once we
25 finish a floor, to occupy the other floor. Downtime

1 between that is all included in that overall project
2 schedule and the winning contractor and awarded
3 contractor would have to include all that in his
4 overall duration.

5 The rotunda has to be started first and
6 completed first. When you get to the phasing, we'll
7 discuss what's going on and the reasons for that.

8 The phasing plan, which I am going to
9 discuss a little bit here that we put together in
10 summary has to be incorporated into your overall
11 project schedule for the awarded contractor. We will
12 coordinate with you guys for the relocation of the
13 courtrooms. The phasing plan, we already went over
14 with the state judiciary what's going to be done, so
15 they are aware of it. So when the awarded contractor
16 is onboard and things start to be moved, your point of
17 contact would be the construction manager, which is
18 Mast Construction and obviously, it's all sort out in
19 the specifications and we'll abide by it by the
20 schedule.

21 Let's talk about this phasing plan now.
22 Specifically, for the rotunda and I would recommend
23 when you get the specifications in the summary, a lot
24 of it is listed in the summary specifically what the
25 phasing plan is going to be. A quick example is the

1 rotunda has a ground floor, first floor, second floor,
2 third floor and fourth floor. That's the first
3 building we're going to do. Phase one of the rotunda
4 is going to be the elevator upgrades, the bathroom
5 renovation, the HVAC system, emergency distribution
6 connection and the fire code upgrades of floors one
7 through four. The ground floor will be left alone
8 because it has to be occupied.

9 In the summary is floors one through
10 four. The first floor offices, the Civil Division 107
11 has to remain occupied, occupiable. So people are
12 going to have to work on a daily basis in that office.
13 So when I talk to Kevin about it with the asbestos
14 abatement and tunnels and stuff, it clearly shows in
15 the drawings where the egress has to be and the tunnel
16 accesses for that.

17 The work in that room, whether it's
18 abatement, sprinkler, HVAC, has to be done on an
19 overtime basis. We call it, not so much overtime,
20 second shift and the way it's worded in the
21 specifications is, it has to be done when it is not
22 occupied, which is after hours and has to be returned
23 by nine a.m. the next morning for useable for the
24 employees. This could be, you start at four o'clock,
25 4:30, when courts end, work until seven o'clock in the

1 morning and turnover there. This could be, you start
2 Friday at 4:30 and work through Monday morning. It
3 all depends on what you guys want to do as far as
4 that, but that's included in your bid. You have to be
5 aware of that. So I don't care how the contractor
6 does it, as long as it's during the time. It has to
7 be done off hours and it has to be done so it's
8 occupiable to a certain extent, obviously, that they
9 can work in there and publicly access to the place.

10 So in the rotunda that's, basically,
11 room 107, which is in the civil division, on the first
12 floor. So your first phase is going to be one, two,
13 three and four. Civil division has to be done on an
14 overtime basis or premium time or whatever it is after
15 hours and that all has to be completed before you can
16 move down into the ground floor because people are
17 going to move from the ground floor into floors one,
18 two, three or four once one, two, three and four are
19 finished.

20 The ground floor has the sheriff's
21 department there that has to be, obviously, occupiable
22 there. They are the same issue. They are not 24/7
23 there, right?

24 MR. EDMONDS: No, but it still has to
25 be done off peak.

1 MR. MARZZIOTTI: Same thing with that
2 is clearly said in the summary and specifications,
3 that room, the sheriff's department, whatever work is
4 in there, abatement, sprinkler, HVAC, any work in that
5 area has to be done exactly like we call it, a second
6 shift, overtime, premium time and again, you want to
7 do it over a span of three weeks working four to 11,
8 as long as by eight o'clock the next morning you turn
9 in and it's good to go, that's fine. If you want to
10 do it 4:30 on a Friday night and work 24/7 to Monday
11 morning and get it all done, that's the contractor's
12 point of view, which obviously, we'll have to
13 coordinate that.

14 Again, once the rotunda is completed
15 and occupiable, that's when we have to start the stair
16 tower portion of the project and the reason for that
17 is because the people from the stair tower have to be
18 relocated into the rotunda to open up areas of work.

19 The stair tower is pretty complex and
20 I'll summarize it by saying floors one, three, five
21 and seven have ceremonial courtrooms, which are
22 double-height courtrooms. There's no courtroom on the
23 second, fourth and sixth. Floors eight through 16 are
24 unoccupied?

25 MR. EDMONDS: 9 through 16.

1 MR. MARZZIOTTI: 9 through 16 are
2 unoccupied, so that work can be done with people --
3 when the other floors are occupied. We want to do two
4 courtrooms at a time or two floors at a time. We can
5 do the first and third because the courtrooms on the
6 first and third are going to be relocated to the
7 rotunda. So the ceremonial courtrooms are going to be
8 occupiable and useable in five and seven. When we
9 finish one and three at a turnover, those two
10 courtrooms have to go down to one and three. So it's
11 going to be an occupied building.

12 We have in the specifications that 90
13 percent of your work on the stair tower is going to
14 have to be during the second shift and we want you to
15 include it in your bid. More likely, 4:30 to 11 or 11
16 to 6 shift -- actually, probably not 11 to 6 because
17 it has to be occupiable by the next morning, but it
18 clearly states in the specifications in the summary
19 and I'm going to read it. In the section, work
20 restrictions, it says, shift work, second and third
21 shifts. Shift work and second and third shifts and
22 overtime is required of the contractor at no cost to
23 the owner. It should be, no additional cost to the
24 owner.

25 Contract work as follows: Rotunda

1 areas described in summary section 1.4 above, also for
2 any slab cuts, slab penetrations or slab removal. I
3 forgot to mention that on the rotunda, when you have
4 to bring duct work through the floors, there are slab
5 cuts and slab removal, that work needs to be done on
6 unoccupiable times.

7 Tower, internal stair, contractors
8 shall anticipate that all work must be implemented as
9 shift work for this phase. So again, because of the
10 majority of that work is hard work, you're cutting
11 through floors, rebuilding an internal stair tower, so
12 that's what we want to talk about.

13 As far as temporary facilities and
14 storage, I'll let Shawn really explain this as far as
15 that. We're allowing an office for the contractor and
16 also for the CM someplace on the facility.

17 MR. EDMONDS: Right. The county is
18 going to provide a space where we can work out of on
19 the facilities because there is no ability to have a
20 site trailer here, not only for the space for that,
21 but bringing power to it, it just doesn't work. So
22 they'll provide an office space.

23 If you look in the specifications, the
24 contractor still has to fit out and furnish those
25 spaces. As far as restrooms, the contractor is also

1 allowed any designated facilities that the county
2 agrees to as long the upkeep is kept and the
3 facilities are returned to their working conditions.

4 Storage is a big thing. Onsite
5 storage, there really is no lay down space. So the
6 way the specifications were developed is, any
7 materials onsite should really be in the spaces that
8 you're working. So if you're on the rotunda, when
9 you're working on the first through fourth floors, you
10 can use those floors as lay-down space and storage,
11 but you can't drop a Sea box outside or anything like
12 that. So if there is material that's going to be
13 shipped and stored, it's going to have to be offsite.
14 So it's really whatever you can fit in the building at
15 that time. It's part of the strategy you'll have to
16 develop.

17 MR. ARUDULAYER: What about occupied
18 area for storage and second shift and what about the
19 storage?

20 MR. EDMONDS: You can store --

21 MR. ARUDULAYER: How do use it on the
22 morning work hours?

23 MR. EDMONDS: For example, if you take
24 an occupied space --

25 MR. ARUDULAYER: Okay. I work in this

1 room at nighttime and in the morning and you come here
2 you say --

3 MR. MARZZIOTTI: You can move the stuff
4 into an non-occupied area for the next morning. For
5 example, on the first floor when we talk about that
6 civil division space, there is part of that floor that
7 won't be occupied. So it's a little bit of an element
8 to what you have to do and it all has to be part of
9 the thought process when you put the bid together.

10 MS. COMAS: That's why we're letting
11 you all know ahead of time. We can't shut the
12 courthouse. There is nothing we can do. So we have
13 to work and we've met with the Judges and the staff
14 from the administrative office of the court for months
15 to try and coordinate as to what we can close and for
16 how long, who we can relocate. So if you think your
17 job is difficult, you have no idea what we've been
18 going through. That's why we want no surprises later
19 on. This is a very important issue because the
20 Assignment Judge said, you can't shut the courthouse
21 down. It has to be operational during its work hours
22 and with the civil division office, that's where all
23 the lawsuits are filed. That's where everything is
24 filed. That's why we can't close that room 107.

25 MR. EDMONDS: I just want to say one

1 other thing. For the majority of the time the areas
2 you'll be working in will be unoccupied. It's really
3 the civil division and the sheriff's office that you
4 have to have that plan of attack. Maybe, you don't do
5 eights. Maybe, you'll do tens for that particular
6 area to give yourself more time to clean up and stuff
7 like that.

8 MR. MARZZIOTTI: There's room where you
9 can keep your stuff outside. Again, you're putting it
10 in an area where it's not occupiable when you're
11 working in the area and by the end of the day, it has
12 to be able to be occupiable and useable by the
13 employees.

14 SPEAKER #1: In the event you're
15 working outside those two specific areas in the
16 rotunda you're talking about and for whatever reason
17 people who occupy those areas decide it's way too
18 noisy, you deal with that on an separate --

19 MR. MARZZIOTTI: We'll deal with that
20 as a separate issue because there is also -- it's more
21 of --

22 SPEAKER #1: Well, working in the space
23 is one thing. We understand that. Working outside
24 the space with people occupied in another space is
25 another thing and if they make enough noise about not

1 being able to work because of noise outside the space,
2 now we're tied into whether or not overtime is
3 required in the outside spaces because it's affecting
4 civil and the sheriff's department and depending on
5 wording whether or not that gets twisted into whether
6 or not you're responsible or not responsible for
7 overtime because you're affecting those divisions.

8 MR. MARZZIOTTI: Ask that question in
9 RFI for those specific areas and we'll address your
10 response.

11 MS. COMAS: Actually, while we were on
12 that discussion about the sheriff's control center, it
13 reminded me that if you are the successful bidder, you
14 will be required to go through background checks for
15 you and your employees and your subcontractors.
16 Obviously, it's a very secured building. They will
17 issue contractors' badges that are tied specifically
18 and I'm just letting you know, not that there is
19 anything, you will have background checks on your
20 employees and your subcontractors. So be advised of
21 that in terms of, you know, when you're thinking of
22 who's going to be on the job or whatever.

23 Obviously, you're going to have access
24 to areas that most people don't have access to. So
25 they have a very -- we have a very, very tight, as I

1 mentioned before, security operation here. Our
2 sheriff's department is very strict about security.

3 MR. KEESHAM: The background checks,
4 will they be the responsibility of the contractor to
5 pay a third party to do or is the sheriff's
6 department --

7 MS. COMAS: The sheriff's department
8 does everything.

9 MR. MARZZIOTTI: The form is actually
10 in the bid specs that you have to fill out.

11 MR. EDMONDS: I think it's right at the
12 tail end of the summary section.

13 MR. MARZZIOTTI: The other issue I want
14 to talk about is budget. We're giving a range of the
15 budget for this project to make sure everybody has the
16 right bonding capacity. It looks like for one project
17 all together is about between 15 and 20 million is
18 what we're looking at. It's a substantial amount
19 project. Please make sure you have the bonding
20 capacity in place that you can, basically, submit a
21 bid for that. I just wanted to tell you that.

22 MR. DiBLASI: When you talk about the
23 after hours, second and third shift, is it the
24 contractor's responsibility to pay for any custodial
25 fees or anything or is that all by county?

1 MR. MARZZIOTTI: That's a good
2 question. Put that in writing. RFI it. The other
3 issue -- again, I don't want to start reciting the
4 phasing of all the work and the way it is, but like
5 Rose said, we've dealt with the court system and the
6 courts for years going on and developing this phasing
7 plan and it's pretty much highlighted in the summary
8 section of what needs to be done and what order. So
9 this order has to be followed because it's the logical
10 order.

11 Again, once the successful bidder is
12 awarded, if they want to come up with something else
13 and if it's something that we didn't think about after
14 a year-and-a-half and after going through everything,
15 I highly doubt it, but we'll listen to it, but your
16 base bid is based on these phases right here. Anybody
17 else want to add anything?

18 MR. MELENDEZ: There is a historical
19 component to the project. The rotunda, we have -- the
20 state made a submission and it was approved for us to
21 proceed of the rotunda and there are areas in the
22 tower in front of the ceremonial courtrooms and the
23 lobbies are historical. So the documents were done
24 around that. So whatever work that gets done in
25 there, we have to maintain the historical significance

1 to those areas.

2 MR. DiBLASI: On the advertisement you
3 list several DPMC codes. Typically, county jobs don't
4 require it, but DPMC is required for this project?

5 MS. COMAS: Yes.

6 MR. DiBLASI: All these trades has to
7 be listed on the bid form?

8 MS. COMAS: That's a good question
9 actually. The county is normally not held to DPMC.
10 However, our Board of Freeholders several years ago
11 adopted a resolution or ordinance rather, where we use
12 the DPMC as a pre-classification requirement and
13 that's been in effect for years. I think, since 2002.

14 The way that works, we identify those
15 trades that we feel are necessary that you need to be
16 approved for. Now, under the local public contracts
17 law, you're normally only required to list your four
18 prime subs. However, if you do not have the DPMC
19 classification that's listed on there and it's not a
20 required trade, you still have to -- you're required
21 to identify it because you have to meet that
22 requirement if you're doing it through your
23 subcontractor.

24 I don't have the thing with me, but,
25 obviously, there's something on there. Let's say

1 elevators, that's not usually a required trade.
2 However, for the purposes of this project because it's
3 a DPMC classification requirement, if you're the GC
4 and you don't have it, you have to identify your
5 elevator sub as a mandatory trade in order to satisfy
6 that and with respect to the requirements, in terms of
7 the capacity, it's for the amount of the contract.

8 So if your elevator guy is classified
9 under DPMC for up to \$10 million and that portion of
10 the bid is, you know, \$9 million, but he's already got
11 \$2 million outstanding, he can't and believe me, I
12 check. I will sit there and I do the math to make
13 sure that everybody has the capability that is
14 permitted by the DPMC.

15 SPEAKER #1: You're saying you want
16 that identified, not just identified, but identified
17 on the bid form?

18 MS. COMAS: As if it was you.

19 SPEAKER #1: As part of the bid
20 document, because it doesn't say that in there. It
21 doesn't say that it needs to be identified in the bid.

22 MS. COMAS: It says, if you're
23 attempting to meet that requirement, you have to
24 provide all the documents.

25 SPEAKER #1: You have to identify it,

1 but it doesn't say necessarily in the bid documents.

2 It wouldn't be a requirement if --

3 MS. COMAS: I think that's not so much
4 of an issue. I mean, I think it's all at the time of
5 bidding -- I think you can ask for different
6 timeframes, if I'm not mistaken, when you do that.
7 DPMC classification, you guys would know better than I
8 do, but my understanding is, you have multiple terms
9 that you can be given the DPMC classification for.

10 Same thing with affirmative action.
11 You can get a three year. You can get a five year.
12 You can get a seven year. All depends on how much
13 money you give them.

14 MR. MARZZIOTTI: As far as asbestos
15 abatement, Kevin, you want to talk about that asbestos
16 abatement?

17 MR. BURNS: I think the big one is what
18 we're dealing with here is asbestos plaster in both,
19 the rotunda and the tower. The tower is a little bit
20 simpler. The work areas are smaller. It's where the
21 stair tower, itself, is going up. The rotunda has
22 asbestos ceiling wall plaster. So the biggest part of
23 this project asbestos-wise is, once we're separated
24 from the occupants in 107 and that GC is responsible
25 for marking out where any ductwork, any penetrations,

1 any of those type of things are going to be made
2 through the plaster walls and the plaster ceilings.
3 At that time, it's going to be no other GC work in
4 that part of the building until the abatement is done.

5 The key component of this is, all mark
6 outs, where you need stuff made, where do you need
7 holes made. The abatement guy comes in and does his
8 work and returns it back to you guys, so you can go in
9 and do your work. That's really the big issue here in
10 the rotunda.

11 SPEAKER #2: What about a simple hole,
12 for like an anchor?

13 MR. BURNS: Anything that's minor with
14 a small drill or whatever, we do put in the
15 specification that we're going to request that you
16 guys hire an abatement guy, who has operations in
17 maintenance with asbestos to be onsite with you guys
18 for any small core drilling like that. But we're
19 really looking for the big mark outs, the trunk work,
20 ductwork, any conduits, stuff like that and it's all
21 in the documents, if you want to read through it. We
22 do ask that a guy is onsite with you guys for the
23 duration of the project in case you need a small hole
24 or something like that.

25 MR. MARZZIOTTI: Joe, anything as far

1 as HVAC?

2 MR. HENDERSHOT: No. I mean, I think,
3 as far as scope goes and the intent of the HVAC,
4 electrical, plumbing, sprinkler, the documents are
5 pretty clear. I will say, make sure that you are
6 looking at those scopes with respect to the phasing of
7 this job, as well. I think that's the most important
8 part on how to phase this work and especially in the
9 rotunda, you know, because it's a complete HVAC
10 replacement units, ductwork, controls, piping, how to
11 make sure you take a careful look at the plumbing work
12 that we have down in the basement of the rotunda, as
13 well. We had some floor trenching down there to tie
14 into the existing building mains and then the stair
15 tower, I think is pretty straightforward. That's more
16 of a -- mechanically, electrically, it's more of a
17 fit-out design than a whole replacement as it is in
18 the rotunda.

19 MS. COMAS: I just wanted to
20 re-emphasize this DPMC thing for clarification
21 purposes because it's getting confusing. Like I said
22 before, if you've ever been on a state project, a
23 Board of Ed, you know that DPMCs are a requirement as
24 well as the subs. Union County only says the GC has
25 to be DPMC classified.

1 However, if you do not have the
2 classification needed required in the bid
3 specifications, you have to find a sub that does. All
4 of a sudden, that sub becomes you.

5 So for the purposes of the amount, for
6 the purposes of being able to substitute that sub, it
7 almost rises to the level of being the bidder, the GC.
8 I just want to make sure you understand that. It's
9 not, oh, it's just another sub and we'll just switch
10 him for somebody. You know that for the four
11 mandatory trades, you can't do that, unless you have
12 circumstances, like, the guy went bankrupt or the guy
13 is refusing to do the work, et cetera.

14 Whoever you identify as a sub for that
15 particular trade becomes you for that trade. That
16 means, the requirement steps up a bit in terms of
17 documentation and providing proof.

18 MR. DiBLASI: But their limit only has
19 to only cover their scope of work?

20 MS. COMAS: Their scope, right. If
21 you're a C008, which is general construction from the
22 ground up, I believe, if you're that, you're good and
23 anything that flows from a C008, but I can use the
24 example of elevator or any of the other trades, you
25 don't have that and understandably some people don't.

1 You have a lot of firms that are C008 and electrical
2 because they are generally an electrical firm. You're
3 getting a plumbing guy, your plumbing guy has to meet
4 those requirements and that has to be your plumbing
5 guy for the remainder of the project. You can't
6 switch it out later on.

7 MR. MARZZIOTTI: So everybody signed
8 the sign-in sheet? We'll take a walk through now.
9 We're going to go through look at the rotunda, the
10 ground floor, first floor and we'll see the upper
11 floors. We're going to walk all the floors to see how
12 it is and we'll go into the stair tower and look at
13 several of the courtrooms and talk about access into
14 the building for the rotunda and the stair tower.

15 MR. EDMONDS: About the walk-through
16 tonight, it's more just a general walk-through. We're
17 not going to get into every door and every room. It's
18 just really kind of seeing the main floors. The idea
19 is when we come back with the subs on those subsequent
20 walk-throughs, we'll try to permit as much access as
21 we possibly can.

22 MR. DiBLASI: Pictures are allowed or
23 no pictures?

24 MR. MARZZIOTTI: I don't know the
25 answer to that question.

1 MS. COMAS: I think just generally it
2 should be fine.

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(The hearing concluded at 5:10 p.m.)

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1 C E R T I F I C A T E

2
3 I, LATITISA RUSSELL, a Certified
4 Court Reporter and Notary Public of the State of
5 New Jersey, certify that the foregoing is a true
6 and accurate transcript of the stenographic
7 notes of the deposition of said witness who was
8 first duly sworn by me, on the date and place
9 hereinbefore set forth.

10 I FURTHER CERTIFY that I am neither
11 attorney, nor counsel for, nor related to or
12 employed by, any of the parties to the action in
13 which this deposition was taken, and further
14 that I am not a relative or employee of any
15 attorney or counsel in this case, nor am I
16 financially interested in this case.

17
18
19
20
21 *Latitisa Russell*
22 _____
 LATITISA RUSSELL, C.C.R.
 LICENSE NO. 30XI00234100

MAST Construction Services, Inc.
 Union County Courthouse Complex
 County of Union, Elizabeth, NJ
 Fire Code Upgrades - Phase C1 Rotunda
 And Phase C2 Tower (Internal Stair)
 Union County Project # 2010 - 033C

Pre-Bid Meeting
 September 21, 2017

Sign in Sheet

Name	Firm	Phone	Email
FRANASCO MELANDEZ	NETTA ARCHT		
FRAN KESHER	SHORELANDS CONST.	732-229-4004	FRANK@SHORELANDS.MB.MS.COM
PETER DIBAS	PAUL OTTO BROS CO.	908-709-9500	INFO@PAULOTTO.COM
ED FORTIN	LESSNER ELECTRIC	908-354-9800 ED.FORTIN@LESSNERELECTRIC.COM	
RAJ SHAI	ALMA CONSTRUCTION CORP	(201) 866-0030	RSHAI@ALMACONSTRUCTION.COM
Charles Chirafesi	OC Facilities Mgmt	(908) 527-4218	chirafesi@ocmij.org

MAST Construction Services, Inc.
 Union County Courthouse Complex
 County of Union, Elizabeth, NJ
 Fire Code Upgrades - Phase C1 Rotunda
 And Phase C2 Tower (Internal Stair)
 Union County Project # 2010 - 033C

Pre-Bid Meeting
 September 21, 2017

Sign in Sheet

Name	Firm	Phone	Email
MIKE GIANO	NATELI CONSTRUCTION	973-575-1500	GIANO@NATELI.COM
TISH RUSSELL	Wiegman Apartments		
MIKE SLANDER	GPC	973-376-6446 973-270-7852 (x)	MIKE@GPTAS.NET BELL@GPTAS.NET
Rafael Assunçao	Bobco	973-317-9000	rafa@bobco.com
Mohamed El-Mamry	Bobco	973-317-9000	MOHAMED@BOBCO.COM
ROSS ROSENZ	SMBA CONSULT	201 998 2300	SMBA@SMBACONSULT.COM

MAST Construction Services, Inc.
 Union County Courthouse Complex
 County of Union, Elizabeth, NJ
 Fire Code Upgrades - Phase C1 Rotunda
 And Phase C2 Tower (Internal Stair)
 Union County Project # 2010 - 033C

Pre-Bid Meeting
 September 21, 2017

Sign in Sheet

Name	Firm	Phone	Email
VICTOR PENNERTHA	PENNERTHA INDUSTRIAL RECONSTRUCTION	201-420-1693-XP202	VPENNERTHA@PENNERTHA.COM
James Tskr	Hall Building Corp.	(732) 938-3393	mail@hallbuilding.com
Joe Murt	Mhm Construction	909-351-1177	bids@m-mnj.com
Joseph Handellor	ATTJ Engineers	908-702-3833	jhandellor@attjeng.com
Joseph Graziano	County of Union	908-789-3653	JGraziano@counion.org

Project Manual
Union County Courthouse
Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower (Internal Stair)

2 Broad Street Elizabeth, New Jersey 07207



NETTAARCHITECTS

1084 Route 22 West
Mountainside, NJ 07092

Netta Architects Project # 2141152 & # 2141151
September 07, 2017

SPECIFICATIONS

**UNION COUNTY COURTHOUSE FIRE CODE UPGRADES
PHASE C1 ROTUNDA AND PHASE C2 TOWER (INTERNAL STAIR)
2 BROAD STREET**

**CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
BA#56-2017; UNION COUNTY ENGINEERING PROJECT #2010-033C
SEPTEMBER 2017**

UNION COUNTY OFFICIALS BOARD OF CHOSEN FREEHOLDERS

Bruce H. Bergen, Chairman
Sergio Granados, Vice Chairman
Linda Carter, Freeholder
Angel G. Estrada, Freeholder
Christopher Hudak, Freeholder
Mohamed S. Jalloh, Freeholder
Bette Jane Kowalski, Freeholder
Alexander Mirabella, Freeholder
Vernell Wright, Freeholder

CLERK OF THE BOARD
James E. Pelletiere, RMC

COUNTY MANAGER
Alfred J. Faella

DEPARTMENT OF ENGINEERING, PUBLIC WORKS AND FACILITIES MANAGEMENT

Joseph A. Graziano, Sr., CPWM, Director

**COUNTY ENGINEER
DIVISION OF ENGINEERING**
Thomas O. Mineo, P.E.
2325 South Avenue
Scotch Plains, New Jersey 07076
Telephone: (908) 789-3675
Fax: (908) 789-3674

PREPARED BY:
Netta Architects
1084 Route 22 West
Mountainside, New Jersey 07092
T: 973-379-0006
F: 973-379-1061

**UNION COUNTY COURTHOUSE FIRE CODE UPGRADES
PHASE C1 ROTUNDA AND PHASE C2 TOWER (INTERNAL STAIR)
2 BROAD STREET
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
BA#56-2017; Union County Engineering Project #2010-033C**

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Contractor Performance Record
Affidavit Regarding List of Disbarred, Suspended or Disqualified Bidders
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**COUNTY OF UNION
NOTICE TO BIDDERS**

Sealed bids will be received by the director of the Division of Purchasing, or her designee, at the County of Union, New Jersey on November 16, 2017 at 10:30 a.m., prevailing time, in the 6th Floor Freeholder Conference Room, U.C. Administration Building, 10 Elizabethtown Plaza, Elizabeth, New Jersey for:

**UNION COUNTY COURTHOUSE FIRE CODE UPGRADES
PHASE C1 ROTUNDA AND PHASE C2 TOWER (INTERNAL STAIR)
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
BA#56-2017; UNION COUNTY ENGINEERING PROJECT #2010-033C**

Bid Packages may be obtained at no charge by registering and downloading at <http://ucnj.org/bid-specs>. Bid Packages may also be obtained in person from the Division of Engineering at 2325 South Avenue, Scotch Plains, New Jersey 07076 between 8:30 a.m. and 4:00 p.m. weekdays upon payment of a non-refundable money order or bank check in the amount of \$850.00 made payable to the County of Union. No Personal / Company checks will be accepted. Requests for mailing of specifications will not be honored. For further information please call 908-789-3675.

A **mandatory pre-bid meeting** will be held on September 21, 2017 at 4:30pm. The meeting will be located at 2 Broad Street, Elizabeth, NJ 07202 in the Facilities Conference Room. Specific questions regarding the project will be addressed at the pre-bid meeting. Due to the complexity of project phasing along with logistical and security issues presented by working in a courthouse, the pre-bid meeting is mandatory. Contractor's that submit a bid without attending the pre-bid meeting will have their bid rejected.

Bidders on this project are required to be classified by the State of NJ, Division of Property Management and Construction (DPMC) under classification # **C009 General Construction / Alterations and Additions, C021 Demolition, C024 Historical Restoration, C029 Structural Steel and Ornamental Iron, C030 Plumbing, C032 HVACR, C045 Sprinkler Systems, C047 Electrical, C092 Asbestos Removal / Treatment, C099 Elevators** as well as other documentary requirements as set forth in the INSTRUCTION TO BIDDERS found in the bid specifications. If the Bidder himself does not have the required classification(s) as stated above, the Bidder must include and identify a subcontractor(s), of any tier, who has the required classification(s) in the List of Subcontractors.

Please note the successful bidder will be required to sign a **PROJECT LABOR AGREEMENT (PLA)** for this project. A **(PLA)** form is included in the bid package for your review. Further, take note of all documents referring to the **(PLA)** and any action required on same. This bid proposal addresses Phase C of the Union County Engineering Project 2010-033 – Union County Courthouse Fire Code Upgrades – Phase C1 Rotunda and Phase C2 Tower (Internal Stair) and said Project will exceed \$5 Million; therefore a **PROJECT LABOR AGREEMENT (PLA)** will be applicable to this bid. The form of same shall be provided in the bid package.

The County reserves the right to reject any and all bids and to waive any and all informalities in the bid.

Bids shall be submitted in a sealed envelope and clearly marked with the subject of the bid, name and address of the bidder, phone & fax number, and date of the bid opening. Each bid must be delivered to reach the Division of Purchasing prior to the stated time of the opening of the bids. The County will not be responsible for late delivery by the U.S. Mail or any other carrier. If hand delivered, please note that parking and security access at the County Complex may cause delays and bidders should take them into consideration in order to submit a timely bid. **No** late bids will be accepted.

Bidders are required to comply with the requirements of N.J.S.A. 10:5-31 et seq. and N.J.S.A.C. 17:27.

LAURA M. SCUTARI, QPS, MPA, DIRECTOR OF PURCHASING

**UNION COUNTY BOARD
OF CHOSEN FREEHOLDERS**

We're Connected to You!

UNION COUNTY BOARD OF CHOSEN FREEHOLDERS

INSTRUCTIONS TO BIDDERS AND FORMS

DEFINITIONS

Wherever reference is made to the County, Title of Project, Bidder, or Vendor/Contractor they shall be as follows:

OWNER/COUNTY:

Union County Board of Chosen Freeholders
UC Administration Building, 6th Floor
10 Elizabethtown Plaza
Elizabeth, New Jersey 07207

ADDRESS BIDS AND SUBMIT TO:

Union County Division of Purchasing
UC Administration Building, 3rd Floor
10 Elizabethtown Plaza
Elizabeth, NJ 07207
Attn: Laura M. Scutari, QPS, MPA, Division of Purchasing
Telephone: 908-527-4130
Facsimile: 908-558-2548

**TITLE OF PROJECT: Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda and Phase C2 Tower (Internal Stair)
2 Broad Street, City of Elizabeth, County of Union, New Jersey
BA#56-2017; Union County Engineering Project #2010-033C**

BIDDER: Bidder shall be a single overall contract bidder

ARCHITECT:

Netta Architects
1084 Route 22 West
Mountainside, New Jersey 07092
Telephone: (973) 379-0006
Facsimile: (973) 379-1061

COUNTY ENGINEER:

Thomas O. Mineo, P.E.
Union County / Division of Engineering
2325 South Avenue
Scotch Plains, NJ 07076
Office: (908) 789-3675
Facsimile: (908) 789-3674
Email: tmineo@ucnj.org

CONSTRUCTION MANAGER:

Mast Construction
96 East Main Street
Little Falls, New Jersey 07424
Telephone: (973) 837-1515
Facsimile: (973) 837-1517

GENERAL SPECIFICATIONS

1. BID FORM

Bids for this Work will be enclosed in a sealed envelope addressed to the Purchasing Division, County of Union, New Jersey, Union County Administration Building, 10 Elizabethtown Plaza, Elizabeth, New Jersey 07207, with the full name of the Project clearly marked on the outside. Refer to the sheet marked "Notice to Bidders (Advertisement)" for the correct name of the Project. Bidders must submit their bids on the attached pricing sheet (Bid Form), in a sealed envelope addressed to the County and bearing on the outside: the name of the Bidder, Bidder's business address, and the title of the Project.

The Division of Purchasing will receive the bids for this Work at the Union County Administration Building, 10 Elizabethtown Plaza, Elizabeth, New Jersey on the date and time noted on the sheet marked "**Notice To Bidders (Advertisement)**".

The County will not assume responsibility for bids forwarded by mail. It is the individual's responsibility to see that the bids are presented to the Purchasing Division at the time and at the place designated.

Bids will be accepted only on the Bid Form supplied. Bids on forms other than the original supplied herein will be rejected. The "complete" Bid Documents includes the Bid Bond, Bid Form, Bidder's Checklist, Consent of Surety, Ownership Disclosure Certification, Non-Collusion Affidavit, and any other documents noted in the Instructions to Bidders or Contract Document to be submitted with this Bid. (See AIA Owner/Contractor Agreement & General Conditions attached.)

The bidder will state in the bidding sheet the price per unit of measure for each scheduled Item of Work for which he will agree to carry out the Work, and the Total Bid Price for the construction of the Project.

The prices in the Bid Form shall be typed or written in pen and ink. Erasures or alterations must be initialed by the bidder in ink.

The bidding sheet for this Project may include a fixed amount as a Bid Allowance. If applicable, all bidders are required to add this fixed amount to their base bid and to include this additional amount in their Bid Bond. This sum will be included in the Contract as well as the performance, labor and materials bond. Payment by the County will be made to the Contractor from these funds only upon the completion of extra Work pursuant to a written Change Order(s) signed by the County's Engineer or his designee and the Contractor, prior to the commencement of such Work. Work commenced prior to written approval by the County shall be done at Contractor's risk. Such payment will only be in the amount agreed to by the parties, in writing in the

Change Order(s). See Section 39, Change Orders, of these general specifications for further details.

Refer to Bid Document Submission Checklist for all required documents.

In the event there is a discrepancy between the unit price given and the extended total, the unit price will govern. Any discrepancies will be mathematically adjusted.

Insert applicable alternates, if any have been specified, applicable to the Bidder's Work. All alternates MUST be bid upon. Any Bidder's failure to do so will be deemed a material, non-waivable defect and shall render the bid nonresponsive. The Bidder shall clearly designate whether the change in price is an addition or subtraction, by using either a "+" sign or the word "addition", or in the alternative, a "-" sign or the word "minus". If there is no other change in price, the Bidder shall insert "NC" or "No Charge".

When two or more low bids are equal in all respects, awards will be made according to the provisions of N.J.S.A. 40A:11-6.1(d).

Where unit prices have already been established by the Contract Documents, the Bidder agrees that such unit prices shall prevail. All unit prices, whether filled in by the Bidder or established by the Contract Documents, shall become part of the Contract. No bid will be considered or award made, unless applicable unit prices, as required, are filled in.

The County reserves the right to reject any or all bids and also reserves the right to waive any informality in the bids received so long as said waiver is not of a response which is considered to be material and non-waivable pursuant to law.

The County of Union has the right to reject any and all bids from any bidder that is in, or contemplates bankruptcy of any chapter of nature. Said bidder shall notify the County, in writing, of any condition or knowledge of the same.

Conditional bids will not be accepted. Bids may be withdrawn prior to the advertised time for the opening of bids or authorized postponement thereof or in accordance with the provisions of N.J.S.A. 40A:11-23.3 discussed below. Bids received after the advertised time shall not be considered. Bidders shall be solely responsible for premature opening or late delivery of bids not properly marked, addressed, or directed.

2. WITHDRAWAL OF BID DUE TO MISTAKE

N.J.S.A. 40A:11-23.3 authorizes a bidder to request withdrawal of a public works bid due to a mistake on the part of the bidder. A mistake is defined by N.J.S.A. 40A:11-2(42) as a clerical error that is an **unintentional and substantial computational error or an unintentional omission of a substantial quantity of labor, material, or both, from the final bid computation.**

A bidder claiming a mistake under N.J.S.A. 40A:11-23.3 must submit a request for withdrawal, **in writing**, by certified or registered mail to Laura M. Scutari, QPA, MPA, Director, Division of Purchasing, County of Union, New Jersey, Union County Administration Building, 10 Elizabethtown Plaza, Elizabeth, New Jersey 07207. The bidder must request withdrawal of a bid due to a mistake, as defined by the law, within five business days after the receipt and opening of the bids. Since the bid withdrawal request shall be effective as of the postmark of the certified or registered mailing, Laura M. Scutari, QPA, Director of the Division of Purchasing or his designee may contact all bidders, after bids are opened, to ascertain if any bidders wish to, or already have exercised a request to withdraw their bid pursuant to N.J.S.A. 40A:11-23.3.

A bidder's request to withdraw the bid **shall** contain evidence, including any pertinent documents, demonstrating that a mistake was made. Such documents and relevant written information shall be reviewed and evaluated by the County's designated staff pursuant to the statutory criteria of N.J.S.A. 40A:11-23.3.

The County will not consider any written request for a bid withdrawal for a mistake, as defined by N.J.S.A. 40A:11-2(42), by a bidder in the preparation of a bid proposal unless the postmark of the certified or registered mailing is within the five business days following the opening of bids.

3. QUALIFICATIONS OF BIDDERS AND REQUIRED SUBMISSIONS

The County may make such investigation as it deems necessary to determine the ability of the Bidders to perform the Work, which includes investigation of any and all subcontractors listed with the bid. The Bidder shall furnish any information and data for this purpose as the County may request.

4. INTERPRETATIONS AND ADDENDA

Any explanation desired by a bidder regarding the meaning or interpretation of the Contract Documents must be requested in writing to the County Engineer via email at tmineo@ucnj.org and with reasonable time allowed for a reply to reach bidders before submission of their bids. Any interpretation or instruction made by the County Engineer will be in the form of an addendum to the Contract Documents or clarification and will be furnished to all prospective bidders. Oral explanations or instructions given

before the award of the Contract will not be binding. Bidders are required to bring to the attention of the County Engineer, the discovery of any apparent ambiguity, inconsistency, error, discrepancy, omission in the Contract Documents for interpretation and correction at least ten (10) working days before opening of bids with the exception of Saturdays, Sundays and holidays.

All Addenda issued through the Offices of the County Engineer are amendments to the Contract Documents and shall be considered in preparing bids. Same shall become part of the Contract Documents.

Addenda take precedence over all earlier documents and over each other according to the latest date. Addenda unless themselves interpretive remain subject to interpretation the same as any other document incorporated in the Contract.

Addenda may be issued by the County Engineer up to seven (7) working days prior to the opening of bids. Failure of any bidder to receive an addendum shall not relieve such bidder from the obligation imposed by such addendum. Bidders are to keep themselves currently acquainted with the Contract Documents during the entire bidding period and make inquiry on their own initiative as to issuance of any Addenda. Receipts of all Addenda shall be acknowledged on the “*Acknowledgement of Receipt of Changes*” included in the bid package and must be submitted with the bid.

5. OBLIGATION OF BIDDER TO INSPECT SITE AND CONTRACT DOCUMENTS

At the time of the opening of bids, each Bidder will be presumed to have inspected the site(s) and to have read, and be thoroughly familiar with the Contract Documents. The failure or neglect of any Bidder to receive or examine any form, instrument, or document shall in no way relieve any Bidder from any obligation in respect to its bid.

The Bidder shall examine the contents of the Project Manual and the set of Drawings and assure itself that all pages of the Specifications, Drawings, and other Contract Documents are included in the documents obtained for bidding purposes. Should the Specifications, Drawings, and other Contract Documents be incomplete, the Bidder shall notify the County Engineer in writing, who will supply the Bidder with any missing pages of Specifications, Drawings, or other Contract Documents. The lack of such written notification by the Bidder will be construed as evidence that the Specifications, Drawings, or other Contract Documents supplied it for bidding purposes are full and complete and as a waiver of any subsequent claim to the contrary.

6. BID AND PERFORMANCE GUARANTEE

Each bidder must furnish a Bid Bond, Certified Check or Bank Cashier's Check in the amount of ten percent (10%) of the Bid. Checks shall be drawn to the order of the County of Union, New Jersey, not to exceed \$20,000.

Each bidder must furnish with the bid a certificate from a Surety Company, i.e. Consent of Surety, stating that in the event of the contract being awarded to said bidder, such Surety Company will provide the Contractor with Bonds guaranteeing the faithful performance of the Work in accordance with the plans and specifications, and the payment for labor, materials, and all other indebtedness which may accrue on the account of this Work. A Performance, Labor and Materials bond will be furnished by the Contractor upon an award of Contract, and will be in the amount of 100% of the contract price.

A one-year Maintenance Bond will be required upon acceptance of the Project by the County in the amount as stated in Section 17 of the General Specifications. Bonds will be written by a firm authorized to issue the bonds under the laws of the State of New Jersey and be in a form acceptable to the County Counsel.

N.J.S.A. 40A:11-1.1 et. seq. allows the prime Contractor to furnish the Performance Security for his Subcontractors. The County of Union requires Performance Security to be furnished by the prime contractor for the entire job in the total amount of the contract.

The County of Union shall award the contract or reject all bids within sixty (60) days; except that the bids of any bidders who consent thereto may, at the request of the County be held for consideration for such longer periods as may be agreed.

The County will return all certified checks or cashier's checks after the proposals have been opened, read, tabulated and checked except those of the three (3) bidders who have bid the lowest total price for carrying out the Project. The County will return the checks of these bidders when a contract is awarded to the successful bidder within ten (10) days after the award of the contract.

If the successful bidder refuses or neglects to sign the said Agreement and furnish the required bonds, the Bid Bond will be held and used by the County to offset any damages for such refusal or neglect.

7. COMMENCEMENT AND COMPLETION

Work will not commence until a Notice to Proceed is received from the County Engineer.

Upon substantial completion of the Project, the Contractor must request a joint inspection with the County Engineer. Upon completion of this inspection, the County Engineer will prepare a list of incomplete or incorrect items (punch list) and have Contractor initial and date same. The Contractor shall rectify all deficiencies noted on the punch list within 30 calendar days of receipt of the list. The County Engineer may approve extensions for extenuating circumstances.

8. BIDDER AFFIDAVIT

All Bidders are required to complete, sign, and submit with their Bid, the attached "Affidavit Regarding List of Debarred, Suspended or Disqualified Bidders". (See form enclosed)

9. CLASSIFICATION AND QUALIFICATION OF BIDDERS

Pursuant to Ordinance Number 557-2002 as adopted by the County on September 5, 2002, all bidders on contracts for public works shall be classified and qualified in accordance with NJSA 40A:11-25 as well as NJSA 52:35-1 et. seq. (See Section 54 of the General Specifications)

This provision shall not apply to subcontractors.

10. UNCOMPLETED CONTRACTS (BUILDING PROJECTS ONLY)

The Bidder shall submit a current Classification/Prequalification Certificate and accompanying form(s) indicating the dollar amount of uncompleted contracts, and a notarized and itemized list of these uncompleted contracts in the form provided, with their bid. (See form enclosed)

11. BID SECURITY

All Bidders are required to submit a form of Bid Security with their bids.
(Bid Bond or Certified Funds)

The Bid Security shall be in the amount of ten percent (10%) of the Bid, but not in excess of Twenty Thousand Dollars (\$20,000.00), and payable to the order of the "County of Union."

12. LABOR AND MATERIALS

The prices will cover all costs of any nature incident to and growing out of the Work, including all labor, material, equipment, transportation, loss by damage or destruction of the Project, settlement of damages, and for replacement of defective work or materials. N.J.S.A. 54:32B-1 et seq. exempts all materials sold to the County of Union from sales or use taxes and should not be included in the prices provided on the Bidding Sheet.

13. INSURANCE REQUIREMENTS

The County of Union requires all contractors to be able to comply with the following insurance requirements. In the event a bid is accepted by the County, the contractor must accept the applicable insurance requirements, as set forth below, as part of any contract awarded to it by the County.

Contractor shall carry and maintain at all times while the contract is in full force and effect, the following insurance coverage with an insurance company or companies acceptable to the County, with limits not less than those shown below. A Certificate of Insurance, shall be filed with the County prior to commencement of any Work indicating the following:

- a) Commercial General Liability (CGL): Coverage for all operations including, but not limited to, contractual, products and completed operations, and personal injury with limits no less than \$5,000,000 per occurrence/\$10,000,000 aggregate. The County of Union, its Board of Chosen Freeholders, officers, employees, agents and servants shall be included as an additional insured. Coverage is provided on a primary and non-contributory basis to the County of Union, et al.
- b) Automobile Liability: Coverage for all owned, non-owned and hired vehicles with limits not less than \$5,000,000 per occurrence, combined single limits (CSL) or its equivalent.
- c) Workers Compensation: As required by the State of New Jersey and Employers Liability with limits not less than \$1,000,000 per accident for bodily injury or disease.
- d) Professional Liability (if design/build): Coverage with limits not less than \$1,000,000 per occurrence or claim, \$2,000,000 aggregate
- e) Contractor's Pollution Legal Liability and/or Asbestos Legal Liability and/or Errors & Omissions (if project involves environmental hazards): Coverage with limits no less than \$1,000,000 per occurrence or claim/\$2,000,000 aggregate.

- f) Builders Risk (for major renovations): During the course of construction utilizing an “All Risk” coverage form with limits equal to the completed value of the project and no coinsurance penalty provisions.

Where applicable, a waiver of subrogation in favor of the County of Union, its Board of Chosen Freeholders, officers, employees, agents, servants and the State of New Jersey is to be included in those policies of insurance where permitted by law.

Notice of Cancellation: Each insurance policy required above shall provide that coverage shall not be canceled, except with notice to the Entity.

Special Risks or Circumstances: The County reserves the right to modify these requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances.

14. INDEMNIFICATION REQUIREMENTS

The County of Union requires all bidders to accept the following indemnification requirements in the event the County accepts their bid. The Contract awarded by the County to the successful bidder will contain the following provision:

“To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the owner and the owner’s consultants, agents, representatives, and employees from and against any and all claims, damages, losses, costs, and expenses, including, but not limited to attorneys’ fees, legal costs and legal expenses arising out of or resulting from the performance of the Contractor’s work under this contract, provided that such claim, damage, loss, cost, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) caused or alleged to be caused by the negligent acts, negligent omissions, and/or fault of the Contractor, anyone directly or indirectly employed or retained by the Contractor, or anyone for whose acts the Contractor may be liable regardless of whether caused in part by the negligent act or omission of a party indemnified hereunder provided it is not caused by the sole negligence of a party indemnified hereunder. Contractor shall further indemnify and hold harmless the County and the County’s consultants, agents, representative, and employees from and against any and all claims, damages, losses, costs, and expenses, including, but not limited to attorneys’ fees, legal costs and legal expenses, arising out of or resulting from performance of the work, provided that such claim, damage, loss, cost, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) caused or alleged to be caused by the negligent acts, negligent omissions, and/or fault of the County or the County’s consultants, agents, representatives, or employees

and arises out of this project and provided such claim, damage, loss, cost, or expense is not caused by the sole negligence of a party indemnified hereunder.”

15. ROYALTIES AND PATENTS

The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall hold the County harmless from loss on account thereof.

16. PLANS AND SPECIFICATIONS

In carrying out the Work, the plan(s) and the specifications will be followed by the Contractor. Minor alterations in the plan may be made or permitted by the County Engineer from time to time and, if no additional Work is necessary, there will be no additional charge for carrying out such minor alterations.

The Contractor shall provide the County Engineer a set of reproducible as-built drawings upon completion of the Project. The Contractor shall maintain an updated construction progress plan in the Project field office at all times.

When applicable, The New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction, as amended, and Supplemental Specifications for State Aid Projects, herein after referred to as the “Standard Specifications”, are made a part of these specifications and contract for the improvements, and will govern the construction of this Project, the material used and the execution of this Project, except as revised and modified herein. The references to these specifications are given herein for the purpose of aiding in the rapid location of the description of the various items herein specified. The entire Work must be carried on and completed to the satisfaction of the County. The Standard Specifications are amended as follows:

“Any reference to the Commissioner, Department, Department Laboratory, Engineer or Inspector should be redefined to be the County of Union”.

17. GUARANTEE AGAINST DEFECTIVE WORK

Prior to final payment being made or before the release of the performance security required by Section 3 above, the Contractor and Surety shall execute and deliver to the County an original Maintenance Bond with an original signature and seal having a penal sum equal to:

- A) One hundred percent (100%) of the final adjusted Contract amount, if such amount is \$50,000.00 or less;

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- B) Fifty percent (50%) of the final adjusted Contract amount, if such amount be greater than \$50,000.00 but less than \$250,000.00; and,
- C) Twenty-five percent (25%) of the final adjusted contract amount, if such amount is \$250,000.00 or more.

The Bond and Surety shall be satisfactory to the Union County Counsel. The Surety shall hold a Certificate of Authorization to do business in the State of New Jersey and shall conform to P.L. 1995 c.384, codified as N.J.S.A. 2A:44-143, 144. The Surety Disclosure Statement and Certification required by N.J.S.A. 2A: 44-143, 144, shall be attached to the Bond. Such Maintenance Bond shall remain in full force and effect for a period of one (1) year from the date of Final Completion. Such Maintenance Bond shall also provide that the Contractor and the Surety guarantee to replace for the said period of one (1) year from the date of Final Completion, all Work performed and/or all materials furnished that were not performed or were not furnished in accordance to the terms and performance requirements of the Contract Documents, and will make good any defects thereof which become apparent before the expiration of one (1) year. If, during that period, any part of the Project, in the judgment of the Engineer, is found defective, the Contractor will repair or replace same within five (5) days of receipt of notice from the County Engineer. If the Contractor refuses or neglects to do such Work in the time specified, the County Engineer may have the Work done by others and the Contractor or his Surety thereof will pay the cost.

The Contractor will furnish the County a Maintenance Bond for a percentage of the final adjusted contract price, as stated above. The one (1) year period will start the day of Final Completion of Project by the County. Final payment is conditional on the receipt of a maintenance bond in a form acceptable to County Counsel.

18. TRAFFIC AND STREET MAINTENANCE

The Work must be started and performed by the Contractor in such a manner as to minimize delays to the traveling public. It must be completed in a timely fashion, with little or no inconvenience to traffic and pedestrians, where such inconvenience may be avoided.

All municipal, county, and state roadways shall remain open to traffic unless otherwise provided for in the technical specifications.

If modified traffic patterns are authorized in order to provide a safe working or traveling environment, the Contractor is responsible for providing all equipment, barrels, cones, signs, and barricades to implement the work zone and detours, unless otherwise specified in the technical specifications. All work zones and detours shall be established in accordance with the technical plans and specifications if provided or in strict compliance with the current version of the Manual for Uniform Traffic Control Devices (MUTCD). The Contractor shall obtain approval for these work zones and

detour plans from the Municipal Police or applicable police agency and the Union County Bureau of Traffic Maintenance prior to implementation.

All traffic control plans shall provide for safe movement of vehicular, bicycle, and pedestrian traffic. Particular attention shall be given to requirements of the Americans with Disabilities Act.

No portion of any street or alleyway may be used for the storage of any materials or equipment without the approval of the Municipal Police or other applicable police agency. Sidewalks, gutters, drains, fire hydrants and private drives shall be maintained for their intended use unless specifically approved by the County Engineer.

Upon suspension of Work, at the end of the day or for protracted periods, the Contractor shall remove all rubbish and materials from the Work site to the approved storage/staging location. All road cuts, saw cuts, and trenches that may pose hazard to vehicular, pedestrian, or bicycle traffic, to include handicapped users, shall be filled to the surface of the roadway or sidewalk. At no time will steel plates or settled trenches be allowed at the daily suspension of Work, unless specifically approved by the County Engineer.

Use of Traffic Control Officers shall be determined by the County in accordance with the provisions of N.J.S.A. 40A:11-23.1(c). If applicable to the Project, the County shall have provided an allowance for same as set forth in the Bid Form.

With respect to pedestrian traffic, the Contractor shall install signs restricting access of the general public and, as necessary, Union County employees to the area of construction. The Contractor shall provide safe access to required areas and place physical barriers to restricted areas. These barriers may range from caution tape to actual barriers, at the direction of the County Engineer.

19. CONTRACTOR'S EMPLOYEES

The Contractor must employ only suitable and competent labor in the Work, and must remove from the Work any incompetent, unsuitable, or disorderly person upon complaint from the County Engineer.

The parties to any contract resulting from this proposal do hereby agree that the provisions of N.J.S.A. 10:2-1 through 10:2-4 (discrimination in employment on public works contracts); 34:11-56.25 et seq. (payment of prevailing rate of wages determined pursuant to N.J.S.A. 34:11-56.30 by the Commissioner), and the Rules and Regulations promulgated pursuant thereto, are hereby made a part of any contract and are binding upon them.

There will be no discrimination against any employee who is employed in the Work to be covered by any contract resulting from this bid because of age, race, creed, color, national origin, ancestry, marital status or sex.

Any person, firm, or corporation violating the provisions of this Section will be deemed and judged a disorderly person.

20. OWNERSHIP DISCLOSURES REQUIRED

Pursuant to P.L. 1977, N.J.S.A. 52:25-24.2, the Bidder shall submit with its Bid, or prior to receipt of bids, a statement setting forth the names and addresses of all stockholders in the corporation or partnership bidding who own ten percent (10%) or greater interest therein. (See forms attached)

21. NON-COLLUSION AFFIDAVIT

The Bidder shall submit with its bid either the attached completed "Non-Collusion Affidavit" or a statement of non-collusion with verbiage similar to same.

22. EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCES

The successful bidder shall be required to complete and submit an Initial Project Workforce Report, New Jersey Department of Treasury Form AA-201, upon notification of award. Failure to submit this completed form may result in the Contract being terminated.

The successful bidder shall also be required to submit a copy of its Monthly Project Workforce Report, New Jersey Department of Treasury Form AA-202, to the New Jersey Department of Treasury's Division of Public Contracts Equal Employment Opportunity Compliance and to the Board.

23. COMPLIANCE WITH NEW JERSEY PREVAILING WAGE ACT

The County of Union, in order to fulfill the requirements of N.J.S.A. 34:11-56a.25 et seq, requires that the following additional conditions be strictly followed. The bidders represent that he is not listed or is not on record in the Office of the Commissioner or the Department of Labor and Industry as one who failed to pay prevailing wages in accordance with the provisions of this Act. The bidder agrees to the inclusion of a contract provision upon award which specifically requires said Contractor to fully comply with each and all of the requirements of the aforesaid Act as it relates to prevailing rates of wages on public contracts as set forth in the New Jersey Prevailing Wage Act, P.L. 1963, Chapter 150 and P.L. 1974, Chapter 64.

A Copy of the Prevailing Wage Rates is attached for your reference. Applicable rates are those wages and fringe benefit rates in effect on the date the contract is awarded. All predetermined rate increases listed at the time the contract award must also be paid, beginning on the dates specified. Rates may change between the time of issuance of this determination and the award of the public works contract. Therefore, prior to the award of the contract, verification must be made with the Public Contracts section, to insure that the rates contained in this determination are still prevailing.

The Contractor agrees to abide and be bound by each and all of the said statutory provisions with respect to the payment of prevailing rates of wages, and acknowledges that the County reserves the right to terminate the Contractor's (or his subcontractors') right to proceed with the scope of Work, or such portion thereof that relates to the failure to pay prevailing rates of wages. In such event or under the terms of N.J.S.A. 34:11-56.27, the Contractor and his surety will be liable to the County of Union for any excess costs occasioned by such a violation.

The Contractor or subcontractors for this Project will post the Prevailing Wage Rates for each craft and classification involved as determined by the Commissioner of Labor and Industry, including the effective date of any changes thereof, in prominent and easily accessible places at the site of the Work or at such place or places as are used by them to pay workmen their wages.

The County of Union requires a copy of payroll records from the Contractor and subcontractors. Payroll records shall be submitted with each voucher request for payment. Prevailing wage rates may be obtained from the New Jersey Labor, Division of Workplace Standards, Public Contracts Section, (609-292-2259).

In addition to compliance with the New Jersey Prevailing Wage Act, the County requires compliance with procedures established by Resolution No. 2014-0408 adopted by the Union County Board of Chosen Freeholders on May 8, 2014. The resolution is furnished in Section 53 of these General Specifications.

UNION LABOR IS PREFERRED ON ALL COUNTY WORK AND, WHERE NOTED, SUBJECT TO A PROJECT LABOR AGREEMENT TO BE EXECUTED BY THE CONTRACTOR AND CONSTRUCTION MANAGER PRIOR TO COMMENCEMENT OF THE WORK. FAILURE OF ANY CONTRACTOR TO COMPLY WITH THIS PROVISION CONSTITUTES A DEFAULT, RESULTING IN IMMEDIATE STOPPAGE OF THE WORK. ANY LOSSES OR OTHER DAMAGES INCURRED BY OTHER PARTIES AS A RESULT OF SAID DEFAULT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. (See Section 55)

The foregoing reference to specific laws will not be deemed to be a limitation of obligation of the Contractor to perform his obligations in full compliance with the provisions and requirements of all federal and state statutes and local ordinances applicable to the Work to be done under the contract.

It is agreed and understood that any contracts and/or orders placed as a result of this proposal will be governed and construed and the rights and obligations of the parties hereto will be determined in accordance with the laws of the State of New Jersey.

Upon completion of the Work, the Contractor will furnish a Certification of Compliance with the New Jersey Prevailing Wage Act. The certificate in a form acceptable to County Counsel is a condition of the final payment. (See form attached)

24. BRAND NAME OR EQUAL

When the Specifications, Forms, and other Contract Documents use “brand name or equivalent” or similar language, the listed brand name shall serve as a reference or point of comparison for the functional or operational characteristic desired for the goods or services being requested. Where a bidder attempts to submit an equivalent product for a brand name, it shall be the responsibility of the bidder to fully describe and document the product to be provided with the bid in order to establish the equivalence claim.

- A. If the Bidder proposes to offer substitute goods as an equal to those specified herein, the bidder shall so indicate with the Bid Proposal. For the purposes of this paragraph, a proposed item shall be considered equal to goods specified herein if:
 - 1. The County, in its sole discretion, determines that: (i) the goods conform substantially, even with deviations, to the brand name goods specified herein; (ii) the goods are equal to or greater than the brand name goods specified herein in terms of quality, durability, functionality, appearance, strength and design; (iii) the goods are capable, at least as well as the brand name goods specified herein, or performing with existing equipment; and (iv) the goods do not cost the County more than the brand name goods specified herein costs the County.
- B. To offer substitute goods as an equal to those specified herein, it is necessary that:

1. The Bidder submits sufficient information with its bid to permit the County to determine that the goods are equivalent to the brand name goods specified herein, including, but not necessarily limited to the brand, catalog number and specifications/data sheets;
 2. The Bidder fully identifies and describes the variations of the goods from the brand name goods specified herein on a separate sheet that is to be submitted with the bid proposal. Bidder's literature WILL NOT suffice in explaining exceptions to these specifications.
 3. The Bidder certifies that the goods (i) are similar in substance to the brand name goods specified, and (ii) are suited to the same use as the item specified;
- C. The County shall be allowed a reasonable time within which to evaluate the Bidder's proposal to offer substitute goods as an equal to those specified herein. The County shall be the sole judge of acceptability. No "or-equal" goods shall be ordered, delivered, assembled, set-up or utilized until the County's evaluation is complete. The County's determination as to equivalency shall be deemed final and absolute.

In the event the Bidder does not provide sufficient supporting documentation with the bid, it will be presumed and required that the brand name goods and services as described in the specifications will be provided.

25. LINES AND GRADES

Normally, horizontal and vertical control points will be provided in the technical specifications. All other surveying will be the responsibility of the Contractor unless otherwise noted.

26. NUMBER OF WORKING DAYS

In accordance with NJSA 40A:11-17, the Work for the within Project shall be completed as specified on the Time of Completion Form. See form attached

There shall be taken a deduction from the contract price, or any wages paid by the County, to any inspector(s) necessarily employed by it on the Work, for any number of days in excess of the number allowed in the specifications.

27. PROMPT PAYMENT OF CONSTRUCTION CONTRACTS (NJ Prompt Payment Act)

Pursuant to NJSA 2A:30A-1 et. seq., payment to the Contractor, other than for Work done pursuant to a contact allowance, where applicable, shall be processed and paid as follows:

1. All contractor bills shall be either approved for payment, or notice provided as to why the bill or any portion of it will not be approved by the representative(s) of the governing body no later than the public meeting following 20 calendar days of the billing date as defined in the statute.
2. If the billing is approved, said bill shall be paid in the payment cycle following the meeting.

28. STOPPING WORK ON ACCOUNT OF BAD WEATHER

Work must only be performed in weather suitable for the type of construction planned or underway. Extremes in temperature, humidity, precipitation, evaporation, etc. can detrimentally affect the constructed product. Refer to the Standard and Technical Specifications for specific items.

29. ACCESS FOR OTHER CONTRACTORS

The Contractor for this Work will give proper access to other contractors who may be employed upon the Project and must not hinder or delay unnecessarily any Work that may be progressing under other contracts.

30. CONDEMNED MATERIALS AND WORK

Any materials and or part of the Work that may be condemned by the County Engineer will be removed and replaced by the Contractor or otherwise rectified, as may be directed by the County Engineer. No payment will be made upon the Work until such faulty work has been made good as may be directed. In the event the Contractor refuses or neglects to make good such faulty work, he will be deemed to have abandoned the contract and proceedings may be taken against him as provided herein.

31. STORAGE

In the event that it is necessary for the Contractor to stockpile or store materials or equipment on the job site, the Contractor shall inform the County of such necessity and the County may offer available space, if any, for storage of such materials or equipment. The Contractor shall use said space only for such purpose. Any and all

materials which may be stored in such space or which may be brought onto the job site at any time by the Contractor will be at the Contractor's sole risk. The County will not be responsible for loss of or damage to said materials or equipment for any cause whatsoever. The Contractor shall take necessary measures to protect any such storage area and shall be responsible for any and all damages.

32. FINAL CLEAN UP

Upon completion of the Work, the Contractor will remove all equipment, unused materials, rubbish, etc., and will repair, or replace in an a manner acceptable to the County Engineer, all areas that may have been damaged in the prosecution of the Work. Same shall be a condition precedent to final payment. Should said Contractor fail to comply with this requirement, the County shall undertake the clean-up with its own forces and charge the cost of same against the Contractor's contract balance.

33. SUB-LETTING OF WORK

Except for the List of Subcontractors, pursuant to NJSA 40A:11-16 (See form attached), no portion of the Work will be sublet by the Contractor to any other entities, except with the consent of the County Engineer. A complete list of subcontractors must be submitted to the County Engineer at the preconstruction meeting. If the job does not warrant a preconstruction meeting, the Contractor must submit such list prior to the start of Work.

All Subcontractors will be subject to NJSA 34:11-56 et al.

N.J.S.A. 40A:11-16 requires the bidder to list in the bid sheets the name or names of all subcontractors involved in the following types of Work: plumbing and gas fitting and all kindred work, steam and hot water heating, ventilating apparatus, steam power plants and kindred work, electrical work, ornamental iron work, and structural steel. In addition, the County may require the identification of specific additional subcontractors. If these trades are expected to be part of the contract, such subcontractors should be listed on the "Subcontractor Identification Statement List of Subcontractors" and Bidder shall certify same on the accompanying sheet titled "Subcontractor Identification Certification". (See forms attached) **Bidder's failure to submit these two forms shall be considered a material defect and result in rejection of Bidder's bid.** Substitutions of any listed subcontractors pursuant to NJSA 40A:11-16 will not be permitted except with the consent of the County Engineer.

34. SAFETY

The Contractor shall observe all rules and regulations of the Federal, State, and local health officials. Attention is directed to Federal, State, and local laws, rules, and regulations concerning construction safety and health standards. The Contractor shall

not require any worker to work in surroundings or under conditions that are unsanitary, hazardous, or dangerous to the worker's health or safety.

The Contractor shall admit to the site, without delay and without the presentation of an inspection warrant, any inspector of OSHA or other legally responsible agency involved in safety and health administration upon presentation of proper credentials.

The Contractor shall make available to the Contractor's employees, subcontractors, the County Engineer, and the public, all information pursuant to OSHA 29 CFR Part 1926.59 of The Hazard Communication Standard 29 CFR 1910.1200, and shall also maintain a file on each job site containing all Material Safety Data Sheets (MSDS) for products in use at the Project. These Material Safety Data Sheets shall be made available to the Engineer upon request.

The Contractor shall at all times conduct the Work to provide for the safety and convenience of the general public and protection of persons and property. The safety provisions of applicable laws, OSHA regulations, building and construction codes, and the rules and regulations of the New Jersey Department of Labor and Commerce shall be observed.

35. QUALITY, SAFETY AND PERFORMANCE STANDARDS

All goods and services must be constructed and provided with the highest quality materials and workmanship. It is the intent of these specifications that only equipment equal to, or exceeding, the standard specified will be acceptable in order to protect the safety of the occupants of the Building.

36. MATTERS NOT MENTIONED IN CONTRACT DOCUMENTS

Any Work, material, or method, not specifically described in these specifications, but shown upon the plans of the Work, will be carried out as shown on said plan.

37. PERMITS

The Contractor will obtain all necessary permits required by law and provide the County with necessary approvals prior to commencement of permitted Work.

38. CONTRACTOR TO PROVIDE PROOF OF PAYMENT

Upon the completion of the Work, the Contractor will furnish a General Release as proof that all claims for labor, materials, etc., have been settled by the Contractor. The General Release, in a form acceptable to County Counsel, is a condition of final payment.

39. CHANGE ORDERS

Change Order Procedures shall comply with *N.J.A.C. 5:30-11.1 et seq.*, “Change Orders and Open End Contracts” and subsequent provisions of the New Jersey Administrative Code.

40. SUPPLEMENTAL WORK

In case any supplemental work is necessary, it will be performed by the Contractor at a price fixed by agreement between the Contractor and the County Engineer and approved by the County as specified in Section 38. The Contractor will do no supplemental work on any character, for which the Contractor will demand pay, except upon the written order of the County.

41. FORM OF CONTRACT

Contracts will be let on the attached Form of Agreement Between County (“Owner”) and Contractor (AIA 101), and General Conditions (AIA 201), as supplemented.

The Contract will be subject to all statutory provisions on the matter of Public Works, Public Contracts, The Law Against Discrimination, the Laws Governing Affirmative Action and Prevailing Rates of Wages under the laws of New Jersey.

The Agreements shall be executed by both parties not later than twenty-one (21) days from the date of the award by the County (Sundays and holidays excluded); however, such time frame may be extended by agreement of the parties.

42. PROGRESS PAYMENTS

Monthly progress payments will be made based on the value of labor and materials incorporated in the Work and of materials suitably stored at the site. An itemized schedule of values shall be submitted with each Application for Payment.

(Refer to the Owner/Contractor Agreement for Retainage and other conditions pertaining to payment and the application of NJSA 2A:30A-1 et. seq.)

All Applications for Payment shall be accompanied by paid invoices for materials incorporated in the Work and for materials suitably stored at the site, and affidavit(s) by Subcontractors whose Work was included in the next to the last application to the effect such Work and such materials have been paid for.

No payment shall be made without Contractor having provided all submittals set forth in this Section, and the approval of same by the County.

For contracts exceeding \$100,000.00, monthly payments will be made on the Work to the extent of 98% of the value of the Work done which is considered to be retainage.

For contracts less than \$100,000.00, monthly payments will be on the Work to the extent of 90% of the value of the Work done. In lieu of the retainage, the Contractor will, at his option, deposit with the County Counsel negotiable bearer bonds of the State of New Jersey or any political subdivision thereof, equal to the amount otherwise withheld as retainage.

When the Project is completed, the final cost of the Project will be based on actual quantities of authorized Work done under each item scheduled in the bidding sheet and approved Change Orders, if any. The money due to the Contractor as determined by said final certificate after deduction of previous monthly payments on account, will be paid to the Contractor in accordance with the terms of the contract dealing with Prompt Payment, providing, however that before such final payment is made, all outstanding claims against the Contractor must be satisfied. Before final payment is released, the Contractor must furnish: **a)** Maintenance Bond (see Section 17 of these general specifications); **b)** Certification of Compliance, New Jersey Prevailing Wage Act (see Sections 23 & 53); and **c)** General Release (see Section 38) in a form satisfactory to County Counsel; **d)** complete set of as-built plans in the latest AutoCad on compact disc; and **e)** a complete set of in-progress photos in jpg, jpeg, or bmp digital format on a compact disc.

43. INSPECTION

The Work must be done in accordance with the plans and specifications, and will be inspected by the County Engineer. An inspector may be placed upon the Work at any time by the County Engineer to see that the plans, specifications, and instructions of the County Engineer are carried out. In connection herewith, bidders are referred to N.J.S.A. 40A:11-17.

44. DAMAGES

The Contractor will be held responsible for all damages that may occur to Work, or to persons or property by reason of the nature of the Work or from the elements, or by reason of inadequate protection of the Work, or from any carelessness or negligence on his part or on the part of his employees. The County will withhold payments on the Work until all suits or claims for damages sustained on, or by reason of, this Work will have been settled by the Contractor.

The construction and final completion of this Work will be guaranteed by the Contractor. Any damages that may be done to the Work or any part thereof, by the elements or otherwise, during its construction, will be made good by the Contractor.

45. LIQUIDATED DAMAGES

If the Project is not completed within the time specified herein or within such further time as may have been granted by the County Engineer, then the Contractor hereby agrees to pay to the County as liquidated damages, but not as a penalty, \$1,000.00 per day for each and every calendar day that he is in default on time to complete the Work. The said sum will be deducted from moneys due the Contractor and if the damages exceed this amount, then the Contractor or his Surety Company will pay the excess. These damages may be waived at the option of the County.

46. AFFIRMATIVE ACTION REQUIREMENTS

EXHIBIT B (Revised 4/10)

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE N.J.S.A. 10:5-31 et seq. (P.L. 1975, C. 127) N.J.A.C. 17:27

CONSTRUCTION CONTRACTS

During the performance of this contract, the contractor agrees as follows:

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, up-grading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry,

marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer, pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.

When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by N.J.A.C. 17:27-7.2; provided, however, that the Division may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B and C, as long as the Division is satisfied that the contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Division, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the targeted employment goal established in accordance with N.J.A.C. 17:27-7.2. The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

(A) If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et. seq., as supplemented and amended from time to time and the Americans with Disabilities Act. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the contractor or subcontractor agrees to afford equal employment opportunities minority and women workers directly, consistent with this chapter. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with affording equal employment opportunities as specified in this chapter, the contractor or subcontractor agrees to be prepared to provide such opportunities to minority and women workers directly, consistent with this chapter, by complying with the hiring or scheduling procedures prescribed under (B) below; and the contractor or subcontractor further agrees to take said action immediately if it determines that the union is not referring minority and women workers consistent with the equal employment opportunity goals set forth in this chapter.

(B) If good faith efforts to meet targeted employment goals have not or cannot be met for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor

or subcontractor agrees to take the following actions:

(1) To notify the public agency compliance officer, the Division, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;

(2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;

(3) Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;

(4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and non-discrimination standards set forth in this regulation, as well as with applicable Federal and State court decisions;

(6) To adhere to the following procedure when minority and women workers apply or are referred to the contractor or subcontractor:

(i) The contractor or subcontractor shall interview the referred minority or women worker.

(ii) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the contractor or subcontractor shall in good faith determine the qualifications of such individuals. The contractor or subcontractor shall hire or schedule those individuals who satisfy appropriate qualification standards in conformity with the equal employment opportunity and non-discrimination principles set forth in this chapter. However, a contractor or subcontractor shall determine that the individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Division. If necessary, the contractor or subcontractor shall hire or schedule minority and women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (C) below.

(iii) The name of any interested women or minority individual shall be maintained on a waiting list, and shall be considered for employment as described in (i) above, whenever vacancies occur. At the request of the Division, the contractor or subcontractor shall provide evidence of its good faith efforts to employ women and minorities from the list to fill vacancies.

(iv) If, for any reason, said contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing of the reasons for the

determination, maintain a copy of the determination in its files, and send a copy to the public agency compliance officer and to the Division.

(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Division and submitted promptly to the Division upon request.

(C) The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of (B) above, it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

After notification of award, but prior to signing a construction contract, the contractor shall submit to the public agency compliance officer and the Division an initial project workforce report (Form AA 201) electronically provided to the public agency by the Division, through its website, for distribution to and completion by the contractor, in accordance with N.J.A.C. 17:27-7. The contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Division and to the public agency compliance officer.

The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and/or off-the-job programs for outreach and training of minorities and women.

(D) The contractor and its subcontractors shall furnish such reports or other documents to the Division of Public Contracts Equal Employment Opportunity Compliance as may be requested by the Division from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Division of Public Contracts Equal Employment Opportunity Compliance for conducting a compliance investigation pursuant to **Subchapter 10 of the Administrative Code (NJAC 17:27)**.

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47. INVESTMENT ACTIVITIES WITH IRAN

Pursuant to P.L. 2012, c25, codified as NJSA 52:32-55 *et seq.*, prohibits State and local public contracts with persons or entities engaging in certain investment activities in energy or finance sectors of Iran.

48. COMPLIANCE WITH THE PUBLIC WORKS CONTRACTOR REGISTRATION ACT - (NJSA 34:11-56.48 *et. seq.*)

Pursuant to the above-referenced law, Bidders are required to be registered with the New Jersey Department of Labor and to possess a current certificate by said Department indicating compliance with the Act prior to the time and date that bids are received. Bidders are notified of this requirement of their compliance. Such certificates or applications shall also be provided for each Subcontractor furnishing plumbing and gas fitting, steam and hot water heating and ventilating apparatus, and all kindred work, steam power plants and kindred work, electrical work, structural steel and ornamental iron work, and such other subcontractors as the specifications require relative to prior identification.

49. UTILITIES

Attention of the bidder is directed to the fact that the approximate locations of known utility structures and facilities that may be encountered within and adjacent to the limits of the Work are shown on the plans and described herein. The accuracy and completeness of this information is not guaranteed by the County Engineer and the bidder is advised to ascertain for himself all the facts concerning the location of these and other utilities.

The Contractor will not proceed with his Work until he has made diligent inquiries of all public utility and municipal officials to determine the exact location of all underground structures and pipes within the site of the Project. The Contractor will notify utility owners not less than ten (10) days in advance of the time he proposes to perform any Work that will endanger or affect their facilities in compliance with **New Jersey One-Call**. In excavating in any part of the Work, care must be taken not to remove or damage any gas, water, sewer, or other pipe, conduit, or structure, - public or private - without the concurrence of the owner and the County Engineer. The Contractor will, at his own expense, shore up, secure and maintain a continuous flow in such structures, and will keep them in repair until final acceptance of the Work.

When pipes or other structures are encountered or when the removal, relocation or protection of these utilities are necessary in carrying out the Project as planned, the Contractor will cooperate with the owner of said utilities and will permit the owners or their agents access to the site of the Work in order to relocate or protect their facilities and not hinder or delay unnecessarily the Work of the owners in moving same. No extra

allowance of payment will be made to the Contractor for the use of any materials, equipment, etc., or for the performance of any Work in connection with the moving of said structures unless the Contractor is specifically ordered by the County Engineer to furnish such materials, equipment, or services. If directed by the County Engineer to do any Work or furnish any materials or equipment, payment will be allowed the Contractor in accordance with the unit prices bid for such Work, or, if such items are not scheduled in the proposal, such Work shall be allowed "Supplemental Work" as provided in Section 39 of these general specifications. The corporations, companies, agencies or municipalities owning or controlling the utilities, and the name, and telephone numbers are listed in the beginning of the Technical Specifications.

50. MATERIAL COMPLIANCE AND SHOP DRAWINGS

The Contractor will require the manufacturer or supplier to furnish three (3) copies of Certification of Compliance with each delivery of materials, components and manufactured items for the Project. Two (2) copies will be furnished to the County Engineer; one copy will be retained by the Contractor. Certificates of Compliance will contain the following information:

1. Project to which material is consigned;
2. Name of the Contractor to which the material is supplied;
3. Kind of material supplied;
4. Quantity of material represented by the Certificate;
5. Means of identifying the consignment, such as label marking, seal number, etc.;
6. Date and method of shipment;
7. That the material is in conformity with the pertinent specifications stated in the certificate; and
8. Signature of a person having legal authority to bind the supplier.

The Contractor will submit to the County Engineer for his approval five (5) copies of complete and fully detailed shop or working drawings for those items listed in the beginning of the technical specifications.

Each drawing will identify the name of the job, location and Contractor.

All drawings will be approved in accordance with the standard specifications. Refer to the Technical Specifications for specific items.

All materials or articles used in the Work will be of American manufacture, insofar as same are available, in conformance with N.J.S.A. 40A:11-18.

51. PRECONSTRUCTION

In order to provide full coordination of this Project among the parties concerned, the County Engineer will arrange for a preconstruction meeting between the Contractor, County Engineer and other interested parties as soon as possible after the contract is executed. At this meeting the Contractor will present his proposed schedule of Work which shall be subject to review and approval of the County through its designated representatives.

52. DISPUTES UNDER THE CONTRACT

A dispute arising under the Contract shall be submitted in writing to the County Engineer with all facts and supporting data. The County Engineer will review the dispute and issue his decision or request additional facts or documentation after which he will render his decision.

In the event the dispute is not then resolved, the matter shall, pursuant to law, be submitted to mediation before being submitted to a court of competent jurisdiction venued in Union County.

The County Engineer will notify the County Counsel when a matter is to be submitted to mediation. The County Counsel will communicate with the parties and inform them of the procedures to be followed in making such a submission.

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**53. ORDINANCE NO. 557-2002 ADOPTED ON SEPTEMBER 5, 2002
BY THE BOARD OF CHOSEN FREEHOLDERS**

Ordinance No. 557-2002 adopted on September 5, 2002 by the Board of Chosen Freeholders on Preclassification of Bidders by the NJDPMC (**if applicable**) pursuant to Ordinance No. 557-2002, the County of Union requires all bidders on projects for the construction, reconstruction, demolition, alteration, repair or maintenance of public buildings to be preclassified by the State of New Jersey, Department of Treasury, Division of Property Management and Construction (“DPMC”).

Bidders must provide proof of classification in the form of a Certificate/Notice of Classification from the DPMC showing a sufficient aggregate rating to cover their bid amount, which is active on the date of receipt of these bids. Further, Bidder must also provide proof of preclassification in the applicable/appropriate trade code necessary for Work on the Project.

AN ORDINANCE IN ACCORDANCE WITH N.J.S.A. 40A:11-25 ESTABLISHING REASONABLE REGULATIONS APPROPRIATE FOR CONTROLLING THE QUALIFICATIONS OF PROSPECTIVE BIDDERS UPON CONTRACTS TO BE AWARDED ON BEHALF OF THE CONTRACTING UNIT, BY THE CLASS OR CATEGORY OF GOODS AND SERVICES TO BE PROVIDED OR PERFORMED AND FIXING THE QUALIFICATIONS REQUIRED ACCORDING TO THE FINANCIAL ABILITY AND EXPERIENCE OF THE BIDDERS AND THE CAPITAL AND EQUIPMENT AVAILABLE TO THEM PERTINENT TO AND REASONABLY RELATED TO THE CLASS AND CATEGORY OF SERVICE TO BE PERFORMED IN THE PERFORMANCE OF ANY SUCH CONTRACT.

WHEREAS, N.J.S.A. 40A:11-25 provides that the governing body of any contracting unit may establish reasonable regulations appropriate for controlling the qualifications of prospective bidders upon contracts to be awarded on behalf of the contracting unit, by the class or category of goods and services to be provided or performed; and

WHEREAS, N.J.S.A. 40A:11-25 also states that the regulations established by the governing body may fix the qualifications required according to the financial ability and experience of the bidders and the capital and equipment available to them pertinent to and reasonably related to the class and category of service to be performed in the performance of any such contract; and

WHEREAS, N.J.S.A. 40A:11-25 also requires that prior to the adoption of any such regulations, a contracting unit shall submit them to a public hearing and notice and

a general description of the subject matter shall be published in not less than two newspapers; and

WHEREAS, N.J.S.A. 52:35-1 et seq. and 18A:18A-27 et seq. establish qualifications for the experience and financial abilities of bidders and the capital and equipment available to them relative to the specific services to be performed; and

WHEREAS, currently state officials, under the Department of Treasury, Division of Property Management and Construction, classify all prospective bidders as to the character and amount of public works on which they shall be qualified to submit bids and bids shall be accepted only from persons qualified in accordance with such classifications; and

WHEREAS, application for classification is open to all Contractors, regardless of the size of the business; and

WHEREAS, classification is based on general standards equally applicable to all Contractors; and

WHEREAS, classification is expressed in terms of trade and an aggregate rating determined on the basis of experience, financial ability, equipment and capital; and

WHEREAS, generally aggregate ratings can range from 0 to \$200,000.00; and

WHEREAS, the County of Union will determine the aggregate rating it will require on contracts depending on the size and expense of the Project, but at no time shall the required aggregate rating exceed \$25,000,000.00 for any one project; and

WHEREAS, such provisions are of considerable benefit to the County and to bidders by insuring that such bidders have the requisite experience, expertise and resources necessary to effectively perform the terms and conditions of the contract:

BE IT ORDAINED by the Board of Chosen Freeholders of the County of Union that it formally adopts as **Policy** that all prospective bidders for building construction projects be classified in accordance with the Department of Treasury – Division of Property Management and Construction pursuant to N.J.S.A. 52:35-1 et seq. and N.J.S.A. 18A:18A-27 et seq.

BE IT FURTHER ORDAINED that the Board of Chosen Freeholders of the County of Union hereby adopts the classification of bidders by the New Jersey Department of Treasury, Division of Property Management and Construction as a reasonable regulation for controlling the qualifications of prospective bidders upon contracts to be awarded for construction on behalf of the County of Union.

BE IT FURTHER ORDAINED that the provisions of this ordinance are severable. To the extent any clause, phrase, sentence, paragraph or provision of this ordinance shall be declared invalid, illegal or unconstitutional, the remaining provisions shall continue to be in full force and effect.

BE IT FURTHER ORDAINED that a public hearing shall be held on this ordinance on September 5, 2002 at the meeting of the Board of Freeholders, County Administration Building, Elizabeth, New Jersey.

BE IT FURTHER ORDAINED that the Clerk of the Board of Freeholders of the County is hereby directed to publish and post notice of this ordinance as required by law.

BE IT FURTHER ORDAINED that within 10 days hereof the Clerk of the Board of Freeholders of the County shall forward certified copies of this ordinance to the County Manager, Director of Finance, County Counsel, and Division of Local Government Services.

This ordinance shall take effect twenty (20) days after final adoption and publication in accordance with applicable law.

54. CONTRACTOR BUSINESS REGISTRATION CERTIFICATE New Mandatory Requirement -Effective 1/18/2010

The recently enacted **P.L. 2009, c.315**, requires that effective January 18, 2010; a contracting agency must receive proof of the bidder's business registration prior to the award of a contract. However, the proof must show that the bidder was in fact registered with the State of New Jersey Department of the Treasury, Division of Revenue and obtained the business registration prior to the receipt of bids.

If subcontractors are named on the bid, proof of the business registration for each subcontractor must be provided prior to the award of bid. Similarly to the bidder, the proof must show that each subcontractor was registered with the State of New Jersey Department of the Treasury, Division of Revenue and obtained the business registration prior to the receipt of bids.

Proof of business registration shall be

- A copy of a Business Registration Certificate issued by the Department of the Treasury, Division of Revenue; or
- A copy of the web version provided by the NJ Division of Revenue, or

Register online at <http://www.state.nj.us/treasury/revenue/busregcert.htm>. Click the "online" link and then select "Register for Tax and Employer Purposes or call the Division at 609-292-1730.

Note: A NJ Certificate of Authority is not acceptable.

FAILURE to submit proof of registration of the bidder or any subcontractor named on the bid prior to the award of contract shall be cause to reject the bid.

FAILURE of the bidder or any subcontractor named on the bid to be registered prior to the receipt of bids is cause for a **MANDATORY REJECTION** of bids. (A NON-WAIVABLE DEFECT). This covers construction Work as well as non-construction bids.

IN ADDITION:

N.J.S.A. 52:32-44 imposes the following requirements on Contractors and all subcontractors that knowingly provide goods or perform services for a Contractor fulfilling this contract:

- 1) the Contractor shall provide written notice to its subcontractors and suppliers to submit proof of business registration to the Contractor;
- 2) subcontractors through all tiers of a project must provide written notice to their subcontractors and suppliers to submit proof of business registration and

subcontractors shall collect such proofs of business registration and maintain them on file;

- 3) prior to receipt of final payment from a contracting agency, the Contractor must submit to the contacting agency an accurate list of all subcontractors and suppliers or attest that none was used; and,
- 4) during the term of this contract, the Contractor and its affiliates shall collect and remit, and shall notify all subcontractors and their affiliates that they must collect and remit, to the Director, New Jersey Division of Taxation, the use tax due pursuant to the Sales and Use Tax Act, (*N.J.S.A. 54:32B-1 et seq.*) on all sales of tangible personal property delivered into this State.

A Contractor, subcontractor or supplier who fails to provide proof of business registration or provides false business registration information shall be liable to a penalty of \$25 for each day of violation, not to exceed \$50,000 for each business registration copy not properly provided or maintained under a contract with a contracting agency. Information on the law and its requirements are available by calling (609) 292-9292.

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55. PROJECT LABOR AGREEMENT (PLA)
(To be signed where the overall project cost exceeds \$5 Million,
irrespective of Phasing)

An Executive Order of Governor James E. McGreevey dated January 17, 2002, requires the use of a Project Labor Agreement in public construction contracts. This Executive Order was codified as N.J.S.A. 52:38-1 et seq. as a result of P.L. 2002, Chapter 44. Contractor must be prepared to abide by the terms of the within Project Labor Agreement, including obtaining the necessary and applicable Letters of Assent from subcontractors (of any tier). Through said Letters of Assent the subcontractors (of any tier) also must be prepared to abide by the terms of the Project Labor Agreement.

Contractor's failure to enter into this Project Labor Agreement shall result in the County's valid refusal to enter into a contract, for the performance of the Work with Contractor and shall constitute a default under the Contract. In addition, Contractor will be required to submit the completed Letters of Assent to the County with the executed Project Labor Agreement. The Project Labor Agreement is to be executed only where the total Project cost is \$5 Million or more, irrespective of Phasing.

This bid proposal addresses Phase C of the Union County Engineering Project 2010-033 – Union County Courthouse Fire Code Upgrades – Phase C1 Rotunda and Phase C2 Tower (Internal Stair) and said Project will exceed \$5 Million; therefore, a Project Labor Agreement (PLA) will be applicable to this bid.

ARTICLE 1 - PREAMBLE

WHEREAS, the COUNTY OF UNION, on behalf of itself, and Project Management Firms ("PMF") acting as Construction Managers, and reflecting the objectives of the COUNTY OF UNION ("UC"), as Owner, desires to provide for the efficient, safe, quality, and timely completion of a construction project for the County in a manner designed to afford lower reasonable costs to Union County, the Union County Freeholder Board, and the Public it represents, and the advancement of public policy objectives; **(See Project Labor Agreement attached)**

WHEREAS, this Project Labor Agreement will foster the achievement of these goals, inter alia by:

- (1) ensuring a reliable source of skilled and experienced labor;
- (2) standardizing the terms and conditions governing the employment of labor on the Project;
- (3) permitting wide flexibility in Work scheduling and shift hours and times; from those which otherwise might obtain;
- (4) receiving negotiated adjustments as to Work rules and staffing requirements from those which otherwise might

- obtain;
- (5) providing comprehensive and standardized mechanisms for the settlement of Work disputes, including those relating to jurisdiction;
 - (6) avoiding the costly delays of potential strikes, slowdowns, walkouts, picketing and other disruptions arising from Work disputes, and promote labor harmony and peace for the duration of the Projects.
 - (7) furthering public policy objectives as to improved employment opportunities for minorities, women and the economically disadvantaged in the construction industry;
 - (8) expediting the construction process; and,

WHEREAS, the signatory Unions desire the stability, security and Work opportunities afforded by a Project Labor Agreement; and

WHEREAS, the Parties desire to maximize Project safety conditions for both workers and the public,

NOW, THEREFORE, the Parties enter into this Agreement:

SECTION 1. PARTIES TO THE AGREEMENT

This is a Project Labor Agreement ("Agreement") entered into by and between UC and its successors and assigns, General Contractors to be named, for certain construction Work to be performed on construction performed pursuant to the "Local Public Contracts Law" in the State of New Jersey and by the Union County Building and Construction Trades Council, AFL-CIO, on behalf of itself and its affiliates and members.

ARTICLE 2 - GENERAL CONDITIONS

SECTION 1. DEFINITIONS

Throughout this Agreement, the Union party and the Building Trades Council are referred to singularly and collectively as "the Union(s)" where specific reference is made to "Local Unions" that phrase is sometimes used; the term "Contractor(s)" shall include the Project Management Firm and all signatory Contractors, and their subcontractors of whatever tier, engaged in on-site Project construction Work within the scope of this Agreement as defined in Article 3; County of Union (UC) is referenced as (Owner); the Union County Building and Construction Trades Council, AFL-CIO is referenced as the BTC, and the Work covered by this Agreement (as defined in Article 3) is referred to as the "Project".

SECTION 2. CONDITIONS FOR AGREEMENT TO BECOME EFFECTIVE

The Agreement shall not become effective unless executed by the BTC, the PMF, and the General Contractor and will remain in effect until the **final** completion of the **Project**.

SECTION 3. ENTITIES BOUND & ADMINISTRATION OF AGREEMENT

This Agreement shall be binding on all signatory Unions and the Project Management Firms and all signatory Contractors performing on-site Project Work, including site preparation and staging areas, as defined in Article 3. The Contractors shall include in any subcontract that they let, for performance during the term of this Agreement, a requirement that their subcontractors, of whatever tier, become signatory and bound by this Agreement with respect to subcontracted Work performed within the scope of Article 3. This Agreement shall be administered by the PMF on behalf of all Contractors.

SECTION 4. SUPREMACY CLAUSE

This Agreement, together with the local Collective Bargaining Agreements appended hereto as Schedule A represents the complete understanding of all signatories and supersedes any national agreement, local agreement or other collective bargaining agreement of any type which would otherwise apply to this Project, in whole or in part. Where a subject covered by the provisions, explicit or implicit, of this Agreement is also covered by a Schedule A, the provisions of this Agreement shall prevail. It is further understood that neither the PMF nor any Contractor shall be required to sign any other agreement as a condition of performing Work on this Project. No practice, understanding or agreement between a Contractor and Local Union, which is not explicitly set forth in this Agreement shall be binding on this Project unless endorsed in writing by the PMF.

SECTION 5. LIABILITY

The liability of any Contractor and the liability of any Union under this Agreement shall be several and not joint. The PMF and any Contractor shall not be liable for any violations of this Agreement by any other Contractor and the BTC and Local Unions shall not be liable for any violations of this Agreement by any other Union.

SECTION 6. THE CONSTRUCTION PROJECT MANAGER

UC shall require in its bid specifications for all Work within the scope of Article 3 that all successful bidders, and their subcontractors of whatever tier, become bound by,

and signatory to, this Agreement. UC is not a party to and shall not be liable in any manner under this Agreement. It is understood that nothing in this Agreement shall be construed as limiting the sole discretion of UC in determining which Contractors shall be awarded contracts for Project Work. It is further understood that UC has sole discretion at any time to terminate, delay or suspend the Work, in whole or part, on this Project.

SECTION 7. AVAILABILITY AND APPLICABILITY TO ALL SUCCESSFUL BIDDERS

The Unions agree that this Agreement will be made available to, and will fully apply to any successful bidder for Project Work who becomes signatory thereto, without regard to whether that successful bidder performs Work at other sites on either a union or non-union basis and without regard to whether employees of such successful bidder are, or are not, members of any unions. This Agreement shall not apply to the Work of any Contractor or PMF, which is performed at any location other than the Project site, as defined in Article 3, Section 1.

ARTICLE 3 - SCOPE OF THE AGREEMENT

The Project Work covered by this Agreement shall be as defined and limited by the following sections of this Article.

SECTION 1: THE WORK

This Agreement shall apply to building construction conducted by the County of Union pursuant to the "Local Public Contracts Law" in the State of New Jersey. This scope of Work may be amended time to time by UC to include Work not performed under the "Local Public Contracts Law".

The scope of Work is confined to the on-site Project Work contained in the scope of the General Contractor's final construction contract.

SECTION 2. EXCLUDED EMPLOYEES

The following persons are not subject to the provisions of this Agreement, even though performing Work on the Project:

Superintendents, supervisors (excluding superintendents and general supervisors and forepersons specifically covered by a craft's Schedule A), engineers, inspectors and testers (excluding divers specifically covered by a craft's Schedule A), quality control/assurance personnel, timekeepers, mail carriers, clerks, office workers, messengers, guards, non-manual employees, and all professional, engineering, administrative and management persons;

Employees of UC or any State agency, authority or entity or employees of any municipality or county or other public employer;

Employees and entities engaged in off-site manufacture, modifications, repair, maintenance, assembly, painting, handling or fabrication of project components, materials, equipment or machinery, unless such offsite operations are covered by the New Jersey Prevailing Wage Act by being dedicated exclusively to the performance of the public works contract or building project and are adjacent to the site of Work, or involved in deliveries to and from the Project site, excepting local deliveries of all major construction materials including fill, ready mix, asphalt and item 4 which are covered by this Agreement.

Employees of the PMF or General Contractor, excepting those performing manual, on-site construction labor who will be covered by this Agreement;

Employees engaged in on-site equipment warranty.

Employees engaged in geophysical testing (whether land or water) other than boring for core samples;

Employees engaged in laboratory or specialty testing or inspections;

Employees engaged in ancillary Project Work performed by third parties such as electric utilities, gas utilities, telephone utility companies, and railroads.

SECTION 3. NON-APPLICATION TO CERTAIN ENTITIES

This Agreement shall not apply to the parents, affiliates, subsidiaries, or other joint or sole ventures of any Contractor or of PMF, which do not perform Work at this Project. It is agreed, for the purposes of this Agreement only, that this Agreement does not have the effect of creating any joint employment, single employer or alter ego status among the owners, the PMF and/or any Contractor. The Agreement shall further not apply to UC or any other state or county agency, authority, or other municipal or public entity and nothing contained herein shall be construed to prohibit or restrict UC or its employees of any other state authority, agency or entity and its employees from performing on or off-site Work related to the Project. As the contracts which comprise the Project Work are completed and accepted, the Agreement shall not have further force or effect on such items or areas except where inspections, additions, repairs, modifications, check-out and/or warranty Work are assigned in writing (copy to Local Union involved) by the General Contractor for performance under the terms of this Agreement.

ARTICLE 4 - UNION RECOGNITION AND EMPLOYMENT

SECTION 1. PRE-HIRE RECOGNITION

The Contractors recognize the signatory Unions as the sole and exclusive bargaining representatives of all craft employees who are performing on-site Project Work within the scope of this Agreement as defined in Article 3.

SECTION 2. UNION REFERRAL

- A. The Contractors agree to hire Project, craft employees covered by this Agreement through the job referral systems and hiring halls (where the referrals meet the qualifications set forth in items 1,2, and 4 subparagraph B) established in the Local Unions' area collective bargaining agreements (attached as Schedule A to this Agreement).

Notwithstanding this, the Contractors shall have sole rights to determine the competency of all referrals; the number of employees required (except with regard to pile driving); the selection of employees to be laid-off (subject to the applicable procedures in Schedule A for permanent and/or temporary layoffs and except as provided in Article 5, Section 3); and the sole right to reject any applicant referred by a Local Union, subject to the show-up payments required in the applicable Schedule A. In the event that a Local Union is unable to fill any request for qualified employees within a 48-hour period after such requisition is made by the Contractor (Saturdays, Sundays, and holidays excepted), the Contractor may employ qualified applicants from another competent source. In the event that the Local Union does not have a job referral system, the Contractor shall give the Local Union first preference to refer applicants, subject to the other provisions of this Article. The Contractor shall notify the Local Union of the Project, craft employees hired within its jurisdiction from any source other than referral by the Union.

- B. A Contractor may request by name, and the Local will honor, referral of persons who have applied to the Local for Project Work and who meet the following qualifications as determined by a Committee of 3 designated, respectively, by the applicable Local Union, the PMF and a mutually selected third party or, in the absence of agreement, the permanent arbitrator (or designee) designated in Article 7:
- (1) possess any license required by NJ law for Project Work to be performed;
 - (2) have worked a total of at least 1000 hours in the Construction craft during the prior 3 years;

- (3) were on the Contractor's active payroll for at least 60 out of the 180 calendar days prior to the contract award;
- (4) have demonstrated ability to safely perform the basic function of the applicable trade.

No more than 12 per centum of the employees covered by this Agreement, per Contractor by craft, shall be hired through the special provisions above (any fraction shall be rounded to the next highest whole number).

C. A certified MBE/WBE contractor may request from the Workforce Coordinator, through the PMF, an exception to, and waiver of, the above per centum limitation upon the number of its employees to be hired through the special provision of Section 2.B above. This exception is based upon hardship and demonstration by the contractor that the Project Work would be the contractor's only job and that it would be obliged to lay off qualified minority and female employees in its current workforce moving from the last job.

The exception and waiver are also conditioned upon the employees meeting the qualifications as set forth in Section 2.B above.

SECTION 3. NON-DISCRIMINATION IN REFERRALS

The Unions represent that their hiring halls and referral systems will be operated in a non-discriminatory manner and in full compliance with all applicable federal, state and local laws and regulations, which require equal employment opportunities. Referrals shall not be affected in any way by the rules, regulations, bylaws, constitutional provisions or any other aspects or obligations of union membership, policies or requirements and shall be subject to such other conditions as are established in this Article. No employment applicant shall be discriminated against by any referral system or hiring hall because of the applicant's union membership, or lack thereof.

SECTION 4. MINORITY AND FEMALE REFERRALS

In the event a Union either fails, or is unable, to refer qualified minority or female applicants in percentages equaling Project affirmative action goals as set forth in UC's bid specifications, the Contractor may employ qualified minority or female applicants from any other available source as Apprentice Equivalents. Apprentice Equivalents will have completed a DOL approved training program, applied to take a construction Apprenticeship test, and will be paid at not less than the applicable equivalent Apprentice rate. With the approval of the Local Administrative Committee (LAC), experience in construction related areas may be accepted as meeting the above requirements.

SECTION 5. CROSS AND QUALIFIED REFERRALS

The Unions shall not knowingly refer to a Contractor an employee then employed by another Contractor working under this Agreement. The Local Unions will exert their utmost efforts to recruit sufficient numbers of skilled and qualified craft employees to fulfill the requirements of the Contractor.

SECTION 6. UNION DUES / WORKING ASSESSMENTS

All employees covered by this Agreement shall be subject to the union security provisions contained in the applicable Schedule A local agreements, as amended from time to time, but only for the period of time during which they are performing on-site Project Work and only to the extent of rendering payment of the applicable union dues and assessments uniformly required for union membership in the Local Union, signatory to this Agreement, which represents the craft in which the employee is performing Project Work. No employee shall be discriminated against at the Project site because of the employee's union membership or lack thereof. In the case of unaffiliated employees, the dues payment can be received by the Unions as a working assessment fee.

SECTION 7. CRAFT FOREPERSONS AND GENERAL FOREPERSONS

The selection of craft forepersons and/or general forepersons and the number of forepersons required shall be solely the responsibility of the Contractor except where otherwise provided by specific provisions of an applicable Schedule A. All forepersons shall take orders exclusively from the designated Contractor representatives. Craft foreperson shall be designated as working forepersons at the request of the Contractor, except when an existing local Collective Bargaining Agreement prohibits a foreperson from working when the craftsperson he is leading exceed a specified number.

ARTICLE 5 - UNION REPRESENTATION

SECTION 1. LOCAL UNION REPRESENTATIVE

Each Local Union representing on-site Project employees shall be entitled to designate, in writing (copy to General Contractor involved and the PMF), one representative, and the Business Manager, who shall be afforded access to the Project.

SECTION 2. STEWARDS

- A. Each Local Union shall have the right to designate a working journey person as a Steward and an alternate, and shall notify the Contractor and PMF of the identity of the designated Steward (and alternate) prior to the

assumption of such duties. Stewards shall not exercise supervisory functions and will receive the regular rate of pay for their craft classifications. There will be no non-working Stewards on the Project.

- B. In addition to their Work as an employee, the Steward shall have the right to receive complaints or grievances and to discuss and assist in their adjustment with the Contractor's appropriate supervisor. Each Steward shall be concerned with the employees of the Steward's Contractor and, if applicable, subcontractors of that Contractor, but not with the employees of any other Contractor. The Contractor will not discriminate against the Steward in the proper performance of Union duties.
- C. The Stewards shall not have the right to determine when overtime shall be worked, or who shall work overtime, except pursuant to a Schedule A provision providing procedures for the equitable distribution of overtime.

SECTION 3. LAYOFF OF A STEWARD

Contractors agree to notify the appropriate Union, 24 hours prior to the layoff of a Steward, except in cases of discipline or discharge for just cause. If a Steward is protected against layoff by a Schedule A, such provisions shall be recognized to the extent the Steward possesses the necessary qualifications to perform the Work required. In any case in which a Steward is discharged or disciplined for just cause, the Local Union involved shall be notified immediately by the Contractor.

ARTICLE 6 - MANAGEMENT'S RIGHTS

SECTION 1. RESERVATION OF RIGHTS

Except as expressly limited by a specific provision of this Agreement, Contractors retain full and exclusive authority for the management of their Project operations including, but not limited to: the right to direct the work force, including determination as to the number to be hired and the qualifications therefore; the promotion, transfer, layoff of its employees; or the discipline or discharge for just cause of its employees; the assignment and schedule of Work; the promulgation of reasonable Project Work rules; and, the requirement, timing and number of employees to be utilized for overtime work. No rules, customs, or practices, which limit or restrict productivity or efficiency of the individual, as determined by the Contractor, GC or PMF, and/or joint working efforts with other employees shall be permitted or observed.

SECTION 2. MATERIALS, METHODS & EQUIPMENT

There shall be no limitations or restriction upon the Contractors' choice of materials, techniques, methods, technology or design, or, regardless of source or

location, upon the use and installation of equipment, machinery, package units, pre-cast, pre-fabricated, pre-finished, or pre-assembled materials, tool, or other labor-saving devices. Contractors may, without restriction, install or use materials, supplies or equipment regardless of their source. The on-site installation or application of such items shall be performed by the craft having jurisdiction over such Work; provided, however, it is recognized that other personnel having special qualifications may participate, in a supervisory capacity, in the installation, check-out or testing of specialized or unusual equipment or facilities as designated by the Contractor. Notwithstanding the foregoing statement of Contractor rights, prefabrication issues relating to work traditionally performed at the job site shall be governed pursuant to the terms of the applicable Schedule A. There shall be no restrictions as to Work, which is performed off-site for the Project, except for work done in a fabrication center, tool yard, or batch plant dedicated exclusively to the performance of Work on the Project, and located adjacent to the "site of Work".

ARTICLE 7 - WORK STOPPAGES AND LOCKOUTS

SECTION 1. NO STRIKES-NO LOCKOUT

There shall not be strikes, sympathy strikes, picketing, work stoppages, slowdowns, hand billing, demonstrations or other disruptive activity at the Project for any reason by any Union or employee against any Contractor or employer while performing Work at the Project. There shall be no other Union, or concerted or employee activity which disrupts or interferes with the operation of the existing free flow of traffic in the project area. Failure of any Union or employee to cross any picket line established by any union, signatory or non-signatory to this Agreement, or the picket or demonstration line of any other organization, at or in proximity to the Project site is a violation of this Article. There shall be no lockout at the Project by any signatory Contractor. Contractors and Unions shall take all steps necessary to ensure compliance with this Section 1 and to ensure uninterrupted construction and the free flow of traffic in the project area for the duration of this Agreement.

SECTION 2. DISCHARGE FOR VIOLATION

A Contractor may discharge any employee violating Section 1 above, and any such employee will not be eligible thereafter for referral under this Agreement for a period of 100 days.

SECTION 3. NOTIFICATION

If a Contractor contends that any Union has violated this Article, it will notify the appropriate district or area council of the Local Union involved advising of such fact, with copies of the notification to the Local Union and the BTC. The district or area council, and the BTC shall each instruct, order and otherwise use their best efforts to

cause the employees, and/or the Local Unions to immediately cease and desist from any violation of this Article. A district or area council, or the BTC complying with these obligations shall not be liable for the unauthorized acts of a Local Union or its members.

SECTION 4. EXPEDITED ARBITRATION

Any Contractor or Union alleging a violation of Section 1 of this Article may utilize the expedited procedure set forth below (in lieu of, or in addition to, any actions at law or equity) that may be brought.

- A. A party invoking this procedure shall notify J.J. Pierson who shall serve as Arbitrator under this expedited arbitration procedure. Copies of such notification will be simultaneously sent to the alleged violator and, if a Local Union is alleged to be in violation, it's International, UC, the PMF, the BTC, and the GC.
- B. The Arbitrator shall thereupon, after notice as to time and place to the Contractor, the GC, the Local Union involved, the BTC, and the PMF, hold a hearing within 48 hours of receipt of the notice invoking the procedure it is contended that the violation still exists. The hearing will not, however, be scheduled for less than 24 hours after the notice to the district or area council required by Section 3 above.
- C. All notices pursuant to this Article may be by telephone, telegraph, hand delivery, or fax, confirmed by overnight delivery, to the arbitrator, Contractor or Union involved. The hearing may be held on any day including Saturdays or Sundays. The hearing shall be completed in one session, which shall not exceed 8 hours duration (no more than 4 hours being allowed to either side to present their case, and conduct their cross examination) unless otherwise agreed. A failure of any Union or Contractor to attend the hearing shall not delay the hearing of evidence by those present or the issuance of an award by the Arbitrator.
- D. The sole issue at the hearing shall be whether a violation of Section 1, above, occurred. If a violation is found to have occurred, the Arbitrator shall issue a Cease and Desist Award restraining such violation and serve copies on the Contractor and Union involved. The Arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages, which issue is reserved solely for court proceedings, if any. The Award shall be issued in writing within 3 hours after the close of the hearing, and may be issued without an Opinion. If any involved party desires an Opinion, one shall be issued within 15 calendar days, but its issuance shall not delay compliance with, or enforcement of, the Award.

- E. An Award issued under this procedure may be enforced by any court of competent jurisdiction upon the filing of the Agreement together with the Award. Notice of the filing of such enforcement proceedings shall be given to the Union or Contractor involved. In any court proceeding to obtain a temporary or preliminary order enforcing the arbitrator's Award as issued under this expedited procedure, the involved Union and Contractor waive their right to a hearing and agree that such proceedings may be ex parte, provided notice is given to opposing counsel. Such agreement does not waive any party's right to participate in a hearing for a final court order of enforcement or in any contempt proceeding.
- F. Any rights created by statute or law governing arbitration proceedings which are inconsistent with the procedure set forth in this Article, or which interfere with compliance thereto, are hereby waived by the Contractors and Unions to whom they accrue.
- G. The fees and expenses of the Arbitrator shall be equally divided between the involved Contractor and Union.

SECTION 5. ARBITRATION OF DISCHARGES FOR VIOLATION

Procedures contained in Article 9 shall not be applicable to any alleged violation of this Article, with the single exception that an employee discharged for violation of Section 1, above, may have recourse to the procedures of Article 9 to determine only if the employee did, in fact, violate the provisions of Section 1 of this Article; but not for the purpose of modifying the discipline imposed where a violation is found to have occurred.

ARTICLE 8 - LOCAL ADMINISTRATIVE COMMITTEE (LAC)

SECTION 1. THE LOCAL ADMINISTRATIVE COMMITTEE WILL MEET ON A REGULAR BASIS TO:

- (1) Implement and oversee the Agreement procedures and initiatives;
- (2) Monitor the effectiveness of the Agreement; and
- (3) Identify opportunities to improve efficiency and Work execution.

SECTION 2. COMPOSITION

The LAC will be co-chaired by the President of the Building and Construction Trades Council or his designee, and designated official of UC. It will be comprised of representatives of the local unions signatory to the project labor agreement (PLA) and representatives of the PMF and other contractors on the Project.

ARTICLE 9 - GRIEVANCE & ARBITRATION PROCEDURE

SECTION 1. PROCEDURE FOR RESOLUTION OF GRIEVANCES

Any question, dispute or claim arising out of, or involving the interpretation or application of this Agreement (other than jurisdictional disputes or alleged violations of Article 7, Section 1) shall be considered a grievance and shall be resolved pursuant to the exclusive procedure of the steps described below; provided, in all cases, that the question, dispute or claim arose during the term of this Agreement.

Step 1:

- (a) When any employee covered by this Agreement feels aggrieved by a claimed violation of this Agreement, the employee shall, through the Local Union business representative or job steward give notice of the claimed violation to the Work site representative of the involved Contractor. To be timely, such notice of the grievance must be given within 7 calendar days after the act, occurrence, or event giving rise to the grievance, or after the act, occurrence or event became known or should have become known to the Union. The business representative of the Local Union or the job steward and the Work site representative of the involved Contractor shall meet and endeavor to adjust the matter within 7 calendar days after timely notice has been given. If they fail to resolve the matter within the prescribed period, the grieving party, may, within 7 calendar days thereafter, pursue Step 2 of the grievance procedure by serving the involved Contractor and the General Contractor with written copies of the grievance setting forth a description of the claimed violation, the date on which the grievance occurred, the provisions of the Agreement alleged to have been violated. Grievances and disputes settled at Step 1 are non-precedential except as to the specific Local Union, employee and Contractor directly involved, unless the settlement is accepted in writing, by the General Contractor, as creating a precedent.

- (b) Should any signatory to this Agreement have a dispute (excepting jurisdictional disputes or alleged violations of Article 7, Section 1) with any other signatory to this Agreement and, if after conferring, a settlement is not reached within 7 calendar days, the dispute shall be reduced to writing and proceed to Step 2 in the same manner as outlined in subparagraph (a) for the adjustment of employee grievances.

Step 2:

The Business Manager or designee of the involved Local Union, together with representatives of the BTC, the involved Contractor, and the General Contractor shall meet in Step 2 within 5 calendar days of the written grievance to arrive at a satisfactory settlement.

Step 3:

- (a) If the grievance shall have been submitted but not resolved in Step 2, any of the participating Step 2 entities may, within 14 calendar days after the initial Step 2 meeting, submit the grievance in writing (copies to other participants) to J.J. Pierson, who shall act as the Arbitrator under this procedure. The Labor Arbitration Rules of the American Arbitration Association shall govern the conduct of the arbitration hearing, at which all Step 2 participants shall be parties. The decision of the Arbitrator shall be final and binding on the involved Contractor, Local Union and employees and the fees and expenses of such arbitration's shall be borne equally by the involved Contractor and Local Union.
- (b) Failure of the grieving party to adhere to the time limits set forth in this Article shall render the grievance null and void. These time limits may be extended only by written consent of the PMF, involved Contractor and involved Local Union at the particular step where the extension is agreed upon. The Arbitrator shall have authority to make decisions only on the issues presented to him and shall not have the authority to change, add to, delete or modify any provision of this Agreement.

SECTION 2. LIMITATION AS TO RETROACTIVITY

No arbitration decision or award may provide retroactivity of any kind exceeding 30 calendar days prior to the date of service of the written grievance on the construction Project Manager and the involved Contractor or Local Union.

SECTION 3. PARTICIPATION BY GENERAL CONTRACTOR

The General Contractor shall be notified by the involved Contractor of all actions at Steps 2 and 3 and, at its election, may participate in full in all proceedings at these Steps, including Step 3 arbitration.

ARTICLE 10 - JURISDICTIONAL DISPUTES

SECTION 1. NO DISRUPTIONS

There will be no strikes, sympathy strikes, work stoppages, slowdowns, picketing or other disruptive activity of any kind arising out of any jurisdictional dispute. Pending the resolution of the dispute, the Work shall continue uninterrupted and as assigned by the Contractor. No jurisdictional dispute shall excuse a violation of Article 7.

SECTION 2. ASSIGNMENT

- A. There shall be a mandatory pre-job markup/assignment meeting prior to the commencement of any Work. Attending such meeting shall be designated representatives of the Union signatories to this Agreement, the PMF, and the involved Contractors. Best efforts will be made to schedule the pre-job meeting in a timely manner after Notice to Proceed is issued but not later than 30 days prior to the start of the Project.
- B. All Project construction Work assignments shall be made by the Contractor according to the area practice.

SECTION 3. PROCEDURE FOR SETTLEMENT OF LABOR DISPUTES

- A. Any Union having a jurisdictional dispute with respect to Project Work assigned to another Union will submit the dispute in writing to the Administrator, Plan for the Settlement of Jurisdictional Disputes in the Construction Industry ("the Plan") within 72 hours and send a copy of the letter to the other Union involved, the Contractor involved, the General Contractor, the BTC, and the district or area councils of the unions involved. Upon receipt of a dispute letter from any union, the Administrator will invoke the procedures set forth in the Plan to resolve the jurisdictional dispute. The jurisdictional dispute letter shall contain the information described in Article IV of the Plan.
- B. Within 5 calendar days of receipt of the dispute letter, there shall be meeting of the General Contractor, the Contractor involved, the Local Unions involved and designees of the BTC and the district or area councils of the Local Unions involved for the purpose of resolving the jurisdictional dispute.
- C. In order to expedite the resolution of jurisdictional disputes, the parties have agreed in advance to select Plan Arbitrator Pierson to hear all unsolved jurisdictional disputes arising under this Agreement. All other

rules and procedures of the Plan shall be followed. If Plan Arbitrator Pierson is not available to hear the dispute within the time limits of the Plan, the Plan's arbitrator selection process shall be utilized to select another arbitrator. In the event that a union involved in the dispute is not a member of the BTC, the dispute shall be submitted directly to Arbitrator Pierson.

- D. The Arbitrator will render a short-form decision within 5 days of the hearing based upon the evidence submitted at the hearing, with a written decision to follow within 30 days of the close of hearing.
- E. This Jurisdictional Dispute Resolution Procedure will only apply to Work performed by Local Unions at the Project.
- F. Any Local Union involved in a jurisdictional dispute on this Project shall continue working in accordance with Section 2 above and without disruption of any kind.

SECTION 4. AWARD

Any jurisdictional award pursuant to Section 3 shall be final and binding on the disputing Local Unions and the involved Contractor on this Project only, and may be enforced in any court of competent jurisdiction. Such award or resolution shall not establish a precedent on any other construction work not covered by this Agreement. In all disputes under this Article, the General Contractor and the involved Contractors shall be considered parties in interest.

SECTION 5. LIMITATIONS

The Jurisdictional Dispute Arbitrator shall have no authority to assign Work to a double crew, that is, to more employees than the minimum required by the Contractor to perform the Work involved; nor to assign Work to employees who are not qualified to perform the Work involved; not to assign Work being performed by non-union employees to union employees. This does not prohibit the establishment, with the agreement of the involved Contractor, of composite crews where more than 1 employee is needed for the job. The aforesaid determinations shall decide only to whom the disputed Work belongs.

SECTION 6. NO INTERFERENCE WITH WORK

There shall be no interference or interruption of any kind with the Work of the Project while any jurisdictional dispute is being resolved. The Work shall proceed as assigned by the Contractor until finally resolved under the applicable procedure of this Article. The award shall be confirmed in writing to the involved parties. There shall be

no strike, work stoppage or interruption in protest of any such award.

ARTICLE 11 - WAGES AND BENEFITS

SECTION 1. CLASSIFICATION AND BASE HOURLY RATE

All employees covered by this Agreement shall be classified in accordance with the Work performed and paid the base hourly wage rates for those classifications as specified in the attached Schedules A, as amended during this Agreement. Recognizing, however, that special conditions may exist or occur on the Project, the parties, by mutual agreement may establish rates and/or hours for one or more classifications, which may differ from Schedules A. Parties to such agreements shall be the General Contractor, the Contractor involved, the involved Local Unions and the BTC.

SECTION 2. EMPLOYEE BENEFIT FUNDS

- A. The Contractors agree to pay contributions on behalf of all employees covered by this Agreement to the established employee benefit funds in the amounts designated in the appropriate Schedule A; provided, however, that the Contractor and the Union agree that only such bona fide employee benefits as are explicitly required under N.J.S.A 34:11-56.30 of the New Jersey State Labor Law shall be included in this requirement and paid by the Contractor on this Project. Bona fide jointly trusted fringe benefit plans established or negotiated through collective bargaining during the life of this Agreement may be added if similarly protected under N.J.S.A. 34:11-56-30. Contractors shall not be required to contribute to non-N.J.S.A 34:11-56.30 benefits, trusts or plans.
- B. The Contractor agrees to be bound by the written terms of the legally established Trust Agreements specifying the detailed basis on which payments are to be paid into, and benefits paid out of, such Trust Funds but only with regard to Work done on this Project and only for those employees to whom this Agreement requires such benefit Payments.
- C. Should any Contractor or sub-contractor become delinquent in the payment of contributions to the fringe benefit funds, then the subcontractor at the next higher tier, or upon notice of the delinquency claim from the Union or the Funds, agrees to withhold from the subcontractor such disputed amount from the next advance, or installment payment for Work performed until the dispute has been resolved.

ARTICLE 12 - HOURS OF WORK, PREMIUM PAYMENTS, SHIFTS AND HOLIDAYS

SECTION 1. WORK WEEK AND WORK DAY

- A. The standard work week shall consist of 40 hours of work at straight time rates per one of the following schedules:
- (1) Five-Day Work Week: Monday-Friday, 5 days, 8 hours plus 1/2 hour unpaid lunch period each day.
 - (2) Four-Day Work Week: Monday-Thursday; 4 days, 10 hours plus 1/2 hour unpaid lunch period each day.
- B. The Day Shift shall commence between the hours of 6:00 a.m. and 9:00 a.m. and shall end between the hours of 2:30 p.m. and 7:30 p.m. Starting and quitting times shall occur at the employees' place of work as may be designated by the Contractor.
- C. Scheduling - The Contractor shall have the option of scheduling either a five-day work week, or four-day work week (when mutually agreed upon on a craft-by-craft basis). The Contractor shall also have the option to set the work day hours consistent with Project requirements, the Project schedule, and minimization of interference with County operations traffic flow. When conditions beyond the control of the Contractor, such as severe weather, power failure, fire or natural disaster, prevent the performance of Project Work on a regularly scheduled work day, the Contractor may, with mutual agreement of the Local Union on a craft-by-craft basis, schedule Friday (where on 4, 10's) during the calendar week in which a workday was lost, at straight time pay; providing the employees involved work a total of 40 hours or less during that work week.
- D. Notice - Contractors shall provide not less than 5 days prior notice to the Local Union involved as to the work week and work hours schedules to be worked or such lesser notice as may be mutually agreed upon.

SECTION 2. OVERTIME

Overtime pay for hours outside of the standard work week and work day, described in paragraph A above, shall be paid in accordance with the applicable Schedule A. There will be no restriction upon the Contractor's scheduling of overtime or the non-discriminatory designation of employees who shall be worked, except as noted in Article 5, Section 2. There shall be no pyramiding of overtime pay under any circumstances. The Contractor shall have the right to schedule work so as to minimize overtime.

SECTION 3. SHIFTS

- A. Flexible Schedules - Scheduling of shift work shall remain flexible in order to meet Project schedules and existing Project conditions including the minimization of interference with County operations. It is not necessary to work a day shift in order to schedule a second shift. Shifts must be worked a minimum of five consecutive work days, must have prior approval of the Construction Project Manager and must be scheduled with not less than five work days notice to the Local Union.

- B. Second/Shift - The second shift (starting between 2 p.m. and 8p.m.) shall consist of 8 hours work (or 10 hours of work) for an equal number of hours pay at the straight time rate plus 15% in lieu of overtime and exclusive of a 1/2 hour unpaid lunch period.

- C. Flexible Starting Times - Shift starting times will be adjusted by the Contractor as necessary to fulfill Project requirements subject to the notice requirements of paragraph A.

- D. Four Tens - When working a four-day work week, the standard work day shall consist of 10 hours work for 10 hours of pay at the straight time rate exclusive of an unpaid 1/2 hour meal period and regardless of the starting time. This provision is applicable to night shifts only, and such night shifts are subject to the shift differential in paragraph B above.

- E. It is agreed that when Project circumstances require a deviation form the above shifts, the involved unions, Contractors and the General Contractor shall adjust the starting times of the above shifts or establish shifts which meet the Project requirements. It is agreed that neither party will unreasonably withhold their agreement.

SECTION 4. HOLIDAYS

- A. Schedule - There shall be 8 recognized holidays on the Project:

New Year's Day	Labor Day
Presidents Day	Veterans Day
Memorial Day	Thanksgiving Day
Fourth of July	Christmas Day

*Work shall be scheduled on Good Friday pursuant to the craft's Schedule

All said holidays shall be observed on the dates designated by New Jersey State Law. In the absence of such designations, they shall be

observed on the calendar date except those holidays which occur on Sunday shall be observed on the following Monday. Holidays falling on Saturday are to be observed on the preceding Friday.

- B. Payment - Regular holiday pay, if any, and/or premium pay for work performed on such a recognized holiday shall be in accordance with the applicable Schedule A.
- C. Exclusivity - No holidays other than those listed in Section 4-A above shall be recognized nor observed except in Presidential Election years when Election Day is a recognized holiday.

SECTION 5. REPORTING PAY

- A. Employees who report to the Work location pursuant to regular schedule and who are not provided with work or whose work is terminated early by a Contractor, for whatever reason, shall receive minimum reporting pay in accordance with the applicable Schedule A.
- B. When an employee, who has completed their scheduled shift and left the Project site, is "called back" to perform special Work of a casual, incidental or irregular nature, the employee shall receive pay for actual hours worked with a minimum guarantee, as may be required by the applicable Schedule A.
- C. When an employee leaves the job or Work location of their own volition or is discharged for cause or is not working as a result of the Contractor's invocation of Section 7 below, they shall be paid only for the actual time worked.
- D. Except as specifically set forth in this Article there shall be no premiums, bonuses, hazardous duty, high time or other special payments of any kind.
- E. There shall be no pay for time not actually worked except as specifically set forth in this Agreement and except where an applicable Schedule A requires a full weeks pay for forepersons.

SECTION 6. PAYMENT OF WAGES

- A. Payday - Payment shall be made by check, drawn on a New Jersey bank with branches located within commuting distance of the job site. Paychecks shall be issued by the Contractor at the job site by 10 a.m. on Thursdays. In the event that the following Friday is a bank holiday, paychecks shall be issued on Wednesday of that week. Not more than 3 days wages shall be held back in any pay period. Paycheck stubs shall

contain the name and business address of the Contractor, together with an itemization of deductions from gross wages.

- B. Termination-Employees who are laid-off or discharged for cause shall be paid in full for that which is due them at the time of termination. The Contractors shall also provide the employee with a written statement setting forth the date of lay off or discharge.

SECTION 7. EMERGENCY WORK SUSPENSION

A Contractor or PMF may, if considered necessary for the protection of life and /or safety of employees or others, suspend all or a portion of Project Work. In such instances, employees will be paid for actual time worked; provided, however, that when a Contractor request that employees remain at the job site available for Work, employees will be paid for "stand-by" time at their hourly rate of pay.

SECTION 8. INJURY/DISABILITY

An employee who, after commencing Work, suffers a work-related injury or disability while performing work duties, shall received no less than 8 hours wages for that day. Further, the employee shall be rehired at such time as able to return to duties provided there is still work available on the Project for which the employee is qualified and able to perform.

SECTION 9. TIME KEEPING

A Contractor may utilize brassing or other systems to check employees in and out. Each employee must check in and out. The Contractor will provide adequate facilities for checking in and out in an expeditious manner.

SECTION 10. MEAL PERIOD

A Contractor shall schedule an unpaid period of not more than 1/2 hour duration at the Work location between the 3rd and 5th hour of the scheduled shift. A Contractor may, for efficiency of operation, establish a schedule which coordinates the meal periods of two or more crafts. If an employee is required to work through the meal period, the employee shall be compensated in a manner established in the applicable Schedule A.

SECTION 11. BREAK PERIODS

There will be not rest periods, organized coffee breaks or other non-working time established during working hours. Individual coffee containers will be permitted at the employee's Work location. Local area practice will prevail for coffee breaks that are not organized.

ARTICLE 13 – APPRENTICES

SECTION 1. RATIOS

Recognizing the need to maintain continuing supportive programs designed to develop adequate numbers of competent workers in the construction industry and to provide craft entry opportunities for minorities, women and economically disadvantaged non-minority males, Contractors will employ apprentices in their respective crafts to perform such work as is within their capabilities and which is customarily performed by the craft in which they are indentured. Contractors may utilize apprentices and such other appropriate classifications as are contained in the applicable Schedule A in a ratio not to exceed 25% of the work force by craft (without regard to whether a lesser ratio is set forth in Schedule A), unless the applicable Schedules A provide for a higher percentage. Apprentices and such other classifications as are appropriate shall be employed in a manner consistent with the provisions of the appropriate Schedule A.

SECTION 2. DEPARTMENT OF LABOR

To assist the Contractors in attaining a maximum effort on this Project, the Unions agree to work in close cooperation with, and accept monitoring by, the New Jersey State and Federal Departments of Labor to ensure that minorities, women, or economically disadvantaged are afforded opportunities to participate in apprenticeship programs which result in the placement of apprentices on this Project. To further ensure that this Contractor effort is attained, up to 50% of the apprentices placed on this Project should be first year, minority, women or economically disadvantaged apprentices. The Local Unions will cooperate with Contractor request for minority, women or economically disadvantaged referrals to meet this Contractor effort.

ARTICLE 14 - SAFETY PROTECTION OF PERSON AND PROPERTY

SECTION 1. SAFETY REQUIREMENTS

Each Contractor will ensure that applicable OSHA requirements and other requirements set forth in the contract documents are at all times maintained on the Project and the employees and Unions agree to cooperate fully with these efforts. Employees must perform their work at all times in a safe manner and protect themselves and the property of the Contractor and the Owner from injury or harm. Failure to do so will be grounds for discipline, including discharge.

SECTION 2. CONTRACTOR RULES

Employees covered by this Agreement shall at all times be bound by the reasonable safety, security, and visitor rules as established by the Contractors and the PMF for this Project. Such rules will be published and posted in conspicuous places throughout the Project.

SECTION 3. INSPECTIONS

The Contractors and PMF retain the right to inspect incoming shipments of equipment, apparatus, machinery and construction materials of every kind.

ARTICLE 15 - NO DISCRIMINATION

SECTION 1. COOPERATIVE EFFORTS

The Contractors and Unions agree that they will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin or age in any manner prohibited by law or regulation. It is recognized that special procedures maybe established by Contractors and Local Unions and the New Jersey State Department of Labor for the training and employment of persons who have not previously qualified to be employed on construction projects of the type covered by this Agreement. The parties to this Agreement will assist in such programs and agree to use their best efforts to ensure that the goals for female and minority employment are met on this Project.

SECTION 2. LANGUAGE OF AGREEMENT

The use of the masculine or feminine gender in this Agreement shall be construed as including both genders.

ARTICLE 16 - GENERAL TERMS

SECTION 1. PROJECT RULES

The Project Management Firm and the Contractors shall establish such reasonable Project rules as are appropriate for the good order of the Project, provided they do not violate the terms of this agreement. These rules will be explained at the pre-job conference and posted at the Project site and may be amended thereafter as necessary. Failure of an employee to observe these rules and regulations shall be grounds for discipline, including discharge. The fact that no order was posted prohibiting a certain type of misconduct shall not be a defense to an employee disciplined or discharged for such misconduct when the action taken is for cause.

SECTION 2. TOOLS OF THE TRADES

The welding/cutting torch and chain fall are tools of the trade having jurisdiction over the work performed. Employees using these tools shall perform any of the Work of the trade. There shall be no restrictions on the emergency use of any tools or equipment by any qualified employee or on the use of any tools or equipment for the

performance of work within the employee's jurisdiction.

SECTION 3. SUPERVISION

Employees shall work under the supervision of the craft foreperson or general foreperson.

SECTION 4. TRAVEL ALLOWANCES

There shall be no payments for travel expenses; travel time, subsistence allowance or other such reimbursements or special pay except as expressly set forth in this Agreement and in Schedule A limited to travel expenses.

SECTION 5. FULL WORK DAY

Employees shall be at their staging area at the starting time established by the Contractor and shall be returned to their staging area by quitting time after performing their assigned functions under the supervision of the Contractor. The signatories reaffirm their policy of a fair day's work for a fair day's wage.

SECTION 6. COOPERATION

The Project Management Firm and the Unions will cooperate in seeking any New Jersey statutory Department of Labor approvals that may be required for implementation of any terms of this Agreement.

ARTICLE 17 - SAVINGS AND SEPARABILITY

SECTION 1. THIS AGREEMENT

In the event that the application of any provision of this Agreement is enjoined, on either an interlocutory or permanent basis, or otherwise found in violation of law, the provision involved shall be rendered, temporarily or permanently, null and void but the remainder of the Agreement shall remain in full force and effect. In such event, the Agreement shall remain in effect for contracts already bid and awarded or in construction where the Contractor voluntarily accepts the Agreement. The parties to this Agreement will enter into negotiations for a substitute provision in conformity with the law and the intent of the parties for contracts to be let in the future.

SECTION 2. THE BID SPECIFICATIONS

In the event that the General Contractor's bid specifications, or other action, requiring that a successful bidder become signatory to this Agreement is enjoined, on either an interlocutory or permanent basis, or otherwise found in violation of law such

requirement shall be rendered, temporarily or permanently, null and void but the Agreement shall remain in full force and effect to the extent allowed by law. In such event, the Agreement shall remain in effect for contracts already bid and awarded or in constructions where the Contractor voluntarily accepts the Agreement. The parties will enter in to negotiations as to modifications to the Agreement to reflect the court action taken and the intent of the parties for contracts to be let in the future.

SECTION 3. NON-LIABILITY

In the event of an occurrence referenced in Section 1 or Section 2 of this Article, neither UC, the Project Management Firm, or any Contractor, or any signatory Union shall be liable, directly or indirectly, for any action taken, or not taken, to comply with any court order, injunction or determination. Project bid specifications will be issued in conformance with court orders in effect and no retroactive payments or other action will be required if the original court determination is ultimately reversed.

SECTION 4. NON-WAIVER

Nothing in this Article shall be construed as waiving the prohibitions of Article 7 as to signatory Contractors and signatory Unions.

ARTICLE 18 – FUTURE CHANGES IN SCHEDULE “A” AREA CONTRACTS

SECTION 1. CHANGES TO AREA CONTRACTS

- A. Schedules “A” to this Agreement shall continue to full force and effect until the Contractor and/or Union parties to the Area Collective Bargaining Agreements which are the basis for Schedules A notify the General Contractor in writing of the mutually agreed upon changes in provisions of such agreements which are applicable to the Project, and their effective dates.
- B. It is agreed that any provisions negotiated into Schedules “A” collective bargaining agreements will not apply to work on this Project than those uniformly required of contractors for construction work normally covered by those agreements; nor shall any provisions be recognized or applied on this Project if it may be construed to apply exclusively, or predominantly, to work covered by this Project Agreement.
- C. Any disagreement between signatories to this Agreement over the incorporation into Schedules “A” of provisions agreed upon in the negotiations of Area Collective Bargaining Agreements shall be resolved in accordance with the procedure set forth in Article 9 of this Agreement.

SECTION 2. LABOR DISPUTES DURING AREA CONTRACT NEGOTIATIONS

The Unions agree that there will be not strikes, work stoppages, sympathy actions, picketing, slowdowns or other disruptive activity or other violations of Article 7 affecting the Project by any Local Union involved in the renegotiations of Area Local Collective Bargaining Agreements nor shall there be any lock-out on the Project affective a Local Union during the course of such renegotiations.

IN WITNESS WHEREOF the parties hereto have, either individually or by their duly authorized representative, caused this Agreement to be executed and to become effective as of the _____ day of _____, 2011.

ATTEST:

JAMES E. PELLETTIERE, CLERK
Board of Chosen Freeholders

APPROVED AS TO FORM

ROBERT E. BARRY, ESQ.
County Counsel

COUNTY OF UNION

By: _____
ALFRED FAELLA
County Manager

ATTEST:

Corporate Secretary/Notary Public

Print Name

CONTRACTOR

President/Authorized Signatory

Print Name

Print Title

ATTEST:

Corporate Secretary/Notary Public

Print Name

CONSTRUCTION MANAGER FIRM

President/Authorized Signatory

Print Name

Print Title

UNION COUNTY BUILDING & CONSTRUCTION TRADES COUNCIL

and on behalf of the following: Asbestos Local #32, Boilermakers Local #28, Bricklayers Local #4, Carpenters Local #715, Electricians Local #102, Elevator Construction Local #1, Ironworkers Local #480, Laborers Local #394, Operating Engineers Local #825, Painters Local #711, Plumbers Local #24, Roofers Local #4, Sheet Metal Workers Local #22, Sheet Metal Workers Local #25, Sheet Metal Workers Local #137, Sprinkler Fitters Local #696, Steam Fitters Local #475, Teamsters Local #408

ATTEST:

Witness

Print Name

LETTER OF ASSENT REQUIRED FROM ALL SUBCONTRACTORS
(OF ANY TIER)

County of Union Project Labor Agreement

The undersigned, as a Contractor(s) or Subcontractor(s) on a Contract which is part of the _____ Project, for and in consideration of the award of a Contract to perform Work on said Project, and in further consideration of the mutual promises made in the Project Labor Agreement, a copy of which was received and is acknowledged, hereby:

- (1) On behalf of itself and all its employees, accepts and agrees to be bound by terms and conditions of the Project Labor Agreement, together with any and all amendments and supplements now existing or which are later made thereto, and understands that any act of non-compliance with all such terms and conditions, including but not limited to, evidence of compliance with the pre-employment controlled substance testing, will subject the non-complying Contractor or employee(s) to being prohibited from the Project Site until full compliance is obtained.
- (2) Certified that it has no commitments or agreements, which would preclude its full compliance with the terms and conditions of said Project Labor Agreement.
- (3) Agrees to secure from any Contractor(s) (as defined in said Project Labor Agreement) which is or becomes a Subcontractor(s) (of any tier), a duly executed Letter of Assent in form identical to this document prior to commencement of any Work.

DATED:

Name of Contractor/Company

Signature of Authorized Representative

Print Name and Title

General Contractor

Contract Number (BA#)

*** To be signed if Project is subject to Project Labor Agreement – See Section 55.**

56. BID PROTEST – LEGAL FEES AND COSTS

In the event a Bidder unsuccessfully challenges a Bid Submission by filing an action in a court of law concerning same, said Bidder shall be responsible for payment of reasonable legal costs and fees incurred by the County relating to said protest.

57. AMERICAN GOODS AND PRODUCTS WHERE POSSIBLE

Bidder shall comply with the requirements of NJSA 40A:11-18 and use only manufactured and farm products of the United States, wherever available, for the Project.

58. NEW JERSEY PAY-TO-PLAY REQUIREMENTS

This Contract is required by law to be publicly advertised for bids. As such, lists of political contributions pursuant to NJSA 19A:44A-1 et. seq. are NOT REQUIRED to be provided with the bids.

59. STATEMENT OF EQUIPMENT TO BE USED IN CONSTRUCTION

Pursuant to NJSA 40A:11-20 entitled Certificate of Bidder Showing Ability to Perform Contract, the County requires a Certification from all bidders submitting a bid showing that the Bidder owns, leases, or controls all necessary equipment required by the Project Plans and Specifications. All bidders shall provide this information at the time of the bid opening using the attached form entitled, "CERTIFICATE OF BIDDER SHOWING ABILITY TO PERFORM CONTRACT".

If the Bidder is not the actual owner of the equipment, it shall state the source from which the equipment will be obtained and shall attach a certificate from the owner or person in control of the equipment demonstrating that the equipment owner has granted the Bidder control of the requisite equipment during such time as may be necessary for completion of the portion of the contract for which the equipment is necessary.

60. NEW JERSEY SALES AND USE TAX REQUIREMENTS,

Contractors are required to comply with the following:

New Jersey Sales and Use Tax Requirements: All contractors with subcontractors, or any of their affiliates, who enter into contracts for the provision of goods or services with or for New Jersey local government entities, are required to collect and remit to the New Jersey Director of Taxation in the Department of the Treasury the use tax due on all of their sales of tangible personal property delivered into the State of New Jersey

pursuant to the "Sales and Use Tax Act," (NJSA 54:32B-1 et, seq.), regardless of whether the tangible personal property is intended for a contract with the contracting agency. This tax shall be remitted for the term of the Contract.

For purposes herein "affiliate" shall mean any entity that: (a) directly, indirectly, or constructively controls another entity, (b) is directly, indirectly, or constructively controlled by another entity, or (c) is subject to the control of a common entity. For purposes of the immediately preceding sentence, an entity controls another entity if it owns, directly or indirectly, more than fifty percent (50%) of the ownership interest in that entity. NJSA 52:32-44(g)(3).

ALFRED J. FAELLA
COUNTY MANAGER

LAURA SCUTARI, QPS, MPA, DIRECTOR
DIVISION OF PURCHASING

BID DOCUMENT SUBMISSION CHECKLIST

ALL SIGNATURES AND SEALS SHALL BE ORIGINALS UNLESS OTHERWISE SPECIFIED
BID SHEETS SHOULD NOT BE SUBMITTED DOUBLE SIDED PAGES, (SINGLE SIDE ONLY)

EACH BIDDER SHOULD COMPLETE THIS FORM AND INITIAL EACH ENTRY.

DATE COMPLETED: _____

PLEASE SUBMIT BID DOCUMENTS ON SINGLE SIDED PAPER ONLY, WITH THE EXCEPTION OF THE SURETY AND BID BOND DOCUMENTS.

IN ACCORDANCE WITH THE BID SPECIFICATIONS I HAVE REVIEWED, COMPLETED / EXECUTED AND INCLUDED THE FOLLOWING FORMS:

_____ Bid Form Page (**Signed, Dated and Bid on all alternatives applicable to the Work**).

_____ Security in the form of:

- _____ Bid bond in an amount equal to 10% of the total amount of this bid not to exceed \$20,000.00; or
- _____ Certified check or cashier's check in the amount of 10% of this bid not to exceed \$20,000.00

_____ Consent of Surety form signed by a Surety Company if the total amount of your Bid is over \$36,000.00. If your bid is accepted, the Surety Company that provided the Consent shall be required to furnish a Performance, Labor and Materials Bond in the amount of 100% of the award of the contract. The County of Union has provided its Consent of Surety form for your use. The use of this form by your Surety Company will expedite the bid review process and eliminate the possibility of having your bid rejected. If, however, you should need to use another form, please use language similar to that used on the Union County form and avoid making any additions or deletions to the Union County form language. In lieu of the Consent of Surety you may submit a Certified Check in the full amount of the bid.

_____ STATEMENT OF BIDDER OWNERSHIP. Pursuant to N.J.S.A. 52:25-24.2, which includes **BOTH** of the following documents:

- Bidder Signature Page
- Bidder Disclosure Statement (**Fill out 2 pages completely**)

_____ SUBCONTRACTOR IDENTIFICATION. Pursuant to N.J.S.A. 40A:11-16, which includes **BOTH** of the following documents:

- Subcontractor Identification Statement: List of Subcontractors (**only for certain types of work**)
- Subcontractor Identification Certification

_____ Acknowledgement of Addendum form: (**This form is to be used only when an addendum has been added to the specifications**).

_____ A copy of the State of New Jersey Department of the Treasury, Division of Revenue, **Business Registration Certificate ("BRC")** should be included with the bids as it must be received by the County prior to the award of the contract. The BRC provided must show that the Bidder was registered at the time of receipt of bids or the bid will be rejected.

- _____ A copy of the State of New Jersey Department of the Treasury, Division of Revenue, **Business Registration Certificate (“BRC”)** of all named or listed subcontractors (List of Subcontractors) in a Construction bid should be included with the bid as the BRC(s) must be received by the County prior to the award of the contract. Each subcontractor’s certificate provided must show that the subcontractor was registered at the time of the receipt of bids or the bid will be rejected.
- _____ Affirmative Action Requirement
- _____ Experience Statement
- _____ Certificate of Bidder showing ability to perform Contract
- _____ Non-Collusion Affidavit – Fill out completely and notarize
- _____ Certificates from New Jersey Department of Labor – Public Works Contractor Registration Act. (**Only for certain types of work**)
- _____ Federal Attachments (**If applicable**)
- _____ NJDPMC Certificate / Notice of Classification (**If applicable**)
- _____ Americans with Disabilities Act
- _____ Statement of Bidder’s Qualifications
- _____ Contractor Performance Record
- _____ Affidavit Regarding List of Debarred, Suspended or Disqualified Bidders
- _____ Prior Negative Experience Questionnaire
- _____ Contractor’s Certification of Compliance – New Jersey Prevailing Wage Act
- _____ Uncompleted Contracts Affidavit (**For Bidder, if applicable**) **MUST ALSO PROVIDE DPMC FORM 701**
- _____ Certificate of Insurance Statement
- _____ Collection of Use Tax on Sales to Local Government Statement
- _____ Acknowledgement of Project Labor Agreement (PLA)
- _____ Time of Completion
- _____ Disclosure of Investment Activities in Iran form

I HAVE TAKEN THE FOLLOWING ACTIONS:

- _____ Visited the site and attended the **Mandatory Pre-Bid Meeting**
- _____ Reviewed the Contract Documents (including any permits the County or its professionals may have obtained), Work, Site, Locality, and Local Conditions and Laws and Regulations that in any manner may affect Cost, Progress, Performance or Furnishing of Work.
- _____ Reviewed Bond Requirements
- _____ Provided Proof of Compliance with New Jersey Prevailing Wage Act
- _____ Reviewed Form of Owner/Contractor Agreement and General Conditions to the Contract

NOTE: QUESTIONS PERTAINING TO THIS BID ARE TO BE DIRECTED TO DIVISION OF ENGINEERING AT 908-789-3675

BIDDING DOCUMENTS

The Bidding Documents consist of the following items:

- **ADDENDA, if issued**
- **CLARIFICATIONS, if issued**
- **INSTRUCTION TO BIDDERS**
- **BID FORM**
- **OWNER-CONTRACTOR AGREEMENT (AIA 101) AND GENERAL CONDITIONS (AIA 201)**
- **SPECIFICATIONS: As outlined in the Table of Contents and included in the Project Manual.**
- **DRAWINGS: As per List of Drawings, indicated on the Project Title Sheet.**

Bidder's Name _____

BID FORM

I/We have carefully examined the plans, specifications, and advertisement for bid for the

**UNION COUNTY COURTHOUSE FIRE CODE UPGRADES
PHASE C1 ROTUNDA AND PHASE C2 TOWER (INTERNAL STAIR)
2 BROAD STREET
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
BA No. 56-2017; Union County Engineering Project No.2010-033C**

that is on file in the Union County Division of Engineering. I/We have inspected the site of the work and will contract to do all the work and furnish all materials mentioned in said plans and specifications. Work will be accomplished in the manner prescribed therein.

LUMP SUM BASE BID:

_____ Dollars \$ _____
Written Figures

A. BID CONTINGENCY ALLOWANCE: (To be used if and when directed by the County)

_____ Dollars \$675,000.00
Written Figures

B. 3rd PARTY TESTING & INSPECTION ALLOWANCE:

_____ Dollars \$25,000.00
Written Figures

**TOTAL LUMP SUM BASE BID PLUS ALLOWANCES AMOUNT:
(Lump Sum Base Bid + A + B Allowances)**

_____ Dollars \$ _____
Written Figures

NOTE: Bid Contingency may include one-half of one percent of contract amount set aside for local training if and when directed by the County.

Bidder's Name _____

CONSENT OF SURETY
TO ACCOMPANY PROPOSAL (BID)

_____ (hereinafter called Surety), organized and existing under the laws of the State of _____ duly authorized and qualified to transact business in the State of New Jersey, in consideration of the sum of One Dollar (\$1.00), lawful money of the United States of America, to it in hand paid, receipt whereof is hereby acknowledged, and in consideration, hereby certifies and agrees that if the contract for which the attached proposal is made be awarded to _____ (hereinafter called Contractor) for the performance of certain work and labor or the supplying of certain materials, or both, as more particularly set forth in said proposal and described for purposes of this instrument as a proposal for _____ to the COUNTY OF UNION and if Contractor shall enter into the contract, Surety will become bound as surety for its faithful performance, labor and material payment and will provide the Contractor with a performance, labor and material payment bond in the full amount of the contract price.

NOTE:
Expiration date
Needed if Annual
Surety

NAME OF INSURANCE COMPANY
ADDRESS: _____

ORIGINAL SIGNATURE
ATTORNEY-IN-FACT FOR INSURANCE CO.

NOTE: PROOF OF AUTHORITY OF OFFICERS OF SURETY COMPANY TO EXECUTE THIS DOCUMENT MUST BE SUBMITTED.

BIDDER SIGNATURE PAGE

THE BIDDER MUST READ THE FOLLOWING INSTRUCTIONS TO COMPLETE THIS PAGE:

1. If doing business under a **trade name, partnership or a sole proprietorship**, you must submit the bid under exact title of the trade name, partnership, or proprietorship, and the bid must be signed by either the **owner**, or a **partner** and **witnessed** by a **notary public**.
2. If a **Corporation**, the bid must be signed by the **President** or **Vice President** and **witnessed** by a **Corporate Secretary** (corporate title must be exact) and **affix corporate seal**. If a Corporate Secretary does not exist, President or Vice President's signature shall be witnessed by a Notary Public.
3. Other persons **authorized** by **corporate resolution** to execute agreements in its behalf may also sign the bid documents (pages). **Copy of a resolution must accompany the bid**.
4. The person who signs this bid form **must also** sign the **Non-Collusion Affidavit**.
5. You **cannot** witness your own signature.

NAME OF BIDDER

ADDRESS OF BIDDER

**ORIGINAL SIGNATURE
CORPORATE SECRETARY**

**PRINT NAME AND TITLE
CORPORATE SECRETARY**

TEL: _____
FAX: _____
E-Mail: _____

BY: _____
ORIGINAL SIGNATURE

Corporate Seal

PRINT OR TYPE NAME AND TITLE

WARNING: IF YOU FAIL TO FULLY, ACCURATELY, AND COMPLETELY SUPPLY THE INFORMATION REQUESTED ON THIS PAGE, YOUR BID MAY BE REJECTED.

Bidder's Name _____

STATEMENT OF OWNERSHIP DISCLOSURE

N.J.S.A. 52:25-24.2 (P.L. 1977, c.33, as amended by P.L. 2016, c.43)

This statement shall be completed, certified to, and included with all bid and proposal submissions. Failure to submit the required information is cause for automatic rejection of the bid or proposal.

Name of Organization: _____

Organization Address: _____

Part I Check the box that represents the type of business organization:

- Sole Proprietorship (skip Parts II and III, execute certification in Part IV)
- Non-Profit Corporation (skip Parts II and III, execute certification in Part IV)
- For-Profit Corporation (any type) Limited Liability Company (LLC)
- Partnership Limited Partnership Limited Liability Partnership (LLP)
- Other (be specific): _____

Part II

- The list below contains the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be. **(COMPLETE THE LIST BELOW IN THIS SECTION)**

OR

- No one stockholder in the corporation owns 10 percent or more of its stock, of any class, or no individual partner in the partnership owns a 10 percent or greater interest therein, or no member in the limited liability company owns a 10 percent or greater interest therein, as the case may be. **(SKIP TO PART IV)**

STATEMENT OF OWNERSHIP DISCLOSURE - CONTINUED

(Please attach additional sheets if more space is needed):

Name of Individual or Business Entity	Home Address (for Individuals) or Business Address

Part III DISCLOSURE OF 10% OR GREATER OWNERSHIP IN THE STOCKHOLDERS, PARTNERS OR LLC MEMBERS LISTED IN PART II

If a bidder has a direct or indirect parent entity which is publicly traded, and any person holds a 10 percent or greater beneficial interest in the publicly traded parent entity as of the last annual federal Security and Exchange Commission (SEC) or foreign equivalent filing, ownership disclosure can be met by providing links to the website(s) containing the last annual filing(s) with the federal Securities and Exchange Commission (or foreign equivalent) that contain the name and address of each person holding a 10% or greater beneficial interest in the publicly traded parent entity, along with the relevant page numbers of the filing(s) that contain the information on each such person. **Attach additional sheets if more space is needed.**

Website (URL) containing the last annual SEC (or foreign equivalent) filing	Page #'s

STATEMENT OF OWNERSHIP DISCLOSURE - CONTINUED

Please list the names and addresses of each stockholder, partner or member owning a 10 percent or greater interest in any corresponding corporation, partnership and/or limited liability company (LLC) listed in Part II **other than for any publicly traded parent entities referenced above**. The disclosure shall be continued until names and addresses of every noncorporate stockholder, and individual partner, and member exceeding the 10 percent ownership criteria established pursuant to N.J.S.A. 52:25-24.2 has been listed. **Attach additional sheets if more space is needed.**

Stockholder/Partner/Member and Corresponding Entity Listed in Part II	Home Address (for Individuals) or Business Address

Part IV Certification

I, being duly sworn upon my oath, hereby represent that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I acknowledge: that I am authorized to execute this certification on behalf of the bidder/proposer; that the **County of Union** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the completion of any contracts with **County of Union** to notify the **County of Union** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the, permitting the **County of Union** to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

Bidder's Name _____

SUBCONTRACTOR IDENTIFICATION STATEMENT

LIST OF SUBCONTRACTORS

This form is ONLY required for plumbing and gas fitting, steam and hot water heating and ventilating apparatus, steam power plants, electrical work, structural steel, ornamental iron work, and any other trades required to be identified by the specifications (including, but not limited, to satisfying any DPMC Classification requirements).

CHECK THIS BOX IF NONE OF THE ABOVE LISTED TRADES OR THOSE REQUIRED TO BE IDENTIFIED IN THE SPECIFICATIONS ARE TO BE USED TO PERFORM THE WORK

In compliance with N.J.S.A. 40A:11-16 and the bid specifications, the undersigned hereby lists the name or names of the following subcontractors:

Company Name: _____

Address: _____

Telephone: _____ Subcontract Amount: \$ _____

Specific Scope of Work Subcontracted: _____

License No. _____

Company Name: _____

Address: _____

Telephone: _____ Subcontract Amount: \$ _____

Specific Scope of Work Subcontracted: _____

License No. _____

Company Name: _____

Address: _____

Telephone: _____ Subcontract Amount: \$ _____

Specific Scope of Work Subcontracted: _____

License No. _____

IF MORE THAN THREE SUBCONTRACTORS, PLEASE COPY THIS SHEET AS NECESSARY AND ATTACH TO THE BID PACKAGE.

(Continued on following page)

Bidder's Name _____

SUBCONTRACTOR IDENTIFICATION CERTIFICATION (Continued)

Note the law does not permit the listing of alternate subcontractors. However, multiple subcontractors for the same trade are permitted to be named provided the bidder meets the following requirements:

- Bidder identifies each subcontractor named for that category;
- Bidder states the scope of work, goods and services (the portion of the work) to be performed by each subcontractor; and
- Bidder provides the price quote provided by each subcontractor.

The bidder is advised that any change of subcontractor(s) from ones listed herein is subject to the County's approval. Change of subcontractor(s) will be approved only if made for good cause and not as a result of an arbitrary purpose.

The undersigned Bidder certifies and declares that the subcontractors listed above shall be used as subcontractors to complete certain portions of the work in this project as set forth in N.J.S.A. 40A: 11-16.

Witness

Date _____

NAME OF BIDDER

ADDRESS

By: _____
ORIGINAL SIGNATURE ONLY

PRINT NAME AND TITLE

Bidder's Name: _____

ACKNOWLEDGMENT OF ADDENDUM

COUNTY OF UNION

(Name of Construction /Public Works Project)

(Project or Bid Number)

Pursuant to N.J.S.A. 40A:11-23.1a., the undersigned bidder, hereby acknowledges receipt of the following notices, revisions, or addenda to the bid advertisement, specifications or bid documents. By indicating date of receipt, bidder acknowledges the submitted bid takes into account the provisions of the notice, revision or addendum. Note that the County of Union's record of notice to bidders shall take precedence and that failure to include provisions of changes in a bid proposal may be subject for rejection of the bid.

Local Unit Reference Number or Title of Addendum/Revision	How Received (mail, fax, pick-up, etc.)	Date Received

ACKNOWLEDGMENT BY BIDDER:

NAME OF BIDDER: _____

ORIGINAL SIGNATURE: _____

PRINTED NAME AND TITLE: _____

DATE: _____

CONTRACTOR BUSINESS REGISTRATION CERTIFICATE

New Mandatory Requirement - Effective 1/18/2010

The recently enacted **P.L. 2009, c.315**, requires that effective January 18, 2010; a contracting agency must receive proof of the bidder's business registration prior to the award of a contract. However, the proof must show that the bidder was in fact registered with the State of New Jersey Department of the Treasury, Division of Revenue and obtained the business registration prior to the receipt of bids.

If subcontractors are named on the bid, proof of the business registration for each subcontractor must be provided prior to the award of bid. Similarly to the bidder, the proof must show that each subcontractor was registered with the State of New Jersey Department of the Treasury, Division of Revenue and obtained the business registration prior to the receipt of bids.

Proof of business registration shall be

- A copy of a Business Registration Certificate issued by the Department of the Treasury, Division of Revenue; or
- A copy of the web version provided by the NJ Division of Revenue, or

Register online at www.nj.gov/treasury/revenue/taxreg.htm. Click the "online" link and then select "Register for Tax and Employer Purposes or call the Division at 609-292-1730.

Note: A NJ Certificate of Authority is not acceptable.

FAILURE to submit proof of registration of the bidder or any subcontractor named on the bid prior to the award of a contract shall be cause to reject the bids.

FAILURE of the bidder or any subcontractor named on the bid to be registered prior to the receipt of bids is cause for a **MANDATORY REJECTION** of bids. (A NON-WAIVABLE DEFECT). This covers construction work as well as non-construction bids.

IN ADDITION:

The contractor shall provide written notice to all **subcontractors and suppliers** not specifically named on the bid of the responsibility to register and submit proof of business registration to the contractor. The requirement of proof of business registration extends down through all levels (tiers) of the project.

Before final payment on the contract is made by the contracting agency, the contractor shall submit an accurate list and the proof of business registration of each subcontractor or supplier used in the fulfillment of the contract, or shall attest that no subcontractors were used.

For the term of the contract, the contractor and each of its affiliates and a subcontractor and each of its affiliates [N.J.S.A. 52:32-44(g)(3)] shall collect and remit to the Director, New Jersey Division of Taxation, the use tax due pursuant to the Sales and Use Tax Act on all sales of tangible personal property delivered into this State, regardless of whether the tangible personal property is intended for a contract with a contracting agency.

A business organization that fails to provide a copy of a business registration as required pursuant to section 1 of P.L.2001,c.134 (C.52:32-44 et al.) or subsection e. or f. of section 92 of P.L.1977,c.110 (C.5:12-92), or that provides false business registration information under the requirements of either of those sections, shall be liable for a penalty of \$25 for each day of violation, not to exceed \$50,000 for each business registration copy not properly provided under a contract with a contracting agency.

Bidder's Name _____

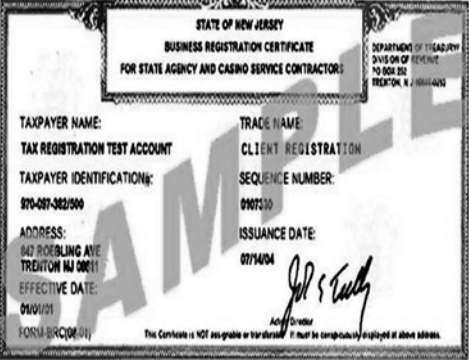
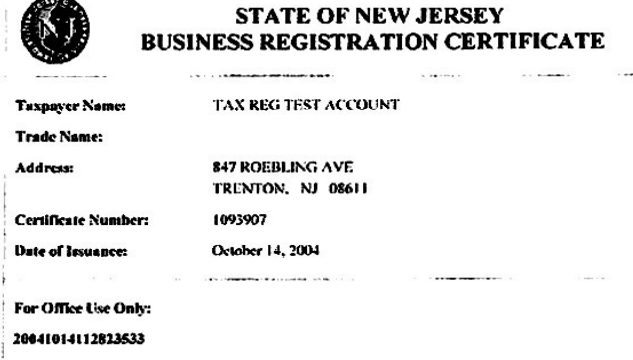
BUSINESS REGISTRATION
Mandatory Requirement

P.L. 2009, c.315, requires that effective January 18, 2010; a contracting agency must receive proof of the bidder's business registration prior to the award of a contract. However, the proof must show that the bidder was in fact registered with the State of New Jersey Department of the Treasury, Division of Revenue and obtained the business registration prior to the receipt of bids.

If subcontractors are named on the bid, proof of the business registration for each must be provided prior to the award of a contract. Similarly to the bidder, the proof must show that each subcontractor was registered with the State of New Jersey Department of the Treasury, Division of Revenue and obtained the business registration prior to the receipt of bids.

Proof of business registration shall be:

- A copy of a Business Registration Certificate issued by the Department of Treasury, Division of Revenue; or
- A copy of the web printed version provided by the NJ Division of Revenue

 <p>STATE OF NEW JERSEY BUSINESS REGISTRATION CERTIFICATE FOR STATE AGENCY AND CASINO SERVICE CONTRACTORS</p> <p>TAXPAYER NAME: TAX REGISTRATION TEST ACCOUNT TRADE NAME: CLIENT REGISTRATION TAXPAYER IDENTIFICATION: 010-007-382/000 SEQUENCE NUMBER: 0107210 ADDRESS: 847 ROEBLING AVE TRENTON NJ 08611 ISSUANCE DATE: 07/14/04 EFFECTIVE DATE: 09/01/04</p> <p>APPROVED: <i>[Signature]</i> Accepted for The Certificate is NOT assignable or transferable. It must be temporarily employed at above address.</p>	 <p>STATE OF NEW JERSEY BUSINESS REGISTRATION CERTIFICATE</p> <p>Taxpayer Name: TAX REG TEST ACCOUNT Trade Name: Address: 847 ROEBLING AVE TRENTON, NJ 08611 Certificate Number: 1093907 Date of Issuance: October 14, 2004</p> <p>For Office Use Only: 20041014112623533</p>
---	--

ATTACH BRC HERE

Bidder's Name _____

AFFIRMATIVE ACTION REQUIREMENT

REQUIRED AFFIRMATIVE ACTION EVIDENCE

General Requirements of P.L. 1975, c. 127: You are hereby put on notice that:

CONSTRUCTION CONTRACTS: The successful contractor must submit within three (3) days of the notice of intent to award or the signing of the contract the initial project manning report (A.A.201). This report should be submitted at the time the signed contract is returned to the County of Union. Attention: *Affirmative Action Officer*.

If the successful contract does not submit the initial project manning report (A.A.201) within the three (3) days from the time the signed contract is returned to the County of Union, the County of Union WILL declare the contractor non-responsive and award the contract to the next lowest responsible bidder.

NAME OF BIDDER

ORIGINAL SIGNATURE

PRINT OR TYPE NAME AND TITLE

DATE THIS FORM IS COMPLETED

EXPERIENCE STATEMENT

I hereby certify that my company has performed the following private or public work, which is relevant to this bid. I further certify that my company has never defaulted under any contract. Should you not sign this form due to prior defaults, please provide details on an attached sheet.

Witness

Date

NAME OF BIDDER

ADDRESS

By: _____
ORIGINAL SIGNATURE ONLY

PRINT NAME AND TITLE

YOU MAY ATTACH ADDITIONAL SHEETS, BUT YOU MUST SIGN AND WITNESS THIS SHEET.

Bidder's Name _____

NON-COLLUSION AFFIDAVIT

(N.J.S.A. 52:34-15)

STATE OF _____)
COUNTY OF _____) **SS:** _____

I _____, of the City of _____, in the County of _____, and the State of _____, of full age, being duly sworn according to law, on my oath depose and say that: I am _____ of the firm of _____, the bidder making the proposal for the above named project, and that I executed the said proposal for the above named project, and that I executed the said proposal with full authority to do so; that said bidder has not, directly or indirectly, entered into any agreement, participation in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the above named project; and that all statements contained in said proposal and in this Affidavit are true and correct, and made with full knowledge that the COUNTY OF UNION, NEW JERSEY relies upon the truth of the statements contained in said proposal and in the statements contained in the affidavit in awarding the contract for the said project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, except bona fide employees or bonafide established commercial or selling agencies maintained by _____ (N.J.S.A. 52:34-15).

NAME OF BIDDER

ORIGINAL SIGNATURE ONLY

NOTE: The person who signed the bidder signature page for the bidder should sign this form also.

Subscribed and sworn before me
this ____ day of _____, 200 ____.

Notary Public of the State of _____
My commission expires: _____

WARNING: IF YOU FAIL TO FULLY, ACCURATELY, AND COMPLETELY FILL OUT THIS AFFIDAVIT OF NON-COLLUSION, YOUR BID MAY BE REJECTED.

Contractor Registration Advisement
For Public Works Projects

A new law, known as “The Public Works Contractor Registration Act” (P.L. 1999, c.238), became effective April 11, 2000. Under the Act, no contractor/subcontractor will be permitted to bid on or engage in any contract for public work, as defined in Section 2 of P.L. 1963, c.150 (C:34:11-56.26), unless that contractor/subcontractor is registered with the New Jersey Department of Labor. The Act provides that upon registration with the Department, a public works contractor/subcontractor will be issued a certificate by the Department indicating compliance with the Act’s requirements. The registration fee has been set at \$300.00 per year. Upon the effective date of the Act, public bodies will be expected to request production of such a certificate from those bidding on or engaging in public works projects.

It is important to note that the term “contractor,” is defined in the, Act as, “a person, partnership, association, joint stock company, trust, corporation or other legal business entity or successor thereof who enters into a contract which is subject to the provision of the “New Jersey Prevailing Wage Act,” P.L. 1963, c.150 (C.34:11-56.25, et seq.) for the construction, reconstruction, demolition, alteration, repair or maintenance of a public building regularly open to and used by the general public or a public institution, and includes any subcontractor or lower tier subcontractor as defined herein: except that, for the purposes of the act, no pumping station, treatment plant or other facility associated with utility and environmental construction, reconstruction, demolition, alteration, repair or maintenance shall be regarded as a public building regularly open to and used by the general public or a public institution.”

Registration forms, copies of the Act, and other relevant information can be obtained by contacting:

Contractor Registration Unit
New Jersey Department of Labor
Division of Wage & Hour Compliance
PO Box 389
Trenton, New Jersey 08625-0389
Telephone: 609-292-9464
Fax: 609-633-8591
E-mail: contreg@dol.state.nj.us

Bidder's Name _____

AMERICANS WITH DISABILITIES ACT
EQUAL OPPORTUNITY FOR INDIVIDUALS WITH DISABILITIES

The contractor and the County of Union (hereafter "Owner") do hereby agree that the provisions of Title II of the Americans With Disabilities Act of 1990 (the "Act") (42 U.S.C.S12.101 et seq.), which prohibits discrimination on the basis of disability by public entities in all services, programs and activities provided or made available by public entities, and the rules and regulations promulgated pursuant thereto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the Owner pursuant to this contract, the contractor agrees that the performance shall be in strict compliance with the Act. In the event the contractor, its agents, servants, employees, or subcontractors violate or are alleged to have violated the Act during the performance of this contract, the contractor shall defend the Owner in any action or administrative proceeding commenced pursuant to this Act. The contractor shall indemnify, protect, and save harmless the Owner, its agents, servants, and employees from and against any and all suits, claims, losses, demands, or damages of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The contractor shall, at its own expense, appear, defend, and pay any and all charges for legal services and any and all costs and other expenses arising from such action or administrative proceeding or incurred in connection therewith. In any and all complaints brought pursuant to the Owner's grievance procedure, the contractor agrees to abide by any decision of the Owner which is rendered pursuant to said grievance procedure. If any action or administrative proceeding results in an award of damages against the Owner, or if the Owner incurs any expense to cure a violation of the ADA which has been brought pursuant to its grievance procedure, the contractor shall satisfy and discharge the same at its own expense.

The Owner shall, as soon as practicable after a claim has been made against it, give written notice thereof to the contractor along with full and complete particulars of the claim. If any action or administrative proceeding is brought against the Owner or any of its agents, servants, and employees, the Owner shall expeditiously forward or have forwarded to the contractor every demand, complaint, notice, summons, pleading, or process received by the Owner or its representatives.

It is expressly agreed and understood that any approval by the Owner of the services provided by the contractor pursuant to this contract will not relieve the contractor of the obligation to comply with the Act and to defend, indemnify, protect, and save harmless the Owner pursuant to this paragraph.

It is further agreed and understood that the Owner assumes no obligation to indemnify or save harmless the contractor, its agents, servants, employees and subcontractors for any claim which may arise out of their performance of this Agreement. Furthermore, the contractor expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the contractor's obligations assumed in this Agreement, nor shall they be construed to relieve the contractor from any liability, nor preclude the Owner from taking any other actions available to it under any other provisions of this Agreement or otherwise at law.

Name _____ (Please print or type)

Signature _____ Date _____

Bidder's Name _____

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. Questions may be answered on separate attached sheets. The Bidder may submit any additional information it desires.

1. _____
(Name of Bidder)

2. _____
(Permanent Main Office Address)

3. _____
(When Organized)

4. _____
(If a Corporation, where incorporated)

5. Number of years your organization has been engaged in construction or contracting business under present firm or trade name? _____

6. How many years of experience in construction work has your organization had (a) as a general contractor? And/or (b) As a subcontractor? _____

7. Contracts on hand: (Attach a list or table showing gross amounts of each Contract and the appropriate dates of completion) _____

8. General character of work performed by you. _____

9. Have you ever failed to complete any work awarded to you? _____

10. Have you ever defaulted on a Contract? _____ If so, complete details, including where and why?

Bidder's Name _____

STATEMENT OF BIDDER'S QUALIFICATIONS - (continued)

11. Has any officer or partner of your organization ever failed to complete a construction contract handled in its own name? If so, state name of individual, name of owner, location and type of project, and reason for the failure to complete. _____

12. List your major equipment available for this Contract.

13. Experience in the construction work similar in importance to this Project.

14. Have you had any material adverse changes from the trades as listed in NJ Notice of Classification within last five (5) years? _____. If so, list prior classification.

15. Background and experience of the principal members of your organization, including the officers.

Individual's Name	Present Position or Office	Yrs. of Construction Experience	Magnitude & Type of Work	In What Capacity

16. Bank Reference. (Name, Address, Phone, Representative) _____
17. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the proper agency? _____
18. The undersigned, hereby authorizes and requests any person, firm or corporation to furnish any information requested by the proper agency in verification of the responses comprising this Statement of Bidder's Qualifications.
17. Bidder's telephone number, fax number and e-mail address (if applicable).
- Phone _____
- Fax _____
- E-mail _____
- Mobile _____

Dated at _____ this _____ day of __, 20__.

BIDDER (Signature)

BIDDER (Print Name)

Subscribed and sworn to before me
this _____ day of _____, 20__.

(Seal) Notary Public of New Jersey/
Specify Other State
My Commission Expires _____, 20__.

**NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH
YOUR PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.**

Bidder's Name _____

CONTRACTOR PERFORMANCE RECORD

List all contracts completed by you below or provide separate form.

Name of Owner	Name & Location of Project: Type Of Work	Prime or Sub-Cont.	Engineer or Architect in Charge for Owner	Contract Price (Omit Cost)	Date Completed	Was Time* Extension Necessary	Were Any Penalties Imposed	Were Liens* Claims or Stop Notice Filed

* If answer is YES, provide explanation of details in connection with non-completion of contracts, time extensions, penalties imposed, labor troubles, liens, claims and notices filed against contracts listed in preceding item "Performance Record" on an attached sheet.

NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH YOUR PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.

Bidder's Name _____

CERTIFICATION

The information above is true and complete to the best of my knowledge and belief.

(Name of Organization)

(Signature)

(Title)

Subscribed and sworn to before me

This _____ day of _____, 20__.

(Seal) Notary Public of New Jersey/
Specify Other State

My Commission Expires _____, 20__.

Bidder's Name _____

**AFFIDAVIT REGARDING LIST OF DEBARRED,
SUSPENDED OR DISQUALIFIED BIDDERS**

STATE OF NEW JERSEY / _____)
Specify, if Other) SS:
COUNTY OF _____)

I, _____, of the (City, Town, Borough, etc.) of _____
State of _____, of full age, being duly sworn according
to law on my oath depose and say that:

I am _____ of the firm of _____,
the Bidder making the Proposal for the above named Project. I have executed the said Proposal with full
authority to do so. Said Bidder is not at the time of the making this bid included on the New Jersey State
Treasurer's or the Federal Government's List of Debarred, Suspended or Disqualified Bidders as a result
of action taken by any State or Federal Agency.

Name of Contractor

By: _____
(Signature of Authorized Representative)

Subscribed and sworn to before me
this _____ day of _____, 20__.

(Seal) Notary Public of New Jersey/
Specify Other State

My Commission Expires _____, 20__.

**NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH YOUR
PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.**

PRIOR NEGATIVE EXPERIENCE QUESTIONNAIRE

(N.J.S.A. 40A:11-4)

1. Within the past ten (10) years, have you been found, through either court adjudication, arbitration, mediation, or other contractually stipulated alternate dispute resolution mechanism, to have: failed to provide or perform goods or services; or failed to complete a contract in a timely manner; or otherwise performed unsatisfactorily under a prior contract with a public entity?

_____ yes _____ no If yes, please provide full, detailed explanation.

2. Within the past ten (10) years, have you defaulted on a contract, thereby requiring a public entity to utilize the services of another contractor to provide the goods or perform the services or to correct or complete the contract?

_____ yes _____ no If yes, please provide full, detailed explanation.

3. Within the past ten (10) years, have you defaulted on a contract, thereby requiring a public entity to look to your surety for completion of the contract or tender of the costs of completion?

_____ yes _____ no If yes, please provide full, detailed explanation.

4. Within the past ten (10) years, have you been debarred or suspended from contracting with any of the agencies or department of the executive branch of the State of New Jersey at the time of the contract award, where the action was based on failure to perform a contract for goods or services with a public entity?

_____ yes _____ no If yes, please provide full, detailed explanation.

Bidder's Name _____

PRIOR NEGATIVE EXPERIENCE CERTIFICATION

I hereby certify that the above statements are true and accurate as of this _____
day of _____, 20__.

Name of Contractor

By _____
(Signature of Authorized Representative)

Subscribed and sworn to before me
This _____ day of _____, 20__.

(Seal) Notary Public of New Jersey/
Specify Other State

My Commission Expires _____, 20__.

NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH YOUR PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.

Bidder's Name _____

TO BE COMPLETED ONLY WHEN FINAL PAYMENT IS REQUESTED

CONTRACTOR'S CERTIFICATION OF COMPLIANCE - NEW JERSEY PREVAILING WAGE ACT

TO: County of Union
Division of Engineering
2325 South Avenue
Scotch Plains, New Jersey 07076

CONTRACT:

PROJECT:

In accordance with the requirements of the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56 et al *, the undersigned contractor on the public work being performed for:

COUNTY OF UNION

hereby certifies that he/she has complied with the contract requirements regarding the payment of the minimum prevailing wages established under "The New Jersey Prevailing Wage Act" N.J.S.A. 34:11-56 et al.

CONTRACTOR:

ADDRESS:

BY:

ORIGINAL SIGNATURE ONLY

STATE OF NEW JERSEY

COUNTY OF _____

Being by me duly sworn according to law, on his oath deposes and says that _____ is _____ of _____ the above named contractor, and that the facts set forth in the above statement are true.

Subscribed and sworn before me
this ____ day of _____, 20__.

Notary Public: _____

My Commission Expires: _____

* N.J.S.A. 34:11-56.33 requires the contractor and subcontractor to file written statements with the public body in form satisfactory to the Commissioner certifying to the amounts then due and owing from such contractor and subcontractor filing such statement to any and all workmen for wages due on account of the public work, setting forth therein the names of the persons whose wages are unpaid and the amount due to each respectively. Union County will withhold the amount so deducted for the benefit of the workmen whose wages are unpaid as shown by the verified statement filed, and will pay directly to any workman the amount shown by such statement to be due to him for such wages. Such payment shall thereby discharge the obligation of the contractor to the person receiving such payment to the extent of the amount thereof.

Bidder's Name _____

UNCOMPLETED CONTRACTS AFFIDAVIT
(To be Submitted with DPMC Form 701)

PURSUANT TO N.J.A.C. 17:19-2.13, BIDDER DECLARES THE FOLLOWING WITH RESPECT TO ITS UNCOMPLETED CONTRACTS, ON ALL WORK, FROM WHATEVER SOURCE (PUBLIC AND PRIVATE), BOTH IN NEW JERSEY AND FROM OTHER GOVERNMENTAL JURISDICTIONS

ENTITY	PROJECT TITLE	ORIGINAL CONTRACT AMOUNT	UNCOMPLETED AMOUNT AS OF BID OPENING DATE	NAME AND TELEPHONE NUMBER OF PARTY TO BE CONTACTED FROM ENTITY FOR VERIFICATION

TOTAL AMOUNT OF UNCOMPLETED CONTRACTS \$ _____

Sworn and Subscribed to Before me

This _____ day of _____ 20____

Notary Public

BIDDER:

(Signature)

(Print Name)

NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH YOUR PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.

Bidder's Name _____

CERTIFICATE OF INSURANCE STATEMENT

The Bidder fully understands the County of Union insurance requirements as stated in the Instructions to Bidders as well as the Owner/Contractor Agreement and agrees to provide all insurance required by these documents prior to the issuance of the Notice to Proceed.

BIDDER (Signature)

BIDDER (Print Name)

NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH YOUR PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.

Bidder's Name _____

COLLECTION OF USE TAX ON SALES TO LOCAL GOVERNMENTS STATEMENT

The Bidder fully understands the requirements of the use tax on sales to local governments as stated in the General Conditions to the Contract for Construction and the Instructions to Bidders, and agrees at all times to comply with the "Contractor Use Tax Collection Legislation", as defined therein, and the terms relating thereto contained in the Contract Documents.

BIDDER (Signature)

BIDDER (Print Name)

NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH YOUR PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.

Bidder's Name _____

ACKNOWLEDGEMENT OF PROJECT LABOR AGREEMENT
(Projects of \$5 Million or more irrespective of Phasing)

Contractor _____, hereby acknowledges that the within Project, upon which the undersigned has submitted a Bid Proposal, requires the execution of a Project Labor Agreement and the utilization of union employees. The undersigned agrees to execute the PLA and comply with all terms and conditions of same in the performance of the Work.

Attest:

Contractor:

By: _____

Bidder's Name _____

TIME OF COMPLETION

The undersigned proposed that if awarded the Contract, the scope of work will be started within ten (10) calendar days and will be substantially completed within 1063 **calendar days (35 months)** from the date of the notice to proceed. (Rotunda 16 month duration / Tower 19 month duration)

I, _____ of _____
NAME (Print or type) COMPANY

Agree to complete work in the time frame specified _____
SIGNATURE

SITE VISIT – GENERAL CONTRACTOR

I, _____ of _____
NAME (Print or type) COMPANY

Visited the site of the work on _____
SIGNATURE

COUNTY OF UNION NEW JERSEY
Division of Purchasing
DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN

Solicitation Number: _____ Bidder/Offeror: _____

Pursuant to Public law 2012, c. 25, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete the certification below to attest, under penalty of perjury, that the person or entity, or one of the person or entity's parents, subsidiaries, or affiliates, is not identified on a list created and maintained by the Department of the Treasury as a person or entity engaging in investment activities in Iran. If the Director finds a person or entity to be in violation of the principles which are the subject of the law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the person or entity.

I certify, pursuant to Public Law 2012, c. 25, that the person or entity listed above for which I am authorized to bid/renew:

is not providing goods or services of \$20,000,000 or more in the energy sector of Iran, including a person or entity that provides oil or liquefied natural gas tankers, or products used to construct or maintain pipe lines used to transport oil or liquefied natural gas, for the energy sector of Iran,
AND

is not a financial institution that extends \$20,000,000 or more in credit to another person or entity, for 45 days or more, if that person or entity will use the credit to provide goods or services in the energy sector in Iran.

In the event that a person or entity is unable to make the above certification because it or one of its parents, subsidiaries, or affiliates has engaged in the above-referenced activities, a detailed, accurate and precise description of the activities must be provided in part 2 below to the Division of Purchase under penalty of perjury. Failure to provide such will result in the proposal being rendered as non-responsive and appropriate penalties, fines and/or sanctions will be assessed as provided by law.

PART 2: PLEASE PROVIDE FURTHER INFORMATION RELATED TO INVESTMENT ACTIVITIES IN IRAN. You must provide, accurate and precise description of the activities of the bidding person/entity, or one of its parents, subsidiaries or affiliates, engaging in the investment activities in Iran outlined above by completing the boxes below.

Name _____ Relationship to Bidder/Offeror _____

Description of Activities _____

Duration of Engagement _____ Anticipated Cessation Date _____

Bidder/Offeror Contact Name _____ Contact Phone Number _____

Certification: I, being duly sworn upon my oath, hereby represent and state that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I attest that I am authorized to execute this certification on behalf of the above referenced person or entity. I acknowledge that Union County is relying on the information contained herein and hereby acknowledge that I am under a continuing obligation from the date of this certification through the completion of any contracts with the County to notify the County in writing of any changes to the answers of information contained herein. I acknowledge that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I recognize that I am subject to criminal prosecution under the law and that it will also constitute a material breach of my agreement(s) with Union County, New Jersey and that the County at its option may declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print) _____ Signature _____

Title _____ Date _____

STANDARD SPECIFICATIONS

The Standard Specifications for Road and Bridge Construction of New Jersey Department of Transportation, 2007 Edition; is added to and/or amended elsewhere herein by the Notice to Contractors (Advertisement), Proposal, Information for Bidders, General Conditions, Special Provisions, Project Plans, and Supplementary Specifications; shall, insofar as technical requirements are involved, govern in the execution of this project.

Such Standard Specifications are made a part of these Specifications by this reference and will not be repeated herein. It is the responsibility of prospective bidders to familiarize themselves with these Standard Specifications, copies of which may be examined at the office of the Engineer and may be obtained, upon payment of the cost thereof, from:

Department of Transportation
State of New Jersey
1035 Parkway Avenue
Trenton, New Jersey 08625

The Notice to Bidders (Advertisement), Proposal, General Conditions, Instructions to Bidders, Special Provisions, Project Plans and/or Technical Specifications shall govern and prevail in the case of conflict between them and the Standard Specifications.

In these Standard Specifications the words "COMMISSIONER" or "DEPARTMENT" shall refer to and mean the person, persons, body, board or agent legally empowered to enter into contracts and otherwise legally act for the Owner. The words "RESIDENT ENGINEER (RE)", "ENGINEER" or "STATE" shall refer to and mean the professional engineering representative of the Owner as hereinbefore defined and the word "INSPECTOR" shall mean the authorized project representative of the Engineer with the authority as hereinbefore defined. The word "LABORATORY" shall mean and refer to the Engineer who may, at his discretion, and with the consent of the Owner, employ qualified technical personnel or testing laboratories to assist him in fulfilling the duties normally assigned to the "LABORATORY" in these Standard Specifications.

When reference is made herein to the bulletins, standards, specifications, publications or requirements of the Manual on Uniform Traffic Control Devices (MUTCD), Institute of Traffic Engineers (ITE), Federal Highway Administration (FHWA), American Association of State Highway Officials (AASHO), the American Concrete Institute (ACI), the American Society of Civil Engineers (ASCE) or similar national or regional societies, associations, institutes or organizations; the requirements of the bulletins, specifications, publications or requirements referred to shall be considered a part of these Specifications by such reference and shall not be repeated herein but shall have the same import and be as binding as if herein set forth in full.

DRAFT AIA Document A101™ - 2007

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the day of in the year
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

«County of Union»
« »
« »

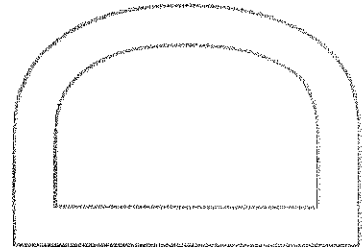
The County Engineer or his designee:
(Name, legal status, address and other information)

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

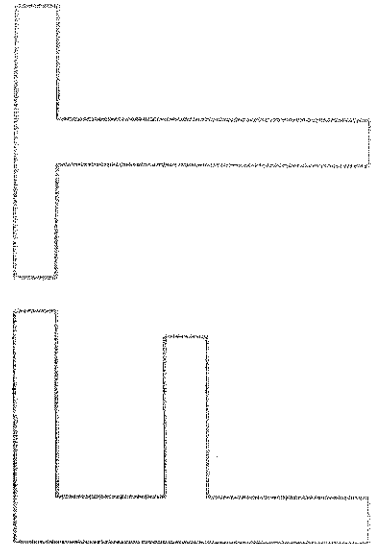
AIA Document A201™-2007, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.



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TABLE OF ARTICLES

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- 2 THE WORK OF THIS CONTRACT
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ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others. The Contractor will not be compensated for labor or materials outside the scope of work that is not properly authorized.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a Notice to proceed issued by the Owner, which is anticipated to be on or about

((()))

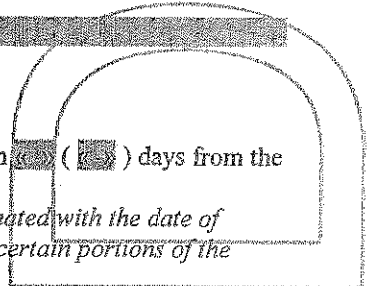
If, prior to the commencement of the Work, the Owner requires time to file mortgages and other security interests, the Owner's time requirement shall be as follows: Not applicable.

((()))

§ 3.2 The Contract Time shall be measured from the date of commencement.

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than () days from the date of commencement, or as follows:

(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)



Portion of Work

Substantial Completion Date

Entire Work

IBD

, subject to adjustments of this Contract Time as provided in the Contract Documents.

(Insert provisions, if any, for liquidated damages relating to failure to achieve Substantial Completion on time or for bonus payments for early completion of the Work.)

« » Should the Contractor fail to complete fully, and in conformity with all provisions of the Contract within the Contract Time, the Contractor shall, and hereby agrees to pay the Owner One Thousand Dollars (\$1,000.00) per day for as liquidated damages, for each consecutive calendar day beyond the number of days allowed by the Contract, which sum is agreed upon as reasonable and proper measure of damages that the Owner will sustain per diem by failure of Contractor to complete Work within time as stipulated; it is being recognized by Owner and Contractor that the injury to Owner that could result from a failure of the Contractor to complete on schedule, is uncertain and cannot be computed exactly. In no way shall costs of Liquidated Damages to be construed as a penalty to the Contractor. (See Bid Documents)

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be « » (\$ « »), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

« »

§ 4.3 Unit prices, if any:

(Identify and state the unit price; state quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price Per Unit (\$0.00)
« »	« »	« »

§ 4.4 Allowances included in the Contract Sum, if any:

(Identify allowance and state exclusions, if any, from the allowance price.)

Item	Price
« »	« »

ARTICLE 5 PAYMENTS

§ 5.1 PROGRESS PAYMENTS

§ 5.1.1 Based upon Applications for Payment submitted to the County Engineer or his designee by the Contractor and Certificates for Payment issued by the County Engineer or his designee, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« »

§ 5.1.3 The Contractor shall submit a Preliminary Payment Request (Pencil Requisition) to the County Engineer or his designee on the twenty-fifth (25th) day of any given calendar month for Work performed during that month,

Upon receipt of the Pencil Requisition from the Contractor, the County Engineer or his designee shall review the Pencil Requisition and approve or disapprove of it in whole or in part as set forth hereafter. Within (4) calendar days of receipt of the Pencil Requisition from the Contractor, the County Engineer or his designee shall return the Pencil Requisition to the Contractor, with those charges that are approved or disapproved, if any, by the County Engineer or his designee, for the Contractor's incorporation into an Application for Payment. Within two (2) calendar days of return of the Pencil Requisition from the County Engineer or his designee, the Contractor shall submit a formal application for Payment to the County Engineer or his designee for review and approval by the County Engineer or his designee incorporating any revisions made by the County Engineer or his designee in the Pencil Requisition submission. Within five (5) calendar days of receipt of Contractor's Application for Payment, the County Engineer or his designee shall take any one of the following actions:

- 1) Certify the entire Application for Payment;
- 2) Certify partial payment and provide the Contractor with reasons for withholding the remaining portion of the payment; or
- 3) Withhold certification of the entire Application for Payment and provide the Contractor with reasons for withholding the entire payment,

Once the Application for Payment is certified either in whole or in part, the County Engineer or his designee shall transmit the Certified Payment Application within three (3) calendar days to the Owner for its review and payment. The Owner shall make payment to the Contractor for the Certified Payment Amount by no later than the time period set forth in the New Jersey Prompt Payment Act following receipt of the Certificate for Payment from the County Engineer or his designee. The Owner shall not be obligated to pay any Application for Payment until the Application for Payment is certified by the County Engineer or his designee. Approval of any Application for Payment may be withheld should the Contractor fail to submit Manning Reports in a timely manner.

Pursuant to N.J.S.A. 2A:30A-1 et seq. (the "Prompt Payment Act"), a public or governmental entity that requires the entity's governing body to vote on authorizations for each periodic payment, final payment, or retainage monies, such as the Owner, is excepted from the timing requirements of the Act. Accordingly, the Owner shall not approve the Contractor's Application for Payment until it is certified by the County Engineer or his designee in accordance herewith and shall not approve the Contractor's Certified Payment Application until the next scheduled public meeting of the Owner following the Owner's receipt of the Certified Payment Application from the County Engineer or his designee. The Owner shall not make payment to the Contractor for the Certified Payment Amount until the Owner's subsequent payment cycle following its approval of the Payment Application.

Pursuant to this same Act, if a payment due pursuant to the provisions herein is not made in a timely manner, the Owner shall be liable for the amount of money owed under the contract, plus interest at a rate equal to the prime rate plus one percent (1%), notwithstanding anything to the contrary in the Contract Documents. Interest on amounts due pursuant to the Act shall be paid to the prime contractor for the period beginning on the day after the required payment date and ending on the day on which the check for payment is received by the Contractor.

Pursuant to this same Act, disputes regarding whether a party has failed to make payments required by the Act may be submitted to a process of alternative dispute resolution, notwithstanding anything to the contrary in the contract documents, where the parties agree to same. Alternative dispute resolution permitted by the Act shall not apply to disputes concerning any other matters that may arise under or from this Contract. Any civil action brought to collect payments shall be conducted in Union County, State of New Jersey, and the prevailing party shall be awarded reasonable costs and attorneys' fees.

§5.1.4 The County Engineer or his designee may decide not to certify payment and may withhold a Certificate for Payment, in whole or in part, to the extent reasonably necessary to protect the Owner if, in the County Engineer or his designee's opinion, the representations as described in Section 5.1.5 below cannot be made to the Owner. If the County Engineer or his designee withholds a Certificate for Payment, the County Engineer or his designee will notify the Contractor and Owner as provided in Section 5.1.3 above. If the Contractor and County Engineer or his designee cannot agree on a revised amount, the County Engineer or his designee will issue a Certificate for Payment for the amount for which the County Engineer or his designee is able to make such representations to the Owner as set forth in Section 5.1.3 above. The County Engineer or his designee may also decide to withhold certifying

payment in whole or in part, or, because of subsequently discovered evidence or subsequent observations, to such extent as may be necessary in the County Engineer or his designee's opinion to protect the Owner from loss because of:

- .1 Defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims;
- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials, or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or another contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or Liquidated Damages for the anticipated delay;
- .7 failure to carry out the Work in accordance with the Contract Documents;
- .8 avoidable delay in the progress of the Work;
- .9 deliberate delay in the submission for approval of names of Subcontractors, materialmen, sources of supply, shop drawings, and samples;
- .10 failure to maintain the Project Site in a safe and satisfactory condition in accordance with good construction practices as determined by the County Engineer or his designee; or
- .11 failure to submit updates as required by the General Conditions.

When the foregoing reasons for withholding certification are resolved, certification will be made for amounts previously withheld in the manner set forth in Section 5.1.3 above.

§5.1.5 The issuance of a separate Certificate for Payment will constitute representations made separately by the County Engineer or his designee to the Owner, based on its individual observations at the site and the data comprising the Application for Payment submitted by the Contractor, that the Work has progressed to the point indicated and that, to the best of the County Engineer or his designee's knowledge, information and belief, quality of the Work is in accordance with the Contract Documents.

The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to minor deviations from the Contract Documents correctable prior to completion and to specific qualifications expressed by the County Engineer or his designee. The

issuance of a separate Certificate of Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a separate Certificate for Payment will not be a representation that the County Engineer or his designees has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed the Contractor's construction means, methods, techniques, sequences or procedures; (3) reviewed copies of requisitions received from Subcontractor's and materials suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§5.1.6 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the County Engineer or his designee may require. This schedule, unless objected to by the County Engineer or his designee, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§5.1.7 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.8 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

- .1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of ~~5~~ percent (~~5~~ %). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201™-2007, General Conditions of the Contract for Construction;
- .2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of ~~5~~ percent (~~5~~ %);
- .3 Subtract the aggregate of previous payments made by the Owner; and
- .4 Subtract amounts, if any, for which the County Engineer or his designee has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201-2007.

§5.1.9 The progress payment amount determined in accordance with Section 5.1.8 shall be further modified under the following circumstances:

- .1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to the full amount of the Contract Sum, less such amounts as the County Engineer or his designee shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and
- .2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of AIA Document A201-2007.

§5.1.10 Retainage shall be determined as follows: Pursuant to N.J.S.A. 40A:11-6.1, the Owner will withhold two percent (2%) of the amount due on each partial payment when the outstanding balance of the Contract exceeds One Hundred Thousand Dollars (\$100,000.00).

§5.1.11 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 FINAL PAYMENT

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2.2 of AIA Document A201-2007, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the County Engineer or his designee.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the County Engineer or his designee's final Certificate for Payment, or as follows:

« »

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 INITIAL DECISION MAKER

The County Engineer or his designee will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A201-2007, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the County Engineer or his designee.)

« »
« »
« »
« »

§ 6.2 BINDING DISPUTE RESOLUTION

Except as provided in Section 5.1.3 of the Standard Form of Agreement between the Owner and Contractor, all claims, disputes or other matters in question between the parties to this Contract, arising out of or relating to the Project or to the Contract, or the alleged breach hereof, shall be subject one to mediation, and if not resolved, then same shall be decided in a Court of competent jurisdiction venued in Union County, New Jersey. No party may be compelled to submit any dispute concerning the Project to arbitration. In the event any claim arising from the Project is beyond the jurisdiction of the court, the Contract consents to joinder as a party to such action or alternative dispute proceeding.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201-2007.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201-2007.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201-2007 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 Payments due and unpaid under the Contract shall in no instance bear interest, except as required by law in accordance with Section 5.1.3 hereof.

§ 8.3 The Contractor shall ensure that the Project Site is maintained in a clean and safe condition at all times, based upon Owner's sole discretion. If the Contractor fails to keep the Project Site in a clean and safe condition, said failure shall result in the following:

- .1 all claims resulting from the Contractor's failure shall be the Contractor's responsibility;
- .2 said failure shall constitute an act of default and a substantial breach of the Contract giving the Owner remedies under the contract Documents; and
- .3 the Owner shall have the right to withhold any payments until the Contractor cures its failure.

Failure to do so shall authorize the Owner to withhold any Applications for payment until such time as the Contractor has rectified same. Further, if the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.

§ 8.4 Indemnification – See Indemnification Requirements in Bid Documents.

§ 8.5 The within contract shall be governed by and interpreted pursuant to the law of the State of New Jersey.

§ 8.6 The Contractor shall comply with the anti-discrimination provisions of N.J.S.A. 10:2-1 et seq., the New Jersey Law Against Discrimination, N.J.S.A. 10:5-1 et seq., N.J.A.C. 17:27-1.1 et seq. and shall guarantee to afford equal opportunity in performance of the Work in accordance with an affirmative action program approved by the State Treasurer. (See Page G-21).

§ 8.7 The Contractor shall submit proof of Business Registration for itself and its subcontractors to the Owner and shall provide written notice to its subcontractors and suppliers of the responsibility to submit proof of business registration to the contractor. The requirement of proof of Business Registration extends down through all levels (tiers) of the Project.

The Contractor agrees to comply with the rules and regulations promulgated pursuant to the Contractor Use Tax Collection Legislation.

For the term of the contract, the Contractor, any subcontractor, and each of their affiliates [N.J.S.A. 52:32-44(g)93], shall collect and remit to the New Jersey Director of the Division of Taxation in the Department of Treasury, the use tax due pursuant to the "Sales and Use Tax Act," P.L. 1966, c. 30 (C.54:32B-1 et seq.) on all of their sales of tangible personal property delivered into the State of New Jersey, regardless of whether the tangible personal property is intended for a contract with a contracting agency. For purposes herein, "affiliate" shall mean any entity that: (a)

directly, indirectly or constructively controls another entity; (b) is directly, indirectly, or constructively controlled by another entity; or (c) is subject to the control of a common entity. For purposes of the immediately preceding sentence, an entity controls another entity if it owns, directly or indirectly, more than fifty percent (50%) of the Ownership interest in that entity.

§8.8 This Standard Form of Agreement and the General Conditions set forth in the Bid Documents shall control in the case of conflict between these documents and the Project Specifications, the Project Manual, and any other exhibits incorporated by reference in this Contract.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below, and incorporated herein as if set forth in their entirety.

§ 9.1.1 The Agreement is this executed AIA Document A101-2007, Standard Form of Agreement Between Owner and Contractor.

§ 9.1.2 The General Conditions are AIA Document A201-2007, General Conditions of the Contract for Construction.

§ 9.1.3 The Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

§ 9.1.4 The Specifications:

(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

« See Specifications as referenced by Exhibit B.

Section	Title	Date	Pages

§ 9.1.5 The Drawings:

(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

« See List of Drawings, annexed hereto as Exhibit C.

Number	Title	Date

§ 9.1.6 The Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 9.

§ 9.1.7 Additional documents, if any, forming part of the Contract Documents:

.1 AIA Document E201™-2007, Digital Data Protocol Exhibit, if completed by the parties, or the following:

■

.2 Other documents, if any, listed below:

■

ARTICLE 10 INSURANCE AND BONDS

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201-2007.

(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201-2007.)

Type of insurance or bond

Limit of liability or bond amount (\$0.00)

This Agreement entered into as of the day and year first written above.

OWNER (Signature)

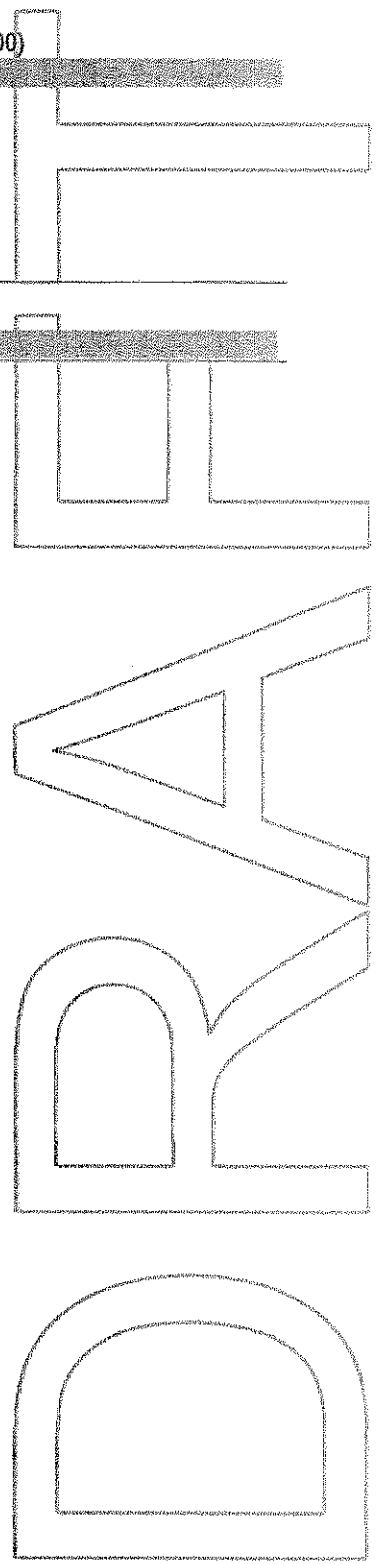
<><>

(Printed name and title)

CONTRACTOR (Signature)

<><>

(Printed name and title)



DRAFT AIA Document A201™ - 2007

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

«County of Union»

« »

THE OWNER:

(Name, legal status and address)

« »

« »

THE ENGINEER, OR HIS DESIGNEE :

(Name, legal status and address)

« »

« »

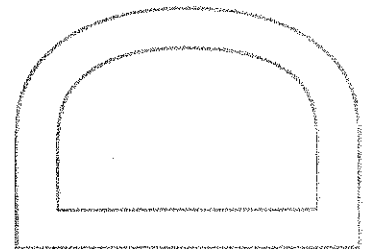
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ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.



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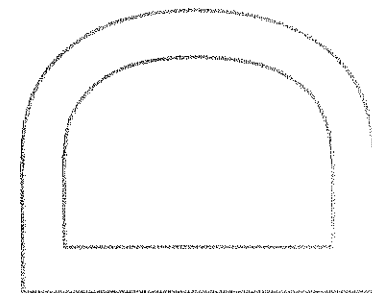
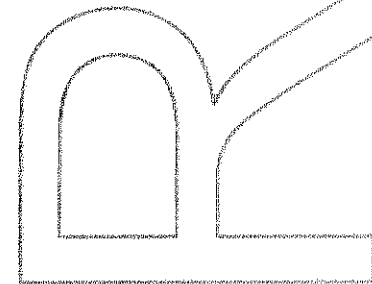
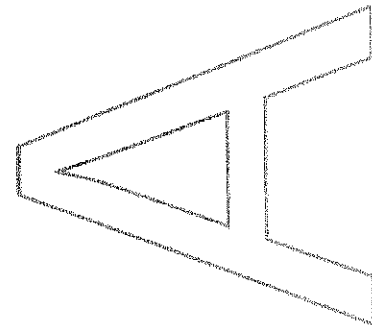
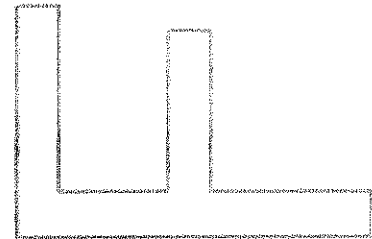
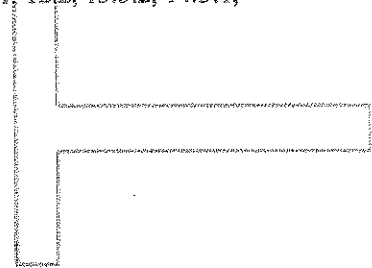
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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect or Engineer. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Engineer, or his designee or the Engineer, or his designee's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Engineer, or his designee or the Engineer, or his designee's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Engineer, or his designee's shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Engineer, or his designee's duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Engineer, or his designee and the Engineer, or his designee's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent

consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Engineer, or his designee s.

§ 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Engineer, or his designee and the Engineer, or his designee 's consultants shall be deemed the authors and Owners of their respective Instruments of Service, including the Drawings and Specifications. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Engineer, or his designee or Engineer, or his designee 's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Engineer, or his designee and the Engineer, or his designee 's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided elsewhere in the Contract Documents, the Engineer, or his designee does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 The Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only in the event that: (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 If readily available, the Owner shall furnish surveys describing physical characteristics and legal limitations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work. The Contractor shall be responsible for requesting and obtaining a utility mark-out.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Article 12 or fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6. Owner shall in no way be responsible for any delays or claims arising from delays for enforcement of this Section.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Engineer, or his designee's additional services made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located and shall maintain as current any approvals or certifications that may be required to perform the Work. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Engineer, or his designee in the Engineer, or his designee's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Engineer, or his designee any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Engineer, or his designee may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a Contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Engineer, or his designee any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Engineer, or his designee may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Engineer, or his designee issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Engineer, or his designee for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Engineer, or his designee and shall not proceed with that portion of the Work without further written instructions from the Engineer, or his designee. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Engineer, or his designee in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after

evaluation by the Engineer, or his designee and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 WARRANTY

The Contractor warrants to the Owner and Engineer, or his designee that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Engineer, or his designee, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Such warranty shall continue for a period of one (1) year from the date of Substantial Completion of the Work. Under this warranty, the Contractor shall remedy at his expense any such failure for the Work to be conforming to the requirement of the Contract, or any other defect appearing in the Work. In addition, the Contractor shall remedy at his own expense, any damage to Owner's owned, controlled, real or personal property, when that damage is the result of the Contractor's failure to provide conforming Work as it relates to the Contract Documents or any other defect of equipment, material, workmanship or design. The Contractor shall also restore any Work damaged in fulfilling its obligations under the terms of this provision. The Contractor's warranty with respect to the Work repaired or replaced hereunder will run for a period of one (1) year from the date of repair or replacement.

§ 3.6 TAXES

The Contractor shall pay use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 **Concealed or Unknown Conditions.** If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Engineer, or his designee before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Engineer, or his designee will promptly investigate such conditions and, if the Engineer, or his designee determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Engineer, or his designee determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Engineer, or his designee shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Engineer, or his designee's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Engineer, or his designee. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- 1 Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- 2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- 3 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2. The unused balance of any allowance shall be deducted from the Contract Sum upon completion and acceptance of the Work by Change Order.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Engineer, or his designee the name and qualifications of a proposed superintendent. The Engineer, or his designee may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Engineer, or his designee has reasonable objection to the proposed superintendent or (2) that the Engineer, or his designee requires additional time to review. Failure of the Engineer, or his designee to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Engineer, or his designee has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Engineer, or his designee's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Engineer, or his designee's approval. The Engineer, or his designee's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Engineer, or his designee reasonable time to review submittals. If the Contractor fails to submit a submittal

schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Engineer, or his designee .

§3.10.4 Should the Contractor responsible for the scheduling requirements of Article 3 herein fail to comply with said scheduling requirements, said failure shall result in the following:

- 1 all claims resulting from the Contractor's failure to prepare or submit a schedule shall be the Contractor's responsibility;
- 2 shall constitute an act of default and a substantial breach of the Contract giving the Owner remedies under the Contract Documents; and
- 3 the Owner shall have the right to withhold any payments until the Contractor complies with the scheduling requirements of Article 3 herein.

§3.10.5 In the event of a Five Prime Contract, the General Contractor shall be responsible for the preparation and submittal of the schedule.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Engineer, or his designee and shall be delivered to the Engineer, or his designee for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Engineer, or his designee is subject to the limitations of Section 4.2.7. Informational submittals upon which the Engineer, or his designee is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Engineer, or his designee without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Engineer, or his designee Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Engineer, or his designee or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Engineer, or his designee that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Engineer, or his designee .

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Engineer or his designee 's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Engineer, or his designee in writing of such deviation at the time of submittal and (1) the Engineer, or his designee has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Engineer, or his designee 's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Engineer, or his designee on previous submittals. In the absence of such written notice, the Engineer, or his designee 's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of Engineer, or his designee ure or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Engineer, or his designee will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Engineer or his designee . The Owner and the Engineer, or his designee shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Engineer, or his designee have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Engineer, or his designee will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Owner before using any portion of the Site.

§ 3.13.3 The Contractor shall store its apparatuses, materials, supplies, and equipment in such orderly fashion at the Site of the Work, if permitted, as will not unduly interfere with the progress of the Work or ongoing operations. The Contractor shall provide protective fencing around the designated storage areas.

§ 3.13.4 The Contractor shall see that stockpiles of materials and storage of equipment are kept to a minimum and neatly stored where directed by the Owner and the Engineer, or his designee.

§ 3.13.5 If the Work is to be executed in areas occupied by the Owner, the Contractor shall inform the Owner in advance of the areas scheduled to be worked on, so that the Owner's personnel may make proper preparations to protect equipment and records.

§3.13.6 The Contractor understands that some or all the Work of the Contract may be performed while the facilities are occupied by personnel, and accordingly shall make all reasonable and necessary provisions to ensure that the contract Work will be of minimal disruption to the environment.

§3.13.7 Materials and equipment that are to be used only directly in the Work, shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project Site. Protection of construction materials and equipment stored at the Project Site from weather, theft, damage and all other adversity is solely the Contractor's responsibility. The Contractor shall bear the responsibility to replace all such materials that may be lost, damaged, or stolen at its expense, whether such materials or equipment have been entirely or partially paid for by the Owner.

§3.13.8 The Contractor and any entity for whom the Contractor is responsibility, shall not erect any sign on the Project Site without the prior written consent of the Owner, which may be withheld in the sole discretion of the Owner.

§3.13.9 Contractor shall ensure that the Work is performed at all times in a manner that affords reasonable access, both vehicular and pedestrian, to the Site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the Site of the Work shall be free from all debris, building materials, and equipment likely to cause hazardous conditions.

§3.13.10 Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project Site, including, without limitation, the lavatories, toilets, entrances, and parking areas, other than those designated by the Owner. Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project Site and the Building, as amended from time to time. The Contractor shall immediately notify the Owner in writing, if during the performance of the Work, the Contractor finds compliance with any portion of such rules and regulations to be impracticable. This notification shall set forth the problems of such compliance and shall suggest alternatives through which the same results intended by such portions of the rules and regulations can be achieved. The Owner may, in the Owner's sole discretion, adopt such suggestions, develop new alternatives or require compliance with the existing requirements of the rules and regulations. The Contractor shall also comply with all insurance requirements and collective bargaining agreements applicable to use and occupancy of the Project Site and the Building.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents. Any costs incurred by the Owner for defective cutting or patching shall be borne by the Contractor responsible therefore.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate Contractor except with written consent of the Owner and of such separate Contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate Contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor, or shall be entitled to reduce the Contract Amount in an amount equal to the Owner's cost to clean up.

§3.15.3 The Contractor shall, on a daily basis, clean debris resulting from its Work, and protect construction in progress and maintain adjoining materials in place during handling and installation, and provide protective covering where required to assure protection from damage or deterioration until Substantial Completion.

§3.15.4 The Contractor shall clean and provide maintenance on completed construction, after installation, as frequently as necessary through the remainder of the construction period.

§3.15.5 The Contractor shall supervise its construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. The term "clean" shall include the removal of debris from the work area to dumpsters furnished by the Prime General Work Contractor or the Contractor for Single Overall Contract Work, whichever contracting method shall apply.

§ 3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Engineer, or his designee access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Engineer, or his designee harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Engineer, or his designee. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Engineer, or his designee.

§ 3.18 INDEMNIFICATION

§ 3.18.1 The County of Union requires all bidders to accept the following indemnification requirements in the event the County accepts their bid. The Contract awarded by the County to the successful bidder will contain the following provision:

"To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner and Owner's consultants, agents, representatives, and employees from and against any and all claims, damages, losses, costs, and expenses, including, but not limited to attorney's fees, legal costs and legal expenses arising out of or resulting from the performance of the Contractor's work under this contract, provided that such claim, damage, loss, cost or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than work itself) caused or alleged to be caused by the negligent acts, negligent omissions, and/or fault of the Contractor, anyone directly or indirectly employed or retained by the Contractor, or anyone for whose acts the Contractor may be liable regardless of whether caused in part by the negligent act or omission of a party indemnified hereunder provided it is not caused by the sole negligence of a party indemnified hereunder. Contractor shall further indemnify and hold harmless the Owner and the Owner's consultants, agents, representative, and employees from and against any and all claims, damages, losses, costs, and expenses, including, but not limited to attorneys' fees, legal costs and legal expenses, arising out of or resulting from performance of the work, provided that such claims, damage, loss, cost, or expense is attributable to bodily injury, sickness, disease or death, or to injury to destruction of tangible property (other than work itself) caused or alleged to be caused by the negligent acts, negligent omissions, and/or fault of the Owner or the Owner's consultants, agents, representatives, or employees and arises out of this project and provided such claim, damage, loss, cost, or expense is not caused by the sole negligence of a party indemnified hereunder."

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ENGINEER, OR HIS DESIGNEE OR ENGINEER

§ 4.1 GENERAL

§ 4.1.1 The Owner shall retain an Engineer, or his designee lawfully licensed to practice Engineer, or his designee are or an entity lawfully practicing Engineer, or his designee are in the jurisdiction where the Project is located. That person or entity is identified as the Engineer, or his designee in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Engineer, or his designee as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Engineer, or his designee. Consent shall not be unreasonably withheld.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Engineer, or his designee will provide administration of the Contract as set forth in its respective Agreements with the Owner and as described in the Contract Documents.

§ 4.2.2 The Engineer, or his designee will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Engineer, or his designee will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Engineer, or his designee about matters arising out of or relating to the Contract. Communications by and with the Engineer, or his designee's consultants shall be through the Engineer, or his designee. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Engineer, or his designee's evaluations of the Contractor's Applications for Payment, the Engineer, or his designee will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Engineer, or his designee has authority to reject Work that does not conform to the Contract Documents. Whenever the Engineer, or his designee considers it necessary or advisable, the Engineer, or his designee will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Engineer, or his designee nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Engineer, or his designee to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Engineer, or his designee will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Engineer, or his designee's action will be taken in accordance with the submittal schedule approved by the Engineer, or his designee or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Engineer, or his designee's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Engineer, or his designee's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Engineer, or his designee's review shall not constitute

approval of safety precautions or, unless otherwise specifically stated by the Engineer, or his designee, of any construction means, methods, techniques, sequences or procedures. The Engineer, or his designee's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Engineer, or his designee will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7. The Engineer, or his designee will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Engineer, or his designee will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Engineer, or his designee agree, the Engineer, or his designee will provide one or more project representatives to assist in carrying out the Engineer, or his designee's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in the Owner's Agreement with the Engineer, or his designee.

§ 4.2.11 The Engineer, or his designee will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Engineer, or his designee's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Engineer, or his designee will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Engineer, or his designee will endeavor to secure faithful performance by both Owner and Contractor and will not show partiality.

§ 4.2.13 The Engineer, or his designee will review and respond to requests for information about the Contract Documents. The Engineer, or his designee's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Engineer, or his designee will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate Contractor or subcontractors of a separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Identification of Subcontractors required by N.J.S.A. 40A:11-16 shall be provided with the bid submission in accordance with the requirements of that statute. Names of persons or entities for any Subcontractor not covered by N.J.S.A. 18A-18 shall be furnished within thirty (30) thirty days of notification of Award of Contract. The Engineer, or his designee will notify the Contractor in writing if the Owner or Engineer, or his designee, after due investigation, has reasonable objection to any such proposed person or entity. The list of proposed Subcontractors shall include a description of the materials and equipment each proposes to furnish and install in the Work. The description shall be insufficient detail to allow the Engineer, or his designee to determine general conformance to Contract requirements. Approval of the submittals as required under this Article shall not relieve the Contractor from conformance to Contract requirements.

§5.2.2 Subcontractors shall comply with the statutory requirements of N.J.S.A. 34:11-56.25 and N.J.S.A. 34:11-56.48. Any subcontractors who fail to comply with those statutory provisions shall be rejected.

§5.2.3 Written confirmation of award of each major subcontract shall be submitted to the Owner by the Contractor, in form subject to his approval, within seven (7) days after receipt of Owner's approval of proposed Subcontractor list as provided under this Article. Every subcontract shall be in writing, shall be submitted to Owner for review and approval prior to execution, and shall specifically provide that the Owner is an intended third (3rd) party beneficiary of such subcontract.

§ 5.2.4 The Contractor shall not contract with a proposed person or entity to whom the Owner or Engineer, or his designee has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.5 If the Owner or Engineer, or his designee has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Engineer, or his designee has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.6 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Engineer, or his designee makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

§5.3.1 By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Engineer, or his designee. Each subcontract agreement shall preserve and protect the rights of the Owner and Engineer, or his designee under the Contract Documents and at law. No Subcontract shall diminish in any way any rights or benefits conferred upon the Owner by these Contract Documents. The Contractor shall make all Contract Documents available to the Subcontractors.

§5.3.2 Where the Contractor sublets portions of the Work, the entire responsibility for the subdividing of Work rests with the Contractor. The Owner and the Engineer, or his designee are not responsible for the manner of the subdivision of the Work, nor will they enter into or settle disagreements or disputes between Contractor and Subcontractors. The Contractor is, and will be held, responsible for the proper execution of the Work of all Subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- 1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing.

§ 5.4.2 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor Contractor or other entity.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site.

§ 6.1.2 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Engineer, or his designee apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.4.1 Should the Contractor cause damage to the Work or property of any separate Contractor on the Project, the Contractor shall promptly settle with such other Contractor by agreement, or otherwise resolve the dispute. If such separate Contractor institutes any legal proceeding against the Owner on account of any damage alleged to have been so sustained, the Contractor shall, indemnify, defend, or bear the cost of defense as the Owner shall in its own discretion determine, and hold the Owner's harmless. Said Indemnification shall be governed by Section 13, Page G7 of the Instructions to Bidders.

§ 6.2.5 The Owner and each separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Engineer, or his designee will allocate the cost among those responsible, which amounts the Owner shall be entitled to reduce the Contract Amounts of the various contracts of those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. Change Orders and Construction Change Directives shall be subject to and processed in accordance with N.J.A.C. 6A:23-7 and N.J.A.C. 6A:26-4.9, where applicable.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Engineer, or his designee ; a Construction Change Directive requires a written agreement by the Owner and Engineer, or his designee and may or may not be agreed to by the Contractor; an order for a minor change in the Work which does not extend the Contract Time, increase the Contract Sum or change the Project Scope may be issued by the Engineer, or his designee alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.1.4 In order to facilitate checking of quotations for extras or credits, all proposals shall be accompanied by a complete itemization of costs including labor, materials and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are subcontracts, they shall be itemized also. In no case will a change be approved without such itemization.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Engineer, or his designee and signed by the Owner, Contractor and Engineer, or his designee stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

A Change Order shall not require consent of the Owner if the Owner has provided an allowance for such a change.

§ 7.2.2 Methods used in determining adjustments to the Contract Sum shall be those listed in Section 7.3.3.

§ 7.2.3 Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change, and any and all adjustments to the Contract Sum and the construction schedule. In the event a Change Order increases the Contract Sum, Contractor shall include the Work covered by such Change Orders in Applications for Payment as if such Work were originally part of the Contract Documents.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Engineer, or his designee and signed by the Owner and Engineer, or his designee, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. A Construction Change Directive shall not require the Agreement of the Engineer, or his designee if the Owner specifically waives their consent in writing. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.6.

§ 7.3.4 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Engineer, or his designee of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time. The Contractor's failure to comply with a Construction Change Directive shall constitute an incident of default and cause for termination by the Owner.

§ 7.3.5 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.6 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Engineer, or his designee shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Engineer, or his designee may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.6 shall be limited to the following:

- .1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- .2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others; and
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work.

§ 7.3.7 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Engineer, or his designee. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.8 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Engineer, or his designee will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Engineer, or his designee determines, in the Engineer, or his designee's professional judgment, to be reasonably justified. The Engineer, or his designee's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.9 When the Owner and Contractor agree with a determination made by the Engineer, or his designee concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Engineer, or his designee will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.3.10 In subparagraphs 7.3.3 and 7.3.6, the allowance for overhead and profit combined shall be based upon the following schedule:

- .1 For the Contractor, for work performed by his own forces, 10% of cost.
- .2 For each Subcontractor, for the work performed by his own forces, 10% of cost.
- .3 For the Contractor, for work performed by a subcontractor, 5% of cost.

§ 7.3.11 Lump sum quotations for changes in the Work will not be accepted. Proposals shall be completely itemized and broken down. They shall be accompanied by such supporting data as the Engineer, or his designee may require, such as copies of subcontractor's or vendor's quotations, quantity take-off sheets, or other similar information.

§ 7.4 MINOR CHANGES IN THE WORK

The Engineer, or his designee has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Engineer, or his designee and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work and services as required by the Contract

Documents, Substantial Completion of the Work shall be accomplished within the period of consecutive calendar days (or by the date), as stated in the Agreement, plus any authorized extension(s) of time as approved by written agreement. Final Completion of the Work shall be no later than thirty (30) consecutive calendar days from the date of Substantial Completion of the Work, unless otherwise set forth in Article 3.2 of the Owner/Contractor Agreement.

§ 8.1.2 Intentionally omitted

§ 8.1.3 Intentionally omitted.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work. There will be no bonus or incentives paid, should the Work, or any portion thereof, be completed in advance of the specified activity milestone dates.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 Intentionally omitted

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 Intentionally omitted

§ 8.3.4 No payment, compensation, or adjustment of any kind shall be made to the Contractor by the Owner for damages resulting from hindrances or delays caused by the delays of other contractors, or from foreseeable circumstances not attributable to the Owner's conduct. The Contractor agrees that it will make no claim against the Owner for payment, compensation, damages, mitigation of Liquidated Damages, or adjustment of any kind for such hindrances or delays, and will accept such extensions of time as may be granted by the Owner in the Owner's sole discretion in full satisfaction for any and all alleged claims against the Owner for any and all such hindrances or delays. For purposes of this Agreement, disputes arising between contractors before or during construction, adverse weather conditions, and delays on the part of local authorities issuing permits shall be considered foreseeable circumstances. Notwithstanding the foregoing, nothing herein shall limit the Contractor's remedies for Owner's negligence, bad faith, active interference, tortious conduct, or other reasons unanticipated by the parties that delay expenditures paid by the Owner to the Engineer, or his designee, other individual or entity, or to any inspector or inspectors necessarily employed by it on the Work, for any number of days in excess of the Contract Time, shall be deducted for the Contract Sum.

§ 8.3.5 The provisions of this Article shall not be so interpreted or construed as to preclude or prevent the Contractor from making and prosecuting any claim against any separate Contractor engaged or employed by the Owner for damages alleged to have been caused or occasioned by any such separate Contractor.

§ 8.3.6 To the extent permitted by law, the Owner may suspend the whole or any part of the Work, if it shall deem it for the best interest of the Owner to do so, without compensation to the Contractor for such suspension, other than extending the time for completion of the Work as much as it may have been delayed by such suspension. During such suspension, all materials delivered upon, but not placed in the Work shall be neatly piled by the Contractor so as not to obstruct public travel, or shall be removed from the line of Work at the direction of the Owner and, unless the

materials be moved by the Contractor upon such direction, the materials shall be removed by the Owner and expense thereof will be charged to the Contractor.

§8.4.1 Should the Contractor fail to complete fully, and in conformity with all provisions of the Contract within the Contract Time, the Contractor shall, and hereby agrees to, pay the Owner one thousand dollars (\$1,000.00) per day, for each consecutive calendar day beyond the number of days allowed by the Contract, which sum is agreed upon as reasonable and proper measure of damages that the Owner will sustain per diem by failure of Contractor to complete Work within time as stipulated; it being recognized by Owner and Contractor that the injury to Owner that could result from a failure of the Contractor to complete on schedule, is uncertain and cannot be computed exactly. In no way shall costs of Liquidated Damages be construed as a penalty to the Contractor.

§8.4.2 It is expressly understood and agreed by and between the Contractor and Owner that the Contract Time prescribed herein is a reasonable time for the completion of the Work.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Engineer, or his designee, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Engineer, or his designee may require. This schedule, unless objected to by the Engineer, or his designee, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 See Article 5 of Standard Form of Agreement between Owner/Contractor.

§ 9.3.1.1 Applications for Payment may include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives but not yet included in Change Orders.

§ 9.3.1.2 Such applications may not include requests for payment of amounts the Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason.

§ 9.3.1.3 All applications for payment shall be accompanied by the Application and Certificate of Payment, AIA Document G702, and the Continuation Sheet, AIA Document G703, fully completed as required or such other application for Payment as the Owner's representative shall use.

§ 9.3.1.4 In cases where the work is awarded on a Single Overall Contract basis, payments shall be made in accordance with applicable State of New Jersey statutes.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§9.3.3.1 All municipal mechanic's liens filed by a lien claimant shall be governed by N.J.S.A. 2A:44-125 et seq. In the event a municipal mechanic's lien is filed, the Owner reserves the right to withhold the full amount of the lien. The Owner may release the funds to the party against whose account the lien is claimed, only after that party files with the Owner's financial officer, a bond in an amount double of all sums claimed ("Double Bond") under the lien, and such bond's form has been approved by the Owner's chief law officer and financial officer, per N.J.S.A. 2A:44-130 or if an acceptable release of liens is filed by the lien claimant.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 See Article 5 of Standard Form of Agreement between Owner and Contractor.

§ 9.4.2 See Article 5 of Standard Form of Agreement between Owner and Contractor

§9.4.3 See Article 5 of Standard Form of Agreement between Owner and Contractor.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 See Article 5 of Standard Form of Agreement between Owner and Contractor

§ 9.5.2 See Article 5 if Standard Form of Agreement between Owner and Contractor.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Engineer, or his designee has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Engineer, or his designee

§ 9.6.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work and shall certify same to Owner. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Engineer, or his designee will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner and Engineer, or his designee on account of portions of the Work done by such Subcontractor.

§ 9.6.4 Neither the Owner nor Engineer, or his designee shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

§ 9.6.5 Payment to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.7 FAILURE OF PAYMENT

If the Engineer, or his designee does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Engineer, or his designee or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Engineer, or his designee, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§9.7 REIMBURSEMENT TO OWNER

§9.7.1 If the Owner is entitled to any reimbursement or payment from the Contractor under, or pursuant to, the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to: (1) deduct an amount equal to that which the Owner is entitled from any

payment then, or thereafter, due the Contractor from the Owner; or (2) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use; provided, however, that a condition precedent to Substantial Completion shall be the Owner's receipt of all certificates of occupancy (permanent or temporary) and any other permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the occupancy of the Project. The Owner may withhold a certification of Substantial Completion if temporary installations or temporary construction exists in areas requesting certification, or if certificates of occupancy are temporary or conditional.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Engineer, or his designee shall prepare a comprehensive list of items to be completed or corrected ("Punch List"). The Contractor shall proceed immediately to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of the list, the Engineer, or his designee, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Engineer, or his designee's inspection discloses any item, whether or not included on the list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Engineer, or his designee. The Contractor shall then submit a request for another inspection by the Engineer, or his designee to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Engineer, or his designee will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall establish responsibilities of the Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the List accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Contractor for its written acceptance and to the Owner for its approval and acceptance as required by Section 9.8.1. No Certificate of Substantial Completion shall be deemed effective unless executed by both Owner and Contractor.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, who shall obtain all necessary modifications to its insurance coverage to permit such occupancy or use. In addition, Contractor shall obtain consent of those public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete pursuant to the terms of that Agreement. When the Contractor considers a portion substantially complete, the Engineer, or his designee shall prepare a Punch List as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Engineer, or his designee shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.9.4 The occupancy of any portion of the Work shall not constitute acceptance of any Work, except as hereinafter stated, nor does it waive the Owner's right to Liquidated Damages. Final Acceptance of the Work shall be for the whole Work only and not part.

§ 9.9.5 Occupancy by the Owner shall not be deemed to constitute a waiver of existing claims on behalf of the Owner or Contractor against each other.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon completion of the Work, the Contractor shall forward to the Engineer, or his designee a written notice that the Work is ready for final inspection and acceptance and shall also forward to the Engineer, or his designee a final Contractor's Application for Payment. The Engineer, or his designee will promptly make such inspection. When the Engineer, or his designee finds the Work acceptable under the Contract Documents and the Contract fully performed, the Engineer, or his designee will promptly issue a final Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their observations and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Engineer, or his designee's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor complies with all requirements set forth in Section 6 of the Standard Form of Agreement between Owner and Contractor and the Contractor submits to the Engineer, or his designee (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 Intentionally omitted

§ 9.10.4 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Engineer, or his designee for review and coordination with the safety programs of other Contractors.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.
- .4 Construction or operations by the Owner or other Contractors.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying Owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4, except damage or loss attributable to acts or omissions of the Owner or Engineer, or his designee or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Engineer, or his designee.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Engineer, or his designee in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Engineer, or his designee the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance.

§ 10.3.3 Intentionally omitted

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 Intentionally omitted

§ 10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The County of Union requires all bidders to be able to comply with the following insurance requirements. In the event a bid is accepted by the County, the bidder must accept the applicable insurance requirements, as set forth below, as part of any contract, awarded to it by the County.

1. Automobile Liability Insurance in any amount of not less than \$1,000,000.00 combined single limits for Bodily Injury and Property Damage Liability. A certificate of such current insurance will be provided to the County and will reflect the provision of at least thirty (30) days notice to the County before any major cancellation or major change may be made the policy.

2. Workers Compensation Insurance insuring the obligations of the Contractor and all Subcontractors under the New Jersey Workers Compensation and Occupational Disability Laws as respects to Work performed under the Contract. Insurance will be extended to include any obligations under the United States Longshoremen's and Harbor Workers Act or any maritime act, when applicable.

3. General Liability Insurance will be provided on a Comprehensive General Liability form with a combined single limit of \$3,000,000.00 per occurrence for Bodily Injury Liability and Property Damage Liability and will include the interest of the County with respect to Work emanating from the Contract with the County. The insurance will include the following:

- a) Personal Injury Liability
- b) Blanket Contractual Liability applies to assumption of liability under any written Contract
- c) Coverage for A, X, C, U exposures, relating to excavation, blasting underground damage
- d) Broad Form Property Damage Liability
- e) Products and/or Completed Operations Liability

A Certificate of Insurance will be filed with the County prior to commencement of any Work. This certificate will contain a provision that insurance afforded under the policies will not be canceled without at least (30) days prior written notice being given to the County.

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§ 11.1.2 The insurance required by Section 11.1.1 shall remain in effect for the duration of the project, i.e., from beginning of construction until final payment and closeout.

§ 11.1.3 All insurance required by Section 11.1.1 shall be issued by insurance companies authorized to do business in the State of New Jersey and rated as "A" or better as determined by A.M. Best Company.

§ 11.1.4 The Contractor waives all rights against the Owner for damages caused by fire or other perils to the extent covered by insurance provided under this Article. Any deductibles, co-insurance, or contribution to the loss will be borne solely by the Contractor.

§ 11.1.5 A certificate of insurance evidencing the coverages required by Section 11.1.1 shall be submitted to the Owner's attorney for approval and transmittal to the Owner and Engineer, or his designee prior to the commencement of the Work. The certificate must be submitted on the ACORD form Certificate of Insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least thirty (30) days written notice has been given to the Owner. If requested by the Owner, the Contractor shall provide complete copies of any policies of insurance required by this Contract to be obtained by the Contractor and Subcontractor(s). Information concerning any reduction of coverage shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

§ 11.2 PROPERTY INSURANCE

§ 11.2.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance in the amount of the initial Contract Sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost

basis without voluntary deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurance interest in the property required by this Section 11.2 to be covered, whichever is earlier. This insurance shall include the interest of the Owner, Contractor, Subcontractor(s), and Sub-Contractor(s) in the Work.

§ 11.2.1.1 Property insurance shall be on an "all-risk" policy form and shall be against the perils of fire and extended coverage and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, falsework, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Engineer, or his designee's services and expenses required as a result of such insured loss. Coverage for all other perils shall not be required unless otherwise provided in the Contract Documents.

§ 11.2.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance which will protect the interests of the Contractor, Subcontractor(s) and Sub-subcontractor(s) in the Work. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.2.1.3 If the property insurance requires minimum deductibles, and such deductibles are identified in the Contract Documents, the Contractor shall pay costs not covered because of such deductibles. If the Owner or insurer increases the required minimum deductibles over the amounts so identified or if the Owner elects to purchase this insurance with voluntary deductible amounts, the Owner shall be responsible for payment of the additional costs not covered because of such increased or voluntary deductibles.

§ 11.2.1.4 Unless otherwise provided in the Contract documents, this property insurance shall cover portions of the Work stored off the site after written approval of the Owner at the value established in the approval, and also portions of the Work in transit.

§ 11.2.1.5 A loss insured under Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgage clause and of Section 11.3.10. The Contractor shall pay Subcontractor(s) their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractor(s) to make payments to their Sub-Contractor(s) in a similar manner.

§ 11.2.2 BOILER AND MACHINERY INSURANCE

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds. The Owner as fiduciary shall have the power to adjust and settle a loss with insurers.

§ 11.2.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused.

§ 11.2.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3 PERFORMANCE BOND, PAYMENT BOND AND MAINTENANCE BOND

§ 11.3.1 Contractor, at its sole expense, shall furnish bonds covering faithful performance of the contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract, including material and labor..

§ 11.3.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be made

§ 11.3.3 The Contractor shall file with the Owner, as a condition of final acceptance, a statement from the Surety of its Performance Bond and Payment Bond, that the Surety is satisfied that all claims for labor and material supplied under its contract have been satisfactorily settled.

§ 11.3.4 As a condition of Substantial Completion of the Work, the Contractor shall provide an acceptable Maintenance Bond in accordance with section 16, page G-9 of the Instructions to Bidders.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work uncovered is contrary to the Engineer, or his designee's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Engineer, or his designee, be uncovered for the Engineer, or his designee's examination and be replaced at the Contractor's expense without change in the Contract Time or Contract Sum.

§ 12.1.2 If a portion of the Work has been covered that the Engineer, or his designee has not specifically requested to examine prior to its being covered, the Engineer, or his designee may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate Contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

The Contractor shall promptly correct Work rejected by the Engineer, or his designee or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Engineer, or his designee's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. The Contractor shall give such notice promptly after discovery of the non-conforming work. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after the receipt of notice from the Owner or Engineer, or his designee, the Owner may correct it in accordance with Section 2.4. This obligation under Section 12.2.2 shall survive acceptance of the Work under the Contract and termination of the Contract.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 Intentionally omitted.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged work, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work, nor to any deficient Work discovered after the one-year period that could not have readily been discovered.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work, that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made. However, there shall be no implied or expressed acceptance of Work not in compliance with applicable law. The amount of said reduction will be within the exclusive determination of the Owner as its representative.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

§ 13.1.1 The Contract shall be governed by the laws of the State of New Jersey.

§ 13.1.2 Nothing in the Contract Documents shall be construed to permit deviation from the governing law.

§ 13.1.3 In accordance with N.J.S.A. 40A:11-18, American manufactured products or materials shall be used in the Work, wherever possible.

13.1.4 RATE OF WAGES

Where the Project is not subject to a Project Labor Agreement, wage notes shall be paid pursuant to the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25 et seq, the Contractor and Subcontractor are required to do the following:

§ 13.1.4.1 Pay to all workmen engaged in the performance of services, directly upon a public work, the prevailing rate of wages, which shall be those in effect for the Project site(s) on the Contract Date and such rates shall remain in effect for (2) years, unless superseded by a subsequent determination.

§ 13.1.4.2 Before final payment, furnish Owner with an affidavit stating that all workmen have been paid the prevailing rate of wages specified in the contract.

§ 13.1.4.3 Keep an accurate record showing the name, craft, or trade and actual hourly rate of wages paid to each workman employed by it in connection with any public work. Records shall be preserved for two (2) years from date of payment.

§ 13.1.4.4 Post the prevailing wage rated for each craft and classification involved as determined by the Commissioner of Labor and Industry, including the effective date of any changes thereof in prominent and easily accessible places at the site of the Work, and at such place or places as are used by them to pay workmen their wages.

§ 13.1.4.5 Submit the Owner, certified payroll records for each payroll period within ten (10) days of the date of the payment of wages. A certified payroll record is defined as "a payroll record that is attested by the employer or the Owner of the company doing business as the employer, or a corporate officer of such company, or an authorized agent of the employer". A copy of the certified payroll form for submission of the payroll records may be obtained by contacting the Department of Labor, Division of Workplace Standards at 609.292.2259.

§ 13.1.4.6 In the event the Owner finds that any workers employed by the Contractor or Subcontractor, covered by the said contract, have been paid a rate of wages less than the prevailing wage required to be paid by such contract, the Owner may terminate the Contractor's or Subcontractor's right to proceed with the Work, or such part of the

Work as to where there has been a failure to pay required wages, and to prosecute the Work to completion or otherwise, the Contractor and its sureties shall be liable to the Owner for any excess costs occasioned thereby,

§ 13.1.4.7 a current wage rate determination is on file at the offices of the Owner for inspection and Contractor's use.

§ 13.1.5 SAFETY AND HEALTH REGULATIONS (OSHA)

§ 13.1.5.1 The Contractor shall comply with the laws, rules, regulations and codes dealing with occupational safety and health, including, but not limited to, the latest amendments of the following:

§ 13.1.5.2 Williams – Steiger Occupational Safety and Health Act of 1970, Public Law 91-595.

§ 13.1.5.3 Part 1910 – Occupational Safety and Health Standards Chapter XVII of Title 29, Code of Federal Regulations.

§ 13.1.5.4 Part 126 – Safety and Health Regulations for Construction, Chapter XVII of Title 29, Code of Federal Regulations.

§ 13.1.5.3 N.J.A.C. 8:59-5.1-5.109 requirements properly label any substances stored in containers) of the Worker and Community Right to Know Act, P.L. 1983, c.315.

§ 13.1.6 ENVIRONMENTAL REGULATIONS

§ 13.1.6.1 The Contractor shall comply with laws, rules, regulations, and codes dealing with the prevention of environmental pollution and the preservation of public natural resources, including but not limited to, the latest amendments of the following:

§ 13.1.6.2 Chapter 251, public Law of 1975 of the State of New Jersey, "soil Erosion and Sediment Control Act."

§ 13.1.7 AFFIRMATION ACTION EMPLOYMENT LAW

Contractor agrees to comply with the terms of the Mandatory Equal Employment Opportunity Language, a copy of which is annexed to the Contract Documents as Exhibit F and incorporated as if set forth herein.

§ 13.1.7.1 Contractor shall submit a copy of the Monthly Project Workforce Report, New Jersey Department of Treasury Form AA-202, to the New Jersey Department of Treasury's Division of Public Contracts Equal Employment Opportunity Compliance and to the Owner

§ 13.1.7.2 Contractor shall complete and submit to the Owner an Initial Project Workforce Report, New Jersey Department of Treasury Form AA 201, upon notification of award and no later than the execution of this Agreement. Failure to submit this completed form may result in this Agreement being terminated.

§ 13.2. SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents, neither party to the Contract shall assign the Contract as a whole without written consent of the other, unless as may be provided for elsewhere in the Contract Documents. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Engineer, or his designee or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Engineer, or his designee timely notice of when and where tests and inspections are to be made so that the Engineer, or his designee may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Engineer, or his designee, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Engineer, or his designee will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Engineer, or his designee of when and where tests and inspections are to be made so that the Engineer, or his designee may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Engineer, or his designee's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Engineer, or his designee.

§ 13.5.5 If the Engineer, or his designee is to observe tests, inspections or approvals required by the Contract Documents, the Engineer, or his designee will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

Except as required by Section 5.1.3 of the Owner Contractor Agreement and notwithstanding anything to the contrary contained in the Contract Documents and related documents, the Owner will pay no interest whatsoever for any payments due.

§ 13.7 TIME LIMITS ON CLAIMS

Intentionally deleted.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;

§ 14.1.2 Intentionally deleted

§ 14.1.3 If one of the reasons described in Section 14.1.1 exists, the Contractor may, upon thirty (30) days' written notice to the Owner and Engineer, or his designee, terminate the Contract

§ 14.1.4 Intentionally deleted.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor after Notice and an opportunity to cure,

- .1 refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 disregards laws, ordinances, rules or regulations, or orders of a public authority having jurisdiction;
- .4 fails to furnish the Owner with assurances satisfactory to the Owner, evidencing the Contractor's ability to complete the Work in compliance with all requirements of the Contract Documents;
- .5 fails after commencement of the Work, to proceed continuously with the construction and completion of the Work, for more than three (3) days, except as permitted by the Contract Documents;
- .6 disregards orders of the Owner or Engineer, or his designee;
- .7 fails to maintain the Site in a clean, safe and orderly manner;
- .8 fails to comply with a Construction Change Directive; or
- .9 otherwise is guilty of any breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. And charge the costs incurred against the Contractor's Contract balance

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished. The Engineer, or his designee's certification issued pursuant to Section 14.2.2 shall be given a presumption of correctness.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Engineer, or his designee's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Engineer, or his designee, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 Intentionally deleted.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;

- 2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- 3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking adjustment or interpretation of Contract terms, payment of money, extension of time, or other relief with respect to the terms of the Contract. Any Contractor Claim seeking the payment of money shall not include consequential damages, which Contractor hereby waives, and shall be calculated in accordance with Section 7.3.6 and Section 7.3.10 hereof.

§ 15.1.2 DECISION OF ENGINEER, OR HIS DESIGNEE

Owner and Contractor agree that the Engineer, or his designee shall be the initial arbiter of all Claims, including those alleging error or omission by the Engineer, or his designee. All claims, shall be referred, initially to the Engineer, or his designee for action as provided in Article 4 and shall be required as a condition precedent to litigation of a Claim between the Contractor and Owner to all such matters arising prior to the date final payment is due, regardless of: (1) whether such matters relate to execution and progress of the Work; or (2) the extent to which the work has been completed. The decision by the Engineer, or his designee in response to a Claim shall not be a condition precedent to litigation in the event: (1) the position of the Engineer, or his designee is vacant; (2) the Engineer, or his designee has not received evidence or has failed to render a decision within agreed time limits; (3) the Engineer, or his designee has failed to take action required under Article 4 within thirty (30) days after the Claim is made; (4) forty-five (45) days have passed after the Claim has been referred to the Engineer, or his designee; or, (5) the claim relates to a mechanic's lien.

§ 15.1.3 TIME LIMITS ON CLAIMS

Claims must be within twenty one (21) calendar days after the occurrence of the event giving rise to the Claim or within twenty-one (21) calendar days after the claimant first becomes aware of the condition giving rise to the Claim, whichever is later. There shall be no time limitation upon any Claims made by the Owner. Claims must be made by written notice to the Engineer, or his designee. An additional Claim made after the initial Claim has been implemented by Change Order will not be considered unless submitted pursuant to the requirements of this Paragraph. Notice shall be deemed effective upon the Engineer, or his designee's receipt of the Notice.

§ 15.1.4 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, unless otherwise agreed in writing, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments to the extent required by the Contract Documents.

§ 15.1.5 CLAIMS FOR CONCEALED OR UNKNOWN CONDITIONS

If conditions are encountered at the Site which are: (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents; or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for the Contract Documents, the Owner and Contractor mutually agree to give written notice to each other; including the Engineer, or his designee and any affected Contractor or subcontractor, upon the observation of the condition within twenty-four (24) hours of first observation of the condition. The Engineer, or his designee will investigate such conditions within seventy-two (72) hours and will diligently process and render a recommendation within twenty-one (21) days unless otherwise agreed in writing. If the Engineer, or his designee determines that the condition at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified the Engineer, or his designee shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in

opposition to such determination must be made within seven (7) days after the Engineer, or his designee has given notice of the decision.

§ 15.1.6 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum written notice as provided herein shall be given before proceeding to execute the Work. All documentation in support of the Contractor's request shall, likewise be provided at the time said written request is made. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.3 or elsewhere in the Contract Documents.

§ 15.2 CLAIMS FOR ADDITIONAL TIME

§ 15.2.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work, all documentation in support of the Contractor's request shall, likewise be provided at the time said written request is made. In the case of a continuing delay, only one Claim is necessary.

§ 15.2.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. The term "abnormal" as used here shall be construed according to the following formula: average rainfall (or snow, low temperature, etc) for the past five (5) years for the month in question, plus ten percent (10%). Accordingly, weather is not deemed to be abnormal unless it is ten percent (10%) worse than the average for the month over the past five (5) years. Claims relating to weather must be submitted within seven (7) calendar days of the occurrence of any such delays.

§ 15.3 CLAIMS FOR INJURY OR DAMAGE TO PERSON OR PROPERTY. If either Party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, of any of the other party's employees or agents, or of others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party, including the Engineer, or his designee, within a reasonable time not exceeding twenty-one (21) days after first occurrence, unless another time period is required by law. The notice shall provide sufficient detail to enable the other party to investigate the matter. If a Claim for additional cost or time related to this Claim is to be asserted, it shall be filed as provided for in Article 15.

§ 15.3.2 The Owner is not required to institute a claim under this section in order to terminate this Agreement.

§ 15.4 RESOLUTION OF CLAIMS AND DISPUTES

The Engineer, or his designee will review Claims and take one or more of the following preliminary actions with ten (10) days of receipt of a Claim: (1) request additional supporting data from the claimant; (2) reject the Claim in whole or in part, stating reasons for rejection; (3) recommend approval of the Claim by other party; or (4) suggest a compromise.

§ 15.4.2 If a Claim has been resolved, the Engineer, or his designee will prepare or obtain appropriate documentation in consultation with Owner's counsel as circumstances dictate.

§ 15.4.3 If a Claim has not been resolved after consideration of the foregoing and of further evidence presented by the parties or requested by the Engineer, or his designee, the Engineer, or his designee will notify the parties in writing that the Engineer, or his designee's decision will be made within seven (7) days, which decision shall be final. Upon expiration of such time period, the Engineer, or his designee will render to the parties the Engineer, or his designee's written decision relative to the Claim, including any change in the Contract Sum or Contract Time or both.

§ 15.5. CLAIMS FORUM

Unless otherwise required by Section 5.1.3 of the Standard Form of Agreement between the Owner and Contractor, claims, disputes, or other matters in question between the parties to this Contract arising out of or relating to the Project or to this Contract, or the alleges breach thereof, shall be subject in the first instance to mediation and failing that, there in, a Court of competent jurisdiction venued in Union County, New Jersey. The Owner may not be compelled to submit any dispute concerning the Project to arbitration. By accepting award of the Contract and executing the Agreement, the Contractor consents to its joinder as a party in any litigation, mediation, arbitration or any other legal proceeding involving the Project and any references in the Contract documents.

§ 16.1 INTERPRETATIONS IN WRITING

§ 16.1.1 Neither the price bid for the work of any Contract, nor the Contract Sum, shall be based in any manner upon oral opinions, or real or alleged instructions of an oral nature, regardless if whether such opinions or instructions are expressed by the Owner, the Engineer, or his designee or its Consultants, the Contractor, or agents or representative of any of them and no such oral communication shall form the basis of a Claim.

§ 16.1.2 These provisions do not intend to deny, on an oral basis, normal discussion, recommendations, explanations, suggestions, approvals, rejections, and similar activity in pursuit of the work of the Project, such as at job conferences and otherwise at the Site. In such instances, the written minutes, correspondence, shop drawing records, written field orders, and other written data shall govern over personal claims regarding statements made contrary to the written data.

§ 17.1 JOB SITE MEETINGS

§ 17.1.1 Job site meetings, when called by the Engineer, or his designee, shall be held at a location and time convenient to the Owner's representatives, the Engineer, or his designee, and Contractor(s). Each Contractor shall attend such meeting, or be represented by a person in authority who is thoroughly familiar with the Project and who can speak and make decisions for the Contractor. In the instance of a Single Overall Contract, each of the major Subcontractors-Structural Steel, and ornamental iron work, plumbing, gas fitting and all kindered work and steam power plants, steam, and hot water heating and ventilating apparatus and Electrical-shall have a person in authority who is thoroughly familiar with the Project attend the meetings.

**§ 18.1 MANDATORY LAW AGAINST DISCRIMINATION LANGUAGE
PROCUREMENT, PROFESSIONAL AND SERVICE CONTRACTS
(N.J.A.C. 13:6-1.3)**

§ 18.1.1 The parties of this contract do hereby agree that the provision of N.J.S.A. 10:2-1 through N.J.S.A. 10:2-4 dealing with discrimination in employment on public contracts, and the rules and regulations promulgated pursuant thereto, are hereby made a part of this contract and are binding upon them.

§ 18.1.1 Pursuant to the provision of N.J.S.A. 10:2-1 through N.J.S.A. 10:2-4, during the performance of this contract, the Contractor agrees as follows:

§ 18.2.1.1 In the hiring of persons for the performance of work under this contract or any subcontract hereunder, or for the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under this contract, no Contractor, including without limitation, the Contractor, nor any person acting on behalf of such Contractor or subcontractor, shall by reason of race, creed, color national origin, ancestry, Marital status, gender identity or expression, affectional or sexual orientation, or sex, discriminate against any person who is qualified and available to perform the Work, to which the employment relates;

§ 18.2.1.2 No Contractor, including, without limitation, the Contractor, Subcontractor, nor any person acting on its behalf shall, in any manner, discriminate against or intimidate any employee engaged in the performance of work under this Contract or any subcontract hereunder, or engaged in the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under such Contract, on account of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation, or sex;

§ 18.2.1.3 There may be deducted from the amount payable to the Contractor by the Owner, under the Contract, a penalty of \$50.00 (fifty dollars) for each person for each calendar day during which such person is discriminated against or intimidated in violation of the provisions of the Contract; and

§ 18.2.1.4 This contract may be canceled or terminated by the Owner, and all the money due or to become due hereunder may be forfeited, for any violation of this section of the Contract occurring after notice to the Contractor from the contracting public agency or any prior violation of this section of the Contract.

§ 19.1 CONTRACTOR AND SUBCONTRACTOR COLLECTION OF USE TAX TO LOCAL GOVERNMENTS

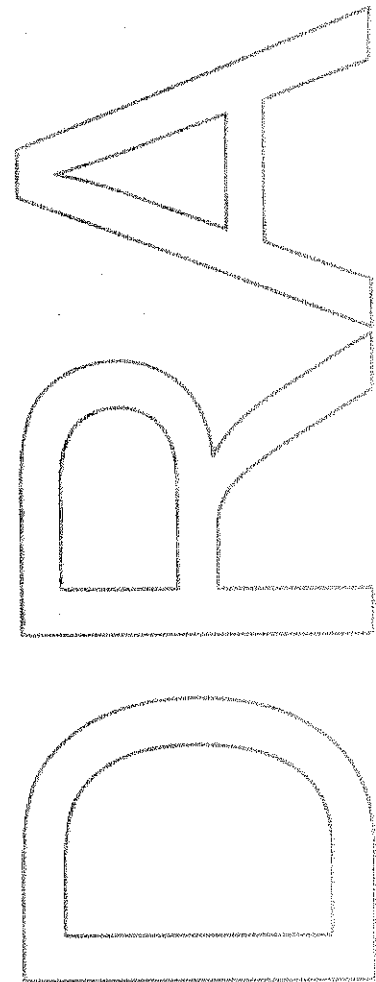
§ 19.1.1 The Contractor acknowledges and agrees that pursuant to P.L. 2004, c. 57, enacted by the State of New Jersey on June 29, 2004, contractors or contractors with subcontractors, or their affiliates, who enter into contracts

with New Jersey local government entities, including without limitation, boards of education, are, effective as of September 1, 2004, required to collect and remit to the New Jersey Director of Taxation in the Department of the Treasury the use tax pursuant to the "sales and Use Tax Act," P.L. 1966, c. 30 (C.54:32B-1 et. seq.) on all their sales of tangible personal property delivered into the State of New Jersey (hereinafter referred to as the "Contractor Use Tax Collection Legislation").

§ 19.2.1 The Contractor hereby covenants and agrees that the Contractor, any subcontractor and each of their affiliates, shall collect and remit to the New Jersey Director of the Division of Taxation in the Department of Treasury, the use tax due pursuant to the "Sales and Use Tax Act," P.L. 1966, c. 30 (C.54:32B-1 et. seq.) on all their sales of tangible personal property delivered into the State of New Jersey. For purposes herein, "affiliate" shall mean any entity that : (a) directly, indirectly or constructively controls another entity; (b) is directly, indirectly, or constructively controlled by another entity; or (c) is subject to the control of a common entity. For purposes of the immediately preceding sentence, an entity controls another entity if it owns, directly or indirectly, more than fifty percent (50%) of the Ownership interest in that entity.

§ 19.3.1 The parties intend that this Article 19 shall comply with the rules and regulations promulgated pursuant to the Contractor Use Tax Collection Legislation and shall be interpreted consistent therewith.

§ 19.4 Notwithstanding anything contained in the Agreement to the contrary, the Contractor hereby agrees to indemnify and hold the Owner harmless from and against any and all fines, taxes, penalties, interest, claims, losses. Costs, expenses, liabilities, or damages arising out of or in connection with the Contractor's failure to comply with the terms and condition of Sections 19.1 and 19.2 to the fullest extent permitted by law and public policy.



OPERATING ENGINEERS **Rates Expiration Date : 03/31/2020**

{For apprentice rates refer to "Operating Engineers" apprentice rates in any county rate package}

The regular workday consists of 8 hours, Monday to Friday, between 6:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:

- Shift work must run for 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive an additional 10% of the regular rate inclusive of benefits, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, plus an additional 10% of the regular rate inclusive of benefits, per hour. The third shift shall receive 8 hours pay for 7 hours of work, plus an additional 15% of the regular rate inclusive of benefits, per hour.
- When such hours are mandated by the project owner, a shift that starts between 8:00 PM and midnight and ends by 6:00 AM Saturday, or that starts after 8:00 PM on Sunday, provided there are consecutive hours of work within the shift, shall receive an additional 15% of the regular rate, inclusive of benefits.
- On Highway, Road, Street, and Sewer projects irregular shifts starting between 5:00 PM and 12:00 AM may be worked Monday through Friday, and shall receive an additional 15% of the regular rate, inclusive of benefits. When working with other trades that receive a higher irregular shift rate, the Operating Engineer shall also receive the higher irregular shift rate.

OVERTIME:

- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veteran's Day.

On hazardous waste removal work or asbestos removal work, on a state or federally designated hazardous waste site, where the operating engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin, and eye protection, the operating engineer shall receive an additional 20% of the hourly wage, per hour.

OPERATING ENGINEERS **Rates Expiration Date : 03/31/2020**

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
48.98	30.70	79.68	80.68	82.03	83.03	85.38

CLASSIFICATIONS:

- A-Frame
- Backhoe (combination)
- Boom Attachment on loaders (Except pipehook)
- Boring & Drilling Machine
- Brush Chopper, Brush Shredder, Tree Shredder
- Bulldozer, finish grade
- Cableway
- Carryall
- Concrete Pump
- Concrete Pumping System (Pumpcrete & similar types)
- Conveyor, 125 feet or longer
- Drill Doctor (Duties include dust collector and maintenance)
- Front End Loader (2 cu. yds. but less than 5 cu. yds.)
- Grader, finish
- Groove Cutting Machine (ride-on type)
- Heater Planer
- Hoist (all types including steam, gas, diesel, electric, air hydraulic, single and double drum, concrete, brick shaft caisson, snorkle roof, and other similar types, Except Chicago-boom type)
- Hydraulic Crane (10 tons & under)
- Hydro-Axe
- Hydro-Blaster
- Jack (screw, air hydraulic, power-operated unit, or console type, Except hand jack or pile load test type)
- Log Skidder

OPERATING ENGINEERS **Rates Expiration Date : 03/31/2020**

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
48.98	30.70	79.68	80.68	82.03	83.03	85.38

CLASSIFICATIONS:

- Pan
- Paver, concrete
- Plate & Frame Filter Press
- Pumpcrete (unit type)
- Pumpcrete, Squeezecrete, or Concrete Pumping machine (regardless of size)
- Scraper
- Side Boom
- Straddle Carrier (Ross and similar types)
- Vacuum Truck
- Whiphammer
- Winch Truck (hoisting)

OPERATING ENGINEERS **Rates Expiration Date : 03/31/2020**

Effective Dates:

	07/01/2017		01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
47.07	30.70	77.77	78.77	80.12	81.12	83.47

CLASSIFICATIONS:

Asphalt Curbing Machine

Asphalt Plant Engineer

Asphalt Spreader

Autograde Curb Trimmer & Sidewalk Shoulder Slipform (CMI & similar types)

Autograde Curecrete Machine (CMI & similar types)

Autograde Tube Finisher & Texturing Machine (CMI & similar types)

Bar Bending Machines (Power)

Batcher, Batching Plant, & Crusher [On Site]

Belt Conveyor System

Boom-Type Skimmer Machine

Bridge Deck Finisher

Bulldozer (all sizes)

Captain (Power Boats)

Car Dumper (railroad)

Compressor & Blower unit for loading/unloading of concrete, cement, fly ash, or similar type materials (used independently or truck-mounted)

Compressor (2 or 3 battery)

Concrete Breaking Machine

Concrete Cleaning/Decontamination Machine

Concrete Finishing Machine

Concrete Saw or Cutter (ride-on type)

Concrete Spreader (Hetzl, Rexomatic & similar types)

Concrete Vibrator

OPERATING ENGINEERS **Rates Expiration Date : 03/31/2020**

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
47.07	30.70	77.77	78.77	80.12	81.12	83.47

CLASSIFICATIONS:

Conveyors - under 125 feet

Crane Signalman

Crushing Machine

Directional Boring Machine

Ditching Machine - Small (Ditchwitch, Vermeer or similar types)

Dope Pot - Mechanical (with or without pump)

Dumpster

Elevator

Fireman

Fork Lift (Economobile, Lull & similar types)

Front End Loader (1 cu. yd. and over but less than 2 cu. yds.)

Generator (2 or 3 battery)

Giraffe Grinder

Grader & Motor Patrols

Grout Pump

Gunnite Machine (Excluding nozzle)

Hammer - Vibratory (in conjunction with generator)

Heavy Equipment Robotics - Operator/Technician

Hoist (roof, tugger, aerial platform hoist, house car)

Hopper

Hopper Doors (power operated)

Ladder (motorized)

Laddervator

OPERATING ENGINEERS **Rates Expiration Date : 03/31/2020**

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
47.07	30.70	77.77	78.77	80.12	81.12	83.47

CLASSIFICATIONS:

Locomotive (Dinky-type)

Maintenance Utility Man

Master Environmental Maintenance Technician

Mechanic

Mixer (Except paving mixers)

Pavement Breaker (truck-mounted or small self-propelled ride-on type)

Pavement Breaker - maintenance of compressor or hydraulic unit

Pipe Bending Machine (power)

Pitch Pump

Plaster Pump (regardless of size)

Post Hole Digger (post pounder, auger)

Roller (black top)

Scale (power)

Seamen Pulverizing Mixer

Shoulder Widener

Silo

Skimmer Machine (boom type)

Steel Cutting Machine (service & maintenance)

Tamrock Drill

Tractor

Transfer Machines

Tug Captains

Tug Master (Power Boats)

OPERATING ENGINEERS Rates Expiration Date : 03/31/2020

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
47.07	30.70	77.77	78.77	80.12	81.12	83.47

CLASSIFICATIONS:

Ultra High Pressure Waterjet Cutting Tool System -
Operator/Maintenance Technician

Vacuum Blasting Machine - Operator/Maintenance Technician

Vibrating Plant (used with unloading)

Welder & Repair Mechanic

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
43.73	30.70	74.43	75.43	76.78	77.78	80.13

CLASSIFICATIONS:

Assistant Engineer/Oiler

Driller's Helper

Field Engineer - Transit man or Instrument man

Maintenance Apprentice (Deckhand)

Maintenance Apprentice (Oiler)

Mechanic's Helper

Off Road Back Dump

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
41.15	30.70	71.85	72.85	74.20	75.20	77.55

CLASSIFICATIONS:

Field Engineer - Rodman or Chainman

TERRITORY
ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

OPERATING ENGINEERS **Rates Expiration Date : 03/31/2020**

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
51.31	30.70	82.01	83.01	84.36	85.36	87.71

CLASSIFICATIONS:

Lead Engineer, Foreman Engineer, Safety Engineer (minimum)

OPERATING ENGINEERS **Rates Expiration Date : 03/31/2020**

Effective Dates:

	07/01/2017		01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
50.57	30.70	81.27	82.27	83.62	84.62	86.97

CLASSIFICATIONS:

- Autograde Pavement Profiler (CMI & similar types)
- Autograde Pavement Profiler - Recycle Type (CMI & similar types)
- Autograde Placer/Trimmer/Spreader Combination (CMI & similar types)
- Autograde Slipform Paver (CMI & similar types)
- Backhoe (Excavator)
- Central Power Plant
- Concrete Paving Machine
- Draglines
- Drill, Bauer, AMI and similar types
- Drillmaster, Quarrymaster
- Drillmaster/Quarrymaster (down-the-hole drill), rotary drill, self-propelled hydraulic drill, self-powered drill
- Elevator Grader
- Field Engineer-Chief of Party
- Front End Loader (5 cu. yards or larger)
- Gradall
- Grader, Rago
- Helicopter Co-Pilot
- Helicopter Communications Engineer
- Juntann Pile Driver
- Locomotive (large)
- Mucking Machine
- Pavement & Concrete Breaker (Superhammer & Hoe Ram)

OPERATING ENGINEERS **Rates Expiration Date : 03/31/2020**

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
50.57	30.70	81.27	82.27	83.62	84.62	86.97

CLASSIFICATIONS:

Pile Driver

Prentice Truck

Roadway Surface Grinder

Scooper (loader & shovel)

Shovel (Excavator)

Trackhoe (Excavator)

Tree Chopper with boom

Trenching Machine (cable plow)

Tunnel Boring Machine

OPERATING ENGINEERS **Rates Expiration Date : 03/31/2020**

Effective Dates:

	07/01/2017		01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
45.44	30.70	76.14	77.14	78.49	79.49	81.84

CLASSIFICATIONS:

- Chipper
- Compressor (single)
- Concrete Spreader (small type)
- Conveyor Loader (Except elevator graders)
- Engines, Large Diesel (1620 HP) & Staging Pump
- Farm Tractor
- Fertilizing Equipment (operation & maintenance)
- Fine Grade Machine (small type)
- Form Line Grader (small type)
- Front End Loader (under 1 cubic yard)
- Generator (single)
- Grease, Gas, Fuel, & Oil Supply Trucks
- Heaters (Nelson or other type)
- Lights - portable generating light plant
- Mixer, Concrete (small)
- Mulching Equipment (operation & maintenance)
- Power Broom or Sweeper
- Pump (diesel engine & hydraulic - regardless of power)
- Pump (larger than 2 inch suction, including submersible pumps)
- Road Finishing Machine (small type)
- Roller - grade, fill, or stone base
- Seeding Equipment (operation & maintenance)
- Sprinkler & Water Pump Trucks

OPERATING ENGINEERS Rates Expiration Date : 03/31/2020

Effective Dates:

	07/01/2017		01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
45.44	30.70	76.14	77.14	78.49	79.49	81.84

CLASSIFICATIONS:

Steam Generator or Boiler

Stone Spreader

Tamping Machine (vibrating ride-on type)

Temporary Heating Plant (Nelson or other type, including propane, natural gas, and flow-type units)

Water or Sprinkler Truck

Welding Machine (gas, diesel, or electric convertor, of any type)

Welding System - Multiple (rectifier transformer type)

Wellpoint Systems (including installation by bull gang and maintenance)

Effective Dates:

	07/01/2017		01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
52.39	30.70	83.09	84.09	85.44	86.44	88.79

CLASSIFICATIONS:

Helicopter Pilot/Engineer

Effective Dates:

	07/01/2017		01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
57.07	30.70	87.77	88.77	90.12	91.12	93.47

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), over 100 tons and TOWER CRANE with boom (including jib and/or leads) 140 ft. and over

Effective Dates:

	07/01/2017		01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
56.07	30.70	86.77	87.77	89.12	90.12	92.47

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), over 100 tons and TOWER CRANE with boom (including jib and/or leads) from 100 ft. to 139 ft.

OPERATING ENGINEERS **Rates Expiration Date : 03/31/2020**

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
52.57	30.70	83.27	84.27	85.62	86.62	88.97

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types) , under 100 tons with a boom (including jib and/or leads) 140 ft. and over

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
55.07	30.70	85.77	86.77	88.12	89.12	91.47

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), over 100 tons and TOWER CRANE with a boom (including jib and/or leads) under 100 ft.

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
51.57	30.70	82.27	83.27	84.62	85.62	87.97

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), under 100 tons with a boom (including jib and/or leads) from 100 ft. to 139 ft.

STRUCTURAL STEEL ERECTION **Rates Expiration Date : 03/31/2020**

{For apprentice rates refer to "Operating Engineers" apprentice rates in any county rate package}

The regular workday consists of 8 hours, Monday to Friday, between 6:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:

- Shift work must run for 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive an additional 10% of the regular rate inclusive of benefits, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, plus an additional 10% of the regular rate inclusive of benefits, per hour. The third shift shall receive 8 hours pay for 7 hours of work, plus an additional 15% of the regular rate inclusive of benefits, per hour.
- When such hours are mandated by the project owner, a shift that starts between 8:00 PM and midnight and ends by 6:00 AM Saturday, or that starts after 8:00 PM on Sunday, provided there are consecutive hours of work within the shift, shall receive an additional 15% of the regular rate, inclusive of benefits.
- On Highway, Road, Street, and Sewer projects irregular shifts starting between 5:00 PM and 12:00 AM may be worked Monday through Friday, and shall receive an additional 15% of the regular rate, inclusive of benefits. When working with other trades that receive a higher irregular shift rate, the Operating Engineer shall also receive the higher irregular shift rate.

OVERTIME:

- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veteran's Day.

On hazardous waste removal work or asbestos removal work, on a state or federally designated hazardous waste site, where the operating engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin, and eye protection, the operating engineer shall receive an additional 20% of the hourly wage, per hour.

Effective Dates:

	07/01/2017		01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
54.20	30.70	84.90	85.90	87.25	88.25	90.60

CLASSIFICATIONS:

Helicopter Pilot or Engineer

STRUCTURAL STEEL ERECTION **Rates Expiration Date : 03/31/2020**

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
50.14	30.70	80.84	81.84	83.19	84.19	86.54

CLASSIFICATIONS:

A-Frame

Cherry Picker -10 tons or less (Over 10 tons use crane rate)

Hoist (all types Except Chicago-boom)

Jack (screw, air hydraulic, power-operated unit or console type, Except hand jack or pile load test type)

Side Boom

Straddle Carrier

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
47.48	30.70	78.18	79.18	80.53	81.53	83.88

CLASSIFICATIONS:

Aerial Platform Used On Hoists

Apprentice Engineer/Oiler with Compressor or Welding Machine

Captain (Power Boats)

Compressor (2 or 3 in battery)

Conveyor or Tugger Hoist

Elevator or House Car

Fireman

Forklift

Generator (2 or 3)

Maintenance Utility Man

Tug Master (Power Boats)

Welding Machines, Gas or Electric Converters on any type-2 or 3 in battery including diesels

STRUCTURAL STEEL ERECTION **Rates Expiration Date : 03/31/2020**

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
45.95	30.70	76.65	77.65	79.00	80.00	82.35

CLASSIFICATIONS:

Compressor (Single)

Generators

Welding Machines, Gas, Diesel, Or Electric Converters of any type-single

Welding System, Multiple (Rectifier Transformer Type)

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
44.19	30.70	74.89	75.89	77.24	78.24	80.59

CLASSIFICATIONS:

Assistant Engineer/Oiler

Drillers Helper

Field Engineer - Transit/Instrument Man

Maintenance Apprentice (Deckhand)

Maintenance Apprentice (Oiler)

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
51.76	30.70	82.46	83.46	84.81	85.81	88.16

CLASSIFICATIONS:

Lead Engineer, Foreman Engineer, Safety Engineer (Minimum)

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
41.15	30.70	71.85	72.85	74.20	75.20	77.55

CLASSIFICATIONS:

Field Engineer - Rodman or Chainman

STRUCTURAL STEEL ERECTION **Rates Expiration Date : 03/31/2020**

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
50.90	30.70	81.60	82.60	83.95	84.95	87.30

CLASSIFICATIONS:

Field Engineer-Chief of Party

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
59.09	30.70	89.79	90.79	92.14	93.14	95.49

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms, including jib, 140 ft. and over, above ground). Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, 140 ft. and over, above ground), and Pile Drivers (all types) over 100 tons and Tower Cranes.

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
57.43	30.70	88.13	89.13	90.48	91.48	93.83

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms including jib, less than 140 ft. above ground), Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, less than 140 ft. above ground), Pile Drivers (all types), over 100 tons and Tower Crane.

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
54.59	30.70	85.29	86.29	87.64	88.64	90.99

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms including jib, 140 ft. and over, above ground), Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, 140 ft. and over, above ground), Pile Drivers (all types), under 100 tons.

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
52.93	30.70	83.63	84.63	85.98	86.98	89.33

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms including jib, less than 140 ft. above ground), Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, less than 140 ft. above ground), Pile Drivers (all types), under 100 tons.

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STRUCTURAL STEEL ERECTION Rates Expiration Date : 03/31/2020

Effective Dates:

07/01/2017			01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
54.59	30.70	85.29	86.29	87.64	88.64	90.99

CLASSIFICATIONS:

Helicopter Co-Pilot

Helicopter Communications Engineer

TEST BORING PRELIMINARY TO CONSTRUCTION-SOUTH/WEST **Rates Expiration Date : 03/31/2020**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Hunterdon, Mercer, Monmouth, Ocean, Salem, Sussex, Warren

The regular workday consists of 8 hours, Monday to Friday, between 6:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:

- Shift work must run for 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive an additional 10% of the regular rate inclusive of benefits, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, plus an additional 10% of the regular rate inclusive of benefits, per hour. The third shift shall receive 8 hours pay for 7 hours of work, plus an additional 15% of the regular rate inclusive of benefits, per hour.
- When such hours are mandated by the project owner, a shift that starts between 8:00 PM and midnight and ends by 6:00 AM Saturday, or that starts after 8:00 PM on Sunday, provided there are consecutive hours of work within the shift, shall receive an additional 15% of the regular rate, inclusive of benefits.
- On Highway, Road, Street, and Sewer projects irregular shifts starting between 5:00 PM and 12:00 AM may be worked Monday through Friday, and shall receive an additional 15% of the regular rate, inclusive of benefits. When working with other trades that receive a higher irregular shift rate, the Operating Engineer shall also receive the higher irregular shift rate.

OVERTIME:

- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veteran's Day.

On hazardous waste removal work or asbestos removal work, on a state or federally designated hazardous waste site, where the operating engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin, and eye protection, the operating engineer shall receive an additional 20% of the hourly wage, per hour.

Effective Dates:

	07/01/2017		01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
50.57	30.70	81.27	82.27	83.62	84.62	86.97

CLASSIFICATIONS:

Driller

Effective Dates:

	07/01/2017		01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
43.73	30.70	74.43	75.43	76.78	77.78	80.13

CLASSIFICATIONS:

Driller's Helper

FREE AIR TUNNEL JOBS **Rates Expiration Date : 08/31/2017**

{For apprentice rates refer to "Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$2.50 per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

Effective Dates:

03/01/2017

Rate	Fringe	Total
41.50	29.03	70.53

CLASSIFICATIONS:

Walking Boss & Superintendent

Effective Dates:

03/01/2017

Rate	Fringe	Total
41.20	29.03	70.23

CLASSIFICATIONS:

Heading Foreman, Shaft Foreman, Rod Foreman, Electrician Foreman, Rigging Foreman

FREE AIR TUNNEL JOBS **Rates Expiration Date : 08/31/2017**

Effective Dates:

03/01/2017

Rate	Fringe	Total
40.70	29.03	69.73

CLASSIFICATIONS:

Iron Foreman, Caulking Foreman, Form Foreman, Cement Finishing Foreman, Concrete Foreman, Track Foreman, Cleanup Foreman, Grout Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
43.20	29.03	72.23

CLASSIFICATIONS:

Blaster

Effective Dates:

03/01/2017

Rate	Fringe	Total
40.15	29.03	69.18

CLASSIFICATIONS:

Top Labor Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.80	29.03	68.83

CLASSIFICATIONS:

Skilled Men (including Caulker, Powder Carrier, all other skilled men)

Skilled Men (including Miner, Drill Runner, Iron Man, Conveyor Man, Manitenance Man, Safety Miner, Rigger, Block Layer, Cement Finisher, Tod Man)

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.65	29.03	68.68

CLASSIFICATIONS:

Semi-Skilled Men (including Bell or Signal Man Top or Bottom, Form Worker & Mover, Concrete Worker, Shaft Man, Tunnel Laborer, Caulker's Helper, all other semi-skilled)

Semi-Skilled Men (including Miner's Helper, Chuck Tender, Track Man, Nipper, Brake Man, Derail Man, Cable Man, Hose Man, Gravel Man, Form Man)

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FREE AIR TUNNEL JOBS Rates Expiration Date : 08/31/2017

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.15	29.03	68.18

CLASSIFICATIONS:

All Others (including Powder Watchman, Change House Attendant, Top Laborer)

DRILL FOR GROUND WATER SUPPLY **Rates Expiration Date : 03/31/2020**

The well driller and/or helper may perform all work relative to the construction, finishing, and servicing of wells, pumps and borings for ground water supply. The present methods of well drilling entailing as they do, many diverse job operations calling for drilling, pump discharge, piping, and the operation of various types of related power equipment, shall all be within the job duties and functions of the well driller and/or helper. In the event that an extension of work should occur beyond water well drilling functions, into the field of general construction work, such extension of work would come under the appropriate rates listed elsewhere in this wage determination.

- For Work Hours, Shift Differentials, Overtime Rates, and Recognized Holidays see the "Operating Engineers" section of this wage determination.

Effective Dates:

	07/01/2017		01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
49.32	30.70	80.02	81.02	82.37	83.37	85.72

CLASSIFICATIONS:

Driller

Effective Dates:

	07/01/2017		01/01/2018	07/01/2018	01/01/2019	07/01/2019
Rate	Fringe	Total	Total	Total	Total	Total
42.48	30.70	73.18	74.18	75.53	76.53	78.88

CLASSIFICATIONS:

Driller's Helper

OPERATING ENGINEERS MARINE-DREDGING **Rates Expiration Date : 09/30/2018**

NOTE: Boat crews carrying explosive material (dynamite, pourfex, and other similar materials) shall be paid at 120% of the hourly wage rate for hours engaged in handling of said materials. Employees required to possess a Hazardous Material Certification as a condition of employment shall be compensated at 120% of the hourly wage rate.

OVERTIME:

Hours in excess of 40 per week, and all hours on Saturdays and Sundays, shall be paid at time and one-half the hourly rate. All hours on holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Martin Luther King Day, Good Friday, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

Effective Dates:

10/01/2016			10/01/2017
Rate	Fringe	Total	Total
37.25	13.78	51.03	52.51

CLASSIFICATIONS:

Lead Dredgerman, Operator, Leverman

Licensed Tug Operator (over 1000 HP)

Effective Dates:

10/01/2016			10/01/2017
Rate	Fringe	Total	Total
32.22	13.38	45.60	46.95

CLASSIFICATIONS:

Derrick Operator, Spider/Spill Barge Operator

Engineer, Electrician, Chief Welder, Chief Mate

Fill Placer, Operator II

Licensed Boat Operator

Maintenance Engineer

Effective Dates:

10/01/2016			10/01/2017
Rate	Fringe	Total	Total
30.33	13.23	43.56	44.86

CLASSIFICATIONS:

Certified Welder

OPERATING ENGINEERS MARINE-DREDGING **Rates Expiration Date : 09/30/2018**

Effective Dates:

10/01/2016			10/01/2017
Rate	Fringe	Total	Total
29.50	12.86	42.36	43.64

CLASSIFICATIONS:

Mate, Drag Barge Operator, Steward, Assistant Fill Placer

Welder

Effective Dates:

10/01/2016			10/01/2017
Rate	Fringe	Total	Total
28.54	12.78	41.32	42.58

CLASSIFICATIONS:

Boat Operator

Effective Dates:

10/01/2016			10/01/2017
Rate	Fringe	Total	Total
23.71	12.10	35.81	36.92

CLASSIFICATIONS:

Shoreman, Deckhand, Rodman, Scowman

MICROSURFACING/SLURRY SEAL Rates Expiration Date : 02/28/2018

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem

IN ALL OTHER COUNTIES use the Heavy and General Laborers - North "Slurry Seal Laborer" rates.

SHIFT DIFFERENTIALS:

Any shift starting at 3:30 PM or later shall receive an additional \$0.35/hr

OVERTIME:

Hours in excess of 8 per day or 40 per week shall be paid at time and one-half the hourly rate. All hours on holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

Effective Dates:

03/01/2017

Rate	Fringe	Total
36.50	21.27	57.77

CLASSIFICATIONS:

Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
33.80	21.27	55.07

CLASSIFICATIONS:

Box man

Effective Dates:

03/01/2017

Rate	Fringe	Total
31.75	21.27	53.02

CLASSIFICATIONS:

Microsurface/Slurry Preparation

Effective Dates:

03/01/2017

Rate	Fringe	Total
31.75	21.27	53.02

CLASSIFICATIONS:

Squeegee man

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NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
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MICROSURFACING/SLURRY SEAL Rates Expiration Date : 02/28/2018

Effective Dates:

03/01/2017

Rate	Fringe	Total
30.30	21.27	51.57

CLASSIFICATIONS:

Cleaner, Taper

ASPHALT LABORERS - SOUTH Rates Expiration Date : 08/31/2017

"THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$2.50 per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

Effective Dates:

03/01/2017

Rate	Fringe	Total
41.00	29.03	70.03

CLASSIFICATIONS:

Paving Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.55	29.03	68.58

CLASSIFICATIONS:

Head Raker

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.40	29.03	68.43

CLASSIFICATIONS:

Raker, Screedman, Luteman

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ASPHALT LABORERS - SOUTH Rates Expiration Date : 08/31/2017

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.15	29.03	68.18

CLASSIFICATIONS:

Tampers, Smoothers, Kettlemen,
Painters, Shovelers, Roller Boys

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.25	29.03	68.28

CLASSIFICATIONS:

Milling Controller

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.45	29.03	68.48

CLASSIFICATIONS:

Traffic Control Coordinator

TEST BORING PRELIMINARY TO CONSTRUCTION-NORTH **Rates Expiration Date : 10/16/2018**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Bergen, Essex, Hudson, Middlesex, Morris, Passaic, Somerset, Union

SHIFT DIFFERENTIAL:

Employees on a shift other than between the hours of 8:00 AM and 5:00 PM shall receive an additional \$1.00 per hour.

OVERTIME:

Hours in excess of 8 per day, Monday through Friday, and all hours on Saturday shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day. Sunday holidays observed the following Monday.

Hazardous Waste Pay (for Levels A, B, and C): an additional 10% of the hourly rate, per hour.

A newly hired Helper with no experience in the industry shall be paid as follows:

- 1st year on the job - 70% of Helper wage rate
- 2nd year on the job - 80% of Helper wage rate
- 3rd year on the job - 90% of Helper wage rate
- All helpers receive full fringe benefit rate.

Effective Dates:

11/01/2016			10/17/2017
Rate	Fringe	Total	Total
30.96	24.76	55.72	57.17

CLASSIFICATIONS:

Helper (4th year helper)

Effective Dates:

11/01/2016			10/17/2017
Rate	Fringe	Total	Total
38.82	24.76	63.58	65.24

CLASSIFICATIONS:

Driller

Effective Dates:

11/01/2016			10/17/2017
Rate	Fringe	Total	Total
44.64	24.76	69.40	71.28

CLASSIFICATIONS:

Foreman

HEAVY & GENERAL LABORERS - NORTH **Rates Expiration Date : 08/31/2017**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, Warren

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$2.50 per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

Effective Dates:

03/01/2017

Rate	Fringe	Total
38.75	29.03	67.78

CLASSIFICATIONS:

"D" Rate:

basic, landscape, asphalt, slurry seal, or railroad track laborer; utility meter installer; traffic director/flagman; salamander tender; pitman; dumpman; rakers or tampers on cold patch work; wrappers or coaters of pipe; waterproofer; timberman; wagon drill or drill master helper; powder carrier; magazine tender; signal man; power buggy operator; tree cutter; operator of basic power tools

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.45	29.03	68.48

CLASSIFICATIONS:

"C" Rate:

pipe layer; laser man; conduit or duct line layer; operator of jack hammer, chipping hammer, pavement breaker, concrete cutter, asphalt cutter, sheet hammer, or walk-behind saw cutter; sandblaster; acetylene cutting or burning; wagon drill, directional drill, or hydraulic drill operator; drill master; core driller; traffic control coordinator; asphalt raker or lute man

HEAVY & GENERAL LABORERS - NORTH **Rates Expiration Date : 08/31/2017**

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.70	29.03	68.73

CLASSIFICATIONS:

"B" Rate:

concrete finisher; setter of brick or stone pavers; stone cutter; form setter; manhole, catch basin, or inlet builder; asphalt screedman; rammer; hardscaping; gunite nozzle man

Effective Dates:

03/01/2017

Rate	Fringe	Total
43.25	29.03	72.28

CLASSIFICATIONS:

"A" Rate:

blaster

Effective Dates:

03/01/2017

Rate	Fringe	Total
41.00	29.03	70.03

CLASSIFICATIONS:

"FOREMAN" Rate:

labor foreman, asphalt foreman, drill foreman, pipe foreman, grade foreman, finisher foreman, concrete foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
42.00	29.03	71.03

CLASSIFICATIONS:

"GENERAL FOREMAN" Rate

HEAVY & GENERAL LABORERS - SOUTH **Rates Expiration Date : 08/31/2017**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$2.50 per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

Effective Dates:

03/01/2017

Rate	Fringe	Total
38.75	29.03	67.78

CLASSIFICATIONS:

basic, landscape, or railroad track laborer; utility meter installer; traffic director/flagman; salamander tender; pitman; dumpman; rakers or tampers on cold patch work; wrappers or coaters of pipe; waterproofers

tree cutter, timberman

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.45	29.03	68.48

CLASSIFICATIONS:

wagon drill or drill master helper; powder carrier; magazine tender; signal man

HEAVY & GENERAL LABORERS - SOUTH **Rates Expiration Date : 08/31/2017**

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.45	29.03	68.48

CLASSIFICATIONS:

pipe layer; laser man; conduit or duct line layer; operator of jack hammer, chipping hammer, pavement breaker, concrete cutter, asphalt cutter, sheet hammer, or walk-behind saw cutter; sandblaster; acetylene cutting or burning

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.45	29.03	68.48

CLASSIFICATIONS:

wagon or directional drill operator; drill master

Effective Dates:

03/01/2017

Rate	Fringe	Total
43.25	29.03	72.28

CLASSIFICATIONS:

blaster

Effective Dates:

03/01/2017

Rate	Fringe	Total
41.00	29.03	70.03

CLASSIFICATIONS:

labor foreman, drill foreman, pipe foreman, grade foreman, finisher foreman, concrete foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
42.00	29.03	71.03

CLASSIFICATIONS:

general foreman

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HEAVY & GENERAL LABORERS - SOUTH Rates Expiration Date : 08/31/2017

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.70	29.03	68.73

CLASSIFICATIONS:

concrete finisher; setter of brick or stone pavers; stone cutter; form setter; manhole, catch basin, or inlet builder; rammer; gunite nozzle man

PIPELINE - MAINLINE TRANSMISSION Rates Expiration Date : 06/03/2018

These rates apply to the following: welding on Transportation Mainline pipe lines (cross-country pipe lines, or any segments thereof, transporting coal, gas, oil, water or other transportable materials, vapors or liquids, including portions of such pipe lines within private property boundaries up to the final metering station or connection - the point where a valve, consumer connection, or town border station divides mainline transmission lines or higher pressure lateral and branch lines from lower pressure distribution systems).

PER DIEM PAYMENT:

In addition to the total wage rate paid for each craft, the following per diem (per day) amounts must also be paid - Pipeline Journeyman: \$42.50; Pipeline Journeyman Welder: \$102.50; and Pipeline Helper: \$42.50. Note: in order to receive the per diem payment an employee must work a minimum of 8 hours in a 24 hour period.

NOTES:

- Journeymen employed as "stringer bead" welders and journeymen who are regularly employed as "hot-pass" welders shall receive \$1.00 per hour more than other journeymen.
- Welders running "stringer bead" or "hot-pass" on "cutouts" or "tie-ins" on a production basis shall be paid \$1.00 per hour above the journeymen rate.
- Whenever a welder helper is employed using a power buffer or power grinder immediately behind the stringer bead and/or hot-pass welders, and the pipe gang is set on a production basis, the helper shall be paid \$2.00 per hour above the helper rate.
- If back welding is performed inside a pipe under either or both of the following conditions, the welder engaged in the welding will receive \$3.00 per hour above the regular rate for the job only for the days on which such back welding is performed:
 - The employer elects, as a regular procedure, to back weld each line-up. This condition is not intended to apply to occasional back welding performed by the pipe gang to repair a bead, to rectify a "high-lo" condition or wall thickness, etc.
 - A welder is required to back weld a completed weld behind the firing line.
- If the welder helper is required to go inside the pipe for the purpose of brushing, buffing and grinding the weld, they shall receive a wage rate \$1.00 per hour above the regular helper rate for the days involved.
- Welders working on "hot work" shall be paid \$2.00 per hour above the regular rate for each day engaged in such work. "Hot work" is defined as work on lines in service where there is the danger of fire or explosion.

The regular workday shall be 8 hours, between 8:00 AM and 4:30 PM.

OVERTIME:

Hours in excess of 8 per day, and all hours on Sundays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day. Sunday holidays observed the following Monday.

Effective Dates:

06/05/2017

Rate	Fringe	Total
54.58	28.97	83.55

CLASSIFICATIONS:

Pipeline Journeyman Welder

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PIPELINE - MAINLINE TRANSMISSION Rates Expiration Date : 06/03/2018

Effective Dates:

06/05/2017

Rate	Fringe	Total
54.58	28.97	83.55

CLASSIFICATIONS:

Pipeline Journeyman

Effective Dates:

06/05/2017

Rate	Fringe	Total
33.27	19.97	53.24

CLASSIFICATIONS:

Pipeline Helper

PIPELINE - GAS DISTRIBUTION **Rates Expiration Date : 10/31/2017**

These rates apply to the following: welding on gas line distribution systems (that portion of the gas distribution system placed in streets, roads, subways, tunnels, viaducts, highways and easements which serves the users of gas).

SHIFT DIFFERENTIALS:

An "irregular" shift may start any time from 5:00 PM to 12:00 AM, Monday through Friday, and shall receive an additional 15% of the regular rate per hour, inclusive of benefits.

OVERTIME:

Hours in excess of forty per week, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day. Sunday holidays observed the following Monday.

Effective Dates:

11/01/2016

Rate	Fringe	Total
57.58	21.55	79.13

CLASSIFICATIONS:

Pipeline Journeyman Welder

Effective Dates:

11/01/2016

Rate	Fringe	Total
57.58	21.55	79.13

CLASSIFICATIONS:

Pipeline Journeyman

Effective Dates:

11/01/2016

Rate	Fringe	Total
37.16	15.74	52.90

CLASSIFICATIONS:

Pipeline Helper

ASPHALT LABORERS- NORTH **Rates Expiration Date : 08/31/2017**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, Warren

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$2.50 per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

Effective Dates:

03/01/2017

Rate	Fringe	Total
41.00	29.03	70.03

CLASSIFICATIONS:

Asphalt Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.70	29.03	68.73

CLASSIFICATIONS:

Asphalt Screedman

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.45	29.03	68.48

CLASSIFICATIONS:

Asphalt Raker or Lute Man

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ASPHALT LABORERS- NORTH Rates Expiration Date : 08/31/2017

Effective Dates:

03/01/2017

Rate	Fringe	Total
38.75	29.03	67.78

CLASSIFICATIONS:

Asphalt Laborer

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date : 12/03/2017**

Electrician-Utility Work (North)

(For apprentice rates refer to Electrician-Utility Work (North) in any county rate package).

These rates apply to work contracted for by the following utility companies:

Public Service Electric & Gas Co. of NJ, GPU Energy, Borough of Madison Electric Department, Sussex Rural Electric Cooperative, Rockland Utilities, and Butler Municipal Electric Co.

These rates do not apply to work on substations or switching stations.

For Utility work contracted for by a utility company other than those listed above or those listed under "Electrician-Utility Work (South), see the "Outside Commercial Rates" for the county in which the jobsite is located.

* FOR OUTSIDE COMMERCIAL RATES PLEASE SEE COUNTY RATES

The regular workday is 8 hours, between 6:00 AM and 6:00 PM.

FOR EMERGENCY WORK ONLY: (emergency work is defined as work caused by storm, catastrophe, act of god, and circumstances beyond the control of the employer)-all hours of work shall be paid at double the hourly rate.

SHIFT DIFFERENTIALS:

Shift work must run for a minimum of 5 consecutive workdays.

2nd shift (between the hours of 4:30 PM and 1:00 AM): 8 hours of work + 17.3% of the regular rate, inclusive of benefits.

3rd shift (between the hours of 12:30 AM and 9:00 AM): 8 hours of work + 31.4% of the regular rate per hour, inclusive of benefits.

OVERTIME:

Hours in excess of 8 per day, or before or after the regular workday Monday through Friday, that is not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.

Four 10-hour days may worked, at straight time, between 7:00 AM and 6:30 PM, Monday through Thursday.

RECOGNIZED HOLIDAYS:

New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day and Christmas Day, or day on which they are legally observed.

Effective Dates:

12/04/2016

Rate	Fringe	Total
52.26	35.01	87.27

CLASSIFICATIONS:

Chief Lineman

Effective Dates:

12/04/2016

Rate	Fringe	Total
49.31	33.03	82.34

CLASSIFICATIONS:

Journeyman Lineman

ELECTRICIAN- UTILITY WORK (NORTH) Rates Expiration Date : 12/03/2017

Effective Dates:

12/04/2016

Rate	Fringe	Total
49.31	33.03	82.34

CLASSIFICATIONS:

Special License Operator

Effective Dates:

12/04/2016

Rate	Fringe	Total
48.81	32.70	81.51

CLASSIFICATIONS:

Transit Man

Effective Dates:

12/04/2016

Rate	Fringe	Total
47.33	31.71	79.04

CLASSIFICATIONS:

Line Equipment Operator

Effective Dates:

12/04/2016

Rate	Fringe	Total
41.42	27.75	69.17

CLASSIFICATIONS:

Dynamite Man

Effective Dates:

12/04/2016

Rate	Fringe	Total
58.18	38.98	97.16

CLASSIFICATIONS:

General Foreman

Effective Dates:

12/04/2016

Rate	Fringe	Total
56.70	37.98	94.68

CLASSIFICATIONS:

Assistant General Foreman

ELECTRICIAN- UTILITY WORK (NORTH) Rates Expiration Date : 12/03/2017

Effective Dates:

12/04/2016

Rate	Fringe	Total
55.22	36.99	92.21

CLASSIFICATIONS:

Line Foreman

Effective Dates:

12/04/2016

Rate	Fringe	Total
39.94	26.75	66.69

CLASSIFICATIONS:

Straight Light Mechanical Leader

Effective Dates:

12/04/2016

Rate	Fringe	Total
37.97	25.43	63.40

CLASSIFICATIONS:

Groundman Winch Operator

Effective Dates:

12/04/2016

Rate	Fringe	Total
37.97	25.43	63.40

CLASSIFICATIONS:

Groundman Truck Operator

Effective Dates:

12/04/2016

Rate	Fringe	Total
37.47	25.10	62.57

CLASSIFICATIONS:

Straight Light Mechanic

Effective Dates:

12/04/2016

Rate	Fringe	Total
37.47	25.10	62.57

CLASSIFICATIONS:

Line Equipment Mechanic

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Effective Dates:

12/04/2016

Rate	Fringe	Total
32.05	21.47	53.52

CLASSIFICATIONS:

Groundman 2nd Year

Effective Dates:

12/04/2016

Rate	Fringe	Total
29.58	19.81	49.39

CLASSIFICATIONS:

Groundman 1st Year

Effective Dates:

12/04/2016

Rate	Fringe	Total
48.81	32.70	81.51

CLASSIFICATIONS:

Line Equipment Foreman

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date : 12/02/2017**

Electrician-Utility Work (South)

(For apprentice rates refer to Electrician-Utility Work (South) in any county rate package).

These rates apply to work contracted for by the following utility company:

Atlantic City Electric.

These rates do not apply to work on substations or switching stations.

For utility work contracted for by a utility company other than the one listed above or those listed under "Electrician-Utility Work (North), see the "Outside Commercial Rates" for the county in which the jobsite is located.

* FOR OUTSIDE COMMERCIAL RATES PLEASE SEE COUNTY RATES

The regular workday is 8 hours, between 7:00 AM and 4:30 PM.

FOR EMERGENCY WORK ONLY: (emergency work is defined as work caused by storm, catastrophe, act of god, and circumstances beyond the control of the employer)- all hours of work shall be paid at double the hourly rate.

SHIFT DIFFERENTIALS:

Shift work must run for a minimum of 5 consecutive workdays.

When two (2) or three (3) shifts are worked the following shall apply:

1st shift (between the hours of 8:00 AM and 4:30 PM)

2nd shift (between the hours of 4:30 PM and 12:30 AM): 8 hours of work + 10% of the regular rate of pay for 7.5 hours worked.

3rd shift (between the hours of 12:30 AM and 8:00 AM): 8 hours of work + 15% of the regular rate of pay for 7 hours worked.

OVERTIME:

Hours in excess of 8 per day, or before or after the regular workday Monday through Friday, that is not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate. All hours on Sundays and Holidays shall be paid double the hourly rate.

Four 10-hour days may be worked, at straight time, between 6:00 AM and 6:00 PM, Monday through Thursday with Friday used as a make-up day.

RECOGNIZED HOLIDAYS:

New Year's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day or on days celebrated.

WORKING RULES:

There shall be a Foreman in charge of each work crew. No crews are to exceed twelve (12) men, including Foremen.

There shall be a General Foreman designated for transmission work when three (3) or more crews are on the same job and for distribution work where there are more than twenty (20) employees on site.

A small job crew shall consist of five (5) or less employees, one (1) of the Journeyman Linemen in the crew shall be designated as a Small Job Foreman.

Work performed from ladders and/or mechanical lift equipment shall be the work of Linemen and/or Apprentices.

On new construction, fitting and framing poles, towers or structures may be done by Journeymen and/or Apprentices. Groundmen may assist, but may not perform any work which would be performed by Linemen if assembled in the air.

There shall be a Journeyman Lineman in each pole setting, erection, grounding, wire and cable-pulling crew of more than three (3) men.

Effective Dates:

12/04/2016

Rate	Fringe	Total
58.38	45.19	103.57

CLASSIFICATIONS:

General Foreman

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date : 12/02/2017**

Effective Dates:

12/04/2016

Rate	Fringe	Total
52.00	41.37	93.37

CLASSIFICATIONS:

Foreman

Effective Dates:

12/04/2016

Rate	Fringe	Total
49.26	39.74	89.00

CLASSIFICATIONS:

Small Job Foreman

Effective Dates:

12/04/2016

Rate	Fringe	Total
45.61	37.54	83.15

CLASSIFICATIONS:

Heavy Equipment Operator

Effective Dates:

12/04/2016

Rate	Fringe	Total
45.61	37.54	83.15

CLASSIFICATIONS:

Cable Splicer

Effective Dates:

12/04/2016

Rate	Fringe	Total
45.61	37.54	83.15

CLASSIFICATIONS:

Journeyman Lineman

Effective Dates:

12/04/2016

Rate	Fringe	Total
45.61	37.54	83.15

CLASSIFICATIONS:

Journeyman Welder

ELECTRICIAN- UTILITY WORK (SOUTH) Rates Expiration Date : 12/02/2017

Effective Dates:

12/04/2016

Rate	Fringe	Total
45.61	37.54	83.15

CLASSIFICATIONS:

Journeyman Painter

Effective Dates:

12/04/2016

Rate	Fringe	Total
36.49	32.08	68.57

CLASSIFICATIONS:

Light Equipment Operator

Effective Dates:

12/04/2016

Rate	Fringe	Total
31.93	29.37	61.30

CLASSIFICATIONS:

Groundman Truck Driver

Effective Dates:

12/04/2016

Rate	Fringe	Total
29.65	27.99	57.64

CLASSIFICATIONS:

Groundman 3rd Year

Effective Dates:

12/04/2016

Rate	Fringe	Total
27.37	26.66	54.03

CLASSIFICATIONS:

Groundman 2nd Year

Effective Dates:

12/04/2016

Rate	Fringe	Total
25.09	25.29	50.38

CLASSIFICATIONS:

Groundman 1st Year

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ELECTRICIAN- UTILITY WORK (SOUTH) Rates Expiration Date : 12/02/2017

Effective Dates:

12/04/2016

Rate	Fringe	Total
20.07	22.27	42.34

CLASSIFICATIONS:

Flagman

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS Rates Expiration Date : 08/31/2017

****THESE RATES APPLY TO CONSTRUCTION ON NEW TRANS HUDSON TUNNELS ONLY****

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$2.50 per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

Effective Dates:

03/01/2017

Rate	Fringe	Total
62.25	29.03	91.28

CLASSIFICATIONS:

Walking Boss & Superintendent

Effective Dates:

03/01/2017

Rate	Fringe	Total
61.80	29.03	90.83

CLASSIFICATIONS:

Heading Foreman, Shaft Foreman, Rod Foreman, Electrical Foreman, Rigging Foreman

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS **Rates Expiration Date : 08/31/2017**

Effective Dates:

03/01/2017

Rate	Fringe	Total
61.05	29.03	90.08

CLASSIFICATIONS:

Iron Foreman, Caulking Foreman, Form Foreman, Cement Finishing Foreman, Concrete Foreman, Track Foreman, Clean-up Foreman, Grout Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
64.80	29.03	93.83

CLASSIFICATIONS:

Blaster

Effective Dates:

03/01/2017

Rate	Fringe	Total
60.23	29.03	89.26

CLASSIFICATIONS:

Top Labor Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
59.70	29.03	88.73

CLASSIFICATIONS:

Skilled Men (including Caulker, Powder Carrier, all other skilled men)

Skilled Men (including Miner, Drill Runner, Iron Man, Conveyor Man, Maintenance Man, Safety Miner, Rigger, Block Layer, Cement Finisher, Rod Man)

Effective Dates:

03/01/2017

Rate	Fringe	Total
59.48	29.03	88.51

CLASSIFICATIONS:

Semi-Skilled Men (including Bell or Signal Man top or bottom, Form Worker & Mover, Concrete Worker, Shaft Man, Tunnel Laborer, Caulker's Helper, all other semi-skilled)

Semi-Skilled Men (including Miner's Helper, Chuck Tender, Track Man, Nipper, Brake Man, Derail Man, Cable Man, Hose Man, Gravel Man, Form Man)

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HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS Rates Expiration Date : 08/31/2017

Effective Dates:

03/01/2017

Rate	Fringe	Total
58.73	29.03	87.76

CLASSIFICATIONS:

All others (including Powder Watchman, Change House Attendant, Top Laborer, Job Steward)

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work by Owner.
4. Purchase contracts.
5. Access to site.
6. Work restrictions.
7. Specification and drawing conventions.

- B. Related Section:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

- A. Project Identification: Renovations Due To Code Modifications, Union County Courthouse Fire Code Upgrades – Phase C1 Rotunda & Phase C2 Tower (Internal Stair)

1. Project Location: 2 Broad Street, Elizabeth, NJ 07202

- B. Owner: County of Union, Department of Engineering & Public Works 2325 South Avenue, Scotch Plains, NJ 07076

- C. Architect: Netta Architects, 1084 Route 22 West, Mountainside, NJ 07092

- D. Construction Manager: MAST Construction Services, Inc.,

- 96 East Main Street, Little Falls, NJ 07424 – 973-837-1515

1. Construction Manager has been engaged for this Project to serve as an advisor to Owner and to provide assistance in administering the Contract for Construction between Owner and Contractor.

E. Project Web Site: Omitted

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. The Rotunda scope includes but is not limited to a new smoke evacuation system, fire suppression (sprinklers), new fire alarm, new signage at stairs and elevators, fire rated egress doors, a new HVAC system, elevator upgrades for ADA compliance and bathroom renovations. Asbestos abatement will also need to be performed in the areas impacted by the renovations.

a. Rotunda C1 Phasing

- 1) Rotunda Phase 1: Elevator Upgrades & Bathroom Renovations / HVAC System / Emergency Distribution Connection / Fire Code Upgrades of Floors 1-4.

- a) Floors 2-4 will be unoccupied during this phase. Room 107 (Civil Division) on the 1st Floor and the entire ground floor level will be occupied. Contract work in Room 107 will need to be completed during off hours (2nd shift, OT, weekends) so that staff can occupy during normal business hours.
- b) Upon completion of this phase, all contract work for floors 1-4, inclusive of all HVAC units, roof top exhaust fans, ductwork risers & controls, fire suppression, fire alarm, elevator upgrade must be completed and operational so that these floors can be occupied for the start of Rotunda Phase 2.

- 2) Rotunda Phase 2: Fire Code Upgrades / HVAC Systems on Ground Floor Level

- a) Floors 1-4 will be occupied during this phase while the ground floor level will be partially occupied with the Sheriff's Control Center staying open and operational during normal business hours. Contract work within the Sheriff's Control Center will need to be completed during off hours (2nd shift, OT, weekends) so that staff can occupy during normal business hours.

2. The new Internal Stair Tower will provide the required means of egress for the Courthouse Tower. In addition to the new stair tower which will require structural modifications and relocation of duct work, conduit, pipes, etc., the scope of work for this portion of the project will also include but is not limited to the following items throughout the building: a new fire suppression system, fire alarm upgrades, new central control and communication system, signage and exit signs. Asbestos abatement will also need to be performed within the areas impacted by the fire code upgrades.

a. Tower (Internal Stair) C2 Phasing

- 1) Tower Phase 1A: Floors 1-4 Asbestos Removal / Fire Suppression / Slab Demolition for New Stairwell

- a) Floors 1 - 4 will be unoccupied during this phase with the exception of the 2nd floor Trial Court Administrator's Office. Upon completion of this phase,

all contract work must be completed to the point that each floor can be occupied. This includes implementing adequate safety protection for openings in slabs (for new stairwell).

- 2) Tower Phase 1B : Floors 5-8 Asbestos Removal / Fire Suppression / Slab Demolition for New Stairwell
 - a) Floors 5 – 8 will be unoccupied during this phase with the exception of the 6th Floor Drug Court. Contract work for this space will need to be completed during off hours (2nd shift, OT, weekends) so that staff can occupy during normal business hours. Upon completion of this phase, all contract work must be completed to the point that each floor can be occupied. This includes implementing adequate safety protection for openings in slabs (for new stairwell).
- 3) Tower Phase 1C : Floors 9-16 Asbestos Removal / Fire Suppression / Slab Demolition for New Stairwell
 - a) Floors 9 – 16 will be unoccupied during this phase. Upon completion of this phase, all contract work must be completed to the point that each floor can be occupied. This includes implementing adequate safety protection for openings in slabs (for new stairwell).
- 4) Tower Phase 2: Construction of Internal Stairwell
- 5) Tower Phase 3: Fire Rated Enclosure of Existing Stairwell
 - a) Prior to commencement of this phase, construction of the new stairwell must be completed and operational.

B. Type of Contract

1. Project will be constructed under a single prime contract.

1.5 WORK BY OWNER (in conjunction with Contractor)

- A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Contractor is responsible to coordinate their Work of this Contract, through the Construction Manager, with the preceding work to be performed by Owner.
- B. Preceding Work: Upon adequate notice (as depicted on the project schedule), the Owner will relocate employees in the areas where contract work will be performed (Contractor is responsible for relocation of any material /furniture / equipment), allowing Contractor to access area to perform their work. Contractor is responsible for protection of area during their work and will clean and restore the area back to its original configuration after their work is complete.

1.6 CONTRACTS

- A. General: Omitted

1.7 ACCESS TO AREAS

- A. General: Contractor shall have access to the areas for construction during the time periods as shown on the approved project schedule. The durations submitted on the schedule (which will be reviewed & approved by the Owner & the Construction Manager) will allow time for the Owner to relocate employees (when necessary), which will allow the Contractor access to the area for the installation of their work. The duration shown on the schedule should allow adequate time for the Contractor to clean and restore the area.

- B. Use of Area: Areas of work must be clearly defined by the Contractor and the Contractor is responsible for all temporary protection / barricade of the areas (inclusive of signage alerting employees / visitors of parameters of work area & any alternate routes for egress).
 - 1. Operations are to be within contract limits identified on plans.
 - 2. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.8 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.

- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 4:00 p.m., Monday through Friday, except as otherwise indicated.
 - 1. Weekend Hours: Per Owner's Approval.
 - 2. Early Morning / Late Night Hours: Per Owner's Approval
 - 3. Hours for Utility Shutdowns: Per City Ordinance and Subject to Review & Approval by Owner.

- C. Shift Work (2nd & 3rd shifts)
 - 1. Shift work (2nd & 3rd shifts) and overtime is required of the contractor, at no cost to the owner, for contract work as follows:
 - a. Rotunda – Areas as described in Summary Section 1.4 above. Also for any slab cuts, slab penetrations or slab removal.
 - b. Tower (Internal Stair) – Contractor should anticipate that all work must be implemented as shift work for this phase.

- D. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Construction Manager not less than seven (7) days in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.
- E. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
1. Notify Construction Manager not less than three (3) days in advance of proposed disruptive operations.
 2. Obtain Owner's written permission before proceeding with disruptive operations.
 3. Contractor to comply with City of Elizabeth Ordinances.
- F. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor air intakes.
- G. Controlled Substances: It shall be the Contractor's responsibility to prevent illegal drug use on the Project. Use of illegal drugs or substances on the Project site by any employee of the Contractor or any subcontractor, shall subject the employee to permanent removal from the site. Persistent use of illegal drugs or substances by employees of the Contractor or any of its subcontractors, shall be default under the construction contract.
- H. Contractor Employee Screening: Contractor to comply with Owner's requirements regarding background screening of Contractor personnel working on the Project site. The Contractor will supply a list, to the Construction Manager (CM), of all of their employees and their Subcontractor's employees who will require access to the site. The CM will provide a form (attached to this section), from the Sheriff's Identification Bureau, which will need to be completed with the proper information by each employee requiring access to the site and returned to the CM. The CM will forward the completed forms to the Sheriff's Identification Bureau for review. Within 7 – 10 days, the Sheriff's Identification Bureau will review the employees form and notify the CM if the employee is cleared to work on site. The CM will forward that information to the Contractor. If employee has been cleared, they will need to go through the process of getting an employee identification badge.
1. Contractor to maintain a list of approved screened personnel with Construction Manager.
- I. Contractor Employee Identification Badges: Once an employee receives clearance to access site by The Sheriff's Identification Bureau, the employee will need to report to the Sheriff's Control Center located at the Rotunda Building at 2 Broad Street (Elizabeth Town Plaza), Elizabeth, NJ for their Contractor Identification Badges. Badges must be worn at all times while working on site and any lost or stolen identification badges must be immediately reported to the CM.
- 1.9 SPECIFICATION AND DRAWING CONVENTIONS
- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULING of WORK

- A. Time Frame: Rotunda C1 & Tower (Internal Stair) C2 - Thirty Five (35) Months or One Thousand – Sixty Three (1,063) Calendar Days. Time frame includes time in between phases and sub-phases (see section 1.4)
1. Rotunda C1: Anticipated Duration – 16 months
 2. Tower (Internal Stair) C2: Anticipated Duration 19 months
- B. Compliance with Schedule – The areas that the Contractor will be working in must comply & adhere to the areas, dates, & durations as listed in the approved project schedule. The Contractor must complete the work in the area in the allotted time frame and will not be allowed to deviate from this schedule without approval from the Construction Manager in conjunction with the Facility.

END OF SECTION 11000

Vendor / Contractor Background Check

All fields must be completed or background will not be done, no exceptions will be made.

Name: _____ Social Security Number: _____

Date of Birth: _____ Sex: **M** or **F** (Circle One) Height: _____ Weight: _____

Current Address: _____

City: _____ State: _____

Phone: _____ Place of Birth: _____

Previous Address: _____

City: _____ State: _____

Present Employer: _____

City: _____ State: _____

Name of Supervisor: _____ Phone: _____

Arrest / Summon Information

Have you ever been arrested for or charged with a violation of the Disorderly Persons Act or City Ordinance? **Yes** or **No** (Circle one) if yes, please list:

Have you ever been arrested, Indicted or convicted of any violations of the Criminal Law? **Yes** or **No** (Circle one) if yes, please list:

Arrest Information must be provided, failure to do so will result in denial of access into any County Facility. Providing false information will also result in denial of access.

Approved / Denied by: _____ Date: _____

ID Issued by: _____ Date: _____

SECTION 011200- LIQUIDATED DAMAGES

PART 1 GENERAL

1.1 TIME AND PERFORMANCE OF THE ESSENCE; BASIS AND REASONABLENESS OF LIQUIDATED DAMAGES

A. Time is of the essence of this Contract. By submitting its Bid hereunder, the CONTRACTOR expressly acknowledges that the OWNER will suffer substantial damages by reason of the CONTRACTOR's non-performance and/or untimely performance. The CONTRACTOR further acknowledges by submission of a Bid hereunder that by reason of the effect of Events of Default in the achievement of any or all Milestones by the CONTRACTOR, the fact of damage to the OWNER by reason of such Events of Default is ascertainable but the precise monetary amount of said damage is not susceptible to ready calculation, and that the amounts set forth in this Section are fair and reasonable.

B. The OWNER has calculated the amount of liquidated damages by taking into account the approximate costs to the OWNER by reason of delay caused by the CONTRACTOR's delay-related Events of Default including scheduling, logistics, personnel and equipment costs; other costs related to delay in the achievement of the Work; and incremental administrative, staff, engineering, consulting, and other costs related to all of the above and the individual and cumulative effects of said Events of Default upon the OWNER's operations.

C. The liquidated damages set forth in this Section shall be deemed reasonable compensation to the OWNER for its loss and damage solely due to delay and shall not be deemed a penalty.

1.2 LIQUIDATED DAMAGES FOR DELAY

A. If the CONTRACTOR fails to meet any of Milestones as set forth due to any Event of Default, the CONTRACTOR shall be liable to and shall pay the OWNER Liquidated Damages in the following amounts, each of which shall be payable in the amounts indicated per calendar day of delay in the achievement of same:

Milestone Date	Requirement	Liquidated Damages
1,063 Calendar days (35 Months) from Notice to Proceed	Substantial Completion	\$ 1,000.00/day

1.3 OWNER'S RIGHT TO WITHHOLD AND FORGIVE; LIMITATION ON AMOUNT OF LIQUIDATED DAMAGES FOR DELAY

A. The OWNER may withhold Liquidated Damages from any monies that may otherwise be due from the OWNER to the CONTRACTOR. Should the aggregate of liquidated damages due the OWNER at any time be greater than the sum otherwise due the CONTRACTOR, the CONTRACTOR shall pay the difference to the OWNER upon demand.

B. Disputes with respect to the amount of Liquidated Damages due at any time, shall be subject to the dispute resolution provisions of the Contract Documents.

PART 2 — PRODUCTS (NOT USED)

PART 3 — EXECUTION (NOT USED)

END OF SECTION 011200

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to the Contractor. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
 - 1. Bid Contingency allowances.
 - 2. Testing and inspecting allowances.
- C. Related Sections:
 - 1. Section 012200 "Unit Prices" for procedures for using unit prices.
 - 2. Section 014000 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 BID CONTINGENCY ALLOWANCES

- A. Use the bid contingency allowance for changes to the contract scope of work only as directed by Construction Manager for Owner's purposes and only by changes that indicate amounts to be charged to the bid allowance.
- B. Contractor's overhead, profit, supervision and related costs for products and equipment ordered by Owner under the bid contingency allowance are as follows:
 - 1. For all bid contingency allowance work performed by the contractor and all subcontractors, the gross cost to the Owner shall not exceed an overhead and profit margin 10% of the net total cost of the work.
- C. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.8 TESTING AND INSPECTING ALLOWANCES

- A. Testing and inspecting allowances include the cost of engaging Third Party Testing, actual tests and inspections, and reporting results.
- B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.
- C. Contractor's overhead, profit, supervision and related costs for products and equipment ordered by Owner under the testing and inspecting allowance are as follows:
 - 1. For all testing and inspecting allowance work performed by the contractor and all subcontractors, the gross cost to the Owner shall not exceed an overhead and profit margin of 10% of the net total cost of the work.
- D. Costs of services not required by the Contract Documents are not included in the allowance.
- E. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.9 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
1. Include installation costs in purchase amount only where indicated as part of the allowance.
 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
 3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

END OF SECTION 012100

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
 - 2. Section 014000 "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased as directed by the Owner.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections. Unit prices submitted in the Contractor's bid are subject to review and approval prior to being utilized for additional work. If Unit Prices cannot be agreed upon by the Owner / Contractor they will not be used.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

September 7, 2017
Bid Issue

Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower-Internal Stair
Elizabeth, New Jersey

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Refer to Unit Price in Bid Form

END OF SECTION 012200

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for products selected under an allowance.
 - 2. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use Netta Architects (attached)
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities

- may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from latest New Jersey adopted IBC-NJ.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.
 4. Architect or his consultant will evaluate and render (1) decision on any substitutions. Re-evaluation of any substitution will be paid for by the general contractor at a rate of \$155.00 dollars an hour to the Architect.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
- a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Not allowed unless otherwise indicated.
- C. Substitutions for Convenience: Architect will consider requests for substitution if received within 30 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
- a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Substitution request is fully documented and properly submitted.
 - e. Requested substitution will not adversely affect Contractor's construction schedule.
 - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - g. Requested substitution is compatible with other portions of the Work.
 - h. Requested substitution has been coordinated with other portions of the Work.
 - i. Requested substitution provides specified warranty.
 - j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

September 7, 2017
Bid Issue

Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower-Internal Stair
Elizabeth, New Jersey

PART 3 - EXECUTION (Not Used)

PROJECT NAME: _____
NETTA PROJECT #: _____
CONTRACT NO. _____
SUBSTITUTION NO. _____

REQUEST FOR SUBSTITUTION

Submit a copy of this form for each requested substitution 21 days after Notice of Contract Award. Fill in all blanks, check all boxes that apply and attach all necessary supporting data.

Specified Item: _____
Specification Section(s)/Paragraph(s): _____
Drawing Number(s): _____
Proposed Substitute: _____

(include, as applicable, manufacturer's name & address, trade name & model number of product and name of fabricator or supplier)

Reason for Proposed Substitution: _____

Net Change to Contract Sum: No Change Deduct \$ _____ Add \$ _____

Change to Contract Time: No Change _____ Days

The following required supporting documents are attached (Check all that apply):

- Complete Product Data
- Itemized comparison of properties of proposed product to specified product.
- List of other projects on which proposed has been used, with project name, design professional's name and owner contact.
- List of maintenance services and replacement materials available.
- Statement of effect of substitution on construction schedule.
- Description of change that will be required in other work or products if substitute product is approved.

FOR SUBSTITUTION REQUEST

The undersigned testifies that he/she:

- Is submitting this substitution request within the limits set forth in the Contract Documents.
- Has investigated the proposed product and determined that it is equal or better than the specified product.
- Will provide the same warranty for the proposed product as for the specified product.
- Will coordinate installation and make other changes as required for the work to be complete in all respects, including: (a) redesign and (b) additional components and capacity required by other work affected by the change.
- Waives all claims for additional costs for evaluation of the substitution request, redesign if required, and reapproval by authorities having jurisdiction, if required.
- Waives reimburse the Owner for additional costs for evaluation of the substitution request, redesign if required, and reapproval by authorities having jurisdiction, if required.

Contractor's Signature: _____

Typed or Printed Name: _____

Title: _____

Company: _____

Address: _____

Phone Number: _____

Owner Approval: _____ Date: _____

Construction Manager Approval: _____ Date: _____
If Applicable

NETTA Architects, Approval: _____ Date: _____

Consulting Engineer Approval: _____ Date: _____

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms acceptable to Architect.

- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract Documents, Contractor may initiate a claim by submitting a request for a change to Architect.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include costs of labor and supervision directly attributable to the change.
 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 7. Proposal Request Form: Use CSI Form 13.6A, "Change Order Request (Proposal)," with attachments CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail."
- C. Contractor Responsibilities: Contractor shall compensate the Architects and/or his consultant at a cost of \$155.00 per hour for all potential re-designs.

1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701/Cma - 1992.
- B. When a change in the Work includes a category or categories of Work both added to and deducted from the Contract, the total quantities of added Work and of deleted Work shall be determined separately for each category and the appropriate unit price or net cost of the Work shall be applied to the difference between the two total quantities.
- C. Unit prices shall be inclusive of all costs and shall be applied to units of measure as defined in the Specifications for each category of Work.
- D. For all extra Work performed by Contractor, the gross cost to the Owner shall include the net cost of the Work to the Contractor plus an allowance for overhead and profit (inclusive of bond and insurance) not to exceed 15% of the net cost.
- E. For all extra Work performed by a Subcontractor, the gross cost to the Owner shall include the net cost of the Work to the Subcontractor plus an allowance for overhead and profit not to exceed 5% of the net cost, plus the Contractor's overhead and profit (inclusive of bond and insurance) not to exceed 10% of the Subcontractor's cost.

- F. Net cost of extra Work shall be the actual or pro-rated cost of:
 - 1. Labor, including foreman, at the prevailing rate of wages, contributions and taxes.
 - 2. Materials entering permanently into the Work, including delivery to the site.
 - 3. The ownership or rental cost of construction equipment and expendable tools, pro-rated for the time necessary for the Work.
 - 4. Power and consumable supplies for the operation of power equipment, pro-rated for the time necessary for the Work. Insurance and Bonds.

- G. Gross costs shall be net costs plus the allowances described above, such allowances being inclusive, of all cost of superintendence, supervision, engineering, overhead, profit, administrative and site office expenses and all other general expenses.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 012200 "Unit Prices" for administrative requirements governing the use of unit prices.
 - 3. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 4. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Construction Manager at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
 - 4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.

5. Subschedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide subschedules showing values coordinated with the scope of each design services contract as described in Section 011000 "Summary."
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of AIA Document G703.
 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
 7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.

10. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
11. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 CHANGES IN THE WORK

- A. When a change in the Work includes a category or categories of Work both added to and deducted from the Contract, the total quantities of added Work and of deleted Work shall be determined separately for each category and the appropriate unit price or net cost of the Work shall be applied to the difference between the two total quantities.
- B. Unit prices shall be inclusive of all costs and shall be applied to units of measure as defined in the Specifications for each category of Work.
- C. For all extra Work performed by Contractor, the gross cost to the Owner shall include the net cost of the Work to the Contractor plus an allowance for overhead and profit (inclusive of bond and insurance) not to exceed 15% of the net cost.
- D. For all extra Work performed by a Subcontractor, the gross cost to the Owner shall include the net cost of the Work to the Subcontractor plus an allowance for overhead and profit not to exceed 5% of the net cost, plus the Contractor's overhead and profit (inclusive of bond and insurance) not to exceed 10% of the Subcontractor's cost.
- E. Net cost of extra Work shall be the actual or pro-rated cost of:
 1. Labor, including foreman, at the prevailing rate of wages, contributions and taxes.
 2. Materials entering permanently into the Work, including delivery to the site.
 3. The ownership or rental cost of construction equipment and expendable tools, pro-rated for the time necessary for the Work.
 4. Power and consumable supplies for the operation of power equipment, pro-rated for the time necessary for the Work. Insurance and Bonds.
- F. Gross costs shall be net costs plus the allowances described above, such allowances being inclusive, of all cost of superintendence, supervision, engineering, overhead, profit, administrative and site office expenses and all other general expenses.

1.6 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and Construction Manager and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Construction Manager monthly, date to be agreed with Owner. The period covered by each Application for Payment is one month.
 - 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G732-2009 as form for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 - 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 - 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 - 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed which is stored on-site.
 - 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 - 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 - 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- G. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Construction Manager by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- I. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.
- J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
 5. Products list (preliminary if not final).
 6. Schedule of unit prices.
 7. Submittal schedule (preliminary if not final).
 8. List of Contractor's staff assignments.
 9. List of Contractor's principal consultants.
 10. Copies of building permits.
 11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 12. Initial progress report.
 13. Report of preconstruction conference.
 14. Certificates of insurance and insurance policies.
 15. Performance and payment bonds.
 16. Data needed to acquire Owner's insurance.
- K. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- L. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.

2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home,

office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
 - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - f. Indicate required installation sequences.
 - g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.

- b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
 8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
 9. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
 10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."
 - C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
 1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
 2. File Preparation Format: DWG, Version , operating in Microsoft Windows operating system.
 3. File Submittal Format: Submit or post coordination drawing files using format same as file preparation format and Portable Data File (PDF) format.
 4. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
 - a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
 - b. Contractor shall execute a data licensing agreement in the form of AIA Document C106.
- 1.7 REQUESTS FOR INFORMATION (RFIs)
- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
 - B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: RFI's will be submitted through ProCore Contract Management Program
1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow an average of seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly.

1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect.
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's response was received.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.
- G. Excessive RFI: Upon receipt of the Architects decision on the potential RFI, Architect's response shall be deemed final. Re-reviews of an RFI shall cause the contractor to compensate the Architect at a rate of \$150.00 dollars per hour to perform the revision.

1.8 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Construction Manager will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner, CM, and Architect, but no later than 15 days after execution of the Agreement.
1. Conduct the conference to review responsibilities and personnel assignments.
 2. Attendees: Authorized representatives of Owner Architect, and their consultants; Construction Manager, Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. LEED requirements.

- m. Preparation of record documents.
 - n. Use of the premises.
 - o. Work restrictions.
 - p. Working hours.
 - q. Owner's occupancy requirements.
 - r. Responsibility for temporary facilities and controls.
 - s. Procedures for moisture and mold control.
 - t. Procedures for disruptions and shutdowns.
 - u. Construction waste management and recycling.
 - v. Parking availability.
 - w. Office, work, and storage areas.
 - x. Equipment deliveries and priorities.
 - y. First aid.
 - z. Security.
 - aa. Progress cleaning.
4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. LEED requirements.
 - i. Review of mockups.
 - j. Possible conflicts.
 - k. Compatibility requirements.
 - l. Time schedules.
 - m. Weather limitations.
 - n. Manufacturer's written instructions.
 - o. Warranty requirements.
 - p. Compatibility of materials.
 - q. Acceptability of substrates.
 - r. Temporary facilities and controls.
 - s. Space and access limitations.
 - t. Regulations of authorities having jurisdiction.
 - u. Testing and inspecting requirements.
 - v. Installation procedures.
 - w. Coordination with other work.
 - x. Required performance results.
 - y. Protection of adjacent work.
 - z. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner, Construction Manager, and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for delivery of material samples, attic stock, and spare parts.
 - f. Requirements for demonstration and training.
 - g. Preparation of Contractor's punch list.
 - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - i. Submittal procedures.
 - j. Coordination of separate contracts.
 - k. Owner's partial occupancy requirements.
 - l. Installation of Owner's furniture, fixtures, and equipment.
 - m. Responsibility for removing temporary facilities and controls.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at weekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner, Construction Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule

revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

- 1) Review schedule for next period.
- b. Review present and future needs of each entity present, including the following:
- 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- F. Coordination Meetings: Conduct Project coordination meetings at weekly monthly regular Insert appropriate interval intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
1. Attendees: In addition to representatives of Owner, Construction Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

- c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site utilization.
 - 9) Temporary facilities and controls.
 - 10) Work hours.
 - 11) Hazards and risks.
 - 12) Progress cleaning.
 - 13) Quality and work standards.
 - 14) Change Orders.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's construction schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Site condition reports.
 - 7. Special reports.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting schedules and reports.
 - 2. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Architect.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.

- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file, where indicated.
 - 2. PDF electronic file.
 - 3. Two paper copies.
- B. Startup construction schedule.
 - 1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
- E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 - 3. Total Float Report: List of all activities sorted in ascending order of total float.
- F. Construction Schedule Updating Reports: Submit with Applications for Payment.
- G. Daily Construction Reports: Submit at monthly intervals.
- H. Material Location Reports: Submit at monthly intervals.
- I. Site Condition Reports: Submit at time of discovery of differing conditions.

- J. Special Reports: Submit at time of unusual event.
- K. Qualification Data: For scheduling consultant.

1.5 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.
- B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
 - 1. Review software limitations and content and format for reports.
 - 2. Verify availability of qualified personnel needed to develop and update schedule.
 - 3. Discuss constraints, including interim milestones.
 - 4. Review delivery dates for Owner-furnished products.
 - 5. Review schedule for work of Owner's separate contracts.
 - 6. Review submittal requirements and procedures.
 - 7. Review time required for review of submittals and resubmittals.
 - 8. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 9. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
 - 10. Review and finalize list of construction activities to be included in schedule.
 - 11. Review procedures for updating schedule.

1.6 COORDINATION

- A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice of Award to date of final completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.

2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 6. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Building flush-out.
 - m. Startup and placement into final use and operation.

8. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
 - a. Structural completion.
 - b. Temporary enclosure and space conditioning.
 - c. Permanent space enclosure.
 - d. Completion of mechanical installation.
 - e. Completion of electrical installation.
 - f. Substantial Completion.
 9. Other Constraints: .
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- E. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
1. See Section 012900 "Payment Procedures" for cost reporting and payment procedures.
- F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
 2. Unanswered Requests for Information.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
 5. Pending modifications affecting the Work and Contract Time.
- G. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- H. Computer Scheduling Software: Prepare schedules using Oracle's Primavera P6.
1. Utilize Oracle's Primavera P6.
- 2.2 STARTUP CONSTRUCTION SCHEDULE
- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven days of date established for the Notice of Award.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Startup Network Diagram: Submit diagram within 14 days of date established for the Notice of Award. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's construction schedule using a cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.
 - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 60 days after date established for the Notice of Award.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
 - 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 - 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to coordinate with the Contract Time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing and commissioning.
 - j. Punch list and final completion.
 - k. Activities occurring following final completion.
 - 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 - 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 - 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

5. Cost- and Resource-Loading of CPM Schedule: Assign cost to construction activities on the CPM schedule. Do not assign costs to submittal activities. Obtain Architect's approval prior to assigning costs to fabrication and delivery activities. Assign costs under main subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project record documents, LEED documentation, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.
 - a. Each activity cost shall reflect an appropriate value subject to approval by Architect.
 - b. Total cost assigned to activities shall equal the total Contract Sum.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
 1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Main events of activity.
 4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the schedule of values).
- G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
 1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.
- H. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
 1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
 2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
 4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
 - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
 - b. Submit value summary printouts one week before each regularly scheduled progress meeting.

2.4 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report through Oracle's Primavera Contract Management Program to record the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Accidents.
 8. Meetings and significant decisions.
 9. Unusual events (see special reports).
 10. Stoppages, delays, shortages, and losses.
 11. Meter readings and similar recordings.
 12. Emergency procedures.
 13. Orders and requests of authorities having jurisdiction.
 14. Change Orders received and implemented.
 15. Construction Change Directives received and implemented.
 16. Services connected and disconnected.
 17. Equipment or system tests and startups.
 18. Partial completions and occupancies.
 19. Substantial Completions authorized.
- B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.

2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue a hard copy of the schedule as well as an electronic file of the P6 schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate final completion percentage for each activity.
- C. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Progress construction photographs.
 - 3. Final completion construction photographs.
- B. Related Requirements:
 - 1. Section 012200 "Unit Prices" for procedures for unit prices for extra photographs.
 - 2. Section 013300 "Submittal Procedures" for submitting photographic documentation.
 - 3. Section 017700 "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.
 - 4. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 PHOTOGRAPHS

- A. Basis for Bids: Base number of construction photographs on average of 20 photographs per week over the duration of Project.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For photographer.
- B. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.
- C. Digital Photographs: Submit image files within three days of taking photographs.
 - 1. Digital Camera: Minimum sensor resolution of 8 megapixels.
 - 2. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
 - 3. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.

- b. Name and contact information for photographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - g. Unique sequential identifier keyed to accompanying key plan.
- D. Construction Photographs: Submit two prints of each photographic view within seven days of taking photographs.
- 1. Format: 8-by-10-inch smooth-surface matte prints on single-weight, commercial-grade photographic paper punched for standard three-ring binder.
 - 2. Identification: On back of each print, provide an applied label or rubber-stamped impression with the following information:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Architect and Construction Manager.
 - d. Name of Contractor.
 - e. Date photograph was taken if not date stamped by camera.
 - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - g. Unique sequential identifier keyed to accompanying key plan.

1.5 USAGE RIGHTS

- A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified photographer to take construction photographs.
- B. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.

- C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
1. Date and Time: Include date and time in file name for each image.
 2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect.
- D. Preconstruction Photographs: Before commencement of excavation, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.
1. Flag excavation areas before taking construction photographs.
 2. Take 20 photographs to show existing conditions adjacent to property before starting the Work.
 3. Take 20 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- E. Construction Progress Photographs: Take 20 photographs monthly, coinciding, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
- F. Architect-Directed Construction Photographs: From time to time, Architect will instruct photographer about number and frequency of photographs and general directions on vantage points. Select actual vantage points and take photographs to show the status of construction and progress since last photographs were taken.
- G. Final Completion Construction Photographs: Take 20 color photographs after date of Substantial Completion for submission as project record documents. Architect will inform photographer of desired vantage points.
1. Do not include date stamp.
- H. Additional Photographs: Architect may request photographs in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum.
1. Three days' notice will be given, where feasible.
 2. In emergency situations, take additional photographs within 24 hours of request.
 3. Circumstances that could require additional photographs include, but are not limited to, the following:
 - a. Special events planned at Project site.
 - b. Immediate follow-up when on-site events result in construction damage or losses.
 - c. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
 - d. Substantial Completion of a major phase or component of the Work.
 - e. Extra record photographs at time of final acceptance.
 - f. Owner's request for special publicity photographs. If needed, insert requirements for aerial photographs.

END OF SECTION 013233

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 3. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 4. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 5. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's and Construction Manager's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's and Construction Manager's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's and Construction Manager's final release or approval.
 - g. Scheduled date of fabrication.
 - h. Scheduled dates for purchasing.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals .
1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
 - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - b. Digital Drawing Software Program: The Contract Drawings are available in Autocad. And shall return the signed
 - c. Contractor shall execute a data licensing agreement in the form of AGREEMENT FOR TRANSFER AND USE OF DOCUMENTS IN ELECTRONIC FORM (Attached). Each subcontractor shall complete and returned signed copy of Data release form.
 - d. The contractor shall pay a fee of \$500.00 to Architect prior to release of files.
 - e. The following digital data files will be furnished for each appropriate discipline:
 - 1) Architectural Floor plans.
 - 2) Architectural Reflected Ceiling Plans.

- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 business days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Construction Manager will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 business days for review of each resubmittal.
 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 business days for initial review of each submittal.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of subcontractor.
 - g. Name of supplier.
 - h. Name of manufacturer.
 - i. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Other necessary identification.

4. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect and Construction Manager will return without review or discard submittals received from sources other than Contractor.
 - a. Transmittal Form for Paper Submittals: Use AIA Document G810.
 - b. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
 - 1) Project name.
 - 2) Date.
 - 3) Destination (To:).
 - 4) Source (From:).
 - 5) Name and address of Architect.
 - 6) Name of Construction Manager.
 - 7) Name of Contractor.
 - 8) Name of firm or entity that prepared submittal.
 - 9) Names of subcontractor, manufacturer, and supplier.
 - 10) Category and type of submittal.
 - 11) Submittal purpose and description.
 - 12) Specification Section number and title.
 - 13) Specification paragraph number or drawing designation and generic name for each of multiple items.
 - 14) Drawing number and detail references, as appropriate.
 - 15) Indication of full or partial submittal.
 - 16) Transmittal number, numbered consecutively.
 - 17) Submittal and transmittal distribution record.
 - 18) Remarks.
 - 19) Signature of transmitter.
- E. Options: Identify options requiring selection by Architect.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections. All submittals to be submitted and reviewed through ProCore Contract Management Program.
- a. Architect, through Construction Manager, will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 - b. All submittals will be go through Construction Manager and not be directly sent to architect.
2. Action Submittals: Submit 7 paper copies of each submittal unless otherwise indicated. Architect, through Construction Manager, will return two copies.
 3. Informational Submittals: Submit 5 paper copies of each submittal unless otherwise indicated. Architect and Construction Manager will not return copies.
 4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. 7 paper copies of Product Data unless otherwise indicated. Architect, through Construction Manager, will return two copies.

- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42.
 3. Submit Shop Drawings in the following format:
 - a. 7 opaque (bond) copies of each submittal. Architect, through Construction Manager, will return 2 copies.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit three full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect, through Construction Manager, will return submittal with options selected.
 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used

materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Architect will retain Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule in the following format:
 - a. PDF electronic file.
 - b. Three paper copies of product schedule or list unless otherwise indicated. Architect, through Construction Manager, will return one copies.
- F. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
- G. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
- H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
- K. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to **Construction Manager**.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Architect without action.

September 7, 2017
Bid Issue

Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower-Internal Stair
Elizabeth, New Jersey

AGREEMENT FOR TRANSFER AND USE OF DOCUMENTS IN ELECTRONIC FORM

This Agreement is made in reference to the following project: **PROJECT NAME AND NUMBER** hereinafter “Project”) for **INSERT OWNER OF PROJECT** (hereinafter “Owner”).

Nicholas J. Netta Architects. (hereinafter “DESIGN PROFESSIONAL”) will provide to **Insert Recipients Name** (hereinafter “Recipient”) certain drawings, specifications and/or other documents prepared by DESIGN PROFESSIONAL or its subconsultants in electronic or other machine-readable format. These documents shall hereinafter be referred to as the “Electronic Documents”. It is understood and agreed that it may become desirable for the Recipient to make certain Electronic Documents available to certain other entities in connection with the Project. It is the intent of this agreement to govern all circumstances under which the Recipient makes Electronic Documents available. Any distribution by Recipient of all or any portion of the Electronic Documents shall be limited for use on this Project only. Such distribution is subject to DESIGN PROFESSIONAL’s approval and may be made only after written notice thereof is given to DESIGN PROFESSIONAL and only after any additional recipient agrees in writing to be bound by the terms of this Agreement. This Agreement shall be incorporated in the General Conditions for the Contract for Construction and shall become binding on all parties who wish to use Electronic Documents. Any individual or entity, including the Owner, to whom DESIGN PROFESSIONAL releases any Electronic Documents or who thereafter receives Electronic Documents shall also be referred to in this agreement as the “Recipient.”

In consideration of DESIGN PROFESSIONAL’s agreement to release Electronic Documents, the Recipient agrees as follows:

1. All drawings, specifications or other documents of any kind prepared by DESIGN PROFESSIONAL or its subconsultants, whether in hard copy or any electronic or machine readable format including Electronic Documents (collectively “DESIGN PROFESSIONAL’s Documents”), are instruments of their services prepared solely for use in connection with the Project and DESIGN PROFESSIONAL and its subconsultants retain all common law, statutory and other reserved rights, including the copyright. This agreement is not intended in any way to alter the respective interests of the parties in DESIGN PROFESSIONAL’s Documents as set forth in any other agreement notwithstanding DESIGN PROFESSIONAL’s agreement to release the Electronic Documents to Recipient.
2. Electronic Documents are provided merely as a convenience to the Recipient in connection with the Recipient’s performance of its responsibilities and obligations relating to the Project. Electronic Documents do not replace or supplement the paper copies of any drawings, specifications or other documents including the Contract Documents for the Project. The Electronic Documents are supplied to Recipient for the limited purpose of: **Insert Purpose for electronic transfer.**
3. The parties agree that Electronic Documents are not, nor shall they be construed to be, a product. It is expressly agreed by the Recipient that there are no warranties of any kind in such Electronic Documents or in the media in which they are contained, either express or implied.
4. If any differences exist between the printed Contract Documents and any Electronic Documents, the information contained in the printed documents shall be presumed to be correct and take precedence over the Electronic Documents, unless DESIGN PROFESSIONAL specifically advises Recipient to the contrary in writing.
5. Recipient agrees not to add to, modify or alter in any way, or to allow others to add to, modify or alter in any way, Electronic Documents or any printed copies thereof, unless Recipient has received the express written consent of DESIGN PROFESSIONAL to do so in this agreement. Recipient recognizes that additions, changes, alterations or modifications to DESIGN PROFESSIONAL’s Documents introduced by anyone other than DESIGN PROFESSIONAL may result in adverse consequences that DESIGN PROFESSIONAL can neither predict nor control. Therefore, even though Recipient has received specific permission from DESIGN PROFESSIONAL to use the Electronic Documents in connection with Recipient’s obligation to prepare certain documents for Project, which preparation requires Recipient to add to, modify, change or alter DESIGN PROFESSIONAL’s Documents, Recipient shall be subject to the provisions of Paragraphs 8 and 9 of this

agreement. Furthermore, where Recipient has received such permission from DESIGN PROFESSIONAL, Recipient shall, in addition to the other obligations set forth herein, be obligated to remove DESIGN PROFESSIONAL's or DESIGN PROFESSIONAL's subconsultant's title block from the copy of the Electronic Documents used by Recipient.

6. The Electronic Documents are supplied in the following format: **Insert type of electronic format.**

Any conversion of format is solely the responsibility of the Recipient. Recipient understands and agrees that the conversion of the printed copies of DESIGN PROFESSIONAL's Documents into electronic or machine-readable format or the conversion of Electronic Documents from the machine-readable formats used by DESIGN PROFESSIONAL to a different format may introduce errors or other inaccuracies. Recipient therefore agrees to confirm the accuracy of the Electronic Documents before using them. Recipient agrees to accept all responsibility for any errors or inaccuracies and to release DESIGN PROFESSIONAL and its subconsultants from any liability or claims for recovery of damages or expenses arising as the result of such errors or inaccuracies.

7. Recipient further agrees that the DESIGN PROFESSIONAL's documents were prepared for use in connection with this project only and that the Electronic Documents are supplied to Recipient for the limited purpose stated above only. Recipient agrees not to use, or allow others to use, the Electronic Documents, in whole or in part, for any purpose or project other than as stated above.
8. Recipient agrees to waive any and all claims and liability against DESIGN PROFESSIONAL and its subconsultants resulting in any way from this agreement or from the use of the Electronic Documents.
9. Recipient further agrees to indemnify and save harmless DESIGN PROFESSIONAL and its subconsultants and each of their partners, officers, shareholders, directors and employees from any and all claims, judgments, suits, liabilities, damages, costs or expenses (including reasonable defense and attorneys fees) arising as the result of either: 1) Recipient's failure to comply with any of the requirements of this agreement; or 2) a defect, error or omission in the Electronic Documents or the information contained therein, which defect, error or omission was not contained in the paper copies of the Contract Documents or where the use of the paper copies of such Contract Documents would have prevented the claim, judgment, suit, liability, damage, cost or expense; or 3) from any addition to, modification, alteration, change to or misinterpretation of the Electronic Documents.

RECIPIENT

Name: _____ **Date:** _____
Title: _____
Company: _____

END OF SECTION 013300

SECTION 013591 - HISTORIC TREATMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general protection and treatment procedures for designated historic spaces, areas, rooms, and surfaces in the Project and the following specific work:
 - 1. Historic removal and dismantling.
- B. Related Sections:
 - 1. Division 04 Section "Maintenance of Stone Assemblies" for specific requirements for cleaning and repairing stone.

1.3 DEFINITIONS

- A. Consolidate: To strengthen loose or deteriorated materials in place.
- B. Dismantle: To disassemble and detach items by hand from existing construction to the limits indicated, using small hand tools and small one-hand power tools, so as to protect nearby historic surfaces; and legally dispose of dismantled items off-site, unless indicated to be salvaged or reinstalled.
- C. Existing to Remain: Existing items that are not to be removed or dismantled.
- D. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by the Architect.
- E. Reconstruct: To remove existing item, replicate damaged or missing components, and reinstall in original position.
- F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.
- G. Reinstall: To protect removed or dismantled item, repair and clean it as indicated for reuse, and reinstall it in original position, or where indicated.
- H. Remove: Specifically for historic spaces, areas, rooms, and surfaces, the term means to detach an item from existing construction to the limits indicated, using hand tools and hand-operated power equipment, and legally dispose of it off-site, unless indicated to be salvaged or reinstalled.

- I. Repair: To correct damage and defects, retaining existing materials, features, and finishes while employing as little new material as possible. Includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- J. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- K. Reproduce: To fabricate a new item, accurate in detail to the original, and in either the same or a similar material as the original, unless otherwise indicated.
- L. Retain: To keep existing items that are not to be removed or dismantled.
- M. Salvage: To protect removed or dismantled items and deliver them to Owner ready for reuse.
- N. Stabilize: To provide structural reinforcement of unsafe or deteriorated items while maintaining the essential form as it exists at present; also, to reestablish a weather-resistant enclosure.

1.4 SUBMITTALS

- A. Construction Schedule for Historic Treatments: Indicate for the entire Project the following for each activity to be performed in historic spaces, areas, and rooms, and on historic surfaces:
- B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by historic treatment operations.
- C. Historic Treatment Program: Submit before work begins.
- D. Inventory of Salvaged Items: After removal or dismantling work is complete, submit a list of items that have been salvaged.

1.5 QUALITY ASSURANCE

- A. Historic Removal and Dismantling Specialist Qualifications: A qualified historic treatment specialist. General selective demolition experience is not sufficient experience for historic removal and dismantling work.
- B. Mockups: Prepare mockups of specific historic treatment procedures specified in this Section to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Typical Removal Work: Remove an approximately 50 sq. ft. area of typical wall, but not less than 10 adjacent whole stone units:
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- C. Historic Treatment Preconstruction Conference: Conduct conference at Project site.
 - 1. General: Review methods and procedures related to historic treatment including, but not limited to, the following:
 - a. Review qualifications of personnel assigned to the work and assign duties.

- b. Review material application, work sequencing, tolerances, and required clearances.
- c. Review areas where existing construction is to remain and requires protection.

1.6 STORAGE AND PROTECTION OF HISTORIC MATERIALS

A. Historic Materials for Reinstallation:

- 1. Repair and clean historic items as indicated and to functional condition for reuse.
- 2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
- 3. Protect items from damage during transport and storage.
- 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make item functional for use indicated.

B. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after historic treatment and construction work in the vicinity is complete.

C. Storage and Protection: When taken from their existing locations, catalog and store historic items within a weathertight enclosure where they are protected from wetting by rain, snow, condensation, or ground water, and from freezing temperatures.

- 1. Identify each item with a nonpermanent mark to document its original location. Indicate original locations on plans elevations, sections, or photographs by annotating the identifying marks.
- 2. Secure stored materials to protect from theft.

1.7 PROJECT CONDITIONS

A. General Size Limitation in Historic Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.

B. Owner will occupy portions of building immediately adjacent to removal and dismantling area. Conduct removal and dismantling work so Owner's operations will not be disrupted.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

D. Sale of removed items is not permitted.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 HISTORIC REMOVAL AND DISMANTLING EQUIPMENT

- A. Removal Equipment: Use only hand-held tools except as follows or unless otherwise approved by the Architect on a case-by-case basis:
 - 1. Light jackhammers are allowed subject to Architect's approval.
 - 2. Large air hammers are not permitted.

3.2 EXAMINATION

- A. Preparation for Removal: Examine construction to be removed to determine best methods to safely and effectively perform removal and dismantling work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed and location of utilities and services to remain that may be hidden by construction that is to be removed.
 - 1. Verify that affected utilities have been disconnected and capped.
 - 2. Inventory and record the condition of items to be removed and dismantled for reinstallation or salvage.
 - 3. Before removal or dismantling of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.
- B. Survey of Existing Conditions: Record existing conditions by use of measured drawings and preconstruction photographs.
 - 1. Comply with requirements specified in Division 01 Section "Photographic Documentation."
- C. Perform surveys as the Work progresses to detect hazards resulting from historic treatment procedures.

3.3 PROTECTION, GENERAL

- A. Ensure that supervisory personnel are on-site and on duty when historic treatment work begins and during its progress.
- B. Protect persons, vehicles, surrounding surfaces of building and surrounding buildings. Refer to Division 02 Section "Selective Structure Demolition".
 - 1. Use only proven protection methods, appropriate to each area and surface being protected.
 - 2. Provide barricades, barriers, and temporary directional signage to exclude public from areas where historic treatment work is being performed.
 - 3. Erect temporary protective covers over walkways and at points of entrance and exit that must remain in service during course of historic treatment work.
 - 4. Contain dust and debris generated by removal and dismantling work and prevent it from reaching the public or adjacent surfaces.
 - 5. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.

6. Protect floors and other surfaces along haul routes from damage, wear, and staining.
7. Provide supplemental sound-control treatment to isolate removal and dismantling work from other areas of the building.

C. Temporary Protection of Historic Materials:

1. Protect existing historic materials with temporary protections and construction. Do not deface or remove existing materials.
2. Do not attach temporary protection to historic surfaces except as indicated as part of the historic treatment program and approved by Architect.

3.4 GENERAL HISTORIC TREATMENT

- A. Ensure that supervisory personnel are present when historic treatment work begins and during its progress.
- B. Halt the process of deterioration and stabilize conditions, unless otherwise indicated. Perform work as indicated on Drawings. Follow the procedures in subparagraphs below and procedures approved in historic treatment program.
1. Retain as much existing material as possible; repair and consolidate rather than replace.
 2. Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.
 3. Use reversible processes wherever possible.
 4. Use historically accurate repair and replacement materials and techniques unless otherwise indicated.
 5. Record existing work before each procedure (preconstruction) and progress during the work with digital preconstruction documentation photographs. Comply with requirements in Division 01 Section "Photographic Documentation."
- C. Notify Architect of visible changes in the integrity of material or components whether due to environmental causes including biological attack, UV degradation, freezing, or thawing; or due to structural defects including cracks, movement, or distortion.
1. Do not proceed with the work in question until directed by Architect.
- D. Where Work requires existing features to be removed or dismantled and reinstalled, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.

3.5 HISTORIC REMOVAL AND DISMANTLING

- A. General: Have removal and dismantling work performed by a qualified historic removal and dismantling specialist. Ensure that historic removal and dismantling specialist's field supervisors are present when removal and dismantling work begins and during its progress.
- B. Perform work in accordance with the historic treatment program and approved mockup(s).
1. Provide supports or reinforcement for existing construction that becomes temporarily weakened by the work, until the work is completed.
 2. Perform cutting by hand or with small power tools wherever possible. Cut holes and slots neatly to size required, with minimum disturbance of adjacent work.

3. Do not drill or cut columns, beams, joints, girders, structural slabs, or other structural supporting elements, without having Contractor's professional engineer's written approval for each location before such work is begun.
 4. Do not use explosives.
- C. Loose Plaster: Identify loose, non-historic plaster and separate it from its substrate by tapping with a hammer and prying with a chisel or screwdriver. Do not use pry bars. Leave sound, firmly adhered plaster in place. Do not damage, remove, or dismantle historic plasterwork except where indicated or where it is an immediate hazard to personnel and as approved by the Architect.
- D. Concrete Floor Surface Removal: Remove floor surfaces, fill, and topping, to the indicated lower elevations or cleavage planes as indicated on Drawings. Use dismantling methods when removing floor surfaces 12 inches or less away from historic walls. Take away material to a uniform surface at the indicated level.
- E. Marble Removal: Remove marble and setting bed to the depth indicated.
1. Procedure: Revise procedure in nine subparagraphs below if directed in writing by Architect based upon exploratory mockup.
 - a. Saw cut marble joints with rigid guides to ensure straight, uniform cuts and to prevent over cutting into adjacent stones. Use thin saw blades so that stones can be reused. Replace with new any removed stones and adjacent stones if cut irregularly or otherwise damaged, at no additional cost to the Owner.
 - b. Gently loosen and pry stone free from setting bed. If a stone unit cannot be separated from the substrate, cut it up as necessary for removal and replace it.
 - c. Saw cut setting bed with parallel cuts 3 to 4 inches apart and of a maximum depth 1/4-inch above the bottom of the setting bed.
 - d. Using the sawed grooves, carefully chip out material to the limits shown.
 - e. Take away material to a uniform surface at the indicated level.
 - f. Carefully monitor the progress of the saw cutting. If at any point the material being cut changes in nature as evidenced by observations such as sounds generated by the cutting blade, resistance to cutting, and color of the dust, stop work in the immediate area, immediately notify the Construction Manager of the condition, and assign workers to continue work elsewhere until the CM issues instructions.
 - g. Where the actual thickness of the setting bed is more than 1-3/4 inches, continue the dismantling.
- F. Anchorages:
1. Remove anchorages associated with removed items.
 2. In non-historic surfaces, patch holes created by anchorage removal in accordance with the requirements for new work.
 3. In historic surfaces, patch or repair holes created by anchorage removal in accordance with Section specific to the historic surface being patched.

END OF SECTION 013591

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.
- C. Related Requirements:
 - 1. Section 012100 "Allowances" for testing and inspecting allowances.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.

2. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.

- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
 - 2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.

1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice of Award, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified (minimum 7 years' experience) full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
 - 3. Owner-performed tests and inspections indicated in the Contract Documents.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate

types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.7 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.8 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.
 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
 4. Demonstrate the proposed range of aesthetic effects and workmanship.
 5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 7. Demolish and remove mockups when directed unless otherwise indicated.
- L. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.
- M. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Specification Sections.
- 1.9 QUALITY CONTROL
- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.

3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.

- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration

into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.
- C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

IAPMO	International Association of Plumbing and Mechanical Officials www.iapmo.org	(909) 472-4100
ICC	International Code Council www.iccsafe.org	(888) 422-7233
ICC-ES	ICC Evaluation Service, Inc. www.icc-es.org	(800) 423-6587 (562) 699-0543

- D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

DOE	Department of Energy www.energy.gov	(202) 586-9220
EPA	Environmental Protection Agency www.epa.gov	(202) 272-0167
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
SD	State Department www.state.gov	(202) 647-4000

- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from U.S. Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office www.gpoaccess.gov/cfr/index.html	(866) 512-1800 (202) 512-1800
FED-STD	Federal Standard (See FS)	
FS	Federal Specification Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil/ Available from Defense Standardization Program www.dsp.dla.mil Available from General Services Administration www.gsa.gov Available from National Institute of Building Sciences www.wbdg.org/ccb	(215) 697-2664 (202) 619-8925 (202) 289-7800
FTMS	Federal Test Method Standard (See FS)	
UFAS	Uniform Federal Accessibility Standards Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use during construction. Contractor is to provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use during construction. Contractor is to provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.

2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
- E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
1. Locations of dust-control partitions at each phase of work.
 2. HVAC system isolation schematic drawing.
 3. Location of proposed air-filtration system discharge.
 4. Waste handling procedures.
 5. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top rails.
- B. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide concrete bases for supporting posts.
- C. Wood Enclosure Fence: Plywood, 8 feet high, framed with four 2-by-4-inch rails, with preservative-treated wood posts spaced not more than 8 feet apart.

- D. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- E. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.
- F. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

- A. Contractor Field Office & Storage: Union County will supply an area for use, by the Contractor, for a field office. The Contractor is responsible to fit out the space which includes providing their own furnishings, office supplies and internet/telephone services that they require. On site storage will be limited to the area(s) of construction within the building that the contractor is currently working in. There will be no exterior storage allowed on the project site. Thus, the contractor is to obtain an off-site area that will be used for storage of materials (that cannot be stored in the building) for use by their employees or Subcontractors.
- B. Construction Manager Field Office: The Construction Manager's field office will be provided by the County of Union. The contractor will be required to provide furnishings as specified in Section 3.2, M

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures".
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Install distribution piping as needed in sizes and pressures adequate for construction.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Sanitary Facilities:
 - 1. Toilets: Use of Owner's designated existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to conditions existing before initial use.
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
 - 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

- H. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner. Provide distribution system of sufficient size, capacity, and power characteristics required for construction operations.
1. Install electric power service overhead unless otherwise indicated.
 2. Connect temporary service to Owner's existing power source, as directed by Owner.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
 2. Install lighting for Project identification sign.
- J. Telephone Service: (Not Required)
- K. Contractor to provide various electrical equipment & office supplies for the exclusive use of the Construction Manager. These items are to be provided through the Contractors Base Bid. This includes, but is not limited to:
- (1) Dell Laptop computer that is to include the following specifications:
 - Windows 10 (64 Bit)
 - Minimum of 8 GB of RAM
 - Minimum of 2Ghz Processor
 - 15 inch Monitor
 - 1 TB Hard Drive
 - (1) APC battery backups LS500 uninterruptible power supply
 - (1) Wireless Keyboards with Optical cordless mouse
 - (1) Digital Camera & carrying case 20 megapixels, & a 64 GB memory media card
 - (2) Sandisk 64 GB USB memory sticks
 - (1) Laser Jet printer with 11x17 printing capability
 - (1) 3' x 6' metal desk
 - (1) high-back swivel chair and (2) side chairs
 - (1) mobile plan rack with twelve 30" sticks
 - (2) Two fire resistant 36" wide legal 4 drawer lateral file cabinets with locks and hanging file folders.
 - (1) 24"x24" commercial grade melamine dry-erase board and a four (4) pack of assorted color dry-erase markers.
 - (1) One First Aid kit.
 - (2) Two trash receptacles Fire
Extinguishers as required.

- * The Contractor is required to utilize the Construction Manager's Project Management Software (ProCore Contract Management Program) through the entire Duration of the project.
- * Most recent version of Microsoft Office Professional Edition on CD-ROM for Laptop.
- * Most recent version of Symantec Norton Antivirus and Firewall with regular update subscription
- * Most recent version of Adobe Acrobat on CD-ROM for Laptop
- * Most recent version of Microsoft Office Project for Laptop
- * Provide, pay, assemble, install, and maintain all service, support, supplies, cables, consumables, paper, folders, utilities, film and development, usage charges, warranty and maintenance required to operate aforementioned equipment and facility.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
1. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations.
1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- C. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
 2. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
 3. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Section 321216 "Asphalt Paving."
- D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- E. Parking: No on-site or off- site parking will be provided. Employees of the Contractor and Subcontractors are responsible for their own parking.
- F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
- G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
1. Identification Signs: Provide Project identification signs as indicated on Drawings.
 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
 3. Maintain and touchup signs so they are legible at all times.
- H. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

- I. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."
- J. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- K. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- L. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Temporary Erosion and Sedimentation Control: Comply with requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent and requirements specified in Section 311000 "Site Clearing."
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Tree and Plant Protection: Comply with requirements specified in Section 015639 "Temporary Tree and Plant Protection."
- F. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- G. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- H. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
 - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel.

- I. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- J. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- K. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- L. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- M. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 - 1. Protect porous materials from water damage.
 - 2. Protect stored and installed material from flowing or standing water.
 - 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 - 4. Remove standing water from decks.
 - 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 - 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 - 2. Keep interior spaces reasonably clean and protected from water damage.
 - 3. Periodically collect and remove waste containing cellulose or other organic matter.

4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard, replace, or clean stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Use permanent HVAC system to control humidity.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove materials that can not be completely restored to their manufactured moisture level within 48 hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.
- D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that

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Bid Issue

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Phase C1 Rotunda & Phase C2 Tower-Internal Stair
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might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 015950 – SAFETY & HEALTH

PART 1 - GENERAL

1.1 COMPLIANCE WITH REGULATIONS

- A. Contractor Responsibility: The Contractor shall assume full responsibility and liability for compliance with all applicable codes, standards and regulations pertaining to the health and safety of personnel during execution of the Work, and shall hold the Owner harmless for any action on the Contractor's part, including employees or subcontractors, that results in illness, injury or death. All Contractors shall comply with Occupational Safety and Health Administration (OSHA) requirements. The Contractor shall provide a copy of their Corporate Safety & Health Plan for record.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION OF PERSONNEL

- A. The Contract shall take all necessary precautions to prevent injury to the public, occupants, or damage to property of others. The public and occupants includes all persons not employed by the Contractor or a subcontractor.
- B. Wherever practical, the work area shall be fenced, barricaded or otherwise blocked off from the public or occupants to prevent unauthorized entry into the work area.

3.2 ENVIRONMENTAL PROTECTION

- A. Dispose of solid, liquid and gaseous contaminants in accordance with local codes, laws, ordinances and regulations.

END OF SECTION - 015950

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for products selected under an allowance.
 - 2. Section 014200 "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.
- C. Comparable product requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Comparable Product Request Form: Use Netta Architects (attached)
 2. Documentation: Show compliance with requirements for comparable products and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, which will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from latest New Jersey adopted IBC-NJ.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
4. Architect or his consultant will evaluate and render (1) decision on any comparable product requests. Re-evaluation of any substitution will be paid for by the general contractor at a rate of \$155.00 dollars an hour to the Architect.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
 1. Store products to allow for inspection and measurement of quantity or counting of units.
 2. Store materials in a manner that will not endanger Project structure.
 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.

6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:

1. **Basis-of-Design Product:** Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. **Visual Matching Specification:** Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. **Visual Selection Specification:** Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. **Conditions for Consideration:** Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

PROJECT NAME: _____
NETTA PROJECT #: _____
CONTRACT NO. _____
SUBSTITUTION NO. _____

REQUEST FOR COMPARABLE PRODUCT

Submit a copy of this form for each requested comparable product 21 days after Notice of Contract Award. Fill in all blanks, check all boxes that apply and attach all necessary supporting data.

Specified Item: _____

Specification Section(s)/Paragraph(s): _____

Drawing Number(s): _____

Proposed comparable product: _____

(include, as applicable, manufacturer's name & address, trade name & model number of product
and name of fabricator or supplier)

Reason for Proposed Comparable Product: _____

Net Change to Contract Sum: No Change Deduct \$ _____ Add \$ _____

Change to Contract Time: No Change _____ Days

The following required supporting documents are attached (Check all that apply):

Complete Product Data

Itemized comparison of properties of proposed product to specified product.

List of other projects on which proposed has been used, with project name, design professional's
name and owner contact.

List of maintenance services and replacement materials available.

Statement of effect of substitution on construction schedule.

Description of change that will be required in other work or products if substitute product is approved.

FOR COMPARABLE PRODUCT REQUEST

The undersigned testifies that he/she:

- Is submitting this comparable product request within the limits set forth in the Contract Documents.
- Has investigated the proposed product and determined that it is equal or better than the specified product.
- Will provide the same warranty for the proposed product as for the specified product.
- Will coordinate installation and make other changes as required for the work to be complete in all respects, including: (a) redesign and (b) additional components and capacity required by other work affected by the change.
- Waives all claims for additional costs for evaluation of the Comparable product request, redesign if required, and reapproval by authorities having jurisdiction, if required.
- Waives reimburse the Owner for additional costs for evaluation of the substitution request, redesign if required, and reapproval by authorities having jurisdiction, if required.

Contractor's Signature: _____

September 7, 2017
Bid Issue

Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower-Internal Stair
Elizabeth, New Jersey

Typed or Printed Name: _____

Title: _____

Company: _____

Address: _____

Phone Number: _____

Owner Approval: _____ Date: _____

Construction Manager Approval: _____ Date: _____
If Applicable

NETTA Architects, Approval: _____ Date: _____

Consulting Engineer Approval: _____ Date: _____

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

- B. Related Requirements:

1. Section 011000 "Summary" for limits on use of Project site.
2. Section 013300 "Submittal Procedures" for submitting surveys.
3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
4. Section 024119 "Selective Structure Demolition" for demolition and removal of selected portions of the building.
5. Section 078413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

- C. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- E. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
 - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Mechanical systems piping and ducts.
 - f. Control systems.
 - g. Communication systems.
 - h. Fire-detection and -alarm systems.
 - i. Conveying systems.
 - j. Electrical wiring systems.
 - k. Operating systems of special construction.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.

2. Establish limits on use of Project site.
 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 4. Inform installers of lines and levels to which they must comply.
 5. Check the location, level and plumb, of every major element as the Work progresses.
 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels in excess of local city ordinances.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls" and Section 017419 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 013233 "Photographic Documentation" for submitting final completion construction photographic documentation.
 - 2. Section 017300 "Execution" for progress cleaning of Project site.
 - 3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 4. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 5. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.

- a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.

5. Submit test/adjust/balance records.
6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
6. Advise Owner of changeover in heat and other utilities.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.

4. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Architect will return annotated file.
 - b. Three paper copies.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
 - p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - q. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls." And Section 017419 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

- a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.
2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two copies.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
1. List of documents.
 2. List of systems.
 3. List of equipment.
 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Construction Manager.
 7. Name and contact information for Architect.
 8. Name and contact information for Commissioning Authority.
 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
 1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."

- G. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for final property survey.
 - 2. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set(s) of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit PDF electronic files of scanned record prints and three set(s) of prints.
 - 2) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one paper copy and annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy and annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy and annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file and paper copy.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file and paper copy.
 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file and paper copy.
 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.

1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For facilitator and instructor.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.4 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name and address of videographer.
 - c. Name of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Date of video recording.

2. Transcript: Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
3. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
4. At completion of training, submit complete training manual(s) for Owner's use prepared and bound in format matching operation and maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Preconstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
 1. Inspect and discuss locations and other facilities required for instruction.
 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 3. Review required content of instruction.
 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.6 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project record documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
 - 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 - 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.

- h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
- a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
- a. Diagnostic instructions.
 - b. Test and inspection procedures.
7. Maintenance: Include the following:
- a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
8. Repairs: Include the following:
- a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
 - 3. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Architect, with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.
- F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Video: Provide minimum 640 x 480 video resolution converted to mp4 format file type, on electronic media.
 - 1. Electronic Media: Read-only format compact disc acceptable to Owner, with commercial-grade graphic label.
 - 2. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.
 - 3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
 - 4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:
 - a. Name of Contractor/Installer.
 - b. Business address.

- c. Business phone number.
 - d. Point of contact.
 - e. E-mail address.
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
 - 1. Film training session(s) in segments not to exceed 15 minutes.
 - a. Produce segments to present a single significant piece of equipment per segment.
 - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
 - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
- D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
 - 1. Furnish additional portable lighting as required.
- E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.
- F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
- G. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

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SECTION 022623 ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 ABATEMENT

- A. This section covers the abatement of potential hazards relating to materials previously determined to be asbestos-containing materials (ACMs) pursuant to applicable regulations associated with the structure described in these specifications.

1.2 RELATED DOCUMENTS

- A. Read this section as part of the overall contract documents. Special attention is brought to all drawings and other specification sections that refer to any work related to the components of the existing building.

1.3 DESCRIPTION OF WORK

- A. The Contractor shall furnish all labor, materials, services, training, insurance, and equipment as needed to complete removal of asbestos-containing and asbestos-contaminated materials identified. The Contractor shall follow all Federal, State and local ordinances, regulations and rules pertaining to asbestos, including its storage, transportation, and disposal.

- B. Attached Drawings AA-1 through AA-8 (Rotunda Building) and Drawings AA-1 through AA-10 (Tower Building) are made part of the overall technical specifications.

1. Work Scope: The Asbestos Abatement Contractor shall remove the following asbestos-containing materials:

Notes: sf = square feet
lf = linear feet
ACM = Asbestos-containing material

Rotunda Building

TYPE OF ACM	LOCATION	APPROXIMATE AMOUNT
Tan undercoat layer of the plaster wall and ceiling system	Throughout entire Rotunda Building; Ground Floor, 1 st Floor, 2 nd Floor, 3 rd Floor and 4 th Floor (excluding Basement)	4,500 sf (estimated; actual quantity to be impacted TBD by General Contractor mark-out)
Various types of asbestos-containing pipe and pipe fitting insulation	Throughout various locations within the Rotunda Building and concealed in pipe chase spaces associated with Elevator expansion, Restrooms and 4 th Floor Storage Areas)	500 lf (estimated; quantity to be impacted TBD by General Contractor mark-out)

Non-Subcode Work – Operations and Maintenance (O&M) – Fastening/Securing/Drilling for hanger brackets and fasteners for supporting HVAC, Plumbing, Fire Alarm, Sprinkler System, etc. for areas not included within a full work area enclosure.

TYPE OF ACM	LOCATION	APPROXIMATE AMOUNT
Tan undercoat layer of the plaster wall and ceiling system	Throughout entire Rotunda Building; Ground Floor, 1 st Floor, 2 nd Floor, 3 rd Floor and 4 th Floor (excluding Basement)	<25 sf Total (actual quantity to be impacted TBD by General Contractor mark-out)

Non-Subcode Work – Operations and Maintenance (O&M) Repair – Complete the O&M repair of any damaged or deterioration asbestos-containing wall/ceiling plaster throughout the Rotunda Building that is not scheduled to be impacted by the renovations and is scheduled to remain. The amount of this material is undefined but assumed to be estimated at 550-650 square feet as noted below:

Tan undercoat layer of the plaster wall and ceiling system	Throughout entire Rotunda Building; Ground Floor, 1 st Floor, 2 nd Floor, 3 rd Floor and 4 th Floor (excluding Basement)	550-650 sf (estimated)
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Tower Building

TYPE OF ACM	LOCATION	APPROXIMATE AMOUNT
Tan acoustical ceiling plaster	11 th Floor; Courtroom at New Stair Tower location	400 sf (quantity to be impacted TBD by General Contractor mark-out)
	7 th Floor; Lobby	800 sf (quantity to be impacted TBD by General Contractor mark-out)
	5 th Floor; Lobby	800 sf (quantity to be impacted TBD by General Contractor mark-out)
	3 rd Floor; Lobby	1,100 sf (quantity to be impacted TBD by General Contractor mark-out)
	1 st Floor; Lobby	1,600 sf (quantity to be impacted TBD by General Contractor mark-out)
Various types of asbestos-containing pipe and pipe fitting insulation	Throughout various locations within the Tower Building and concealed in pipe chase spaces associated with Stair Tower installation	500 lf (quantity to be impacted TBD by General Contractor)

TYPE OF ACM	LOCATION	APPROXIMATE AMOUNT
Tan 9"x9" floor tile and associated black asphaltic mastic	7 th Floor; Room 701 in corner to be renovated (below carpeting)	20 sf (estimated; quantity to be impacted TBD by General Contractor)
Various colored and styled 9"x9" floor tile and associated black asphaltic mastic	Elevator servicing the 14 th to 16 th Floors	25 sf (estimated)
<u>Non-Subcode Work – Operations and Maintenance (O&M)</u> – Fastening/Securing/Drilling for hanger brackets and fasteners for supporting HVAC, Plumbing, Fire Alarm, Sprinkler System, etc. for areas not included within a full work area enclosure as noted below:		
Tan acoustical ceiling plaster	Tower Building; 11 th Floor, 7 th Floor, 5 th Floor, 3 rd Floor and 1 st Floor Courtroom and Lobby spaces (not contained within a full work area enclosure)	<25 sf Total (actual quantity to be impacted TBD by General Contractor mark-out)

- C. The “Approximate Amount(s)” of ACM listed above are offered merely to provide a general and relative frame of reference. No attempt has been made to quantify the exact amount of ACM, non-ACM and contaminated non-ACM in the above-mentioned locations, nor elsewhere. The Contractor is expected to have acquainted itself with the spaces involved, and to have investigated the location and amount of all identified materials. The Approximate Amounts or lack of an amount approximation, shall not in any way be construed or applied so as to limit the Contractor’s obligation to remove and dispose of, or otherwise treat as specified, all ACM, non-ACM and contaminated non-ACM so identified, nor to form the basis for any change of the Contract Sum or Time.
- D. **The General Contractor shall be required to properly mark-out both sides of any wall that will require wall plaster abatement in the Rotunda Building. It shall be the General Contractor’s responsibility to ensure that the mark outs on either side of any plaster wall to be penetrated by ductwork, piping, conduit, etc. “lines-up” on each side of the wall properly so no asbestos-containing plaster remaining will be impacted by the General Contractor’s work following the abatement activities. The asbestos abatement contractor shall not be required to demolish the underlying substrate (i.e., brick, concrete masonry, terra cotta, etc.) present below the plaster unless the substrate can be properly cleaned or is associated with the elevator expansion work. All waste removed as part of this abatement work shall be treated as asbestos-containing waste.**
- E. **The General Contractor shall be responsible for the pre-abatement removal of any suspended ceiling tile and existing HVAC ductwork in the Rotunda Building and the removal and dismantlement of any suspended ceiling tile, grid work and lighting in the vicinity of the proposed stair tower in the Tower Building as directed by the Owner. The General Contractor shall also be required to remove and/or relocate all movable furniture, files, etc. not addressed by the County of Union in order to allow for the asbestos abatement work for each Phase to commence as necessary.**

- F. The General Contractor shall also be required to utilize a two-man team of properly trained New Jersey-licensed asbestos abatement workers from the asbestos abatement contractor to conduct any Operations & Maintenance (O&M) clean-up work that may arise as it relates to the dismantlement of any ceiling tile system within the Rotunda Building or the Tower Building's 1st Floor, 3rd Floor, 5th Floor, 7th Floor or 11th Floor for the duration of the dismantlement activities.**
- G. As previously noted in Section 1.3, B the asbestos abatement contractor will be responsible for the O&M repair of any damaged or deterioration asbestos-containing wall/ceiling plaster throughout the Rotunda Building that is not scheduled to be impacted by the renovations and is scheduled to remain. The amount of this material is undefined but assumed to be estimated at 550-650 square feet. The asbestos abatement contractor shall be complete all repair regardless if the total amount exceeds the above estimate, at no additional cost to the Owner.**

1.4 SCHEDULING

- A. Coordinate, phase, and schedule the Asbestos Abatement Work specified herein in conjunction with the remainder of the work of this contract.
1. Complete the Asbestos Abatement Work specified for the Phase I work (Phase 1A and Phase 1B) at the Rotunda Building over a seventy-five (75) business-day period. The end of the seventy-fifth (75th) business-day of this period shall be referred to as the "Asbestos Abatement Deadline."
 2. Complete the Asbestos Abatement Work specified for the Phase I work (Weekend Phase's at the Ground Floor Sheriff's Control Center and First Floor Civil Division Office 107) at the Rotunda Building over no more than six (6) weekend workshift periods. The end of the Sunday of any weekend period utilized shall be referred to as the "Asbestos Abatement Deadline" for that Scope of Work.
 3. The start of the seventy-five (75) business-day period and six (6) weekend workshift period shall be determined by a two-week Notice-to-Proceed to be issued by the Owner.
 4. Complete all restoration Work specified herein or otherwise necessary to restore damage or loss of value caused by the Contractor's activities by the end of the twentieth (20th) business-day following completion of Phase IA, Phase 1B and Weekend Phases of the overall project. The end of this twentieth (20th) business-day of this period shall be referred to as the "Restoration Deadline".
 5. Complete the Asbestos Abatement Work specified for the Phase II work Phase 1A, Phase 1B and Phase 1C) at the Tower Building over a seventy (70) off-hour business-day period. The end of the seventieth (70th) off-hour business-day of this period shall be referred to as the "Asbestos Abatement Deadline."
 6. The start of the seventy (70) off-hour business-day period shall be determined by a two-week Notice-to-Proceed to be issued by the Owner.
 7. Complete all restoration Work specified herein or otherwise necessary to restore damage or loss of value caused by the Contractor's activities by the end of the twentieth (20th) business-day following completion of Phase II of the overall project. The end of this

twentieth (20th) business-day of this period shall be referred to as the “Restoration Deadline”.

8. Weekend and overtime work is not expected on this Project for the Phase I work, except for bagout times to be determined by the Contractor and AST, and will require special notification. Should the Contractor wish to work outside the hours of 7:30 am through 5:30 pm, Monday through Friday, or at any time on a Saturday, Sunday, or legal holiday, it shall notify the Owner and the ASCM at least 24 hours in advance, except in cases of emergency. Weekend, holiday, off-hour, and extended work hours shall be subject to the Owner's prior approval.
9. Weekend and overtime work is expected on this Project for the Phase II work at the Tower Building and the Weekend Phase work at the Rotunda Building and will require no specific Owner's approval except for dates of anticipated work. Each Weekend Phase is expected to be completed between a Friday evening and a Sunday evening.

1.5 DOCUMENTS

The current issue of each document incorporated by reference herein shall govern. Where conflict among requirements or with the specification exists, the more stringent requirements shall apply.

A. OSHA regulations: Provide special attention the following:

1. CFR 1910 (general industry)
2. CFR 1910.134 (respiratory protection)
3. CFR 1910.141 (sanitation)
4. CFR 1910.300-399 (electrical)
5. CFR 1910.1001 (asbestos)
6. CFR 1910.1200 (hard communication)
7. CFR 1926 (construction safety)
8. CFR 1926.52 (noise)
9. CFR 1926.62 (lead)
10. CFR 1926.1101 (asbestos)
11. CFR 1926.59 (hazard communication)
12. CFR 1926.40-449 (electrical)
13. CFR 1926.450-452 (ladders and scaffolding)

B. EPA regulations; Provide special attention to the following:

1. NESHAP - National Emission Standards for Hazardous Air Pollutants. 40 CFR 61, Subparts A (General Provisions, Sections 01-10) and M (Asbestos, Sections 140-157).
2. AHERA - Asbestos-Containing Materials in School Rule 40 CFR 763, Subpart E.

C. DOT regulations; Provide special attention to the Hazardous Materials Regulations, 49 CFR 171-180, in particular:

1. 49 CFR 171.14(b)(4) (placarding)
2. 49 CFR 172.300-308, 324 (marking)
3. 49 CFR 174.400, 466 (labeling)
4. 49 CFR 172.500, 504, 560 (placarding)

D. Other Standards

1. American National Standards Institute
 - a. ANSI Standard Z9.2 Fundamentals Governing the Design and Operation of Local Exhaust Systems.
 - b. ANSI Standard A40.8 National Plumbing Code.
2. National Fire Protection Association
3. NFPA 70 National Electrical Code
4. NFPA 70E Standard for Electrical Safety Requirements for Employee Workplaces.

E. New Jersey Regulations

12:120 and N.J.A.C. 8:60 (licensing).
7:26-1 et.seq. (waste transport).
N.J.A.C. 5:23-8 (New Jersey Asbestos Hazard Abatement Subcode).

1.6 DEFINITIONS

- A. The definitions utilized in this Section of these Specifications are verbatim with those of the New Jersey Asbestos Hazard Abatement Subcode of the New Jersey Uniform Construction Code, otherwise referred to as "Subchapter 8" or the "Subcode" (N.J.A.C. 5:23-8).

1.7 SUBMITTALS

Approval by the ASCM of the following submittals is required before initiation of any work of this section:

- A. Work schedule and plan identifying firm start and end dates, the hours to be worked on a daily basis, and the Contractor's plans for complete the Work, including:
1. Scope of Work; Defined in written and graphic form.
 2. Sequencing; Sequencing of asbestos work.
 3. Shifts; Length and projected times of day of work shifts.
 4. Interfacing; Interface of trades involved in the work.
 5. Special procedures; A detailed description of any proposed methods of special asbestos abatement procedures, such as glovebag work, mechanical flooring removal, etc., where used. Submit manufacturer's technical specifications and product description literature for the methods and equipment used.
- B. Copies of all notifications as required by these Specifications including identification of the Contractor's waste hauler, the hauler's NJDEP identification number, and the intended disposal site of the contaminated wastes, and all applicable permits.

- C. Copies of the Contractor's New Jersey Asbestos "A" license and respiratory protection program.
- D. The name of the testing laboratory providing the Contractor's OSHA compliance monitoring.
- E. The name and qualifications of the individual who will act as the project supervisor during the asbestos abatement portion of this Project.
- F. Information, including copies of applicable certificates and licenses from training agencies and/or manufacturers, concerning the qualifications of the Contractor, and Subcontractor, either's personnel, relative to their ability to execute the electrical, plumbing, and mechanical installation or dismantlement directly specified or otherwise necessary to complete the specified Work.
- G. Material Safety Data sheets for all hazardous chemicals to be used on the Project.
- H. Obtain any required building permits from the local enforcement agency and submit all required notifications, including but not necessarily limited to those required by N.J.A.C. 5:23-8.5, 40 CFR 61, N.J.A.C. 7:26-2.12 and N.J.A.C. 12:120.7 and 8:60.7. The Contractor shall provide copies of all permits and/or notification submissions to the Owner and the Owner's consultant prior to the commencement of the Work. The Contractor shall bear the costs of any and all permits, notifications and amendments.**
- I. The Contractor shall also submit any required paperwork to the Construction Official for any Temporary Certificates of Occupancy/Approval or Final Certificates of Occupancy/Approval as it relates to Asbestos Abatement at no additional cost to the Owner.**

1.8 PERFORMANCE REQUIREMENTS

- A. Project/site conditions
 - 1. Restore the Work area(s) and auxiliary areas utilized during abatement to conditions equal to or better than original. Any damages or loss of value caused during the performance of asbestos abatement or other activities shall be repaired by the Contractor to the satisfaction of the Owner within ten (10) business days after completion of any Phase and at no additional expenses to the Owner.

PART 2 - PRODUCTS

2.1 PRODUCTS - GENERAL

- A. Deliver all materials in the original packages, containers, or bundles, bearing the name of the manufacturer, the brand name and any Material Safety Data Sheets which pertain to the materials.
- B. Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.
- C. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Materials that become contaminated with asbestos shall be disposed of in accordance with applicable regulations.
- D. No materials, equipment or tools belonging to the Owner shall be used by the Contractor, except in case of an emergency and upon explicit authorization by the Owner.

2.2 MATERIALS

- A. All materials on this Project must meet the requirements of the Subcode.
- B. For work area preparation, utilize materials (e.g., polyethylene sheeting, lumber, etc.) rated to be fire retardant, as tested by ASTM Standard E-84. Additionally, utilize polyethylene sheeting conforming to the requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Firms.

2.3 TOOLS AND EQUIPMENT

- A. Utilize tools and equipment meeting the requirements of the Subcode.

PART 3 - EXECUTION

3.1 WORK AREA PREPARATION - GENERAL

- A. Provide for adequate lighting during all phases of the set up, abatement, clearance and following the work. The Contractor shall provide an adequate quality and quantity of “string”-type lighting for use during all work herein.
- B. Post adequate warning signs denoting the potential danger of airborne asbestos at designated entrances to work areas including, as a minimum, those described in N.J.A.C. 5:23-8 the New Jersey Asbestos Hazard Abatement Subcode, and State occupational safety and health and fire safety regulations (where applicable), and shall prevent access to posted areas by unauthorized or inadequately protected persons.
- C. Maintain adequate portable fire extinguisher equipment within the work area meeting at least the requirements of 29 CFR 1910.157 and State occupational safety and health regulations and fire safety regulations.
- D. Clean surfaces of contaminated containers and equipment by wet sponging and/or HEPA vacuuming before moving them to uncontaminated areas.

3.2 DISPOSAL AND WASTE TRANSPORT

- A. Provide a copy of the waste manifest indicating the chain of custody, final disposal site and date to the Owner for each waste container or truck containing asbestos-containing or asbestos-contaminated waste within 15 days from when the container or truck leaves the worksite.
- B. Promptly containerize debris. Maintain waste in a secure waste container location arranged with the Owner.

3.3 WORK AREA ISOLATION AND PROCEDURES

- A. Complete the asbestos abatement removal specified for the Phase I Rotunda Building (Phase 1A and Phase 1B) utilizing no more than twenty-five (25) full work area enclosures established and maintained in accordance with N.J.A.C. 5:23-8.15 “Asbestos Hazard Abatement Projects”, N.J.A.C. 5:23-8.19 “Abatement in Occupied Buildings” and these Specifications.
- B. Complete the asbestos abatement removal specified for the Phase II Tower Building (Phase 1A, Phase 1B and Phase 1C) utilizing no more than five (5) full work area enclosures established and

- maintained in accordance with N.J.A.C. 5:23-8.15 "Asbestos Hazard Abatement Projects", N.J.A.C. 5:23-8.19 "Abatement in Occupied Buildings" and these specifications.
- C. Complete the work specified for the assistance in the O&M ceiling tile removal, the O&M fastening/drilling and O&M repair work in accordance with N.J.A.C. 5:23-8.14 "Operations and Maintenance Activities" and these Specifications. No specific phases have been defined for the O&M work. O&M work may take place at any time during the overall project in conjunction with the General Contractor's schedule.
 - D. Complete the floor tile/mastic removal work specified for Room 701 on the 7th Floor and the Elevator servicing the 14th to 16th Floors of the Tower Building in accordance with N.J.A.C. 5:23-8.20 "Removal of Non-Friable Materials" and these Specifications utilizing an exclusion method available pursuant to the New Jersey Asbestos Licenses and Permits.
 - E. HVAC units within or servicing the work areas shall be shut-down for the duration of the work,
 - F. During any occupied abatement work, the AST shall gather 1 air sample/10,000 square feet of occupied building space. The AST shall also gather 1 air sample within each work area enclosure during removal activities as part of this project.
 - G. A letter identifying the asbestos abatement project shall be provided to building occupants twenty (20) days prior to the asbestos abatement start. This 20-Day Occupant Notice shall be posted 7 days prior to abatement.

3.4 NEGATIVE AIR FILTRATION UNIT INSTALLATION AND OPERATION

- A. Exhaust all negative air filtration units to the exterior of the building utilizing a form fitting manifold.
- B. At least one negative air filtration unit of minimum rated 1800 CFM capacity shall be installed in each full work area enclosure as a back-up unit.
- C. During occupied abatement work, maintain negative pressure differential and 0.05 in W.C. within each full work area enclosure in accordance with N.J.A.C. 5:23-8.19. Pressure differential shall be monitored at the decontamination units and at any interior make-up air locations by digital monometers with continuous printout.
- D. Maintain a minimum of four air changes per hour within all work areas. Air changes to be verified and field tested by the AST.

3.5 INSTALLATION OF SEPARATION BARRIERS AND OCCUPANT TUNNELS

- A. Where the Drawings or these Specifications indicate a separation barrier or occupant "access tunnel" is to be installed, construct the separation barriers in compliance with the following requirements and as indicated in Section 3.7, C and D.
- B. Utilize minimally ½" plywood sheeting for all separation barriers constructed as part of this Project. Install plywood over a framework of 2" x 4" lumber studding.
- C. Install lumber studs horizontally across the top (i.e., at ceiling level) and bottom (i.e., at floor level) of the span to be sealed. Install additional studding shall be installed vertically across

- the span at 16" on center, except as necessary to leave a minimally 3' x 6' opening in the framework per (D).
- D. Fasten the plywood sheeting to the lumber framework, sized to minimize seams. If the Drawings or Specifications specify that the barrier be installed with a "kick-out" hatch, cover the hatch with a single piece of plywood sheeting. Attach the kick-out hatch to the framework in a manner which will permit the hatch to be forcibly removed in the event that emergency egress by Occupants utilizing the "access tunnels" or is needed by the workers from the work site (e.g., utilize duct tape to hold the plywood in place).
 - E. Utilize silicone caulk to seal all of the seams of the barrier with the exception of the kick-out hatch seams.
 - F. Install two independently affixed layers of polyethylene sheeting on both sides of the separation barrier (i.e., four sheets of polyethylene). Utilize spray paint to mark the location of the kick-out hatch on the work site side of the separation barrier. In any location where a barrier is constructed to the exterior to the building, the outer layer of polyethylene sheeting shall be reinforced.
 - G. In those locations where the Drawings or these Specifications indicate a separation barrier with a lockable door, modify the barrier specified as follows:
 - H. Omit the opening within the framework for the kick-out hatch and leave an opening large enough to construct a plywood door.
 - I. Install the door with commercially-available hardware installed from the work site side of the barrier. Provide a lock and hasp to enable the door to be locked at all times that the Contractor is not in the work area.
 - J. Prepare the side of the door opening facing the work area with three sheets of interlocking polyethylene sheeting flaps, weighted to close.
 - K. The Contractor shall be aware that additional separation barriers may need to be installed at additional locations (i.e., Courtroom Office stairwells, over Elevator Doors, etc.) during the overall Project that are not specifically shown on the drawings due to building usage and waste routes. The Contractor shall complete this additional barrier construction at no additional cost to the Owner.**

3.6 FREESTANDING LUMBER AND POLYETHYLENE WALL CONSTRUCTION

- A. Wherever these Specifications or the Drawings indicate a freestanding lumber and polyethylene wall, install in accordance with the following requirements.
- B. Utilize minimally 1" x 3" lumber studding or furring strips to construct a framework for the wall.
- C. Install horizontal lumber at floor level along the entire interface of the lumber framework with the floor.
- D. Install vertical studding, as necessary to construct the framework, with a vertical lumber stud at each end of the lumber framework. Install this studding so as to extend the upper surface of the horizontal studding at the top of the framework to the ceiling level.

- E. Staple a single layer of six mil polyethylene sheeting to the exterior (i.e., furthest from the work site) of the lumber frame, covering the entirety of the frame. Staple a single layer of six mil polyethylene sheeting to the interior side of the frame, also covering the entirety of the frame. Tape this sheeting to the floor and walls of the opening being sealed, cover with duct tape. During the preparation of any full work area enclosure, install a third sheet of six mil polyethylene sheeting over the framework as the layer of wall sheeting required by N.J.A.C. 5:23-8.14.

3.7 FULL WORK AREA ENCLOSURES – ROTUNDA BUILDING

- A. The General Contractor shall properly and carefully mark-out all locations of plaster impacts as discussed previously at this time or previous to the commencement of the asbestos abatement activities.
- B. Construct the separation barriers and/or separation barriers with lockable doors as indicated on the Drawings in accordance with Section 3.5 and the Subcode.
- C. **Construct two (2) lumber studded and wood framed “access tunnels”, as detailed on the drawings, to allow for the occupants of the First Floor Civil Division Office 107 and the Ground Floor Sheriff’s Control Center spaces on a daily basis. These tunnels shall be constructed of rigid 2’x4’ lumber studding with a plywood shell. The tunnels shall be constructed as a separation barrier, with lumber studding placed 16” on center on all sides including the top, in accordance with Section 3.6 and the Subcode and all seated on Masonite or similar material to protect flooring and allow for proper securing of the tunnels. The Ground Floor tunnel will be at least 3’-3’ 6” wide and 7’ high and placed within the Ground Floor of the Rotunda Building and act as a separation barrier during Phase 1A. The First Floor tunnel will be at least 3’-3’ 6” wide and 7’ high and placed within the First Floor of the Rotunda Building and act as a separation barrier during Phase 1B. These tunnels will also need to be constructed sufficiently to allow for the potential for workers to safely and properly work above or to get over these tunnels for access on either side.**
- D. **These Contractor shall provide adequate string-type lighting and exit signage within each tunnel established on this project. An emergency “kick-out” hatch shall be established within each tunnel as detailed in Section 3.5.**
- E. **The Ground Floor Sheriff’s Control Center spaces and the First Floor Civil Division Office 107 spaces (Weekend Phases) will be completed (over no more than a six (6) separate weekend periods as previously discussed) at a time when the County can vacate the spaces properly during each Weekend Phase. The remainder of the Rotunda Building will be vacated of all County personnel, visitors and the General Contractor (and Sub Contractors) for the duration of the Phase I work therein.**
- F. Construct the decontamination unit(s) as indicated on the Drawings as necessary to construct no more than twenty-five (25) full work area enclosures. Six (6) full work area enclosures will be needed to complete the Ground Floor Sheriff’s Control Center spaces and the First Floor Civil Division Office 107 spaces once these are made available (Weekend Phases). The decontamination unit(s) can be constructed of lumber studding and polyethylene sheeting as long as they are behind separation barriers and not within occupied building space.
- G. Wet wipe and HEPA vacuum all surfaces throughout the work area(s).

- H. Install GFCI equipment panels for temporary power. GFCI panel and power source shall both be located outside of the work areas with direction from the Owner. The Contractor shall provide a licensed electrician, with direction from the Owner, to make sure all electrical power to the work area(s) has been de-activated and de-energized as required by the Subcode.
- I. All areas exhibiting carpet within the work area(s) shall be protected. This shall require the Contractor to provide a layer of "Masonite" or equivalent over all carpet locations, to remain in-place, including the duct taping of all seams. This "Masonite" or equivalent shall then be covered with one layer of reinforced polyethylene sheeting and secured in place utilizing minimal seams. Once this is complete, the two layers of polyethylene floor sheeting shall be installed as required by the Subcode.
- J. Prepare all ceiling-mounted equipment throughout the work area(s) with critical barriers. Utilize extreme care when handling live fire/smoke detectors.
- K. Complete work area preparation in accordance with the Subcode including ceiling polyethylene sheeting where necessary. Construct the work area(s) to exclude all live electrical equipment, conduit, etc. from the work area. If any electrical equipment must remain live, it must be prepared with a separation barrier in accordance with the Subcode and Section 3.10.
- L. Install negative air filtration units in accordance with Section 3.5.
- M. Work area enclosures can be made smaller, and more manageable, by connecting plaster removal locations by connecting those work area locations utilizing polyethylene and lumber wall tunnel systems as discussed in Section 3.6.
- N. The Contractor may be required to utilize either man-lifts or erect scaffolding systems to complete the work within the twenty-five (25) full work area enclosures established for the Rotunda Building. The Contractor shall provide shop drawings prepared by a qualified scaffold contractor and approved by a New Jersey-licensed Professional Engineer for the use of any scaffolding systems (if applicable).
- O. All areas exhibiting carpet within the any work area(s) shall be protected. This shall require the Contractor to provide a layer of "Masonite" or equivalent over all carpet locations, to remain in-place, including the duct taping of all seams. This "Masonite" or equivalent shall then be covered with one layer of reinforced polyethylene sheeting and secured in place utilizing minimal seams. Once this is complete, the two layers of polyethylene floor sheeting shall be installed as required by the Subcode.
- P. All workers shall utilize appropriate safety equipment in accordance with applicable OSHA safety codes.
- Q. Following the issuance of a pre-commencement Notice-to-Proceed for each work area by the on-site AST, the Contractor shall begin removal of the plaster wall/ceiling locations, and drilling of core holes, fasteners, etc., as marked out by the General Contractor. Any asbestos-containing pipe insulation located in any work area established shall be removed as part of the overall abatement work including the piping in the 4th Floor Storage areas. As noted earlier in these Specifications, these specific plaster locations are to be clearly marked out by the General Contractor prior to abatement start.

- R. Utilize rigorous care in the application of water to building elements and materials to remain in place following completion of the asbestos abatement work. Care should also be taken to prevent leakage to carpets below polyethylene sheeting throughout the work area(s).
- S. Score/cut the plaster utilizing appropriate equipment and leave as neat and clean an edge as possible on exposed surfaces rendering the exposed plaster as non-friable. Brush encapsulant on all exposed edges of the plaster following removal.
- T. **Complete the removal and disposal of any wall plaster system, and concealed asbestos-containing pipe insulation, associated with the Rotunda Building's Elevator Modernization and Renovations work. This will include the substrate walls behind the elevators within the offices/restrooms that may contain pipe chase spaces potentially concealing asbestos-containing pipe insulation. These walls will be demolished in their entirety and the demolition debris shall be disposed of as asbestos-containing waste. The substrate walls surrounding and making up the Elevator shafts shall remain intact.**
- U. **The Contractor shall be responsible for the removal and disposal of any Elevator door frames in The Rotunda Building, as directed by the General Contractor, in order to properly access any concealed plaster behind these assemblies as necessary.**
- V. Demolish the substrate wall components (i.e., concrete, terra cotta, etc.) throughout the remainder of the Rotunda Building only if the plaster cannot be properly removed from the underlying substrate.
- W. Once bag-out and final cleaning activities have taken place, the Contractor shall proceed with encapsulation. Bag-out activities may occur at any time since the Contractor will control all waste transport routes in the Rotunda Building. The entirety of the work area(s) surfaces shall be encapsulated as indicated in the Subcode.
- X. Upon receipt of final clearance air samples for each work area, the Contractor shall proceed with breakdown and close-out activities.

3.8 FULL WORK AREA ENCLOSURES – TOWER BUILDING

- A. The General Contractor shall properly and carefully mark-out all locations of acoustical plaster impacts as discussed previously at this time or previous to the commencement of the asbestos abatement activities.
- B. **The Work in the Tower Building will be completed over three sub-Phases in Phase II. Phase 1A will include the 1st Floor and 3rd Floor spaces, Phase 1B will include the 5th Floor and 7th Floor spaces and Phase 1C will include the 11th Floor spaces.**
- C. **The General Contractor shall perform the required pre-demolition of the existing Offices spaces on the 3rd and 7th Floors as necessary to allow for the proper construction of the full work enclosure on these floors at the New Stair Tower location and overall Lobby spaces.**
- D. Construct the separation barriers and/or separation barriers with lockable doors as indicated on the Drawings in accordance with Section 3.5 and the Subcode.
- E. Construct the decontamination unit(s) as indicated on the Drawings as necessary to construct no more than five (5) full work area enclosures. The decontamination unit(s) can be

constructed of lumber studding and polyethylene sheeting as long as they are behind separation barriers and not within occupied building space.

- F. Wet wipe and HEPA vacuum all surfaces throughout the work area(s).
- G. Install GFCI equipment panels for temporary power. GFCI panel and power source shall both be located outside of the work areas with direction from the Owner. The Contractor shall provide a licensed electrician, with direction from the Owner, to make sure all electrical power to the work area(s) has been de-activated and de-energized as required by the Subcode.
- H. All areas exhibiting carpet within the any work area(s) shall be protected. This shall require the Contractor to provide a layer of "Masonite" or equivalent over all carpet locations, to remain in-place, including the duct taping of all seams. This "Masonite" or equivalent shall then be covered with one layer of reinforced polyethylene sheeting and secured in place utilizing minimal seams. Once this is complete, the two layers of polyethylene floor sheeting shall be installed as required by the Subcode.
- I. Prepare all ceiling-mounted equipment throughout the work area(s) with critical barriers. Utilize extreme care when handling live fire/smoke detectors.
- J. Complete work area preparation in accordance with the Subcode; no ceiling polyethylene sheeting will be necessary. Construct the work area(s) to exclude all live electrical equipment, conduit, etc. from the work area. If any electrical equipment must remain live, it must be prepared with a separation barrier in accordance with the Subcode and Section 3.10.
- K. Install negative air filtration units in accordance with Section 3.5.
- L. Following the issuance of a pre-commencement Notice-to-Proceed for each work area by the on-site AST, the Contractor shall begin removal of the acoustical plaster ceiling locations, and drilling of core holes, fasteners, etc., as marked out by the General Contractor. Any asbestos-containing pipe insulation located in any work area established shall be removed as part of the overall abatement work. As noted earlier in these Specifications, these specific plaster locations are to be clearly marked out by the General Contractor prior to abatement start.
- M. Utilize rigorous care in the application of water to building elements and materials to remain in place following completion of the asbestos abatement work. Care should also be taken to prevent leakage to carpets below polyethylene sheeting throughout the work area(s).
- N. The Contractor may be required to utilize either man-lifts or erect scaffolding systems to complete the work within the five (5) full work area enclosures established for the Tower Building. The Contractor shall provide shop drawings prepared by a qualified scaffold contractor and approved by a New Jersey-licensed Professional Engineer for the use of any scaffolding systems (if applicable).
- O. All workers shall utilize appropriate safety equipment in accordance with applicable OSHA safety codes.
- P. **Complete the removal and disposal of each asbestos-containing acoustical ceiling plaster system in its entirety in the vicinity of the new Stair Tower location and throughout the Lobby spaces, and any concealed asbestos-containing pipe insulation, associated with each floor as noted in the Specifications (1st Floor, 3rd Floor, 5th Floor, 7th Floor and 11th Floor). The Contractor shall be required to remove both the acoustic layer, the undercoat layer**

and the underlying metal/wooden lathe if the General Contractor deems this necessary at no additional cost to the Owner.

- Q. Complete the removal of the remaining acoustical ceiling plaster applications in the Courtroom's and various Offices on the 1st Floor, 3rd Floor, 5th Floor and 7th Floor and 11th Floor only at the specific locations indicated for the sprinkler installation. These spaces, if not contained within the full work area enclosure, will be completed utilizing Operations & Maintenance (O&M) activities as detailed in Section 3.9. As noted earlier in these Specifications, these specific plaster locations are to be clearly marked out by the General Contractor prior to abatement start and are assumed to be core-type openings from spaces above. This O&M in the adjacent spaces shall be completed during the same overall time period as the full enclosure work.
- R. Complete work area cleaning and bag-out activities. Bag-out activities shall occur during times when the building is at its least occupancy. Off-hour work shall be scheduled only for the bag-out activities and shall be coordinated between the on-site AST and the County of Union as necessary utilizing the freight elevator as appropriate.
- S. Once bag-out and final cleaning activities have taken place, the Contractor shall proceed with encapsulation. The entirety of each work area surfaces shall be encapsulated as indicated in the Subcode.
- T. Upon receipt of final clearance air samples, the Contractor shall proceed with breakdown and close-out activities.

3.9 OPERATIONS AND MAINTENANCE (O&M) ACTIVITIES RELATED TO WALL/CEILING PLASTER SYSTEMS

- A. As noted earlier in these Specifications, these specific plaster locations are to be clearly marked out by the General Contractor prior to abatement start.
- B. All work shall be conducted by licensed asbestos handlers. A competent person/asbestos supervisor shall be present to oversee the work.
- C. Maintain a facility for showering and changing clothes (the decontamination unit constructed for any full work area enclosure within the building structures may be utilized) at the abatement location so that workers can shower after performing asbestos related Work. Maintain the shower of sufficient size, equipped with hot and cold water, soap, and towels so that personnel can properly shower.
- D. Respirators and disposable clothing are to be worn for the duration of the work.
- E. Install localized negative air filtration in the vicinity of the work.
- F. Install "drop-cloth" polyethylene sheeting on floor(s) beneath areas to be impacted.
- G. Perform activity in two person teams. After misting the area with amended water, one person should perform the drilling/anchoring activity while the second person utilizes a HEPA filter equipped vacuum to immediately clean up debris.
- H. Where possible, power tools equipped with HEPA vacuum attachments should be utilized.
- I. After completion of each penetration or cut, and the wet cleaning of the affected area, the hole or cut section shall be encapsulated using a penetrating encapsulant. All openings and

perimeters of openings shall be secured from delamination caused by subsequent work by other trades.

- J. Fasten the fire alarm fixtures, piping, devices or similar hardware (i.e., screws, clips, etc.) properly and securely to any fixture/device/raceway as directed and specified by the General Contractor.

3.10 GLOVEBAG PROCEDURES – OCCUPIED CONDITIONS (IF APPLICABLE)

- A. Provide the following preparatory procedures prior to undertaking the glovebag removal for any uncovered asbestos-containing pipe insulation that is located outside any specific full work area enclosure and is deemed by the General Contractor and Owner as to be “live” and needing to be removed as part of the renovation activities:
- B. Install a local tent enclosure a minimum of five feet from the pipe insulation to be removed. Construct tent enclosure of a minimum of 1 layer of 6 mil polyethylene sheeting and extend from the floor to the ceiling. Then install two independently affixed layers of polyethylene sheeting, on the floor, extending up the wall polyethylene sheeting with the required 12” and 24” overlaps as defined in the Subcode.
- C. **The tent enclosure shall be fitted with the appropriate amount and sized negative air filtration units (HEPA units), as necessary, to ensure a minimum of four (4) air changes per hour and a negative pressure differential of 0.05 W.C. as defined in the Subcode during the removal activities.**
- D. Provide a dedicated shower facility at the Project site for daily use by workers.
- E. Cooperate with the on-site AST so that each of the Contractor's crews that will be performing the glovebag technique may be observed by the AST during the entire preparation, removal, and cleanup of the first glovebag operation they conduct on the project. The AST reserves the right to select the area where this initial operation is to take place, and to witness more than one glovebag procedure.
- F. Provide a sufficient quantity of smoke tubes to smoke test each glovebag within which removal of ACM shall be performed during this Project. Coordinate Work to allow the AST to personally observe each smoke test performed on every glovebag utilized during this Project. If any worker is observed removing ACM within a glovebag which the on-site AST did not personally observe the smoke test, that worker may be immediately ejected from the work site for the duration of the Project at the AST’s discretion.
- G. The AST will observe the operation in order to verify that the proper procedures are being followed, and that the personnel demonstrate knowledge and competence in the glovebag operation. If the observation proves to be satisfactory, the personnel observed will be considered pre-qualified to conduct the glovebag operation. Only personnel pre-qualified in accordance with these procedures will be allowed to conduct the glovebag operation on this Project.
- H. The AST shall have the right to inspect any or all glovebags prior to the removal of any asbestos-containing materials.
- I. Complete removal, work area cleaning, bag-out activities (during times of least occupancy), encapsulation and closeout activities.

3.11 “WRAP & CUT” PIPING REMOVAL (IF APPLICABLE)

- A. Any uncovered asbestos-containing pipe insulation that is located outside any specific work area enclosure and is deemed by the General Contractor and Owner as to be already terminated, to be terminated or “dead” and needing to be removed as part of the renovation activities shall be removed utilizing the “Wrap & Cut” removal method.
- B. Post-OSHA approved asbestos hazard warning signs at the perimeter of the abatement areas. Control access into the secured areas to properly trained and protected personnel only.
- C. Maintain a facility for showering and changing clothes (the decontamination unit constructed for any full work area enclosure within the building structures may be utilized) at the abatement location so that workers can shower after performing asbestos related Work. Maintain the shower of sufficient size, equipped with hot and cold water, soap, and towels so that personnel can properly shower.
- D. The Contractor shall be required to utilize appropriate man-lift equipment, rolling scaffolds or scaffolding to complete the work. Provide shop drawings prepared by a qualified scaffold contractor and approved by a New Jersey-licensed Professional Engineer for the scaffolding systems (if applicable).
- E. All workers shall utilize appropriate safety equipment in accordance with applicable OSHA safety codes.
- F. The Contractor shall utilize two-man teams and utilize non-friable removal methods. Utilize the “Wrap & Cut” removal method by wetting the pipe insulation in question, wrapping the pipe insulation (and the underlying substrate) with two layers of polyethylene sheeting and dismantling and/or cutting into manageable sections for removal and disposal. Remove these dismantled/cut piping sections in a manner so as to not excessively disturb/impact the pipe insulation.
- G. Place material, as noted, in two independently wrapped layers of sealed six mil polyethylene sheeting with OSHA approved warning labels and prepare for proper disposal.

3.12 REMOVAL OF ASBESTOS-CONTAINING 9” x 9” FLOOR TILE AND ASSOCIATED MASTIC

- A. Maintain a facility for showering and changing clothes shall be available at the abatement location so that workers can shower after performing asbestos related Work. Maintain the shower of sufficient size, equipped with hot and cold water, soap, and towels so that personnel can properly shower.
- B. Complete the removal of the floor tile and associated mastic utilizing no more than two (2) work area enclosures.
- C. Install critical barriers over all windows, doorways, etc. in the work area as necessary.
- D. Install negative air filtration at a rate of four (4) air changes per hour within the work area.
- E. Install three sheets of interlocking polyethylene sheeting weighted to close over the entrance(s) to each work area and prepare critical barriers over any equipment/supplies that remain in any work area.

- F. Carefully remove any carpeting overlaying floor tile and dispose of as general construction debris. If any tiles adhere to the carpet, then the carpet shall be disposed of as asbestos-containing waste.
- G. Perform the floor tile/mastic utilizing “non-friable” removal techniques in accordance with N.J.A.C. 5:23-8.20 and these Specifications. Utilize a removal method which will not cause the building environment to become contaminated with airborne asbestos fibers (i.e., dry-ice, heat machine, etc.). The Contractor shall adhere to the requirements set forth in the New Jersey Department of Health and Senior Services “Removing Vinyl Asbestos Tile in New Jersey” document.
- H. Utilize a commercially-available solvent to remove associated asbestos-containing mastic adherent to any concrete decking and follow manufactures information regarding final floor cleaning to allow for re-flooring work to follow.
- I. Do not encapsulate substrate flooring following floor tile/mastic removal.
- J. The floor tile/mastic removal work area will be subject to clearance air sampling utilizing PCM pursuant to N.J.A.C. 5:23-8.21 et.seq. and N.J.A.C 8:60 and 12:120. Cooperate with the Engineer/Consultant, who will conduct the clearance air sampling. Respond to re-clean of the work area as necessary to achieve compliance with the clearance air sampling of the Subcode and Performance Standard.

3.13 WORK PROCEDURES – LIVE ELECTRICAL EQUIPMENT

- A. **The Contractor shall Post the \$571.00 fee for acquisition of a variation to allow live electrical equipment/conduit within the work area if deemed necessary.**
- B. The ASCM firm, T&M Associates (T&M), shall prepare and submit the variation request to the New Jersey Department of Community Affairs (NJDCA).
- C. Prior to the commencement of the project, provide a licensed electrician to identify and label all live electrical boxes, conduit, equipment, etc. within the work area. Any electrical hazards (open boxes, etc.) shall be repaired at this time.
- D. All live electrical conduit, cables, etc., within the Phase I work area shall be prepared with critical barriers.
- E. Utilize extreme care when working adjacent to live electrical equipment, and use water sparingly.
- F. All workers shall wear rubber gloves and boots while working in close proximity to live electrical equipment.
- G. Utilize only fiberglass or wood ladders; do not utilize aluminum ladders.

3.14 CONTAMINATION CONTINGENCY PLAN (DURING OCCUPIED ABATEMENT WORK)

- A. If the pressure differential drops below 0.05 inches W.C., the following procedures shall be implemented:

1. The Asbestos Safety Technician and the contractor shall investigate and evaluate the engineering controls to determine the source of the pressure loss.
 2. The contractor shall institute corrective action such as: additional sealing, critical barrier maintenance and construction, changing of exhaust unit filters, adjustment of make-up air, operation of additional exhaust units or other necessary measures to reestablish acceptable pressure differential.
- B. If the pressure differential drops below 0.01 inches W.C., the following procedures shall be implemented:
1. The contractor shall cease abatement activity in the work area.
 2. The asbestos safety control monitor shall notify the Owner to evacuate the pressurized space(s). The pressurized space(s) shall include all space outside the work area which is pressurized to maintain the required pressure differential relative to the work area and is isolated from the rest of the building in terms of air flow. The pressurized space may include the entire building in terms of air flow. The pressurized space may include the entire building exclusive of the work area or any part of the building that is pressurized to isolate it from the work area.
 3. The asbestos safety technician and the contractor supervisor shall investigate and evaluate the engineering controls and determine the source of the pressure loss.
 4. The contractor shall institute corrective action such as: additional sealing, critical barrier maintenance and construction changing of exhaust units or other necessary measures to reestablish an acceptable pressure differential.
 5. Reoccupancy shall not be permitted in any area unless a pressure differential of 0.05 inches w.c. or greater is reestablished.
 6. If a pressure differential of 0.05 inches w.c. or greater is not reestablished within 24 hours of the first reading below 0.01 inches w.c., than the building shall be evacuated.
- C. If air levels exceed 0.010 f/cc, the following procedures shall be implemented:
1. The asbestos safety technician and the contractor supervisor shall investigate and evaluate the engineering controls to determine the source of the high air level.
 2. An additional / second PCM air sample shall be taken at each place at which a high air level was obtained. The additional / second PCM sample may be split, and if the result of the air sample is less than or equal to 0.010 f/cc the contingency plan is terminated. If the result of the air sample exceeds 0.010 f/cc, the contractor, in consultation with the asbestos safety control monitor, shall choose the option of cleaning and retesting by PCM analysis or analyzing the split sample by TEM analysis. If the result of the TEM analysis exceeds 0.010 f/cc, than cleaning shall be undertaken.
 3. The decision as to the timing of the cleaning activity shall be made by the asbestos safety control monitor firm in consultation with the Owner and the contractor.
 4. Cleaning shall include, but not be limited to, wet wiping and misting the air. Cleaning the affected areas shall be continued outside of containment and PCM sampling shall also be

continued until the result in the area is equal to or less than 0.010 f/cc by either PCM or TEM analysis.

5. If laboratory analysis of air samples does not yield a reading less than or equal to 0.010 f/cc within 24 hours of receipt of the first test result above 0.010 f/cc, then the building shall be evacuated.
 6. Reoccupancy shall not be permitted in any area where PCM analysis reveals results greater than 0.010 f/cc, unless TEM results indicate asbestos fibers are equal to or less than 0.010 f/cc. In the case of reoccupancy, all air samples used to make the determination to allow reentry shall be analyzed by an accredited laboratory.
- D. If a power outage occurs during active abatement work, the building occupants shall be evacuated until the air samples determine that the occupied spaces are safe, and power has been restored. If a power outage occurs when the building is unoccupied, occupancy will not be permitted until air samples determine that the spaces to be occupied are safe and power has been restored.

3.15 AIR MONITORING – SUBCODE REQUIREMENTS

- A. These Specifications adhere to the progress and clearance air sampling requirements of the Subcode (N.J.A.C. 5:23-8.21 et.seq.).
1. The removal work areas shall be subject to the Subcode’s progress air sampling protocols utilizing Phase Contrast Microscopy (PCM).
 2. Transmission Electron Microscopy (TEM) shall be utilized by the ASCM for clearance sampling in the full work area enclosures, PCM and TEM shall be utilized in other areas as appropriate.
- B. During occupied abatement work, the AST shall also perform additional progress air sampling on the waste route. Certified Asbestos Analyst Registry (AAR) personnel shall analyze all occupied samples collected as part of this project.
- C. During occupied abatement work, in addition to progress sampling at the work area perimeters, the AST will be conducting air tests in occupied areas of the building during the abatement activities and within the work areas. “Occupied” air samples will be initiated at the start of the work each day with results available within four hours of the start of each sample set pursuant to N.J.A.C. 5:23-8.19.4. The contractor shall be prepared to respond immediately to unacceptable results.
- D. Respond to unacceptable progress and clearance air sample results obtained by ASCM during any portion of this Work as required by the Subcode.

3.16 SPECIAL PRECAUTIONS – REQUIREMENTS RELATED TO N.J.A.C. 5:23-8.15 (1) 1

- A. The following section of the New Jersey Asbestos Hazard Abatement Subcode (N.J.A.C. 5:23-8, the “Subcode”) will be addressed further in this Section as a matter of Code:
- (i) Special precautions shall be implemented, where appropriate, including, but not limited to, the following examples:

1. Asbestos abatement projects involving ceiling tile and T-grid components, elevators, carpet, contaminated soil and projects in tunnels, crawl spaces, plumbing access panels, and/or involving live electrical panels or live steam lines are likely to present unique conditions that will require special precautions in addition to the procedures described in this section. In instances where special precautions need to be instituted, they shall be described in plans and specifications.
- B. Complete work area preparation below any acoustical ceiling plaster, ceiling plaster and suspended ceiling tile location to be removed as part of this project in accordance with the Subcode.
- C. Polyethylene sheeting shall not be required on any ceiling system that exhibits asbestos-containing materials and will be removed as part of this Project. However, the following additional requirements will need to be implemented prior to and as part of the asbestos abatement procedures:
- D. Upon completion of work area preparations, including but not limited to separation barrier installation, critical barriers installation, wall polyethylene sheeting, floor polyethylene sheeting, negative air filtration installation, monometer installation, etc. the Contractor shall do the following upon the issuance of a pre-commencement Notice to Proceed issued by the on-site AST:
- E. The Contractor shall begin with the limited dismantlement of any acoustical ceiling plaster systems, ceiling plaster systems and/or suspended ceiling tile systems (all applications and associated wire/wooden lathe and/or metal supporting elements) along perimeter locations only at this time. All components removed at this time, utilizing appropriate wet methods, shall be disposed of as asbestos-containing waste. Any metal that can be cleaned, can be at this time and disposed of as general construction debris.
- F. The Contractor, with the assistance of the on-site AST, shall determine at this time if any additional wall polyethylene sheeting and/or critical barriers need to be installed above any of the acoustical ceiling plaster systems, ceiling plaster systems and/or suspended ceiling tile systems and will do so if necessary at this time.
- G. Once any additional wall polyethylene sheeting and/or critical barriers are installed, the Contractor may commence with complete removal of any acoustical ceiling plaster systems, ceiling plaster systems and/or suspended ceiling tile systems.
- H. Complete removal of any asbestos-containing pipe insulation and/or duct insulation uncovered at this time. All fibrous glass pipe insulation and fibrous glass duct insulation shall also be removed and disposed of as asbestos-containing waste in the same manner as the asbestos-containing pipe insulation/pipe fitting insulation if present in the work areas.
- I. Complete work area cleaning and bag-out activities as detailed in the Subcode and the Asbestos Abatement Specifications.

- J. The entirety of the work area surfaces, including the spaces above the previously removed acoustical ceiling plaster systems, ceiling plaster systems and/or suspended ceiling tile systems, shall be encapsulated as required by the Subcode, the Asbestos Abatement Specifications and this Section.

END OF SECTION 022623

Approved and Released by
Accredited AHERA Project Designer
Kevin Burns



Accreditation Number: NAETI 48245

SECTION 022626 - LEAD-BASED PAINT MANAGEMENT

PART 1 - LEAD-BASED PAINT MANAGEMENT: GENERAL

- 1.1 The Contractor should assume that any number of structural and architectural components and elements associated with the Rotunda Building and Tower Building may exhibit lead-based paint (LBP). No specific lead-based paint (LBP) testing/screening has been performed as part of this project.
- A. The Lead-Based Paint Management Work, or "LBP Work", shall be defined as the Work that encompasses the handling of lead-based paint (LBP), materials to which LBP is applied, and any waste and contamination resulting from the handling or disturbance of LBP, or any other lead-bearing surface.
- B. It is not the intent of this section to define or require a LBP abatement project or LBP hazard abatement project as may be defined by the New Jersey Lead Hazard Evaluation and Abatement Subcode (N.J.A.C. 5:17). Further, these Contract Documents are not meant to require the Contractor to retain a New Jersey-licensed lead abatement contractor to complete the LBP Work as specified. This statement, nor any other in the Contract Documents, does not limit the Contractor's responsibility to act in a manner pursuant to N.J.A.C. 5:17, or any other regulations, depending upon conditions resulting from the Contractor's performance of the Work and other activities.
- C. This section pertains to all Work for this project involving the disturbance of paint, and related dust/debris. All painted surfaces are likely to contain some concentration of lead. There are also surfaces that may be contaminated with lead containing dust and/or debris. As part of the performance of this Work, incorporate appropriate lead paint/dust testing, containment, worker protection and disposal procedures.
- D. Perform all work necessary to carry out the proper removal and disposal of all lead-contaminated waste, in accordance with all applicable laws, codes, rules and regulations and in accordance with the requirements set forth in this section.

1.2 SCOPE OF LBP MANAGEMENT WORK

- A. The Scope of the LBP Work shall include those activities necessary to assure compliance with applicable worker protection and waste disposal standards, and to prevent release of fugitive lead-containing debris and dust generated from the LBP to the surrounding properties. These Specifications delineate no specific activities, but rather the Contractor shall prepare and make available upon request by the Owner or authorized representative a plan sufficient to achieve these requirements.

PART 2 - JOB CONDITIONS

2.1 CONTRACTOR RESPONSIBILITY

- A. Provide investigation as necessary to properly plan LBP Management Work.

2.2 PHASING

- A. Phase the LBP Work in accordance with the overall renovation/demolition Work phasing. The LBP Work is not meant to be an activity separate from the overall renovation/demolition process, but rather an essential element of the renovation/demolition Work to allow for the demolition and any other related Work to be undertaken with proper LBP management.

2.3 METHODS

- A. Provide work methods pursuant to applicable standards and good industry practice. The Contractor's attention is particularly brought to OSHA requirements relative to torch cutting controls and use of HEPA-fitted cutting tool options under certain conditions.

PART 3 - REGULATORY REQUIREMENTS, REFERENCE STANDARDS

- 3.1 Include provisions for the proper containment, removal, and disposal of lead-containing waste, as well as appropriate worker protection in accordance with all applicable laws, codes, rules and regulations pertaining to lead. Applicable guidelines and standards listed in this Scope of Work include, but are not necessarily limited to:

- 1. Code of Federal Regulations (CFR) Publications:

- 29 CFR, Part 1926.62 Lead Exposure in Construction; Interim Final Rule Vol. 58, No. 84

- 40 CFR 61, Subpart A General Provisions (Hazardous Air Pollutants Listing)

- 40 CFR 61.152 Standards for Waste Manufacturing, Demolition, Renovation, Spraying and Fabricating Operations

- 40 CFR 241 Guidelines for the Land Disposal of Solid Wastes

- 40 CFR 257 Criteria for Classification of Solid Waste

- 40 CFR 261 Identification and Listing of Hazardous Wastes

- 40 CFR 262 Standards Applicable to Generators of Hazardous Waste

- 2. Current NJDEP requirements, N.J.A.C. 7:26-1 et.seq.

PART 4 - WORKER PROTECTION

4.1 GENERAL

- A. Treat any surface coating and/or underlying substrate containing lead in any concentration that will be disturbed as a potential lead hazard to workers in accordance with 29 CFR 1926.62, Lead Exposure in Construction. This standard applies to all construction work in which lead in any concentration is present.
- B. Maintain a program in accordance with 29 CFR 1926.62 at minimum and be responsible for protecting and training employees on worker safety, health hazards, etc. relating to lead. This program shall be incorporated into the Contractor's written health and safety plan. The Contractor should consult the following publications and/or competent environmental counsel:

- OSHA - 3079 Respiratory Protection

- OSHA - 3142 Lead in Construction

PART 5 - MANAGEMENT PROCEDURES

5.1 WORK PLANS

- A. Prepare and make available upon request by the Owner or authorized representative task specific Work Plan prior to starting Work detailing how the Contractor shall accomplish each task of work related to the disturbance of any LBP surface or contaminated material. Prepare the Work Plan with the needs, logistics and constraints of the individual job in mind, taking into account such factors as paint removal method, worker safety, proximity to other personnel and/or the public, protection of the environment including containment and air monitoring requirements, condition of the underlying substrate.
- B. Prepare and make available upon request by the Owner or authorized representative the Plan to include methods of minimizing and containing the generation of all dust, including dust generated while cleaning up construction and demolition debris. These methods may include such techniques as wet mopping and/or wiping, HEPA vacuuming or the use of a negative pressure ventilation system where lead dust is generated. Once the Work has been completed and debris has been properly removed from the site, all surfaces shall be free and clear of visible dust. All work areas shall be cleaned on a daily basis at the end of each shift. Particular attention to be paid to fugitive dust which may arise from the sites and contaminate adjacent properties.
- C. At no time perform any Work which may impact upon lead containing material until authorization from the Owner or its authorized representative is obtained.

PART 6 - PROTECTION OF ADJACENT AREAS AND THE ENVIRONMENT

6.1 CONTROL OF CONTAMINATION ON SITE

- A. If it's determined by visual identification that the exterior of this property, or adjacent properties have been contaminated as a result of the Contractor's work, clean the affected premises at no charge to the Owner. The Contractor shall be responsible for all costs incurred by this clean-up activity.

6.2 DISPOSAL REQUIREMENTS

- A. Perform sampling and analysis as may be required to assure the proper and legal handling of the waste. If any chemical analysis or sampling is performed by or on behalf of the Contractor, its Transporter, or its Treatment Storage and Disposal facility (TSD), a copy of such analysis must be provided to the Owner at no additional cost to the Owner. (Note: As prevailing law may allow, painted metal may be designated as recyclable and disposed of at a scrap metal facility for reuse or resale).
- B. Ensure that waste disposal Transporter (be it the Contractor itself or a Subcontractor) warrants and represents possession of all permits and/or licenses required under the Resource Conservation and Recovery Act (RCRA) as well as any state or local permits or licenses required for removal, repackaging, transportation and disposal of hazardous waste.
- C. Treat and dispose hazardous waste materials removed by the waste disposal Subcontractor at an Environmental Protection Agency (EPA) permitted Treatment, Storage and Disposal Facility.
- D. Treat and dispose of all wastes, drums, and other items removed hereunder within sixty (60) days after removal from the site. Ensure that the waste disposal Subcontractor provides completed shipping documents for all hazardous wastes removed, which contain the information required under 40 CFR Part 262 Subpart B (hereinafter the "Manifest Form") and NJDEP requirements. Such Certificates

shall include references to the Manifest Form for the shipment as well as address and EPA identification numbers for the generator facility.

- E. Ensure that all TSD facilities or transporters which the waste disposal Transporter intends to use to treat and/or dispose of hazardous waste are approved for use by the Owner prior to any delivery of waste by the waste disposal Transporter to such TSD facility. The Owner reserves the right to inspect the waste disposal Transporter's equipment storage facility and TSD facility at any time prior to or subsequent to the award of this Contract.
- F. Should any problems arise regarding the TSD facility chosen to accept the waste for treatment and disposal that would require the return of waste to the Owner, or should such TSD facility have violated any environmental regulation which would result in regulatory enforcement action, ensure that the waste disposal Subcontractor immediately notifies the Contractor in writing of such situation, identifies an alternate TSD and obtains written approval from the Owner for disposal at such TSD.
- G. Ensure that the waste disposal Transporter provides completed shipping documents, hereinafter referred to as "Bills of Lading", for all non-hazardous waste removed from Owner property. A Bill of Lading must accompany each waste shipment and must include information regarding the quantity and type of waste, the waste transporter name, and the date of removal from the property.

6.3 TRANSPORTATION REQUIREMENTS

- A. Arrange that the waste disposal Transporter providing waste transportation services possesses a valid Waste Hauler's permit issued pursuant to the NJDEP regulations.
- B. Package and transport all waste shall in accordance with the applicable sections of the Department of Transportation (DOT) regulations.

END OF SECTION 022626

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Salvage of existing items to be reused or recycled.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.5 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- D. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
- E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.
 - 1. Comply with requirements specified in Division 01 Section "Photographic Documentation."

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

- a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
- b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
- c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
- d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
- e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
- f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
- g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Comply with requirements for access and protection specified in "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 5. Dispose of demolished items and materials promptly. Comply with requirements in "Construction Waste Management and Disposal."

- B. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.
- C. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
 - 1. Concrete toppings.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
 - 2. Product Data for Credit IEQ 4.3: For liquid floor treatments and curing and sealing compounds, documentation including printed statement of VOC content.
 - 3. Design Mixtures for Credit ID 1: For each concrete mixture containing fly ash as a replacement for portland cement or other portland cement replacements, and for equivalent concrete mixtures that do not contain portland cement replacements.
- C. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- D. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

1. The contractor shall deliver to the engineer, at the completion of the job, one (1) electronic version of the final field copies of all steel reinforcing shop drawings.
 - E. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.
 1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.
 - F. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 1. Location of construction joints is subject to approval of the Architect.
 - G. Samples: For waterstops and vapor retarder.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installer, manufacturer, and testing agency.
 - B. Welding certificates.
 - C. Material Certificates: For each of the following, signed by manufacturers:
 1. Cementitious materials.
 2. Admixtures.
 3. Form materials and form-release agents.
 4. Steel reinforcement and accessories.
 5. Fiber reinforcement.
 6. Waterstops.
 7. Curing compounds.
 8. Floor and slab treatments.
 9. Bonding agents.
 10. Adhesives.
 11. Vapor retarders.
 12. Semirigid joint filler.
 13. Joint-filler strips.
 14. Repair materials.
 15. Mechanical Splices.
 - D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
 1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
 - E. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
 - F. Field quality-control test and inspection reports.
 - G. Minutes of preinstallation conference.

1.6 QUALITY ASSURANCE

- A. **Installer Qualifications:** A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. **Manufacturer Qualifications:** A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. **Testing Agency Qualifications:** An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- D. **Source Limitations:** Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures through single source from single manufacturer.
- E. **Welding Qualifications:** Qualify procedures and personnel according to AWS D1.4/D1.4M, "Structural Welding Code-Reinforcing Steel."
- F. **ACI Publications:** Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301, "Specification for Structural Concrete."
 - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
 - 3. ACI 216, "Guide for Determining Fire Endurance of Concrete Elements".
- G. **Concrete Testing Service:** Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- H. **Mockups:** Cast concrete slab-on-grade and formed-surface panels as required by the Architect/owner to demonstrate typical joints, surface finish, texture, tolerances, and standard of workmanship.
 - 1. Build panel approximately 200 sq. ft. (18.6 sq. m) for slab-on-grade and 100 sq. ft. (9.3 sq. m) for formed surface in the location indicated or, if not indicated, as directed by Architect.
 - 2. Approved panels may become part of the completed Work if undisturbed at time of Substantial Completion.
- I. **Preinstallation Conference:** Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
 - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.

- b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete subcontractor.
 - e. Special concrete finish subcontractor.
2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 1. Plywood, metal, or other approved panel materials.
 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
 - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
 - c. Structural 1, B-B or better; mill oiled and edge sealed.
 - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.
- E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

- G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- H. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- I. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
 - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than [25] [60] <Insert number> percent.
- B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- C. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- D. Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM A 615/A 615M, Grade 60 (Grade 420) ASTM A 706/A 706M, deformed bars, assembled with clips.
- E. Plain-Steel Wire: ASTM A 82 /A 82M, [as drawn] [galvanized].
- F. Deformed-Steel Wire: ASTM A 496/A 496M .
- G. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.
- H. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/ A 497M, flat sheet.

2.3 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut bars true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

- C. Mechanical Splices: For splicing reinforcing bars, splice material must conform with testing set forth in ASTM 1034/1034M, and shall develop in tension or compression, as required, at least 125% of the specified yield strength of the bar.

2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I [II] [I/II] [III] [V], color as indicated on Architectural Contract documents. Supplement with the following:
 - a. Fly Ash: ASTM C 618, Class C or F.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
 - 2. Blended Hydraulic Cement: ASTM C 595, Type [IS, portland blast-furnace slag] [IP, portland-pozzolan] [I (PM), pozzolan-modified portland] [I (SM), slag-modified portland] cement.
- B. Normal-Weight Aggregates: ASTM C 33, Class [3S] [3M] coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: 3/4 inch (19 mm) nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M and potable.

2.5 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
 - 7. Watertight Concrete and Reinforcement Corrosion Protection Admixture: Ipanex, IPA Systems, Inc.

2.6 VAPOR RETARDERS

Refer to Architectural Documents.

2.7 FLOOR AND SLAB TREATMENTS

Refer to Architectural Documents.

2.8 LIQUID FLOOR TREATMENTS

Refer to Architectural Documents for all floor treatment requirements.

2.9 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Axim Italcementi Group, Inc.; CATEXOL CimFilm.
 - b. BASF Construction Chemicals - Building Systems; Confilm.
 - c. ChemMasters; SprayFilm.
 - d. Conspec by Dayton Superior; Aquafilm.
 - e. Dayton Superior Corporation; Sure Film (J-74).
 - f. Edoco by Dayton Superior; BurkeFilm.
 - g. Euclid Chemical Company (The), an RPM company; Eucobar.
 - h. Kaufman Products, Inc.; Vapor-Aid.
 - i. Lambert Corporation; LAMBCO Skin.
 - j. L&M Construction Chemicals, Inc.; E-CON.
 - k. Meadows, W. R., Inc.; EVAPRE.
 - l. Metalcrete Industries; Waterhold.
 - m. Nox-Crete Products Group; MONOFILM.
 - n. Sika Corporation; SikaFilm.
 - o. SpecChem, LLC; Spec Film.
 - p. Symons by Dayton Superior; Finishing Aid.
 - q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
 - r. Unitex; PRO-FILM.
 - s. Vexcon Chemicals, Inc.; Certi-Vex Envio Set.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Anti-Hydro International, Inc.; AH Clear Cure WB.
 - b. BASF Construction Chemicals - Building Systems; Kure-N-Seal WB.
 - c. ChemMasters; Safe-Cure & Seal 20.
 - d. Conspec by Dayton Superior; Cure and Seal WB.
 - e. Cresset Chemical Company; Crete-Trete 309-VOC Cure & Seal.
 - f. Dayton Superior Corporation; Safe Cure and Seal (J-18).
 - g. Edoco by Dayton Superior; Spartan Cote WB II.

- h. Euclid Chemical Company (The), an RPM company; Aqua Cure VOX; Clearseal WB 150.
- i. Kaufman Products, Inc.; Cure & Seal 309 Emulsion.
- j. Lambert Corporation; Glazecote Sealer-20.
- k. L&M Construction Chemicals, Inc.; Dress & Seal WB.
- l. Meadows, W. R., Inc.; Vocomp-20.
- m. Metalcrete Industries; Metcure.
- n. Nox-Crete Products Group; Cure & Seal 150E.
- o. Symons by Dayton Superior; Cure & Seal 18 Percent E.
- p. TK Products, Division of Sierra Corporation; TK-2519 WB.
- q. Vexcon Chemicals, Inc.; Starseal 309.

2.10 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, [epoxy resin with a Type A shore durometer hardness of 80] [aromatic polyurea with a Type A shore durometer hardness range of 90 to 95] per ASTM D 2240.
- C. Bonding Agent: ASTM C 1059/C1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Reglets: Fabricate reglets of not less than 0.022-inch- (0.55-mm-) thick, galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- F. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.034 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.11 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested according to ASTM C 109/C 109M.

- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.
1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
 4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

2.12 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume may be used to reduce the total amount of portland cement. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash: 25 percent.
 2. Combined Fly Ash and Pozzolan: 25 percent.
 3. Ground Granulated Blast-Furnace Slag: 50 percent.
 4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.13 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Concrete Toppings: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: As indicated on contract documents.
 2. Minimum Cementitious Materials Content: 500 lb/cu. yd. (297 kg/cu. m).
 3. Slump Limit: 4 inches (100 mm) plus or minus 1 inch (25 mm).
 4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch (19-mm) nominal maximum aggregate size for slabs exposed to freeze and thaw only.
 5. Air Content: Do not allow air content of troweled finished toppings to exceed 3 percent.

6. Steel-Fiber Reinforcement: Add to concrete mixture as indicated on contract documents according to manufacturer's written instructions.

2.14 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.15 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C116M, and furnish batch ticket information.
 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities per Architectural documents and designated by ACI 347 as abrupt or gradual, as follows:
 1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
 2. Class B, 1/4 inch (6 mm) Class C, 1/2 inch (13 mm) for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

Retain option in first subparagraph below if adopting recommendation of ACI 347. ACI 301 requires concrete to reach its specified compressive strength.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.

2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 SHORES AND RESHORES

A. Comply with ACI 318 (ACI 318M), ACI 347 and ACI 301 for design, installation, and removal of shoring and reshoring.

1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarders according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches (150 mm) and seal with manufacturers recommended tape.

B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarders according to manufacturer's written instructions.

C. Granular Course: Cover vapor retarder with granular fill, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch (0 mm) or minus 3/4 inch (19 mm).

3.6 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Weld reinforcing bars according to AWS D1.4/D1.4M, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.7 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
 2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 WATERSTOPS

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.
- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.9 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.10 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view as indicated on Architectural documents.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, to be covered with a coating or covering material applied directly to concrete as indicated on Architectural documents.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.11 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in one direction.
1. Apply scratch finish to surfaces indicated and to receive concrete floor toppings and to receive mortar setting beds for bonded cementitious floor finishes and as indicated on Architectural documents.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
1. Apply float finish to surfaces indicated and to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo and as indicated on Architectural documents.
- D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces indicated and exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system and as indicated on Architectural documents.
 2. Finish on-grade and supported surfaces to the applicable minimum following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface. The contractor shall supply floor leveling material and other corrective measures in areas where floor finish provisions exceed the flatness and levelness requirements. Per ACI 302.1R, F(L) requirements should only be applied to slabs-on-ground that are level and suspended slabs that are both level and shored.
 - a. For carpeted slabs, specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
 - b. For thin floor coverings, specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
 - c. For thin floor coverings, specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
 - d. For very flat floors for high speed forklifts, air pallets, and ice and roller rinks, specified overall values of flatness, F(F) 45; and of levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 24.
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated and where ceramic or quarry tile is to be installed by either thickset or thin-set method and as indicated on Architectural documents. While concrete is still plastic, slightly scarify surface with a fine broom.
1. Comply with flatness and levelness tolerances for trowel finished floor surfaces.

- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
- G. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate or aluminum granule finish where indicated and to concrete stair treads, platforms, and ramps. Apply according to manufacturer's written instructions and as follows:
 - 1. Uniformly spread dampened slip-resistive aggregate or aluminum granules over surface in one or two applications. Tamp aggregate flush with surface, but do not force below surface.
 - 2. After broadcasting and tamping, apply float finish.
 - 3. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate or aluminum granules.
- H. Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces according to manufacturer's written instructions and as follows:
 - 1. Uniformly apply dry-shake floor hardener per manufacturer's recommendations.
 - 2. Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader, and embed by power floating. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.
 - 3. After final floating, apply a trowel finish. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.

3.12 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.13 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
 - 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.14 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
 - 1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 - 2. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.
- B. Polished Concrete Floor Treatment: Apply polished concrete finish system to cured and prepared slabs to match accepted mockup.
 - 1. Machine grind floor surfaces to receive polished finishes level and smooth and to depth required to reveal aggregate to match approved mockup.
 - 2. Apply penetrating liquid floor treatment for polished concrete in polishing sequence and according to manufacturer's written instructions, allowing recommended drying time between successive coats.
 - 3. Continue polishing with progressively finer grit diamond polishing pads to gloss level to match approved mockup.
 - 4. Control and dispose of waste products produced by grinding and polishing operations.
 - 5. Neutralize and clean polished floor surfaces.
- C. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

3.15 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least six months. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.16 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete, Limit cut depth to 3/4 inch (19 mm). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.17 FIELD QUALITY CONTROL

- A. Except as otherwise indicated on drawings or specified herein, all work under this Section shall conform to applicable requirements of the local Building Code and regulations of all government authorities having jurisdiction, applicable State Code, and ACI 318.
- B. Testing and Inspecting: Engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and to prepare and submit reports.
- C. Inspections:
1. Steel reinforcement placement.
 2. Steel reinforcement welding.
 3. Headed bolts and studs.
 4. Verification of use of required design mixture.
 5. Concrete placement, including conveying and depositing.
 6. Curing procedures and maintenance of curing temperature.
 7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
 5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 6. Compression Test Specimens: ASTM C 31/C 31M, and either ASTM C617 (Bonded Caps) or ASTM C1231 (Unbonded Caps).
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
 - c. Cast and field cure additional sets of two standard cylinder specimens for construction sequencing purposes for each composite sample.
 7. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

- a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
 - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
 10. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
 11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 12. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
 13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- E. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 24 hours of finishing.

3.18 PROTECTION OF LIQUID FLOOR TREATMENTS

- A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 033000

SECTION 051200 – STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes:

1. Structural steel.
2. Architecturally exposed structural steel.
3. Grout.

- B. Related Sections:

1. Division 01 Section "Quality Requirements" for independent testing agency procedures and administrative requirements.
2. Division 05 Section "Architecturally Exposed Steel Framing" for additional requirements for Architecturally Exposed Structural Steel.
3. Division 05 Section "Steel Decking" for field installation of shear connectors through deck.
4. Division 05 Section "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame, miscellaneous steel fabrications, and other metal items not defined as structural steel.
5. Division 05 Section "Metal Stairs."
6. Division 09 painting Sections and Division 09 Section "High-Performance Coatings" for surface preparation and priming requirements.
7. Division 13 Section "Metal Building Systems" for structural steel.

1.3 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- B. Architecturally Exposed Structural Steel: Structural steel designated as architecturally exposed structural steel in the Contract Documents.
- C. Heavy Sections: Rolled and built-up sections as follows:
 1. Shapes included in ASTM A 6/A 6M with flanges thicker than 1-1/2 inches (38 mm).
 2. Welded built-up members with plates thicker than 2 inches (50 mm).
 3. Column baseplates thicker than 2 inches (50 mm).

1.4 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering design by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.
 - 1. Select and complete connections using schematic details indicated and AISC 360.
 - 2. Use ASD; data are given at service-load level.
- B. Moment Connections: Type PR, partially and FR, fully restrained.
- C. Construction: As indicated on Contract Documents.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
 - 2. Laboratory Test Reports for Credit IEQ 4: For primers, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Shop Drawings: Show fabrication of structural-steel components. The contractor shall deliver to the engineer, at the completion of the job, one (1) electronic version of the final field copies of all steel erection drawing shop drawings.
 - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - 2. Include embedment drawings.
 - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
 - 5. For structural-steel connections indicated to comply with design loads, include structural design data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing, including the following:
 - 1. Power source (constant current or constant voltage).

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer, Fabricator, Professional Engineer, and Testing Agency.

- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Mill test reports for structural steel, including chemical and physical properties.
- E. Product Test Reports: For the following:
 - 1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 - 2. Direct-tension indicators.
 - 3. Tension-control, high-strength bolt-nut-washer assemblies.
 - 4. Shear stud connectors.
 - 5. Shop primers.
 - 6. Nonshrink grout.
- F. Source quality-control reports.

1.7 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- B. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement P3 or SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.
- D. Comply with applicable provisions of the following specifications and documents:
 - 1. AISC 303.
 - 2. AISC 341 and AISC 341s1.
 - 3. AISC 360.
 - 4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- E. Mockups: Build mockups of architecturally exposed structural steel to set quality standards for fabrication and installation.
 - 1. Coordinate finish painting requirements with Division 09 painting Sections.
 - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- F. Preinstallation Conference: Conduct conference at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.9 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than the following:
 - 1. W-Shapes: 60 percent.
 - 2. Channels, Angles 60 percent.
 - 3. Plate and Bar: 25 percent.
 - 4. Cold-Formed Hollow Structural Sections: 25 percent.
 - 5. Steel Pipe: 25 percent.
 - 6. All Other Steel Materials: 25 percent.
- C. W-Shapes: ASTM A 992/A 992M.
- D. Channels, Angles ASTM A 36/A 36M.
- E. Plate and Bar: ASTM A 36/A 36M.

- F. Corrosion-Resisting Structural Steel, Shapes, Plates, and Bars: ASTM A 588/A 588M, Grade 50 (345).
- G. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B structural tubing.
- H. Corrosion-Resisting Cold-Formed Hollow Structural Sections: ASTM A 847/A847M, structural tubing.
- I. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
 - 1. Weight Class: As indicated on documents.
 - 2. Finish: Black, except where indicated to be galvanized.
- J. Steel Castings: ASTM A 216/A 216M, Grade WCB with supplementary requirement S11.
- K. Steel Forgings: ASTM A 668/A 668M.
- L. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.
 - 1. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with plain finish.
- B. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563, Grade DH, (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers with plain finish.
 - 1. Direct-Tension Indicators: ASTM F 959, Type 490 (ASTM F 959M, Type 10.9), compressible-washer type with plain finish.
- C. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers.
 - 1. Finish: Hot-dip zinc coating.
 - 2. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with finish.
- D. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex or round head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
 - 1. Finish: Plain.
- E. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- F. Unheaded Anchor Rods: ASTM F1554, Grade 36 (ASTM F1554 Grade 55, weldable can be substituted for Grade 36) or as indicated on documents.

1. Configuration: Straight and threaded with nut for anchorage.
 2. Nuts: ASTM A 563 (ASTM A 563M) heavy hex carbon steel.
 3. Plate Washers: ASTM A 36/A 36M carbon steel to be used at all column baseplate locations.
 4. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
 5. Finish: Plain.
- G. Headed Anchor Rods: ASTM F 1554, Grade 36 (ASTM F 1554, Grade 55, weldable can be substituted for Grade 36) straight with heavy-hex head, or as indicated on documents.
1. Nuts: ASTM A 563 (ASTM A 563M) heavy hex carbon steel.
 2. Plate Washers: ASTM A 36/A 36M carbon steel to be used at all column baseplate locations.
 3. Washers: ASTM F 436 (ASTM F 436M) Type 1, hardened carbon steel.
 4. Finish: Plain.
- H. Threaded Rods: ASTM A 36/A 36M.
1. Nuts: ASTM A 563 (ASTM A 563M) heavy hex carbon steel.
 2. Washers: ASTM F 436 (ASTM F 436M) Type 1, hardened carbon steel.
 3. Finish: Plain.
- I. Clevises and/or Turnbuckles: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1035.
- J. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.
- K. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.
- L. Expansion Anchors: Type and size as indicated on documents. Wedge type, torque-controlled, with impact section to prevent thread damage and wedge ridges to prevent spinning during installation, complete with required nuts, washers, and manufacturer's installation instructions. All expansion anchors shall be equipped with length identification markings.
1. Interior Use: For use in conditioned environments free from potential moisture, provide carbon steel anchors with zinc plating in accordance with ASTM B633.
 2. Exposed Use: In exposed, potentially wet, or otherwise corrosive environment, provide anchors of Type 304 or Type 316 stainless steel with stainless steel nuts, and washers of matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener. All nuts shall conform to ASTM A563 Grade A unless otherwise specified. Stainless steel anchors shall not be installed in contact with galvanized steel, aluminum, or other galvanically dissimilar metals.
 3. Products: Provide the following:
 - a. Hilti Kwik Bolt TZ Expansion Anchor for installation into concrete.
 - b. Hilti Kwik Bolt III Expansion Anchor for installation into masonry.
- M. Cartridge Injection Adhesive Anchors and rebar doweling: Threaded steel rod or inserts, complete with nuts, washers, polymer, cementitious, epoxy, or hybrid mortar adhesive injection system, and manufacturer's installation instructions. Type and size as indicated on documents.
1. Interior Use: For use in conditioned environments free from potential moisture, provide threaded carbon steel rods conforming to ISO898, ASTM A36, or ASTM A 193, Grade B7 as indicated on documents.
 2. Exposed Use: In exposed, potentially wet or otherwise corrosive environments provide stainless steel anchors, nuts, and washers in accordance with ASTM F593. Provide nuts and washers with matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener. All nuts shall conform with ASTM

F594 unless otherwise specified. Stainless steel anchors shall not be installed in contact with galvanized steel, aluminum, or other galvanically dissimilar metals.

3. Products: Provide the following:
 - a. Hilti HAS or HIT threaded rods or rebar (by others) with Hilti HIT HY-150 Adhesive for anchorage to masonry or stone. Hilti HIT HY-20 Adhesive System for anchorage to brick or concrete masonry (with screen tubes).
 - b. Hilti HAS, HIS threaded rods or rebar (by others) for doweling with Hilti HIT-RE 500-SD Adhesive Anchoring System for anchorage to concrete.

2.3 PRIMER

- A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer, complying with MPI #79 and compatible with topcoat unless otherwise indicated on documents or in Division 09.
- C. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20, ASTM A 780.

2.4 GROUT

- A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.
- B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
 1. Camber structural-steel members where indicated.
 2. Fabricate beams with rolling camber up.
 3. Identify high-strength structural steel according to ASTM A 6/ A 6M and maintain markings until structural steel has been erected.
 4. Mark and match-mark materials for field assembly.
 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Architecturally Exposed Structural Steel: Comply with fabrication requirements, including tolerance limits, of AISC 303 for structural steel identified as architecturally exposed structural steel.
 1. Fabricate with exposed surfaces smooth, square, and free of surface blemishes including pitting, rust, scale, seam marks, roller marks, rolled trade names, and roughness.
 2. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, treating, and shop priming.

- C. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
 - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- D. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.
- E. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- F. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."
- G. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.
- H. Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural steel. Straighten as required to provide uniform, square, and true members in completed wall framing.
- I. Welded Door Frames: Build up welded door frames attached to structural steel. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk, machine screws, uniformly spaced not more than 10 inches (250 mm) o.c., unless otherwise indicated on documents.
- J. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members with reinforcing as indicated on documents.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces.
 - 2. Base-Plate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: [Snug tightened] [Pretensioned] [Slip critical].
- B. Weld Connections: Comply with AWS D1.1/D1.1M[and AWS D1.8/D1.8M] for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
 - 2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC 303 for mill material.
 - 3. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.
 - a. Grind butt welds flush.
 - b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
 - 2. Surfaces to be field welded.
 - 3. Surfaces to be high-strength bolted with slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials.
 - 5. Galvanized surfaces.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 - 1. SSPC-SP 3, "Power Tool Cleaning", unless indicated otherwise on documents or in Division 09.

2.8 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/ A 123M.
 - 1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.
 - 2. Galvanize lintels and shelf angles attached to structural-steel frames and/or located in exterior walls.

2.9 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
 - 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- C. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - 1. Liquid Penetrant Inspection: ASTM E 165.
 - 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - 3. Ultrasonic Inspection: ASTM E 164.
 - 4. Radiographic Inspection: ASTM E 94.
- E. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

1. Bend tests will be performed if visual inspections reveal either a less-than- continuous 360-degree flash or welding repairs to any shear connector.
2. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with Steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments, for compliance with requirements.
 1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
 1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations, to elevations indicated, and according to AISC 303 and AISC 360.
- B. Base, Bearing and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 2. Weld plate washers to top of base plate.
 3. [Snug-tighten] [Pretension] anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel and architecturally exposed structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact

with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Remove erection bolts on welded, architecturally exposed structural steel; fill holes with plug welds; and grind smooth at exposed surfaces.
- G. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
- H. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- I. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
1. Joint Type: [Snug tightened] [Pretensioned] [Slip critical].
- B. Weld Connections: Comply with AWS D1.1/D1.1M[and AWS D1.8/D1.8M] for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
 3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
 4. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.
 - a. Grind butt welds flush.
 - b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.

- B. Bolted Connections: Field-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Field fillet welds will be visually inspected according to AWS D1.1/D1.1M.
 - 1. In addition to visual inspection, all suspect field fillet welds and all field full/partial penetration welds will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.
- D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
 - 1. Perform bend tests if visual inspections reveal either a less-than- continuous 360-degree flash or welding repairs to any shear connector.
 - 2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.
- E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.6 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
- C. Touchup Painting: Cleaning and touchup painting are specified in Division 09 painting Sections.

END OF SECTION 051200

SECTION 053100 - STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Cold-formed metal deck as indicated on drawings and as specified herein.
2. Flashing saddles, sumps, closure members, and cover plates at edges, ends and intersection.
3. Continuous metal screed at edges around the building perimeter, around openings, and as required to prevent leakage of concrete.
4. Metal flashing and closure plates around columns and around the work of other trades which penetrate the deck.
5. Cutting and forming of holes and openings through metal deck, including the reinforcing of deck to support safely both temporary and permanent construction.
6. Supports and/or shoring for metal deck not shown or specified or provided under other sections of this Specification, but necessary for the proper, rigid and safe support of metal deck and of load imposed thereon.
7. Touchup painting in field.

1.3 QUALITY ASSURANCE

- A. American Iron and Steel Institute - Cold-Formed Steel Design Manual; Specification for the Design of Cold-Formed Steel Structural Members.
- B. Steel Deck Institute - Design Manual for composite decks, form decks and roof decks.
- C. American Welding Society - Structural Welding Code.
- D. Design of decking shall be in accordance with AISI Specification for the Design of Cold-Formed Steel Structural Members. Maximum fiber stress in bending, 20,000 psi except where otherwise specified.

1.4 SUBMITTALS

- A. Product Data: Submit copies of manufacturer's latest published literature for materials specified herein for approval and obtain approval before materials are fabricated and delivered to the site.
- B. Certificates: When requested submit certificates attesting to compliance with these specifications for approval. Obtain approval prior to fabrication and shipment of materials.
- C. Shop Drawings: Prepare clear, precise tracings, drawn to scale of 1/8 inch equals 1 foot or larger, indicating

units in plan, and show required details at larger scale. Describe fully the proposed installation procedure and welding to be done.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials specified herein, with manufacturer's name and point of origin, labeled or tagged on materials with each delivery.
- B. Protect materials from contact with earth and protect from detrimental conditions.

1.6 PROJECT CONDITIONS

- A. Protect work in progress from weather and damage. Work damaged shall be removed and replaced when so directed at no additional cost.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Steel Deck:
 - a. Epic Metals Corporation.
 - b. New Millennium Building Systems, LLC.
 - c. Nucor Corp.; Vulcraft Division.
 - d. Roof Deck, Inc.
 - e. United Steel Deck, Inc.
 - f. Valley Joist; Division of EBSCO Industries, Inc.
 - g. Verco Manufacturing Co.

2.2 ROOF DECK

- A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 30, and with the following:
 - 1. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G60 zinc coating.
 - 2. Deck Profile: As indicated or Type NR, narrow rib.
 - 3. Profile Depth: As indicated or 1-1/2 inches.
 - 4. Design Uncoated-Steel Thickness: 0.0295 inch.
 - 5. Span Condition: As indicated or Simple span.
 - 6. Side Laps: Overlapped.

2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 30, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels, if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

3.3 ROOF-DECK INSTALLATION

- A. Fasten floor deck units to steel by not less than 3/4 inch diameter fusion welds spaced 12 inches on center with a minimum of 2 welds per unit.
- B. Fasten roof deck units to steel by not less than 1/2 inch diameter fusion welds spaced 6 inches on center at end laps and 12 inches on center at intermediate supports.
- C. Fasten side laps of adjacent deck units between supports at intervals not exceeding 30 inches on center.
- D. Install and anchor roof deck units to resist gross uplift load of 45 psf at eave overhang and 30 psf for other roof areas.

- E. Temporarily seal joints and openings promptly after installation of decking to prevent entrance of water or foreign matter into cells. Permanent installation of cover plates, taping and sealing shall be done under another division of the specification.
- F. Field Paint: Touchup welds and any abrasions to factory finish with the manufacturer's approved zinc coating or paint.

3.4 REPAIRS AND PROTECTION

- A. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.
 - 1. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.
- B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 053100

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

- 1. Roof rafter framing.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.

- 1. Design Loads: As indicated.
- 2. Roof Rafter Framing: Horizontal deflection of 1/240 of the horizontally projected span.
- 3. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
- 4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of 1/2 inch.

- B. Cold-Formed Steel Framing, General: Design according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions."

1.4 SUBMITTALS

- A. Product Data: For each type of cold-formed metal framing product and accessory indicated.
- B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

1. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:
 1. Steel sheet.
 2. Power-actuated anchors.
 3. Mechanical fasteners.
 4. Vertical deflection clips.
 5. Miscellaneous structural clips and accessories.

1.5 QUALITY ASSURANCE

- A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated.
- C. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- D. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following:
 1. Dale/Incor.
 2. Dietrich Metal Framing; a Worthington Industries Company.

3. MarinoWare; a division of Ware Industries.

2.2 MATERIALS

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
 1. Coating: G90 or equivalent.
- B. Steel Sheet for Vertical Deflection Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
 1. Grade: 50, Class 1 or 2.
 2. Coating: G90.

2.3 ROOF-RAFTER FRAMING

- A. steel rafters: manufacturer's standard c-shaped steel sections, of web depths indicated, or to match existing adjacent construction conditions, unpunched, with stiffened flanges, and as follows:
 1. Minimum Base-Metal Thickness: 0.0329 inch.
 2. Flange Width: 1-5/8 inches, minimum.
- B. Built-up Members: Built-up members of manufacturer's standard C-shaped steel section, with stiffened flanges, nested into a U-shaped steel section joist track, with unstiffened flanges; unpunched; of web depths indicated; and as follows:
 1. Minimum Base-Metal Thickness: 0.0329 inch.
 2. Flange Width: 1-5/8 inches, minimum.

2.4 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 1. End clips.

2.5 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- B. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10

times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.

- C. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

2.6 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035.
- B. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.7 FABRICATION

- A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
 - 4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
 - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
 - 2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Install sealer gaskets to isolate the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 - 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.
- D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- H. Install insulation, specified in Division 07 Section "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
 - 1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 RAFTER INSTALLATION

- A. Install joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Shop Drawings.
- B. Install rafters bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten rafters to both flanges of joist track.
 - 1. Install rafters over supporting frame with a minimum end bearing of 1-1/2 inches.
 - 2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated on Shop Drawings.
- C. Space rafters as follows:
 - 1. Rafter Spacing: As indicated.
- D. Frame openings with built-up rafter headers consisting of nesting rafters, or another combination of connected rafters if indicated.
- E. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

3.5 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Miscellaneous steel framing and supports.
 - 2. Loose bearing and leveling plates.
 - 3. Steel weld plates and angles.
- B. Related Sections:
 - 1. Division 05 Section "Structural Steel".
 - 2. Division 05 Section "Metal Stairs".

1.3 SUBMITTALS

- A. Shop Drawings: Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
- B. Templates: For anchors and bolts.
- C. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Qualification Data: For qualified professional engineer.
- E. Mill Certificates: Signed by manufacturers of stainless-steel certifying that products furnished comply with requirements.
- F. Welding certificates.

1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel."
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1, "Structural Welding Code - Steel."

2. AWS D1.2, "Structural Welding Code - Aluminum."
3. AWS D1.6, "Structural Welding Code - Stainless Steel."

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.6 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 METALS

A. Ferrous Metals:

1. Steel Plates, Shapes, and Bars: ASTM A 36.
2. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
3. Steel Tubing: ASTM A 500, cold-formed steel tubing.
4. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.
5. Slotted Channel Framing: Cold-formed metal channels complying with MFMA-3, 1-5/8 by 1-5/8 inches. Channels made from galvanized steel complying with ASTM A 653, structural steel, Grade 33, with G90 coating; 0.079-inch nominal thickness.
6. Cast Iron: ASTM A 48, Class 30, unless another class is indicated or required by structural loads.

B. Nonferrous Metals:

1. Aluminum Extrusions: ASTM B 221, alloy 6063-T6.
2. Aluminum-Alloy Rolled Tread Plate: ASTM B 632, alloy 6061-T6.
3. Aluminum Castings: ASTM B 26, Alloy 443.0-F.

2.3 FASTENERS

- A. General: Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade, and class required.

- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.
- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
 - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- D. Eyebolts: ASTM A 489.
- E. Machine Screws: ASME B18.6.3.
- F. Lag Screws: ASME B18.2.1.
- G. Wood Screws: Flat head, ASME B18.6.1.
- H. Plain Washers: Round, ASME B18.22.1.
- I. Lock Washers: Helical, spring type, ASME B18.21.1.
- J. Post-Installed Anchors: Torque-controlled expansion anchors.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
 - 2. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.4 MISCELLANEOUS MATERIALS

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI #79.
- B. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.
 - 1. Products:
 - a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
 - b. Carboline Company; Carbozinc 621.
 - c. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
 - d. Sherwin-Williams Company (The); Corothane I Galva Pac Zinc Primer.
 - e. Tnemec Company, Inc.; Tneme-Zinc 90-97.
- C. Galvanizing Repair Paint: SSPC-Paint 20, high-zinc-dust-content paint for regalvanizing welds in steel.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

2.5 FABRICATION

- A. General: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.

1. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
2. Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. Remove welding flux immediately. Finish exposed welds smooth and blended.
3. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.
4. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
5. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, not less than 24 inches o.c.

- B. Miscellaneous Framing and Supports: Provide steel framing and supports not specified in other Sections as needed to complete the Work. Fabricate units from steel shapes, plates, and bars of welded construction. Cut, drill, and tap units to receive hardware, hangers, and similar items.

2.6 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Finish metal fabrications after assembly.
- B. Steel and Iron Finishes:
1. Hot-dip galvanize items as indicated to comply with ASTM A 123 or ASTM A 153 as applicable.
 2. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below for environmental exposure conditions of installed metal fabrications:
 - a. Exteriors (SSPC Zone 1B) and Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - b. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."
 3. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, with edges and surfaces level, plumb, and true.
1. Fit exposed connections accurately together. Weld connections that are not to be left as exposed joints but cannot be shop welded. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication.
 2. Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
 3. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

- B. Touch up surfaces and finishes after erection.
 - 1. Painted Surfaces: Clean field welds, bolted connections, and abraded areas and touch up paint with the same material as used for shop painting.
 - 2. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05500

SECTION 055100 - METAL STAIRS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Preassembled steel stairs with concrete-filled treads.
- 2. Steel tube railings attached to metal stairs.
- 3. Steel tube handrails attached to walls adjacent to metal stairs.

- B. Related Sections:

- 1. Division 03 Section "Cast-in-Place Concrete" for concrete fill for stair treads and platforms.
- 2. Division 06 Section "Miscellaneous Rough Carpentry" for wood blocking for anchoring railings.
- 3. Division 09 Section "Non-Structural Metal Framing" for metal backing for anchoring railings.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design metal stairs, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

- B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

- 1. Uniform Load: 100 lbf/sq. ft..
- 2. Concentrated Load: 300 lbf applied on an area of 4 sq. in..
- 3. Uniform and concentrated loads need not be assumed to act concurrently.
- 4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
- 5. Limit deflection of treads, platforms, and framing members to $L/240$ or 1/4 inch, whichever is less.

- C. Structural Performance of Railings: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

- 1. Handrails and Top Rails of Guards:

- a. Uniform load of 50 lbf/ ft. applied in any direction.
- b. Concentrated load of 200 lbf applied in any direction.
- c. Uniform and concentrated loads need not be assumed to act concurrently.

- 2. Infill of Guards:

- a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
- b. Infill load and other loads need not be assumed to act concurrently.

D. Seismic Performance: Metal stairs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

- 1. Component Importance Factor is 1.5.

1.4 ACTION SUBMITTALS

A. Product Data: For metal stairs and the following:

- 1. Prefilled metal-pan stair treads.
- 2. Abrasive nosings.
- 3. Paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," for class of stair designated, unless more stringent requirements are indicated.

- 1. Preassembled Stairs: Commercial class.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel."

D. Welding Qualifications: Qualify procedures and personnel according to the following:

- 1. AWS D1.1, "Structural Welding Code - Steel."
- 2. AWS D1.3, "Structural Welding Code - Sheet Steel."

1.7 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for metal stairs. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

- C. Coordinate locations of hanger rods and struts with other work so that they will not encroach on required stair width and will be within the fire-resistance-rated stair enclosure.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36.
- B. Steel Tubing: ASTM A 500 (cold formed) or ASTM A 513.
- C. Wire Rod for Grating Crossbars: ASTM A 510.
- D. Cast Iron: Either gray iron, ASTM A 48, or malleable iron, ASTM A 47, unless otherwise indicated.
- E. Uncoated, Cold-Rolled Steel Sheet: ASTM A 1008, structural steel, Grade 25, unless another grade is required by design loads; exposed.
- F. Galvanized-Steel Sheet: ASTM A 653, G90 coating, structural steel, Grade 33, unless another grade is required by design loads.

2.3 NONFERROUS METALS

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.
- B. Aluminum Castings: ASTM B 26, Alloy 443.0-F.
- C. Nickel Silver Castings: ASTM B 584, Alloy UNS No. C97600 (20 percent leaded nickel bronze).

2.4 ABRASIVE NOSINGS

- A. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.

2.5 FASTENERS

- A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.
- B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.

- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
 - 1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for stairs indicated to be shop primed with zinc-rich primer.
- D. Machine Screws: ASME B18.6.3.
- E. Lag Screws: ASME B18.2.1.
- F. Plain Washers: Round, ASME B18.22.1.
- G. Lock Washers: Helical, spring type, ASME B18.21.1.
- H. Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.

2.6 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Shop Primers: Provide primers that comply with Division 09 Section "High-Performance Coatings."
- C. Concrete Materials and Properties: Comply with requirements in Section Division 03 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.

2.7 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
 - 1. Join components by welding unless otherwise indicated.
 - 2. Use connections that maintain structural value of joined pieces.
- B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Form exposed work with accurate angles and surfaces and straight edges.
- F. Weld connections to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. Weld exposed corners and seams continuously unless otherwise indicated.
 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 2 welds: completely sanded joint, some undercutting and pinholes okay.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated. Locate joints where least conspicuous.
- H. Fabricate joints that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

2.8 STEEL-FRAMED STAIRS

A. Stair Framing:

1. Fabricate stringers of steel plates or channels.
 - a. Provide closures for exposed ends of channel stringers.
2. Construct platforms of steel plate or channel headers and miscellaneous framing members as needed to comply with performance requirements.
3. Weld stringers to headers; weld framing members to stringers and headers.
4. Where stairs are enclosed by gypsum board shaft-wall assemblies, provide hanger rods or struts to support landings from floor construction above or below. Locate hanger rods and struts where they will not encroach on required stair width and will be within the fire-resistance-rated stair enclosure.
5. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.

B. Metal-Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements but not less than 0.067 inch.

1. Steel Sheet: Uncoated cold-rolled steel sheet unless otherwise indicated.
2. Directly weld metal pans to stringers; locate welds on top of subtreads where they will be concealed by concrete fill. Do not weld risers to stringers.
3. Shape metal pans to include nosing integral with riser.
4. At Contractor's option, provide stair assemblies with metal-pan subtreads filled with reinforced concrete during fabrication.
5. Provide subplatforms of configuration indicated or, if not indicated, the same as subtreads. Weld subplatforms to platform framing.
 - a. Smooth Soffit Construction: Construct subplatforms with flat metal under surfaces to produce smooth soffits.

2.9 STAIR RAILINGS

- ### A. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.

1. Rails and Posts: 1-5/8-inch-diameter top and bottom rails and 1-1/2-inch-square posts.
 2. Picket Infill: 1/2-inch-square pickets spaced less than 4 inches clear.
- B. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
1. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 2 welds: completely sanded joint, some undercutting and pinholes okay.
- C. Form changes in direction of railings as follows:
1. By bending.
- D. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- E. Close exposed ends of railing members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
1. For non-galvanized railings, provide non-galvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.
- H. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.10 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal stairs after assembly.
- C. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
1. Interior Stairs: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 2. Interior Stairs: SSPC-SP 3, "Power Tool Cleaning."
- D. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- E. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- F. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.
- G. Place and finish concrete fill for treads and platforms to comply with Division 03 Section "Cast-in-Place Concrete."
 - 1. Install abrasive nosings with anchors fully embedded in concrete. Center nosings on tread width.

3.2 INSTALLING RAILINGS

- A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:
 - 1. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with post-installed anchors and bolts.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil. dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 Section "High-Performance Coatings."

END OF SECTION 055100

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Aluminum tube handrails at access flooring locations shown.
- B. Related Sections:
 - 1. Division 05 Section "Metal Stairs" for railing and handrails associated with metal stairs.
 - 2. Division 09 Section "Access Flooring" for steps associated with access flooring.

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Manufacturer's product lines of mechanically connected railings.
 - 2. Railing brackets.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each type of exposed finish required.
 - 1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
 - 2. Fittings and brackets.

3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.

1.5 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 2. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
 - b. Infill load and other loads need not be assumed to act concurrently.

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.
 - 1. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

2.3 ALUMINUM

- A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.
- B. Extruded Tubing: ASTM B 221, Alloy 6063-T5.
- C. Extruded Structural Pipe: ASTM B 429, Alloy 6063-T6.
 - 1. Provide Standard Weight (Schedule 40) pipe unless otherwise indicated.

2.4 FASTENERS

- A. General: Provide the following:
 - 1. Aluminum Railings: Type 304 stainless-steel fasteners.
 - 2. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. Fasteners for Interconnecting Railing Components:
 - 1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
- D. Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
 - 1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.

2.5 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
 - 1. For aluminum railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

- B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.6 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Connections: Fabricate railings with either welded or non-welded connections unless otherwise indicated.
- H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove flux immediately.
 - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- I. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- J. Close exposed ends of railing members with prefabricated end fittings.
- K. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- L. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
 - 1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

- M. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.
- N. For railing posts set in concrete, provide stainless-steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

2.7 ALUMINUM FINISHES

- A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- B. Clear Anodic Finish: AAMA 611, AA-M12C22A41.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
 - 1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.
- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

- A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.
- B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.4 ANCHORING POSTS

- A. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.
- C. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
 - 1. For aluminum pipe railings, attach posts using fittings designed and engineered for this purpose.
- D. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.5 ATTACHING RAILINGS

- A. Anchor railing ends at walls with round flanges anchored to wall construction and welded to railing ends.
- B. Secure wall brackets and railing end flanges to building construction as follows:
 - 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 - 2. For hollow masonry anchorage, use toggle bolts.
 - 3. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.
 - 4. For steel-framed partitions, use toggle bolts installed through flanges of steel framing or through concealed steel reinforcements.

3.6 ADJUSTING AND CLEANING

- A. Clean aluminum by washing thoroughly with clean water and soap and rinsing with clean water.

3.7 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 055213

SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Wood blocking and nailers.
 - 2. Plywood backing panels.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
 - 1. Preservative-treated wood.
 - 2. Fire-retardant-treated wood.
 - 3. Power-driven fasteners.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
 - 3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat all miscellaneous carpentry unless otherwise indicated.
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 2. Design Value Adjustment Factors: Treated lumber shall be tested according ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D 6841.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- C. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
- D. Application: Treat all miscellaneous carpentry unless otherwise indicated.
 - 1. Concealed blocking.
 - 2. Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.
 - 3. Plywood backing panels.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.

3. Cants.
4. Furring.

- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber of any species.
- C. For utility shelving, provide lumber with 15 percent maximum moisture content of eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine; Standard or No. 3 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
- D. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:
 1. Mixed southern pine, No. 2 grade; SPIB.
 2. Eastern softwoods, No. 2 Common grade; NELMA.
 3. Northern species, No. 2 Common grade; NLGA.
 4. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.

2.5 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: DOC PS 1, Exterior, C-C Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.
- B. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153.
- C. Power-Driven Fasteners: NES NER-272.
- D. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.

2.6 MISCELLANEOUS MATERIALS

- A. Flexible Flashing: Self-adhesive butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit.
- B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.
- D. Do not splice structural members between supports unless otherwise indicated.
- E. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- F. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

3.2 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053

SECTION 074113 - BATTEN-SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes batten-seam metal roof panels.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
- B. Shop Drawings:
 - 1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - 2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Sample Warranties: For special warranties.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.

1.7 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.8 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.
 - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Deflection Limits: For wind loads, no greater than 1/180 of the span.
- B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 1680 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 1.57 lbf/sq. ft..
- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 2.86 lbf/sq. ft..
- D. Hydrostatic-Head Resistance: No water penetration when tested according to ASTM E 2140.
- E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
- F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 BATTEN-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panel assembly designed to be installed by covering vertical side edges of adjacent panels with battens and mechanically attaching panels to supports using concealed clips. Include battens and accessories required for weathertight installation.
- B. Wide-Profile, Snap-on-Batten-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and a flat pan between ribs; designed for independent installation by mechanically attaching panels to supports using concealed clips located between panels, engaging the opposite edge of adjacent panels, and installing snap-on battens over panel joints.
 - 1. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Nominal Thickness: 0.022 inch.
 - b. Color: As selected by Architect from manufacturer's full range <Insert color>.
 - 2. Batten Material: Same material, finish, and color as roof panels.

3. Clips: One-piece fixed to accommodate thermal movement.
 - a. Material: 0.028-inch- nominal thickness, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.
4. Panel Coverage: To match existing adjacent roofing.
5. Batten Height: To match existing adjacent roofing.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils thick, specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer when recommended by underlayment manufacturer.
 1. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.
 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.

2.4 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645; cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.

2.5 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 3. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal roof panel manufacturer for application, but not less than thickness of metal being secured.

2.6 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Steel Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
 2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
 - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
 1. Apply over the entire roof surface.
- B. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."

3.4 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Shim or otherwise plumb substrates receiving metal panels.
 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 3. Install screw fasteners in predrilled holes.
 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 5. Install flashing and trim as metal panel work proceeds.
 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
- C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
- D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- E. Batten-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each batten-seam joint at location, spacing, and with fasteners recommended by manufacturer.
1. Install clips to supports with self-drilling fasteners.
 2. Apply battens to metal roof panel seams, fully engaged to provide weathertight joints.
 3. Watertight Installation:
 - a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend by manufacturer as needed to make panels watertight.
 - b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
 - c. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.
- F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal roof panel manufacturer.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.5 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal roof panel installation, including accessories. Report results in writing.
- B. Remove and replace metal roof panels where tests and inspections indicate that they do not comply with specified requirements.
- C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074113

SECTION 075323 - ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Adhered, ethylene-propylene-diene-monomer (EPDM) roofing system.
 - 2. Roof insulation.

- B. Related Requirements:

- 1. Division 06 Section "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
 - 2. Division 07 Section "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
 - 3. Division 07 Section "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.6 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, and other components of roofing system.
 - 2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain components including roof insulation fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.
 - 1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
 - 2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
 - 3. Dynamic Puncture Resistance: Tested in accordance with ASTM D5635 of 20 joules.
 - 4. Static Puncture Resistance: Tested in accordance with ASTM D120 of 19 lbf.
- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Tested by a qualified testing agency to resist uplift pressures as shown on structural drawings:

2.3 EPDM ROOFING

- A. Fabric-Backed EPDM: ASTM D 4637, Type III, uniform, flexible EPDM sheet, laminated to a nonwoven polyester fabric backing except at selvages.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide "Sure-White Fleece Back EPDM Roofing" (nonreinforced) by Carlisle SynTec Incorporated or approved equal.
 - 1. Composite Thickness: 115 mils, nominal.
 - 2. Exposed Face Color: White on black.

2.4 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
- B. Sheet Flashing: 60-mil- thick EPDM, partially cured or cured, according to application.
- C. Protection Sheet: Epichlorohydrin or neoprene nonreinforced flexible sheet, 55- to 60-mil- thick, recommended by EPDM manufacturer for resistance to hydrocarbons, non-aromatic solvents, grease, and oil.
- D. Bonding Adhesive: Manufacturer's standard cold-applied adhesive formulated for compatibility and use with fabric-backed membrane roofing.
- E. Seaming Material: Manufacturer's standard, synthetic-rubber polymer primer and 3-inch- wide minimum, butyl splice tape with release film.
- F. Lap Sealant: Manufacturer's standard, single-component sealant, colored to match membrane roofing.
- G. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.
- H. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- I. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch thick, prepunched.
- J. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening membrane to substrate, and acceptable to roofing system manufacturer.
- K. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, molded pipe boot flashings, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.
 - 1. Provide white flashing accessories for white EPDM membrane roofing.

2.5 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by EPDM roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

- B. Extruded-Polystyrene Board Insulation: ASTM C 578, Type IV, 1.6-lb/cu. ft. minimum density, square edged.
 - 1. Acceptable Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. DiversiFoam Products.
 - b. Dow Chemical Company (The).
 - c. Owens Corning.
 - d. Pactiv Corporation.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches unless otherwise indicated.
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.6 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
 - 1. Modified asphaltic, asbestos-free, cold-applied adhesive.
 - 2. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.
 - 3. Full-spread spray-applied, low-rise, two-component urethane adhesive.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:
 - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
 - 4. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
 - 5. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Install insulation strips according to acoustical roof deck manufacturer's written instructions.

3.3 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.4 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
 - 1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
- G. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:
 - 1. Prime surface of concrete deck with asphalt primer at rate of 3/4 gal./100 sq. ft., and allow primer to dry.
 - 2. Set each layer of insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F of equiviscous temperature.
 - 3. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

- H. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
 - 1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
 - 2. Set each subsequent layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.5 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Adhere fabric-backed roofing over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll membrane roofing and allow to relax before installing.
- B. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer, and allow to partially dry before installing roofing. Do not apply to splice area of roofing.
- D. Hot Roofing Asphalt: Apply a solid mopping of hot roofing asphalt to substrate at temperature and rate required by manufacturer, and install fabric-backed roofing. Do not apply to splice area of roofing.
- E. Fabric-Backed Membrane Adhesive: Apply to substrate at rate required by manufacturer, and install fabric-backed roofing.
- F. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeters.
- G. Apply roofing with side laps shingled with slope of roof deck where possible.
- H. Adhesive Seam Installation: Clean both faces of splice areas, apply splicing cement, and firmly roll side and end laps of overlapping roofing according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing terminations.
 - 1. Apply a continuous bead of in-seam sealant before closing splice if required by roofing system manufacturer.
- I. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing terminations.
- J. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.
- K. Spread sealant or mastic bed over deck-drain flange at roof drains, and securely seal membrane roofing in place with clamping ring.
- L. Adhere protection sheet over membrane roofing at locations indicated.

3.6 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.

- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.
- E. Terminate and seal top of sheet flashings.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish reports to Architect.
- B. Flood Testing: Flood test each roofing area for leaks, according to recommendations in ASTM D 5957, after completing roofing and flashing but before overlying construction is placed. Install temporary containment assemblies, plug or dam drains, and flood with potable water.
 - 1. Flood to an average depth of 2-1/2 inches with a minimum depth of 1 inch and not exceeding a depth of 4 inches. Maintain 2 inches of clearance from top of base flashing.
 - 2. Flood each area for 48 hours.
 - 3. After flood testing, repair leaks, repeat flood tests, and make further repairs until roofing and flashing installations are watertight.
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- D. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.8 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

END OF SECTION 075323

SECTION 078100 - APPLIED FIREPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes sprayed fire-resistive materials (SFRM).

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of fireproofing.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by fireproofing manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply fireproofing when ambient or substrate temperature is 44 deg. F or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.
- B. Ventilation: Ventilate building spaces during and after application of fireproofing, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fireproofing dries thoroughly.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.

- B. Source Limitations: Obtain fireproofing from single source.
- C. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Steel members are to be considered unrestrained unless specifically noted otherwise.
- D. Asbestos: Provide products containing no detectable asbestos.

2.2 SPRAYED FIRE-RESISTIVE MATERIALS

- A. SFRM: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carbolite Company, subsidiary of RPM International, Fireproofing Products Div.; AD Southwest Fireproofing Type 5MD and Pyrocrete 40.
 - b. Grace, W. R. & Co. - Conn.; Grace Construction Products; Monokote MK-6 Series.
 - c. Isolatek International; Cafco 300.
 - d. Pyrok, Inc., Pyrok-MD.
 - 2. Bond Strength: Minimum Insert value cohesive and adhesive strength based on field testing according to ASTM E 736.
 - 3. Density: Not less than 22 lb./cu. ft. and as specified in the approved fire-resistance design, according to ASTM E 605.
 - 4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than 0.375 inch.
 - 5. Combustion Characteristics: ASTM E 136.
 - 6. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 10 or less.
 - b. Smoke-Developed Index: 10 or less.
 - 7. Compressive Strength: Minimum 10 lbf/sq. in. according to ASTM E 761.
 - 8. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
 - 9. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
 - 10. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours according to ASTM E 859.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design. Verify compliance with the following:
 - 1. Substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fireproofing with substrates under conditions of normal use or fire exposure.
 - 2. Objects penetrating fireproofing, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
 - 3. Substrates receiving fireproofing are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fireproofing application.
- B. Conduct tests according to fireproofing manufacturer's written recommendations to verify that substrates are free of substances capable of interfering with bond.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Cover other work subject to damage from fallout or overspray of fireproofing materials during application.
- B. Clean substrates of substances that could impair bond of fireproofing.
- C. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fireproofing. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

3.3 APPLICATION

- A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fireproofing work.
- B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.
- C. Coordinate application of fireproofing with other construction to minimize need to cut or remove fireproofing.
 - 1. Do not begin applying fireproofing until clips, hangers, supports, sleeves, and other items penetrating fireproofing are in place.
 - 2. Defer installing ducts, piping, and other items that would interfere with applying fireproofing until application of fireproofing is completed.

- D. Install auxiliary materials as required, as detailed, and according to fire-resistance design and fireproofing manufacturer's written recommendations for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by fireproofing manufacturer.
- E. Spray apply fireproofing to maximum extent possible. Following the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.
- F. Extend fireproofing in full thickness over entire area of each substrate to be protected.
- G. Install body of fireproofing in a single course unless otherwise recommended in writing by fireproofing manufacturer.
- H. Provide a uniform finish complying with description indicated for each type of fireproofing material and matching finish approved for required mockups.
- I. Cure fireproofing according to fireproofing manufacturer's written recommendations.
- J. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.
- K. Finishes: Where indicated, apply fireproofing to produce the following finishes:
 - 1. Manufacturer's Standard Finishes: Finish according to manufacturer's written instructions for each finish selected.

3.4 FIELD QUALITY CONTROL

- A. Fireproofing will be considered defective if it does not pass tests and inspections.
 - 1. Remove and replace fireproofing that does not pass tests and inspections, and retest.
 - 2. Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.
- B. Prepare test and inspection reports.

3.5 CLEANING, PROTECTING, AND REPAIRING

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
- B. Protect fireproofing, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes, so fireproofing will be without damage or deterioration at time of Substantial Completion.
- C. As installation of other construction proceeds, inspect fireproofing and repair damaged areas and fireproofing removed due to work of other trades.
- D. Repair fireproofing damaged by other work before concealing it with other construction.

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- E. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION 078100

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Penetrations in fire-resistance-rated walls.
- 2. Penetrations in horizontal assemblies.

- B. Related Sections:

- 1. Division 07 Section "Fire-Resistive Joint Systems" for joints in or between fire-resistance-rated construction, at exterior curtain-wall/floor intersections, and in smoke barriers.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

- B. Installer Qualifications: A firm experienced in installing penetration firestopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration firestopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.

- C. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:

- 1. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
- 2. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:

- a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
- b. Classification markings on penetration firestopping correspond to designations listed by the following:
 - 1) UL in its "Fire Resistance Directory."

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

PART 2 - PRODUCTS

2.1 PENETRATION FIRESTOPPING

- A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 - 1. Fire-resistance-rated walls include smoke-barrier walls, and fire partitions, unless otherwise indicated.
 - 2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 - 1. Horizontal assemblies include floors.
 - 2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
 - 3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

- E. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.
 - 1. Collars.
 - 2. Steel sleeves.

2.2 FILL MATERIALS

- A. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.
- C. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and non-sag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of non-sag grade for both opening conditions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.
- C. Install fill materials for firestopping by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

END OF SECTION 078413

SECTION 078446 - FIRE-RESISTIVE JOINT SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Joints in or between fire-resistance-rated constructions.
- 2. Joints in smoke barriers.

- B. Related Sections:

- 1. Division 07 Section "Penetration Firestopping" for penetrations in fire-resistance-rated walls, horizontal assemblies, and smoke barriers.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fire-resistive joint systems.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."
- B. Installer Qualifications: A firm experienced in installing fire-resistive joint systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its fire-resistive joint system products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.
- C. Fire-Test-Response Characteristics: Fire-resistive joint systems shall comply with the following requirements:

1. Fire-resistive joint system tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
2. Fire-resistive joint systems are identical to those tested per testing standard referenced in "Fire-Resistive Joint Systems" Article. Provide rated systems complying with the following requirements:
 - a. Fire-resistive joint system products bear classification marking of qualified testing agency.
 - b. Fire-resistive joint systems correspond to those indicated by reference to designations listed by the following:
 - 1) UL in its "Fire Resistance Directory."

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by fire-resistive joint system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure fire-resistive joint systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

- A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
- B. Coordinate sizing of joints to accommodate fire-resistive joint systems.
- C. Notify Owner's testing agency at least seven days in advance of fire-resistive joint system installations; confirm dates and times on day preceding each series of installations.

PART 2 - PRODUCTS

2.1 FIRE-RESISTIVE JOINT SYSTEMS

- A. Where required, provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
- B. Joints in or between Fire-Resistance-Rated Construction: Provide fire-resistive joint systems with ratings determined per ASTM E 1966 or UL 2079:
 1. Joints include those installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies, and roofs or roof/ceiling assemblies.
 2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of construction they will join.
 3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. A/D Fire Protection Systems Inc.
 - b. CEMCO.
 - c. Fire Trak Corp.
 - d. Grace Construction Products.
 - e. Hilti, Inc.
 - f. Johns Manville.
 - g. Nelson Firestop Products.
 - h. NUCO Inc.
 - i. Passive Fire Protection Partners.
 - j. RectorSeal Corporation.
 - k. Specified Technologies Inc.
 - l. 3M Fire Protection Products.
 - m. Tremco, Inc.; Tremco Fire Protection Systems Group.
 - n. USG Corporation.
- C. Joints in Smoke Barriers: Provide fire-resistive joint systems with ratings determined per UL 2079.
1. L-Rating: Not exceeding 5.0 cfm/ft of joint at 0.30 inch wg at both ambient and elevated temperatures.
 2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. A/D Fire Protection Systems Inc.
 - b. Grace Construction Products.
 - c. Hilti, Inc.
 - d. Johns Manville.
 - e. Nelson Firestop Products.
 - f. NUCO Inc.
 - g. Passive Fire Protection Partners.
 - h. RectorSeal Corporation.
 - i. Specified Technologies Inc.
 - j. 3M Fire Protection Products.
 - k. Tremco, Inc.; Tremco Fire Protection Systems Group.
 - l. USG Corporation.
- D. Exposed Fire-Resistive Joint Systems: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- E. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials that are needed to install fill materials and to maintain ratings required. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing agency for systems indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
 - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
 - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. General: Install fire-resistive joint systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.
- C. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
 - 2. Apply fill materials so they contact and adhere to substrates formed by joints.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

END OF SECTION 078446

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes
 - 1. Interior joints in vertical surfaces and horizontal surfaces.
- B. Related Sections:
 - 1. Division 08 Section "Glazing" for glazing sealants.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- C. Compatibility and adhesion test reports.
- D. Product certificates.

1.5 QUALITY ASSURANCE

- A. Preconstruction Compatibility and Adhesion Testing: Submit samples of materials that will contact or affect joint sealants to joint-sealant manufacturers for testing according to ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

1.6 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- C. Single-Component Nonsag Urethane Sealant:
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Sika Corporation, Inc.; Sikaflex - 1a.
 - b. Sonneborn, Division of ChemRex Inc.; Ultra or NP 1.
 - c. Tremco; Vulkem 116.
 - 2. Type and Grade: S (single component) and NS (nonsag).
 - 3. Class: 25.
 - 4. Uses Related to Exposure: T (traffic) and NT (nontraffic).

5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

D. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. Dow Corning Corporation; 799.
- b. GE Advanced Materials - Silicones; UltraGlaze SSG4000.
- c. Polymeric Systems, Inc.; PSI-631.
- d. Tremco Incorporated; Tremsil 600.

2.4 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products: One of the following or approved equal:

- a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
- b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

2.5 PREFORMED JOINT SEALANTS

A. Preformed Silicone-Sealant System: Manufacturer's standard system consisting of pre-cured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates.

1. Products:

- a. Dow Corning Corporation; 123 Silicone Seal.
- b. GE Silicones; UltraSpan US1100.
- c. Pecora Corporation; Sil-Span.
- d. Tremco; Spectrem Ez Seal.

2.6 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down

to minus 26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.
 - a. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
 - 2. Remove laitance and form-release agents from concrete.
 - a. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
- G. Installation of Preformed Silicone-Sealant System: Comply with manufacturer's written instructions.
- H. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.
- I. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces.

1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Tile control and expansion joints.
 - c. Vertical joints on exposed surfaces of unit masonry concrete walls and partitions.
 2. Joint Sealant: Urethane, S, NS, 25, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces not subject to significant movement.
1. Joint Locations:
 - a. Control joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints between interior wall surfaces and frames of interior doors.
 2. Joint Sealant: Acrylic latex.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Concealed mastics[<JS-#>].
1. Joint Locations:
 - a. Aluminum thresholds.
 - b. Sill plates.
 - c. <Insert other joints>.
 - d. Other joints as indicated on Drawings.
 2. Joint Sealant: [Butyl-rubber based] <Insert joint sealant>.
 3. Joint-Sealant Color: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range of colors] <Insert color>.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes hollow-metal work.

1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of exposed finish required.
- E. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Product test reports.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Amweld International, LLC.
 - 2. Ceco Door Products; an Assa Abloy Group company.
 - 3. Curries Company; an Assa Abloy Group company.

4. Greensteel Industries, Ltd.
5. Karpen Steel Custom Doors & Frames.
6. Pioneer Industries, Inc.
7. Premier Products, Inc.
8. Republic Doors and Frames.
9. Steelcraft; an Ingersoll-Rand company.

2.2 REGULATORY REQUIREMENTS

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

2.3 INTERIOR DOORS AND FRAMES

- A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.
1. Physical Performance: Level B according to SDI A250.4.
 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches.
 - c. Face: Metallic-coated, cold-rolled steel sheet, minimum thickness of 0.042 inch.
 - d. Edge Construction: Model 2, Seamless.
 - e. Core: Manufacturer's standard.
 3. Frames:
 - a. Materials: Metallic-coated, steel sheet, minimum thickness of 0.053 inch.
 - b. Construction: Knocked down, Slip-on drywall, Face welded, Full profile welded.
 4. Exposed Finish: Prime.

2.4 FRAME ANCHORS

- A. Jamb Anchors:
1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
 3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
 4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

2.5 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008 or ASTM A 1011, hot-dip galvanized according to ASTM A 153, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153.
- F. Power-Actuated Fasteners in Concrete: From corrosion-resistant materials.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing).
- I. Glazing: Section 088000 "Glazing."
- J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat.

2.6 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 2. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
 3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 4. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 32 inches o.c., to match coursing, and as follows:
 - 1) Two anchors per jamb up to 60 inches high.

- 2) Three anchors per jamb from 60 to 90 inches high.
 - 3) Four anchors per jamb from 90 to 120 inches high.
 - 4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
- b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
- 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
- c. Compression Type: Not less than two anchors in each frame.
- d. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.
5. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.
- a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- C. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- D. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 3. Provide loose stops and moldings on inside of hollow-metal work.
 4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
- 2.7 STEEL FINISHES
- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
1. Shop Primer: SDI A250.10.
- B. Factory Finish: SDI A250.3.
1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.
 - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
 4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
 5. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
 6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 7. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- B. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
 - c. At Bottom of Door: 3/4 inch plus or minus 1/32 inch.
 - d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
 3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.
- C. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.2 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section Includes: Finish Hardware for door openings, except as otherwise specified herein.
 - 1. Door hardware for steel (hollow metal) doors.
 - 2. Door hardware for aluminum doors.
 - 3. Door hardware for wood doors.
 - 4. Door hardware for other doors indicated.
 - 5. Keyed cylinders as indicated.

- B. Related Sections:
 - 1. Division 6: Rough Carpentry.
 - 2. Division 8: Aluminum Doors and Frames
 - 3. Division 8: Hollow Metal Doors and Frames.
 - 4. Division 8: Wood Doors.
 - 5. Division 26 Electrical
 - 6. Division 28: Electronic Security

- C. References: Comply with applicable requirements of the following standards. Where these standards conflict with other specific requirements, the most restrictive shall govern.
 - 1. Builders Hardware Manufacturing Association (BHMA)
 - 2. NFPA 101 Life Safety Code
 - 3. NFPA 80 -Fire Doors and Windows
 - 4. ANSI-A156.xx- Various Performance Standards for Finish Hardware
 - 5. UL10C – Positive Pressure Fire Test of Door Assemblies
 - 6. ANSI-A117.1 – Accessible and Usable Buildings and Facilities
 - 7. DHI /ANSI A115.IG – Installation Guide for Doors and Hardware
 - 8. ICC – International Building Code

- D. Intent of Hardware Groups
 - 1. Should items of hardware not definitely specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
 - 2. Where items of hardware aren't definitely or correctly specified, are required for completion of the Work, a written statement of such omission, error, or other discrepancy to be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.

1.2 SUBSTITUTIONS:

- A. Comply with Division 1.

1.3 SUBMITTALS:

- A. Comply with Division 1.

- B. Special Submittal Requirements: Combine submittals of this Section with Sections listed below to ensure the "design intent" of the system/assembly is understood and can be reviewed together.
- C. Product Data: Manufacturer's specifications and technical data including the following:
1. Detailed specification of construction and fabrication.
 2. Manufacturer's installation instructions.
 3. Wiring diagrams for each electric product specified. Coordinate voltage with electrical before submitting.
 4. Submit 6 copies of catalog cuts with hardware schedule.
- D. Shop Drawings - Hardware Schedule: Submit 6 complete reproducible copy of detailed hardware schedule in a vertical format.
1. List groups and suffixes in proper sequence.
 2. Completely describe door and list architectural door number.
 3. Manufacturer, product name, and catalog number.
 4. Function, type, and style.
 5. Size and finish of each item.
 6. Mounting heights.
 7. Explanation of abbreviations and symbols used within schedule.
 8. Detailed wiring diagrams, specially developed for each opening, indicating all electric hardware, security equipment and access control equipment, and door and frame rough-ins required for specific opening.
- E. Templates: Submit templates and "reviewed Hardware Schedule" to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.
1. Templates, wiring diagrams and "reviewed Hardware Schedule" of electrical terms to electrical for coordination and verification of voltages and locations.
- F. Samples: (If requested by the Architect)
1. 1 sample of Lever and Rose/Escutcheon design, (pair).
 2. 3 samples of metal finishes
- G. Contract Closeout Submittals: Comply with Division 1 including specific requirements indicated.
1. Operating and maintenance manuals: Submit 3 sets containing the following.
 - a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representative for each manufacturer.
 - d. Parts list for each product.
 2. Copy of final hardware schedule, edited to reflect, "As installed".
 3. Copy of final keying schedule
 4. As installed "Wiring Diagrams" for each piece of hardware connected to power, both low voltage and 110 volts.
 5. One set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.4 QUALITY ASSURANCE

A. Comply with Division 1.

1. Statement of qualification for distributor and installers.
2. Statement of compliance with regulatory requirements and single source responsibility.
3. Distributor's Qualifications: Firm with 3 years experience in the distribution of commercial hardware.
 - a. Distributor to employ full time Architectural Hardware Consultants (AHC) for the purpose of scheduling and coordinating hardware and establishing keying schedule.
 - b. Hardware Schedule shall be prepared and signed by an AHC.
4. Installer's Qualifications: Firm with 3 years experienced in installation of similar hardware to that required for this Project, including specific requirements indicated.
5. Regulatory Label Requirements: Provide testing agency label or stamp on hardware for labeled openings.
 - a. Provide UL listed hardware for labeled and 20 minute openings in conformance with requirements for class of opening scheduled.
 - b. Underwriters Laboratories requirements have precedence over this specification where conflict exists.
6. Single Source Responsibility: Except where specified in hardware schedule, furnish products of only one manufacturer for each type of hardware.

- B. Review Project for extent of finish hardware required to complete the Work. Where there is a conflict between these Specifications and the existing hardware, notify the Architect in writing and furnish hardware in compliance with the Specification unless otherwise directed in writing by the Architect.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping: Comply with Division 1.

1. Deliver products in original unopened packaging with legible manufacturer's identification.
2. Package hardware to prevent damage during transit and storage.
3. Mark hardware to correspond with "reviewed hardware schedule".
4. Deliver hardware to door and frame manufacturer upon request.

- B. Storage and Protection: Comply with manufacturer's recommendations.

1.6 PROJECT CONDITIONS:

- A. Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.
- B. Review Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.

1.7 WARRANTY:

- A. Refer to Conditions of the Contract

B. Special Manufacturer's Warranty:

1. Closers: Thirty years
2. Exit Devices: Five Years
3. Locksets & Cylinders: Ten years
4. All other Hardware: Two years.

1.8 OWNER'S INSTRUCTION:

- A. Instruct Owner's personnel in operation and maintenance of hardware units.

1.9 MAINTENANCE:

- A. Extra Service Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals Section.

1. Special Tools: Provide special wrenches and tools applicable to each different or special hardware component.
2. Maintenance Tools: Provide maintenance tools and accessories supplied by hardware component manufacturer.
3. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra service materials.

- B. Maintenance Service: Submit for Owner's consideration maintenance service agreement for electronic products installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. The following manufacturers are approved subject to compliance with requirements of the Contract Documents. Approval of manufacturers other than those listed shall be in accordance with Division 1.

<u>Item:</u>	<u>Manufacturer:</u>
Hinges	Ives
Continuous Hinges	ABH
Grade1 Locksets	Schlage
Cylinders	Corbin Russwin-Match Existing
Closers	LCN
Push Pull Plates	Ives
Push/Pull Bars	Ives
Protection Plates	Ives
Overhead Stops	ABH
Door Stops	Ives
Flush Bolts	Ives
Card Readers	By Others
Door Position Switches	SDC
Threshold & Gasketing	Reese
Key Cabinet	Telkee

2.2 MATERIALS:

- A. Hinges: Shall be Concealed bearing hinges

1. Template screw hole locations
2. Concealed Bearings
3. Equip with easily seated, non-rising pins.
4. Non Removable Pin screws shall be slotted stainless steel screws.
5. Bearing assembly is to be installed after plating.
6. Sufficient size to allow 180-degree swing of door
7. Provide hinge type as listed in schedule.
8. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
9. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function and finish
10. UL10C listed for Fire rated doors.

B. Pin and Barrel Continuous Hinges:

1. Certified by BHMA for ANSI A156.26, Grade 1
2. Fabricated from 14 gauge material
3. UL and ULC listed for fire-rated 4' x 8' single doors and 8' x 8' pairs up to 3 hour.
4. Slim barrel design
5. Twin nylon self lubricating bearings located between all knuckles except top and bottom.
6. Two stainless steel bearings top and bottom, to prevent sagging if nylon bearings degrade during a fire.
7. Limited Lifetime warranty

C. Mortise Type Locks and Latchsets:

1. Tested and approved by BHMA for ANSI A156.13, Series 1000, Operational and Security Grade 1, Extra-Heavy Duty, and be UL10C listed.
2. 3/4 inch throw latchbolt
3. Provide sufficient curved strike lip to protect door trim
4. Functions and design as indicated in the hardware groups.

D. Exit Devices shall:

1. Tested and approved by BHMA for ANSI 156.3, Grade 1
2. Furnish UL or recognized independent laboratory certified mechanical operational testing.
3. Provide a deadlocking latchbolt
4. Non-fire rated exit devices shall have cylinder dogging.
5. Lever design shall match lockset lever design
6. Provide strikes as required by application.
7. Fire exit devices to be listed for UL10C
8. UL listed for Accident Hazard
9. Shall consist of a push pad, the actuating portion of which extends across, shall not be less than one half the width of the door leaf.

E. Cylinders:

1. Provide the necessary cylinder housings, collars, rings & springs as recommended by the manufacturer for proper installation.
2. Provide the proper cylinder cams or tail piece as required to operate all locksets and other keyed hardware items listed in the hardware sets.
3. Coordinate and provide as required for related sections.

- F. Door Closers shall:
1. Tested and approved by BHMA for ANSI 156.4, Grade 1
 2. UL10C certified
 3. Conform to ANSI 156.4
 4. Metal covers
 5. Separate adjusting valves for closing and latching speed, and back check
 6. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions
 7. Full rack and pinion type closer
 8. Mount closers **on non-public side of door**, unless otherwise noted in specification
 9. Closers shall be non-handed, non-sized and multi-sized.
- G. Door Stops: Provide a dome floor or wall stop for every opening as listed in the hardware sets.
1. Wall stop and floor stop shall be wrought bronze, brass or stainless steel.
 2. Provide fastener suitable for wall construction.
 3. Coordinate reinforcement of walls where wall stop is specified.
 4. Provide dome stops where wall stops are not practical. Provide spacers or carpet riser for floor conditions encountered
- H. Over Head Stops: Provide a Surface mounted or concealed overhead when a floor or wall stop cannot be used or when listed in the hardware set.
1. Surface overhead stops shall be heavy duty bronze or stainless steel.
- I. Push Plates: Provide with four beveled edges ANSI J301, .050 thickness, size as indicated in hardware set. Furnish oval-head countersunk screws to match finish.
- J. Pulls with plates: Provide with four beveled edges ANSI J301, .050 thickness Plates with ANSI J401 Pull as listed in hardware set. Provide proper fasteners for door construction.
- K. Push Pull Bars: Provide ANSI J504, .1" Diameter. Pull and push bar model and series as listed in hardware set. Provide proper fasteners for door construction.
- L. Kick plates: Provide with four beveled edges ANSI J102, 16 inches high by width less 2 inches on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.
- M. Door Bolts: Flush bolts for wood or metal doors.
1. Manual flush bolts, Certified ANSI/BHMA 156.16 at openings where allowed local authority.
 2. Provide Dust Proof Strike, Certified ANSI/BHMA 156.16 at doors with flush bolts without thresholds.
- N. Power Supply: Provide power supply for (ELR) Electric Latch Retraction exit devices
1. UL Listed for class II output
 2. Include circuit breakers for protection of motherboard
 3. 115 Volt AC input= 115 Volt at 4 Amps
 4. Control module shall include Fire alarm terminal and Auxiliary contacts for remote signaling.
- O. Power Transfer: Power transfer device shall be of door and frame edge mount design. Manufactured to be concealed when door is closed. Housing made from cast materials with stainless steel tubular two piece spring loaded pivot parts. Furnish with pre-installed wires in quantity indicated or as needed for electric hardware. Cutout size to be approximately 1.25 inches wide x 9 inches long. Back plates are made of 14 gage steel. Provide 4 screw mounting holes countersunk with flathead screws. Units shall allow 180

degree opening of doors. Units "UL Listed" as Miscellaneous Fire Door Accessory. Coordinate position in door and frame with other hardware applications.

- P. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.
- Q. Weather stripping: Provide at head and jambs only those units where resilient or flexible seal strip is easily replaceable. Where bar-type weather strip is used with parallel arm mounted closers install weather strip first.
 - 1. Weather strip shall be resilient seal of (Neoprene, Polyurethane, Vinyl, Pile, Nylon Brush, Silicone)
 - 2. UL10C Positive Pressure rated seal set when required.
- R. Door Bottoms/Sweeps: Surface mounted or concealed door bottom where listed in the hardware sets.
 - 1. Door seal shall be resilient seal of (Neoprene, Polyurethane, Nylon Brush, Silicone)
 - 2. UL10C Positive Pressure rated seal set when required.
- S. Thresholds: Thresholds shall be aluminum beveled type with maximum height of ½" for conformance with ADA requirements. Furnish as specified and per details. Provide fasteners and screws suitable for floor conditions.
- T. Provide one wall mounted Telkee, series key cabinet complete with hooks, index and tags to accommodate 50% expansion. Coordinate mounting location with architect.
- U. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occur.

2.3 FINISH:

- A. Designations used in Schedule of Finish Hardware - 3.5, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products
- B. Powder coat door closers to match other hardware, unless otherwise noted.
- C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

2.4 KEYS AND KEYING:

- A. Provide construction keying with All Brass Cores during the construction period. Permanent keys (prepared according to the accepted keying schedule) will be furnished to the Owner.
- B. Cylinders: Coordinate keying requirements with requirements of Owner's existing Corbin keying system
- C. Transmit Masterkeys and other Security keys to hardware supplier.
- D. Furnish keys in the following quantities:
 - 1. 3 each Masterkeys
 - 2. 3 each Change keys each keyed core
 - 3. 5 each Construction masterkeys
 - 4. 100 Key blanks

- E. Final keying requirements are to be determined by the Owner

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of conditions: Examine doors, frames, related items and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.
 - 1. Do not proceed until unsatisfactory conditions have been corrected.

3.2 HARDWARE LOCATIONS:

- A. Mount hardware units at heights indicated in the following publications except as specifically indicated or required to comply with the governing regulations.
 - 1. Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames, by the Door and Hardware Institute (DHI).
 - 2. Recommended locations for Architectural Hardware for flush wood doors (DHI).
 - 3. WDMA Industry Standard I.S.-1A-04, Industry Standard for Architectural wood flush doors.

3.3 INSTALLATION:

- A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- B. Conform to local governing agency security ordinance.
- C. Install Conforming to ICC/ANSI A117.1 Accessible and Usable Building and Facilities.
 - 1. Adjust door closer sweep periods so that from the open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.
- D. Installed hardware using the manufacturers fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.

3.4 FIELD QUALITY CONTROL AND FINAL ADJUSTMENT

- A. Contractor/Installers, Field Services: After installation is complete, contractor shall inspect the completed door openings on site to verify installation of hardware is complete and properly adjusted, in accordance with both the Contract Documents and final shop drawings.
 - 1. Check and adjust closers to ensure proper operation.
 - 2. Check latchset, lockset, and exit devices are properly installed and adjusted to ensure proper operation.
 - a. Verify levers are free from binding.
 - b. Ensure latchbolts and dead bolts are engaged into strike and hardware is functioning.

3. Report findings, in writing, to architect indicating that all hardware is installed and functioning properly. Include recommendations outlining corrective actions for improperly functioning hardware if required.

3.5 SCHEDULE OF FINISH HARDWARE:

Manufacturer List

<u>Code</u>	<u>Name</u>
AB	ABH Manufacturing
BY	By Others
CR	Corbin Russwin
IV	Ives
KNC	KN Crowder
LC	LCN
RS	Reese Enterprises Inc.
SC	Schlage
SDC	Security Door Controls
TE	Telkee
VD	Von Duprin

Finish List

<u>Code</u>	<u>Description</u>
626	Satin Chromium Plated
628	Satin Aluminum, Clear Anodized
630	Satin Stainless Steel
652	Satin Chromium Plated
689	Aluminum Painted
GR	Grey
US28	Aluminum - Clear Anodized
US26D	Chromium Plated, Dull
US32D	Stainless Steel, Dull

Option List

<u>Code</u>	<u>Description</u>
PT	Power Transfer Prep
B4E	Beveled 4 Edges
NRP	NON Removable Pin Hinge
CSK	Counter Sunk Screws

Hardware Sets
Radio Room

SpeXtra: 357946

Hardware Group No. 01 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-NL-F-06	630	VON
1	EA	RIM CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 01 TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	PADLOCK	PL5170	626	C-R

Hardware Group No. 02 FSR

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
2	EA	CONTINUOUS HINGE	A500	630	ABH
1	EA	FIRE EXIT HARDWARE	9849-L-BE-F-06	630	VON
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8402 10" X 1" LDW B-CS	630	IVE
2	EA	MAG HOLDER	2100	628	ABH
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	MEETING STILE GASK	129CP-F	628	REE
2	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 02 TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 5 X 4.5	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU MORTISE LOCK	L9092LEU 06A RX	626	SCH
			FAIL SECURE		
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE
1	EA	WIRE HARNESS	CON-38		VON
			TO ELEC. HWR.		
1	EA	WIRE HARNESS	CON-6W		VON
			TO POWER SUPPLY		
1	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. REQUEST TO EXIT SWITCH TO SHUNT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
2. ACCESS BY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
3. ACCESS BY VALID CREDENTIAL SHUNTING ALARM MONITORING AND UNLOCKING OUTSIDE LEVER.

Hardware Group No. 03 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONTINUOUS HINGE	A500	630	ABH
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-06	630	VON
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 04 FSR

Provide each RU door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	BALANCE	BY ROOF HATCH MFG		B/O

Hardware Group No. 04 TOW

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
2	EA	CONTINUOUS HINGE	A500	630	ABH
1	EA	FIRE EXIT HARDWARE	9849-L-BE-F-06	630	VON
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8402 10" X 1" LDW B-CS	630	IVE
2	EA	MAG HOLDER	2100	628	ABH
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	MEETING STILE GASK	129CP-F	628	REE
2	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 05 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	PADLOCK	PL5170	626	C-R

Hardware Group No. 06 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080L 06A	626	SCH
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 07 FSR

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
2	EA	CONTINUOUS HINGE	A500	630	ABH
1	EA	FIRE EXIT HARDWARE	9849-L-BE-F-06	630	VON
2	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
2	EA	KICK PLATE	8402 10" X 1" LDW B-CS	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	MEETING STILE GASK	129CP-F	628	REE
2	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 07A TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-LC-98-L-F-E996-06-FS-CON	630	VON
1	EA	RIM CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE
1	EA	WIRE HARNESS	CON-38		VON
1	EA	WIRE HARNESS	TO ELEC. HWR. CON-6W		VON
1	EA	CARD READER	TO POWER SUPPLY BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. ALARM WILL SOUND UPON INVALID EGRESS.
2. EGRESS BY VALID CREDENTIAL TO INSIDE READER SHUNTING ALARM.
3. ACCESS BY KEY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.

Hardware Group No. 07B TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-LC-98-L-F-E996-06-FS-CON	630	VON
1	EA	RIM CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE
1	EA	WIRE HARNESS	CON-38 TO ELEC. HWR.		VON
1	EA	WIRE HARNESS	CON-6W TO POWER SUPPLY		VON
1	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. ALARM WILL SOUND UPON INVALID EGRESS.
2. EGRESS BY VALID CREDENTIAL TO INSIDE READER SHUNTING ALARM.
3. ACCESS BY KEY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.

Hardware Group No. 07C TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC FIRE EXIT HARDWARE	ALK-98-L-F-E996-06-FS-CON	630	VON
1	EA	RIM CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE
1	EA	WIRE HARNESS	CON-38 TO ELEC. HWR.		VON
1	EA	WIRE HARNESS	CON-6W TO POWER SUPPLY		VON
2	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. ALARM WILL SOUND UPON INVALID EGRESS.
2. EGRESS BY VALID CREDENTIAL TO INSIDE READER SHUNTING ALARM.
3. ACCESS BY KEY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
4. ACCESS BY VALID CREDENTIAL UNLOCKING AND SHUNTING LOCAL ALARM.

Hardware Group No. 07D TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC FIRE EXIT HARDWARE	ALK-98-L-F-E996-06-FS-CON	630	VON
1	EA	RIM CYL	TO MATCH EXIST	626	C-R
1	EA	OH STOP	410S	630	GLY
1	EA	SURFACE CLOSER	4011 ST-1544	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE
1	EA	WIRE HARNESS	CON-38 TO ELEC. HWR.		VON
1	EA	WIRE HARNESS	CON-6W TO POWER SUPPLY		VON
2	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. ALARM WILL SOUND UPON INVALID EGRESS.
2. EGRESS BY VALID CREDENTIAL TO INSIDE READER SHUNTING ALARM.
3. ACCESS BY KEY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
4. ACCESS BY VALID CREDENTIAL UNLOCKING AND SHUNTING LOCAL ALARM.

Hardware Group No. 08 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070L 06A	626	SCH
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 08 TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-06	630	VON
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 09 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
4	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080L 06A	626	SCH
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 09 TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONTINUOUS HINGE	A500	630	ABH
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-06	630	VON
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	MAG HOLDER	2100	628	ABH
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 10 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	L9040 06A L583-363 L283-722	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8402 10" X 1" LDW B-CS	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 10 TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU MORTISE LOCK	L9092LEU 06A RX	626	SCH
			FAIL SECURE		
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE
1	EA	WIRE HARNESS	CON-38		VON
			TO ELEC. HWR.		
1	EA	WIRE HARNESS	CON-6W		VON
			TO POWER SUPPLY		
1	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. REQUEST TO EXIT SWITCH TO SHUNT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
2. ACCESS BY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
3. ACCESS BY VALID CREDENTIAL SHUNTING ALARM MONITORING AND UNLOCKING OUTSIDE LEVER.

Hardware Group No. 10A TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070L 06A	626	SCH
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	OH STOP	410S	630	GLY
1	EA	SURFACE CLOSER	4011 ST-1544	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 10B TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU MORTISE LOCK	L9092LEU 06A RX	626	SCH
			FAIL SECURE		
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	OH STOP	410S	630	GLY
1	EA	SURFACE CLOSER	4011 ST-1544	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE
1	EA	WIRE HARNESS	CON-38		VON
			TO ELEC. HWR.		
1	EA	WIRE HARNESS	CON-6W		VON
			TO POWER SUPPLY		
1	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. REQUEST TO EXIT SWITCH TO SHUNT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
2. ACCESS BY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
3. ACCESS BY VALID CREDENTIAL SHUNTING ALARM MONITORING AND UNLOCKING OUTSIDE LEVER.

Hardware Group No. 11 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080L 06A	626	SCH
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 11 TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 12 FSR

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
6	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	SET	CONST LATCHING BOLT	FB51P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	EU MORTISE LOCK	L9092LEU 06A RX FAIL SECURE	626	SCH
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	COORDINATOR	COR X FL W/ BRACKETS	628	IVE
2	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	MEETING STILE GASK	129CP-F	628	REE
2	EA	DOOR SWEEP	964C	628	REE
1	EA	THRESHOLD	TO MATCH EXISTING	628	REE
2	EA	WIRE HARNESS	CON-38 TO ELEC. HWR.		VON
2	EA	WIRE HARNESS	CON-6W TO POWER SUPPLY		VON
1	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
2	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. REQUEST TO EXIT SWITCH TO SHUNT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
2. ACCESS BY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
3. ACCESS BY VALID CREDENTIAL SHUNTING ALARM MONITORING AND UNLOCKING OUTSIDE LEVER.

Hardware Group No. 13 FSR

Provide each PR door(s) with the following:

Qty	EA	Description	Catalog Number	Finish	Mfr
2	EA	CONTINUOUS HINGE	A500 W/ EPT CUT OUT	630	ABH
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-LC-9849-L-F-06-CON	630	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-LC-9849-L-F-E996-06-FSE-CON FAIL SECURE	630	VON
2	EA	RIM CYL	TO MATCH EXIST	626	C-R
2	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
2	EA	KICK PLATE	8402 10" X 1" LDW B-CS	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	MEETING STILE GASK	129CP-F	628	REE
2	EA	DOOR SWEEP	964C	628	REE
2	EA	WIRE HARNESS	CON-38 TO ELEC. HWR.		VON
2	EA	WIRE HARNESS	CON-6W TO POWER SUPPLY		VON
1	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
2	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. REQUEST TO EXIT SWITCH TO SHUNT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
2. ACCESS BY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
3. ACCESS BY VALID CREDENTIAL SHUNTING ALARM MONITORING AND UNLOCKING OUTSIDE LEVER.

Hardware Group No. 14 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU MORTISE LOCK	L9092LEU 06A RX	626	SCH
			FAIL SECURE		
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	OH STOP	410S	630	GLY
1	EA	SURFACE CLOSER	4011 ST-1544	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE
1	EA	WIRE HARNESS	CON-38		VON
			TO ELEC. HWR.		
1	EA	WIRE HARNESS	CON-6W		VON
			TO POWER SUPPLY		
1	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. REQUEST TO EXIT SWITCH TO SHUNT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
2. ACCESS BY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
3. ACCESS BY VALID CREDENTIAL SHUNTING ALARM MONITORING AND UNLOCKING OUTSIDE LEVER.

Hardware Group No. 14 TOW

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	EU MORTISE LOCK	L9092LEU 06A RX	626	SCH
			FAIL SECURE		
1	EA	COORDINATOR	COR X FL	628	IVE
			W/ BRACKETS		
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	MEETING STILE GASK	129CP-F	628	REE
1	EA	DOOR SWEEP	964C	628	REE
1	EA	WIRE HARNESS	CON-38		VON
			TO ELEC. HWR.		
1	EA	WIRE HARNESS	CON-6W		VON
			TO POWER SUPPLY		
1	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. REQUEST TO EXIT SWITCH TO SHUNT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
2. ACCESS BY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
3. ACCESS BY VALID CREDENTIAL SHUNTING ALARM MONITORING AND UNLOCKING OUTSIDE LEVER.

Hardware Group No. 15 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070L 06A	626	SCH
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	OH STOP	410S	630	GLY
1	EA	SURFACE CLOSER	4011 ST-1544	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 15 TOW

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
6	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	SET	CONST LATCHING BOLT	FB51P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	EU MORTISE LOCK	L9092LEU 06A RX	626	SCH
			FAIL SECURE		
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	COORDINATOR	COR X FL	628	IVE
			W/ BRACKETS		
2	EA	SURFACE CLOSER	4011	689	LCN
2	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	MEETING STILE GASK	129CP-F	628	REE
2	EA	DOOR SWEEP	964C	628	REE
1	EA	THRESHOLD	TO MATCH EXISTING	628	REE
2	EA	WIRE HARNESS	CON-38		VON
			TO ELEC. HWR.		
2	EA	WIRE HARNESS	CON-6W		VON
			TO POWER SUPPLY		
1	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
2	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. REQUEST TO EXIT SWITCH TO SHUNT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
2. ACCESS BY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
3. ACCESS BY VALID CREDENTIAL SHUNTING ALARM MONITORING AND UNLOCKING OUTSIDE LEVER.

Hardware Group No. 16 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080L 06A	626	SCH
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 16 TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	L9040 06A L583-363 L283-722	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8402 10" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 16A TOW

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	L9040 06A L583-363 L283-722	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8402 10" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 17 FSR

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONTINUOUS HINGE	A500	630	ABH
			W/ EPT CUT OUT		
1	EA	CONTINUOUS HINGE	A500	630	ABH
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	SET	CONST LATCHING BOLT	FB51P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	EU MORTISE LOCK	L9092LEU 06A RX	626	SCH
			FAIL SECURE		
2	EA	RIM CYL	TO MATCH EXIST	626	C-R
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	FIRE/LIFE CLOSER	4040SE WMS	689	LCN
2	EA	KICK PLATE	8402 10" X 1" LDW B-CS	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	MEETING STILE GASK	129CP-F	628	REE
2	EA	DOOR SWEEP	964C	628	REE
1	EA	WIRE HARNESS	CON-38		VON
			TO ELEC. HWR.		
1	EA	WIRE HARNESS	CON-6W		VON
			TO POWER SUPPLY		
1	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
2	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. REQUEST TO EXIT SWITCH TO SHUNT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
2. ACCESS BY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
3. ACCESS BY VALID CREDENTIAL SHUNTING ALARM MONITORING AND UNLOCKING OUTSIDE LEVER.

Hardware Group No. 18 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 5 X 4.5	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU MORTISE LOCK	L9092LEU 06A RX	626	SCH
			FAIL SECURE		
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE
1	EA	WIRE HARNESS	CON-38		VON
			TO ELEC. HWR.		
1	EA	WIRE HARNESS	CON-6W		VON
			TO POWER SUPPLY		
1	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. REQUEST TO EXIT SWITCH TO SHUNT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
2. ACCESS BY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
3. ACCESS BY VALID CREDENTIAL SHUNTING ALARM MONITORING AND UNLOCKING OUTSIDE LEVER.

Hardware Group No. 19 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	L9040 06A L583-363 L283-722	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8402 10" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 20 FSR

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
2	EA	CONTINUOUS HINGE	A500	630	ABH
1	EA	FIRE EXIT HARDWARE	9849-L-F-06	630	VON
2	EA	RIM CYL	TO MATCH EXIST	626	C-R
2	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
2	EA	KICK PLATE	8402 10" X 1" LDW B-CS	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	MEETING STILE GASK	129CP-F	628	REE
2	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 21 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
4	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080L 06A	626	SCH
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	OH STOP	410S	630	GLY
1	EA	SURFACE CLOSER	4011 ST-1544	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 22 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU MORTISE LOCK	L9092LEU 06A RX	626	SCH
			FAIL SECURE		
1	EA	MORT CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE
1	EA	WIRE HARNESS	CON-38		VON
			TO ELEC. HWR.		
1	EA	WIRE HARNESS	CON-6W		VON
			TO POWER SUPPLY		
1	EA	CARD READER	BY SECURITY		B/O
1	EA	POWER SUPPLY	BY SECURITY		B/O
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	WIRE DIAGRAM	TO SUIT		B/O

OPERATIONAL DESCRIPTION:

1. ALWAYS FREE EGRESS. REQUEST TO EXIT SWITCH TO SHUNT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
2. ACCESS BY IN OUTSIDE CYLINDER. ALARM WILL BE SIGNALLED AT ALARM MONITORING OF ACCESS CONTROL SYSTEM.
3. ACCESS BY VALID CREDENTIAL SHUNTING ALARM MONITORING AND UNLOCKING OUTSIDE LEVER.

Hardware Group No. 23 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONTINUOUS HINGE	A500	630	ABH
1	EA	FIRE EXIT HARDWARE	98-L-NL-F-06	630	VON
1	EA	RIM CYL	TO MATCH EXIST	626	C-R
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8402 10" X 1" LDW B-CS	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE
1	EA	THRESHOLD	TO MATCH EXISTING	628	REE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

Hardware Group No. 24 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	OH STOP	410S	630	GLY
1	EA	SURFACE CLOSER	4011 ST-1544	689	LCN
1	EA	KICK PLATE	8402 10" X 1" LDW B-CS	630	IVE
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. 25 FSR

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONTINUOUS HINGE	A500	630	ABH
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-06	630	VON
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	MAG HOLDER	2100	628	ABH
1	EA	PERIM SEAL	638CH	CHA	REE
1	EA	DOOR SWEEP	964C	628	REE

Hardware Group No. NIC

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	DR AND FRM	NOT IN CONTRACT		B/O

END OF SECTION 087100

Catalog Cuts

for

Union County Courthouse (Rotunda, Stair Tower, and Radio Room)

Sorted by Manufacturer

Prepared By
RICK MACFARLANE
ALLEGION PLC
289 BROADWAY

HILLSDALE NEW JERSEY
Phone 201-390-9875

Created 8/22/2017

Catalog Cut Summary

Mfr	Description	Catalog Number	Cut	Page Number
ABH	CONTINUOUS HINGE	A500	ABH_8010	
ABH	MAG HOLDER	2100	ABH_8004	
GLY	OH STOP	410S	GLY_0005	
IVE	HW HINGE	3CB1HW 5 X 4.5	IVE_0248	
IVE	AUTO FLUSH BOLT	FB31P	IVE_0090	
IVE	KICK PLATE	8402 10" X 1" LDW B-CS	IVE_0223	
IVE	CONST LATCHING BOLT	FB51P	IVE_0092	
IVE	COORDINATOR	COR X FL	IVE_0101	
IVE	DUST PROOF STRIKE	DP2	IVE_0098	
IVE	WALL STOP	WS406/407CVX	IVE_0141	
IVE	HW HINGE	3CB1HW 4.5 X 4.5	IVE_0248	
IVE	HW HINGE	3CB1HW 4.5 X 4.5 NRP	IVE_0248	
LCN	SURFACE CLOSER	4111 EDA	LCN_4110	
LCN	SURFACE CLOSER	4111 SCUSH	LCN_4110	
LCN	FIRE/LIFE CLOSER	4040SE WMS	LCN_4040SE	
LCN	SURFACE CLOSER	4011 ST-1544	LCN_4010	
LCN	SURFACE CLOSER	4011	LCN_4010	
REE	DOOR SWEEP	964C	REE_0001	
REE	PERIM SEAL	638CH	REE_0020	
REE	MEETING STILE GASK	129CP-F	REE_0001	
SCE	DOOR CONTACT	679-05HM	SCE_0060	
SCH	CLASSROOM LOCK	L9070L 06A	SCH_0011	
SCH	STOREROOM LOCK	L9080L 06A	SCH_0011	
SCH	PASSAGE SET	L9010 06A	SCH_0011	
SCH	EU MORTISE LOCK	L9092LEU 06A RX	SCH_0112	
SCH	PRIVACY LOCK	L9040 06A L583-363 L283-722	SCH_0011	
VON	FIRE EXIT HARDWARE	98-L-BE-F-06	VON_0002	
VON	ELEC FIRE EXIT HARDWARE	RX-LC-98-L-F-E996-06-FS-CON	VON_0002~VON_0117~VON_0094	
VON	FIRE EXIT HARDWARE	9849-L-BE-F-06	VON_0012	
VON	FIRE EXIT HARDWARE	98-L-NL-F-06	VON_0002	
VON	ELEC FIRE EXIT HARDWARE	RX-LC-9849-L-F-06-CON	VON_0012~VON_0117	

Project: Union County Courthouse (Rotunda, Stair Tower, and Radio Room)	Control #: 357946	Print Date: Aug 22 2017 10:56AM EDT	
Company: Allegion PLC	Version #: 1	Ver Date: Aug 22 2017 7:43AM EDT	Page 2 of 3

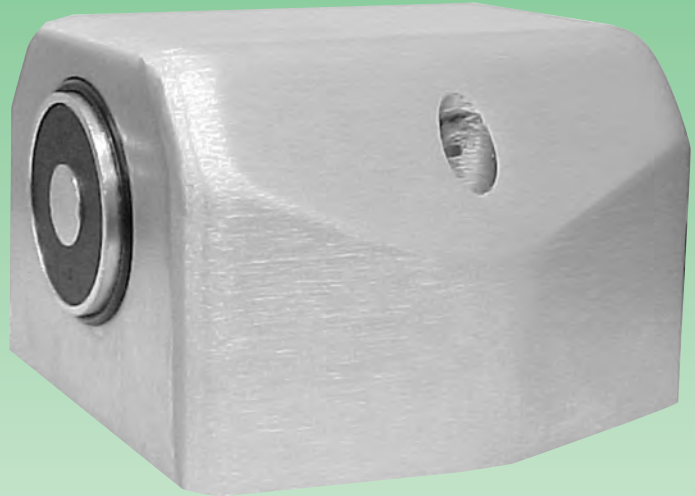
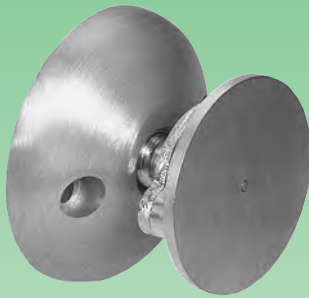
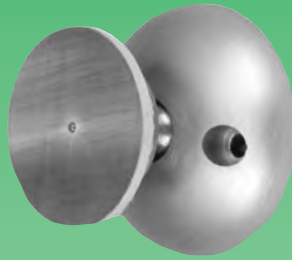
Mfr	Description	Catalog Number	Cut	Page Number
VON	FIRE EXIT HARDWARE	9849-L-F-06	VON_0012	
VON	ELEC FIRE EXIT HARDWARE	RX-LC-9849-L-F- E996-06-FSE-CON	VON_0012~VON_0117~ VON_0094	
VON	ELEC FIRE EXIT HARDWARE	ALK-98-L-F-E996- 06-FS-CON	VON_0002~VON_0127~ VON_0127~VON_0094	
VON	POWER TRANSFER	EPT10 CON	VON_0201	

Project: Union County Courthouse (Rotunda, Stair Tower, and Radio Room)	Control #: 357946	Print Date: Aug 22 2017 10:56AM EDT	
Company: Allegion PLC	Version #: 1	Ver Date: Aug 22 2017 7:43AM EDT	Page 3 of 3

ABH[®]

MAGNETIC DOOR HOLDERS

NEW Universal Voltage
12VDC 24VAC/DC 120VAC



ARCHITECTURAL BUILDERS HARDWARE MFG., INC.

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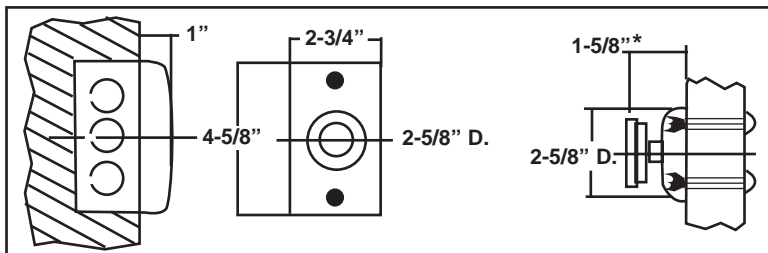
ABH is a certified minority manufacturer.

The newly designed 2000 Series Electro-magnetic Door Holders is now **Tri-Voltage**. Each model (except 2500) can be wired **12V DC, 24V AC/DC or 120V AC**. Units can be used on fire/smoke barrier doors held open until released by a remote switching device. They can also be used to just hold a door open. The armature is thru-bolted to the door for security and can be **provided with any projection required**. When ordering indicate model, total projection, finish and door thickness if other than 1-3/4".

- 30-45 pound holding power
- Underwriters US and Canada Listed
California State Fire Marshal Listed
New York City MEA
ANSI/BHMA 156.14
- Most models available in US28, sprayed finishes and US32D



2100 RECESSED WALL MOUNT

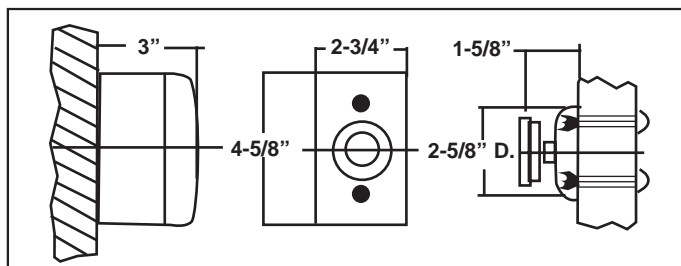


* 2-5/8 with 1" extension

BHMA
C00011



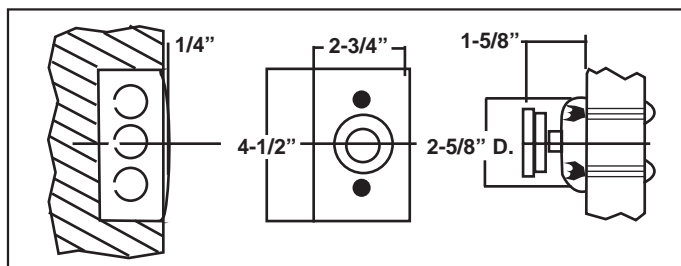
2300 SURFACE WALL MOUNT



BHMA
C00011



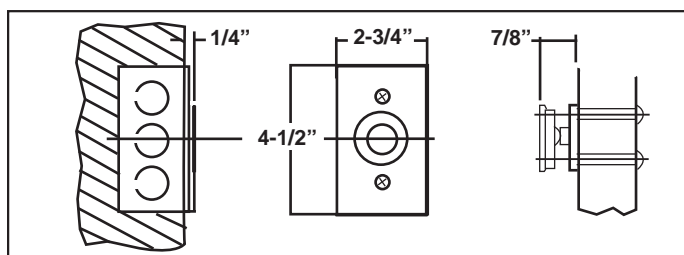
2400 FLUSH WALL MOUNTED



BHMA
C00011



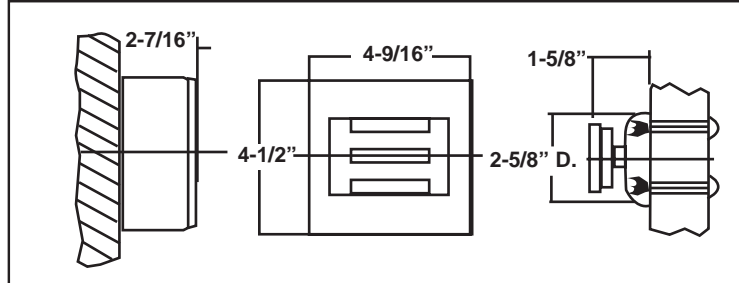
2400L FLUSH WALL MOUNTED



BHMA
C00011

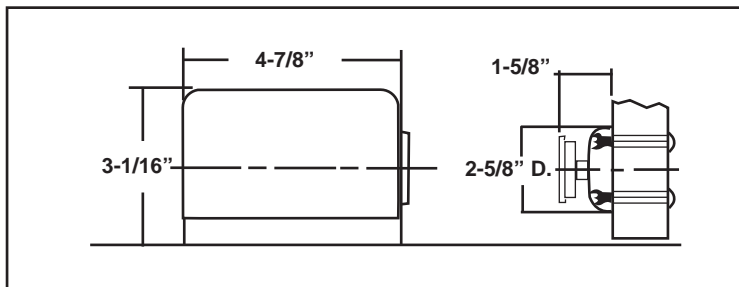
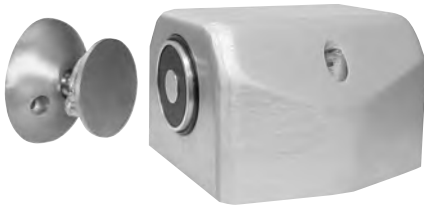
2500 SURFACE WALL MOUNTED

400# Holding Force 2510 - 24AC/DC



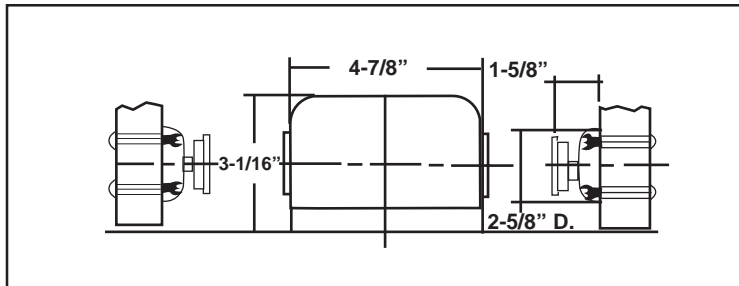
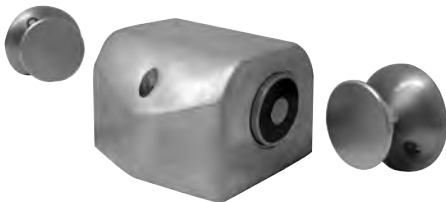
BHMA
C00011

2600 SINGLE FLOOR MOUNT



BHMA
C00031

2700 DOUBLE FLOOR MOUNT



BHMA
C00031

ARMATURE EXTENSIONS



S20020 - Length as requested

Mount door
portion horizontally

20020



20050



1/2"

20075



3/4"

20100



1"

Other extension lengths available on request

20120



120° Swivel Extension

PERFORMANCE DATA			
MODEL	VOLTS	mAmps	VA
2100, 2300	12DC	60	.72
2400, 2600, 2700	24AC	30	.72
2400L	24DC	30	.72
	120AC	30	3.60
2510	24AC/DC	105	1.26

CROSS REFERENCE

FUNCTION	ABH	DORMA	RIXSON	NORTON	YALE	SARGENT	CORBIN RUSSWIN	LCN
RECESSED WALL MOUNTED 2-5/8" TOTAL PROJ	2100	EM-F24120	FM-997	6934	5934	1560	MA 203 MA 243	SEM 7840
RECESSED WALL MOUNTED 3-5/8" TOTAL PROJ	2100* w/1" extension	EM-F24120	FM-998	6933	5933	1560	MA 204 MA 244	SEM 7850
SURFACE WALL MOUNTED 4-5/8" TOTAL PROJ	2300	EM-S24120	FM-996 FM-999	6935	5935	-	-	SEM 7830
FLUSH WALL MOUNTED 1-13/16" TOTAL PROJ	2400	EM-R24120	FM-990	6936	5936	1561	-	-
1-1/8" TOTAL PROJ	2400L	-	FM-989	-	-	-	-	-
400# SURFACE WALL MOUNTED 4-1/16" TOTAL PROJ	2500	-	FM-993	-	-	-	-	-
FLOOR (SINGLE)	2600	EM-FM24120	FM-980	6931	5931	1562	MA 201	SEM 7820
FLOOR (DOUBLE)	2700	EM-DFM24120	FM-981	6932	5932	1563	-	-
SPRAYED FINISHES	S1 - Aluminum S2 - Brass S3 - Bronze S5 - To match US10B							

*Replaces 2210 & 2220.

All models (except 2510) are universal voltage (12VDC, 24V AC/DC, 120AC).

Architectural Builders Hardware Mfg., Inc.
FAX 800.9FAXABH (932.9224)
 E-mail: abhinfo@abhmfg.com
 Visit our web site at <http://www.abhmfg.com>

ABH is a minority
 owned and operated
 manufacturing company

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 Printed in USA 04/04





Manufacturing, Inc.



- Overhead Holders & Stops
- Hospital Push/Pull Latches
- Electro-Magnetic Door Holders
- Electrical Power Transfer Products
- Aluminum Continuous Geared Hinges
- Stainless Steel Edge Guards
- Pivots & Pivot Sets
- Rescue Hardware
- Coordinators, Flush Bolts & Roller Latches
- Slide Bolts, Surface Bolts & Miscellaneous Products



Stainless Steel Continuous Pin & Barrel Hinges

Stainless Steel Continuous Pin & Barrel Hinges Cross-Reference Chart

Type	ABH*	ASSA Abloy*		Hager*	Stanley*	Ives*
		Markar*	McKinney*			
Full Concealed	A500WT	FM300	MCK-FM300	790-900	651	700
	A500WT	FM300WT	-	-	-	-
	A505	HG305	MCK-HG305	790-905	652	705
	A510	HG310	MCK-HG310	-	-	-
	A511	HG311	MCK-HG311	790-911	656	711
	A515	HG315	MCK-HG315	790-915	653	715
	A526	HG326	MCK-HG326	790-926	-	-
	A529	HG329	-	790-929	-	-
	A5500	FM3500	MCK-FM3500	-	651HD	-
	A5505	FM3505	MCK-FM3505	-	652HD	-
	A5515	FM3515	-	-	653HD	-
Full Surface	A502	FS302	MCK-FS302	-	657	702
Half Surface	A503	HS303	MCK-HS303	790-903	-	-
Half Mortise	A504	HM304	MCK-HM304	790-904	654	-
	A506	HG306	MCK-HG306	790-906	655	-
Type	ABH*	ASSA Abloy*		Hager*	Stanley*	Ives*
		Markar*	McKinney*			
Hospital Tip	HT	HT-MP	HT	HT	HT	HT
Dutch Door	DD	DDP-MP	DDP	DD	DD	DD
Power Transfer Cut-Out	PT	CTP	EPT	EPT	EPT	EPT
Security Pins	SP	AVAIL	SECURITY STUDS	-	AVAIL	-
Sheared Leaf	SL	AVAIL	SHEARED LEAF	-	AVAIL	-
Adjustable Studs	AS	AS	AS	-	-	-
Clinical Bearings	CB	MB	MB	-	-	-
Lead-Lined Cover	LL	LL-MP	LL	-	-	-
Raised Barrel (Swaged)	RB	RB-MP	RB	AVAIL	RB	-
Concealed Electrical Thru-Wire (number indicates quantity of wires)	TW4	-	CC-4	ETW-4	-	TW4
	TW8	-	CC-8	ETW-8	CE-600	TW8
	TW12	-	-	-	-	-
Concealed Electrical Thru-Wires with Molex® Connectors - EZ Connect (number indicates quantity of wires)	EZ4	EL4	EL4	ETW-4	-	TW4
	EZ8	EL8	EL8	ETW-8	-	TW8
	EZ12	EL12	EL12	-	-	-
Moveable Panel for Electrical Access Prep	M	ETAP	ETAP	-	-	-
Contact Switch with Concealed Electrical Thru-Wires (number indicates quantity of wires)	CT4	-	-	-	-	-
	CT8	-	-	-	-	-
	CT12	-	-	-	-	-
Adjustable Monitoring Switch	AMS	AMS	AMS	-	-	-

*Brand names are trademarks or registered trademarks of their respective companies.

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Full Surface Models

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Stainless Steel Continuous Pin & Barrel Hinges



Innovation, Quality,
Customer Service...

General Info

Standard Features

- **Clinical Bearings** - All hinges are manufactured with clinical bearings to provide a more permanent solution to lubricating hinges and help prevent build-up of dust and other foreign substances around the knuckles of the hinge.
- **Welded End Pins** - Both the top and bottom end pins are permanently welded to the hinge so the pin will not loosen after years of use.
- Continuous hinges alleviate most common alignment problems such as door binding and sagging by evenly distributing the weight throughout the entire door and frame
- Provides extra security by eliminating the gap between the door and the frame; thus, disallowing the ability to pry the opening
- All hinges are surface applied - no mortising of the door or frame required
- Will cover old butt hinge cut-outs
- Meets and/or exceeds ANSI 156.26, Grade 1
- Templated hinges - hole patterns for the standard lengths remain consistent from one order to the next
- 3/16" diameter stainless steel pin
- Base material is heavy duty 14 gauge 304 grade stainless steel (except for A5500, A5515 and A5505 models which are heavier duty 12 gauge stainless steel)

Warranty

ABH provides a **limited lifetime warranty** on its hinges for the lifetime of the door opening, except for electrically modified hinges which carry a five year limited warranty.

Fire Rating

All ABH stainless steel pin & barrel hinge models have been tested and certified by UL® (U.S.A. and Canada) for up to and including a 3-Hour Fire Listing on all 4'0" x 10'0" doors:

- 20 minutes - wood doors
- 90 minutes - hollow metal and
 - composite core
 - wood fire doors
- 3 hours - hollow metal doors

How to Order

Example : A500 083 US32D TW4 M

Model:

Full Concealed

- A500 • A510 • A529
- A500RB • A511 • A5500
- A500WT • A515 • A5505
- A505 • A515RB • A5515
- A505RB • A526

Half Surface

- A503

Half Mortise

- A504
- A506

Full Surface

- A502

Hinge Height:

- 078 = 78-3/4"
- 083 = 83-1/8"
- 085 = 85"
- 095 = 95"
- 118 = 118-3/4"

Finish:

- US32D = Satin Stainless Steel
- US32 = Bright Stainless Steel
- Custom Finish

Options, if Applicable:

(See pages G-6 to G-7 for details and availability)

- | | | | | |
|--------|--------|----------|----------|----------------|
| • TW4 | • M | • HT | • CUT | • SL |
| • TW8 | • PT | • DD | • SNB | • ADB |
| • TW12 | • AMS | • STUD | • 1/2 WS | • CUSTOM HOLES |
| • EZ4 | • CT4 | • AS | • AWS | • NO HOLES |
| • EZ8 | • CT8 | • SEC | • LL | |
| • EZ12 | • CT12 | • SPLICE | | |



Hinge Types

Full Concealed - Both hinge leaves are concealed between the rabbet of the frame and the door.

- Standard fasteners provided (door and frame leaves):
 - 10-24 x 7/8" self-drilling, thread forming undercut tek screws
 - #10 x 1-1/4" undercut sheet metal screws (for wood applications)

Half Mortise - The frame leaf is mounted to the face of the frame and the door leaf is concealed between the rabbet of the frame and the door.

- Standard fasteners provided:
 - Door leaf is provided with:
 - 10-24 x 7/8" self-drilling, thread forming undercut tek screws
 - #10 x 1-1/4" undercut wood screws (for wood applications)
 - Frame leaf is provided with:
 - 1/4-20 x 3/4" pan head self-drilling tek screws
 - Cover clips for the fastener cover

Half Surface - The frame leaf is concealed between the rabbet of the frame and the door and the door leaf is mounted to the face of the door.

- Standard fasteners provided:
 - Door leaf is provided with:
 - 1/4-20 x 3/4" pan head self-drilling tek screws
 - Cover clips for the fastener cover
 - Frame leaf is provided with:
 - 10-24 x 7/8" self-drilling, thread forming undercut tek screws
 - #10 x 1-1/4" undercut wood screws (for wood applications)

Full Surface - Frame leaf is mounted to the face of the frame and the door leaf is mounted to the face of the door.

- Standard fasteners provided (door and frame leaves):
 - 1/4-20 x 3/4" pan head self-drilling tek screws
 - Cover clips for the fastener cover

Swing Clear

A swing clear hinge allows the door to swing completely clear of the door opening. Typically used in medical centers where the access area must be the entire door width, it allows for large items such as gurneys and wheelchairs to pass. ABH offers the **A511, A526 and A529** swing clear models.

Raised Barrel

The hinge barrel is offset away from the hinge jamb on a raised barrel hinge. They are used when the door is set back in a deep reveal and there is not enough room for the hinge barrel to extend past the face of the frame. **ABH offers the A500RB, A505RB and A515RB** raised barrel models.



Full Concealed



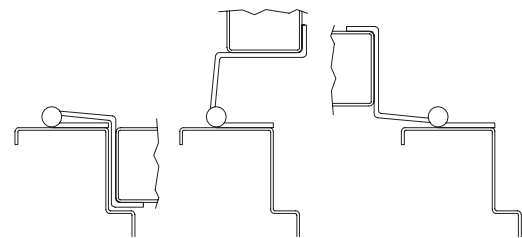
Half Mortise



Half Surface



Full Surface

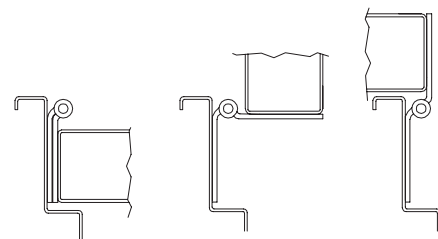


0° Opening

90° Opening

180° Opening

A511 Full Concealed, Swing Clear



0° Opening

90° Opening

180° Opening

A500RB Full Concealed, Raised Barrel



Door Clearance Chart

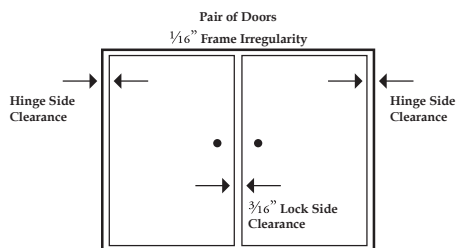
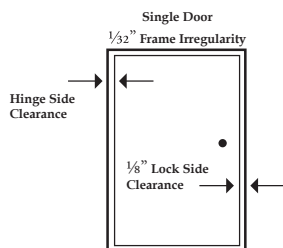
Single Door - Square Edged								
Hinge Model		Hinge Side Clearance	+	Lock Side Clearance	+	Frame Irregularity	=	Square Edged Door Undersize (Single)
Full Concealed	A500*, A500RB, A511, A515, A515RB, A529	7/32"	+	1/8"	+	1/32"	=	3/8"
	A505**, A510**, A526**	9/32"	+	1/8"	+	1/32"	=	7/16"
	A5500*, A5515	5/16"	+	1/8"	+	1/32"	=	15/32"
	A5505**	3/8"	+	1/8"	+	1/32"	=	17/32"
Half Mortise	A504*, A506	1/8"	+	1/8"	+	1/32"	=	9/32"
Half Surface	A503	1/8"	+	1/8"	+	1/32"	=	9/32"
Full Surface	A502	1/16"	+	1/8"	+	1/32"	=	7/32"

Pair of Doors - Square Edged								
Hinge Model		Hinge Side Clearance (Pair)	+	Lock Side Clearance	+	Frame Irregularity	=	Square Edged Door Undersize (Pair)
Full Concealed	A500*, A500RB, A511, A515, A515RB, A529	7/16"	+	3/16"	+	1/16"	=	11/16"
	A505**, A510**, A526**	9/16"	+	3/16"	+	1/16"	=	13/16"
	A5500*, A5515	5/8"	+	3/16"	+	1/16"	=	7/8"
	A5505**	3/4"	+	3/16"	+	1/16"	=	1"
Half Mortise	A504*, A506	1/4"	+	3/16"	+	1/16"	=	1/2"
Half Surface	A503	1/4"	+	3/16"	+	1/16"	=	1/2"
Full Surface	A502	1/8"	+	3/16"	+	1/16"	=	3/8"

* For beveled doors, standard clearance is applied to the high side (wide side) of the door.

Please add 1/32" for single beveled doors and 1/16" for pair of beveled doors (applicable for A500, A5500 and A504 only).

**When using the optional "AS" Adjustable Studs, 1/8" additional adjustment clearance is allowed.



Stainless Steel Continuous Pin & Barrel Hinges



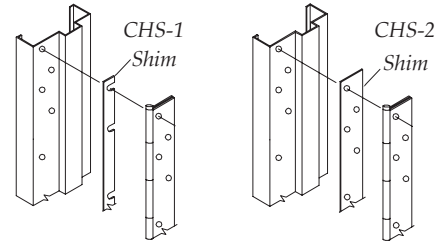
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Parts

Continuous Hinge Shims

ABH offers two different types of hinge shims, both made of 16 gauge stainless steel material. Available in standard hinge sizes (78- $\frac{3}{4}$ ", 83- $\frac{1}{8}$ ", 85", 95", 118- $\frac{3}{4}$ "). **Specify height when ordering.**

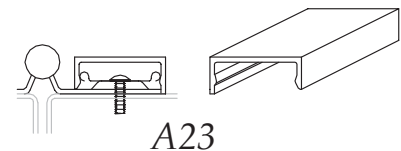
- **CHS-1** – Slip-in installation
- **CHS-2** – Hinge must be removed for installation



Replacement Covers

Available for full surface, half mortise and half surface models, replacement covers are supplied with allen head set screw and wrench for installation. They are supplied in aluminum anodized finish and for standard hinge sizes only (78- $\frac{3}{4}$ ", 83- $\frac{1}{8}$ ", 85", 95", 118- $\frac{3}{4}$ "). **Specify height when ordering.**

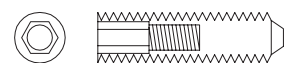
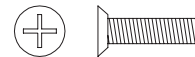
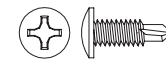
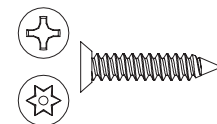
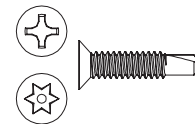
- **A23** – Hinge leaf cover for A502, A503, A504 & A506



Fasteners - Bulk Packed

 – sold in quantities of 500 only

- **SSH1024FHSDS-500** - 10-24 x $\frac{7}{8}$ " Phillips flat head, undercut, self-drilling, thread-forming tek machine screw
- **SSH1024FHSDSSEC-500** - 10-24 x $\frac{7}{8}$ " Pin-in torx flat head, undercut, self-drilling, thread-forming tek machine security screw
- **SSH10FHWS-500** - #10 x 1- $\frac{1}{4}$ " Phillips flat head, undercut wood screw
- **SSH10FHWSSEC-500** - #10 x 1- $\frac{1}{4}$ " Pin-in torx flat head, undercut wood security screw
- **SSH1/420RHSDS-500** - $\frac{1}{4}$ -20 x $\frac{3}{4}$ " Round head self-drilling, thread-forming tek machine screw
- **SSH-AS-WD-500** - Adjustable Stud with 10-32 internal thread, 1- $\frac{3}{8}$ " long, right hand thread for wood door with 10-32 x $\frac{3}{4}$ " Phillips flat head, undercut machine screw
- **SSH-AS-MD-500** - Adjustable Stud with 10-32 internal thread, 1- $\frac{3}{8}$ " long, left hand thread for metal door with 10-32 x $\frac{3}{4}$ " Phillips flat head, undercut machine screw



Screw Packs

 – Specify the following when ordering:

- Hinge model
- Hinge length
- Door material & frame material
- **Example:** A500083-SCR x MDMF



Architectural Builders Hardware Manufacturing, Inc.
1222 Ardmore Avenue, Itasca, IL 60143
Tel: 630-875-9900 • Fax: 630-875-9918 / 800-932-9224
Web: www.abhmfg.com • Email: abhinfo@abhmfg.com

Electrical Options

“TW” - Concealed Electrical Thru-Wire

Transfers power from the frame to the door in a discreet manner.

- **TW4** - (4) 30 AWG wires
- **TW8** - (8) 30 AWG wires
- **TW12** - (12) 30 AWG wires

“EZ” - Concealed Electrical Thru-Wire with Molex® Connectors

Transfers power from the frame to the door in a discreet manner. Molex® plug-in connectors provided for installation ease.

- **EZ4** - (4) 30 AWG wires with Molex® connectors
- **EZ8** - (8) 30 AWG wires with Molex® connectors
- **EZ12** - (12) 30 AWG wires with Molex® connectors

“M” - Moveable Electrical Access Prep

Hinge is supplied as one complete piece (pin and barrel are continuous), but both hinge leaves are cut to allow access to the electrical section without having to uninstall the hinge.

“PT” - Cut-out Prep for Power Transfer

Hinge is prepped for the use electrical power transfer to be used - must specify which model power transfer unit being used. See ABH Electrical Power Transfer section in the catalog for available models (sold separately).

“AMS” - Adjustable Monitoring Switch

Adjustable button switch is installed in the frame leaf to monitor the door position. Specify handing.

“CT” Concealed Electrical Thru-Wire and Monitor Switch

Monitor switch is installed in the frame leaf to monitor the door position while the wires transfer power from the frame to the door in a discreet manner.

- **CT4** - (4) 30 AWG wires
- **CT8** - (8) 30 AWG wires
- **CT12** - (12) 30 AWG wires

Electrical Options - Compatibility Chart							
Hinge Model		TW	EZ	M	PT	AMS	CT
Full Concealed	A500	●	●	●	●	●	●
	A500RB	●	●	●	●	●	●
	A500WT	●	●	●	●	●	●
	A505	●	●	●	●	●	●
	A505RB	●	●	●	●	●	●
	A510	●	●	●	●	●	●
	A511	●	●	●	●	●	●
	A515				●		
	A515RB	●	●	●	●	●	●
	A526				●		
	A529				●		
	A5500	●	●	●	●	●	●
	A5515	●	●	●	●	●	●
A5505	●	●	●	●	●	●	
Half Mortise	A504				●		
	A506				●		
Half Surface	A503				●		
Full Surface	A502						



Stainless Steel Continuous Pin & Barrel Hinges



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Non - Electrical Options

“CUT” - Cut to Custom Length

If a non-standard length hinge is required, ABH will cut from the bottom of the hinge to the desired length as long as it does not interfere with a screw hole. **Specify length and handing.**

“SPLICE” - Spliced Hinge

For hinges exceeding 118-3/4”, ABH splices two separate lengths with an alternately split stainless steel pin that holds the barrel together. **Specify length and handing.**

“HT” - Welded Hospital Tip

Top of the hinge barrel is cut at a 45° angle and then welded to help provide and support a safer environment in hospitals and other institutions. **Specify handing.**

“DD” - Dutch Door

Modified door leaf cut to fit a dutch door application. Go online for order form or, specify top and bottom door leaf heights as well as clearance required between top and bottom and handing when ordering.

“STUD” - Security Studs

1/2” diameter stainless steel studs are permanently mounted to the frame leaf projecting 1/4” and extend into the door leaf for added security.

“AS” - Adjustable Studs

Threaded studs are supplied for hinges with door edge guards on both faces of the door to help correct door alignment issues up to 3/8”. Additional door reinforcement required. **Specify wood or metal door.**

“SEC” - Security Fasteners

Security fasteners are supplied in lieu of standard fasteners for all exposed areas. **Specify wood or metal door and frame**

“SNB” - Sex Bolts

When using on wood doors, sex bolts are provided for the surface mounted door portion.

“LL” - Lead-Lined

Lead is provided for the door portion fastener cover for half surface and full surface hinges.

“SL” - Sheared Leaf

Concealed leaf is sheared to accommodate a 1-3/8” thick door.

“ADB” - Cut for Automatic Door Bottom

Specify automatic door bottom model when ordering.

“CUSTOM HOLE”

Contact factory with custom mounting hole locations desired for unusual frame and/or door conditions. Restrictions apply.

“NO HOLE”

Contact factory for hinge without mounting holes.

“CUSTOM FINISH”

Custom powder coated finishes available – contact factory for details. Customer color sample approval will be required prior to fabrication.

Hinge Model		CUT	SPLICE	HT	DD	STUD	AS	SEC	SNB	LL	SL	ADB	CUSTOM HOLES	NO HOLES	CUSTOM FINISH
Full Concealed	A500	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A500RB	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A500WT	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A505	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A505RB	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A510	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A511	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A515	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A515RB	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A526	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A529	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A5500	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A5515	•	•	•	•	•	•	•	•	•	•	•	•	•	•
A5505	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Half Mortise	A504	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A506	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Half Surface	A503	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Full Surface	A502	•	•	•	•	•	•	•	•	•	•	•	•	•	•



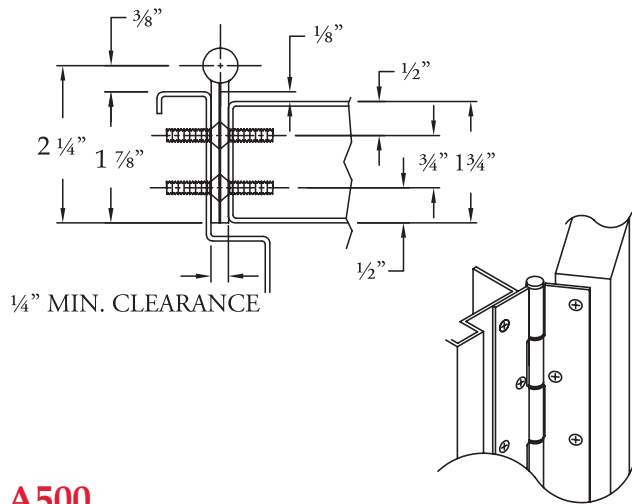
Architectural Builders Hardware Manufacturing, Inc.
1222 Ardmore Avenue, Itasca, IL 60143
Tel: 630-875-9900 • Fax: 630-875-9918 / 800-932-9224
Web: www.abhmfg.com • Email: abhinfo@abhmfg.com

Stainless Steel Continuous Pin & Barrel Hinges



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Full Concealed



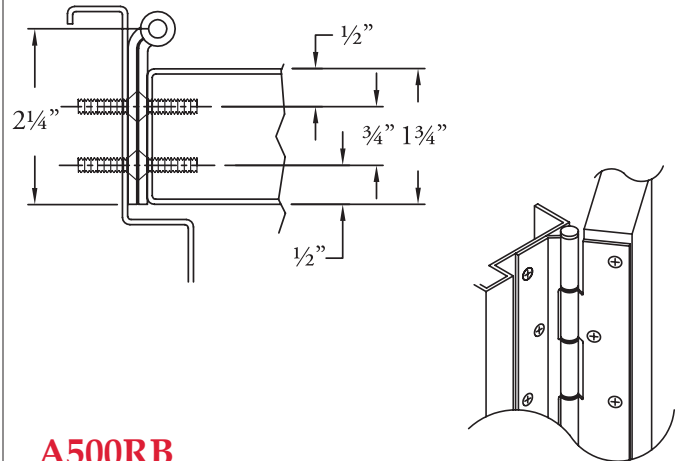
A500

Standard Features

- Full concealed, heavy duty
- 1/8" door inset
- 48" door width maximum
- 600 lbs. door weight maximum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel and #10 x 1-1/4" undercut wood screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



A500RB

Standard Features

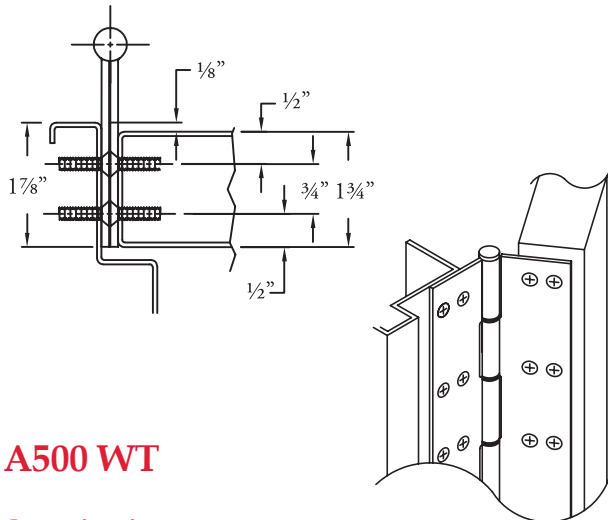
- Raised barrel (swaged) for door set back in deep reveals
- Full concealed, heavy duty
- 48" door width maximum
- 600 lbs. door weight maximum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel and #10 x 1-1/4" undercut wood screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



Full Concealed



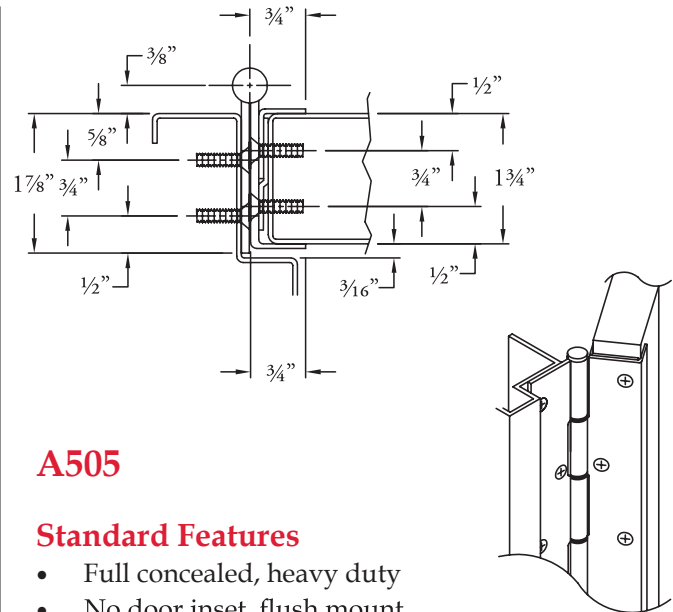
A500 WT

Standard Features

- Full concealed, heavy duty
- 1/8" door inset
- Wide throw for applications that need extra clearance for the door or the frame - 5" maximum from center of barrel to edge of hinge leaf
- The use of a caster on the lock side of tall or heavier doors is recommended to help carry to offset load
- 48" door width maximum
- 600 lbs. door weight maximum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel and #10 x 1-1/4" undercut wood screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85" and 95"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



A505

Standard Features

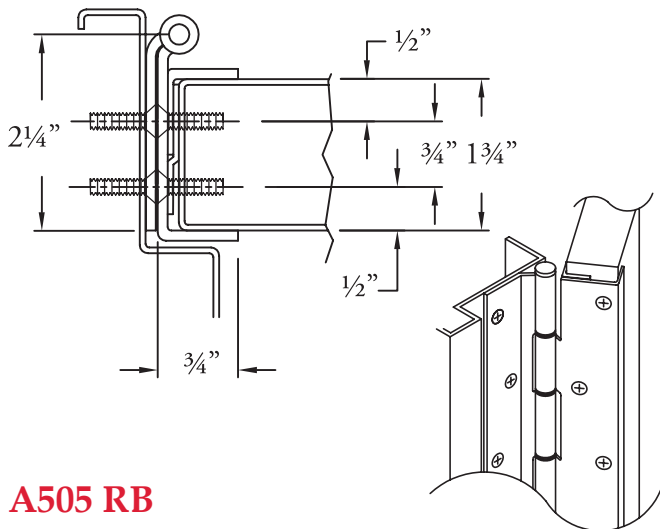
- Full concealed, heavy duty
- No door inset, flush mount
- Door edge guard on both faces of door
- 48" door width maximum
- 600 lbs. door weight maximum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel and #10 x 1-1/4" undercut wood screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



Full Concealed



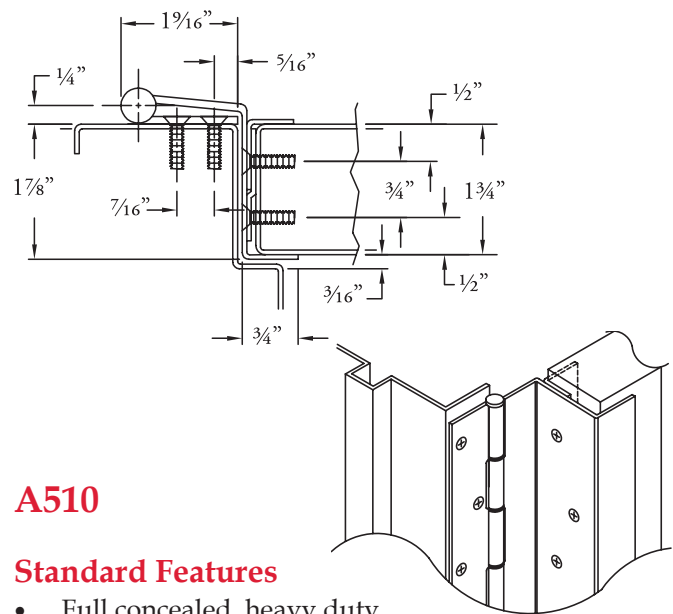
A505 RB

Standard Features

- Raised barrel (swaged) for door set back in deep reveals
- Full concealed, heavy duty
- No door inset, flush mount
- Door edge guard on both faces of door
- 48" door width maximum
- 600 lbs. door weight maximum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel and #10 x 1-1/4" undercut wood screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL[®] (U.S.A. and Canada) on 4'0" x 10'0" doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



A510

Standard Features

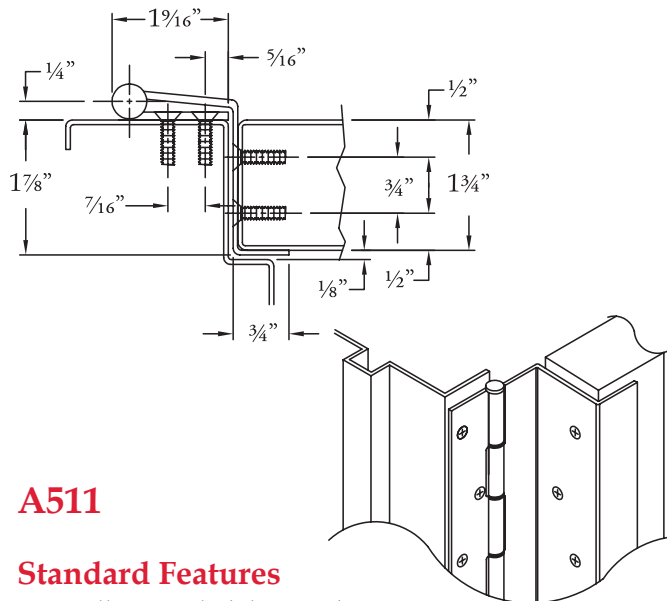
- Full concealed, heavy duty
- No door inset, flush mount
- Swing clear application
- Door edge guard on both faces of door
- 48" door width maximum
- 600 lbs. door weight maximum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel and #10 x 1-1/4" undercut wood screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL[®] (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



Full Concealed



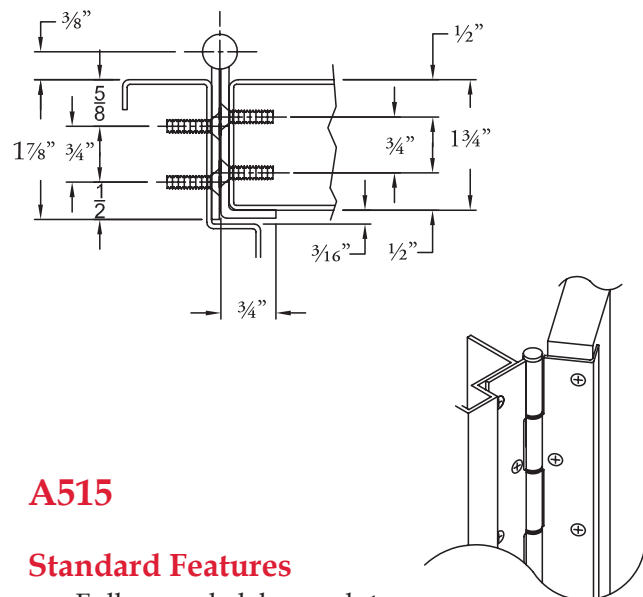
A511

Standard Features

- Full concealed, heavy duty
- No door inset, flush mount
- Swing clear
- Door edge guard on stop side only
- 48" door width maximum
- 600 lbs. door weight maximum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel and #10 x 1-1/4" undercut wood screws, stainless steel
- Lengths: 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



A515

Standard Features

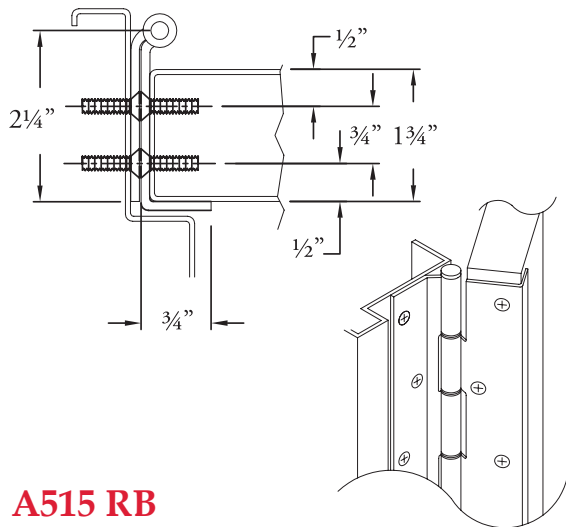
- Full concealed, heavy duty
- No door inset, flush mount
- Door edge guard on stop side only
- 48" door width maximum
- 600 lbs. door weight maximum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel and #10 x 1-1/4" undercut wood screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



Full Concealed



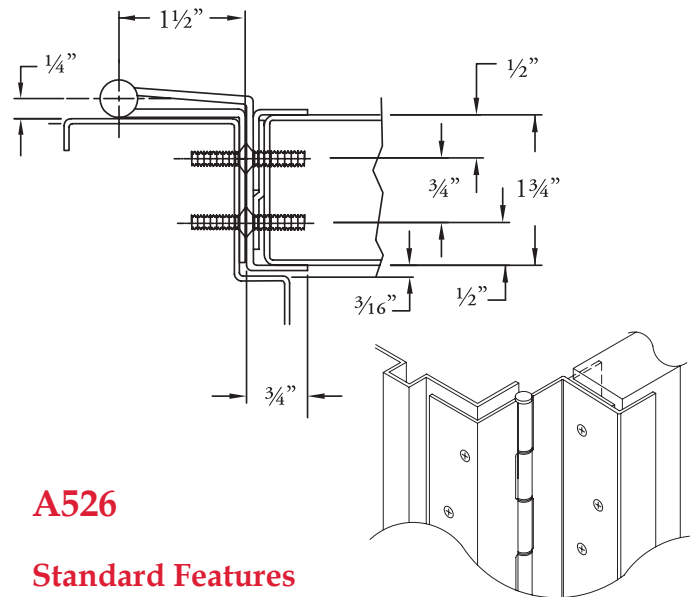
A515 RB

Standard Features

- Raised barrel (swaged) for door set back in deep reveals
- Full concealed, heavy duty
- No door inset, flush mount
- Door edge guard on stop side only
- 48" door width maximum
- 600 lbs. door weight maximum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel and #10 x 1-1/4" undercut wood screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



A526

Standard Features

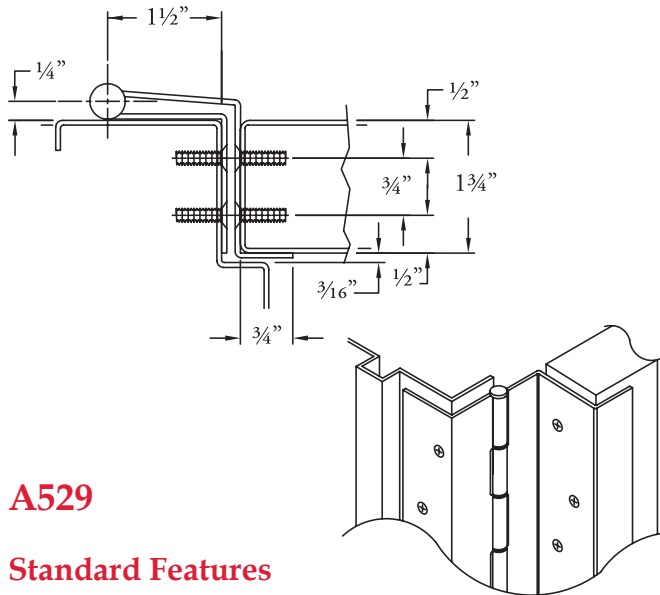
- Full concealed, heavy duty
- No door inset, flush mount
- Swing clear
- Door edge guards on both faces of the door
- 48" door width maximum
- 600 lbs. door weight maximum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel and #10 x 1-1/4" undercut wood screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



Full Concealed



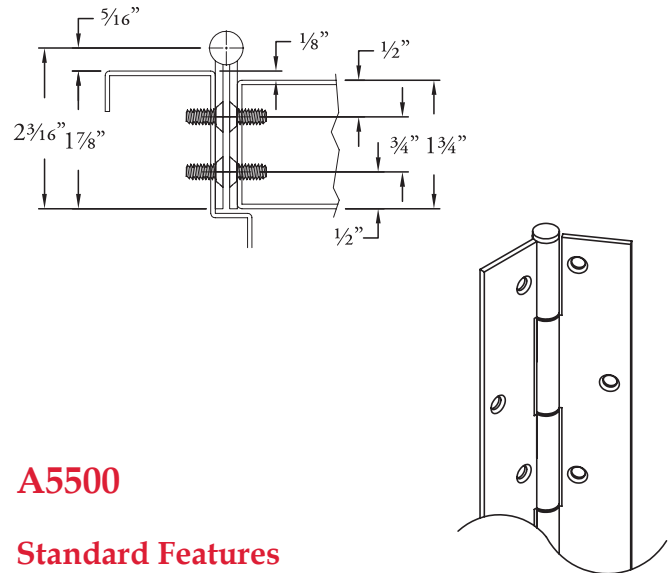
A529

Standard Features

- Full concealed, heavy duty
- No door inset, flush mount
- Swing clear
- Door edge guard on stop side only
- 48" door width maximum
- 600 lbs. door weight maximum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel and #10 x 1-1/4" undercut wood screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL[®] (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



A5500

Standard Features

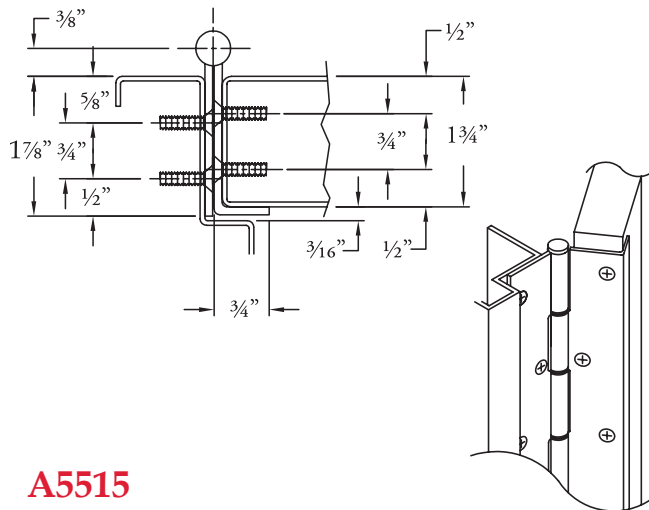
- Full concealed, extra heavy duty
- 12 gauge 304 grade stainless steel material
- 1/8" inset
- For doors up to 2-1/4" thick
- Welded hospital tip provided standard
- 48" door width maximum
- 900 lbs. door weight maximum
- **Fasteners:** 12-24 x 1/2" undercut machine screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL[®] (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



Full Concealed



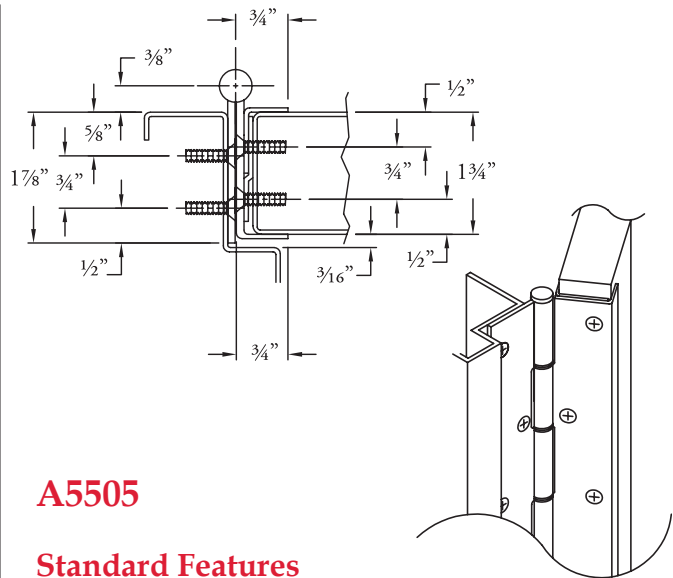
A5515

Standard Features

- Full concealed, extra heavy duty
- 12 gauge 304 grade stainless steel material
- No door inset, flush mount
- Welded hospital tip provided standard
- Door edge guard on stop side only
- 48" door width maximum
- 900 lbs. door weight maximum
- **Fasteners:** 12-24 x 1/2" undercut machine screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



A5505

Standard Features

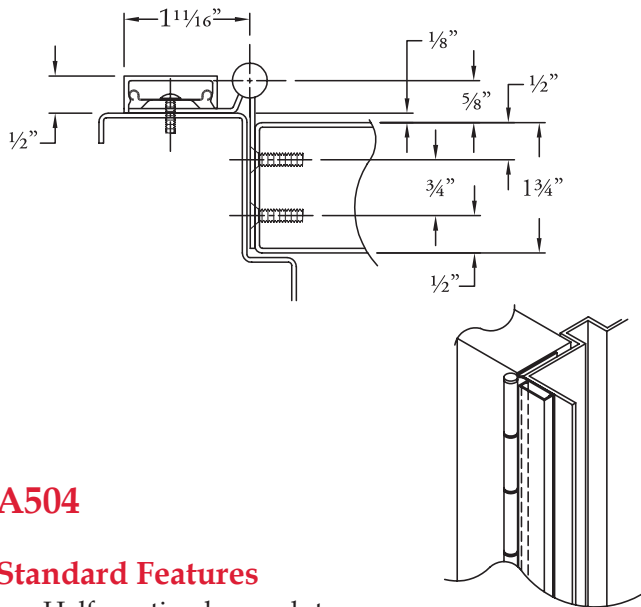
- Full concealed, heavy duty
- 12 gauge 304 grade stainless steel material for hinge leaves
- 16 gauge 304 stainless steel material for edge guard angle bracket
- No door inset, flush mount
- Welded hospital tip provided standard
- Door edge guards on both faces of the door
- 48" door width maximum
- 900 lbs. door weight maximum
- **Fasteners:** 12-24 x 1/2" undercut machine screws, stainless steel
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



Half Mortise



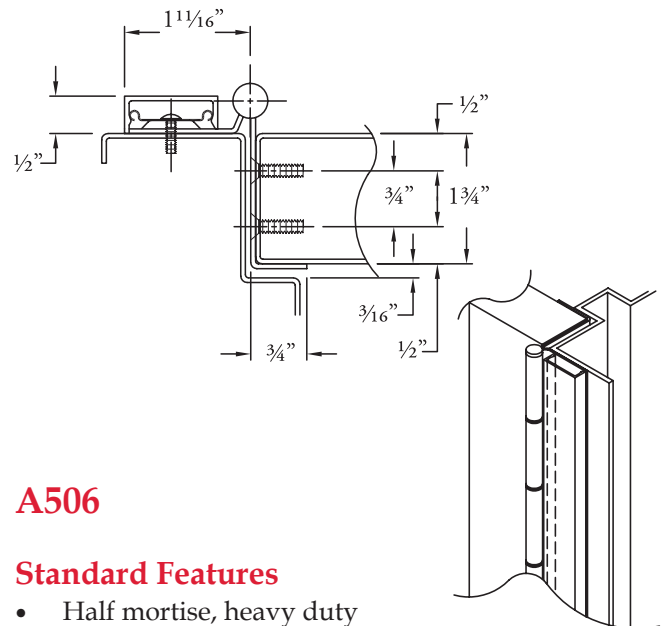
A504

Standard Features

- Half mortise, heavy duty
- 1/8" door inset
- 48" door width maximum
- 600 lbs. door weight maximum
- Frame leaf fastener cover is clear anodized aluminum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel for door and 1/4 -20 x 3/4" round head self-drilling tek machine screws, zinc plated for frame
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



A506

Standard Features

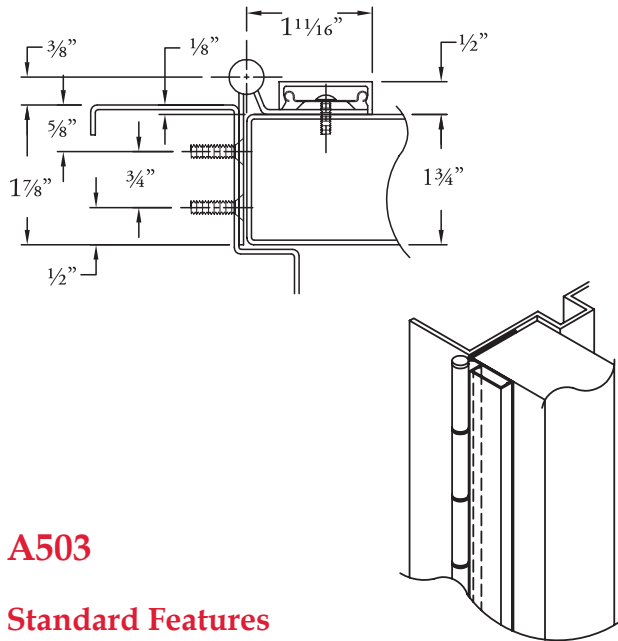
- Half mortise, heavy duty
- No door inset, flush mount
- Door edge guard on stop side only
- 48" door width maximum
- 600 lbs. door weight maximum
- Frame leaf fastener cover is clear anodized aluminum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel for door and 1/4 -20 x 3/4" round head self-drilling tek machine screws, zinc plated for frame
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



Half Surface & Full Surface



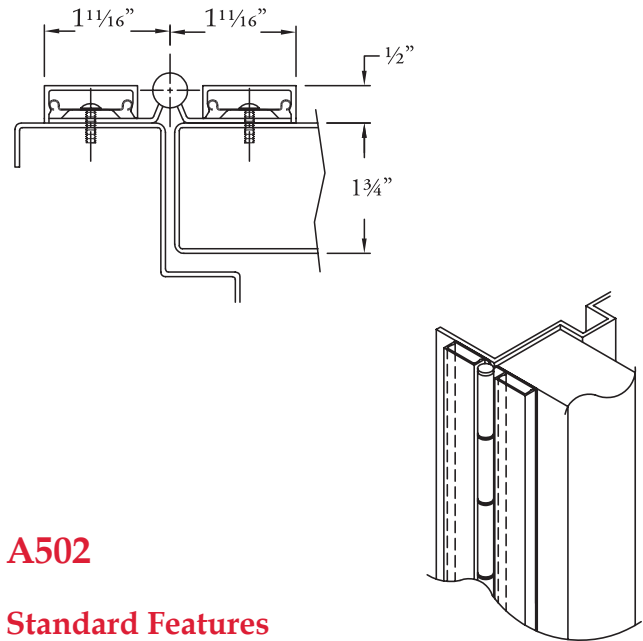
A503

Standard Features

- Half surface, heavy duty
- 1/8" door inset
- 48" door width maximum
- 600 lbs. door weight maximum
- Door leaf fastener cover is clear anodized aluminum
- **Fasteners:** 10-24 x 7/8" undercut, self-drilling, thread-forming tek machine screws, stainless steel for frame and 1/4-20 x 3/4" round head self-drilling tek machine screws, zinc plated for door
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



A502

Standard Features

- Full surface, heavy duty
- No door inset, flush mount
- 48" door width maximum
- 600 lbs. door weight maximum
- Frame and door leaf fastener covers are clear anodized aluminum
- **Fasteners:** 1/4-20 x 3/4" round head self-drilling, thread-forming tek machine screws, zinc plated
- **Lengths:** 78-3/4", 83-1/8", 85", 95" and 118-3/4"
- **Finishes:** US32D Satin Stainless Steel or US32 Bright Stainless Steel
- **Fire Rating** - tested and certified by UL® (U.S.A. and Canada) on 4'0" x 10'0" fire rated doors, based on the following
 - 20 minutes - wood doors
 - 90 minutes - hollow metal and composite core wood fire doors
 - 3 hours - hollow metal doors

Options Available

- See pages G-6 to G-7 for modification availability and details



410 Concealed Overhead Door Holders/Stops



410 Series Medium-Duty

Glynn-Johnson offers the most complete line of overhead door holders and stops, offering solutions for the most complex door control problems. The 410 series offers the industry's widest variety of functions, base materials and finishes to fit all medium to light-duty applications.

The perfect combination of form and function, Glynn-Johnson 410 series holders and stops offer effective door control and a low-profile design. Each model is constructed so that the channel is encased in the door and the jamb bracket is mortised in the frame. When the door is open, the arm and jamb bracket are visible. Conversely, when the door is in the closed position, the entire holder is completely concealed.

These versatile models can be used with most surface-applied door closers. The provided templates allow for variable mounting positions, ranging from 85° to 110° of opening. These templates are designed for installation in almost all types of doors, including doors with conventional butt-type hinges or specialty hinges.

Four Models:

- 410H Series Hold-Open
- 410S Series Stop-Only
- 410F Series Friction Hold-Open
- 410SE Series Special Stop-Only

Five Sizes:

- Simple
- Standardized
- Each model is available in five sizes

One Option:

- SOC—Pin-in-Socket Security Screw Package

Unmatched Convenience:

- Non-Handed
- Improved Compatibility with Door Closers
- Single/Double-Acting Doors
- Interior Applications
- Durable
- Easy to Install
- Improved Corrosion Resistance

Materials and Finishes:

All models are available in 300 series Stainless Steel, Brass and Steel substrates. The broadest range of finishes in the industry is provided to complement any design.

Finishes	Description
US3	Polished Brass
US4	Satin Brass
US10	Satin Bronze
US10B	Oil Rubbed Bronze
US32	Polished Stainless Steel
US32D	Satin Stainless Steel
SP4	Powder Coat Brass
SP10	Powder Coat Bronze
SP28	Powder Coat Aluminum
SP313	Powder Coat Dark Bronze
SPBLK	Powder Coat Black
652	Chrome-like Coating

Models

Glynn-Johnson 410 series holders and stops are designed for medium- to light-duty applications. They're ideal for openings that are subject to normal activity, providing protection for the door, frame, hinges and surrounding walls or obstructions.

All models incorporate the popular channel/slide-arm design and offset jamb brackets. This improved design allows for simple field modification of functions, should user requirements change.

410H Series Hold-Open

(Suffix H) Hold-Open models provide a convenient method of holding the door open at a predetermined position for short or long periods of time, permitting an unobstructed traffic flow. The Hold-Open tension can be adjusted using an allen wrench through the end of the slider located in the channel mounted in the top of the door.

These models feature a rugged, automatic Hold-Open mechanism activated when the door is opened to a preset angle. Each model meets the 250,000 test cycles required for Grade 1 classification. The Hold-Open feature is not selectable, so the door is always held open.

410S Series Stop-Only

(Suffix S) When the Hold-Open function is not a requirement, the Stop-Only function provides an effective method of door control. The Stop-Only model may be used on fire doors.

410F Series Friction Hold-Open

(Suffix F) Friction Hold-Open models are ideal for patient room doors, wardrobe and closet doors, or similar applications where multiple Hold-Open positions are desired. The friction tension can be adjusted using an allen wrench on the slider located in the channel mounted at the top of the door.

410SE Series Special Stop-Only

(Suffix SE) When Stop-Only models are used in conjunction with single-point, Hold-Open electronic door closers, the Stop-Only function may be ordered less the shock-absorbing mechanism. Used as an auxiliary stop, these optional models prolong the life of the closer. The stop location is adjusted using an allen wrench on the stop block located in the channel.

Note: Caution should be taken when using this option in other applications, as the elimination of the shock-absorbing spring can put added stress on the door and frame.

Application Information

UL Classification

The 410 series Stop-Only models are classified by Underwriters Laboratories (UL) as Miscellaneous Fire Door Accessories. This classification applies to use on either Hollow Metal Fire Doors or Wood Fire Doors. Where Wood Door manufacturer's listing allows for the cutout required for installation, concealed overhead stops may be used on those wood fire doors. These units may be used on doors of any rating. As a reminder, the Miscellaneous Fire Door Accessories (GVUX) section is defined by UL as: "Miscellaneous fire door accessories are intended in the individual Listings. The accessories have been investigated to determine that when installed in accordance with the manufacturer's instructions, the accessories do not adversely affect the fire rating of the fire door and/or fire door frames."

Dead-Stop Templating:

Dead-Stop Templating is recommended for applications where a wall or similar obstruction is in place at an opening angle of 110° or less (i.e., doors that open back-to-back). Dead-Stop Templating can be applied to Hold-Open, Stop-Only and Friction models. The Dead-Stop position is the point at which the shock-absorbing spring is fully compressed. Therefore, when Dead-Stop Templating is used, the initial degree of opening will be 5° to 7° less than the Dead-Stop opening.

Example: If the holder is templated to a 100° dead stop, the door will hold open at an angle between 93° and 95° but no further than 100°.

Note: Do not use dead-stop templating on the 410SE Series since there is no shock-absorbing spring.

Environmental Considerations:

Environmental factors should always be considered when specifying overhead holders and stops. Doors that are positioned on a building's exterior or subject to corrosive conditions should be equipped with a holder constructed primarily of stainless steel, brass or bronze materials. For interior applications, steel is acceptable, though brass and bronze substrates generally provide a more attractive architectural-grade finish.

Heavy-Use Applications:

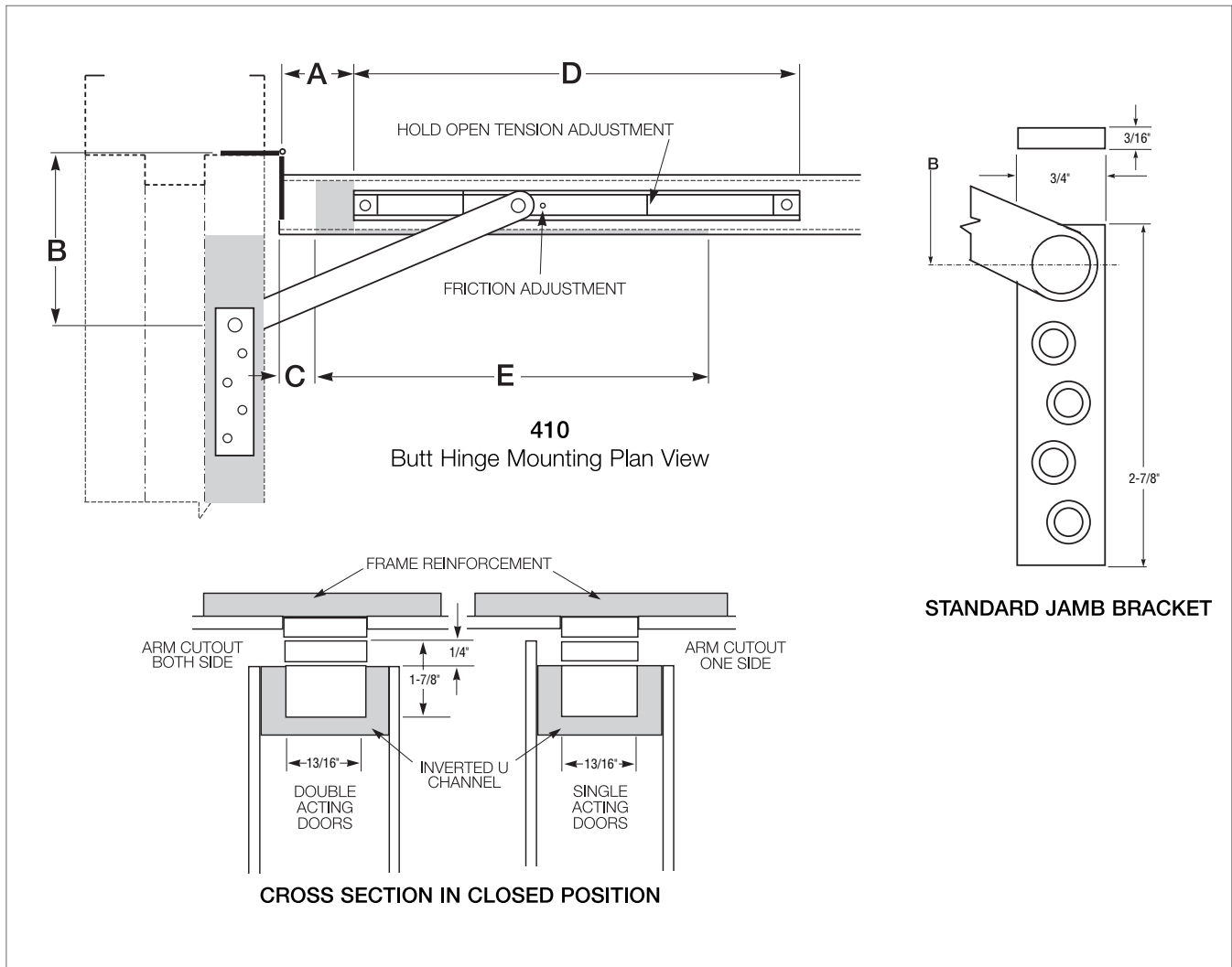
A heavy-duty holder or stop should be considered when doors and frames are subject to heavy, frequent use. Also, heavy-duty units should be considered on exterior doors subject to wind.

Options

Suffix SOC (Pin-in-Socket Security Screw Package):

A screw package with pin-in-socket screws for mounting the jamb bracket to the frame is provided instead of the standard screw package.

410 Series Concealed Overhead Door Holders/Stops



SIZE	BUTTS/OFFSET PIVOTS				CENTER HUNG			
	DOOR OPENING	STOP ONLY	HOLD OPEN	FRICTION	DOOR OPENING	STOP ONLY	HOLD OPEN	FRICTION
1	18"-23"	411S	411H	411F	----	----	----	----
2	23-1/16"-27"	412S	412H	412F	----	----	----	----
3	27-1/16"-33"	413S	413H	413F	33-1/16"-39"	413S	413H	413F
4	33-1/16"-39"	414S	414H	414F	39-1/16"-45"	414S	414H	414F
5	39-1/16"-45"	415S	415H	415F	45-1/16"-51"	415S	415H	415F

Note: This chart illustrates the most common types of hinging and door opening sizes. For unusual door details, contact Glynn-Johnson for availability.

G-J Model	BHMA*	FED. Spec.
411-415 H	C04511	1166
411-415 S	C04541	1166A
411-415 F	C04531	1164

* First numeral (0) designates optional material.
 To specify:
 Brass material, change 0 to 1 (i.e. C14511)
 Stainless Steel Material, change 0 to 5 (i.e. C54511)
 Steel material, change 0 to 8 (i.e. C84511)

The template information on this page is for reference only and is not intended to serve as an installation template. For complete dimensional information, refer to Glynn-Johnson template book.



How to Order

	41	1	H	-	US10B	-	SOC
<p>Overhead Series: 41</p> <p>Size (Door Opening Using Butts or Offset Pivots): 1 (18"-23") 2 (23-1/16"-27") 3 (27-1/16"-33") 4 (33-1/16"-39") 5 (39-1/16"-45")</p> <p>Function: H Hold-Open F Friction Hold-Open S Stop-Only SE Special Stop-Only</p> <p>Finishes: US3 Polished Brass US4 Satin Brass US10 Satin Bronze US10B Oil Rubbed Bronze US32 Polished Stainless Steel US32D Satin Stainless Steel SP4 Powder Coat Brass SP10 Powder Coat Bronze SP28 Powder Coat Aluminum SP313 Powder Coat Dark Bronze SPBLK Powder Coat Black 652 Chrome-like Coating</p> <p>Option: SOC Pin-in-Socket Security Screws</p>							

A
Hinges & Pivots

B
Pulls & Plates

C2
Flush Bolts & Coordinators

D
Latches, Catches & Bolts

E
Stops

F
Exterior Hardware

G
Miscellaneous Hardware



Meets ANSI A156.3 Type 25.
UL Listed 3 Hour Fire Doors 8'0" x 10'0"



Meets ANSI A156.3 Type 25.
UL Listed 3 Hour Fire Doors 8'0" x 8'0"

FB31P Top and Bottom Bolts (Pair)

- Fully Automatic—inactive door is latched, bolts are extended when active door closes, door is unlatched, bolts retract when active door is opened.
- Low Actuation Forces—Top Bolt Has No Spring Tension.
- Fits standard ANSI A115.4 Door Frame Preparations.
- Non-handed.
- Bolt throw is 3/4" with a 7/8" vertical adjustment.
- Bolt backset is 3/4"
- Standard Rod Length is 12", which is measured from the center of the flush bolt body to the bolt tip. Optional rod lengths available for top bolt only on non-fire rated openings—18", 24", 36" and 48."

DP1 or DP2 optional dust proof strike available, see page C11.

FB31T Top Bolt Only FB31B Bottom Bolt Only

FB32 Top Bolt with Auxiliary Fire Latch

- FB32 Model with Auxiliary Fire Latch eliminates the bottom bolt and is UL Listed for Fire Doors.

FB33 Top Bolt with Auxiliary Fire Latch and Retrofit Plate

- FB33 Model with Auxiliary Fire Latch eliminates the bottom bolt and includes a retrofit plate to cover existing bottom bolt prep. UL Listed for Fire Doors.

Dimensions

Body Size: 1" Wide x 6-3/4" Long x 2" Deep

Guide Size: 1" Wide x 1-27/32" Long x 27/32" High x 3/32" Thick

Strike Size: 15/16" Wide x 2-1/4" Long x 1/16" Thick

Rub Plate Size: 1-1/4" Wide x 1-11/16" Long x 3/64" Thick

Auxiliary Fire Latch Size: 1" Wide x 1-3/4" Long x 3-1/4" Deep

Retrofit Plate Size: 1" Wide x 6-3/4" Long x 3/32" Thick

Finishes

Ives Number	US3	US4	US10	US10B	US32	US32D
BHMA	605	606	612	613	629	630

A
Hinges & Pivots

B
Pulls & Plates

C4
Flush Bolts & Coordinators

D
Latches, Catches & Bolts

E
Stops

F
Exterior Hardware

G
Miscellaneous Hardware



Top Bolt

Bottom Bolt

Meets ANSI A156.3 Type 27.
UL Listed 3 Hour Fire Doors 8'0" x 10'0"

FB51P Top and Bottom Bolts (Pair)

- Constant Latching—inactive door remains latched until the active door is opened, releasing the automatic bottom bolt and then the top bolt can be manually released. Inactive door will relatch automatically when closed.
- Low Actuation Forces.
- Fits standard ANSI A115.4 Door and Frame Preparations.
- Non-handed.
- 3/4" bolt throw with a 7/8" vertical adjustment.
- 3/4" backset
- Standard Rod Length is 12", which is measured from the center of the flush bolt body to the bolt tip. Optional rod lengths available for top bolt only on non-fire rated openings—18", 24", 36" and 48".

DP1 or DP2 optional dust proof strike available, see page C11.

FB51T Top Bolt Only

FB52 Top Bolt with Auxiliary Fire Latch

- FB52 Model with Auxiliary Fire Latch eliminates the bottom bolt and is UL Listed for Fire Doors.

FB53 Top Bolt with Auxiliary Fire Latch & Retrofit Plate

- FB53 Model with Auxiliary Fire Latch eliminates the bottom bolt and includes a retrofit plate to cover existing bottom bolt prep. UL Listed for Fire Doors.



Top Bolt

Auxiliary Fire Latch

Meets ANSI A156.3 Type 27.
UL Listed 3 Hour Fire Doors 8'0" x 10'0"

Dimensions

- Body Size: 1" Wide x 6-3/4" Long x 2" Deep
- Guide Size: 1" Wide x 1-27/32" Long x 11/16" High x 3/32" Thick
- Strike Size: 15/16" Wide x 2-1/4" Long x 1/16" Thick
- Rub Plate Size: 1-1/4" Wide x 1-11/16" Long x 3/64" Thick
- Auxiliary Fire Latch Size: 1" Wide x 1-3/4" Long x 3-1/4" Deep
- Retrofit Plate Size: 1" Wide x 6-3/4" Long x 3/32" Thick

Finishes

Ives Number	US3	US4	US10	US10B	US32	US32D
BHMA	605	606	612	613	629	630



DP1



DP2

Meets Meets ANSI/BHMA 156.16, L14011.

**DP1
DP2** **Dust Proof Strikes**

- Designed for use with the bottom bolt of all flush bolts.
- Spring-loaded plunger returns to floor or threshold level anytime flush bolt is retracted, eliminating need to clean standard floor strikes.
- Strike hole is 3/4" Diameter and 1-1/8" Deep

Dimensions

DP1 Face Plate: 1-7/16" Diameter

DP2 Face Plate: 1-5/8" W x 3-1/2" L x 1/8" Thick

Body: 1-3/16" Diameter x 1-7/8" Deep

Finishes

Ives Number	US3	US4	US10	US10B	US26	US26D
BHMA	605	606	612	613	625	626

Hinges & Pivots
A

Pulls & Plates
B

Flush Bolts & Coordinators
C11

Latches, Catches & Bolts
D

Stops
E

Exterior Hardware
F

Miscellaneous Hardware
G

A
Hinges & Pivots

B
Pulls & Plates

C12
Flush Bolts & Coordinators

D
Latches, Catches & Bolts

E
Stops

F
Exterior Hardware

G
Miscellaneous Hardware



Meets ANSI/BHMA A156.3, Type 21A.
UL Listed for installation on labeled frame.

COR Series Bar Coordinators

- The COR Series Coordinators are designed for use on pairs of doors when one door needs to close before the other.
- All COR units function easily. The active door lever, located nearest to the active stop, holds the active door open until the trigger mechanism is released by the closing of the inactive leaf.
- All COR units may not function correctly with swingclear hinges.
- All COR units are equipped with an adjustable override feature which allows the active door to close under extreme pressure.
- All COR units are compatible with Flush Bolts.
- The COR Series is available in five sizes for variable door opening widths.
- The COR Series does not cover the entire length of the stop, so a FL filler bar can be provided to maintain architecturally clean lines.
- COR Series Coordinator Channels and FL fillers are made of aluminum.
- Optional Filler Bars: FL20 - 20", FL32 - 32" and FL44 - 44", available to maintain clean line.
- Optional Mounting Brackets available: MB1, MB2, MB1F, MB2F, MB3F, MB1V, MB2V, and MB3V for other stop applied hardware.

For Openings Where Doors Are Same Size

Coordinator Number	Length of Channel	For Opening Widths	Common Applications
COR32	32"	34" - 52"	Pair of 2'0" Doors
COR42	42"	52" - 72"	Pair of 2'6" Doors
COR52	52"	62" - 92"	Pair of 3'0" Doors
COR60	60"	70" - 108"	Pair of 3'6" Doors
COR72	72"	84" - 132"	Pair of 4'0" Doors

For Openings Where Doors Are Unequal Size

The coordinator length should equal the active door width plus approximately 1/2 the inactive door width. The coordinator must be 6" longer than the active door width and shorter than the overall frame opening between stops.

Finishes

Ives Finish	US28	US26D	315AN
BHMA	628	713	711



FL Series Filler Bars

- The FL Filler Bars are available in three sizes for variable frame openings.
- FL Filler Bars are made of aluminum
- FL Filler Bars are field sized to frame opening.

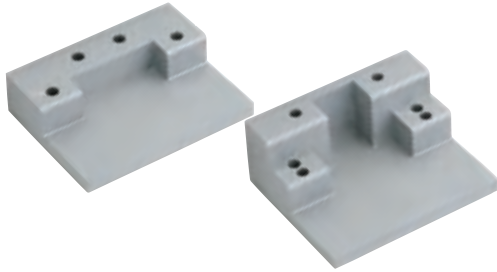
Filler Bar Number

Filler Bar Number	Length	Dimensions
FL20	20"	1-5/8" W x 5/8" D x 20" L
FL32	32"	1-5/8" W x 5/8" D x 32" L
FL44	44"	1-5/8" W x 5/8" D x 44" L

Finishes

Ives Finish	US28	US26D	315AN
BHMA	628	713	711

MB1 and MB2



Mounting Brackets

- Allows stop mounted hardware to be properly installed without damaging the COR coordinator, such as a parallel arm closer or a non-fire-rated surface vertical rod strike.
- Stop mounted hardware will need to be lowered to compensate for the height of the coordinator and mounting bracket.
- MB mounting brackets are made of aluminum

Product	Jamb Depth	Stop Width	Dimensions
MB1	4-3/4" Min.	Over 2-1/2"	4" W x 3" D x 15/16" T
MB2	4-3/4" Min.	Up to 2-1/2"	4" W x 3-1/4" D x 1-5/8" T

Finishes

Ives Finish	USP	SP28	SPBLK
BHMA	600	689	622

MB1F, MB2F and MB3F MB1V, MB2V and MB3V



MB1V

MB2V



MB3V

Fire Rated Mounting Brackets

- Allows for fire-rated stop mounted hardware to be properly installed without damaging the COR Coordinators, such as fire-rated surface vertical rod exit device strikes.
- Latch will need to be lowered to compensate for the height of the coordinator and mounting bracket.
- MB-V are designed for Von Duprin 8827-F soffit latch.
- Mounting brackets are made of steel.

Product	Jamb Depth	Stop Width	Dimensions
MB1F	5"	1-1/2" - 2-1/4"	4" W x 3" D x 1-5/8" T
MB1V	5"	1-1/2" - 2-1/4"	4" W x 3" D x 1-5/8" T
MB2F	5-7/8"	2-3/8" - 3-1/4"	4" W x 4" D x 1-5/8" T
MB2V	5-7/8"	2-3/8" - 3-1/4"	4" W x 4" D x 1-5/8" T
MB3F	6-7/8"	Over 3-3/8"	4" W x 3-1/2" D x 1" T
MB3V	6-7/8"	Over 3-3/8"	4" W x 3-1/2" D x 1" T

Finishes

Ives Finish	USP	SP28	SPBLK
BHMA	600	689	622

A Hinges & Pivots

B Pulls & Plates

C14 Flush Bolts & Coordinators

D Latches, Catches & Bolts

E Stops

F Exterior Hardware

G Miscellaneous Hardware

COR7G and COR9G



Meets ANSI/BHMA A156.3, Type 21.
UL Listed for Fire Doors.

Gravity Coordinators

- When active door is open, coordinator prevents active door from closing until inactive door bypasses. Closing of inactive door causes strike plate on top of door to contact cam and lift arm, allowing active door to close. As inactive door continues closing, roller rides over strike plate on to door bracket, holding arm above active door.
- Non-handed.
- Gravity action arm and door bracket are adjustable on the job for ease of installation. Rubber roller provides quiet and efficient operation, and helps protect the astragal and doors from damage.
- Nylon roller on short arm glides smoothly over door bracket and strike, ensuring silent operation.
- Made of forged brass.
- COR7G for use on pairs of doors with astragal on active door up to 4' or with astragal on inactive door up to 3'4" or with astragal on both doors up to 2'10"
- COR9G for use on pairs of doors with astragal on active over 4' or with astragal on inactive door over 3'4" or with astragal on both doors over 2'10"

Product	Projection
COR7G	7"
COR9G	9"

Finishes

Ives Finish	US3	US4	US10	US10B	US26	US26D
BHMA	605	606	612	613	625	626



Meets ANSI/BHMA A156.3, Type 21.

CB1 Carry Bar

- Used when it is possible for the inactive door to be opened before the active door.
- Prevents damage to the doors and other hardware.
- Nylon roller insures quiet and efficient operation.
- Non-handed.
- All-steel construction.
- Standard sex bolts for mounting.

Finishes

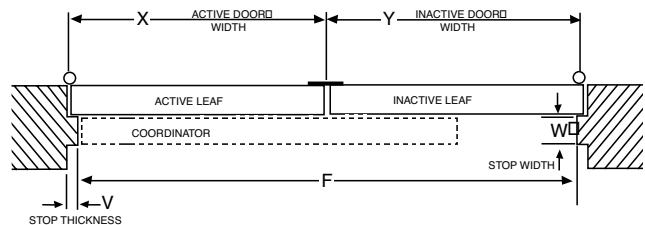
Ives Finish	US3	US4	US10	US10B	US26	US26D	SPBLK	USP
BHMA	605	606	612	613	625	626	622	600

How to Order COR and Accessories

COR	52	US28	FL20	D	36"
<p>COR Size: 32, 42, 52, 60, 72</p>					
<p>Finishes: US28, US26D, 315AN</p>					
<p>Filler Bar (if desired): FL20, FL32, FL44</p>					
<p>Vertical Rod Exit Device Cutout Type (if applicable): A, B, C, D, E, F, G If other Vertical Rod Exit Device not listed on chart, from page C16, include information as shown on page C16.</p>					
<p>Active Door Size – Required for ALL Vertical Rod Exit Device Applications</p>					

To determine the size COR you need:

1. Start with the active door width (X).
2. Next consider the overall frame opening between stops (F).
3. Preferably, the coordinator would equal the active door width (X) + approximately 1/2 inactive door width (Y).
The coordinator must be 6" longer than the active door width (X) and less than the overall frame opening between stop (F).



Examples:

- Pair of 30" Doors, 5/8" Stops
Active Door Size, X = 30"
Overall Frame Opening between Stops, F = 58-3/4"
Recommended Coordinator: COR42
- Pair of 36" Doors, 5/8" Stops
Active Door Size, X = 36"
Overall Frame Opening between Stops, F = 70-3/4"
Recommended Coordinator: COR52
- 36" Active Door, 18" Inactive door, 5/8" Stops
Active Door Size, X = 36"
Overall Frame Opening between Stops, F = 52-3/4"
Recommended Coordinator: COR42
- 48" Active Door, 24" Inactive Door, 5/8" Stops
Active Door Size, X = 48"
Overall Frame Opening between Stops, F = 94-3/4"
Recommended Coordinator: COR60

A
Hinges & Pivots

B
Pulls & Plates

C15
Flush Bolts & Coordinators

D
Latches, Catchers & Bolts

E
Stops

F
Exterior Hardware

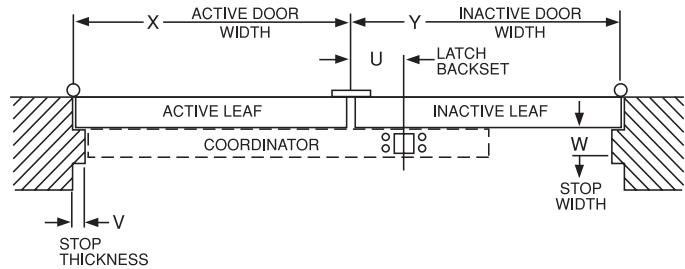
G
Miscellaneous Hardware

Special Factory Preparation for Use with Vertical Rod Exit Devices

Coordinators may need to be prepared at the factory for use with some surface or concealed vertical rod exit devices. (See Chart below)

If the exit device is not listed the following information is needed.

1. Exit Device Manufacturer and Model No.
2. Active Door Size, "X"
3. Inactive Door Size, "Y"
4. Exit Device Backset, "U"
5. Stop Width, "W"
6. Stop Thickness if other than 5/8", "V"



Exit Device Manufacturer	Exit Device Number	Device Backset	Maximum Active Door	Coordinator Size Needed	Coordinator Cutout Type	Mounting Bracket Needed
Von Duprin	5547-F	2-3/8"	33" 43" 51" 63"	42" 52" 60" 72"	Type A	None
Von Duprin	8827-F	2-3/4"	33" 43" 51" 63"	42" 52" 60" 72"	Type B	MB1V, MB2V or MB3V see page C3
Von Duprin	8847-F	2-3/8"	33" 43" 51" 63"	42" 52" 60" 72"	Type C	None
Von Duprin	33/3547 33/3547-F 98/9947 98/9947-F	2-3/4"	33" 43" 51" 64"	42" 52" 60" 72"	Type D	None
Von Duprin	33/3548 33/3548-F 98/9948 98/9948-F	2-3/4"	33" 43" 51" 64"	42" 52" 60" 72"	Type D	None
Von Duprin	33/3547WDC 33/3547WDC-F 98/9947WDC 98/9947WDC-F	1-5/16"	34" 44" 52" 65"	42" 52" 60" 72"	Type E	None
Falcon	17-C F-17-C 18-C F-18-C XX-C F-XX-C 24-C F-24-C 25-C F-25-C	2-3/4"	33" 43" 51" 63"	42" 52" 60" 72"	Type F	None
Falcon	17-C-WDC F-17-C-WDC 18-C-WDC F-18-C-WDC XX-C-WDC F-XX-C-WDC 24-C-WDC F-24-C-WDC 25-C-WDC F-25-C-WDC	2-13/16"	33" 43" 51" 63"	42" 52" 60" 72"	Type G	None



WS406CVX Wall Bumpers WS406CCV WS407CVX WS407CCV

WS406CVX & WS407CVX
Meets ANSI/BHMA 156.16 L22201 for brass,
and L52101 for stainless steel.

WS406CCV & WS407CCV
Meets ANSI/BHMA 156.16 L22251 for brass
and L52251 for stainless steel.

- Constructed in sturdy yet economical wrought base of brass or stainless steel construction.
- Feature concealed tamper-proof mounting.
- Shipped factory preassembled backplate to reduce installation cost.
- Easy installation by inserting screwdriver through small hole in rubber.

WS406CVX (406) – convex rubber bumper, packed with wood screw and plastic anchor.

WS406CCV (406-1/2) – concave rubber bumper, which avoids damage to locks with projecting buttons, packed with wood screw and plastic anchor.

WS407CVX (407) – convex rubber bumper packed with screw and drywall anchor.

WS407CCV (407-1/2) – concave rubber bumper which avoids damage to locks with projecting buttons and is packed with screw and drywall anchor.

Dimensions

Base Diameter: 2-1/2"

Base Thickness: 3/8"

Overall Projection: 1"

Finishes *brass*

Ives Number	US3	US4	US5*	US10	US10B	US15	US15A**	US26	US26D	B716**
BHMA	605	606	609*	612	613	619	620	625	626	

Finishes *stainless steel*

Ives Number	US32D
BHMA	630

* only available on WS407CVX Slim-Pak of 15

** available on WS407CCV or WS407CVX Slim-Pak of 15

A
Hinges & Pivots

B
Pulls & Plates

C
Flush Bolts & Coordinators

D
Latches, Catches & Bolts

E12
Stops

F
Exterior Hardware

G
Miscellaneous Hardware

A
Hinges & Pivots

B14
Pulls & Plates

C
Flush Bolts & Coordinators

D
Latches, Catches & Bolts

E
Stops

F
Exterior Hardware

G
Miscellaneous Hardware

8400 Series Protection Plates

- Door protection plates are available in .050" thick brass, stainless steel or aluminum; and 1/8" thick high impact polyethylene in clear or black.
- Bevel edge options; specify B4E for all four edges.
- Mounting screw pack furnished standard, 16 screws per pack. Optional screw packs are available for TEK or TORK screw heads. Refer to the following chart for ordering.
- Specify NMH for no mounting holes. (Not available on 8402)
- Specify NMH-A for no mounting holes with adhesive. (Not available on 8402)
- Specify CS for counter sunk mounting holes.
- Specify ERS prepped with extra row of screws.

Kickplate Gasket Tape Tape is recommended when using a brass plate on a metal door to reduce tarnishing from electrolytic oxidation. One tape pack will cover an the perimeters of a 8" x 34" kickplate. Order 8401 Gasket Tape.



8400 Protection Plate 8402 (UL)* Protection Plate

*UL mark appears in upper right corner. Factory supplied screws must be used.

Number of screw packs required by plate size (specify TEK Screws or TORK screws).

	22"-25"	26"-33"	34"-41"	42"-48"
4"-8"	1	1	1	1
9"-16"	1	1	1	1
17"-24"	1	1	1	2
25"-32"	1	1	2	2
33"-40"	1	2	2	2
41"-48"	2	2	2	2

Finishes brass 24" x 48" max. size

US Number	US3	US4	US10	US10B	US15	US26	US26D
BHMA	605	606	612	613	619	625	626

Finishes stainless steel

US Number	US32	US32D
BHMA	629	630

Finishes aluminum

US Number	US28
BHMA	628

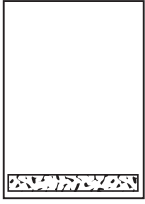
Finishes plastic

Clear and Black

Residential Grade Kickplates available Carded only, finishes PA28, PA3, PA619, PA716, B3, B505, B619, B716

A

Hinges & Pivots



Mop Plates

- Protect the bottom of the pull side of door subject to cleaning and mopping procedures.
- Size Ranges: 4" to 6" high, 22" to 48" wide

B18

Pulls & Plates

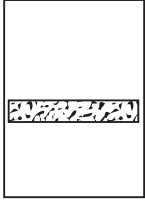


Kick Plates

- Protect the bottom of the push side of doors subject to scuffing from foot traffic.
- Recommended for all doors subject to normal use (especially doors using a closer).
- Size Ranges: 8" to 24" high, 22" to 48" wide

C

Flush Bolts & Coordinators

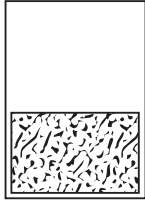


Stretcher Plates

- Protect doors at specific areas where consistent contact is made by stretchers, service carts or other equipment.
- Usually applied to push side of doors.
- Specify "B4E" Option for beveled edges.
- Size Ranges: 6" to 8" high, 22" to 48" wide

D

Latches, Catches & Bolts



Armor Plates

- Protect lower half of doors from abuse by hard carts, trucks and rough usage.
- Usually applied to push side of single doors and both sides of double acting doors.
- Size Ranges: 26" to 48" high, 22" to 48" wide

E

Stops

F

Exterior Hardware

G

Miscellaneous Hardware



Meets ANSI/BHMA A156.1
A8133 – Steel
A5133 – Stainless Steel
A2133 – Brass

3PB1 3 Knuckle, Plain Bearing Full Mortise Hinge

- For standard weight doors
- Low frequency usage
- Packed with wood and metal screws

Not for use with a door closer.

Options

- NRP, Non-Removable Pin
- SH, Security Stud
- HT, Hospital Tip
- RC, Round Corners - 1/4" or 5/8" Radius
- SEC, Security Fasteners - Pin-in-Socket

Dimensions

Size (Inches)	Size (mm)	Gauge
3.5 x 3.5	90 x 90	0.134
4 x 4	102 x 102	0.134
4.5 x 4	114 x 102	0.134
4.5 x 4.5	114 x 114	0.134
5 x 4.5	127 x 114	0.134



Meets ANSI/BHMA A156.1
A8112 – Steel
A5112 – Stainless Steel
A2112 – Brass

3CB1 3 Knuckle, Concealed Bearing Full Mortise Hinge

- For standard weight doors
- Medium frequency usage
- Packed with wood and metal screws

Options

- NRP, Non-Removable Pin
- SH, Security stud
- HT, Hospital Tip
- RC, Round Corners - 1/4" or 5/8" Radius
- SEC, Security Fasteners - Pin-in-Socket

Dimensions

Size (Inches)	Size (mm)	Gauge
3.5 x 3.5	90 x 90	0.134
4 x 4	102 x 102	0.134
4.5 x 4	114 x 102	0.134
4.5 x 4.5	114 x 114	0.134
5 x 4.5	127 x 114	0.134

Finishes brass

Ives Finish	US3	US4	US10	US10B	US10A	US11	US15	US26	US26D
BHMA	605	606	612	613	614	616	619	625	626

Finishes steel

Ives Finish	USP	US3	US4	US10	US10B	US10A	US11	US15	US26	US26D
BHMA	600	632	633	639	640	641	643	646	651	652

Finishes stainless steel

Ives Finish	US32	US32D
BHMA	629	630



3CB1HW 3 Knuckle, Concealed Bearing Full Mortise Hinge

- For heavy weight doors
- High frequency usage
- Packed with wood and metal screws

Options

- NRP, Non-Removable Pin
- SH, Security stud
- HT, Hospital Tip
- RC, Round Corners - 1/4" or 5/8" Radius
- SEC, Security Fastners - Pin-in-Socket

Dimensions

Size (Inches)	Size (mm)	Gauge
4.5 x 4	114 x 102	0.180
4.5 x 4.5	114 x 114	0.180
5 x 4.5	127 x 114	0.190
5 x 5	127 x 127	0.190

Meets ANSI/BHMA A156.1
A8112 – Steel
A5112 – Stainless Steel
A2112 – Brass



3SP1 3 Knuckle Spring Full Mortise Hinge

- For automatic closing of doors
- Packed with wood and metal screws

Options

- HT, Hospital Tip
- RC, Round Corners - 1/4" or 5/8" Radius
- SEC, Security Fastners - Pin-in-Socket

Dimensions

Size (Inches)	Size (mm)	Gauge
4 x 4	102 x 102	0.134
4.5 x 4	114 x 102	0.134
4.5 x 4.5	114 x 114	0.134

Meets ANSI/BHMA A156.7
K81071F – Steel
K51071F – Stainless Steel
UL listed for use with fire rated doors

Finishes *brass*

Ives Finish	US3	US4	US10	US10B	US10A	US11	US15	US26	US26D
BHMA	605	606	612	613	614	616	619	625	626

Finishes *steel*

Ives Finish	USP	US3	US4	US10	US10B	US10A	US11	US15	US26	US26D
BHMA	600	632	633	639	640	641	643	646	651	652

Finishes *stainless steel*

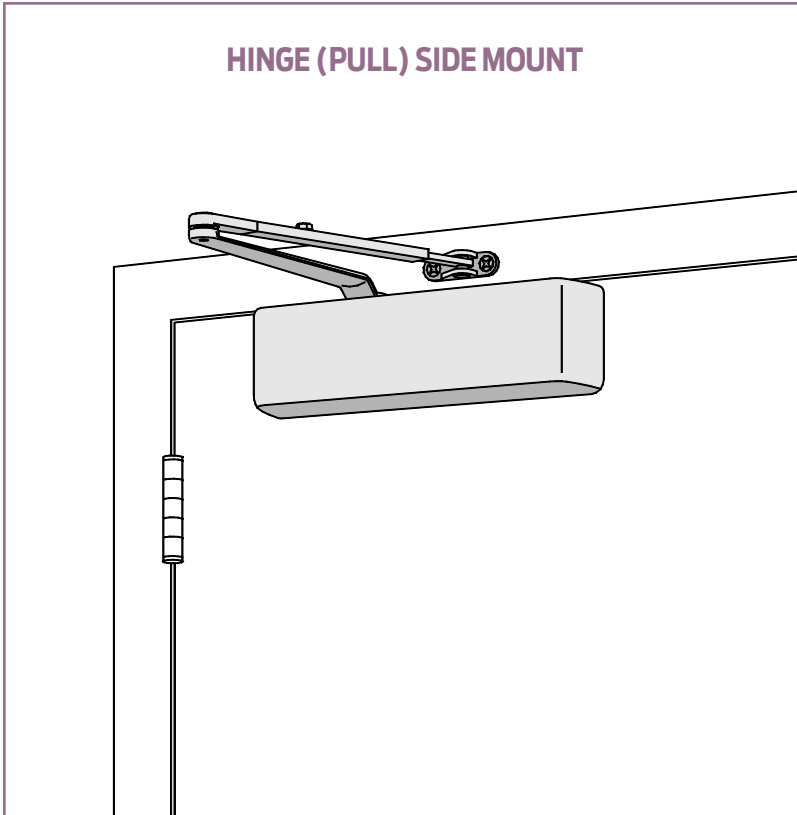
Ives Finish	US32	US32D
BHMA	629	630

4010 SERIES

FEATURES

The 4010 is LCN's best performing heavy duty closer designed specifically for institutional and other rugged high traffic applications.

- Cast Iron
- Forged Steel Main Arm
- Double Heat Treated Steel Pinion
- All Weather Fluid
- LCN Patented Green Dial
- UL & cUL Listed
- Peel-n-Stick Templates for Fast and Accurate Installations



- Standard 4010 Series closer is shipped with regular arm, standard plastic cover, and self reaming and tapping screws. See 4010 Series page 5 for options.
- Size 6 (4016) cylinder for interior doors to 5' 0" and exterior doors to 4' 0".
- Non-sized cylinder (4011) adjustable for interior doors to 4' 6" and exterior doors to 3' 6".
- Closer mounts hinge side, specify right or left swinging door.
- 4011 cylinder meets ADA requirements. See 4010 Series page 6.
- Standard or optional custom powder coat finish.
- Optional plated finish on metal cover, arm and fasteners.
- Optional SRI primer for installations in corrosive conditions is available with powder coat finish only.
- The 4010 Series is UL and cUL listed with regular or fusible link arms for self-closing doors.
- Tested and certified under ANSI Standard A156.4, grade one.



MOUNTING					FINISH		COVER		CYLINDER			**ARM FUNCTION									
HINGE (PULL) SIDE	TOP JAMB (PULL)	TOP JAMB (PUSH)	PARALLEL ARM	STOP FACE	POWDER COAT	PLATED	PLASTIC	METAL	NON-HANDED	NON-SIZED	ACCESSIBILITY	DELAYED ACTION	AVB***	REGULAR (DOUBLE)	STANDARD (SINGLE)	HOLD-OPEN	FUSIBLE LINK	EDA/HEDA	CUSH/HCUSH	SCUSH/SHCUSH	DOUBLE EGRESS
●	○	○	○	○	●	●	●	●	○	●	♿	●	○	140°	○	140°	140°	○	○	○	○

● AVAILABLE
○ NOT AVAILABLE

♿ Closer available with less than 5.0 lbs. opening force on 36" door.
** Maximum opening/hold-open point with standard template.
*** Advanced Variable Backcheck.

4010 SERIES

MOUNTING DETAILS

HINGE (PULL) SIDE MOUNTING

MAXIMUM OPENING

Can be templated for
100°

(A) = 5-15/16" (151 mm)

(B) = 11-15/16" (303 mm)

or 140°

(A) = 4-3/16" (106 mm)

(B) = 10-3/16" (259 mm)

Hold-open points up to maximum opening with hold-open arm.

Arm Clearance above door.

Regular arm requires

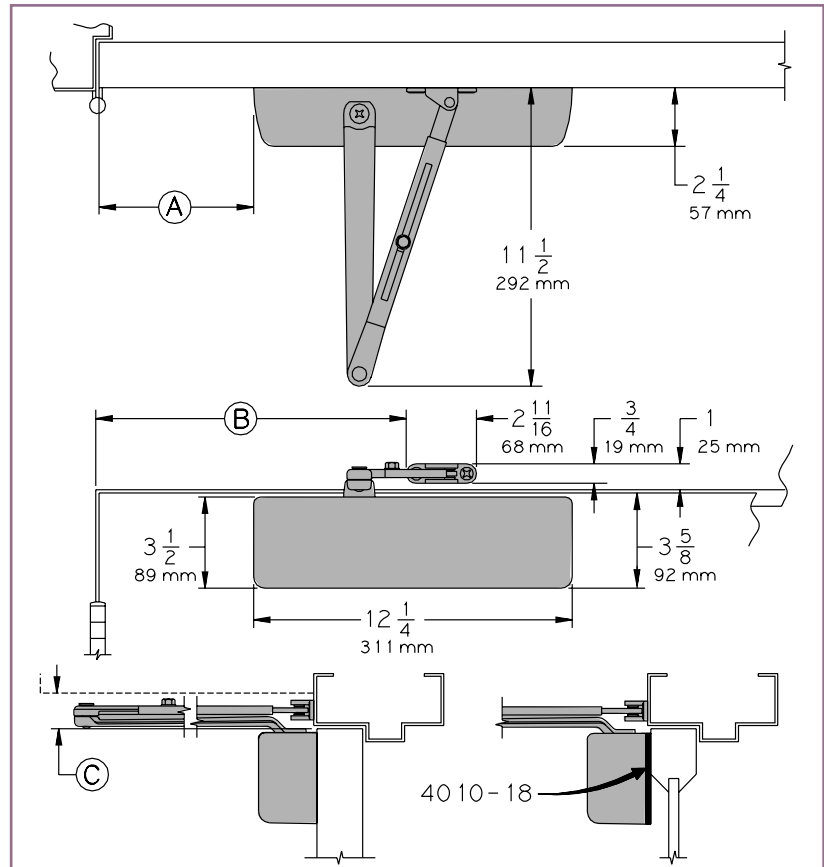
(C) = 1-1/16" (27 mm).

Hold-open arm requires

(C) = 1-3/8" (35 mm).

Fusible link arm requires

(C) = 1-5/8" (41 mm).



- **Butt Hinges** should not exceed 5" (127 mm) in width.
- **Auxiliary Stop** is recommended at hold-open point or where a door cannot swing 140°.
- **Reveal** should not exceed 3/4" (19 mm). Should not exceed 1/8" (3 mm) for Fusible link arm.
- **Top Rail** less than 3-3/4" (95 mm) requires PLATE, 4010-18. Plate requires 2" (51 mm) minimum.
- **Clearance** of 2-1/4" (57 mm) behind door required for 90° installation.
- **Delayed Action** Add suffix "DEL" to selected cylinder. Not available with 4016 cylinder. Delays closing from maximum opening to approximately 70°. Delay time adjustable up to approximately 1 minute.

Options

- Size 6 or non-sized cylinder.
- Delayed action cylinder.
- Hold-open or fusible link arm.
- Metal cover.

Special Templates

Customized installation templates or products may be available to solve unusual applications. Contact LCN Product Support for assistance.

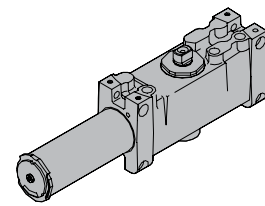
4010 SERIES

CYLINDERS

CYLINDER, 4010-3071

Standard, handed cast iron cylinder assembly.
For various applications see "Table of Sizes" on 4010 Series page 6. Available in size 1 (Adjustable 1-5) or size 6.

3071

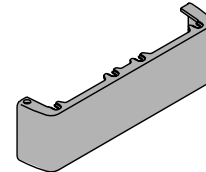


COVERS

COVER, 4010-72

Standard, non-handed plastic cover.

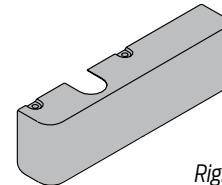
72



METAL COVER, 4010-72MC

Optional, handed cover. Required for plated finishes and custom powder coat finishes.

72MC



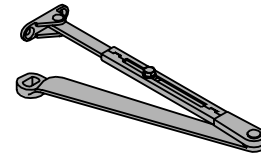
Right Hand Shown

ARMS

REGULAR ARM, 4010-3077

Non-handed arm.

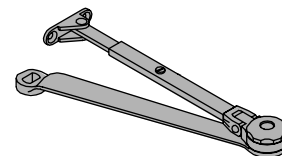
3077



HOLD-OPEN ARM, 4010-3049

Optional, handed arm provides hold-open function, adjustable at elbow.

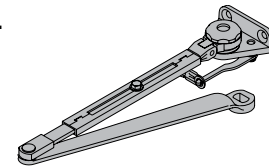
3049



FUSIBLE LINK ARM, 4010-3049FL

Optional, handed arm releases hold-open function when exposed to temperatures above 165° F. 1/8" (3 mm) maximum reveal.
NOTE: Check local codes before specifying FL arms. NOT A life safety product!

3049FL

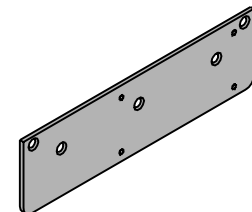


INSTALLATION ACCESSORIES

PLATE, 4010-18

Required where top rail is less than 3-3/4" (95 mm).
Plate requires minimum 2" (51 mm) top rail.

18



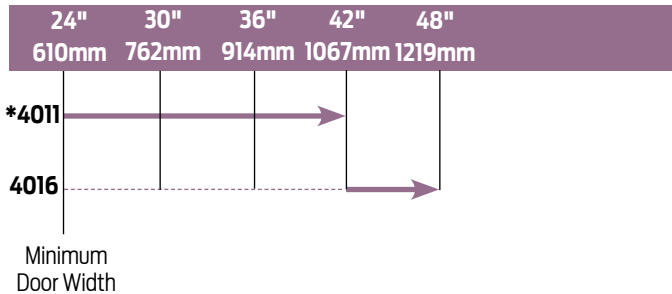
4010 SERIES

TABLE OF SIZES

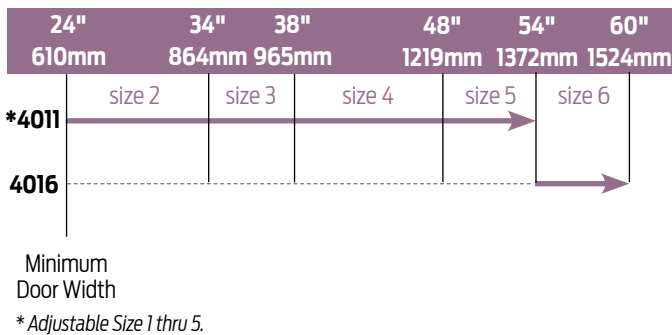
Select closer based on width of door.
 The spring power of non-sized 4011 cylinder is adjustable from size 1 through size 5 and is shipped set to size 3.
 Sized 4010 Series cylinders available in size 6.
 Delayed action not available with 4016 cylinder.

→ Indicates recommended range of door width for closer size.

EXTERIOR (and VESTIBULE) DOOR WIDTH




INTERIOR DOOR WIDTH



REDUCED OPENING FORCE 4010 CLOSERS

CAUTION! Any manual door closer, including those certified by BHMA to conform to ANSI Standard A156.4, that is selected, installed and adjusted based on ADA or other reduced opening force requirements may not provide sufficient power to reliably close and latch a door.

Refer to AUTOMATIC OPERATORS section for information on systems that meet reduced opening force requirements without affecting closing power.

	DOOR WIDTH	36"	42"	48"
	8.5* lbs.	4011	4011	4011
	5.0* lbs.	4011	4011	4011

* Maximum opening force.

HOW-TO-ORDER 4010 SERIES CLOSERS

1. SELECT CYLINDER SIZE

- 4011 (adjustable from size 1 to 5)
- 4016 (DEL not available)

2. SPECIFY HAND

- RH
- LH

3. SELECT FINISH

- Standard Powder Coat _____
 Aluminum, Dark Bronze, Statuary,
 Light Bronze, Black, Brass.

Closer will be shipped with:

- STANDARD COVER,
- REGULAR ARM,
- SELF REAMING and TAPPING SCREWS,
unless options listed below are selected.

CLOSER OPTIONS

CYLINDER

- Delayed Action (DEL)

COVER

- Metal (MC)

ARM

- Hold-Open (H)
- Fusible Link, 165°F (FL)

FINISH

- Custom Powder Coat (RAL) _____
 (handed metal cover required)
- Plated Finish, US _____
 (handed metal cover required)
- SRI primer (use with powder coat finishes only)

SCREW PACK

- TB* & SRT Screw (TBSRT)
- Wood & Machine Screw (WMS)
- TB*, Wood & Machine Screw (TBWMS)
- TORX Machine Screw (TORX)
- TB* & TORX Machine Screw (TBTRX)
 * Specify door thickness if other than 1-3/4".

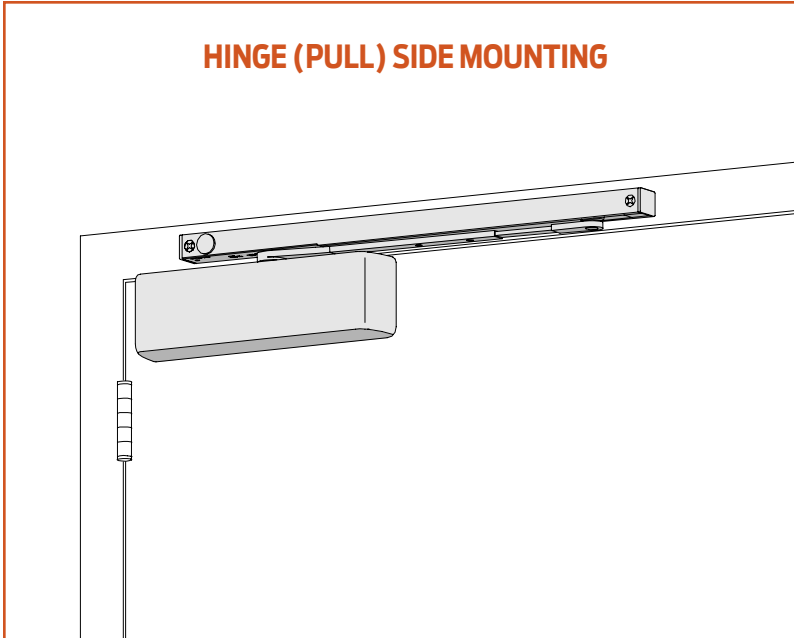
INSTALLATION ACCESSORIES

- Plate, 4010-18

SPECIAL TEMPLATE

- ST- _____

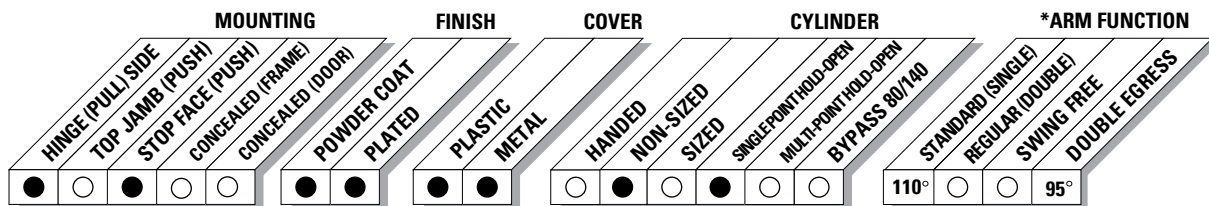
4040SE SERIES



The 4040SE SENTRONIC® is a heavy duty, non-handed, non-sized closer/holder designed to provide single point hold-open for fire and smoke barrier doors. The door is held open until current interruption releases the holding mechanism and the door closes. Single lever (track) arm closer is specifically designed for interior doors. Choice of finishes, track functions, and installation accessories meet virtually all life safety requirements.

The 4040SE and SEL Series is UL listed for smoke barrier or labeled fire doors. cUL listed for self-closing doors without hold-open. Tested and certified under ANSI Standard A156.15. Conforms to life safety code, NFPA 101.

- Standard 4040SE Series closer shipped with a standard arm, 24V or 120V (please specify) SE track, standard plastic clip-on cover, and wood and machine screw pack. SEL tracks are optional, see 4040SE Series pages 20 & 21 for options.
- Non-sized cylinders for interior doors to 4'0".
- Hold-open force is adjustable.
- Momentary on/off switch board assembly for testing door release also provides over-voltage protection. Field replaceable.
- Functions as a full rack and pinion closer when hold-open is not engaged or current is interrupted.
- Closer mounts on either push or pull side of the door.
- Non-handed for mounting on either right or left hand door.
- Concealed or surface wiring.
- Interfaces with alarm systems.
- Standard or optional custom powder coated finishes on cover and arm.
- Optional plated finishes.



● AVAILABLE
○ NOT AVAILABLE

* Maximum hold-open with standard template. See individual closer series for degrees of opening and hold-open per installation.

4040SE SERIES

HINGE (PULL) SIDE MOUNTING

Information applies to 4040 SE unless otherwise specified.

MAXIMUM OPENING

Templating allows 110°.

Hold-open points between 85° and 110° in approximately 3° increments.

Pull side mounting on a double egress frame requires a handed double egress arm.

Maximum hold-open to 95°.

2-11/16" (67 mm) maximum reveal on pull side.

SEL track provides hold-open points between 90° and 120°, in approximately 3° increments.

SE, SEL ELECTRICAL OPTIONS

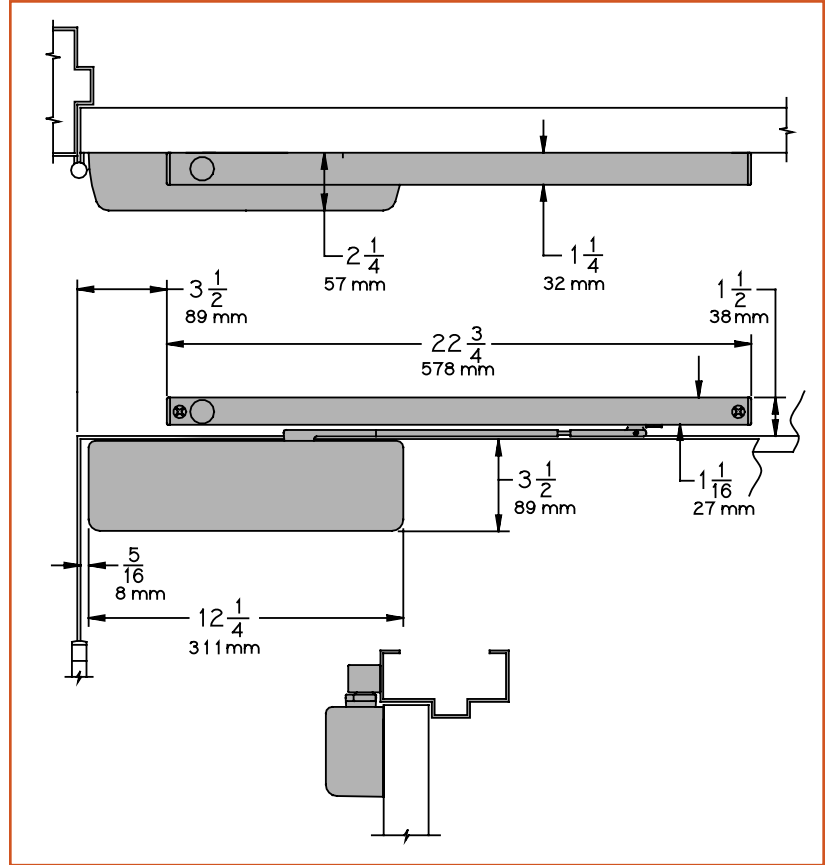
These track assemblies require a single power circuit for the holding solenoid.

SE or SEL holding solenoid is either 24V or 120V input, please specify.

An optional 4040SE-3210

TRANSFORMER reduces 120V AC line voltage to 24V AC.

Circuitry accepts either AC or DC input.



- **Butt Hinges** should not exceed 5" (127 mm) in width.
- **Swing Clear Hinges** consult factory.
- **Auxiliary Stop** is recommended at hold-open point.
- **Reveal** should not exceed 1/8" (3 mm) for standard arm. Should not exceed 2-11/16" (68 mm) for double egress arm.
- **Top Rail** minimum 3-1/2" (89 mm).
Installation with PLATE, 4040SE-18 requires SPECIAL TEMPLATE and 1-3/4" (44 mm) minimum top rail.
- **Head Frame** requires 2" (51 mm) minimum.
- **Flush Ceiling** with 2" (51 mm) head frame does not require special templating.
- **Door Width** 2' 4" (711 mm) minimum for single door with SE.
4' 8" (1422 mm) minimum for paired doors with SE.
- **Clearance** of 2-3/8" (60 mm) behind door required for 90° installation.
- **Wiring Diagram** See "FIRE/LIFE SAFETY" section page 19 for typical wiring and electrical diagram.

Options

- Long (SEL) track.
- Handed double egress arm for reveal under 2-11/16" (67 mm).
- Metal cover.
- 24V or 120V input for SE or SEL, please specify.

Special Templates

Customized installation templates or products may be available to solve unusual applications. Contact LCN Product Support for assistance.

4040SE SERIES

STOP FACE (PUSH SIDE) MOUNTING

Information applies to 4040 SE closers unless otherwise specified.

MAXIMUM OPENING

Templating allows 110°.

Hold-open points between 85° and 110° in approximately 3° increments.

SEL track provides hold-open points between 90° and 120°, in approximately 3° increments.

SEL track provides hold-open points between 90° and 120°, in approximately 3° increments.

SE, SEL ELECTRICAL OPTIONS

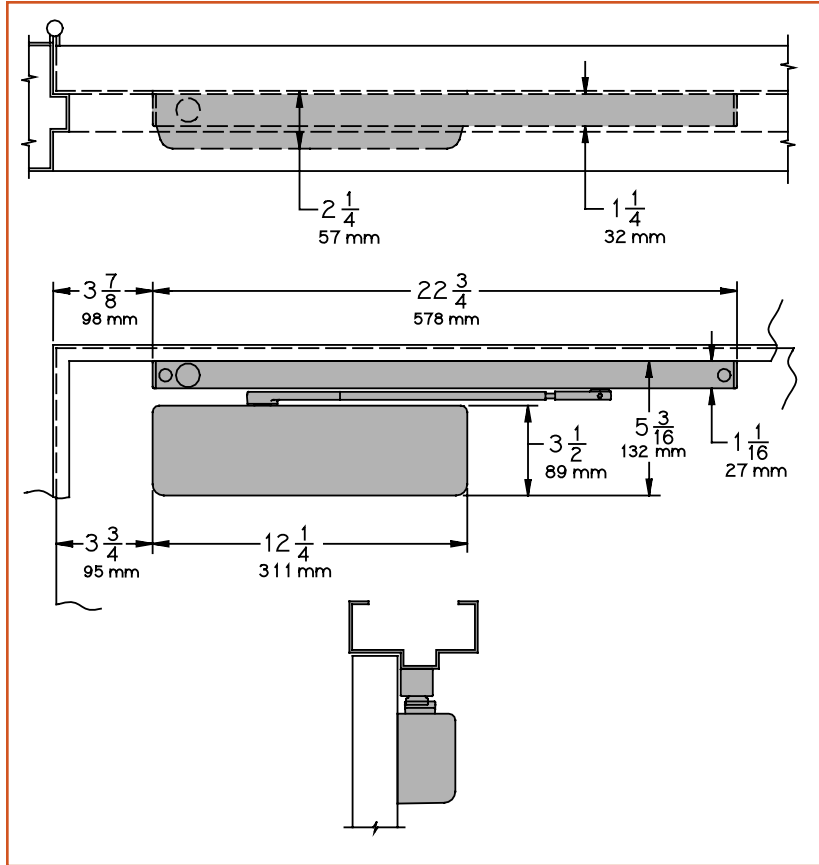
These track assemblies require a single power circuit for the holding solenoid.

SE or SEL holding solenoid is either 24V or 120V input, please specify.

An optional 4040SE-3210

TRANSFORMER reduces 120V AC line voltage to 24V AC.

Circuitry accepts either AC or DC input.



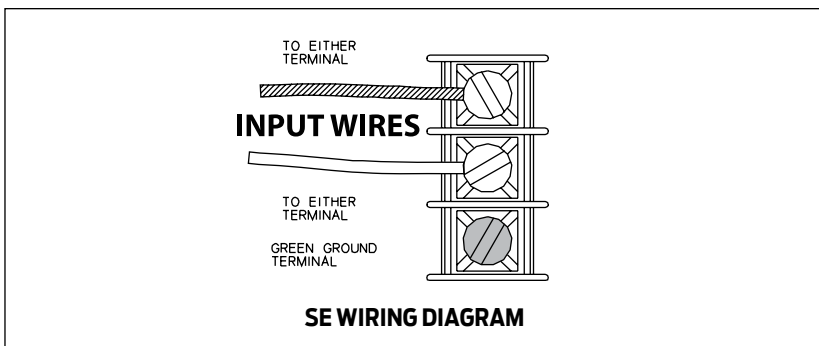
- **Butt Hinges** should not exceed 5" (127 mm) in width.
- **Auxiliary Stop** is recommended at hold-open point.
- **Top Rail** minimum 5-3/4" (146 mm).
Installation with PLATE, 4040SE-18PA requires SPECIAL TEMPLATE and 2" (51 mm) minimum top rail.
- **Stop Width** 1-1/4" (32 mm) minimum.
- **Door Width** 2' 4" (711 mm) minimum for single door with SE.
4' 8" (1422 mm) minimum for paired doors with SE.
- **Wiring Diagram**

Options

- Long (SEL) track.
- Metal cover.
- 24V or 120V input for SE or SEL, please specify.

Special Templates

Customized installation templates or products may be available to solve unusual applications. Contact LCN Product Support for assistance.

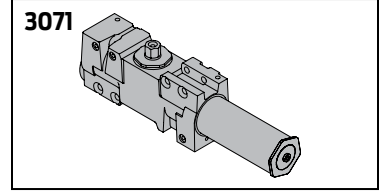


4040SE SERIES

CYLINDER

CYLINDER, 4040SE-3071

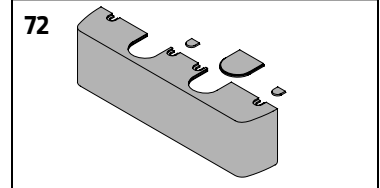
Standard, non-handed cast iron cylinder assembly.



COVERS

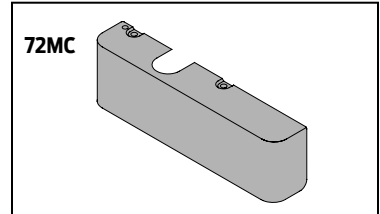
COVER, 4040SE-72

Standard, non-handed plastic clip-on cover.



METAL COVER, 4040SE-72MC

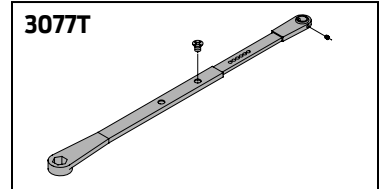
Optional, handed cover. Required for plated finishes and custom powder coat finishes.



ARMS

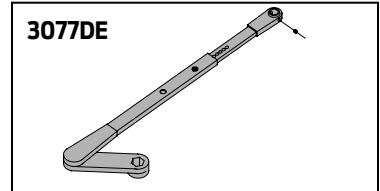
STANDARD ARM, 4040SE-3077T

Non-handed arm, adjustable to select hold-open point.



DOUBLE EGRESS ARM, 4040SE-3077DE

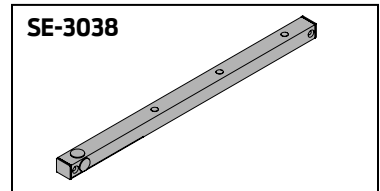
Optional, handed arm for pull side installations on double egress doors and frames. Not required for push side mounting on double egress frames.



TRACKS

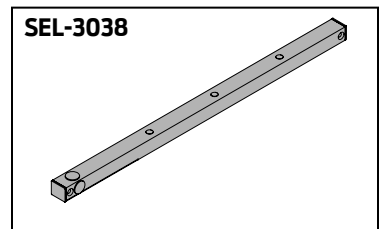
SE TRACK, 4040SE-3038

Standard, non-handed track for SE closers. Mounts on either head frame or stop. 24V or 120V AC/DC input for holding solenoid, please specify. Includes test switch assembly with fuse.



SEL TRACK, 4040SEL-3038

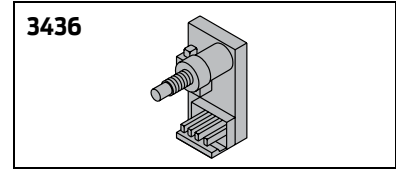
Optional, non-handed long track mounts on either head frame or stop. 24V or 120V AC/DC input standard for holding solenoid, please specify. Includes test switch assembly with fuse.



4040SE SERIES

SWITCH

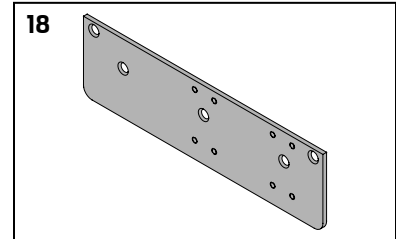
TEST SWITCH, 4040SE-3436



INSTALLATION ACCESSORIES

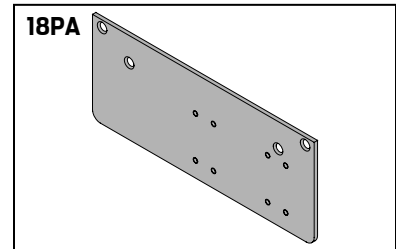
PLATE, 4040SE-18

Required where top rail is less than 3-1/2" (89 mm).
Plate requires minimum 2" (51 mm) top rail.
Plate installations require a SPECIAL TEMPLATE.



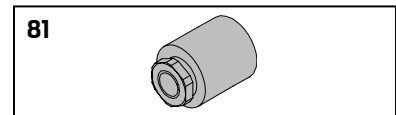
PLATE, 4040SE-18PA

Required where top rail is less than 5-3/4" (146 mm).
Plate requires minimum 2" (51 mm) top rail.
Plate installations require a SPECIAL TEMPLATE.



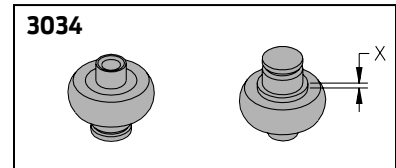
CONDUIT QUICK-CONNECTOR, 4040SE-81

Two piece connector for use with 1/2" conduit.



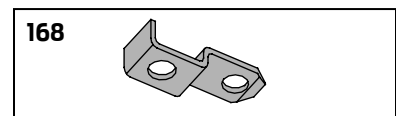
TRACK ROLLER, 4040SE-3034

Quiet, low friction roller assembly.
Shoulder dimension "X" = 1/8" (3 mm).



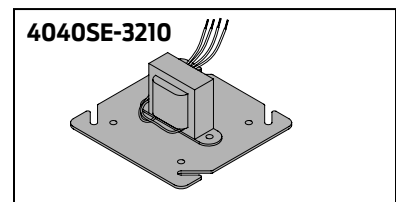
TRACK SLIDER, 4040SE-168

Alloy metal slider for use in SE series tracks only.



TRANSFORMER, 4040SE-3210

Reduces line voltage from 120V to 24V AC.
Mounted on cover for 4" (102 mm) x 4" x 2-1/8" (54 mm)
junction box (by others).



4040SE SERIES

TABLE OF SIZES

4040SE series cylinders accommodate interior doors up to 48" (1219 mm) wide.

Closing power of 4040SE Series closers is adjustable through a range of sizes up to size 4.

Minimum door widths:

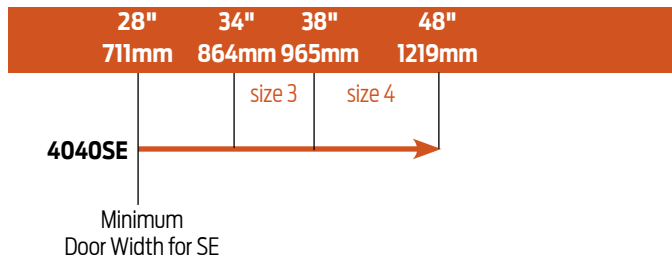
for SE on paired door, min. width 60" (1524 mm).

for SE, minimum door width 28" (711 mm).

for SEL, minimum door width 30" (762 mm).

Details are listed on the MOUNTING DETAILS pages.

INTERIOR DOOR WIDTH



HOW-TO-ORDER 4040SE SERIES CLOSERS

1. SELECT TRACK

- SE
- SEL

2. VOLTAGE

- 24V AC/DC
- 120V AC/DC

3. SPECIFY FINISH

- Standard Powder Coat _____
Aluminum, Dark Bronze, Statuary,
Light Bronze, Black, Brass.

Closer will be shipped with:

- STANDARD CYLINDER,
- STANDARD CLIP-ON COVER,
- STANDARD ARM,
- STANDARD TRACK,
- WOOD & MACHINE SCREW PACK,
unless options listed below are selected.

CLOSER OPTIONS

COVER

- Metal (MC)
(please specify right or left hand)

FINISHES

- Custom Powder Coat (RAL)
(handed metal cover required)
- Plated Finish, US _____
(handed metal cover required)

ARM

- Double Egress (DE)
(please specify right or left hand)

SCREW PACK

- TB*, Wood & Machine Screw (TBWMS)
- TORX Machine Screw (TORX)
- TB* & TORX Machine Screw (TBTRX)
* Specify door thickness if other than 1-3/4".

INSTALLATION ACCESSORIES

- Plate, 4040SE-18
- Plate, 4040SE-18PA
- Transformer, 4040SE-3210

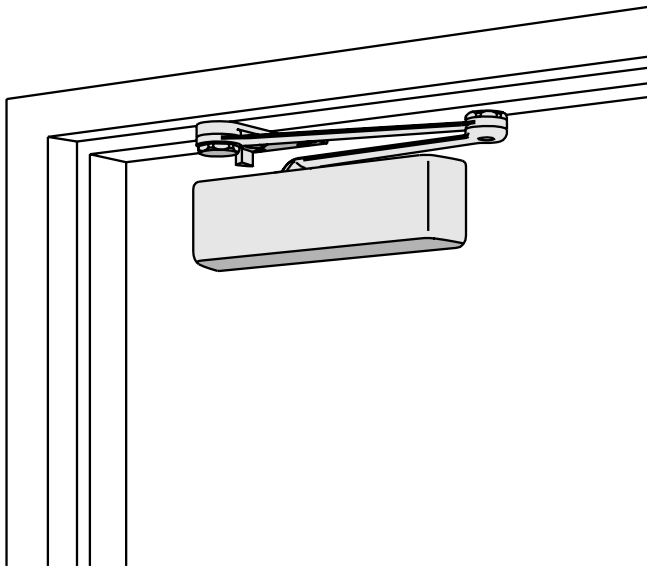
SPECIAL TEMPLATE

- ST- _____ (if required)

4110 SERIES

FEATURES

*PARALLEL ARM (PUSH SIDE) MOUNT



*4110 HCUSH mount shown

The 4110 is LCN's best performing heavy duty closer designed specifically for institutional and other rugged high traffic applications.

- Cast Iron
- Extra Duty Forged Steel Arm Standard
- Double Heat Treated Steel Pinion
- All Weather Fluid
- Advanced Variable Backcheck
- LCN Patented Green Dial
- UL & cUL Listed
- Peel-n-Stick Templates for Fast and Accurate Installations

- Standard 4110 Series closer is shipped with Extra Duty arm, standard plastic cover, 4110-201 FIFTH SCREW SPACER and self reaming and tapping screws. See 4110 Series pages 57 & 58 for options.
- Sized cylinders adjustable for interior doors to 5'0" and exterior doors to 4'0".
- Non-sized cylinder adjustable for interior doors to 4'6" and exterior doors to 3'6".
- Closer mounts parallel arm, specify right or left swinging door.
- 4111 cylinder meets ADA requirements. See 4110 Series page 59.
- Standard or optional custom powder coat finish.
- Optional plated finish on metal cover, arm and fasteners.
- Optional SRI primer for installations in corrosive conditions is available with powder coat only.
- The 4110 Series is UL and cUL listed for self-closing doors without hold-open.
- Tested and certified under ANSI Standard A156.4, grade one.



MOUNTING					FINISH		COVER			CYLINDER		**ARM FUNCTION									
HINGE (PULL/SIDE)	TOP JAMB (PULL)	TOP JAMB (PUSH)	PARALLEL ARM	STOP FACE	POWDER COAT	PLATED	PLASTIC	METAL	NON-HANDED	NON-SIZED	ACCESSIBILITY	DELAYED ACTION	AVB***	REGULAR (DOUBLE)	STANDARD (SINGLE)	HOLD-OPEN	FUSIBLE LINK	EDA/HEDA	CUSH/HCUSH	SCUSH/SHCUSH	DOUBLE EGRESS
○	○	○	●	○	●	●	●	●	○	●	♿	●	●	○	○	○	180°	180°	110°	110°	○

● AVAILABLE
○ NOT AVAILABLE

♿ Closer available with less than 5.0 lbs. opening force on 36" door.
** Maximum opening/hold-open point with standard template.
*** Advanced Variable Backcheck.

4110 SERIES

PARALLEL ARM (PUSH SIDE) MOUNTING

MAXIMUM OPENING

EDA or Fusible Link arm can be templated for

100°

Ⓐ = 5-15/16" (151 mm)

Ⓑ = 7-1/4" (184 mm)

140°

Ⓐ = 4-7/16" (113 mm)

Ⓑ = 5-3/4" (146 mm)

or 180°

Ⓐ = 2-15/16" (75 mm)

Ⓑ = 4-1/4" (108 mm)

Hold-open points up to maximum opening with HEDA or Fusible Link arm.

CUSH arm can be templated for maximum opening at

85°

Ⓐ = 8-5/16" (211 mm)

Ⓑ = 9-5/8" (244 mm)

90°

Ⓐ = 7-11/16" (195 mm)

Ⓑ = 9" (229 mm)

100°

Ⓐ = 6-7/16" (164 mm)

Ⓑ = 7-3/4" (197 mm)

or 110°

Ⓐ = 5-9/16" (141 mm)

Ⓑ = 6-7/8" (175 mm)

Hold-open point at maximum opening with HCUSH arm.

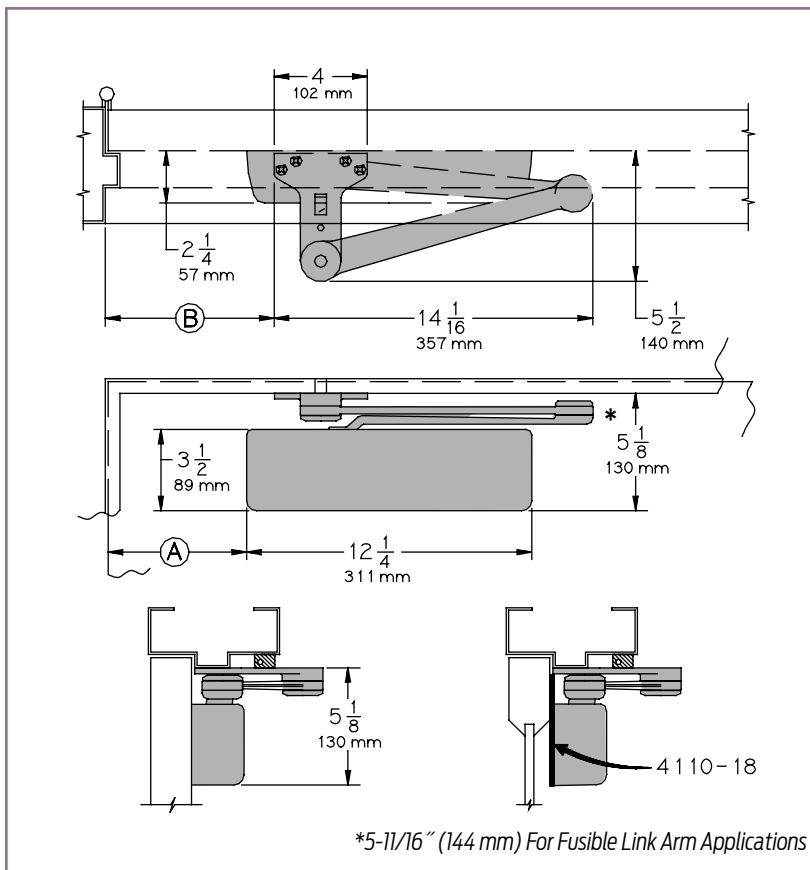
Spring Cush hold-open points are approximately 5° less than templated stop point.

Options

- Size 6 or non-sized cylinder.
- Delayed Action and/or Advanced Variable Backcheck cylinder.
- HEDA, CUSH, HCUSH, SPRING CUSH, SPRING HCUSH or Fusible Link arm.
- Metal cover.

Special Templates

Customized installation templates or products may be available to solve unusual applications. Contact LCN Product Support for assistance.



- **Butt Hinges** should not exceed 5" (127 mm) in width.
- **Auxiliary Stop** is recommended at hold-open point, where a door cannot swing 180°, or where CUSH-N-STOP arm is not used.
- **Clearance** for EDA, or CUSH shoe is 5-1/2" (140 mm) from door face.
- **Top Rail** less than 5-1/8" (130 mm) measured from stop requires PLATE, 4110-18. Plate requires 2" (51 mm) minimum measured from the stop.
- **Stop Width** minimum 1" (25 mm).
- **Head Frame** flush or rabbeted requires CUSH FLUSH PANEL ADAPTER, 4110-419.
- **Reveal** less than 2-3/4" (70 mm), use CUSH SHOE SUPPORT, 4110-30 with CUSH arms.
- **Blade Stop Spacer**, 4110-61 required to clear 1/2" (13 mm) blade stop.
- **Cush Arm** requires CUSH SHOE SUPPORT, 4110-30 for fifth screw anchorage with CUSH arms.
- **Delayed Action** Add suffix "DEL" to selected cylinder (eg. 4111 DEL). Not available with 4116 cylinder. Delays closing from maximum opening to approximately 70°. Delay time adjustable up to approximately 1 minute.
- **Advanced Variable Backcheck** cylinder starts backcheck at approximately 45° instead of the normal 75°. Add suffix "AVB" to selected cylinder.

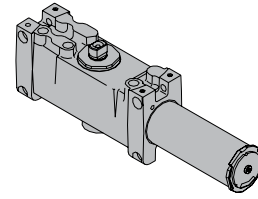
4110 SERIES

CYLINDERS

CYLINDER, 4110-3071

Standard, handed cast iron cylinder assembly.
For various applications see "Table of Sizes" on 4110 Series page 59.

3071

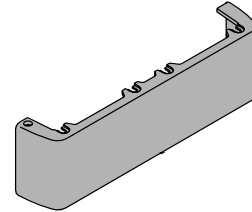


COVERS

COVER, 4110-72

Standard, non-handed plastic cover.

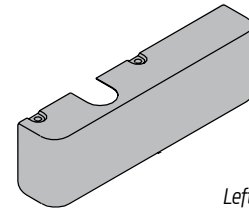
72



METAL COVER, 4110-72MC

Optional, handed cover. Required for plated finishes and custom powder coat finishes.

72MC



Left Hand Shown

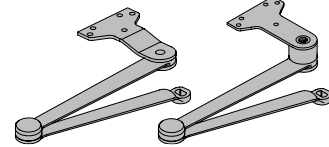
ARMS

EXTRA DUTY ARM, 4110-3077EDA, 4110-3077EDAG

Non-handed parallel arm features forged, solid steel main and forearm for potentially abusive installations.
Optional 4110-62G thick hub shoe for blade stop clearance.

3077

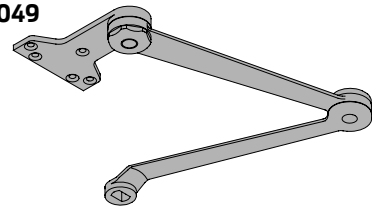
3077EDAG



HOLD-OPEN ARM 4110-3049EDA

Optional handed arm provides hold-open function, adjustable at shoe.

3049



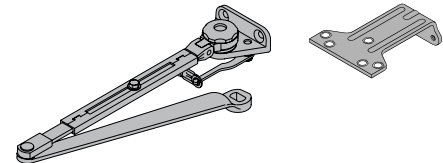
FUSIBLE LINK ARM, 4110-3049FL

Optional, handed arm releases hold-open function adjustable at shoe when exposed to temperatures above 165° F.

NOTE: Check local codes before specifying FL arms. NOT A life safety product!

3049FL

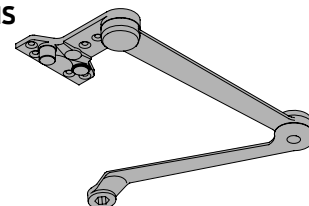
62FL



CUSH-N-STOP ARM, 4110-3077CNS

Non-handed parallel arm features solid forged steel main arm and forearm with built-in stop in soffit shoe.

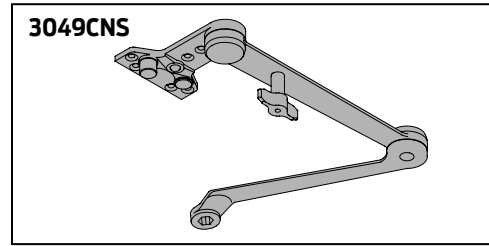
3077CNS



4110 SERIES

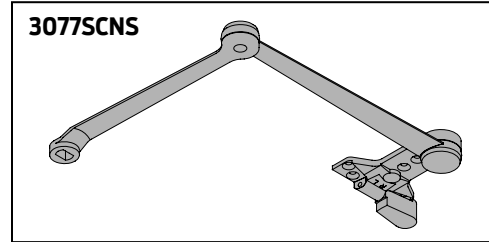
H-CUSH ARM 4110-3049CNS

Non-handed arm provides hold-open function with templated stop/hold-open points. Handle controls hold-open function.



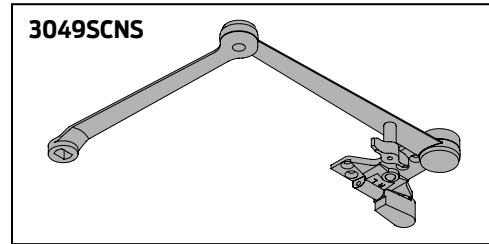
SPRING CUSH ARM, 4110-3077SCNS

Optional, non-handed parallel arm for abusive applications features solid forged steel main arm and forearm with spring loaded stop in the soffit shoe.



SPRING H-CUSH ARM, 4110-3049SCNS

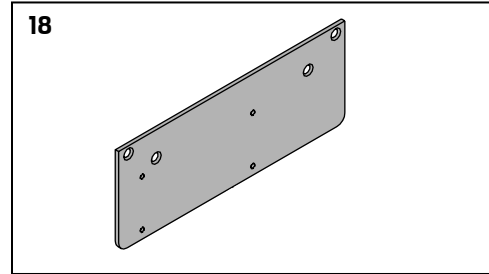
Optional, non-handed parallel arm for abusive applications features solid forged steel main arm and forearm with spring loaded stop in the soffit shoe. Handle controls hold-open function.



INSTALLATION ACCESSORIES

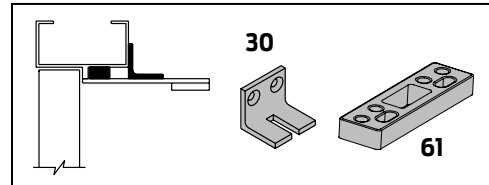
PLATE, 4110-18

Required for push side mount where top rail is less than 5-1/8" (130 mm), measured from the stop. Plate requires minimum 2" (51 mm) minimum top rail. Plate also used with CUSH Arm installations.



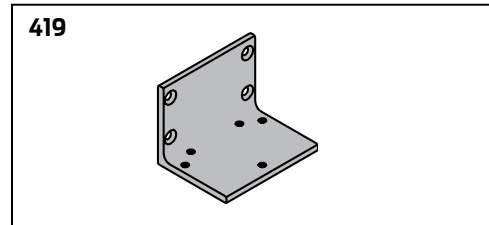
CUSH SHOE SUPPORT, 4110-30

Provides anchorage for fifth screw used with CUSH arm, where reveal is less than 3-1/16" (78 mm).



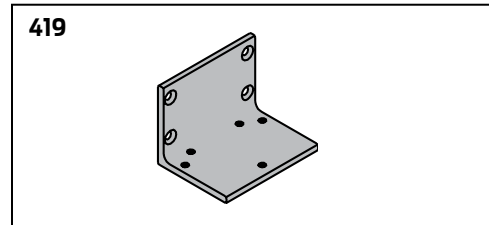
BLADE STOP SPACER, 4110-61

Lowers parallel arm shoe to clear 1/2" (13 mm) blade stop



PA FLUSH PANEL ADAPTER, 4110-419

Provides horizontal mounting surface for CUSH shoe on single rabbeted or flush frame.



4110 SERIES

TABLE OF SIZES

Select closer based on width of door.

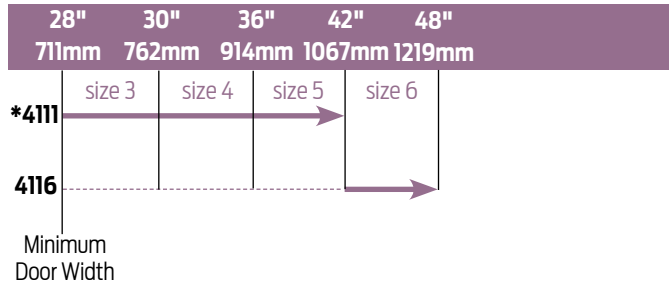
The spring power of non-sized 4111 cylinder is adjustable from size 1 through size 5 and is shipped set to size 3.

Sized 4116 series cylinders 6.

Delayed action not available with 4116 cylinder

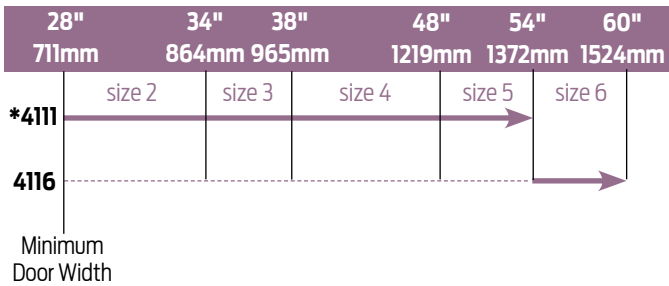
H - CUSH and SPRING H-CUSH arm not available with 4116 cylinder.

EXTERIOR (and VESTIBULE) DOOR WIDTH



* Adjustable Size 1 thru 5

INTERIOR DOOR WIDTH



→ Indicates recommended range of door width for closer size.

* Adjustable Size 1 thru 5.

REDUCED OPENING FORCE 4110 CLOSERS

CAUTION! Any manual door closer, including those certified by BHMA to conform to ANSI Standard A156.4, that is selected, installed and adjusted based on ADA or other reduced opening force requirements may not provide sufficient power to reliably close and latch a door.

Refer to AUTOMATIC OPERATORS section for information on systems that meet reduced opening force requirements without effecting closing power.

	DOOR WIDTH	36"	42"	48"
	8.5* lbs.	4111	4111	4111
	5.0* lbs.	4111	4111	4111

* Maximum opening force.

HOW-TO-ORDER 4110 SERIES CLOSERS

1. SELECT CYLINDER SIZE

- 4111 (adjustable from size 1 to 5)
- 4116 (DEL, SHCUSH or HCUSH arm not available)

2. SPECIFY HAND

- RH
- LH

3. SELECT FINISH

- Standard Powder Coat _____
Aluminum, Dark Bronze, Statuary,
Light Bronze, Black, Brass.

Closer will be shipped with:

- STANDARD COVER,
- FIFTH SCREW SPACER,
- EDA ARM,
- SELF-REAMING and TAPPING SCREWS
unless options listed below are selected.

4110 CLOSER OPTIONS

CYLINDER

- Delayed Action (DEL) (not available with 4116)
- Advanced Variable Backcheck (AVB)

COVER

- Metal (MC)

FINISH

- Custom Powder Coat (RAL) _____
(handed metal cover required)
- Plated Finish, US _____
(handed metal cover required)
- SRI primer (use with powder coat finishes only)

SPECIFY ARM

- Hold-Open Extra Duty (HEDA)
- Fusible Link, 165° F (FL)
- Cush-N-Stop (CUSH)
- H-Cush-N-Stop (n/a with 4116 cylinder) (HCUSH)
- Spring Cush (SCUSH)
- Spring H-Cush (n/a with 4116 cylinder) (SHCUSH)
- Extra Duty (EDA)
- H-Extra Duty (HEDA)

SCREW PACK

- TB*, Self-Reaming & Tapping (TBSRT)
- Wood & Machine Screw (WMS)
- TB*, Wood & Machine Screw (TBWMS)
- TORX Machine Screw (TORX)
- TB* & TORX Machine Screw (TBTRX)
** Specify door thickness if other than 1-3/4".*

INSTALLATION ACCESSORIES

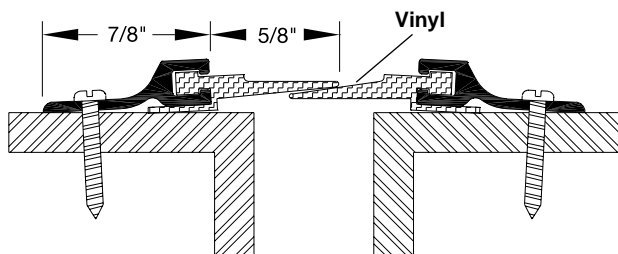
- Plate, 4110-18
- CUSH Shoe Support, 4110-30
- Blade Stop Spacer, 4110-61
- PA Flush Panel Adapter, 4110-419

SPECIAL TEMPLATE

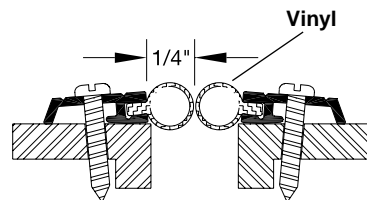
- ST- _____

NOTE: When used as an astragal on double doors, two lengths must be ordered — one for each door.

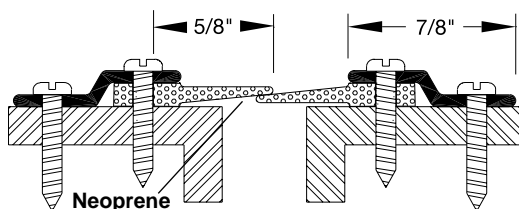
M35A
M35C
M35D
M35G



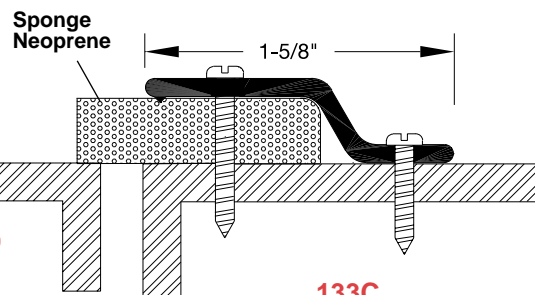
DS75A
DS75C
DS75D
DS75G



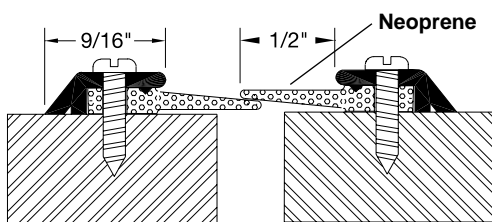
92C
92D
92G



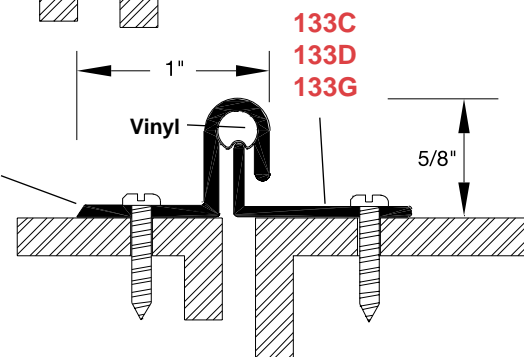
93C
93D
93G



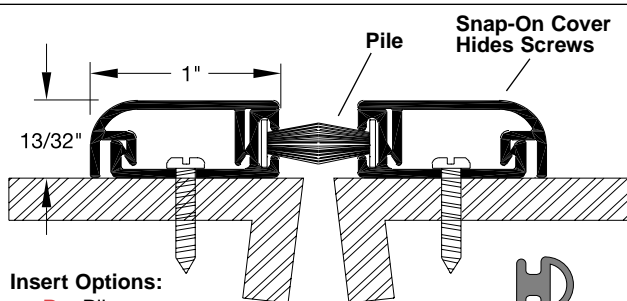
103C
103D
103G



203C
203D
203G



129CP
129CV
129DP
129DV
129GP
129GV



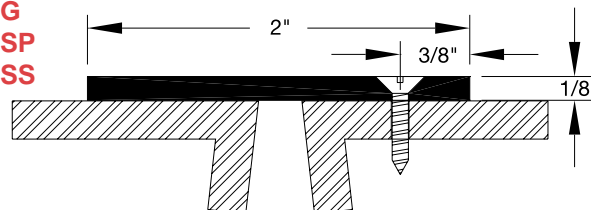
Insert Options:
P = Pile
V = Vinyl



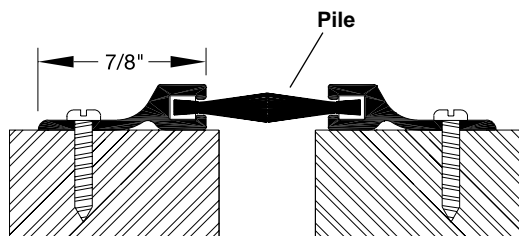
183C
183D
183G
183SP
183SS



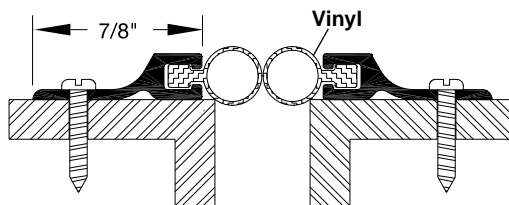
SP = Steel, Gray Prime
SS = Stainless Steel, Type 304 stainless steel finish — 12 ga. (.105)



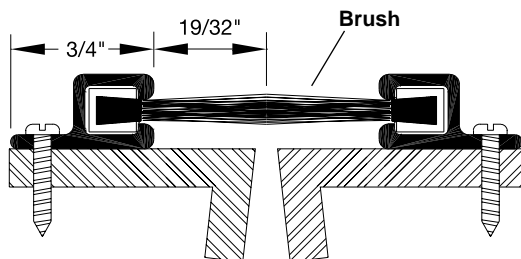
804A
804C
804D
804G



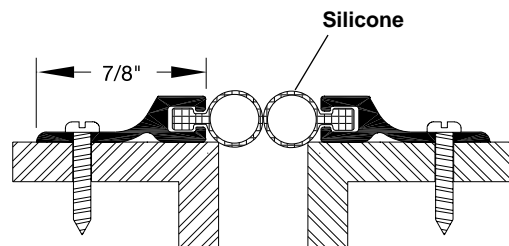
807A
807C
807D
807G



964C
964D



678A
678C
678D
678G

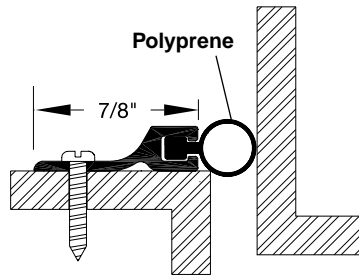


NOTE: When used as an astragal on double doors, two lengths must be ordered — one for each door.

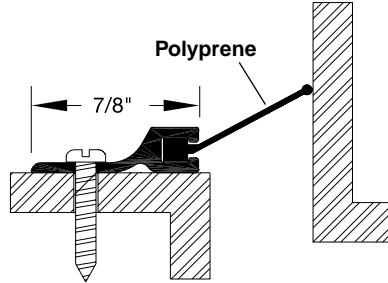
Polyprene

Polyprene®, a thermoplastic compound rubber, is a series of high-performance elastomers which combine the desirable characteristics of vulcanized rubber, such as flexibility and low compression set with the processing ease of thermoplastics.

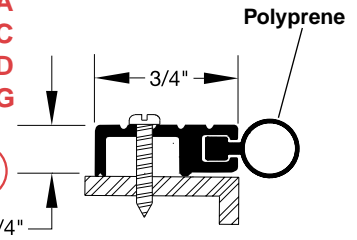
815A
815C
815D
815G



817A
817C
817D
817G



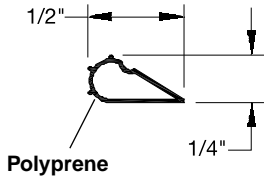
818A
818C
818D
818G



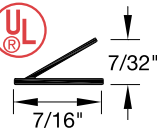
797W White
797B Black



Note: 797 and 798 available in 17', 19', 21', 25' and 500' rolls.



798B Black

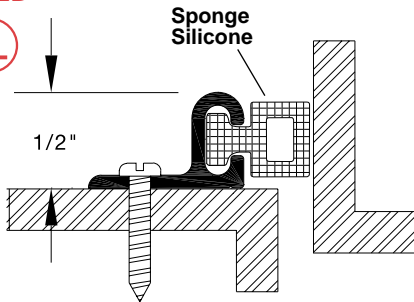


- Withstands a wide variety of temperature extremes: remains stable and keeps its shape from -76°F to 250°F.
- Has soft, good low temperature flexibility.
- More wear resistant than silicone rubber.
- Low compression set – outstanding memory for consistent long-term sealing pressure.
- Unaffected by sunlight, ozone and ultraviolet rays.
- Fatigue resistance – unsurpassed flex fatigue resistance.

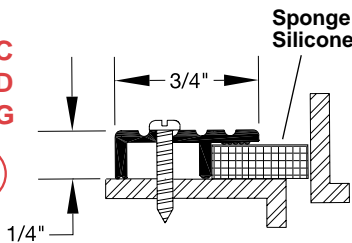
Silicone

Silicone rubbers are synthetic polymers with unusual molecular structures; giant backbones of alternating silicon and oxygen atoms. This linkage is similar to that found in quartz, thus silicones have superior heat resistance compared to other elastomers.

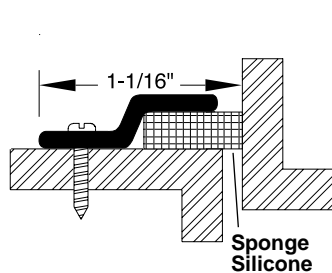
612C 612G
612D



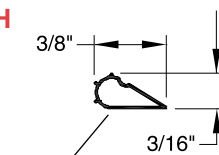
616C
616D
616G



619C
619D
619G



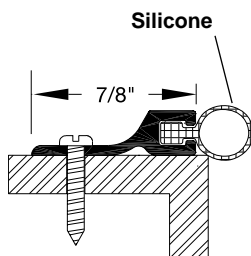
638CH



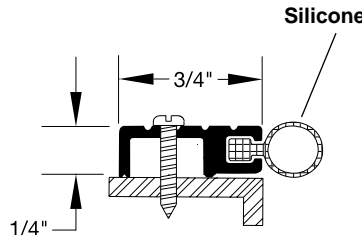
Silicone

Charcoal color available in 17', 19', 21' and 25' rolls.

678A
678C
678D
678G



688A
688C
688D
688G



Note: All self-adhesive weatherstrips must be applied on clean, dry frames between +50°F and +100°F. Smoke seals have a pre-installation shelf life of 6 to 9 months.



Door position switches



674-OH

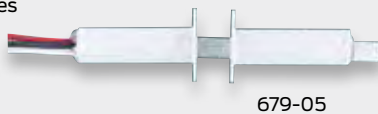
Overhead door, floor mount magnetic switch

Overview

Door position switches are used to detect the open or closed status of an opening and then send this status to a control panel. They come in a variety of shapes and sizes and are designed for monitoring door positions, roof hatches, gates etc.

Concealed SPDT magnetic switches

For wood doors and frames
0.3 Amps @ 30 VDC



679-05

Concealed/flush mount magnetic switches

For aluminum, wood and hollow metal doors 0.25 Amps @ 30 VDC
UL Listed



7764

For hollow metal doors and frames
0.3 Amps @ 30 VDC



679-05 HM

Surface mount magnetic switches

For aluminum, wood and hollow metal doors 0.25 Amps @ 30 VDC
UL Listed



7766

For wood doors and metal frames
0.3 Amps @ 30 VDC



679-05 WD

Ordering information

- **674-OH** - Overhead door floor mount
- **679-05** - Wood door and frame
- **679-05HM** - Hollow metal door and frame
- **679-05WD** - Wood door and metal frame
- **7764** - Concealed/flush mount
- **7766** - Surface mount

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About Allegion

Allegion (NYSE: ALLE) is a global pioneer in safety and security, with leading brands like CISA®, Interflex®, LCN®, Schlage® and Von Duprin®. Focusing on security around the door and adjacent areas, Allegion produces a range of solutions for homes, businesses, schools and other institutions. Allegion is a \$2 billion company, with products sold in almost 130 countries. For more, visit www.allegion.com.

aptiQ ■ LCN ■  ■ STEELCRAFT ■ VON DUPRIN



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L Series

Nothing is tougher

At Schlage we know that every product you specify has to stand up to constant use and abuse. Your building's locking systems face an additional challenge – keeping people and other assets safe while delivering constant, reliable performance. Schlage L Series Extra Heavy Duty Mortise Locks are built to withstand the rigors of daily use without fail.

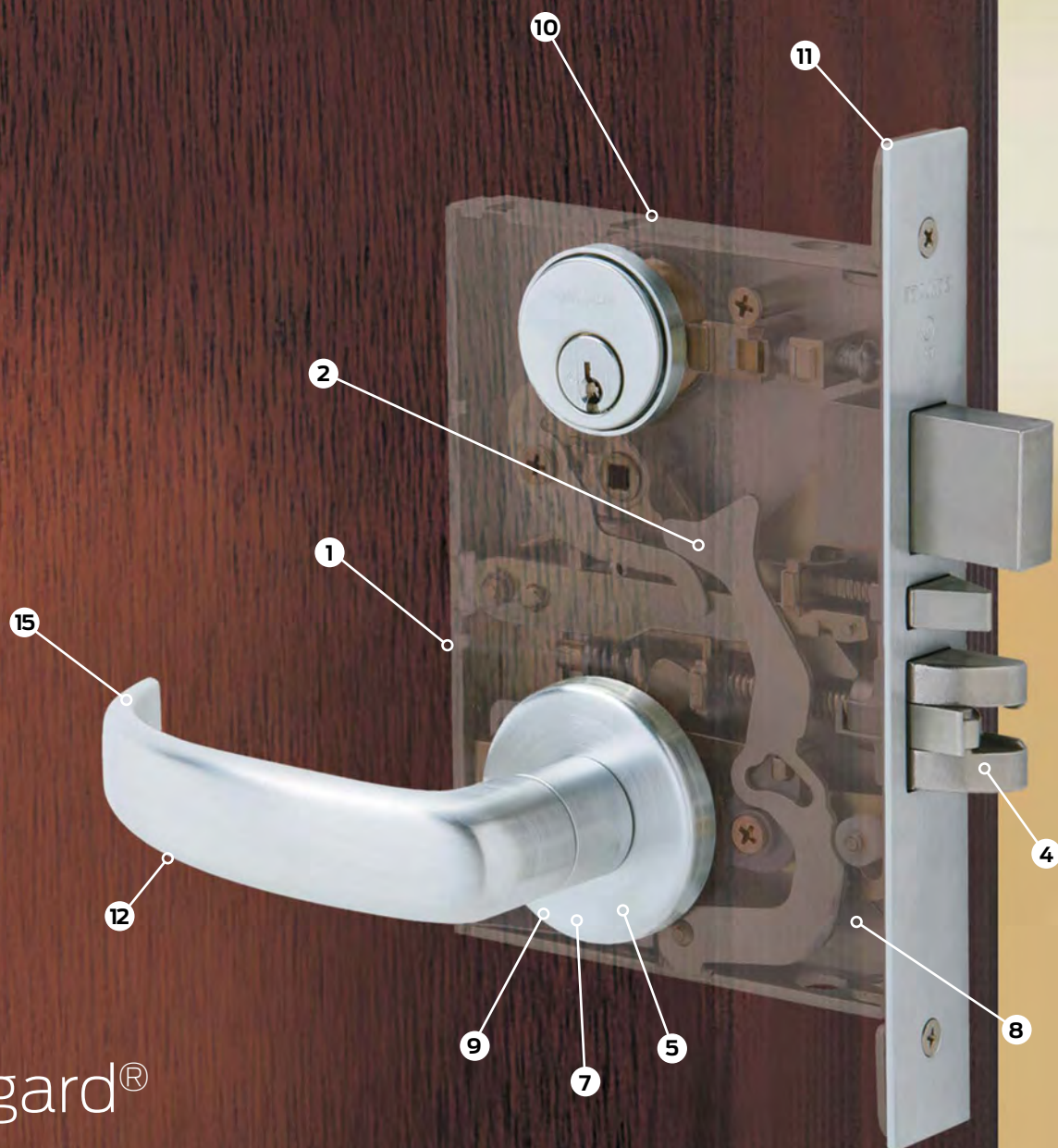


We don't compromise on security

The safety and security of your clients' buildings is something we take very seriously. That's why every Schlage lock and deadbolt undergoes intensive testing to determine its ANSI grade level:

- Cycle tests
- Resistance tests
- Door impact tests
- Warped door tests
- Bolt strength tests

We pay attention to these details so you can focus on creating a functional and aesthetically pleasing environment for your clients. In fact, every one of our L Series locks meets ANSI Grade 1 standards for safety.



Vandlgard®

The L Series Vandlgard is ideal for areas subject to abuse or anywhere vandalism is likely to be present. Vandlgard prevents damage to internal lock components caused by excessive force from kicking, hitting or standing on the lever to gain access.

It's easy to retrofit standard L Series locks with Vandlgard using the Vandlgard Retrofit Kit and an instructional DVD that shows installation on existing hardware.

The right lock for every application

Schlage L9000 Series

Our L9000 Series locks are ideal for use in schools, hospitals and factories, where the finest hardware must also deliver consistent, dependable operation and stand up to constant use and abuse.

Strength and durability

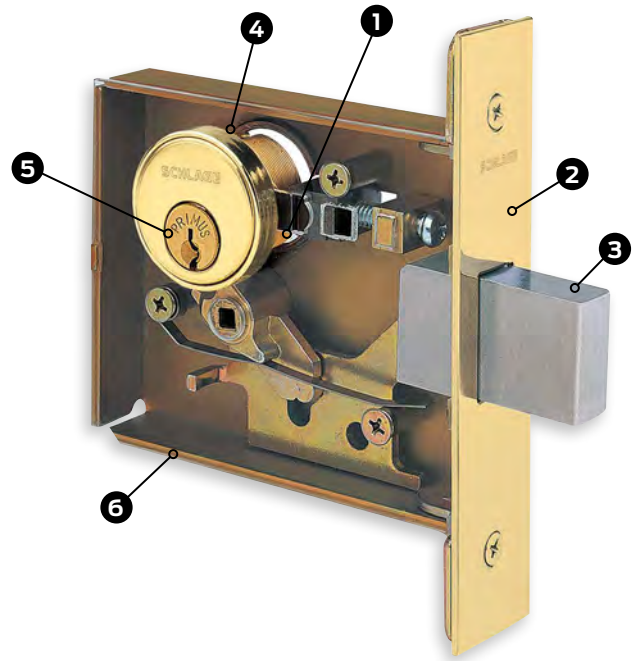
1. Fully wrapped heavy-gauge steel case protects against door edge attacks
2. All-metal zinc dichromate-plated working parts
3. Inside lock case protects electronic components
4. Two-piece anti-friction tongue reduces wear and tear
5. Outside and inside trim thru-bolted together and through the door

Security built in

6. Break-away spindle prevents unsecured failures and provides easy spindle replacement
7. Hub blocking plate protects lock against spindle manipulation
8. Spring-loaded fusible link provides fail secure mode in case of fire
9. Inside lever applied by screwless shank mounting – no exposed trim mount screws

Adaptable to your application

10. Universal lock case – ten functions in one case
11. Floating mounting tabs automatically adjust to fit a beveled door edge
12. Field-reversible handing without opening lock case
13. External spring cages allow for simple trim retrofit
14. Locking thumbturn on the inside of door visually shows when the door is locked and unlocked
15. Lever rotation in both directions (up and down) for ease of use
16. Independent lever rotation



Schlage L400 Series

Our L400 Series locks are designed for use as primary locks where no latching is required, such as restrooms and small doors to utility spaces. They also offer optimum security when used as auxiliary locks in other applications.

1. High-strength steel alloy cylinder retainer
2. Armored front in brass, bronze or stainless steel; adjustable for door bevel
3. 1" (25 mm) stainless steel throw deadbolt
4. Deeper retainer groove in cylinder shell increases security against wrenching and pullout; all cylinders backward compatible
5. 6-pin Everest® cylinder with patented keys standard
6. Steel case and parts are corrosion resistant

The M Collection

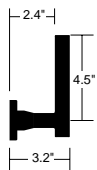
A range of options. A single standard of quality.

Introducing the M Collection, an entire lineup of decorative levers designed to maintain a custom high-style look on doors throughout any building—from the main entrance to the supply closet.

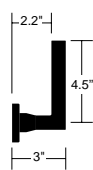
The ability to suite M Collection levers across multiple platforms from Schlage and Von Duprin means consistent style and functionality—along with unrivaled security.

The M Collection was designed to function as a visual extension of any interior, from contemporary to classic.

M51



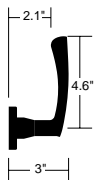
M52



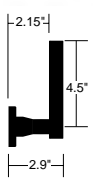
M53



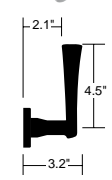
M56



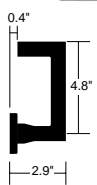
M57



M61



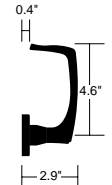
M81



M82



M83

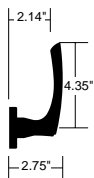


Finish options									
Color	Bright brass	Satin brass	Antique brass	Satin nickel	Bright chrome	Satin chrome	Bright stainless steel	Satin stainless steel	Aged bronze
ANSI/BHMA number	605	606	609	619	625	626/626AM	629	630/630AM	643
US number	US3	US4	US5	US15	US26	US26D	US32	US32D	US11

AM = Antimicrobial.

See pricebook for additional trim and finish availability. 33A, 95 & 99 devices not available in 619 & 630 finishes.

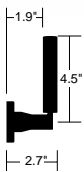
M54



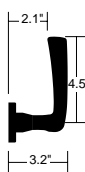
M55



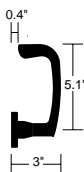
M62



M63



M84



M85



All lever designs shown (M Collection and Standard) can be paired with any of the following commercial graded products for suiting across an office, a floor or an entire building.

Locks



Schlage L Series mortise locks Grade 1

Schlage L Series locks have long been the industry standard for mortise locks, with a comprehensive offering of functions and options to support any opening need.



Schlage LT Series tubular locks Grade 2

The perfect compliment to the Schlage L Series or the Von Duprin exit devices, the LT Series tubular chassis is based on venerable L Series mortise lock and provides an alternative to lever suiting for interior doors.

Exit devices



Von Duprin 98/99 exit devices Grade 1

Von Duprin created the first exit device in 1908, and continues to redefine the industry today with unsurpassed quality and industry-unique features such as concealed vertical cables. The 98/99 Series exit device is intended for standard-stile doors. For use with 996L trim only.



Von Duprin 33A/35A exit devices Grade 1

Offering the same innovate features as the 98/99 Series, the 33A/35A Series of exit devices is intended for narrow-stile doors. For use with 360L trim only.



Von Duprin 94/95 exit devices Grade 1

The 94/95 has the pushbar trim recessed into the door to minimize the external profile, allowing more room for people and equipment to pass through. For use with 940L trim only.

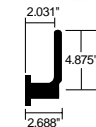
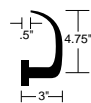
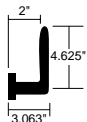
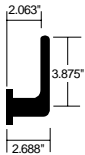
Images shown with Schlage L Mortise 'A' rose; additional rose and escutcheon designs available.

The Standard Collection

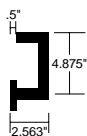
Built on our tradition of raising industry standards.

Like the M Collection, these lever designs suite with exit devices and locks from our trusted Schlage and Von Duprin brands. And, they are built to the same exacting standards.

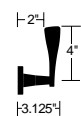
Our Standard Collection levers offer a more traditional style that is appropriate for use in a number of commercial applications.



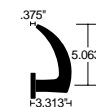
Longitude



Merano



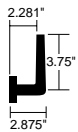
Omega



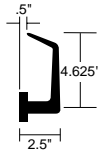
Finish options											
Color	Bright brass	Satin brass	Antique brass	Satin bronze	Oil rubbed Bronze	Satin nickel	Bright chrome	Satin chrome	Bright stainless steel	Satin stainless steel	Aged bronze
ANSI/BHMA number	605	606	609	612	613	619	625	626/626AM	629	630/630AM	643
US number	US3	US4	US5	US10	US10B	US15	US26	US26D	US32	US32D	US11

AM = Antimicrobial.
See pricebook for additional trim and finish availability. 33A, 95 & 99 devices not available in 619 & 630 finishes.

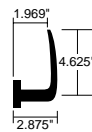
05
♿



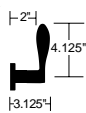
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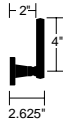
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Accent
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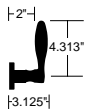
Asti
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Latitude
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St Annes
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To learn more about suiting of Schlage and Von Duprin products with our decorative or standard levers contact your security consultant or visit allegion.com/us.

Escutcheons and roses

Choose from three types of escutcheon and two rose sizes to add tough, durable performance to your lockset.

Escutcheons



L Full face

Specify by adding 'L' after lever design.

Material: Cold-forged brass, bronze or stainless steel

Finishes: 605, 606, 609, 612, 613, 619, 625, 626, 629, 630, 643e

Size: 8" x 1 3/4" x 7/16"
(203 mm x 44 mm x 11 mm)



L Concealed

Specify by adding 'C' suffix to function and by adding 'L' after lever design.

Material: Cold-forged brass, bronze or stainless steel

Finishes: 605, 606, 609, 612, 613, 619, 625, 626, 629, 630, 643e

Size: 8" x 1 3/4" x 7/16"
(203 mm x 44 mm x 11 mm)



N Escutcheon

Specify by adding 'N' after lever design.

Material: Heavy wrought reinforced brass, bronze or stainless steel

Finishes: 605, 606, 609, 612, 613, 619, 625, 626, 629, 630, 643e

Size: 8" x 2 9/16" x 7/16"
(203 mm x 65 mm x 11 mm)



Roses



A Wrought rose

2 1/8" (54 mm) diameter

Available for use on L Series knob and lever designs. Specify by adding 'A' after lever design

Finishes: 605, 606, 609, 612, 613, 619, 625, 626, 629, 630, 643e



B Wrought rose

2 9/16" (65 mm) diameter

Available for use on L Series knob and lever designs. Specify by adding 'B' after lever design.

Finishes: 605, 606, 609, 612, 613, 619, 625, 626, 629, 630, 643e



C Wrought rose

2 5/8" (66 mm) diameter

Available for use on L Series knob and lever designs. Specify by adding 'C' after lever design.

Finishes: 605, 606, 609, 619, 625, 626, 629, 630, 643e

Thumbturns

Choose from three variations of thumbturn locks that help you meet the demands of specialized commercial projects.



Hotel occupancy indicator 09-611

For lock function L9486P, this unit can be used with A or B roses. Requires a 1 3/8" (35 mm) cylinder for 1 3/4" (44 mm) doors. Specify finish when ordering separately.



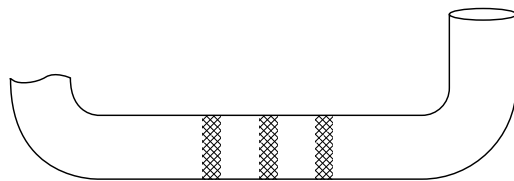
Optional EZ turn L583-363

Available for rose and escutcheon trim. Disability turn (ADA) option to standard thumbturn. Can be used with thumbturn-function L Series lock except L9463 and L463. Specify lock per L583-363 when ordering.



Coin turn

For lock function L9044 and L9444 with rose trim. Specify 09-509 and finish per L283-124 when ordering.



03 Lever shown

Products featuring a knurled surface will be indicated by adding the prefix "8" to the lever number. For example, L9050P 803A/03A.

Tactile warning (knurling)

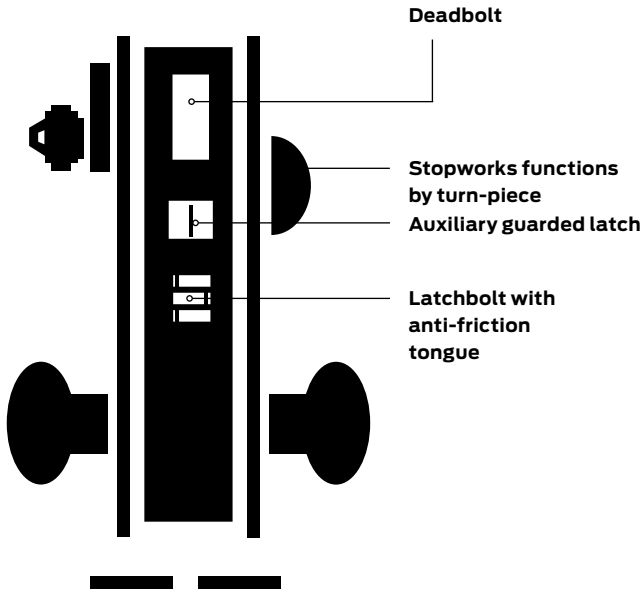
Schlage L Series commercial levers feature knurling only on the outside lever unless otherwise specified.

This feature is available on the following lever models:

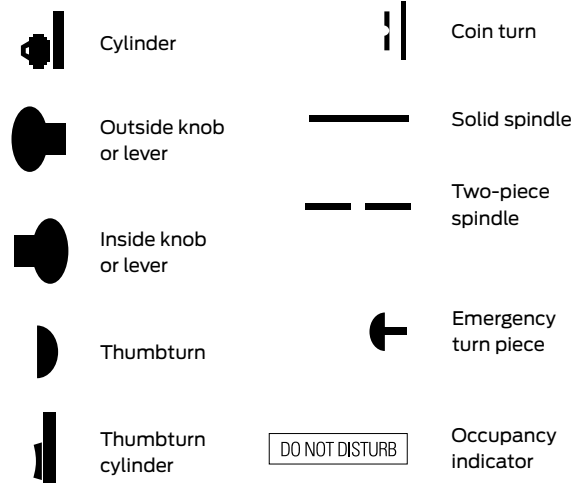
01, 02, 03, 05, 06, 07, 12, 17, 18, 41, 42 and 93.

Lock functions

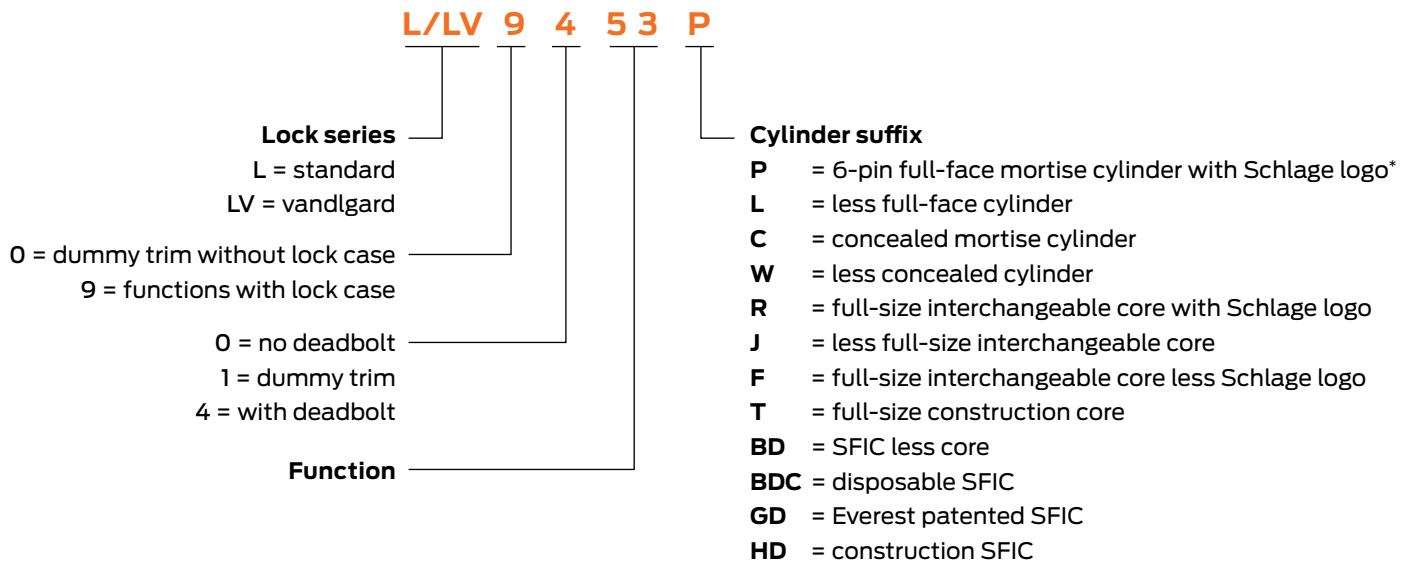
Lock components



Symbol key



Product identification guide



SFIC = Small Format (Best® style) Interchangeable Core
 To order less Schlage logo, specify lock
 "with K510-612 faceplate."

LV = Vandlgard® function allows exterior lever to rotate freely down while remaining securely locked.

Lock functions

ANSI A156.13, Series 1000



Schlage ANSI
L9010 F01

Passage latch

Latchbolt retracted by knob/lever from either side at all times. Inside lever is always free for immediate egress.



L9040 F22
LV9040

Bath/bedroom privacy lock

Latchbolt retracted by knob/lever from either side unless outside is locked by inside thumbturn. Turning inside knob/lever or closing door unlocks outside knob/lever. To unlock from outside remove emergency button, insert emergency thumbturn (furnished) in access hole and rotate. Inside lever is always free for immediate egress.



L9044
LV9044

Privacy with coin turn outside

Latchbolt retracted by knob/lever from either side unless outside is locked by inside thumbturn or outside coin turn. Operating inside knob/lever, closing door, rotating inside thumbturn or rotating outside coin turn unlocks outside knob/lever. Specify per L283-056 for Torx® screws. Available with rose trim only. (Previously XL11-868)



L9440 F19
LV9440

Privacy with deadbolt

Latchbolt retracted by knob/lever from either side. Deadbolt thrown or retracted by inside thumbturn. Throwing deadbolt locks outside knob/lever. Rotating inside knob/lever simultaneously retracts deadbolt and latchbolt, and unlocks outside knob/lever. To unlock from outside remove emergency button, insert emergency thumbturn in access hole and rotate. Inside liner is always free for immediate egress. (Previously XL11-761.)



Schlage ANSI
L9444
LV9444

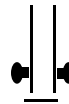
Privacy with deadbolt and coin turn outside

Latchbolt retracted by knob/lever from either side. Deadbolt thrown or retracted by inside thumbturn or outside coin turn. Throwing deadbolt locks outside knob/lever. Rotating inside knob/lever simultaneously retracts deadbolt and latchbolt, and unlocks outside knob/lever. Rotating outside coin turn retracts deadbolt and unlocks outside knob/lever. Specify per L283-056 for Torx screws. Available with rose trim only. Inside lever is always free for immediate egress. (Previously XL11-868)



L0170
Half dummy trim

Knob/lever on one side fixed by mounting bar.



L0172
Full dummy trim

Knob/lever on both sides fixed by mounting bar.



L9175
Half dummy trim with lock case

Fixed knob/lever on one side inoperable. Includes lock case and armored front. Options same as L9176 below.



L9176
Full dummy trim with lock case*

Fixed knob/lever on both sides. Includes lock case and blank armor front. May be ordered with optional XL11-743 armored front with cutout to receive deadbolt.

*In a double-door application where the dummy will be used as the strike order 10-091 Armored Front Strike separately.

Lock functions

Single cylinder non-deadbolt functions



Schlage ANSI
L9050 **F04**
LV9050

Office and inner entry lock

Latchbolt retracted by knob/lever from either side unless outside is made inoperative by key outside or by turning inside thumbturn. When outside is locked, latchbolt is retracted by key outside or by knob/lever inside. Outside knob/lever remains locked until thumbturn is returned to vertical or unlocked by key. Auxiliary latch deadlocks latchbolt when door is closed. Inside liner is always free for immediate egress.



L9056
LV9056

L9050 with automatic unlocking

Latchbolt retracted by knob/lever from either side unless outside is made inoperative by key outside or by rotating inside thumbturn. Outside knob/lever unlocked by key outside, thumbturn or closing door. Rotating inside knob/lever simultaneously retracts latchbolt and unlocks outside knob/lever. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress.



L9070 **F05**
LV9070

Classroom lock

Latchbolt retracted by knob/lever from either side unless outside is locked by key. Unlocked from outside by key. Inside knob/lever always free for immediate exit. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress.



L9076 **F06**
LV9076

Classroom holdback lock

Latchbolt retracted by knob/lever from either side unless outside is locked by key. When locked, latchbolt retracted by key outside or knob/lever inside. Auxiliary latch deadlocks latchbolt when door is closed. Depress inside knob/lever and turn key 360° for holdback feature. Inside lever is always free for immediate egress.



L9080 **F07**
LV9080

Storeroom lock

Latchbolt retracted by key outside or by knob/lever inside. Outside knob/lever is always inoperative. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress.



Schlage ANSI
L9080EL
LV9080EL

Electrically locked (fail safe)

Outside knob/lever continuously locked by 24V AC or DC. Latchbolt retracted by key outside or by knob/lever inside. Switch or power failure allows outside knob/lever to retract latchbolt. Auxiliary latch deadlocks latchbolt when door is closed. Inside knob/lever always free for immediate exit. Inside lever is always free for immediate egress.



L9080EU
LV9080EU

Electrically unlocked (fail secure)

Outside knob/lever unlocked by 24V AC or DC. Latchbolt retracted by key outside or knob/lever inside. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress.




L9080EL-RX / LV9080EL-RX
L9080EU-RX / LV9080EU-RX

Request to exit (RX) electrified lock

Same as L9080EL and L9080EU functions. In addition, a micro-switch positioned inside the lock case monitors the retractor crank, and is actuated when rotation of the inside or outside knob/levers rotates the retractor hub. The switch signals the use of that opening to security systems, allowing a non-disruptive means of immediate egress. Specify per L283-263 with L functions, specify L283-239 with LV functions. Inside lever is always free for immediate egress.


Lock functions

Single cylinder deadbolt functions




Schlage ANSI
L9453 F20
LV9453
Entrance lock

Latchbolt retracted by knob/lever from either side unless outside is locked by 20° rotation of thumbturn. Deadbolt thrown or retracted by 90° rotation of thumbturn. When locked, key outside or knob/lever inside retracts deadbolt and latchbolt simultaneously. Outside knob/lever remains locked until thumbturn is restored to vertical position. Throwing deadbolt automatically locks outside knob/lever. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress.




L9456 F13
LV9456
Corridor lock

Latchbolt retracted by knob/lever from either side. Deadbolt thrown or retracted by key outside or inside thumbturn. Throwing deadbolt locks outside knob/lever. Turning inside knob/lever simultaneously retracts deadbolt and latchbolt and unlocks outside knob/lever. Inside lever is always free for immediate egress.




L9465
Closet/storeroom lock

Latchbolt retracted by knob/lever from either side. Deadbolt thrown or retracted by key outside.




L9473 F21
Dormitory/bedroom lock

Latchbolt retracted by knob/lever from either side. Deadbolt thrown or retracted by key outside or thumbturn inside.




L9480 LV9480
Storeroom lock with deadbolt

Latchbolt retracted by key outside or by lever or knob inside. Outside knob/lever always fixed. Deadbolt thrown or retracted by key outside or thumbturn inside. Turning inside knob/lever simultaneously retracts both deadbolt and latchbolt. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress. (Previously XL11-591)




L9485 x XL11-557
Prison function lock

Latch retracted by key outside or knob inside. Outside knob always free spinning. Deadbolt only thrown or retracted by guard's key. Inside knob becomes fixed when deadbolt is thrown. Prisoner's key only retracts latchbolt. Furnished standard with tamper-resistant Torx screws. Specify per XL11-557.




Schlage ANSI
L9485 F20
LV9485
Faculty/hotel/restroom lock

Latchbolt retracted by key outside or by knob/lever inside. Outside knob/lever always fixed. Deadbolt thrown or retracted by inside thumbturn. When deadbolt is thrown all keys become inoperative except emergency or display keys. Turning inside knob/lever retracts both deadbolt and latchbolt simultaneously. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress.




L9486 F15
LV9486
Faculty/hotel/restroom lock
“do not disturb” indicator

Latchbolt retracted by key outside or by knob/lever inside. Outside knob/lever always fixed. Deadbolt thrown or retracted by inside thumbturn. When deadbolt is thrown “do not disturb” plate is displayed. All keys become inoperative except emergency or display keys. Turning inside knob/lever retracts both deadbolt and latchbolt simultaneously. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress.



L9486 x L583-375 LV9486 x L583-375
L9486 with “occupied” indicator

Latchbolt retracted by key outside or by knob/lever inside. Outside knob/lever always fixed. Deadbolt thrown or retracted by inside thumbturn. When deadbolt is thrown “Occupied” plate is displayed and all keys become inoperative except emergency keys. Turning inside knob/lever simultaneously retracts both deadbolt and latchbolt. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress. (Previously XL11-580)



L9496
Privacy with “occupied” indicator

Knob/lever retracts latchbolt from either side. Deadbolt thrown or retracted by key outside (retraction by key required in the event of an emergency) or inside thumbturn. Throwing deadbolt locks outside knob/lever and displays “Occupied” plate. Rotating inside knob/lever simultaneously retracts both deadbolt and latchbolt, and unlocks outside knob/lever. Inside lever is always free for immediate egress. (Previously XL11-885)

* In a double-door application where the dummy will be used as the strike order 10-091 Armored front strike separately.

Lock functions

Double cylinder non-deadbolt functions



Schlage ANSI
L9060 F09
LV9060

Apartment entrance lock

Latchbolt retracted by knob/lever from either side unless outside is locked by key from inside. When locked, latchbolt retracted by key outside or knob/lever inside. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress.



L9071
LV9071

Classroom security lock

Latchbolt retracted by knob/lever from either side unless outside is locked by key from either side. When locked, latchbolt retracted by key outside or knob/lever inside. Auxiliary latch deadlocks latchbolt when door is locked. Inside lever is always free for immediate egress.



L9077
LV9077

Classroom security holdback lock

Latchbolt retracted by knob/lever from either side unless outside is locked by key from either side. When locked, latchbolt retracted by key outside or knob/lever inside. Auxiliary latch deadlocks latchbolt when door is locked. Depress inside knob/lever and turn key 360° for holdback feature. Inside lever is always free for immediate egress.



L9082 F30
LV9082

Institution lock

Latchbolt retracted by key from either side. Knob/lever on both sides always inoperative. Auxiliary latch deadlocks latchbolt when door is closed.



L9082EL
LV9082EU

L9082 electrically locked or electrically unlocked both sides*

EL: Outside and inside knob or lever continually locked electrically. Latchbolt retracted by key either side. Switch or power failure allows outside and inside knob/lever to retract latchbolt. Auxiliary latch deadlocks latchbolt when door is closed. EU: Outside and inside knob/lever unlocked electrically. Latchbolt retracted by key either side. Switch or power failure keeps inside and outside knob/lever locked. Auxiliary latch deadlocks latchbolt when door is closed. (Previously XL11-452)

Lock functions

Double cylinder deadbolt functions



Schlage ANSI
L9457
LV9457

Classroom security lock with deadbolt

Latchbolt retracted by knob/lever from either side. Deadbolt thrown or retracted by key from either side. Throwing deadbolt locks outside knob/lever. Turning inside knob/lever simultaneously retracts deadbolt and latchbolt, and unlocks outside knob/lever. Inside lever is always free for immediate egress.



L9466 **F14**

Store/utility room lock with deadbolt*

Latchbolt retracted by knob/lever from either side. Deadbolt thrown or retracted by key from either side.



L9482 x XL11-943
LV9482 x XL11-943

Institution lock with deadbolt*

Latchbolt retracted by key from either side. Knob/lever on both sides always inoperative. Deadbolt thrown or retracted by key either side. Auxiliary latch deadlocks latchbolt when door is closed. Specify per XL11-543.

In a double-door application where the dummy will be used as the strike order 10-091 Armored front strike separately.

*Caution: Double cylinder locks on residences and any door in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

Lock functions

Full mortise deadlocks



Schlage ANSI
L9460 **F17**

Cylinder x thumbturn lock

Deadbolt thrown or retracted by key outside or thumbturn inside.



L9462 **F16**

Double cylinder lock*

Deadbolt operated by key from either side.



L9463

Classroom lock

Deadbolt thrown or retracted by key from outside. Inside thumbturn cylinder retracts deadbolt, but cannot project it.



L9464 **F18**

Cylinder lock

Deadbolt thrown or retracted by key from one side. No trim on opposite side.



L9460 x XL11-635

L9460 with pull

Knob/lever both sides fixed. Deadbolt thrown or retracted by key outside or thumbturn inside.



L9460 x XL11-886

Single cylinder deadlock with pull

Deadbolt thrown or retracted by key outside or thumbturn inside. No latch, but inside knob or lever is spring-loaded. Rotating inside knob/lever also retracts deadbolt. Fixed outside knob/lever.



L9462 x XL11-886

Double cylinder deadlock with pull*

Deadbolt thrown or retracted by key from either side. No latch, but inside knob/lever is spring-loaded. Rotating inside knob/lever also retracts deadbolt. Fixed outside knob/lever.



L9464 x XL11-886

Deadlock with pull

Deadbolt thrown or retracted by key from one side. No latch, but inside knob/lever is spring-loaded. Rotating inside knob/lever also retracts deadbolt. Fixed outside knob/lever.

Lock functions

Small mortise deadlocks



Schlage ANSI
L460 **E06071**

Cylinder x thumbturn lock

Deadbolt thrown or retracted by key outside or thumbturn inside.



L462 **E06061**

Double cylinder lock*

Deadbolt operated by key from either side.



L463 **E06091**

Classroom lock

Deadbolt thrown or retracted by key from outside. Inside thumbturn cylinder retracts deadbolt, but cannot project it.



L464 **E06081**

Cylinder lock

Deadbolt thrown or retracted by key from one side. No trim on opposite side.



L480

Door bolt

Deadbolt thrown or retracted by thumbturn from one side. No trim on opposite site.



L496











Deadbolt with "occupied" indicator

Deadbolt thrown or retracted by key outside or thumbturn inside. When deadbolt is thrown "Occupied" plate is displayed. (Previously XL11-911)























Schlage L Series universal transformation instructions

The L9050 universal case can be transformed into nine different functions* with just a few additional parts.

For some functions, additional parts are not necessary.

ANSI function	Function type	Function description
F04	 L9050 (w/thumbturn) office	Latchbolt operated by lever either side except when outside lever is made inoperative by a stop or other mechanical means other than key. When outside lever is locked, latchbolt is retracted by key from outside or by operating inside lever. Auxiliary deadlatch.
F01	 L9010 passage	Latchbolt operated by lever from either side at all times.
F05	 L9070 classroom	Latchbolt operated by lever either side except when outside lever is locked from outside by key or push button mechanism. When outside is locked latchbolt is retracted by key or by operating key or push button, and outside lever from outside or by operating inside lever. Auxiliary deadlatch.
F07	 L9080 storeroom	Latchbolt operated by key outside or by operating inside lever. Outside lever always inoperative. Auxiliary deadlatch.
F09	 L9060 apartment entrance	Latchbolt operated by lever either side, except when made inoperative by key from inside. When outside is locked latchbolt is retracted by key from outside or by operating inside lever. Auxiliary deadlatch.
F31	 L9080 (less outside cylinder) exit or communicating	Latchbolt operated by inside lever. Non-removable blank trim or no trim outside.
F32	 L9071 classroom security	Latchbolt retracted by lever either side except when outside lever is locked by key from inside or outside. When outside lever is locked latchbolt is retracted by key either side or by inside lever. Auxiliary deadlatch.
	 L9080 (less outside lever) service	Latchbolt operated by key outside or by operating inside lever. No outside lever. Auxiliary deadlatch.
	 L9080 (less inside trim) utility	Latchbolt retracted by key outside; outside lever always inoperative. No inside trim. Auxiliary deadlatch.
	 L9070 (less inside trim) closet	Latchbolt operated by lever on outside except when outside lever is locked from outside by key. When outside is locked latchbolt is retracted by key or by operating key from outside lever. Auxiliary deadlatch.

* Assumes Everest cylinders and L9050 as base function (L283-133 chassis/L9050LB distributor lock case) — only applies to sectional trim (not escutcheon).

Transformation instructions	Additional part(s)				
Install cloverleaf cam cylinder on outside; install thumbturn assembly 09-509-027 on inside.	No additional parts required.				
Do not install thumbturn unit 09-509-027 on inside or cylinder outside. Install chassis in the unlocked position.	No additional parts required.				
Install cloverleaf cam cylinder on outside; do not install thumbturn assembly 09-509-027 on inside.	No additional parts required.				
Do not install thumbturn 09-509-027 on inside. Install chassis in the locked position. Replace cloverleaf cam L583-153 with straight cam B502-948 (Everest), L583-255 with K510-680 (IC and SFIC) and install on outside.	Cams B502-948 (Everest), K510-680 (IC and SFIC) or L583-476 or L583-477 for modular cylinders	 B502-948	 K510-680	 L583-476 1 1/8" / 1 3/8" / 1 5/8"	 L583-477 1 1/4" / 1 1/2" / 1 3/4"
Do not install thumbturn 09-509-027 on inside. Install cloverleaf cam cylinder on inside. Replace clover leaf cam L583-153 with straight cam B502-948 (Everest), L583-255 with K510-680 (IC and SFIC) and install on outside.	Mortise cylinder assembly and cams B502-948 (Everest), K510-680 (IC and SFIC) or L583-476 for modular cylinders	 B502-948	 K510-680	 L583-476 1 1/8" / 1 3/8" / 1 5/8"	 L583-477 1 1/4" / 1 1/2" / 1 3/4"
Do not install thumbturn unit 09-509-027 on inside. Install chassis in the locked position. Install inside lever with L285-150 mounting plate; do not install outside lever or cylinder.	Mounting plate L283-150	 L283-150			
Do not install thumbturn unit 09-509-027 on inside. Install cloverleaf cam cylinder on inside and outside.	Mortise cylinder assembly and cam L583-153	 Mortise cylinder assembly	 L583-153	 L583-274 1 1/8" / 1 3/8" / 1 5/8"	 L583-275 1 1/4" / 1 1/2" / 1 3/4"
Do not install thumbturn unit 09-509-027 on inside. Install chassis in the locked position. Replace cloverleaf cam L583-153 with straight cam B502-948 (Everest), L583-255 with K510-680 (IC and SFIC) and install on outside. Install inside lever with L285-150 mounting plate; do not install outside lever.	Cams B502-948 (Everest), K510-680 (IC and SFIC), mounting plate L283-150 or L583-476 or L583-477 for modular cylinders	 L283-150	 B502-948	 K510-680	 L583-476 1 1/8" / 1 3/8" / 1 5/8"
Do not install thumbturn unit 09-509-027 on inside. Install chassis in the locked position. Replace cloverleaf cam L583-153 with straight cam B502-948 (Everest), L583-255 with K510-680 (IC and SFIC) and install on outside. Install inside lever on outside with L283-150 mounting plate; do not install inside lever.	Cams B502-948 (Everest), K510-680 (IC and SFIC), mounting plate L283-150 or L583-476 or L583-477 for modular cylinders	 L283-150	 B502-948	 K510-680	 L583-476 1 1/8" / 1 3/8" / 1 5/8"
Install cloverleaf cam cylinder on outside; do not install thumbturn assembly 09-509-027 on inside. Install inside trim on outside with L283-150 mounting plate.	Mounting plate L283-150	 L283-150			

Specifications

Handing:

L9000 Series lock bodies are field-reversible without disassembly. L400 Series locks are non-handed.

Door thickness:

1³/₄" (44 mm) standard. 1³/₈" (35 mm) to 2¹/₂" (64 mm) optional. Over 2¹/₂" (64 mm) door ranges vary by function. No escutcheon available for 1³/₄" (44 mm) doors standard. 2" to 2³/₈" (51 mm to 60 mm) optional. Specify door thickness if other than 1³/₄".

Backset:

2³/₄" (70 mm) only.

Armored front:

L9000 Series: 1¹/₄" x 8" x 7⁷/₃₂" (32 mm x 203 mm x 6 mm) standard. 1¹/₁₆" x 8" x 1⁷/₃₂" (27 mm x 203 mm x 6 mm) optional.
L400 Series: 4⁷/₁₆" x 3⁵/₈" x 1" (113 mm x 92 mm x 25 mm)

Case size:

L9000 Series: 4⁷/₁₆" x 6¹/₁₆" x 1" (113 mm x 154 mm x 25 mm)
L400 Series: 4⁷/₁₆" x 3⁵/₈" x 1" (113 mm x 92 mm x 25 mm)

Spacing:

Knob or lever to cylinder, 3⁷/₈" (98mm); knob or lever to thumbturn hub, 2¹¹/₁₆" (68mm).

Bolts:

1" (25mm) throw stainless steel deadbolt and 3³/₄" (19mm) throw stainless steel latch with anti-friction tongue.

Exposed trim:

Knobs: #41 and #42 heavy-duty wrought brass, bronze or stainless steel knobs match D Series knobs.

Levers: Forged brass or bronze and cast stainless steel. Designs available to match D Series levers.

93 Lever design: Extruded brass, bronze or stainless steel.

Mediterranean designs: Forged-brass lever and rose.

Escutcheons: L escutcheons are cold-forged brass or bronze and stainless steel. N escutcheons are heavy wrought reinforced brass, bronze and stainless steel.

Trim combinations: Available with knob both sides, lever both sides, or knob and lever with rose or escutcheon both sides.

Strike:

L9000 Series: ANSI curved lip strike 1¹/₄" x 4⁷/₈" (32 mm x 124 mm) x 1³/₁₆" (30 mm) lip to center with dust box standard. L400 Series: 1¹/₈" x 3⁵/₈" (29 mm x 92 mm) with dust box.

Cylinder & keys:

6-pin Everest C123 keyway cylinder with two patented keys standard.

Keying options:

Interchangeable core and Primus high security cylinders. Master keying, grand master keying and construction keying.

Certifications

ANSI:

L9000: ANSI A156.13 Series 1000, Grade 1 Operational and Security, UL Listed for 3-hour fire door (except L9076 and L9007). With interchangeable core cylinders: Grade 2 Security.

With concealed shell cylinder: A156.13 Grade 1 Operational and Security. ANSI/ASTM F476-76 Grade 40, UL Listed. L400: ANSI A156.5 Grade 1.

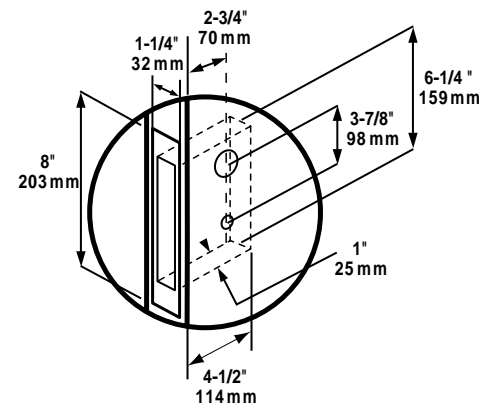
California State Reference Code:

(Formerly Title 19, California State Fire Marshal Standard) All levers with returns comply; levers return to within 1/2" of door face.

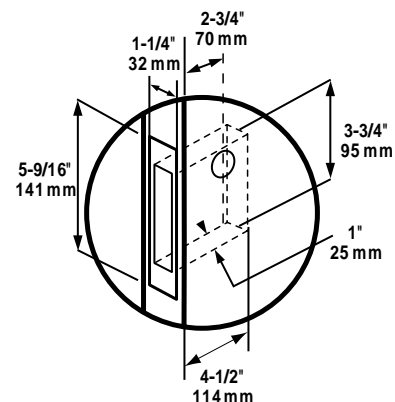
UL / cUL:

All locks listed for A label single doors, 4' by 10'. Letter F and UL symbol on latch front indicate listing. Electrified functions are UL19X Listed for single-point locking applications. UL437 Listed locking cylinder optional: specify Primus 20-500 Series cylinder.

Door preparation for L9000 Series



Door preparation for L400 Series






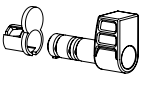
How to order

To order Schlage products, descriptive data should be in the same sequence as shown.

Line item	Qty	Product	Outside		Inside		Hand	Front	Strike	Door thickness	Ext	Dim	Additional details
			Des	Fin	Des	Fin							
1	2	3	4	5	6	7	8	9	10	11	12	13	14

- 1 Line item number
- 2 Quality
- 3 Complete model number with function and cylinder type

To order cylinder options, change “P” at the end of the model number as follows:

	<p>L9453P Standard</p> <p>L9453L Less standard cylinder. For Primus cylinder, specify this option and order Primus cylinder separately.</p> <p>L945C With temporary plastic construction cylinder. Double cylinder functions ordered less cylinder are furnished with these construction cylinders to maintain timing of key cams.</p>
	<p>L9453J Prepared for full size interchangeable core, less core. For Primus core, specify this option and order Primus core separately.</p> <p>L9453R With full-size conventional interchangeable core installed. Order control keys separately.</p> <p>L9453T With full-size (temporary) construction core installed. Order all keys separately.</p>
	<p>L9453BD Prepared for small format (Falcon, Best, etc.) interchangeable core (SFIC), less core.</p> <p>L9453GD With Everest B Family restricted keyway small format core installed. Order control keys separately.</p> <p>L9453HD With small format keyed brass construction core installed. Order all keys separately.</p>
	<p>L9453BDC With small format disposable plastic construction core installed.</p>

- 4/5 Outside design / finish. Specify tactile warning (knurling) here as “8” before lever design, e.g. 803. To specify complete design, combine the numeric knob or lever design with the alpha rose or escutcheon design. Example: 03L, 93A, 42B. When ordering Mediterranean design levers with L escutcheons, specify AST/00L, AVA/00L or MER/00L.
- 6/7 Inside design/finish. Leave blank if same as outside.
- 8 Hand. One hand per line item.
- 9 Front (use “Strike” field on Schlage form). Leave blank for standard armored front or enter number for narrow front.
- 10 Strike. Leave blank for standard or specify part number for optional strike. LLL = Less strike.
 100 = 1" 114 = 1 1/4" 112 = 1 1/2" 200 = 2"
 118 = 1 1/8" 138 = 1 3/8" 134 = 1 3/4"
- 11 Door thickness, if non-standard. Example: 200 = 2".
- 12 Extension, to specify whether thick door is extended inside (EI), outside (EO), differently (ED) or equally (EE).
- 13 Dimension for strike lip lengths. See strike page for availability of specific dimensions with specific strikes.
- 14 Keying detail (e.g. key symbol, keyway, biting) and other special requirements.

Example

Line item	Qty	Product	Outside		Inside		Hand	Front	Strike	Door thickness	Ext	Dim	Additional details
			Des	Fin	Des	Fin							
1	50	L9453P	03A	626			RH		10-091				
2	50	L9453P	03A	626			LH		10-091				
3	10	L9040	03A	626			RH			138			
4	10	L9040	03A	626		625	LH	09-668		138			
5	50	L9456P	07L	626		625	RH	09-668					
6	50	L9456P	07L	626			LH						

Note: Schlage order forms are available at no charge by contacting your Allegion security & safety consultant or customer service.



L909x Series

Electrified mortise



Overview

The Schlage L909x Series is the next generation of electrified mortise lock. The series utilizes the latest technology to offer tremendous utility and flexibility.

- Universal input voltage – accepts 12 or 24V DC for installation flexibility
- User selectable fail safe/fail secure – changing mode between EL and EU is as simple as flipping a switch on the lock case
- Low maximum current draw – 0.4amps - allows multiple locks on a single power supply
- Low holding current – 0.01 amps – produces minimal heat, eliminating “hot levers” in electrically locking applications and allowing reliable operation even in poorly ventilated wood doors
- All-new RX switch monitors the inside lever with enhanced detection level that balances security with lever sensitivity
- New modular RX design – RX can be added on at a later time without opening the lock case
- Standard Allegion Connect quick-connect Molex system (can be cut off if traditional wiring splicing preferred)
- UL listed for 3 hour fire door

Available functions

Models without deadbolt

- No cylinders
 - L9090: Outside lever EL/EU
 - L9091: Both levers EL/EU
- Outside cylinder
 - L9092: Outside lever EL/EU*
 - L9093: Both levers EL/EU
- Inside and outside cylinders
 - L9094: Outside lever EL/EU
 - L9095: Both levers EL/EU**

Deadbolt Models

- Outside cylinder, inside thumbturn
 - L9492: outside lever EL/EU
 - L9493: both levers EL/EU
- Inside and outside cylinders
 - L9494: Outside lever EL/EU
 - L9495: Both levers EL/EU

Available options

- Request to Exit (RX)
- Latchbolt Monitor (LX)
- Door Position Sensor (DPS) - *non-deadbolt functions only*
- Deadbolt Monitor (DM) - *deadbolt functions only*

*L9092 replaces L9080EL/EU; **L9095 replaces L9082EL/EU

Ordering instructions

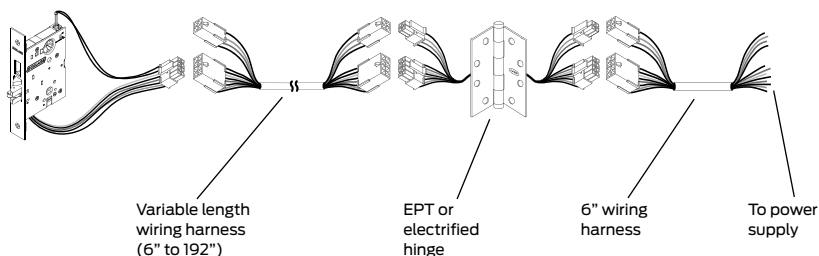
Order using standard Schlage order form as follows:

L Series mortise indicators				
Function + cylinder	Trim	Finish	Handing	Option code
L9092EUP	06A	626	RH	RX, LX, DPS

Lock specifications				
Function	L9090EL/EU, L9091EL/EU, L9092EL/EU, L9093EL/EU, L9094EL/EU, L9095EL/EU, L9492EL/EU, L9493EL/EU, L9494EL/EU, L9495EL/EU (see front of datasheet for model details) Specifying EL or EU provides the factory pre-set position; setting can easily be changed by moving a switch on the lock case.			
Cylinder	P (Everest 29 standard cylinder) L (Less cylinder) R (Everest 29 FSIC)	J (Less FSIC) T (Construction FSIC) GD (Everest 29 SFIC)	BD (Less SFIC) BDC (Disposable SFIC) HD (Construction SFIC)	
	Leave cylinder code blank if cylinder not applicable			
Trim	Standard levers: 01, 02, 03, 05, 06, 07, 12, 17, 18, ACC, AST, LAT, LON, MER, OME Decorative levers: M51, M52, M53, M54, M55, M56, M57, M61, M62, M63, M81, M82, M83, M84, M85 Sectional (rose) designs: A, B, C, AVA (AST lever only), MER (MER lever only). Escutcheon designs: L and N.			
Finish	605 Bright brass 606 Satin brass 609 Satin brass, blackened 612 Satin bronze	613 Oil rubbed bronze 619 Satin nickel 625 Bright chrome 626 Satin chrome	626AM Satin chrome anti-microbial 629 Bright stainless steel 630 Satin stainless steel	630AM Satin stainless steel anti-microbial 643e Aged bronze
Handing	LH (Left Hand) LR (Left Hand Reverse)	RH (Right Hand) RR (Right Hand Reverse)		
Option	RX (Request to Exit), LX (Latchbolt Monitor), DPS (Door Position Sensor, available non-deadbolt models), DM (Deadbolt Monitor, available deadbolt models). See pricebook for additional lock options. Note: Messaging indicators are not available for the L909x Series			

Allegion Connect

The L909x Series electrified mortise comes standard with Allegion Connect, a factory-installed Molex connector system that utilizes quick-connect harnesses and hinges for simplified installation and maintenance. Alternately, the connector can be cut off and the lock installed with traditional wire splicing methods. Note that the Allegion Connect harnesses and hinges are sold separately.



Allegion Connect cables	Door type	
	Hollow metal	Wood
6" wire harness	Con-6	Con-6P
12" wire harness	Con-12	Con-12P
26" wire harness	Con-26	Con-26P
32" wire harness	Con-32	Con-32P
38" wire harness	Con-38	Con-38P
44" wire harness	Con-44	Con-44P
50" wire harness	Con-50	Con-50P
192" wire harness	Con-192	Con-192P
6" extension to power supply	Con-6W	Con-6W

Note: Harness for hollow metal doors have connectors both ends; wood door harness comes w/connector on one-end with crimped pins on other w/attachable connector (required in wood doors due to more narrow cable raceway)

About Allegion

Allegion (NYSE: ALLE) is a global pioneer in safety and security, with leading brands like CISA®, Interflex®, LCN®, Schlage® and Von Duprin®. Focusing on security around the door and adjacent areas, Allegion produces a range of solutions for homes, businesses, schools and other institutions. Allegion is a \$2 billion company, with products sold in almost 130 countries. For more, visit www.allegion.com.



L Series mortise indicators

Overview

The 180 degree visibility indicator for the Schlage L Series mortise lock offers unparalleled visibility and flexibility. The unique features of the indicator make it ideally suited for classroom security applications as well as traditional occupied/vacant applications.

The L Series indicator features:

- 2" x 1/2" display for easy viewing at a distance
- 180° windows for visibility at any angle
- High-mount placement for quick assessment during emergency lockdown
- High contrast colors (white/red, black/white) for ease of reading
- Choice of four text and/or symbol messages
- Available for over 30 functions, for inside or outside of door
- Available in Sectional trim or N Escutcheon trim

Sectional trim



N escutcheon trim



N escutcheon indicators



Cylinder

Thumbturn

Cointurn

Emergency key

Sectional indicators



Cylinder







Thumbturn

Cointurn

Emergency key

Note: Indicators used on cylinder functions will require an additional door preparation hole. Sectional trim requires two mounting screws into door. Please reference product templates for details.

Available messages and option codes

 LOCKED	 OCCUPIED	DO NOT DISTURB	
 UNLOCKED	 VACANT		

Inside trim	L283-711	L283-712	L283-713	L283-714
Outside trim	L283-721	L283-722	L283-723	L283-724

Note: indicators available for inside or outside only; not possible to have an indicator on both inside and outside trim

Ordering instructions

To order an indicator as part of a new lock, specify the option code corresponding to the desired message (locked/unlocked, occupied/vacant, etc) and desired trim placement (inside or outside) at the end of the lock order. Order from Schlage using the standard order form as shown below. Please see pricebook for “retrofit kits” that allow indicator upgrades to installed Schlage L Series mortise locks.

L Series mortise indicators

Function + cylinder	Trim	Finish	Handing	Option code
L9050P	06A	626	RH	L283-721

Lock specifications

Function	Available with inside indicator: L/LV9040, 9044, 9050, 9056, 9060, 9071, 9440, 9444, 9456, 9457, 9458, 9460, 9462, 9463, 9466, 9473, 9480, 9485, 9350, 9371, 460, 462, 463, 480 Available with outside indicator: L/LV9040, 9044, 9050, 9056, 9060, 9070, 9071, 9440, 9444, 9456, 9457, 9458, 9460, 9462, 9463, 9464, 9465, 9466, 9473, 9480, 9485, 9350, 9370, 9371, 460, 462, 463, 464			
Cylinder	P (Everest 29 standard cylinder) L (Less cylinder)	R (Everest 29 FSIC) J (Less FSIC) T (Construction FSIC)	GD (Everest 29 SFIC) BD (Less SFIC) BDC (Disposable SFIC) HD (Construction SFIC)	
	Leave cylinder code blank if cylinder not applicable			
Trim	Standard levers: 01, 02, 03, 05, 06, 07, 12, 17, 18, ACC, AST, LAT, LON, MER, OME Decorative levers: M51, M52, M53, M54, M55, M56, M57, M61, M62, M63, M81, M82, M83, M84, M85 A, B, or C Sectional (Rose) design or N Escutcheon, AVA (AST lever only) and MER (MER lever only) also available.			
Finish	605 Bright brass 606 Satin brass 609 Satin brass, blackened	619 Satin nickel 625 Bright chrome 626 Satin chrome	626AM Satin chrome anti-microbial 629 Bright stainless steel 630 Satin stainless steel	630AM Satin stainless steel anti-microbial 643e Aged bronze
Handing	LH (Left Hand) LR (Left Hand Reverse)	RH (Right Hand) RR (Right Hand Reverse)		
Option	Specify indicator option code from table at top of page for desired message and placement Note: Can only specify an indicator for inside or outside trim; not possible to have indicators on both sides			
Ordering examples	L9050P 03N 626 RH L283-711	Office function w/Escutcheon locked/unlocked indicator on inside (thumbturn side) of door		
	L9050P 06A 626 RH L283-721	Office function w/Sectional locked/unlocked indicator on outside (cylinder side) of door		

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SCHLAGE

L909x Series

Electrified mortise lock



Overview

The most complex electronic access systems still rely on mechanical hardware to operate properly. Advanced electronic technology can go to waste without adequate mechanical locking strength and functionality.

The Schlage L909x series of electrified mortise locks serves as the mechanical component to an electrified locking solution. The lock can be integrated into an electronic access control system or be used as a stand-alone solution with a buzzer or other device as the controller.

The L909x series offers exceptional flexibility and power savings. The lock automatically adapts to 12 or 24V DC input, and a case-mounted switch allows selection between EL and EU operation. Request to exit is modular and can be added without opening the lock case. 0.4amps maximum current draw allows multiple units on a single power supply, while 0.01amps holding current eliminates "hot levers" in EL applications.

Utilizing the same levers, trims and options as the Schlage L-series mortise, the L909x integrates as seamless with the mechanical component of the project as the electronic. And because it is based on the Schlage L mortise, it carries the same proven record of performance, strength and durability from the most trusted name in the industry.

Recommended applications

The L909x Series Electrified Mortise Lock is useful for many applications, including but not limited to:

- Security control centers
- Cashier rooms
- Fire safety exits
- Equipment rooms
- Hazardous material storage

Features and benefits

- Universal input voltage- accepts 12 or 24V DC for installation flexibility
- User selectable fail safe/fail secure through use of switch on lock case
- Low maximum current draw allows multiple locks on a single power supply
- Low holding current produces minimal heat, eliminating "hot levers" in electrically locking applications
- Modular RX design allows RX to be added at a later time without opening the lock case
- UL listed for 3 hour fire door

Available Options:

- Request to Exit (RX)
- Latchbolt Monitor (LX)
- Door Position Sensor (DPS)
- non-deadbolt functions only
- Deadbolt Monitor (DM)
- deadbolt functions only

L Series mechanical specifications

Handing	Field reversible
Door thickness	1 3/4" (44 mm) standard, 1 3/8" (35 mm) to 2 1/2" (64 mm) optional. Over 2 1/2" (64 mm) door ranges vary by function. Specify door thickness other than 1 3/4".
Backset	2 3/4" (70 mm) only
Armored front	Standard: 1 1/4" x 8" x 7/32" (32 mm x 203 mm x 6 mm) Optional: 1 1/16" x 8" x 7/32" (27 mm x 203 mm x 6 mm)
Case size	4 7/16" x 6 1/16" x 1" (113 mm x 154 mm x 25 mm)
Spacing	Knob or lever to cylinder, 3 7/8" (98 mm); knob or lever to thumbturn hub, 2 11/16" (68 mm)
Bolts	1" (25 mm) throw stainless steel deadbolt and 3/4" (19 mm) throw stainless steel latch with anti-friction tongue
Cylinders and keys	6-pin solid brass cylinder is standard with Everest 29 S123 keyway furnished as default. Furnished with 2 nickel silver keys. Additional Schlage keyways available.
Keying options	Available in full size interchangeable core (FSIC) and small format interchangeable core (SFIC). Also available less cylinder and less FSIC to allow for Primus XP cylinder usage.
Strike	ANSI curved lip strike 1 1/4" x 4 7/8" (32 mm x 124 mm) x 1 3/16" (30 mm) lip to center with dust box standard
Trim	Three rose (sectional) trims and two escutcheon trims
Levers	30 available lever designs

L Series electronic specifications

Voltage	Auto-detects 12/24V DC operation
Peak current	0.4 amps
Holding current	0.010 amps
Operating temperature	Maximum +140°F (+60°C) Minimum -22°F (-30°C)
Interfacing devices	HandReaders, wall switches, security consoles, access card readers, thermo-sensitive devices, smoke and fire alarms, telephone access controls, automatic time devices and computerized controls
Micro switch electrical rating for request-to-exit (RX) function and latchbolt monitor (LX)	3 amps, 125V AC; 2 amps, 30V DC

L Series electrified functions

No Cylinder	L9090EL/EU Electrically locking/unlocking outside lever L9091EL/EU Electrically locking/unlocking both levers
Outside Cylinder	L9092EL/EU (Replaces L9080EL/EU) Electrically locking/unlocking outside lever L9093EL/EU Electrically locking/unlocking both levers
Inside & Outside Cylinder	L9094EL/EU Electrically locking/unlocking outside lever L9095EL/EU (Replaces L9082EL/EU) Electrically locking/unlocking both levers

Note: See pricebook for additional details.

L Series electrified deadbolt functions

Outside Cylinder	L9492EL/EU Electrically locking/unlocking outsider lever L9493EL/EU Electrically locking/unlocking both levers
Inside & Outside Cylinder	L9494EL/EU Electrically locking/unlocking outsider lever L9495EL/EU Electrically locking/unlocking both levers

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About Allegion

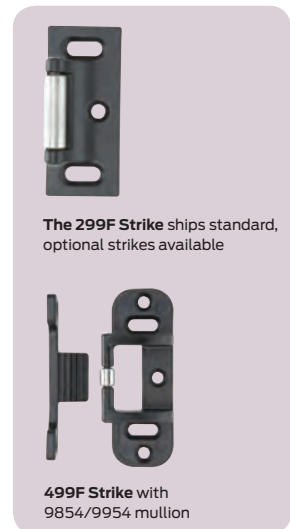
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98-F/99-F Rim exit device



98-F and 99-F Rim fire exit devices for all types of single doors up to 4' x 10' (1219mm x 3048mm) or 8' x 10' (2438mm x 3048mm) double doors with 9954 or 9854 mullion, UL listed for fire exit hardware. See page 76 for detailed information on UL listed fire exit hardware label and door opening size information. Devices are ANSI A156.3 – 2014 Grade 1. The 98-F device has a smooth mechanism case and the 99-F device has a grooved case. The rim device is non-handed except when the following device options are used: -2 (double cylinder) or SS (signal switch). See opposite page for available outside trim and device functions.

Finishes – US3, US3A, US4, US4A, US10, US26, US26D, US26D-AM Antimicrobial, US28, 313, 315 & 643E. US15 and US32D available with 98 Series only.



Specifications

Device functions	Device ships EO/DT/NL. Field selectable. For TP, K or L remove NL drive screw from device.	
Device lengths	3'	2'4" to 3' (711mm to 914 mm) Door size
	4'	2'10" to 4' (864 mm to 1219 mm) Door size
Device centerline from finished floor	39 ¹³ / ₁₆ " (1011 mm) 39 ¹¹ / ₁₆ " (1008 mm) with mullion	
Center case dimensions	8" x 2 ³ / ₄ " x 2 ³ / ₈ " (203mm x 70mm x 60mm)	
Mechanism case dimensions	2 ¹ / ₄ " x 2 ¹ / ₄ " (57mm x 57mm)	
Projection	Pushbar neutral – 3 ¹³ / ₁₆ " (97 mm) Pushbar depressed – 3 ¹ / ₁₆ " (78 mm)	
Latch bolt	Deadlocking, 3/4" (19mm) throw	
Fasteners & sex bolts (SNB)	Includes screw pack for 1 ³ / ₄ " (44mm) and 2 ¹ / ₄ " (57mm) thick metal or wood doors. Optional 425 SNB available for metal doors. 425 & 825 SNB required on wood doors without SLM blocking. See page 11 for quantities.	
Electric options	LX	Latchbolt monitor switch
	RX	Pushpad monitor switch
	RX2	Double pushpad monitor switch
	E	Electric locking & unlocking trim
	EL	Electric latch retraction
	QEL	Quiet electric latch retraction
	SS	Signal switch
	CX	Chexit delayed exit
	ALK	Alarm exit kit
	WP-RX	Waterproof request to exit
	CON	Allegion Connect
Mechanical options	-2	Double cylinder
	AX	Accessible device
	GBK	Glass bead kit
	PN	Pneumatic latch retraction
	XP	Extra protection
	SNB	Sex bolts
	SEC	Security screws
	SLM	Special Laminated Material Blocking
Dogging option	No mechanical dogging. EL and QEL option available	
Strikes	299F – Dull black, 499F with mullions	

XP

Extra protection

- 90° latch-to-strike contact
- Force resistance of 2,000+ lbs.

RX

Pushpad monitor switch

- Signals use of an opening
- SPDT switch to monitor pushpad

EL

Electric latch retraction

- Enables remote unlatching
- Alternative to manual dogging

ALK

Alarm exit kit

- Unauthorized opening triggers 85-decibel horn
- Set in armed or disarmed mode by key

QEL

Quiet electric latch retraction

- Bolt retraction via switch
- Converts exit door to push-pull operation

CX

Chexit delayed exit

- Meets NFPA 101 requirements
- Self-contained controls, locking, alarm

AX

Accessible device

- UL certified to meet new 5 lb. maximum operating force requirement
- Exceeds ANSI/BHMA requirements

SG

Safety glow

- Shows exit door location in darkness or smoke
- Developed to meet MEA standards

PN

Pneumatic latch retraction




- For areas where electrical devices banned
- Special linkage for mechanical or pneumatic dogging





CON

Allegion Connectors

- Common connectors to connect various door hardware all the way to the power supply

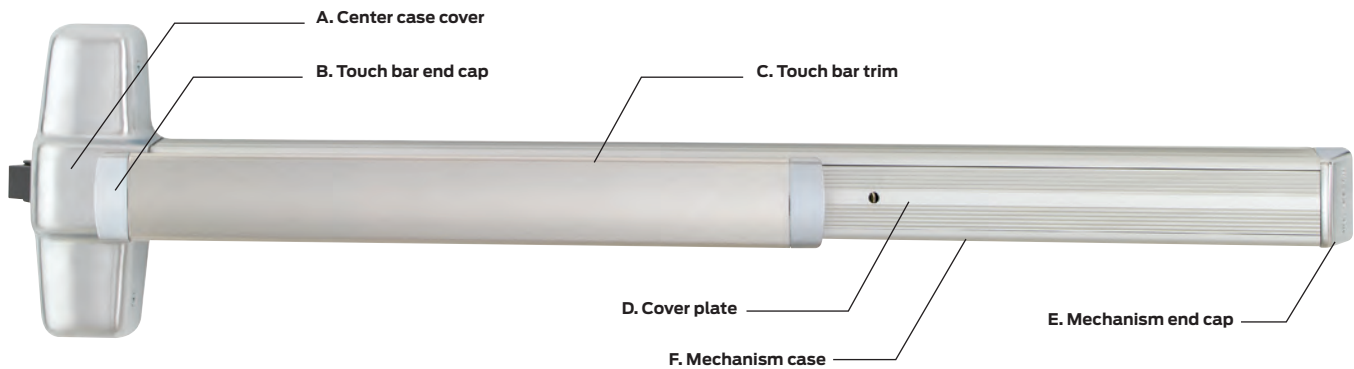
Standard trim

	EO	DT 	NL 	NL-OP 
	No outside trim Exit only	Dummy trim Pull when dogged (not recommended for fire device)	Night latch Key retracts latchbolt	Night latch Key retracts latchbolt optional pull required
Product description	98EO-F 99EO-F	98DT-F 99DT-F	98NL-F 99NL-F	98NL-OP-F 99NL-OP-F
Trim description	—	990DT	990NL-R/V	110NL-MD 110NL-WD
Escutcheon plate size	—	3" x 14 ¹³ / ₁₆ " x 3 ³ / ₃₂ " (76x360x2mm)	3" x 14 ¹³ / ₁₆ " x 3 ³ / ₃₂ " (76x360x2mm)	—
Pull center to center	—	5 ¹ / ₂ " (140mm)	5 ¹ / ₂ " (140mm)	—
Projection	—	2" (51mm)	2" (51mm)	—
ANSI function	01	02	03	03
Cylinder type	—	—	Rim	Rim
Handing	—	—	—	—
Optional trim	x990EO x996EO	x996K-DT x996L-DT x696DT x697DT	x996K-NL x996L-NL x696NL x697NL	
#425 SNB optional - HMD req. WD w/o SLM pkg.	6	2	2	2
#825 SNB req. WD w/o SLM pkg.	2 (if using trim)	2	2	2
#425 SNB req. w/ 499F	2	2	2	2

	L 	L-NL 	L-BE 	L-DT 
	Lever Key locks & unlocks	Lever – night latch Key retracts latchbolt	Lever – blank escutcheon Always operable (no cylinder)	Lever dummy trim pull when dogged (not recommended for fire device)
Product description	98L-F 99L-F	98L-NL-F 99L-NL-F	98L-BE-F 99L-BE-F	98L-DT-F 99L-DT-F
Trim description	996L-R/V*	996L-NL-R/V	996L-BE-R/V*	996L-DT
Escutcheon plate size	2 ³ / ₄ " x 10 ³ / ₄ " x 2 ⁷ / ₃₂ " (70x273x21mm)	2 ³ / ₄ " x 10 ³ / ₄ " x 2 ⁷ / ₃₂ " (70x273x21mm)	2 ³ / ₄ " x 10 ³ / ₄ " x 2 ⁷ / ₃₂ " (70x273x21mm)	2 ³ / ₄ " x 10 ³ / ₄ " x 2 ⁷ / ₃₂ " (70x273x21mm)
Pull center to center	—	—	—	—
Projection	2 ⁷ / ₈ " (73mm)	2 ⁷ / ₈ " (73mm)	2 ⁷ / ₈ " (73mm)	2 ⁷ / ₈ " (73mm)
ANSI function	08	03	14	02
Cylinder type	Rim	Rim	—	—
Handing	Handed/Reversible	Handed/Reversible	Handed/Reversible	Handed/Reversible
#425 SNB optional - HMD req. WD w/o SLM pkg.	2	2	2	2
#825 SNB req. WD w/o SLM pkg.	2 (if using trim)	2	2	2
#425 SNB req. w/ 499F	2	2	2	2

* Electrified lever operation available

98/99 Finishes



Finishes

Color	US number	BHMA number	A, B, E	C	D & F
Bright brass	US3	605	Bright brass	Bright brass US3, 605	Buffed anodized
Satin brass	US4	606	Bright brass	Satin brass US4, 606	Anodized
Satin bronze	US10	612	Plated	Satin bronze US10, 612	Anodized
Bright chrome	US26	625	Plated	Bright stainless steel US32, 629	Buffed anodized
Satin chrome	US26D	626	Plated	Satin stainless steel US32D, 630	Anodized
Satin stainless steel*	US32D	630	Stainless steel	Satin stainless steel US32D, 630	Anodized
Aluminum, anodized	US28	628	Powder coat	Satin stainless steel US32D, 630	Anodized
Duranodic dark bronze	313	710	Powder coat	Powder coat	Powder coat
Black	315	622	Powder coat	Powder coat	Powder coat
Aged bronze 643E	–	–	Relieved aged bronze	Relieved aged bronze	Aged bronze, no relief

Special Finishes

Color	US number	BHMA number	A, B, E	C	D & F
Satin bronze, oil-rubbed	US10B	613	Oil-rubbed, US10B	Oil-rubbed, US10B	Powder coat
Powder coat**	RAL #	–	Powder coat	Satin stainless steel US32D, 630 (unless specified to match device)	Powder coat
Bright bronze	US9	611	Plated	Bright bronze US9, 611	Buffed anodized
Satin nickel*	US15	619	Plated, clear powder	Satin stainless steel US32D	Anodized
Satin chrome (antimicrobial)	U26D-AM	626-AM	AM Clear over chrome	AM Clear over satin stainless steel US32D, 630	AM Clear over anodized
Satin stainless steel (antimicrobial)	US32D-AM	630-AM	AM Clear over stainless steel	AM Clear over Satin Stainless Steel US32D, 630	AM Clear over anodized

Touch bar trim options — Knurled
 Embossed “Push”
 Braille (Caution-Stairwell), satin stainless steel only
 RSS, US32D only, red silk screen lettered “EMERGENCY EXIT ONLY – PUSH TO OPEN AND SOUND ALARM.”

* US32D and US15—available on 98 Series only

** Other custom logo touchbar trim and RAL color combinations available - consult factory



98/99 Finishes

Finishes*

	Color	US number	BHMA number
	Chromium, polished	US26	625
	Anodized, aluminum	US28	628
	Chromium, dull	US26D	626
	Brass, polished	US3	605
	Brass, dull	US4	606

	Color	US number	BHMA number
	Bronze, dull	US10	612
	Satin nickel Available for 35A ONLY	US15	619
	Satin stainless steel	US32D	630
	Duranodic dark bronze	313	710
	Black	315	711
	Aged bronze 643e	-	-

Special finishes

	Color	US number	BHMA number
	Satin chrome, Antimicrobial	US26D-AM	626-AM
	Satin stainless steel, antimicrobial	US32D-AM	630-AM

Pushpad options — Knurled
 Embossed “Push”
 Braille (Caution-Stairwell), satin stainless steel only
 RSS – (Emergency Exit – Push to open and sound alarm) – Red Silkscreen lettering on US32D

* Note: Durable powder coated finishes available at specific special request. PLEASE CONTACT FACTORY.

98/99 Strike information

Strikes for rim devices

264	299	299F	499F	1408
Projection $\frac{9}{16}$ " (14mm)	Projection $\frac{13}{16}$ " (21mm)	Projection $\frac{13}{16}$ " (21mm)	Projection $\frac{15}{16}$ " (24mm)	One per pair of doors
1439-Blade stop	1410-Integral stop	1606	1609	
Projection $\frac{1}{2}$ " (13mm)	Projection $\frac{1}{2}$ " (13mm)	Projection $\frac{3}{8}$ " (10mm) Panic devices only	Projection $\frac{15}{16}$ " (24mm) - Requires coordinator - For panic exit application only, not fire rated	

XP Strikes for rim devices

909	954
Projection $\frac{13}{16}$ " (21mm)	Projection $\frac{7}{8}$ " (22mm) - For fire rated double door applications

Strikes for vertical cable devices

249 - Top strike	349 - Bottom strike
Projection $\frac{9}{16}$ " (14mm)	Projection $\frac{1}{8}$ " (3mm)

Strikes for vertical rod devices

248L-4	260U-Flush transom panic only 260U-F-Flush transom fire only	299	299F	499F
Projection $\frac{3}{8}$ " (10mm)	Projection $\frac{3}{8}$ " (10mm)	Projection $\frac{13}{16}$ " (21mm)	Projection $\frac{13}{16}$ " (21mm)	Projection $\frac{15}{16}$ " (24mm)
304L	338	385A	283	
Projection $\frac{13}{16}$ " (21mm)	Mortise $\frac{5}{8}$ " (16mm)	Mortise $2\frac{1}{2}$ " (64mm)	For use with WDC devices when used with wood frames	

Strikes for mortise lock devices

575	575-2	576A	576B
For use on $\frac{13}{4}$ " (44mm) or $2\frac{1}{4}$ " (57mm) Single door and $2\frac{1}{4}$ " (57mm) double door with coordinator.	For use on $\frac{13}{4}$ " (44mm) thick double door with coordinator and astragal.	Open back strike for $\frac{13}{4}$ " (44mm) thick double doors without coordinator.	Open back strike for $2\frac{1}{4}$ " (57mm) thick double doors without coordinator.

- Not for use with astragals
- For use on wood doors, contact door manufacturer

- Acceptable for 90 minute pair of hollow metal doors

98/99 Strike/Stile information

Device type	Standard single door			Standard double door			Optional single door			Optional double door									
	Strike	Trim/Stile		Strike w/ mullion*	Trim/Stile		Strike	Trim/stile		Strike w/mullion*	Trim/Stile								
98/99	299	990/996	696/697		990/996	696/697													
		4 1/2" (114mm)	4 3/8" (111mm)	299 x 4954	4 7/8" (124mm)	4 3/4" (121mm)	1439 or 1410	3 13/16" (97mm)	3 13/16" (97mm)	299 x 5654	4 7/16" (113mm)	4 1/4" (108mm)							
							1606	4 1/16" (103mm)	3 15/16" (100mm)	1408 x 5754	3 13/16" (97mm)	3 13/16" (97mm)							
										1606 x 1654	4 3/8" (112mm)	4 1/4" (108mm)							
XP 98/99	909		909 x 4954-XP																
98-F/99-F	299F	4 1/2" (114mm)	4 3/8" (111mm)	499F x 9954	4 7/8" (124mm)	4 3/4" (121mm)				499F x 9854 KR9954									
XP98-F/XP99-F	909			954 x 9954-XP															
9875	575	4 3/4" (121mm)	4 3/4" (121mm)	575-2						576A-576B	4 3/4" (121mm)	4 3/4" (121mm)							
9875-F	575	4 3/4" (121mm)	4 3/4" (121mm)	575-2						576A-576B	4 3/4" (121mm)	4 3/4" (121mm)							
9857 9957	299 (Top) 299 (Middle) 304L/284-L (Bottom)	4 1/2" (114mm)	4 3/8" (111mm)	299 x 4954	4 7/8" (124mm)	4 3/4" (121mm)	1439 or 1410	3 13/16" (97mm)	3 13/16" (97mm)	299 x 5654	4 7/16" (113mm)	4 1/4" (108mm)							
							1606	4 1/16" (103mm)	3 15/16" (100mm)	1408 x 5754	3 13/16" (97mm)	3 13/16" (97mm)							
										1606 x 1654	4 3/8" (112mm)	4 1/4" (108mm)							
9857-F 9957-F	299 (Top) 299F (Middle) 304L (Bottom)	4 1/2" (114mm)	4 3/8" (111mm)	299F 499F x 9954 304L	4 7/8" (124mm)	4 3/4" (121mm)													
	Strike	Application			Trim/Stile		Optional strike			Application	Trim/Stile								
9827 9927	299 (Top) 304L/248-L-4 (Bottom)	Single door			990/996	696/697	260U (Top) 385A (Bottom)			Single door	990/996	696/697							
PL9827/PL9927	299 (Top) 304L/248-L-4 (Bottom)				Two vertical rod devices						3 11/16" (94mm)	3 5/8" (92mm)	260U (Stainless) 385A (Bottom)			Two vertical rod devices	3 11/16" (94mm)	3 5/8" (92mm)	
9827-F 9927-F	299 (Top) 304L (Bottom)	Vertical rod with Mortise lock device						4 3/4" (121mm)	4 3/4" (121mm)	304L (Bottom)							Vertical rod with Mortise lock device	4 3/4" (121mm)	4 3/4" (121mm)
9847 9947 9848 9948	338 (Top) 385A (Bottom)				Two vertical rods			4 1/4" (108mm)	4 1/8" (105mm)				304L (Bottom)			Two vertical rods		4 1/4" (108mm)	4 1/8" (105mm)
9847-F 9947-F 9848-F 9948-F	338 (Top) 385A (Bottom)	Vertical rod with Mortise lock device						4 3/4" (121mm)	4 3/4" (121mm)	304L (Bottom)							Vertical rod with Mortise lock device	4 3/4" (121mm)	4 3/4" (121mm)
9847WDC 9947WDC	338 (Top) 385A (Bottom)				Single door			4 1/4" (108mm)	4 1/8" (108mm)				304L			Single door		4 1/4" (108mm)	4 1/8" (108mm)
		Two vertical rod devices						4 1/4" (108mm)	4 1/8" (108mm)	304L							Two vertical rod devices	4 1/4" (108mm)	4 1/8" (108mm)
								Vertical rod with Mortise lock device										4 3/4" (121mm)	4 3/4" (121mm)
9847WDC-F 9947WDC-F	338 (Top) 385A (Bottom)	Two vertical rod devices			4 1/4" (108mm)	4 1/8" (108mm)	304L				Two vertical rod devices	4 1/4" (108mm)	4 1/8" (108mm)						
9849 9949	249 (Top) 349 (Bottom)	Vertical cable with Mortise lock device			4 3/4" (121mm)	4 3/4" (121mm)	-			Vertical cable with Mortise lock device	4 3/4" (121mm)	4 3/4" (121mm)							
9849-F 9949-F 9849-F 9949-F	249 (Top) 349 (Bottom)	Two vertical cables			4 1/4" (108mm)	4 1/8" (108mm)	-			Two vertical cable	4 1/4" (108mm)	4 1/8" (105mm)							
		Vertical cable with Mortise lock device			4 3/4" (121mm)	4 3/4" (121mm)	-			Vertical cable with Mortise lock device	4 3/4" (121mm)	4 3/4" (121mm)							
9850WDC 9950WDC	150 (Top) 450 (Bottom)	Single door			4 1/4" (108mm)	4 1/8" (108mm)	-			Single door	4 1/4" (108mm)	4 1/8" (108mm)							
		Two vertical cable devices			4 1/4" (108mm)	4 1/8" (108mm)	-			Two vertical Cable devices	4 1/4" (108mm)	4 1/8" (108mm)							
		Vertical cable with Mortise lock device			4 1/4" (108mm)	4 1/8" (108mm)	-			Vertical cable with Mortise lock device	4 3/4" (121mm)	4 3/4" (121mm)							
9850WDC-F 9950WDC-F	150 (Top) 450 (Bottom)	Two vertical cable devices			4 1/4" (108mm)	4 1/8" (108mm)	-			Two Vertical Cable Devices	4 1/4" (108mm)	4 1/8" (108mm)							

Strike options / Dogging options

UL Listing for fire exit hardware

UL Listed fire exit hardware label and opening size

Exit device	Door material	Single door	Double door						
			With 9954 mullion	With 9854 mullion	With kr9954 mullion	With kr9854 mullion	V x v same direction	V x mortise same direction	V x v double egress
98-F 99-F	Metal	3 Hour 4' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 8'	3 Hour 8' x 8'	—	—	—
9875-F 9975-F	Metal	3 Hour 4' x 10'	—	—	—	—	—	3 Hour 8' x 10'	—
9827-F 9927-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9827LBR-F 9927LBR-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	—	3 Hour 8' x 10'
9857-F 9957-F	Metal	3 Hour 4' x 8'	3 Hour 8' x 8'	3 Hour 8' x 8'	3 Hour 8' x 8'	3 Hour 8' x 8'	—	—	—
9847-F 9947-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9847LBR-F 9947LBR-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	—	3 Hour 8' x 10'
9848-F 9948-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9849-F 9949-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9849LBL-F 9949LBL-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	—	3 Hour 8' x 10'

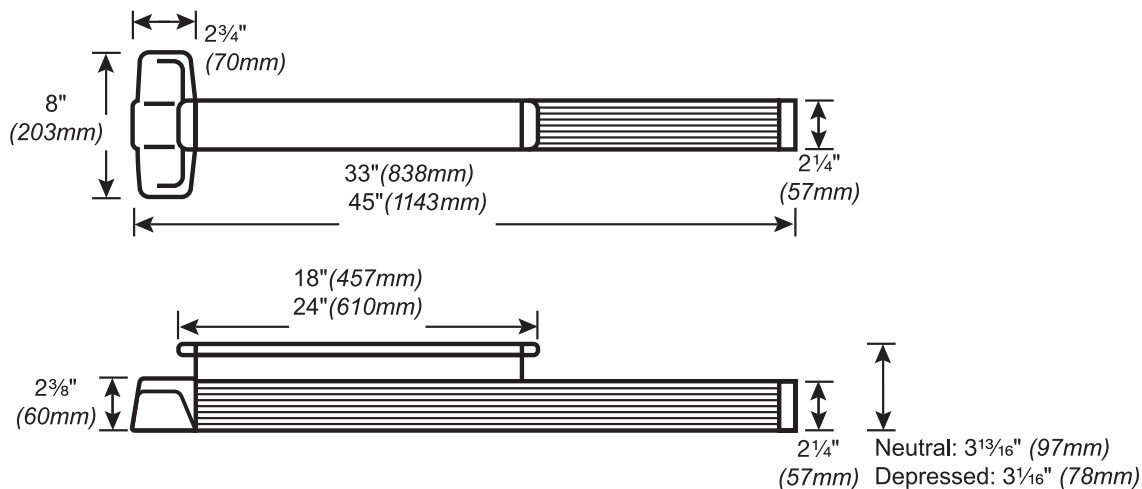
* Currently, no door manufacturers offer a listing over 90 minutes with doors swinging same direction. Consult wood door manufacturers for current UL listings.

98/99 Function, grade, type options

ANSI Function, grade & type

Function	Grade 1, type 1	Grade 1, type 2	Grade 1, type 3	Grade 1, type 7	Grade 1, type 7	Grade 1, type 8	Grade 1, type 8	Grade 1, type 8	Grade 1, type 9
1	98EO & F 99EO & F	9827EO & F 9927EO & F	9875EO & F 9975EO & F	9847WDCEO & F 9947WDCEO & F	9850WDCEO & F 9950WDCEO & F	9847EO & F 9947EO & F	9848EO & F 9948EO & F	9849EO & F 9949EO & F	9857EO & F 9957EO & F
2	98DT 99DT	9827DT 9927DT	9875DT 9975DT	9847WDCDT 9947WDCDT	9850WDCDT 9950WDCDT	9847DT 9947DT	9848DT 9948DT	9849DT 9949DT	9857DT 9957DT
3	98NL & F 99NL & F	9827NL & F 9927NL & F	9875NL & F 9975NL & F	9847WDCNL & F 9947WDCNL & F	9850WDCNL & F 9950WDCNL & F	9847NL & F 9947NL & F	9848NL & F 9948NL & F	9849NL & F 9949NL & F	9857NL & F 9957NL & F
3	98K-NL & F 99K-NL & F	9827K-NL & F 9927K-NL & F	9875K-NL & F 9975K-NL & F	9847WDCK-NL & F 9947WDCK-NL & F	9850WDCK-NL & F 9950WDCK-NL & F	9847K-NL & F 9947K-NL & F	9848K-NL & F 9948K-NL & F	9849K-NL & F 9949K-NL & F	9857K-NL & F 9957K-NL & F
3	98L-NL & F 99L-NL & F	9827L-NL & F 9927L-NL & F	9875L-NL & F 9975L-NL & F	9847WDCL-NL & F 9947WDCL-NL & F	9850WDCL-NL & F 9950WDCL-NL & F	9847L-NL & F 9947L-NL & F	9848L-NL & F 9948L-NL & F	9849L-NL & F 9949L-NL & F	9857L-NL & F 9957L-NL & F
5	98TP & F 99TP & F	9827TP & F 9927TP & F	9875TP & F 9975TP & F	9847WDCTP & F 9947WDCTP & F	9850WDCTP & F 9950WDCTP & F	9847TP & F 9947TP & F	9848TP & F 9948TP & F	9849TP & F 9949TP & F	9857TP & F 9957TP & F
7	98TP-2 & F 99TP-2 & F		9875TP-2 & F 9975TP-2 & F						
8	98K & F 99K & F	9827K & F 9927K & F	9875K & F 9975K & F	9847WDCK & F 9947WDCK & F	9850WDCK & F 9950WDCK & F	9847K & F 9947K & F	9848K & F 9948K & F	9849K & F 9949K & F	9857K & F 9957K & F
8	98L & F 99L & F	9827L & F 9927L & F	9875L & F 9975L & F	9847WDCL & F 9947WDCL & F	9850WDCL & F 9950WDCL & F	9847L & F 9947L & F	9848L & F 9948L & F	9849L & F 9949L & F	9857L & F 9957L & F
10	98K-2 & F 99K-2 & F		9875K-2 & F 9975K-2 & F						
10	98L-2 & F 99L-2 & F		9875L-2 & F 9975L-2 & F						
11 12		9827TL & F 9927TL & F		9847WDC & F 9947WDC & F	9850WDC & F 9950WDC & F	9847TL & F 9947TL & F	9848 & F 9948 & F	9849 & F 9949 & F	9857TL & F 9957TL & F
14	98K-BE & F 99K-BE & F	9827K-BE & F 9927K-BE & F	9875K-BE & F 9975K-BE & F	9847WDCK-BE & F 9947WDCK-BE & F	9850WDCK-BE & F 9950WDCK-BE & F	9847K-BE & F 9947K-BE & F	9848K-BE & F 9948K-BE & F	9849K-BE & F 9949K-BE & F	9857K-BE & F 9957K-BE & F
14	98L-BE & F 99L-BE & F	9827L-BE & F 9927L-BE & F	9875L-BE & F 9975L-BE & F	9847WDCL-BE & F 9947WDCL-BE & F	9850WDCL-BE & F 9950WDCL-BE & F	9847L-BE & F 9947L-BE & F	9848L-BE & F 9948L-BE & F	9849L-BE & F 9949L-BE & F	9857L-BE & F 9957L-BE & F
16		9827TL-BE & F 9927TL-BE & F		9847WDC & F 9947WDC & F	9850WDC & F 9950WDC & F	9847TL-BE & F 9947TL-BE & F	9848 & F 9948 & F	9849 & F 9949 & F	9857TL-BE & F 9957TL-BE & F

Dimensions



Electrical options

RX Request to exit

The RX (2xit) feature is used to signal the use of an opening. This device is equipped with one internal SPDT switch which monitors the pushpad.

The device can be connected to a security console, or may be used as a single door alarm when used with a horn and power supply.

The RX switch option should not be used to control a load, but as a signalling switch (0.5 amps. resistive maximum).

The RX switch is available in a low current (LC) switch. Most commonly used in computer operated monitoring systems.

To order, specify:

- Standard – use prefix RX, example RX99EO
- Low Current – use prefix RX-LC, example RX-LC98EO

RX2 Double request to exit

The RX2 feature uses two RX switches.

To order, specify:

- Standard – Use prefix RX2, example RX299EO

WP-RX Waterproof request to exit

LX Latchbolt monitoring



The LX feature is used to signal the use of an opening. This device is equipped with one internal SPDT switch which monitors the latch bolt.

The device can be connected to a security console, or may be used as a single door alarm when used with a horn and power supply.

The LX switch option should not be used to control a load, but as a signalling switch (0.5 amps. resistive maximum).

The LX switch is available in a low current (LC) switch. Most commonly used in computer operated monitoring systems.

To order, specify:

- Standard – Use prefix LX, example LX99EO
- Low Current – Use prefix LX-LC, example LX-LC98EO

Electrical rating for all switches:

- Standard – 2 Amp maximum @ 24VDC
- Low Current (LC) - below 50 Milliamps @ 24VDC

Note: All switches can be either factory or field installed



SS Signal switch

Monitors pushpad and latch bolt

The SS feature is used to signal the unauthorized use of an opening. This device is equipped with two internal SPDT switches. One switch monitors both the pushpad and the latch bolt assembly, making the latch bolt tamper resistant, for positive security. An additional SPDT switch is connected to the 1 1/4" (32mm) mortise cylinder with straight cam for alarm "bypass." (Schlage cam reference L583-475). The device can be connected to a security console, or may be used as a single door alarm when used with a horn and power supply.

Pushpad reads: "Emergency Exit ONLY – Push To Open And Sound Alarm." Pushpad is only available in US32D finish with red silk-screened lettering.

The SS mortise lock device is furnished with both the signal switch device and the SS7500 mortise lock. The SS7500 mortise lock has the versatility and advantages of the 7500 lock with the addition of signalling functions to monitor latch bolt operation and the trim locking function. The SS7500 mortise lock is supplied standard with the SS mortise lock device.

To order, specify:

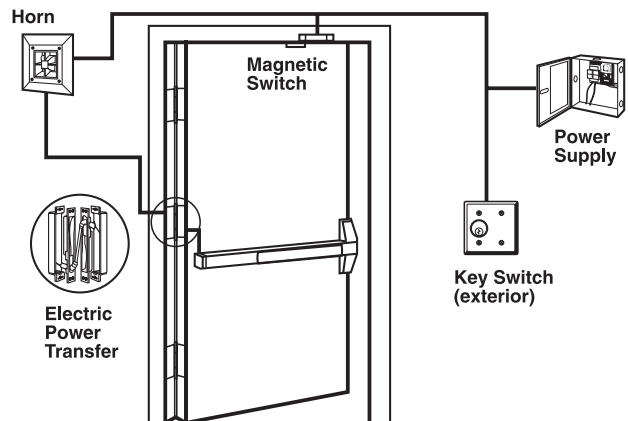
1. Prefix SS, example SS99L.
2. Handing required, LHR or RHR.

Electrical ratings:

Up to 2.0 AMPS @ 24VDC

Popular SS application

Unauthorized use of this opening will activate the local horn. The key switch permits inhibiting this system for authorized entry.



VON DUPRIN®

E996L, E7500

Electrified trims



Overview

E996L- Electrified breakaway lever trim

E996L Electrified Breakaway lever trim provides remote locking and unlocking capabilities while incorporating the patented Breakaway trim design.

The 24VDC solenoid can be energized from a distant controller, thus allowing access control of the opening. The control of stairwells in high-rise buildings is a common application for this trim. When electrically unlocked the unit operates as a normal lever trim. When electrically locked, the lever feels locked, but when more than 35 pounds of torque pressure is applied, the Breakaway lever feature engages.

The E996L is provided standard in a fail safe (FS) condition, but can be field converted to fail secure (FSE) where allowed. The trim can be ordered with a device, added to an existing 98/99 series device application, or a conversion kit can be added to an existing 996L Breakaway lever trim. On new construction applications, the E996L trim will require less door prep.

The E996L is available with a blank escutcheon (BE) function, or with cylinder operation for night latch (NL) function.

The E996L electrified trim replaces the current "E" electric feature on 98/99 series rim devices. Consult factory for requirements.

E7500- Electric mortise lock

The electric mortise lock device has all the versatility and advantages of the standard mortise lock device, plus the advantage of being electrically controlled by a remote switching device, an access control system or an automatic fire alarm system. The device features the 7500 mortise lock. The E7500 controls the locking of the outside trim. When unlocked, the door remains latched, preserving the fire rating of the door and making it particularly useful where codes permit locking but require unlocking during a fire emergency. The outside trim cylinder retracts the latch bolt for mechanical override of night latch function. Only available with TP, K or L functions.

The E7500 lock contains a SPDT signal to monitor the outside trim condition (locked or unlocked) and a second SPDT signal switch to monitor the latch bolt.

Features and benefits

E996L

- Fail safe standard, field converted fail secure optional
- Conversion kits available to add to existing 996L trim
- Available with blank escutcheon function or cylinder operation for night latch function

E7500

- Field reversible handing
- 24 VDC continuous-duty solenoid
- Fail safe or fail secure optional¹

¹ Some fire codes will require fail safe (FS) operation for stairwell doors. Be sure to specify the correct operation for your application.

E996L specifications

Solenoid	24VDC
Solenoid draw	0.22 AMPS

To order, specify

Note: To order, please reference Von Duprin catalog and price book

- Use "E" prefix, example E996L
- When ordering with device specify trim series with "E" prefix, example 9927L-BE 3' US26D E996L.
- Device type, R/V (rim/surface or concealed vertical rod) or M (mortise)
- RHR is furnished standard if not specified. Field reversible.
- Lever style (06 lever is furnished standard)
- Finish: US3, US4, US10, US10B, SP313, US26, US26D, SPBLK, US15

E7500 specifications

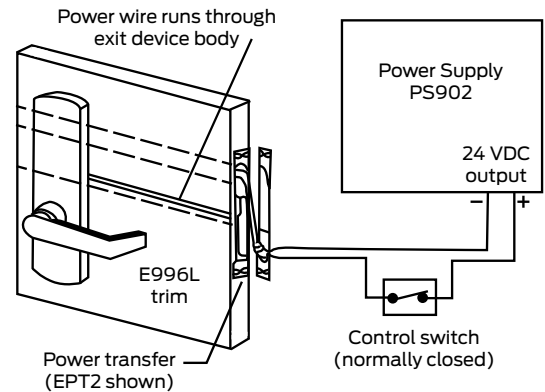
Solenoid	.60 Amps @ 12VDC .30 Amps @ 24VDC
Each switch	Up to 2.0 Amps @ 24VDC Maximum

The E option does not include the power transfer from door to frame, the power supply or the control operator. (Refer to EPT-10 and PS902 or PS914 power supply)

To order, specify

Note: To order, please reference Von Duprin catalog and price book

- Use prefix "E," example E9975
- FS or FSE
- Voltage and current



E996L Electrical wiring

- Power input for E996L is 24 VDC
- Two wires on the trim are non-polarized (18 AWG minimum)

Standard features:

- Field reversible handing
- 24 VDC continuous duty solenoid

Optional features:

- Fail safe (locked when energized, unlocked when de-energized or during power failure). Specify with suffix "FS."
- Fail secure (unlocked when energized, locked when de-energized or during power failure). Specify with suffix "FSE."
- 24 VAC (with SO option)
- 12 VDC
- 12 VAC (with SO option)

Note: Some fire codes will require "Fail Safe" (FS) operation for stairwell doors. Be sure to specify the correct operation for your application.

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About Allegion

Allegion (NYSE: ALLE) is a global pioneer in safety and security, with leading brands like CISA®, Interflex®, LCN®, Schlage® and Von Duprin®. Focusing on security around the door and adjacent areas, Allegion produces a range of solutions for homes, businesses, schools and other institutions. Allegion is a \$2 billion company, with products sold in almost 130 countries. For more, visit www.allegion.com.

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98/99 Electrical options

ALK Alarm kit



ALK Alarm kit is a simple yet effective way to deter unauthorized use of an opening. While the exit device is still a means of egress, the ALK kit contains an internal horn. When the touch bar is depressed, the horn sounds to provide an audible means of signaling that the opening has been violated. The alarm kit can be armed or disarmed by key thus allowing the exit device to be set in an armed or disarmed mode. The horn is rated at 85 decibels.

For hardware Applications

The assembly includes both a 24VDC Input and External Inhibit standard. The External Inhibit provides remote arming and disarming.

The key switch uses a standard 1 1/4" (32mm) mortise cylinder with a straight cam (Schlage 20-001, L583-475 cam). The unit operates on one standard 9-volt alkaline battery. When the battery is weak, the horn will emit an intermittent low battery alert signal.

Auto reset (AR) option is available with this kit. This kit allows the device to resume the alarm option after a preset time. Preset times can be field selected at 1.5, 3, or 4.5 minutes.

Alarm kits are available with a choice of two switch kits, RX or LX. RX monitors the touchpad and is furnished standard. LX optional latch bolt monitoring is recommended for use with surface vertical rod exit devices or when alarm needs to sound from both the exit device and trim side of the door. Specify ALK-LX.

Note: For latch bolt monitoring on a 98/9975 with ALK, specify a SS7500 lock. LX switch not available for 98/9975 devices.

The ALK is available in two styles, 99ALK, grooved cover and 98ALK, smooth cover.

The ALK includes a 6" x 20" decal for application on door "EMERGENCY EXIT ONLY. ALARM WILL SOUND." RSS push bar trim can be used instead of the door decal, specify RSS push bar trim when ordering the device.

When the ALK is used, standard dogging is removed. If cylinder dogging is required there are two choices. Special center case dogging is available or for 3' or 4' doors. The ALK can be moved to the hinge side of the device and standard cylinder dogging can be added.

To Order, Specify:

1. Standard, 98 ALK
2. Cylinder Dogging, CD98 ALK
3. Special center case dogging, SD98 ALK

Minimum door opening sizes on ALK applications

Device	3' (914mm) Length	4' (1219mm) Length
98/98-F/99/99-F	2'10" (864mm)	3'4" (1016mm)
9875/9875-F/9975/9975-F	2'10" (864mm)	3'4" (1016mm)
9827/9827-F/9927/9927-F	2'10" (864mm)	3'4" (1016mm)
9857/9857-F/9957/9957-F	2'10" (864mm)	3'4" (1016mm)
9847/9847-F/9947/9947-F	2'9" (838mm)	3'3" (991mm)
9848/9848-F/9948/9948-F	2'9" (838mm)	3'3" (991mm)

98/99 Electrical options

RX Request to exit

The RX (2bit) feature is used to signal the use of an opening. This device is equipped with one internal SPDT switch which monitors the pushpad.

The device can be connected to a security console, or may be used as a single door alarm when used with a horn and power supply.

The RX switch option should not be used to control a load, but as a signalling switch (0.5 amps. resistive maximum).

The RX switch is available in a low current (LC) switch. Most commonly used in computer operated monitoring systems.

To order, specify:

- Standard – use prefix RX, example RX99E0
- Low Current – use prefix RX-LC, example RX-LC99E0

RX2 Double request to exit

The RX2 feature uses two RX switches.

To order, specify:

- Standard – Use prefix RX2, example RX299E0

WP-RX Waterproof request to exit

LX Latchbolt monitoring



The LX feature is used to signal the use of an opening. This device is equipped with one internal SPDT switch which monitors the latch bolt.

The device can be connected to a security console, or may be used as a single door alarm when used with a horn and power supply.

The LX switch option should not be used to control a load, but as a signalling switch (0.5 amps. resistive maximum).

The LX switch is available in a low current (LC) switch. Most commonly used in computer operated monitoring systems.

To order, specify:

- Standard – Use prefix LX, example LX99E0
- Low Current – Use prefix LX-LC, example LX-LC99E0

Electrical rating for all switches:

- Standard – 2 Amp maximum @ 24VDC
- Low Current (LC) – below 50 Milliamps @ 24VDC

Note: All switches can be either factory or field installed

🔥 9849-F/9949-F Concealed vertical cable fire exit device



9849/9949 Concealed vertical cable device for use on single or double metal doors, UL listed for panic exit hardware. See page 76 for detailed information on UL listed fire exit hardware label and door opening size information. Devices are ANSI A156.3 – 2014 Grade 1. The 9849 device has a smooth mechanism case and the 9949 device has a grooved case. The concealed vertical cable device is non-handed except when the following device options are used: SD (special dogging), or SS (signal switch). See opposite page for available outside trim and device functions.

Finishes – US3, US3A, US4, US4A, US10, US26, US26D, US26D-AM Antimicrobial, US28, 313, 315 & 643E. US15 and US32D available with 98 Series only.



Specifications

Device functions	Device ships EO/DT/NL. Field selectable. For TP, K or L remove NL drive screw from device.	
Device lengths	2'	2' (610 mm) Door size
	3'	2'4" to 3' (711mm to 914 mm) Door size
	4'	2'10" to 4' (864 mm to 1219 mm) Door size
Device centerline from finished floor	39 ⁵ / ₈ " (1006 mm) Standard	
Center case dimensions	8" x 2 ³ / ₄ " x 2 ³ / ₈ " (203mm x 70mm x 60mm)	
Mechanism case dimensions	2 ¹ / ₄ " x 2 ¹ / ₄ " (57mm x 57mm)	
Projection	Pushbar neutral – 3 ¹³ / ₁₆ " (97 mm) Pushbar depressed – 3 ¹ / ₈ " (78 mm)	
Latch bolt	Deadlocking anti-friction top & bottom bolt, ⁵ / ₈ " (16mm) throw	
Door undercut	³ / ₄ " (19mm) maximum (24231516 spacer block kit needed for ³ / ₄ " undercut)	
Top & bottom Latch case	5 ¹³ / ₁₆ " x 1 ¹ / ₄ " x 1 ⁷ / ₁₆ " (147mm x 32mm x 37mm)	
Vertical cable	7/ ₃₂ " (6mm) Diameter stainless steel cables	
Fasteners & sex bolts (SNB)	Includes screw pack for 1 ³ / ₄ " (44mm) to 2 ¹ / ₄ " (57mm) thick metal doors. Optional 425 SNB available.	
Electric options	ALK	Alarm exit kit
	CX	Chexit delayed exit
	E	Electric unlocking and locking trim
	EL	Electric latch retraction
	HD-EL	Electric latch retraction w/ hex dogging
	QEL	Quiet electric latch retraction
	*LX	Latchbolt monitor switch
	RX2	Double pushpad monitor switch
	RX996L	Trim monitor switch
	RX	Pushpad monitor switch
	RXLC	Pushpad monitor switch - low current
	SS	Signal switch
	WP-RX	Waterproof request to exit
	CON	Allegion Connect
Mechanical options	GBK	Glass bead kit
	LBL	Less bottom latch
	AX	Accessible device (LBL only)
	PN	Pneumatic latch retraction
	SEC	Security screws
	SG	Safety glow
	SNB	Sex bolts
Dogging option	No mechanical dogging. EL and QEL option available	
Strikes	Top – 249 - Unfinished, Bottom – 349 - Unfinished	

CX
Chexit delayed exit

- Meets NFPA 101 requirements
- Self-contained controls, locking, alarm

SS
Signal switch

- Signals unauthorized use of an opening
- Switch makes latch bolt tamper-resistant

EL
Electric latch retraction

- Enables remote unlatching
- Alternative to manual dogging

RX
Pushpad monitor switch

- Signals use of an opening
- SPDT switch to monitor pushpad

QEL
Quiet electric latch retraction

- Bolt retraction via switch
- Converts exit door to push-pull operation

E (E996L)
Electrified breakaway lever

- Electrified remote locking/unlocking
- Standard in fail safe condition

AX
Accessible device

- UL certified to meet new 5 lb. maximum operating force requirement
- Exceeds ANSI/BHMA requirements

CON
Allegion Connectors





- Common connectors to connect various door hardware all the way to the power supply



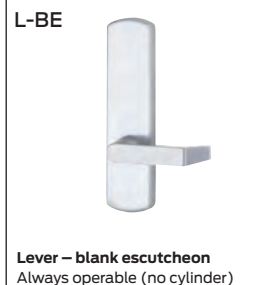
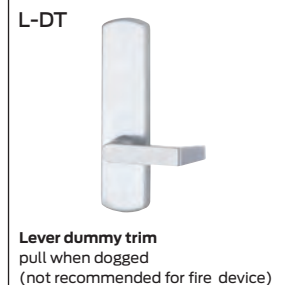
PN
Pneumatic latch retraction

- For areas where electrical devices banned
- Special linkage for mechanical or pneumatic dogging

*For 98/9949 devices, LX switch monitors trim input or electric dogging of EL/QEL devices. LX switch does not monitor latchbolt condition.

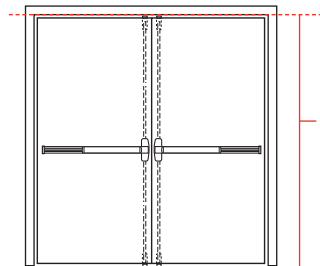
Standard trim

	EO	DT	NL	NL-OP
				
Product description	9849EO-F 9949EO-F	— —	9849NL-F 9949NL-F	9849NL-OP-F 9949NL-OP-F
Trim description	—	990DT	990NL-R/V	110NL-MD
Escutcheon plate size	—	3" x 14 ^{13/16} " x 3 ^{3/32} " (76x360x2mm)	3" x 14 ^{13/16} " x 3 ^{3/32} " (76x360x2mm)	—
Pull center to center	—	5 ^{1/2} " (140mm)	5 ^{1/2} " (140mm)	—
Projection	—	2" (51mm)	2" (51mm)	—
ANSI function	01	02	03	03
Cylinder type	—	—	Rim	Rim
Handing	—	—	—	—
Optional trim	x990EO x996EO	x996K-DT x996L-DT x696DT x697DT	x996K-NL x996L-NL x696NL x697NL	
Optional #425 SNB quantity for device	6	2	2	6

	L	L-NL	L-BE	L-DT
				
Product description	9849L-F 9949L-F	9849L-NL-F 9949L-NL-F	9849L-BE-F 9949L-BE-F	— —
Trim description	996L-R/V*	996L-NL-R/V	996L-BE-R/V*	996L-DT
Escutcheon plate size	2 ^{3/4} " x 10 ^{3/4} " x 2 ^{7/32} " (70x273x21mm)	2 ^{3/4} " x 10 ^{3/4} " x 2 ^{7/32} " (70x273x21mm)	2 ^{3/4} " x 10 ^{3/4} " x 2 ^{7/32} " (70x273x21mm)	2 ^{3/4} " x 10 ^{3/4} " x 2 ^{7/32} " (70x273x21mm)
Pull center to center	—	—	—	—
Projection	2 ^{7/8} " (73mm)	2 ^{7/8} " (73mm)	2 ^{7/8} " (73mm)	2 ^{7/8} " (73mm)
ANSI function	08	03	14	02
Cylinder type	Rim	Rim	—	—
Handing	Handed/Reversible	Handed/Reversible	Handed/Reversible	Handed/Reversible
Optional #425 SNB quantity for device	2	2	2	2

* Electrified lever operation available

Nominal door opening height		Top cable part number	Bottom cable part number
72" - 82"	6'0" - 6'10"	47250398	47250403
*82" - 96"	*6'10" - 8'	47250175	47250178
>96" - 110"	>8'0" - 9' 2"	47250176	47250179
>110" - 120"	>9'2" - 10'	47250177	47250180

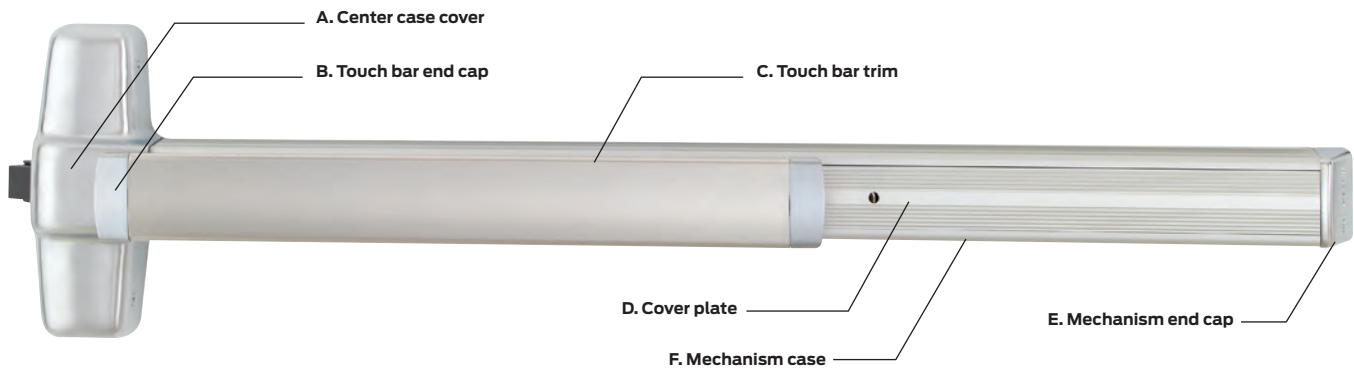


Door opening height is distance from bottom of frame header to finished floor.

See table on left for standard offering.

*Default door opening height. Specify door opening height if other than the default. For door heights less than 6'0" and greater than 10', contact our Customer Care department to discuss your specific application needs.

98/99 Finishes



Finishes

Color	US number	BHMA number	A, B, E	C	D & F
Bright brass	US3	605	Bright brass	Bright brass US3, 605	Buffed anodized
Satin brass	US4	606	Bright brass	Satin brass US4, 606	Anodized
Satin bronze	US10	612	Plated	Satin bronze US10, 612	Anodized
Bright chrome	US26	625	Plated	Bright stainless steel US32, 629	Buffed anodized
Satin chrome	US26D	626	Plated	Satin stainless steel US32D, 630	Anodized
Satin stainless steel*	US32D	630	Stainless steel	Satin stainless steel US32D, 630	Anodized
Aluminum, anodized	US28	628	Powder coat	Satin stainless steel US32D, 630	Anodized
Duranodic dark bronze	313	710	Powder coat	Powder coat	Powder coat
Black	315	622	Powder coat	Powder coat	Powder coat
Aged bronze 643E	–	–	Relieved aged bronze	Relieved aged bronze	Aged bronze, no relief

Special Finishes

Color	US number	BHMA number	A, B, E	C	D & F
Satin bronze, oil-rubbed	US10B	613	Oil-rubbed, US10B	Oil-rubbed, US10B	Powder coat
Powder coat**	RAL #	–	Powder coat	Satin stainless steel US32D, 630 (unless specified to match device)	Powder coat
Bright bronze	US9	611	Plated	Bright bronze US9, 611	Buffed anodized
Satin nickel*	US15	619	Plated, clear powder	Satin stainless steel US32D	Anodized
Satin chrome (antimicrobial)	U26D-AM	626-AM	AM Clear over chrome	AM Clear over satin stainless steel US32D, 630	AM Clear over anodized
Satin stainless steel (antimicrobial)	US32D-AM	630-AM	AM Clear over stainless steel	AM Clear over Satin Stainless Steel US32D, 630	AM Clear over anodized

Touch bar trim options — Knurled
 Embossed “Push”
 Braille (Caution-Stairwell), satin stainless steel only
 RSS, US32D only, red silk screen lettered “EMERGENCY EXIT ONLY – PUSH TO OPEN AND SOUND ALARM.”

* US32D and US15—available on 98 Series only

** Other custom logo touchbar trim and RAL color combinations available - consult factory



98/99 Finishes

Finishes*

	Color	US number	BHMA number
	Chromium, polished	US26	625
	Anodized, aluminum	US28	628
	Chromium, dull	US26D	626
	Brass, polished	US3	605
	Brass, dull	US4	606

	Color	US number	BHMA number
	Bronze, dull	US10	612
	Satin nickel Available for 35A ONLY	US15	619
	Satin stainless steel	US32D	630
	Duranodic dark bronze	313	710
	Black	315	711
	Aged bronze 643e	-	-

Special finishes

	Color	US number	BHMA number
	Satin chrome, Antimicrobial	US26D-AM	626-AM
	Satin stainless steel, antimicrobial	US32D-AM	630-AM

Pushpad options — Knurled
 Embossed "Push"
 Braille (Caution-Stairwell), satin stainless steel only
 RSS – (Emergency Exit – Push to open and sound alarm) – Red Silkscreen lettering on US32D

* Note: Durable powder coated finishes available at specific special request. PLEASE CONTACT FACTORY.

98/99 Strike information

Strikes for rim devices

264 <p>Projection $\frac{9}{16}$" (14mm)</p>	299 <p>Projection $\frac{13}{16}$" (21mm)</p>	299F <p>Projection $\frac{13}{16}$" (21mm)</p>	499F <p>Projection $\frac{15}{16}$" (24mm)</p>	1408 <p>One per pair of doors</p>
1439-Blade stop <p>Projection $\frac{1}{2}$" (13mm)</p>	1410-Integral stop <p>Projection $\frac{1}{2}$" (13mm)</p>	1606 <p>Projection $\frac{3}{8}$" (10mm) Panic devices only</p>	1609 <p>- Requires coordinator - For panic exit application only, not fire rated</p>	

XP Strikes for rim devices

909 <p>Projection $\frac{13}{16}$" (21mm)</p>	954 <p>Projection $\frac{7}{8}$" (22mm) - For fire rated double door applications</p>
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Strikes for vertical cable devices

249 - Top strike <p>Projection $\frac{9}{16}$" (14mm)</p>	349 - Bottom strike <p>Projection $\frac{1}{8}$" (3mm)</p>
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Strikes for vertical rod devices

248L-4 <p>Projection $\frac{3}{8}$" (10mm)</p>	260U-Flush transom panic only 260U-F-Flush transom fire only <p>Projection $\frac{3}{8}$" (10mm)</p>	299 <p>Projection $\frac{13}{16}$" (21mm)</p>	299F <p>Projection $\frac{13}{16}$" (21mm)</p>	499F <p>Projection $\frac{15}{16}$" (24mm)</p>
304L <p>Projection $\frac{13}{16}$" (21mm)</p>	338 <p>Mortise $\frac{5}{8}$" (16mm)</p>	385A <p>Mortise $2\frac{1}{2}$" (64mm)</p>	283 <p>For use with WDC devices when used with wood frames</p>	

Strikes for mortise lock devices

575 <p>For use on $\frac{13}{4}$" (44mm) or $2\frac{1}{4}$" (57mm) Single door and $2\frac{1}{4}$" (57mm) double door with coordinator.</p>	575-2 <p>For use on $\frac{13}{4}$" (44mm) thick double door with coordinator and astragal.</p>	576A <p>Open back strike for $\frac{13}{4}$" (44mm) thick double doors without coordinator.</p>	576B <p>Open back strike for $2\frac{1}{4}$" (57mm) thick double doors without coordinator.</p>
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- Not for use with astragals
- For use on wood doors, contact door manufacturer

- Acceptable for 90 minute pair of hollow metal doors

98/99 Strike/Stile information

Device type	Standard single door			Standard double door			Optional single door			Optional double door											
	Strike	Trim/Stile		Strike w/ mullion*	Trim/Stile		Strike	Trim/stile		Strike w/mullion*	Trim/Stile										
98/99	299	990/996	696/697		990/996	696/697															
		4 1/2" (114mm)	4 3/8" (111mm)	299 x 4954	4 7/8" (124mm)	4 3/4" (121mm)	1439 or 1410	3 13/16" (97mm)	3 13/16" (97mm)	299 x 5654	4 7/16" (113mm)	4 1/4" (108mm)									
							1606	4 1/16" (103mm)	3 15/16" (100mm)	1408 x 5754	3 13/16" (97mm)	3 13/16" (97mm)									
										1606 x 1654	4 3/8" (112mm)	4 1/4" (108mm)									
XP 98/99	909		909 x 4954-XP			—	—	—	—	—	—										
98-F/99-F	299F	4 1/2" (114mm)	4 3/8" (111mm)	499F x 9954	4 7/8" (124mm)	4 3/4" (121mm)	—	—	—	499F x 9854 KR9954	—	—									
XP98-F/XP99-F	909			954 x 9954-XP			—	—	—	—	—										
9875	575	4 3/4" (121mm)	4 3/4" (121mm)	575-2	—	—	—	—	—	576A-576B	4 3/4" (121mm)	4 3/4" (121mm)									
9875-F	575	4 3/4" (121mm)	4 3/4" (121mm)	575-2	—	—	—	—	—	576A-576B	4 3/4" (121mm)	4 3/4" (121mm)									
9857 9957	299 (Top) 299 (Middle) 304L/284-L (Bottom)	4 1/2" (114mm)	4 3/8" (111mm)	299 x 4954	4 7/8" (124mm)	4 3/4" (121mm)	1439 or 1410	3 13/16" (97mm)	3 13/16" (97mm)	299 x 5654	4 7/16" (113mm)	4 1/4" (108mm)									
							1606	4 1/16" (103mm)	3 15/16" (100mm)	1408 x 5754	3 13/16" (97mm)	3 13/16" (97mm)									
										1606 x 1654	4 3/8" (112mm)	4 1/4" (108mm)									
9857-F 9957-F	299 (Top) 299F (Middle) 304L (Bottom)	4 1/2" (114mm)	4 3/8" (111mm)	299F 499F x 9954 304L	4 7/8" (124mm)	4 3/4" (121mm)	—	—	—	—	—										
	Strike	Application			Trim/Stile		Optional strike			Application		Trim/Stile									
9827 9927	299 (Top) 304L/248-L-4 (Bottom)	Single door			990/996	696/697	260U (Top) 385A (Bottom)			Single door		990/996	696/697								
PL9827/PL9927	299 (Top) 304L/248-L-4 (Bottom)				Two vertical rod devices							3 11/16" (94mm)	3 5/8" (92mm)	260U (Stainless) 385A (Bottom)			Two vertical rod devices		3 11/16" (94mm)	3 5/8" (92mm)	
9827-F 9927-F	299 (Top) 304L (Bottom)	Vertical rod with Mortise lock device						4 3/4" (121mm)	4 3/4" (121mm)	304L (Bottom)			Vertical rod with Mortise lock device						4 3/4" (121mm)	4 3/4" (121mm)	
9847 9947 9848 9948	338 (Top) 385A (Bottom)				Two vertical rods			4 1/4" (108mm)	4 1/8" (105mm)						304L (Bottom)			Two vertical rods		4 1/4" (108mm)	4 1/8" (105mm)
9847-F 9947-F 9848-F 9948-F	338 (Top) 385A (Bottom)	Vertical rod with Mortise lock device						4 3/4" (121mm)	4 3/4" (121mm)	304L (Bottom)			Vertical rod with Mortise lock device							4 3/4" (121mm)	4 3/4" (121mm)
9847WDC 9947WDC	338 (Top) 385A (Bottom)				Single door			4 1/4" (108mm)	4 1/8" (108mm)						304L			Single door		4 1/4" (108mm)	4 1/8" (108mm)
		Two vertical rod devices						4 1/4" (108mm)	4 1/8" (108mm)	304L			Two vertical rod devices							4 1/4" (108mm)	4 1/8" (108mm)
								Vertical rod with Mortise lock device												4 3/4" (121mm)	4 3/4" (121mm)
9847WDC-F 9947WDC-F	338 (Top) 385A (Bottom)	Two vertical rod devices			4 1/4" (108mm)	4 1/8" (108mm)	304L				Two vertical rod devices		4 1/4" (108mm)	4 1/8" (108mm)							
9849 9949	249 (Top) 349 (Bottom)	Vertical cable with Mortise lock device			4 3/4" (121mm)	4 3/4" (121mm)	—			Vertical cable with Mortise lock device		4 3/4" (121mm)	4 3/4" (121mm)								
9849-F 9949-F 9849-F 9949-F	249 (Top) 349 (Bottom)	Two vertical cables			4 1/4" (108mm)	4 1/8" (108mm)	—			Two vertical cable		4 1/4" (108mm)	4 1/8" (105mm)								
		Vertical cable with Mortise lock device			4 3/4" (121mm)	4 3/4" (121mm)	—			Vertical cable with Mortise lock device		4 3/4" (121mm)	4 3/4" (121mm)								
9850WDC 9950WDC	150 (Top) 450 (Bottom)	Single door			4 1/4" (108mm)	4 1/8" (108mm)	—			Single door		4 1/4" (108mm)	4 1/8" (108mm)								
		Two vertical cable devices			4 1/4" (108mm)	4 1/8" (108mm)	—			Two vertical Cable devices		4 1/4" (108mm)	4 1/8" (108mm)								
		Vertical cable with Mortise lock device			4 1/4" (108mm)	4 1/8" (108mm)	—			Vertical cable with Mortise lock device		4 3/4" (121mm)	4 3/4" (121mm)								
9850WDC-F 9950WDC-F	150 (Top) 450 (Bottom)	Two vertical cable devices			4 1/4" (108mm)	4 1/8" (108mm)	—			Two Vertical Cable Devices		4 1/4" (108mm)	4 1/8" (108mm)								

Strike options / Dogging options

UL Listing for fire exit hardware

UL Listed fire exit hardware label and opening size

Exit device	Door material	Single door	Double door						
			With 9954 mullion	With 9854 mullion	With kr9954 mullion	With kr9854 mullion	V x v same direction	V x mortise same direction	V x v double egress
98-F 99-F	Metal	3 Hour 4' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 8'	3 Hour 8' x 8'	—	—	—
9875-F 9975-F	Metal	3 Hour 4' x 10'	—	—	—	—	—	3 Hour 8' x 10'	—
9827-F 9927-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9827LBR-F 9927LBR-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	—	3 Hour 8' x 10'
9857-F 9957-F	Metal	3 Hour 4' x 8'	3 Hour 8' x 8'	3 Hour 8' x 8'	3 Hour 8' x 8'	3 Hour 8' x 8'	—	—	—
9847-F 9947-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9847LBR-F 9947LBR-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	—	3 Hour 8' x 10'
9848-F 9948-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9849-F 9949-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	3 Hour 8' x 10'	3 Hour 8' x 10'
9849LBL-F 9949LBL-F	Metal	—	—	—	—	—	90 Minute* 8' x 10'	—	3 Hour 8' x 10'

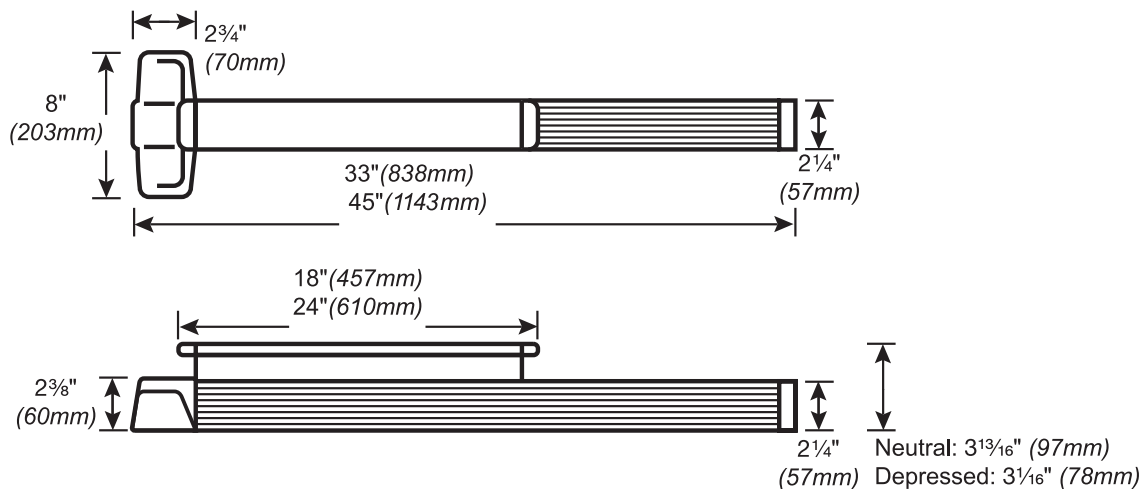
* Currently, no door manufacturers offer a listing over 90 minutes with doors swinging same direction. Consult wood door manufacturers for current UL listings.

98/99 Function, grade, type options

ANSI Function, grade & type

Function	Grade 1, type 1	Grade 1, type 2	Grade 1, type 3	Grade 1, type 7	Grade 1, type 7	Grade 1, type 8	Grade 1, type 8	Grade 1, type 8	Grade 1, type 9
1	98EO & F 99EO & F	9827EO & F 9927EO & F	9875EO & F 9975EO & F	9847WDCEO & F 9947WDCEO & F	9850WDCEO & F 9950WDCEO & F	9847EO & F 9947EO & F	9848EO & F 9948EO & F	9849EO & F 9949EO & F	9857EO & F 9957EO & F
2	98DT 99DT	9827DT 9927DT	9875DT 9975DT	9847WDCDT 9947WDCDT	9850WDCDT 9950WDCDT	9847DT 9947DT	9848DT 9948DT	9849DT 9949DT	9857DT 9957DT
3	98NL & F 99NL & F	9827NL & F 9927NL & F	9875NL & F 9975NL & F	9847WDCNL & F 9947WDCNL & F	9850WDCNL & F 9950WDCNL & F	9847NL & F 9947NL & F	9848NL & F 9948NL & F	9849NL & F 9949NL & F	9857NL & F 9957NL & F
3	98K-NL & F 99K-NL & F	9827K-NL & F 9927K-NL & F	9875K-NL & F 9975K-NL & F	9847WDCK-NL & F 9947WDCK-NL & F	9850WDCK-NL & F 9950WDCK-NL & F	9847K-NL & F 9947K-NL & F	9848K-NL & F 9948K-NL & F	9849K-NL & F 9949K-NL & F	9857K-NL & F 9957K-NL & F
3	98L-NL & F 99L-NL & F	9827L-NL & F 9927L-NL & F	9875L-NL & F 9975L-NL & F	9847WDCL-NL & F 9947WDCL-NL & F	9850WDCL-NL & F 9950WDCL-NL & F	9847L-NL & F 9947L-NL & F	9848L-NL & F 9948L-NL & F	9849L-NL & F 9949L-NL & F	9857L-NL & F 9957L-NL & F
5	98TP & F 99TP & F	9827TP & F 9927TP & F	9875TP & F 9975TP & F	9847WDCTP & F 9947WDCTP & F	9850WDCTP & F 9950WDCTP & F	9847TP & F 9947TP & F	9848TP & F 9948TP & F	9849TP & F 9949TP & F	9857TP & F 9957TP & F
7	98TP-2 & F 99TP-2 & F		9875TP-2 & F 9975TP-2 & F						
8	98K & F 99K & F	9827K & F 9927K & F	9875K & F 9975K & F	9847WDCK & F 9947WDCK & F	9850WDCK & F 9950WDCK & F	9847K & F 9947K & F	9848K & F 9948K & F	9849K & F 9949K & F	9857K & F 9957K & F
8	98L & F 99L & F	9827L & F 9927L & F	9875L & F 9975L & F	9847WDCL & F 9947WDCL & F	9850WDCL & F 9950WDCL & F	9847L & F 9947L & F	9848L & F 9948L & F	9849L & F 9949L & F	9857L & F 9957L & F
10	98K-2 & F 99K-2 & F		9875K-2 & F 9975K-2 & F						
10	98L-2 & F 99L-2 & F		9875L-2 & F 9975L-2 & F						
11 12		9827TL & F 9927TL & F		9847WDC & F 9947WDC & F	9850WDC & F 9950WDC & F	9847TL & F 9947TL & F	9848 & F 9948 & F	9849 & F 9949 & F	9857TL & F 9957TL & F
14	98K-BE & F 99K-BE & F	9827K-BE & F 9927K-BE & F	9875K-BE & F 9975K-BE & F	9847WDCK-BE & F 9947WDCK-BE & F	9850WDCK-BE & F 9950WDCK-BE & F	9847K-BE & F 9947K-BE & F	9848K-BE & F 9948K-BE & F	9849K-BE & F 9949K-BE & F	9857K-BE & F 9957K-BE & F
14	98L-BE & F 99L-BE & F	9827L-BE & F 9927L-BE & F	9875L-BE & F 9975L-BE & F	9847WDCL-BE & F 9947WDCL-BE & F	9850WDCL-BE & F 9950WDCL-BE & F	9847L-BE & F 9947L-BE & F	9848L-BE & F 9948L-BE & F	9849L-BE & F 9949L-BE & F	9857L-BE & F 9957L-BE & F
16		9827TL-BE & F 9927TL-BE & F		9847WDC & F 9947WDC & F	9850WDC & F 9950WDC & F	9847TL-BE & F 9947TL-BE & F	9848 & F 9948 & F	9849 & F 9949 & F	9857TL-BE & F 9957TL-BE & F

Dimensions



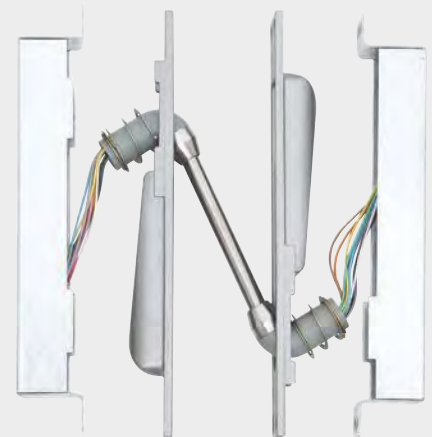
VON DUPRIN®

Electrical power transfer

Overview

Electric power transfer provides a means of transferring electrical power from a door frame to the edge of a swinging door. The units are completely concealed when the door is in the closed position, and are ideally suited for installations involving abuse or heavy traffic.

Two models are available; EPT-2, two 18 gauge wires and EPT-10, ten 24 gauge wires.



Features and benefits

- UL Listed for use on fire doors
- UL listed as Miscellaneous Door Accessory
- Ball-and-socket joint construction provides cut and pinch protection for wiring
- Built for heavy traffic and high abuse openings

Door applications

- Up to 5" butt hinges – 180° swing.
- 5 1/2" butt hinges – 130° swing.
- 6" butt hinges – 110° swing.
- 3/4" offset pivots – 180° swing.

Not for use with swing clear hinges, center-hung pivots, pocket pivots or balanced doors.

Door applications shown are for 1 3/4" door thickness, for all other applications contact Technical Support to confirm compatibility.

Finishes

- SP28 (sprayed aluminum)
- SP313 (sprayed duranodic)

Dimensions

Housing	9" X 1 1/4" X 1 5/8" (229mm X 32mm X 38mm)
EPT-2	Two 18 gauge wires, up to 2 AMPS @ 24VDC, with a 16 AMPS maximum surge
EPT-10	Ten 24 gauge wires, up to 1 AMPS @ 24VDC, with a 16 AMPS maximum surge
PNT-1	5/32" tubing

To order, specify

- **EPT-2, EPT-10 or PNT-1.**
- **Finish, SP28 or SP313.**

About Allegion

Allegion (NYSE: ALLE) is a global pioneer in safety and security, with leading brands like CISA®, Interflex®, LCN®, Schlage® and Von Duprin®. Focusing on security around the door and adjacent areas, Allegion produces a range of solutions for homes, businesses, schools and other institutions. Allegion is a \$2 billion company, with products sold in almost 130 countries. For more, visit www.allegion.com.

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SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

- 1. Doors.

1.3 ACTION SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.

1.4 QUALITY ASSURANCE

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: GANA's "Laminated Glazing Reference Manual" and GANA's "Glazing Manual."
 - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, test standard, whether glazing is for use in fire doors or other openings, whether or not glazing passes hose-stream test, whether or not glazing has a temperature rise rating of 450 deg F, and the fire-resistance rating in minutes.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

- A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.

- B. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

2.2 GLASS PRODUCTS

- A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.

2.3 FIRE-PROTECTION-RATED GLAZING

- A. Fire-Protection-Rated Glazing, General: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252 for door assemblies and NFPA 257 for window assemblies.

2.4 GLAZING GASKETS

- A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:
 1. Neoprene complying with ASTM C 864.
 2. EPDM complying with ASTM C 864.
 3. Silicone complying with ASTM C 1115.
 4. Thermoplastic polyolefin rubber complying with ASTM C 1115.

2.5 GLAZING SEALANTS

- A. General:
 1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealants for Fire-Rated Glazing Products: Products that are approved by testing agencies that listed and labeled fire-resistant glazing products with which they are used for applications and fire-protection ratings indicated.

2.6 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.7 MISCELLANEOUS GLAZING MATERIALS

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- F. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

2.8 MONOLITHIC-GLASS TYPES

- A. Glass Type: Clear fully tempered float glass.
1. Thickness: 6.0 mm.
 2. Provide safety glazing labeling.
 3. Factory apply manufacturer's standard opacifier to coated second surface of lites, with resulting products complying with Specification No. 89-1-6 in GANA's Tempering Division's "Engineering Standards Manual":

2.9 FIRE-PROTECTION-RATED GLAZING TYPES

- A. Glass Type: 20-minute fire-rated glazing with hose-stream test; laminated ceramic glazing or gel-filled, double glazing units.
1. Provide safety glazing labeling.
- B. Glass Type: 90-minute fire-rated glazing; laminated glass with intumescent interlayers or gel-filled, double glazing units.
1. Provide safety glazing labeling.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where length plus width is larger than 50 inches.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Apply heel bead of elastomeric sealant.
- F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.3 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.4 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.5 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

END OF SECTION 088000

SECTION 092116 - GYPSUM BOARD SHAFT WALL ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes gypsum board shaft-wall assemblies for the following:
 - 1. Shaft-wall enclosures.
 - 2. Chase enclosures.
- B. Related Sections include the following:
 - 1. Division 07 Section "Fire-Resistive Joint Systems" for head-of-wall assemblies that incorporate gypsum board shaft-wall assemblies.

1.3 SUBMITTALS

- A. Product Data: For each gypsum board shaft-wall assembly indicated.

1.4 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Provide materials and construction identical to those of assemblies with fire-resistance ratings determined according to ASTM E 119 by a testing and inspecting agency.
- B. STC-Rated Assemblies: Provide materials and construction identical to those of assemblies tested according to ASTM E 90 and classified according to ASTM E 413 by a testing and inspecting agency.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, and bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.
- C. Stack panels flat on leveled supports off floor or slab to prevent sagging.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or with gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install panels that are wet, moisture damaged, or mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. American Gypsum Company.
 - 2. G-P Gypsum.
 - 3. National Gypsum Company.
 - 4. USG Corporation.

2.2 GYPSUM BOARD SHAFT WALL ASSEMBLIES

- A. Fire-Resistance Rating: As indicated.
- B. STC Rating: 51, minimum.
- C. Studs: Manufacturer's standard profile for repetitive members, corner and end members, and fire-resistance-rated assembly indicated.
 - 1. Depth: As indicated.
 - 2. Minimum Base-Metal Thickness: 0.033 inch.
- D. Runner Tracks: Manufacturer's standard J-profile track with manufacturer's standard long-leg length, but at least 2 inches long and matching studs in depth.
 - 1. Minimum Base-Metal Thickness: 0.033 inch.
- E. Firestop Tracks: Provide firestop track at head of shaft wall on each floor level.
- F. Room-Side Finish: As indicated.
- G. Shaft-Side Finish: Gypsum shaftliner board, moisture- and mold-resistant Type X.
- H. Insulation: Sound attenuation blankets.

2.3 PANEL PRODUCTS

- A. Panel Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
 - 1. Thickness: 1 inch.
 - 2. Long Edges: Double bevel.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- B. Gypsum Board: As specified in Section 092900 "Gypsum Board."

2.4 NON-LOAD-BEARING STEEL FRAMING

- A. Steel Framing Members: Comply with ASTM C 645 requirements for metal.
- B. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Fire Trak Corp.; Fire Trak System attached to studs with Fire Trak Posi Klip.
 - b. Grace Construction Products; FlameSafe FlowTrak System.
 - c. Metal-Lite, Inc.; The System.
 - d. Steel Network Inc. (The); VertiClip SLD VertiTrack VTD Series.

2.5 AUXILIARY MATERIALS

- A. Trim Accessories: Material and shapes as specified in Section 092900 "Gypsum Board" that comply with gypsum board shaft wall assembly manufacturer's written recommendations for application indicated.
- B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
- C. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions.
- D. Sound Attenuation Blankets: As specified in Section 092900 "Gypsum Board."

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and ASTM C 754 other than stud-spacing requirements.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.
- C. Sprayed Fire-Resistive Materials: Patch or replace sprayed fire-resistive materials removed or damaged during installation of shaft wall assemblies. After application, remove only to extent necessary for installation of gypsum board shaft wall assemblies.
- D. Building Expansion Joints: Frame both sides of expansion joints with furring and other support.

- E. Install supplementary framing around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, handrails, and similar items.
- F. Penetrations: Install supplementary steel framing around perimeter of penetration behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.
- G. Isolate perimeter of gypsum panels from building structure, while maintaining continuity of fire-rated construction.
- H. Firestop Tracks: Install to maintain continuity of fire-resistance-rated assembly indicated.
- I. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect while maintaining fire-resistance rating of gypsum board shaft wall assemblies.
- J. Sound-Rated Shaft Wall Assemblies: Seal with acoustical sealant at perimeter of each assembly and at joints and penetrations.
- K. Cant Panels: At projections into shaft exceeding 4 inches, install 1/2- or 5/8-inch- thick gypsum board cants covering tops of projections.
- L. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.
- M. Remove and replace panels that are wet, moisture damaged, or mold damaged.

END OF SECTION 092116

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Non-load-bearing steel framing systems for interior gypsum board assemblies.
 - 2. Suspension systems for interior gypsum ceilings and soffits.

- B. Related Sections:

- 1. Division 07 Section "Fire-Resistive Joint Systems" for head-of-wall joint systems installed with non-load-bearing steel framing.
 - 2. Division 09 Section "Gypsum Board Shaft Wall Assemblies" for non-load-bearing metal shaft-wall framing, gypsum panels, and other components of shaft-wall assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

PART 2 - PRODUCTS

2.1 FRAMING SYSTEMS

- A. Steel Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners of equivalent minimum base-metal thickness.
 - 1. Minimum Base-Metal Thickness: 0.027 inch.
 - 2. Depth: As indicated on Drawings.

- B. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Metal Thickness: 0.033 inch.
- C. Cold-Rolled Channel Bridging: Steel, 0.053-inch minimum base-metal thickness, with minimum 1/2-inch-wide flanges.
 - 1. Depth: 1-1/2 inches.
 - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch- thick, galvanized steel.
- D. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
 - 1. Minimum Base-Metal Thickness: 0.033 inch.
 - 2. Depth: As indicated on Drawings.
- E. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch- wide flanges.
 - 1. Depth: As indicated on Drawings or 3/4 inch.
 - 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.033 inch.
 - 3. Tie Wire: ASTM A 641, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.
- F. Z-Shaped Furring: With slotted or non-slotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum uncoated-metal thickness of 0.018 inch, and depth required to fit insulation thickness indicated.

2.2 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.
- B. Hanger Attachments to Concrete:
 - 1. Anchors: Capable of sustaining a load equal to 5 times that imposed as determined by ASTM E 488.
 - a. Type: Postinstalled, expansion anchor.
 - 2. Powder-Actuated Fasteners: Capable of sustaining, a load equal to 10 times that imposed as determined by ASTM E 1190.
- C. Wire Hangers: ASTM A 641, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
- D. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch and minimum 1/2-inch- wide flanges.
 - 1. Depth: 2-1/2 inches.
- E. Furring Channels (Furring Members):

2.3 AUXILIARY MATERIALS

- A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide asphalt saturated organic felt or foam gasket.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.
- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.2 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
 - 1. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 2. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

3. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
 4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Direct Furring:
1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
- F. Z-Furring Members:
1. Erect insulation vertically and hold in place with Z-furring members spaced 24 inches o.c.
 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
 3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.
- G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.3 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 3. Do not attach hangers to steel roof deck.
 4. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 5. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 6. Do not connect or suspend steel framing from ducts, pipes, or conduit.

- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.
- F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Interior gypsum board.

- B. Related Sections:

- 1. Division 07 Section "Fire-Resistive Joint Systems" for head-of-wall assemblies that incorporate gypsum board.
- 2. Division 09 Section "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board.
- 3. Division 09 Section "Gypsum Board Shaft Wall Assemblies" for metal shaft-wall framing, gypsum shaft liners, and other components of shaft-wall assemblies.
- 4. Division 09 Painting Sections for primers applied to gypsum board surfaces.

1.3 SUBMITTALS

- A. Product Data: For each type of product.

1.4 QUALITY ASSURANCE

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

1.5 STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.

- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. American Gypsum.
 - 2. CertainTeed Corp.
 - 3. Georgia-Pacific Gypsum LLC.
 - 4. Lafarge North America Inc.
 - 5. National Gypsum Company.
 - 6. USG Corporation.
- B. Gypsum Wallboard: ASTM C 1396.
- C. Gypsum Board, Type X: ASTM C 1396.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
- D. Gypsum Ceiling Board: ASTM C 1396.
 - 1. Thickness: 1/2 inch.
 - 2. Long Edges: Tapered.

2.2 SPECIALTY GYPSUM BOARD

- A. Gypsum Board, Type C: ASTM C 1396. Manufactured to have increased fire-resistive capability.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. American Gypsum; Firebloc Type C.
 - b. CertainTeed Corp.; ProRoc Type C.
 - c. Georgia-Pacific Gypsum LLC; Fireguard C.
 - d. Lafarge North America Inc.; Firecheck Type C.
 - e. National Gypsum Company; Gold Bond Fire-Shield C.
 - f. USG Corporation; Firecode C Core.
 - 2. Thickness: As required by fire-resistance-rated assembly indicated on Drawings.
 - 3. Long Edges: Tapered.

2.3 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
- B. Exterior Trim: ASTM C 1047.
 - 1. Material: Hot-dip galvanized steel sheet, plastic, or rolled zinc.
- C. Aluminum Trim: ASTM B 221, Alloy 6063-T5.

2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - 2. Exterior Gypsum Soffit Board: Paper.
 - 3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 - 4. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

2.5 AUXILIARY MATERIALS

- A. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
- C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing).

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

- A. Comply with ASTM C 840.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- D. Install trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

1. Aluminum Trim: Install in locations indicated on Drawings.
 2. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- E. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- G. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
- H. Protect adjacent surfaces from drywall compound and texture finishes and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- I. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 092900

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for ceilings.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Evaluation reports.
- C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to NVLAP.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 50 450 or less.

2.2 ACOUSTICAL PANEL CEILINGS, GENERAL

- A. Acoustical Panel Standard: Comply with ASTM E 1264.
- B. Metal Suspension System Standard: Comply with ASTM C 635.
- C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

2.3 ACOUSTICAL PANELS

- A. General: Provide replacement panels matching existing.
- B. Available Products: Subject to compliance with requirements, provide products by one of the following manufacturers:
 1. Armstrong World Industries, Inc.
 2. Ecophon CertainTeed, Inc.
 3. USG Interiors, Inc.
- C. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:
 1. Type and Form: Type III, mineral base with painted finish; Form 1, nodular.
 2. Pattern: C (perforated, small holes).
- D. Color: White.
- E. LR: Not less than 0.65.
- F. Edge/Joint Detail: Square.
- G. Thickness: 5/8 inch.
- H. Modular Size: 24 by 24 inches and 24 by 48 inches.

2.4 METAL SUSPENSION SYSTEM

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.
- B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
- C. Available Products: Subject to compliance with requirements, provide products by one of the following manufacturers:

1. Armstrong World Industries, Inc.
2. Chicago Metallic Corporation.
3. Ecophon CertainTeed, Inc.
4. USG Interiors, Inc.

D. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 coating designation, with prefinished 15/16-inch- wide metal caps on flanges.

1. Structural Classification: Intermediate-duty system.
2. End Condition of Cross Runners: Override (stepped) type.
3. Face Design: Flat, flush.
4. Cap Material: Steel cold-rolled sheet.
5. Cap Finish: Painted white.

2.5 METAL EDGE MOLDINGS AND TRIM

A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.

1. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners, unless otherwise indicated.

2.6 ACOUSTICAL SEALANT

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

B. Products: Subject to compliance with requirements, provide one of the following:

1. Acoustical Sealant for Exposed and Concealed Joints:
 - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
 - b. USG Corporation; SHEETROCK Acoustical Sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

- A. Install acoustical panel ceilings to comply with ASTM C 636 and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- C. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
- D. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.
 - 1. Arrange directionally patterned acoustical panels as indicated on reflected ceiling plans.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Resilient base.
 - 2. Resilient stair tread, riser and accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg. F.

1.6 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg. F, in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg. F or more than 95 deg. F.

- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOPLASTIC-RUBBER BASE

- A. Basis of Design Manufacturers and Products: Subject to compliance with requirements, provide product indicated on Finish Schedule on Drawings or approved comparable product.
- B. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).
 - 1. Group: I (solid, homogeneous).
- C. Thickness: 0.125 inch.
- D. Height: As indicated on Drawings.
- E. Lengths: Cut lengths 48 inches long.
- F. Outside Corners: Job formed or preformed.
- G. Inside Corners: Job formed or preformed.
- H. Colors: Refer to Finish Schedule on Drawings.

2.2 RESILIENT STAIR ACCESSORIES

- A. Resilient Stair Treads and Risers:
 - 1. Manufacturers: Subject to compliance with requirements, provide resilient stair tread as shown on Finish Schedule or approved equal.
- B. Nosing Style: Square, adjustable to cover angles between 60 and 90 degrees.
- C. Nosing Height: 1-1/2 inches.
- D. Thickness: 1/4 inch and tapered to back edge.
- E. Size: Lengths and depths to fit each stair tread in one piece.
- F. Risers: Smooth, flat, coved-toe, 7 inches high by length matching treads; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.
 - 1. Thickness: 0.125 inch.

2.3 INSTALLATION MATERIALS

- A. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Do not install resilient products until they are the same temperature as the space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- C. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length. Miter corners to minimize open joints.

3.1 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Stair Accessories:
 - 1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
 - 2. Tightly adhere to substrates throughout length of each piece.
 - 3. For treads installed as separate, equal-length units, install to produce a flush joint between units.
- C. Rubber Stair Treads and Risers: Install treads in one piece, full length of tread. Where tread does not extend to riser at rear of tread, cover intervening space with smooth finish rubber filler of same color and thickness as tread. Embed entire area of platform and tread, including nosing, in waterproof adhesive (not soluble in water), and where necessary, weight rubber until adhesive has set. Joints between panels and between treads and panels or fillers shall be tight, flush and inconspicuous. Borders shall conform to contours of landings and platforms.

3.2 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.
 - 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Vinyl composition floor tile.
- B. Related Sections:
 - 1. Division 09 Section "Resilient Base and Accessories" for resilient wall and stair base.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: Full-size units of each color and pattern of floor tile required.
- C. Samples for Verification: Full-size units of each color and pattern of floor tile required.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.8 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 VINYL COMPOSITION FLOOR TILE

- A. Products: Subject to compliance with requirements, provide products as shown on Finish Schedule or approved equal.
- B. Tile Standard: ASTM F 1066, Class 1, solid-color tile.
- C. Wearing Surface: Smooth.
- D. Thickness: 0.125 inch.
- E. Size: 12 by 12 inches.
- F. Colors and Patterns: As indicated by manufacturer's designations.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
- C. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.
 - 1. Joint-Sealant Color: Match floor tile.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
 - 4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until they are same temperature as space where they are to be installed.

1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles in pattern indicated.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.

G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.

B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Floor Polish: Remove soil, visible adhesive, and surface blemishes from floor tile surfaces before applying liquid floor polish.

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1. Apply two coat(s).
- E. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 096900 - ACCESS FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Access-flooring panels.
- 2. Understructure.
- 3. Floor panel coverings.

- B. Related Sections:

- 1. Division 26 Section "Grounding and Bonding for Electrical Systems" for connection to ground of access-flooring understructure.

1.3 COORDINATION

- A. Coordinate location of mechanical and electrical work in underfloor cavity to prevent interference with access-flooring pedestals.
- B. Mark pedestal locations on subfloor using a grid to enable mechanical and electrical work to proceed without interfering with access-flooring pedestals.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include layout of access-flooring system and relationship to adjoining Work based on field-verified dimensions.
 - 1. Details and sections with descriptive notes indicating materials, finishes, fasteners, typical and special edge conditions, accessories, and understructures.
- C. Samples:
 - 1. Floor Covering: Full-size units for each color and texture specified.
 - 2. Exposed Metal Accessories: Approximately 10 inches in length.
 - 3. One complete full-size floor panel, pedestal, and understructure unit for each type of access-flooring system required.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of access-flooring system.
- C. Product Test Reports: For each type of flooring material and exposed finish, for tests performed by a qualified testing agency.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not install access flooring until spaces are enclosed, ambient temperature is between 50 and 90 deg. F, and relative humidity is not less than 20 and not more than 70 percent.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide access-flooring systems capable of complying with the following performance requirements according to testing procedures in CISCA's "Recommended Test Procedures for Access Floors":

1. Concentrated Loads: 1250 lbf with the following deflection and permanent set:

- a. Top-Surface Deflection: 0.10 inch.
- b. Permanent Set: 0.010 inch.

2. Ultimate Loads: 2500 lbf.

3. Rolling Loads: With local or overall deformation not to exceed 0.040 inch.

- a. CISCA Wheel 1: 10 passes at 1000 lbf.
- b. CISCA Wheel 2: 10,000 passes at 800 lbf.

4. Pedestal Axial Load Test: 5000 lbf.

5. Pedestal Overturning Moment Test: 1000 lbf x inches.

6. Uniform Load Test: 300 lbf/sq. ft. with a maximum top-surface deflection not to exceed 0.040 inch and a permanent set not to exceed 0.010 inch.

7. Drop Impact Load Test: 150 lb.

- B. Fire Performance:

1. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

- a. Flame-Spread Index: 25 or less.

b. Smoke-Developed Index: 50 or less.

2. Combustion Characteristics: ASTM E 136.

2.2 MANUFACTURERS

A. Source Limitations: Obtain access-flooring system from single source from single manufacturer.

2.3 FLOOR PANELS

A. Floor Panels, General: Provide modular panels interchangeable with other field panels without disturbing adjacent panels or understructure.

1. Size: Nominal 24 by 24 inches.
2. Attachment to Understructure: Bolted.

B. Cementitious-Core Steel Panels: Fabricated from cold-rolled steel sheet, with the die-cut flat top sheet and die-formed and stiffened bottom pan welded together, and with metal surfaces protected against corrosion by manufacturer's standard factory-applied finish. Fully grout internal spaces of completed units with manufacturer's standard cementitious fill.

2.4 UNDERSTRUCTURE

A. Pedestals: Assembly consisting of base, column with provisions for height adjustment, and head (cap); made of steel.

1. Base: Square or circular base with not less than 16 sq. in. of bearing area.
2. Column: Of height required to bring finished floor to elevations indicated. Weld to base plate.
3. Provide vibration-proof leveling mechanism for making and holding fine adjustments in height over a range of not less than 2 inches and for locking at a selected height, so deliberate action is required to change height setting and prevent vibratory displacement.
4. Head: Designed to support the panel system indicated.
 - a. Bolted Assemblies: Provide head with four holes aligned with holes in floor panels for bolting of panels to pedestals.

2.5 FLOOR PANEL COVERINGS

A. High-Pressure Plastic Laminate: Factory applied, NEMA LD 3, High-Wear type, Grade HDH; fabricated in one piece to cover each panel face with integral trim edging.

1. Electrical Resistance: Average no less than 1 megohm and no more than 20,000 megohms when installed floor coverings are surface-to-ground tested according to NFPA 99.
2. Colors, Textures, and Patterns: As selected by Architect from manufacturer's full range.

2.6 FABRICATION

A. Fabrication Tolerances:

1. Size: Plus or minus 0.020 inch of required size.
2. Squareness: Plus or minus 0.015 inch between diagonal measurements across top of panel.

3. Flatness: Plus or minus 0.035 inch, measured on a diagonal on top of panel.
- B. Panel Markings: Clearly and permanently mark floor panels on their underside with panel type and concentrated-load rating.
- C. Bolted Panels: Provide panels with holes drilled in corners to align precisely with threaded holes in pedestal heads and to accept countersunk screws with heads flush with top of panel.
 1. Captive Fasteners: Provide fasteners held captive to panels.
- D. Cutouts: Fabricate cutouts in floor panels for cable penetrations and service outlets. Provide reinforcement or additional support, if needed, to make panels with cutouts comply with structural performance requirements.
 1. Grommets: Where indicated, fit cutouts with manufacturer's standard grommets; or, if size of cutouts exceeds maximum grommet size available, trim edge of cutouts with manufacturer's standard plastic molding with tapered top flange.

2.7 ACCESSORIES

- A. Adhesives: Manufacturer's standard adhesive for bonding pedestal bases to subfloor.
- B. Service Outlets: Standard UL-listed and -labeled assemblies, for recessed mounting flush with top of floor panels; for power, communication, and signal services; and complying with the following requirements:
 1. Structural Performance: Cover capable of supporting a 800-lbf concentrated load.
 2. Cover and Box Type: Hinged polycarbonate cover with opening for passage of cables when cover is closed and including frame and steel box or formed-steel plate for mounting electrical receptacles.
 3. Location: In center of panel quadrant unless otherwise indicated.
 4. Receptacles and Wiring: Electrical receptacles and wiring for service outlets are specified elsewhere.
- C. Steps: Provide steps of size and arrangement indicated with floor coverings to match access flooring. Apply nonslip aluminum nosings to treads unless otherwise indicated.
- D. Railings: Standard extruded-aluminum railings at ramps and open-sided perimeter of access flooring where indicated. Include handrail, intermediate rails, posts, brackets, end caps, wall returns, wall and floor flanges, plates, and anchorages where required.
 1. Provide railings that comply with structural performance requirements specified in Section 055213 "Pipe and Tube Railings."
- E. Panel Lifting Device: Panel manufacturer's standard portable lifting device for each type of panel required.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer and manufacturer's representative present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. Verify that substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, foreign deposits, and debris that might interfere with attachment of pedestals.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Lay out floor panel installation to keep the number of cut panels at floor perimeter to a minimum. Avoid using panels cut to less than 6 inches.
- B. Locate each pedestal, complete any necessary subfloor preparation, and vacuum subfloor to remove dust, dirt, and construction debris before beginning installation.

3.3 INSTALLATION

- A. Install access-flooring system and accessories under supervision of access-flooring manufacturer's authorized representative to produce a rigid, firm installation that complies with performance requirements and is free of instability, rocking, rattles, and squeaks.
- B. Adhesive Attachment of Pedestals: Set pedestals in adhesive, according to access-flooring manufacturer's written instructions, to provide full bearing of pedestal base on subfloor.
- C. Adjust pedestals to permit top of installed panels to be set flat, level, and to proper height.
- D. Install flooring panels securely in place, properly seated with panel edges flush. Do not force panels into place.
- E. Scribe perimeter panels to provide a close fit with adjoining construction with no voids greater than 1/8 inch where panels abut vertical surfaces.
 1. To prevent dusting, seal cut edges of steel-encapsulated, wood-core panels with sealer recommended in writing by panel manufacturer.
- F. Cut and trim access flooring and perform other dirt-or-debris-producing activities at a remote location or as required to prevent contamination of subfloor under already-installed access flooring.
- G. Grounded Flooring Access Panel Systems: Ground flooring system as recommended by manufacturer and as needed to comply with performance requirements for electrical resistance of floor coverings.
 1. Panel-to-Understructure Resistance: Not more than 10 ohms as measured without floor coverings.
- H. Closures: Scribe closures to closely fit against subfloor and adjacent finished-floor surfaces. Set in mastic and seal to maintain plenum effect within underfloor cavity.
- I. Clean dust, dirt, and construction debris caused by floor installation, and vacuum subfloor area as installation of floor panels proceeds.
- J. Install access flooring without change in elevation between adjacent panels and within the following tolerances:
 1. Plus or minus 1/16 inch in any 10-foot distance.
 2. Plus or minus 1/8 inch from a level plane over entire access-flooring area.

3.4 PROTECTION

- A. Prohibit traffic on access flooring for 24 hours and removal of floor panels for 72 hours after installation to allow pedestal adhesive to set.
- B. After completing installation, vacuum access flooring and cover with continuous sheets of reinforced paper or plastic. Maintain protective covering until time of Substantial Completion.
- C. Replace access-flooring panels that are stained, scratched, or otherwise damaged or that do not comply with specified requirements.

END OF SECTION 096900

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on exterior substrates.
 - 1. Concrete.
 - 2. Steel.
 - 3. Galvanized metal.
 - 4. Stainless-steel flashing.

1.2 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples: For each type of paint system and each color and gloss of topcoat.
- C. Product List: For each product indicated. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in other Part 2 articles for the paint category indicated.

2.2 PAINT, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.
- D. Colors: As selected by Architect from manufacturer's full range.

2.3 BLOCK FILLERS

- A. Block Filler, Latex, Interior/Exterior: MPI #4.

2.4 PRIMERS/SEALERS

- A. Primer, Alkali Resistant, Water Based: MPI #3.

- B. Primer, Bonding, Water Based: MPI #17.]
- C. Primer, Bonding, Solvent Based: MPI #69.

2.5 METAL PRIMERS

- A. Primer, Alkyd, Anti-Corrosive for Metal: MPI #79.
- B. Primer, Galvanized, Water Based: MPI #134.
- C. Primer, Galvanized: As recommended in writing by topcoat manufacturer.

2.6 WATER-BASED PAINTS

- A. Latex, Exterior Flat (Gloss Level 1): MPI #10.
- B. Latex, Exterior Semi-Gloss (Gloss Level 5): MPI #11.
- C. Light Industrial Coating, Exterior, Water Based (Gloss Level 3): MPI #161.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Masonry (Clay and CMU): 12 percent.
 - 3. Wood: 15 percent.
 - 4. Portland Cement Plaster: 12 percent.
 - 5. Gypsum Board: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.
- B. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

1. Latex System:
 - a. Prime Coat: Latex, exterior, matching topcoat.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4), MPI #15.

B. CMU Substrates:

1. Latex System:
 - a. Prime Coat: Block filler, latex, interior/exterior, MPI #4.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4), MPI #15.

C. Steel Substrates:

1. Alkyd System:
 - a. Prime Coat: Primer, alkyd, anticorrosive for metal, MPI #79.
 - b. Prime Coat: Shop primer specified in Section 051200 "Structural Steel Framing" where substrate is specified.
 - c. Intermediate Coat: Exterior alkyd enamel matching topcoat.
 - d. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5), MPI #94.

D. Galvanized-Metal Substrates:

1. Latex System:

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- a. Prime Coat: Primer, galvanized metal, as recommended in writing by topcoat manufacturer for exterior use on galvanized-metal substrates with topcoat indicated.
- b. Intermediate Coat: Latex, exterior, matching topcoat.
- c. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4), MPI #15.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on interior substrates.
 - 1. Concrete.
 - 2. Concrete masonry units (CMU).
 - 3. Steel.
 - 4. Galvanized metal.
 - 5. Gypsum board.

1.2 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples: For each type of paint system and in each color and gloss of topcoat.
- C. Product List: For each product indicated. Include printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in other Part 2 articles for the paint category indicated.

2.2 PAINT, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. Colors: As selected by Architect from manufacturer's full range.

2.3 BLOCK FILLERS

- A. Block Filler, Latex, Interior/Exterior: MPI #4.

2.4 PRIMERS/SEALERS

- A. Primer, Alkali Resistant, Water Based: MPI #3.
- B. Primer Sealer, Interior, Institutional Low Odor/VOC: MPI #149.

- C. Primer Sealer, Alkyd, Interior: MPI #45.

2.5 METAL PRIMERS

- A. Primer, Alkyd, Anti-Corrosive, for Metal: MPI #79.
- B. Primer, Galvanized, Water Based: MPI #134.

2.6 WATER-BASED PAINTS

- A. Latex, Interior, Flat, (Gloss Level 1): MPI #53.
- B. Latex, Interior, (Gloss Level 2): MPI #44.
- C. Latex, Interior, (Gloss Level 3): MPI #52.
- D. Latex, Interior, (Gloss Level 4): MPI #43.
- E. Latex, Interior, Semi-Gloss, (Gloss Level 5): MPI #54.
- F. Latex, Interior, Institutional Low Odor/VOC, Flat (Gloss Level 1): MPI #143.
- G. Light Industrial Coating, Interior, Water Based (Gloss Level 3): MPI #151.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Masonry (Clay and CMU): 12 percent.
 - 3. Wood: 15 percent.
 - 4. Gypsum Board: 12 percent.
 - 5. Plaster: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 INTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Nontraffic Surfaces:
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.
 - b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
 - c. Topcoat: Latex, interior, institutional low odor/VOC, (Gloss Level 2), MPI #144.
 - 2. High-Performance Architectural Latex System:
 - a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
 - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
 - c. Topcoat: Latex, interior, high performance architectural, (Gloss Level 3), MPI #139.
 - 3. Water-Based Clear Sealer System:

- a. First Coat: Sealer, water based, for concrete floors, MPI #99.
 - b. Topcoat: Sealer, water based, for concrete floors, MPI #99.
- B. CMU Substrates:
1. High-Performance Architectural Latex System:
 - a. Block Filler: Block filler, latex, interior/exterior, MPI #4.
 - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
 - c. Topcoat: Latex, interior, high performance architectural, (Gloss Level 3), MPI #139.
- C. Steel Substrates:
1. Alkyd System:
 - a. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #79 or primer, alkyd, quick dry, for metal, MPI #76.
 - b. Prime Coat: Shop primer specified in Section 051200 "Structural Steel Framing" where substrate is specified.
 - c. Intermediate Coat: Alkyd, interior, matching topcoat.
 - d. Topcoat: Alkyd, interior, (Gloss Level 3), MPI #51.
- D. Galvanized-Metal Substrates:
1. Alkyd System:
 - a. Prime Coat: Primer, vinyl wash, MPI #80.
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, (Gloss Level 3), MPI #51.
- E. Gypsum Board Substrates:
1. Latex System:
 - a. Prime Coat: Primer sealer, latex, interior, MPI #50.
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, (Gloss Level 2), MPI #44.

END OF SECTION 099123

SECTION 102113 - TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Solid-polymer toilet compartments configured as toilet enclosures and urinal screens.

- B. Related Sections:

- 1. Division 10 Section "Toilet Room Accessories" for toilet tissue dispensers, grab bars and similar accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

- B. Shop Drawings: For toilet compartments. Include plans, elevations, sections, details, and attachments to other work.

- 1. Show locations of cutouts for compartment-mounted toilet accessories.
 - 2. Show locations of centerlines of toilet fixtures.
 - 3. Show overhead support or bracing locations.

- C. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:

- 1. Each type of material, color, and finish required for units, prepared on 6-inch- square Samples of same thickness and material indicated for Work.
 - 2. Each type of hardware and accessory.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For toilet compartments to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84, or another standard acceptable to authorities having jurisdiction, by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" and ICC/ANSI A117.1 for toilet compartments designated as accessible.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Castings: ASTM B 26/B 26M.
- B. Aluminum Extrusions: ASTM B 221.
- C. Brass Castings: ASTM B 584.
- D. Brass Extrusions: ASTM B 455.
- E. Steel Sheet: Commercial steel sheet for exposed applications; mill phosphatized and selected for smoothness.
 - 1. Electrolytically Zinc Coated: ASTM A 879/A 879M, 01Z.
 - 2. Hot-Dip Galvanized: ASTM A 653/A 653M, either hot-dip galvanized or galvanized.
- F. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.
- G. Stainless-Steel Castings: ASTM A 743/A 743M.
- H. Zamac: ASTM B 86, commercial zinc-alloy die castings.
- I. Plastic Laminate: NEMA LD 3, general-purpose HGS grade, 0.048-inch nominal thickness.

2.2 SOLID-POLYMER UNITS (TP1, TP2)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the basis of design toilet compartments as indicated on Finish Schedule or by one of the following or approved comparable product:
 - 1. Scranton Products
 - 2. Bradley

- B. Toilet-Enclosure Style: Overhead braced.
- C. Urinal-Screen Style: Wall hung.
- D. Door, Panel, Screen, and Pilaster Construction: Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.
 - 1. Heat-Sink Strip: Manufacturer's standard continuous, extruded-aluminum or stainless-steel strip fastened to exposed bottom edges of solid-polymer components to prevent burning.
 - 2. Color and Pattern: One color and pattern in each room as selected by Architect from manufacturer's full range "Stainless, EX Texture".
- E. Pilaster Shoes: Manufacturer's standard design; stainless steel.
- F. Brackets (Fittings):
 - 1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.
- G. Overhead Cross Bracing for Ceiling-Hung Units: As recommended by manufacturer and fabricated from solid polymer.

2.3 ACCESSORIES

- A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.
 - 1. Material: Stainless steel.
 - 2. Hinges: Manufacturer's standard.
 - 3. Latch and Keeper: Manufacturer's standard surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
 - 4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.
 - 5. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
 - 6. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.
- B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.
- C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel.

2.4 FABRICATION

- A. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

- B. Door Size and Swings: Unless otherwise indicated, provide 24-inch- wide, in-swinging doors for standard toilet compartments and 36-inch- wide, out-swinging doors with a minimum 32-inch- wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
 - 1. Maximum Clearances:
 - a. Pilasters and Panels: 1/2 inch.
 - b. Panels and Walls: 1 inch.
- B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.

3.2 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION 102113

SECTION 102800 - TOILET ROOM ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories as shown and scheduled.
 - 2. Miscellaneous accessories.
- B. Related Sections:
 - 1. Division 05 Section "Metal Fabrications" for concealed supports.

1.3 QUALITY ASSURANCE

- A. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper anchorage, operation and servicing of accessory units.
- B. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in other work and coordinate their delivery to avoid delay.
- C. Products: Provide products of same manufacturer for each type of accessory unit and for units exposed in same areas.
- D. Code Requirements: Provide grab bars of types, capable of sustaining loads, as required by authorities having jurisdiction.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data, catalogue cuts and installation instructions for each toilet accessory.
- B. Setting Drawings: Provide setting drawings, templates, instructions, and directions for installation of anchorage devices in other work.
- C. Samples: Submit samples of toilet accessories as requested by Architect.

1.5 SYSTEM PERFORMANCE

- A. Grab bars in handicap toilets shall be capable of supporting 250 pounds for 5 minutes. Reinforce support system to achieve great rigidity so that glass wall panels do not break.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver accessories to the site, ready for use, in the manufacturer's original and unopened containers and packaging, bearing labels as to type or material, manufacturer's name and brand name.
- B. Store and handle accessories in accordance with manufacturer's instructions.
- C. Remove materials which are disfigured, scratched or not suitable and replace with new materials.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gauge minimum, unless otherwise indicated.
- B. Brass: Leaded and unleaded, flat products, rods, shapes, forgings, and flat products with finished edges.
- C. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B456, Type SC 2.
- D. Galvanized Steel Sheet: ASTM A527, G60.
- E. Fasteners, General: No exposed fastening devices permitted on exposed frames.
 - 1. Exposed Fasteners: Match finishes on which they are being used.
 - 2. Concealed Fasteners: Galvanized or cadmium plated.

2.2 TOILET ACCESSORIES

- A. Basis of Design Manufacturers and Products: Subject to compliance with requirements, provide products indicated on the Finish Schedule or by one of the following or other approved comparable manufacturers.
 - 1. American Specialties, Inc.
 - 2. Bradley Corp.

2.3 FABRICATION

- A. Stamped names or labels on exposed faces of toilet accessory units are not permitted. Unobtrusive labels on surfaces not exposed to view are acceptable.
- B. Fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800

SECTION 122413 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Manually operated roller shades with single rollers.

- B. Related Sections:

- 1. Division 06 Section "Miscellaneous Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- 1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

- B. Samples for Initial Selection: For each type and color of shade and material.

- 1. Include Samples of accessories involving color selection.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each type of shadeband material, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roller shades to include in maintenance manuals.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

- A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
 - 1. Bead Chains: Manufacturer's standard.
 - a. Loop Length: Full length of roller shade.
 - b. Limit Stops: Provide upper and lower ball stops.
 - c. Chain-Retainer Type: Clip, jamb mount.
- B. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 - 1. Roller Drive-End Location: Right side of inside face of shade.
 - 2. Direction of Shadeband Roll: Regular, from back of roller.
 - 3. Shadeband-to-Roller Attachment: Manufacturer's standard method.
- C. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
- D. Shadebands:
 - 1. Shadeband Material: Light-filtering fabric.
 - 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Color and Finish: As selected by Architect from manufacturer's full range.
- E. Installation Accessories:

1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
 - a. Shape: L-shaped.
 - b. Height: Manufacturer's standard height required to conceal roller and shadeband when shade is fully open, but not less than 4 inches.
2. Endcap Covers: To cover exposed endcaps.
3. Closure Panel and Wall Clip: Removable aluminum panel designed for installation at bottom of site-constructed ceiling recess or pocket and for snap-in attachment to wall clip without fasteners.
 - a. Closure-Panel Width: 2 inches.
4. Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.3 SHADEBAND MATERIALS

- A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
 1. Source: Roller-shade manufacturer.
 2. Type: PVC-coated fiberglass.
 3. Weave: Mesh.
 4. Orientation on Shadeband: Up the bolt.
 5. Openess Factor: 2-3%
 6. Color: As selected by Architect from manufacturer's full range.

2.4 ROLLER-SHADE FABRICATION

- A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
 1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch. Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch.
 2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.
- C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible except as follows:
 1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER-SHADE INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.

3.3 ADJUSTING

- A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

- A. Clean roller-shade surfaces after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION 122413

SECTION 123661 - SIMULATED STONE COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Quartz agglomerate countertops and backsplashes.

1.3 ACTION SUBMITTALS

- A. Product Data: For countertop materials.
- B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.
- C. Samples for Initial Selection: For each type of material exposed to view.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions of countertops by field measurements before countertop fabrication is complete.

1.5 COORDINATION

- A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design Product: Subject to compliance with requirements, provide Basis of Design product as shown on Finish Schedule or approved comparable product.

2.2 COUNTERTOP MATERIALS

- A. Composition: Quartz agglomerate in a cement matrix.
- B. Physical Performance Characteristics:
 - 1. Compressive Strength: 13,000 psi, in accordance with ASTM C 109.
 - 2. Flexural Strength: 890 psi, in accordance with ASTM C 293.
 - 3. Specific Gravity: 2.31, in accordance with ASTM C 97.

4. Porosity/Absorption: 0.18 percent, unsealed, in accordance with ASTM C 642.
5. Chemical Durability: 0.05 percent expansion, in accordance with ASTM C 1260 for ASR Reactivity.
6. Freeze Thaw: 0.49 percent expansion, 300 cycles, in accordance with ASTM C 666.
7. Fire Rating: Class 1 (A), in accordance with ASTM E 84.
 - a. Flame spread index: 0.
 - b. Fuel contribution: 0.
 - c. Smoke density index: 0.
8. Colors and Patterns: Refer to Finish Schedule on Drawings.

2.3 FABRICATION

- A. Shop Assembly: Fabricate using standard stone cutting equipment in accordance with manufacturer's fabrication and installation guidelines.
 1. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions.
 2. Form joints between components without conspicuous joints.
 3. Provide factory cutouts for plumbing fittings and bath accessories as indicated on Drawings.
 4. Rout and finish component edges with minimum radius of 1/8.
 - a. Rout cutouts, radii and contours to template.
 - b. Shape inside corner radius to minimum of 1/4 inch to relieve corner stress.
 - c. Smooth edges.
 - d. Repair or replace defective and inaccurate work.
 5. Fabricate with loose backsplashes for field assembly.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions including but not limited to the following:
- B. Install countertops level to a tolerance of 1/8 inch in 8 feet.

- C. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Pre-drill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
 - 1. Install backsplashes to comply with manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
- D. Four-Sided Perimeter Support: Provide a four-sided perimeter frame for countertops. Provide front-to-back support every 36 inches.
- E. Cantilevers: Cantilevers less than 9 inches do not always require additional support. Cantilevers of 9 to 12 inches require either corbels or front to back rod support every 24 inches. Cantilevers greater than 12 inches require legs, columns or either stainless steel or aluminum reinforcing rods every 24 inches.
- F. Support Rods: Either stainless steel or aluminum to avoid rusting which could produce bleed through staining.
- G. Clean and polish surfaces in accordance with manufacturer's care and maintenance instructions.

3.4 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION 123661

SECTION 140120 - ELEVATOR MAINTENANCE AGREEMENT

PART 1 - GENERAL

1.1 SUMMARY

A. DEFINITIONS OF TERMS

1. Purchaser/Owner:
2. Purchaser's/Owner's Agent/Designee/Rep.:
3. Elevator Contractor/Contractor/Vendor:
4. Contractor/Elevator Contractor/Vendor: Any persons, partners, firm, corporation or officer(s) of such companies having an agreement with the "Purchaser / Owner" to furnish qualified labor and materials for the execution of the services and maintenance work described herein.
5. Consultant: CBA Elevator Consultants, 190 Main Street, Suite 402, Hackensack, NJ 07601.
6. Agreement/Contract/Contract Documents: This specific document, all pages; and any appendices, alternates, addenda, or substitutions as may be referenced under exhibits or riders approved by the parties for the final execution of the Agreement.

1.2 GENERAL CONDITIONS

A. ABBREVIATIONS AND SYMBOLS

1. Abbreviations for associations, institutions, societies, reference documents and/or governing agencies, that may appear in the Contract Document, shall mean the following:
 - a. AIA - American Institute of Architects
 - b. ANSI - American National Standards Institute
 - c. ASME - American Society of Mechanical Engineers
 - d. IBC - International Building Code
 - e. AHJ - Authority Having Jurisdiction
 - f. GA - Governing Agency
 - g. NEC - National Electrical Code
 - h. OSHA - Occupational Safety and Health Administration

B. SUPERSEDE

1. This document constitutes the entire understanding between the parties hereto with respect to the subject matter hereof and shall supersede all previous negotiations, commitments, and understandings.
2. Contractor shall give all requisite notices to the proper authorities, obtain all official inspections, permits, and licenses made necessary by the work and shall comply with all laws, ordinances, rules, and regulations pertaining thereto. If requested, Contractor shall provide the Owner with any required inspection approval certificates. In addition, the Contractor shall conform to the rules and regulations of the Local Municipal Authority having jurisdiction, National Board of Fire Underwriters, the National Electrical Code, and the Latest American National Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks, where applicable. If the Contractor performs any work contrary to or not in conformity with such laws, ordinances, rules and regulations, Contractor shall bear all costs incurred from such actions and shall remedy such condition.

C. ADDITIONAL COVERAGE

1. All other materials, solid-state components, equipment, etc. not mentioned above which are part of the elevator installation are included in this agreement.

D. INSPECTION

1. The quality of maintenance service shall be subject to inspection by the Owner or his representative at any time. Should it be found that the quality of the maintenance service being performed is not satisfactory, and that the requirements of the specifications are not being met, the Owner may terminate the contract in accordance with the provisions in Section 1.6, and employ any other Contractor to place the equipment in a satisfactory condition. The existing Contractor shall be liable to the Owner for such costs thereof.

E. MAINTENANCE CODE REQUIREMENTS

1. Notwithstanding anything to the contrary herein, Contractor shall perform all maintenance as per the requirements of Section 8.6, "Maintenance, Repair and Replacements" in accordance with:
 - a. ASME A17.1-2013, A17.7-2007 and IBC-2015 NJ Edition and Chapter 30
 - b. This shall include the installation of required code data plates on all elevators where they are currently not provided. Contractor must update or replace code data plate as required for component replacements or upgrades as per code requirement.
2. Contractor shall provide the required written Maintenance Control Program and Maintenance Records, and Maintenance Records must be kept in the machine room.

F. STOP WORK ORDER

1. The Owner reserves the right to stop the work covered by this proposal and contract at any time that he deems the successful Bidder to be unable or incapable of performing the work to the satisfaction of the Owner. In the event of such stopping, the Owner shall have the right to arrange for the completion of the work in such manner, as he may deem advisable. In the event that the Owner stops the work as provided herein, the Contractor shall be given written notice thereof together with the reason therefore, and the Contractor shall have ten working days to respond thereto, before any such stop order shall become effective.

G. PROTECTION OF PERSONS AND PROPERTY

1. The Contractor shall employ and supervise required safety programs and take all necessary precautions while performing his work.
2. The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury, or loss to:
 - a. All employees and others persons on the Work site.
 - b. All materials and equipment for this particular job site, whether on or off site.
 - c. Other property at or near the site.
 - d. Cause the least possible interference with or obstruction to areas on or near which the work covered hereby may be performed.
3. The Contractor shall comply with all applicable laws, ordinances, rules, regulations, and lawful orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. He shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.
4. All damages or loss to any property referred to in Paragraph B, above, caused in whole or in part by the Contractor, or his Subcontractor, or anyone directly or indirectly employed by any of them, shall be remedied by the Contractor.

5. The Contractor shall designate a responsible member of his Company whose duty shall be the prevention of accidents and submit OSHA training credentials for all maintenance personnel. In any emergency affecting the safety of persons or property, the Contractor shall act to prevent threatened damage, injury or loss and notify the owner of such upon discovery.

H. CONTRACTORS LIABILITY INSURANCE

1. The Contractor shall not commence work under this Contract until it has obtained and provided owner with proof of the following insurance.
2. The Contractor will, throughout the duration of this contract or any contract or any work authorized under purchase order or otherwise, at its expense, carry and from time to time renew Worker's Compensation Insurance, Public Liability Insurance with limits not less than described as follows:
 - a. Comprehensive General Liability
 - 1) General Aggregate: \$5,000,000
 - 2) Products Comp/Aggregate: \$2,000,000
 - 3) Personal Injury: \$1,000,000
 - 4) Each Occurrence: \$2,000,000
 - b. Comprehensive Automobile
 - 1) Combined Single Limit: \$1,000,000
 - c. Excess Umbrella Liability
 - 1) Each Occurrence: \$5,000,000
 - 2) Aggregate: \$5,000,000
 - d. Workers Compensation: Statutory Limitations
3. The Contractor hereby agrees to indemnify and hold harmless the Owner from and against, liability claims, demands and costs, fees and expenses (including reasonable attorneys', engineers', consultants' and experts' fees,) incurred by Owner or any other indemnity hereunder on account of injury to persons including death resulting therefrom and damage to property caused in whole or in part by Contractor only to the extent of work performed by Contractor, employees, and agents of the Contractor and Contractor's property, except from and against such claims and demands arising solely and directly out of negligence of the Owner. This indemnity covers the acts and omissions of Contractor's agents, employees, licensees and subcontractors and insures to the benefit of Owner and its directors, officers and employees.
4. All damage or loss to the property, caused in whole or in part by the Contractor, any subcontractor, and sub-subcontractor or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, shall be remedied by the Contractor, at absolutely no cost to Consultant or Owner. Consultant and Owner may take any and all steps each may deem appropriate to avoid, prevent or remedy any situation; all of which shall be at the Contractor's expense. Contractor shall indemnify and hold harmless Owner and its directors, officers and employees with respect to any claim arising from its work, installation or supervision hereunder.
5. The Contractor shall, at his or its own expense, defend any and all actions at law brought against the Owner or any other indemnity hereunder based thereon and shall pay all reasonable attorney fees and all expenses and promptly discharge any judgments arising therefrom. These conditions shall also apply to any subcontracted operations.
6. The Owner agrees to give the Contractor notice within a reasonable time (Sunday and holidays exempted) of any accidents, alteration or change affecting the equipment covered by this Contract and of any change of ownership. It is understood and agreed that the Contractor will notify the Owner immediately when any equipment becomes unsafe or operating in a manner which might cause injury to anyone using said equipment and it is further understood and agreed that the Contractor will immediately remove any equipment from service when the equipment becomes unsafe or operating in a manner which might cause injury to anyone using said equipment.

I. MAINTAINING GOOD RELATIONS

1. Contractor agrees that it shall not at any time prior to or during the term of this Contract, either directly or indirectly use any sub-contractors and/or labor and/or materials which would or will create any difficulty with other contractors and/or subcontractors and/or labor engaged by Contractor or Owner or others in the construction, maintenance and/or operation of the development or any part thereof.

J. ASSIGNMENT

1. Contractor shall not assign this Contract or any interest therein or delegate any duties hereunder without the prior written consent of the Owner in each instance.
2. The violation by Contractor of any of the covenants, agreements, terms, provisions and conditions contained in this section shall be deemed a substantial default by Contractor under the terms of this Contract.

K. FORCE MAJEURE

1. Neither party shall be liable by reason of any failure or delay in the performance of its obligations due to strikes, riots, fires, explosions, acts of God, war, governmental action or any other cause which is beyond the reasonable control of such parties. The performance of such party shall be excused for such reasonable time as may be required to resume performance following cessation of such cause.

L. CONTRACTOR'S LICENSE

1. If required by law, Contractor certifies that it is licensed in the state, municipality and/or local jurisdiction where the property is located to perform the elevator maintenance services pursuant to this Agreement, and that the license will be maintained current and valid for the Initial Term and any renewal term of this Agreement, including any new requirements enacted.

M. COMPLIANCE WITH LAW

1. Contractor shall obtain any and all government permits and licenses required for the proper and lawful conduct of the Contractor's business at Contractor's sole cost and expense. If the failure to secure such license and/or permit would, in any way, affect Owner, Contractor, at Contractor's sole expense, shall be responsible to clear all violations and pay all fines imposed, and shall at all times comply with the terms and conditions of each such license or permit.
2. Contractor shall, as part of its operation, comply with all applicable laws, orders and regulations of any governmental agencies and authorities having jurisdiction in these matters, at no additional cost to the Contract or Owner.
3. Contractor shall provide Owner with a proposed schedule of inspections, tests and maintenance for the coming year; such schedule to be provided on each subsequent anniversary date. Schedule shall incorporate minimum requirements as specified herein. Such schedule shall include anticipated times when units will be taken out of service and duration of same. If for any reason this schedule is modified at any time, Management shall be notified.
4. Contractor shall comply with regulations of all other governmental agencies having jurisdiction, and written recommendations of Owner's insurance carrier or independent elevator consultant for repairs as covered herein.
5. Owner shall have the right to cancel this contract at any time immediately upon written notice if the Contractor ceases to meet the requirements of this clause.

N. SUBCONTRACTING

1. Contractor shall not subcontract any work or responsibility in this Contract, except items that are out of normal scope, such as machine and motor repairs, without the prior written consent of Owner.

O. NON-WAIVER PROVISIONS

1. The failure of Owner to insist, in one or more instances, upon the strict performance of any of the covenants, terms, provisions or conditions of this Contract or to exercise any election herein contained, shall not be construed as a waiver or relinquishment for the future of such covenant, agreement, term, provision, conditions or election, but the same shall continue and remain in full force and effect. No waiver by Owner of any covenant, agreement, term provision, or conditions of this Contract shall be deemed to have been made unless expressed in writing and signed by Owner.

P. MECHANIC'S LIEN

1. Contractor agrees that if any mechanic's lien is filed against the building for work done, services claimed to have been rendered or materials claimed to have been furnished in connection with or pursuant to the provision of this contract, that Contractor shall cause such mechanic's lien to be discharged within 30 days after filing, at Contractor's expense by discharge or bonding, and proof of same shall be provided by Contractor to Owner.
2. Contractor will hold Owner, its directors, officers, agents and employees harmless against any such lien and any expenses or fees, including reasonable attorneys fees, incurred in connection therewith. Upon Contractor's failure to comply herewith, the same may be furnished by Owner at Contractor's sole expense.

Q. LABOR STRIKE OR LOCKOUT

1. In the event of a labor dispute, including but not limited to a strike or lockout, Contractor must continue to meet the standards of service required by this Contract. In the event that an equal level of service is not provided, Owner shall have the right to reduce or suspend the monthly payment for maintenance until the labor dispute is resolved or service resumes, or to cancel this contract immediately upon written notice in order to obtain the services of another maintenance Contractor.

R. COMPETENCY OF ELEVATOR CONTRACTOR

1. The Contractor shall prove to the satisfaction of the Owner that his Company has actively engaged in the maintenance, service, repair, and replacement of materials and equipment in elevators of similar operations, control system, speed, and capacity as those covered by this Agreement, for at least the past five years.
2. The Contractor shall show that he has the necessary facilities located within a reasonable distance from the site, to perform all the services required under this specification. If requested, the Contractor shall show proof of the following:
 - a. That his present Company has been in operation for at least the past five years and is capable of performing all the work described, in these Specifications. Include the following:
 - 1) List of employees responsible for this project including, names, titles and number of years of service with the Contractor's Company.
 - 2) The location and address of the main facility that will service this Contract.
 - b. That his facilities are equipped with or has access to:
 - 1) Machine shop facilities capable of performing all of the normal tasks and functions typically encountered in the trade.
 - 2) Turning tools capable of handling any hoisting machine and motor on the job site.
 - 3) Machine tools capable of turning main motor drive sheave grooves on the machine.
 - 4) All tools necessary to perform tasks and functions typically encountered in the trade.
 - 5) New replacement parts (coils, contracts, springs, brushes, relays, rollers, bearings and packing where applicable).

3. The Contractor shall use only skilled, competent, trained elevator personnel, who will be properly supervised and licensed if required by the authority having jurisdiction.

S. MANUFACTURER'S SUPPORT AVAILABILITY

1. Contractor must not be bound by support barriers with any original equipment manufacturer. Contractor should submit a statement regarding their ability to gain technical support and/or parts for each type of elevator equipment serviced under this contract. This should include, but not be limited to, controls, solid-state drive components, door equipment, emergency communication systems, rotating equipment, pump and power units.

T. SPARE PARTS

1. The contractor shall have minor spare parts maintained at the site.
 - a. The Contractor shall provide (at the building) storage cabinets for spare parts and metal containers for storage of waste and other flammable materials.
2. Additionally, the Contractor shall have available for immediate delivery and installation (maintained off-site), sufficient supply of the following emergency spare parts for the repair of each elevator system concerned. The inventory shall include, but not necessarily be limited to, the following:
 - a. Lamps, minimum two each type
 - b. Electronic and solid-state components and/or boards for each type and size used
 - c. Controller contacts and coils for each size and type used
 - d. Relays and switches, minimum one of each type used
 - e. Selector tapes and selector motor
 - f. Door interlocks
 - g. Brake magnets, cores, coils, and related items for brake repairs
 - h. Transformers, regulators and rectifiers for each type and size used
 - i. Limit switches and terminal stopping switches
 - j. Guide rollers for car and counterweight
 - k. Stator complete with windings for all motors
3. All OEM parts, replacement parts, and major repairs shall be kept within a 25-mile radius of the site and shall be deliverable within 24 hours.
4. Contractor guarantee's they can obtain all necessary spare parts.

U. DRAWINGS AND WIRING DIAGRAMS

1. Drawings and wiring diagrams which are furnished either by the Owner or by the Contractor to facilitate the Contractor's work shall be maintained and revised by him periodically as changes occur. At the expiration of the contract, the Contractor shall turn over to the Owner three copies of the drawings and wiring diagrams, completely revised to date, covering the elevator. These drawings and wiring diagrams shall faithfully represent the "as modified" condition existing at the expiration date. These diagrams are and shall be the property of the Owner and turned over to the Owner upon demand.

V. MATERIALS AND WORKMANSHIP

1. All materials and parts are to be new and of the best quality of the kind specified. Installation of such materials shall be accomplished in a neat workmanlike manner. In case the Contractor should receive written notification from the Owner stating the presence of inferior, improper, or unsound materials or workmanship, the Contractor shall, within twenty-four (24) hours proceed to remove such work or materials and make good all other work or materials damaged thereby. If the Owner permits said work or materials to remain, the Owner shall be allowed the difference in value or shall, at its election, have the right to have said work or materials repaired or replaced as well as the damage caused thereby, at the expense of the Contractor, at any time during the Contract term; and neither payments made to the Contractor, nor any other acts of the Owner shall be construed as evidence of acceptance and waiver.

W. EQUAL OPPORTUNITY

1. The Contractor shall maintain policies of employment as follows:
 - a. The Contractor and all Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, or age. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, national origin, or age. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.
 - b. The Contractor and all Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, national origin, or age.

X. EEO EMPLOYMENT PRACTICES AND COMPLIANCE

1. The parties hereto agree to voluntarily comply with the basic tenants of the Equal Employment Opportunity Requirements of Executive Order 11246, as amended by Executive Order 11375, Title VII of the Civil Rights Restoration Act of 1987, various state Fair Employment Practices Acts, and any other federal or state laws pertaining to equal employment opportunity, and that they will not discriminate against any employee or applicant for employment on the basis of race, color, religion, disability, age, sex, national origin or ancestry in matters pertaining to recruitment, hiring, training, upgrading, transfer, compensation or termination. In addition, Contractor agrees to indemnify and hold harmless Owner, its parent, affiliates, employees, agents, representatives, and any of its or their officers, directors, employees, agents, successors, or assigns, harmless from all loss, cost or expense, including reasonable attorneys' fees for any violation by Contractor, its employees, agents, representatives, or assigns of the rules and regulations set forth and enforced by the Immigration and Naturalization Services pursuant to the Immigration and Nationality Act, as well as the Illegal Immigration Reform and Immigrant Responsibility Act which obligation to indemnify shall survive the expiration or termination of this Agreement.
2. Contractor agrees to maintain comprehensive records of all services performed under this Agreement. These records will be available for inspection by Owner at anytime during regular business hours and upon 48 hours written notice.

Y. PROTECTION OF WORK AND PROPERTY

1. The Contractor shall continuously maintain adequate protection of all his work from damage and shall protect the Owner's property from injury or loss arising out of this contract. The Contractor shall make good any such damages, injury or loss, except such as may be directly caused by agents or employees of the Owner. The Contractor shall provide all barricades required to protect open hoistways or shafts per OSHA regulations. Such protection shall include any necessary guards or other barricades for employee protections during and after the maintenance procedure.

Z. REPRESENTATION

1. Contractor represents that it will:
 - a. Perform elevator maintenance services under this Agreement in accordance with acceptable industry professional and ethical standards,
 - b. Not proceed with performance of various aspects of the Services if costs are chargeable to the owner, unless authorized by the Owner's Representative at the property,
 - c. Conduct any handling of Owner's Confidential Information in accordance with acceptable industry professional and ethical standards,

- d. Not represent to any third party that it has authority to sign, endorse or represent a contractual relationship with or in Owner's name, or enter into any agreement on behalf of Owner in connection herewith (unless expressly authorized in writing by Owner),
 - e. Safeguard the physical security of Owner's Confidential Information if it has access to or possession of such information,
 - f. Ensure that only "Authorized Representatives" of this Agreement, will have access to any of Owner's Confidential Information while rendering the Services, and that it will not be copied, or disseminated to anyone other than the Authorized Representative.
 - g. Ensure that all of its employees, representatives, agents or assigns will not solicit any of Owner's employees for any purpose. The Parties agree that any alteration to any of the Addenda or Exhibits hereto shall be null and void, unless made in writing by mutual consent of the Parties. The obligations of Contractor set forth herein shall remain in full force and effect for the later of a period of one (1) year from the date of termination or expiration of this Agreement, or the date the Confidential Information is returned to whomever disclosed such information, after the date of termination or expiration of this Agreement.
2. This agreement and all material included shall be considered confidential. Owner and Consultant require that this agreement not be forwarded to any third party for evaluation or any other purpose without the expressed written consent of both the Owner and Consultant.

1.3 SCOPE OF WORK

A. HOURS OF WORK

1. All scheduled work shall be performed during regular working hours of the regular working day of the elevator trade, 8:00 A.M. to 4:30 P.M., Monday through Friday, except union designated holidays.
2. Scheduled repairs and/or other major adjustment procedures necessitating removal of an elevator for an extended period of time must be scheduled through the Owner's Representative. The Owner's Representative retains the right to have such work completed during overtime hours with the understanding the Contractor shall pay for the regular labor portion and the Owner's extraordinary obligation is extra premium labor costs only.

B. VIOLATIONS

1. All work necessary to correct any violating conditions and submit necessary paperwork to clear ALL active elevator violations at this location shall be the responsibility of the Contractor within three months of the date of commencement of this Contract and subsequently clearing any future violations received from the Authority Having Jurisdiction (AHJ) or municipal authority.

C. EMERGENCY CALL BACK SERVICE

1. The Contractor shall provide 24 hour per day, 7 days per week including weekends and holidays call back service without additional charge. This consists of dispatching qualified employees in response to emergency calls from the owner by telephone or otherwise, for adjustments or repairs on any day of the week, at any hour of the day or night. The Contractor agrees to have a qualified mechanic report to the building after receipt of a request for service by telephone or otherwise from the Owner or his representative. The Owner shall be provided with names and telephone numbers of the persons to be contacted for this service. This 24-hour callback service includes all repair work to place a shut down elevator in proper operation.
 - a. Call back service in response to passenger entrapment's shall be within one-half hour (1/2) for calls during normal business hours and one (1) hour after normal business hours
 - b. Call back service for out-of-service units shall be provided within one (1) hour during normal business hours and within two (2) hours between 6:00 a.m. – 8:00 a.m. and 4:30 p.m. – 6:30 p.m. Monday through Friday, except holidays.

- c. Call back service for out-of-service units shall be provided within three (3) hours at all other times not specified above.
 - d. Call back service for non-essential system malfunctions that do not constitute an operational or safety condition shall be provided during normal working hours of regular working days within four (4) hours of the request for service.
2. Emergency repairs shall be made in a timely manner to restore the elevators to operating order. If repairs cannot be made immediately, the mechanic or Contractor representative shall notify the building manager or superintendent as to the reason.

D. SCHEDULED SERVICE PROCEDURES

1. The Elevator Contractor shall provide all labor, material, tools, and supplies necessary to perform a full maintenance service program as specified, including inspections, adjustments, repairs, replacements, cleaning and tests as herein specified for all equipment under this contract.
2. The Contractor shall use skilled, trained men directly employed and supervised by his organization. They shall be qualified to keep the elevator equipment properly adjusted and will use all reasonable care in maintaining the equipment in a proper and safe operating condition.
3. The Contractor is to make any and all inspections and adjustments to the elevator system in accordance with the manufacturer's recommendations. Maintenance procedure charts shall be located in each elevator machine room. Each check chart in the machine room(s) must be kept up to date so as to reflect the scheduled items of maintenance. Upon completion of the maintenance, the Contractor must initial the check chart to indicate what work has been completed. Contractor shall provide additional charts as needed. In addition to the check chart located in the elevator motor room(s), Contractor shall furnish work tickets to the Owner which will indicate all the malfunctions of the elevators and the corrective work performed by the Contractor. The work tickets shall specify due dates and time in which the work was performed and shall be signed by the Contractor's mechanic.
4. All regularly scheduled inspections shall be recorded or signed by the Contractor's mechanic. Work tickets shall also show time arrived and departed from the job. In the event the Contractor has the records stored electronically, then they shall provide free and simple access to the files.

E. ELEVATOR PERFORMANCE

1. The control system shall be maintained to provide smooth acceleration and retardation. Contractor must maintain elevators in accordance with the original equipment manufacturer (O.E.M.) design performance specifications (including floor-to-floor times, door timing, rated speed, group supervisory system, etc.). If the system is not maintained within the accepted industry standards, then the Contractor shall supply necessary labor to bring elevator to within standards. See Section 1.8 Item 2 for the Performance Standards.

F. SCOPE OF COMPONENT – REPAIR AND REPLACEMENT

1. The Contractor will use competent trained personnel directly employed and supervised by the Contractor. They shall be qualified to keep the elevator and/or escalator equipment properly adjusted and will use all reasonable care in maintaining the equipment in a proper and safe operating condition. They shall regularly and systematically examine, adjust, lubricate and clean; and when conditions warrant, repair or replace any mechanical, electrical, moving or stationary parts as listed, providing the specific item is incorporated within, or a segment of the elevator unit. The Contractor hereby takes full responsibility to repair or replace to manufacturer's standards all components of the elevator and/or escalator equipment not specifically excluded, including, but not limited to, the following:
 - a. Machine: Worm and gear, thrust bearings, lateral bearings, drive and deflector sheaves, couplings, sheave bearings, brake pulley, brake coil, brake shoes and linings, brake pins and brake contacts, sound isolation, and other component parts.
 - b. Deflector / Secondary / Hoistway: Deflector sheave, bearings, car and counterweight buffers, car and counterweight guide rails, top and bottom limit/normal/final switches, counterweight

- and counterweight guide shoes including rollers or gibs, slowdown switches, leveling switches and associated cams and vanes, electronic components and steel tape assemblies, car and counterweight 2:1 sheaves.
- c. Controller / Selector: All relays, rectifiers, regulators, solid state components, resistors, condensers, transformers, motors, cams, switches, bearings, wiring, cable, tape, driving mechanism, contacts, conductors, dash pots, timing devices, selector switches, computer devices, steel selector tape, mechanical and electrical driving equipment, coils, solenoids, resistance grids, magnets and inductors, switch assemblies, and springs, microprocessors, transducers and printed circuit boards, arc deflectors, fuses, and load weighing and transducers.
 - d. Motor / Motor Drive: Motor windings, gearless hoist motors, stator, brushes, holders, rotating elements, bearings, field coils, armature and stator, shaft, collector and slip rings, rotor, commutator, transformers and all solid state equipment as applicable, SCR Drives and Variable Frequency Drives are also included. Motor windings and controller coils shall be periodically treated with proper insulating compound.
 - e. Door Operators: Car door hangers, car door contacts, door protective devices, tracks, door clutch mechanism, closers and closer arms, car safety, elevator car guide shoes gibs or rollers, car door gibs and car gates.
 - f. Hoistway / Car Door: Tracks and hangers, bottom door guides, interlocks, auxiliary door closing devices, cams, rollers, locks and contacts, air cord and chains, pivot and pivot pins, hinges, auxiliary hinges, gate switches. All car and hoistway door equipment including manual or powered vertical bi-parting doors, cams, car switches, annunciators, and parking devices.
 - g. Governor: Governor sheave and shaft assembly, bearings, contacts and governor jaws, switches, governor tension sheave assembly.
 - h. Car Safety Mechanism: Car safety, tiller/tail ropes, linkages and plank switches.
 - i. Wire Ropes: Renew all wire ropes, including hoisting, compensating, tiller/tail, and governor ropes, as often as is necessary to maintain an adequate factor of safety. Equalize the tension on all hoisting and compensation cables. The Contractor shall also shorten the wire ropes as required to maintain the legal counterweight and related equipment clearances. Whenever wire ropes are replaced or shortened, only wedge-type shackles shall be used if applicable. Any modifications or permits necessary to achieve this result shall be the responsibility of the Contractor. Perform all drum rope re-shackling as required by code; no wedge shackles allowed on drum cables.
 - j. Wiring: Replace and repair as required, traveling conductor cables, hoistway and machine room wiring, including the conductors extending from the main line switches to the controllers. The mainline switch together with fuses for same, are excluded.
 - k. Lighting: Contractor shall be responsible to re-lamp all lighting fixtures in the pit, machine room, and hoistway on top of and underneath the elevator car. Cab lighting is excluded.
 - l. Fixtures: Fixture contacts, push buttons, key switches, locks, lamps and sockets of button stations (car and hall) lanterns, position indicators (car and hall), direction indicators, re-lamp signal equipment including hall lanterns, position indicators, car and hall stations, lobby indicator panels, intercom systems, alarm bells and elevator monitoring system. Maintain and replace as needed all backup batteries for elevator components, including those for in-car communication, emergency car lighting, and lowering of hydraulic elevators. All cab ventilation systems, including ventilation fans and associated switches are to be covered by the Contractor.
 - m. Guide Rails: Shall be kept free of rust. Where roller guides are used, rails shall be kept dry and properly lubricated when sliding guides are used. Periodically examine rail brackets for tightness of bolts and nuts. File any rough surface, or gouge which may appear due to action of the safety devices.
 - n. Lubricants: Furnish and utilize lubricants, consisting of oils, greases, and compounds, blended specifically for elevator equipment. They shall be of the highest quality, consistency for the purposes employed, and the parts, to which applied. Cleaning compounds, waste clothes, and other materials, are to be supplied with the understanding that the cleaning agents employed shall not be flammable nor noxious. This material shall always be stored in approved metal containers provided by the Contractor.

- o. **Cleaning:** The Contractor shall during the course of all examinations remove and discard immediately all accumulated dirt and debris hoistways, pits, machine rooms, secondary levels, and pits and assigned Contractor work space. Prior to each annual anniversary date of this Agreement, Contractor shall thoroughly clean down the entire hoistway of all accumulated dirt, grease, dust and debris each year. Cleaning compounds, waste, cloths and other materials necessary are to be supplied by the Contractor and shall be kept properly sealed to prevent leakage and stored in metal cabinets. It is understood and agreed between the parties that cleaning agents employed shall not be flammable or noxious. All waste shall be discarded in compliance with all laws and codes. All documentation on stored compounds required by Owner shall be supplied by Contractor.
- p. **Painting:** The Contractor shall keep the exterior of the machinery and any other parts of the equipment subject to rust and paint deterioration, identified and presentable at all times with heat resistant enamel. The machine room floor and all storage areas shall be painted annually with a good quality deck enamel.
- q. **Examinations / Tests:** Examine all safety devices and governors and conduct annual no load tests. Each fifth year perform a full load, full speed test of safety mechanism, overhead speed governors, car and counterweight buffers. Car balance shall be checked and the governor will be re-calibrated and sealed for proper tripping speed and tagged. All tests will be conducted in accordance with the provisions of the American National Safety Code, for Elevator and Escalators ASME A17.1, A17.2, A17.3 Current Editions and all Local municipal codes having jurisdiction.
- r. **Notify:** The Contractor shall be responsible for notifying the Owner (in writing) of the existence or development of any defects in, or repairs required to, the elevator equipment that he does not consider his responsibility under the terms of the contract. The Contractor shall furnish the Owner with a written estimate of the cost to correct any such defects or make the required repairs. The Owner reserves the right to make the final determination concerning the responsibility for such defects, corrections, or repairs.
- s. **Hazards:** The Contractor shall be responsible for giving immediate notice to the Owner of any condition that he discovers that may present a hazard to either the equipment or passengers.

G. SUPERVISORY SYSTEM

- 1. The Contractor shall check and test quarterly the group supervisory (dispatching) system to insure proper adjustment of all circuits and time settings, and that the system is performing as designed and installed by the manufacturer.
- 2. Contractor shall submit to Owner a full description of the test of the supervisory system, and results of such test. The test shall include observations, adjustments and report of proper indications of cars in group, method of assignment, cars automatically removed from group as a result of individual malfunction, main floor demand setting, priority and security setting, preferred service response, peak traffic recognition and time clock settings for this purpose, car and hall call circuitry, direction performance operation, door dwell timing device settings, main floor loading times and sequence, and conditions which expedite or delay normal dispatch times.

H. ITEMS EXCLUDED FROM CONTRACT

- 1. The Elevator Contractor shall not be responsible for upgrading equipment to meet changes in Code requirements (after date of contract commencement), nor to install new attachments on the elevators whether or not recommended or directed by Insurance Companies or by Authorities Having Jurisdiction.
- 2. The Contractor shall not be required by this agreement, except as noted herein, to make renewals or repairs necessitated by proven negligence or misuse of the equipment by persons other than the Contractor, his representative and employees, or by any other proven cause beyond the Contractors control except ordinary wear and tear.
- 3. Following items related or incorporated in the elevator system are not included in this contract:

- a. Refinishing, repairing or replacing, car frames, platforms. This shall include cleaning and refinishing of the interior of the cars and exterior of hoistway door frames.
 - b. Cab enclosure, car door, cab lighting cab flooring, car door panels, light tubes and bulbs inside cab enclosure, handrails, mirrors and carpets
 - c. Hoistway enclosure.
 - d. Hoistway door panels, frames and sills.
 - e. Repair or replacement of life safety systems such as fire recall and smoke sensing devices
 - f. Other items, actions or occurrences caused by negligence, misuse, abuse or vandalism, provided Contractor gives immediate timely notification to the client of such an occurrence, new attachments or upgrades that may be recommended by governmental authorities and/or insurance companies.
4. Furthermore, the Contractor shall not be liable for any loss, damage, or delay due to any cause beyond the Contractor's control resulting from acts of government, strikes, lockouts, fire, explosion, theft, floods, riot, civil commotion, war, malicious mischief, or act of God.

I. PRO-RATED ITEMS

1. The Contractor may elect to prorate or exclude specific components as a result of their own equipment inspection in accordance with the following:
 - a. The present replacement and/or repair cost of each itemized component or system specified at the time of bidding is proposed as a pre-maintenance option.
 - b. Detailed formula for pro-rata clause based on the present replacement price, labor and material escalation in accordance with this document and percentage of time this Agreement is in force prior to replacement.
 - c. Pro-ration provisions shall be specifically detailed for the applicable vertical transportation units with the understanding that such limitations do not reduce or eliminate the Contractor's liability on other systems covered under the terms of this Agreement, and repair or replacement of such items prior to or during the term of this Agreement will automatically delete reduced coverage for all future work required after the first repair or replacement.
2. Pro-rations or other component coverage modifications shall be approved by the Owner prior to the execution and/or Contract renewal or such changes shall be null and void without conflict or alteration of other contractual conditions including price and maintenance contingencies.

J. OBSOLESCENCE

1. For the purpose of this contractual contingency, Component Obsolescence shall be defined as the inability to purchase and/or otherwise repair parts of the system no longer produced by the original equipment manufacturer or a third-party after market supplier.
2. In the event equipment and/or a component part thereof, as covered under this agreement, cannot be replaced on a direct exchange basis or repaired using readily available components and labor, the condition shall be reported to the Owner Representative with the following information:
 - a. Alternative equipment or component parts renewal options for restoration of the system due to obsolescence.
 - b. Procurement and installation time for restoration of system service.
 - c. Any Local Law or safety code requirements that will be triggered by the alternative equipment or component renewal (i.e., including filing, tests and approvals).
3. Payment for obsolescence work shall be based on the extra cost to the Contractor only.
 - a. Labor cost over and above the time necessary for standard equipment and component renewal or repair procedures.
 - 1) Contractual hourly rate schedule as provided under Section 1.8 Item 1 shall be used to compute any extra labor charges if applicable.

- 2) Actual material cost to the Contractor minus the value of the standard component replacement cost plus a maximum of five percent (5%) mark-up on the cost only.
- 3) At Owner's option, a lump sum extra cost price may be employed in lieu of time and material as indicated above.
4. Subsequent to the Owners authorization to proceed with an alternative obsolescence repair and approval of the relative extra cost, if any, the Contractor shall immediately perform such work and restore operating services.
5. The Owner shall retain the right to competitively bid obsolescence repairs and replacements; and, such work as performed by another qualified contractor shall not diminish or otherwise alter the coverage provided under this agreement subject to the following:
 - a. The Contractor has the right to inspect work performed by others; and, when conditions warrant, reject obsolescence procedures that increase their contractual liability.
 - 1) Should the Contractor reject an obsolescence repair by others, a qualified third party consultant shall be commissioned to evaluate work and render a decision regarding the acceptability of the prevailing conditions.

K. MAINTENANCE SERVICE SCHEDULE

1. Maintenance under this contract shall provide a constant, high quality service to properly protect all elevator equipment from deterioration and to provide constant peak performance of all elevators, resulting in a minimum of down time for any portion of the system. The Elevator Control Systems shall be checked and tested quarterly, to insure that all circuits and time settings are properly adjusted, and that the system performs as designed.
2. The time of day that the elevator can be shut down for routine maintenance shall be scheduled with the Owner or his Representative to minimize the disruption caused by the elevator being out of service. If for any reason an elevator should be out of service for more than the usual trouble shooting time of approximately 60 minutes, the Contractor shall notify the Owner or his Representative when the elevator was taken out of service, the reason why and what time the elevator is expected to be returned to service for proper and safe operation.
3. When the elevator is in shutdown, a sign shall be placed at each opening stating: "This Elevator Being Serviced". A record shall be maintained by the Contractor of non-emergency maintenance items in need of correction that come to his attention, and he shall provide this list to the Owner for necessary corrective action during the Contractor's routine visits. Contractor shall follow any state or municipal code requirement regarding specific signage or tape during maintenance or repair activities.

L. MONTHLY REPORTS

1. The Contractor must submit a monthly report to the Owner no later than the 10th day of each month covered by this contract, covering the prior month's contract activity. The report should chronicle all the outages, whether for maintenance, repair or modernization and should indicate the date and time of outage and the reason for the outage. A written explanation should be provided for each duplicate callback, for each entrapment, for each accident and for each repair that involves the unscheduled shutdown of an elevator.

M. RECORDS

1. The Contractor shall provide and keep current suitable check charts in the machine room for each elevator. Upon completion of maintenance, the Contractor shall properly initial the chart to indicate the work has been completed. The Contractor Superintendent is required to review the maintenance and initial check charts monthly. In addition to the check charts in the machine room, the Contractor shall be responsible for completing the Owner's logbook, which is on the premises and lists arrival and departure times of all Contractor employees. The log shall contain columnar line entries for date, employee position classification, employee name, time of arrival, time of departure, hours worked

and type and extent of work performed on each unit. The log shall be kept at the security desk or other secure area.

2. Contractor shall maintain complete and accurate accounting records, in a form in accordance with standard accounting practices, to substantiate Contractor's charge hereunder. Such records shall include payroll records, job cards, attendance cards and job summaries, and the Contractor shall retain such records for a period of six (6) years from the date of final payment hereunder. Owner shall have access to copies of such records which shall be granted upon request of Owner for purposes of audit during normal business hours during the term of this Contract and during the respective periods in which Contractor is required to maintain such records as herein provided. If such audit reveals an overcharge by Contractor, then, in addition to immediate refund and other remedies hereunder and at law or equity, Contractor shall pay Owner's cost of the audit.
3. Contractor shall, at any time during the term of this Contract, upon written request of the Owner, promptly submit to Owner a complete report of inspections, repairs or re-installation of parts or services performed and supply samples of lubricants, compounds, or other materials employed, at no cost to Owner.

N. MAINTENANCE RESPONSIBILITY

1. The Contractor will conduct semiannual evaluations of equipment performance including contract speed, acceleration and deceleration, door operation, riding quality, car leveling, floor-to-floor time, system operation. If after these evaluations are conducted and conditions warrant, the Contractor will perform the necessary adjustments, repairs, and replacements to return the equipment to the original as built quality. The Contractor is to issue report to Owner on the results of equipment evaluations.
2. The Owner or Consultant reserves the right to make inspections and tests as and when deemed advisable. If it is found that the elevator and associated equipment are deficient either electrically or mechanically, the Contractor will be notified of these deficiencies in writing, and it shall be his responsibility to make the necessary corrections within 10 days after his receipt of such notice. In the event that the deficiencies have not been corrected within 10 days or within 24 hours if elevator is inoperative, the Owner may terminate the Contract and employ a replacement Contractor to make the corrections at the Contractor's expense.
3. Approximately six (6) months prior to the end of the contract term, the Owner, or his designated representative will make a thorough maintenance inspection of the elevators covered under the contract. At the conclusion of this inspection, the Owner shall give the Contractor written notice of any deficiencies found. The Contractor shall be responsible for correction of these deficiencies within 10 days after receipt of such notice.

O. PERFORMANCE HOURS AT THE SITE

1. All labor under this Maintenance Program will be performed during the regular working hours and days of this Contractor. A qualified staff of mechanics and helpers (as required), shall be available to properly and diligently complete all work as required and specified at the site.
 - a. Minimum hours per elevator per month
 - 1) Two hours per month for preventive maintenance services
 - 2) Any manpower specified herein shall be the minimum provided; Contractor shall be responsible to provide whatever manpower necessary to meet the requirements of the Contract.
 - b. Contractor shall not consider visits to the building for emergency calls as routine maintenance unless the emergency call has been addressed and confirmed by building personnel prior to the commencement of maintenance services.
 - c. Owner reserves the right to review credentials of the assigned mechanic and to approve or disapprove of his assignment to service the building. If such work is beyond the skill and experience of the route mechanics or the owner disapproves of his appointment to the building,

then the Contractor shall provide such people qualified to perform such work during regular business hours at no additional cost.

2. Reporting to the Building. The Contractor mechanics shall upon arriving at the building sign in with the lobby security officer upon arrival at the building at any hour, perform the required work, and upon completing work during regular business hours, the mechanic shall report to the building office to brief building management regarding the work performed and the status of the elevators. If mechanic completes after regular business hours, he shall report the information to the lobby security officer. After briefing building management, the mechanic shall sign out with the lobby security officer.
- d. Provide web-based customer account access to view elevator maintenance records, online any-time. It shall provide the capability and software to monitor the elevators from unlimited local and remote locations simultaneously using a computer and internet-based elevator management system.

P. PERIODIC EXAMINATION

1. All safety devices, governors, wire ropes and conductor cables, shall be calibrated and/or tested periodically, in accordance with American Society of Mechanical Engineers (ASME) Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks, ASME A17.1, ASME A17.2, ASME A17.3, and codes by the Local Authority Having Jurisdiction as the same may be amended, supplemented or substituted, and in accordance with all applicable laws and codes. The Contractor shall furnish all necessary material and labor to make these tests. Any additional testing required by local authorities shall be included.

Q. SAFETY INSPECTION AND TESTS

1. The Contractor shall perform all required routine and/or periodic tests, including annual and five year tests, as mandated by the authorities having jurisdiction and the applicable codes, on all devices of any type covered under this Contract. This includes required testing of fire service operation and annual emergency power testing if applicable. Any additional testing required by local authorities, shall be included. Contractor shall include any necessary paperwork, machine room or other logs, filing fees, tagging of devices, and/or notifications to the appropriate authorities without additional charge.
2. After completion of these required tests, and inspections, a document will be submitted, indicating at least, the following information. This document may be the Contractor's standard form, or forms provided by the agencies having jurisdiction.
 - a. Type of test
 - b. Name of organization performing test
 - c. Address of the facility being tested
 - d. Elevator identification No.
 - e. Car capacity
 - f. Speed
 - g. Type of elevator
 - h. Type of machine
 - i. Manufacturer of Safety
 - j. Type of safety
 - k. Indication that governor has been checked for proper tripping speed and that the over-speed switch is functional
 - l. Type, size, and condition of governor rope before and after test
 - m. Load at which safety was tested
 - n. Speed at which governor tripped
 - o. Length of marks on each guide rail made by safety jaws
 - p. Did car or counterweight set level?
 - q. Did governor set satisfactorily?

- r. Was governor calibrated? At what speed?
 - s. Relief valve pressure
 - t. Maximum working pressure
 - u. Indicate Date Test was made
 - v. Signature of individual performing tests
 - w. Any additional remarks applicable
3. After performing the tests all load weighing devices, etc., shall be checked and adjusted as required to meet manufacturer's recommendations. All seals or settings of equipment, if altered, shall be properly replaced or set. Car shall not be placed in service until all tests, checks, tags, and adjustments are complete and elevators are in proper and normal working conditions. The Contractor shall not be held responsible for any damage to the building and equipments caused by these tests, unless such damage is a result of his negligence. Failure to follow correct procedures to prevent damage and failure to perform pretest examinations shall be considered negligence by the Contractor.

R. SCHEDULED SERVICE PROCEDURES

1. Maintenance requirements, in addition to scheduled and emergency repairs, renewals and testing, shall include but are not limited to:
 - a. Examination of wire ropes to maintain proper tensioning and legal bottom clearances on a monthly basis for shortening and adjusting ropes as required and performance of all re-shackling procedures per ASME A17.1 standards and local laws in conjunction with maintenance of related slack cable devices, machine limits or other safety equipment.
 - b. Examination, repair and replacement of all electrical wiring, traveling cables, conduits, connections and related apparatus extending from the main line power supply switch in the machine or other power supplies in hoistways.
 - c. Maintenance of pit, hoistway and machine room lighting to include relamping, wiring and switch controls.
 - d. Mandated inspections and relative labor requirements for third party witnessed examinations and/or test procedures as approved by the Owner.

1.4 TERM

A. COMMENCEMENT OF CONTRACT

1. This Maintenance Contract shall commence on _____ and shall continue thereafter for a period of THREE (3) years. Either party may terminate this Contract either at the end of the THREE (3) years or at the end of the any subsequent period by giving the other party written notice at least thirty (30) days prior to the end of the then current term.
2. The price shall be firm for the first year of the contract. The remaining years may be adjusted in accordance with the instructions noted in Section 1.5 Item 3.

B. INTERIM SERVICE

1. The Contractor shall furnish interim service from the date of the contract award until the completion of the elevator. The terms of the attached full service maintenance specification shall govern the component coverage provided by the Contractor. If there are any components scheduled for removal during the modernization, Contractor can elect to repair as necessary to provide elevator service prior to the commencement of the modernization. Upon the expiration of the interim service period, the term of the CBA maintenance contract shall commence.

C. TERMS OF PAYMENT

1. The Contractor shall submit monthly invoices for services rendered and as agreed upon by the terms of this document. These invoices will be processed in accordance with the established procedures of the Owner.

D. BILLING RATES

1. See Section 1.8 Item 1 for rates to be charged for all work not covered under the scope of this contract. These rates may escalate on each anniversary of the commencement date of this contract according to the straight time increase in labor cost compared to the previous year.
2. If Section 1.8 Item 1 is not attached to this contract, the schedule that was submitted with the Contractor's original bid shall be in effect for this contract.

1.5 PAYMENT

A. PAYMENT TERM

1. The Owner agrees to pay the Contractor for service herein stated, _____ DOLLARS (\$ _____) PLUS APPLICABLE TAX during the term of this Contract.

B. RENEWAL

1. This contract does not automatically renew at the termination of the contractual period in force. Execution of a formal written agreement between Owner and Contractor will be required, 90 days prior to expiration.
2. The Owner shall have the right to renew this agreement on a year-to-year basis upon expiration of the initial contract period. All terms, conditions, and provisions shall remain intact.

C. ESCALATION

1. Contractor shall provide to Owner, at or before the commencement of this Contract, a separate statement of Contractor's labor cost, material costs and total costs for the performance of this Contract. Upon submission by Contractor to Owner satisfactory evidence that the Contractor's actual labor and/or material costs for the performance of this Contract have increased, the Contractor's compensation under this Contract shall be increased annually on each anniversary date succeeding the effective date of this Contract as follows:
 - a. Labor Portion – of the price will be increased or decreased by the percentage of increase or decrease in the straight time hourly labor cost for the month within which falls the yearly anniversary of the commencement of the service as compared with such straight time hourly labor cost initially used in determining the original price. The phrase "straight time hourly labor cost" means the sum of the straight time hourly rate paid to elevator mechanics in the geographical area where the equipment is to be maintained, plus the average hourly cost of Fringe Benefits paid to these elevator mechanics. "Fringe Benefits" are defined as benefits granted in lieu of or in addition to hourly rate increases, and include Pensions, Vacations, Paid Holidays, Group Life, Sickness, Accident and Hospitalization Insurance.
 - 1) Labor portion shall constitute 80% of contract price and shall be increased by the actual percent increase in the straight time direct labor cost. Base labor rate as of _____.
 - b. Material Portion – The increase in material costs shall be the difference of the index of "Wholesale Metal Products", published by the U. S. Department of Labor, Bureau of Labor Statistics, in the base year and the year in which the increase is to be calculated. The monthly index to be used for the base year is the index for the month in which this Contract becomes effective. The Contractor shall issue to Owner, copy of Index, published by the U.S. Department of Labor.
 - 1) Material portion shall constitute 20% of contract price and shall be increased by the percent increase in material cost.

- c. Submission - Contractor must submit with increase notice, a breakdown of items that constitute the total increase.
2. Notwithstanding anything to the contrary, the maximum annual increase shall not be more than five percent (5%) of the total contracted payment for the preceding contract year.

D. NON-PAYMENT

1. The Owner may have the elevators' performance checked periodically by an independent elevator consultant to ensure the Contractor is performing in accordance with the terms and conditions of this Contract. If the Consultant determines that Contractor is not performing its obligations hereunder, then, in addition to all other rights and remedies reserved to Owner herein or at law or equity, including the right of cancellation, Owner may retain the monthly payments to Contractor until the deficiencies are fully cured and Contractor shall pay to Owner the cost of retaining consultant.

E. PERFORMANCE GUARANTEE

1. If any unit is out of service due to equipment failure longer than two (2) consecutive working days for any non-scheduled reason, the monthly maintenance cost of that unit will be credited to the next monthly billing. All repairs shall be scheduled in writing.
2. If the Contractor does not respond within the time frames specified in this contract in Section 1.3 Item 3 entitled "Emergency Call Back Service" the following month's billing will be credited in the amount of \$500 for each event.
3. If, during 30 consecutive days, the Owner experiences three (3) call backs on the same unit for the same problem, the monthly maintenance cost of that unit will be credited to the next monthly billing.
4. No penalty shall be assessed under items A or C if damage is caused by vandalism or any other cause excluded elsewhere in this contract.
5. From time to time, the Owner shall employ a Consultant to inspect the vertical transportation equipment. The Contractor shall correct, repair or replace items noted on Consultant's punch list within the time frame stipulated or otherwise agreed. In the event that the Contractor does not demonstrate intent to comply with Consultant's punch list in a timely manner, Owner may deduct \$500 from each subsequent month's billing until the punch list is completed.
6. Contractor must perform all tests mandated by the authorities having jurisdiction prior to the expiration date, or liquidated damages in the amount of \$100 per day per device shall be charged to the Contractor. Contractor must provide a status report to the Owner when the tests are completed. The liquidated damages specified here shall not be construed to limit or supersede any other rights the Owner may have, including being reimbursed by the Contractor for imposed fines or other costs, as a consequence of a missed test (or a test performed after the due date) by the Contractor.

F. DEDUCTIONS

1. Should an elevator or escalator be shutdown or be taken out of service for a normal repair (not of an unusual nature), Contractor agrees to begin the repair within three business days, and they shall fully staff the repair of that elevator until it is returned to service. A repair shall be defined as set forth in the collective bargaining agreement entered into between Contractor and the local chapter of the International Union of Elevator Constructors.
 - a. The Owner retains the right to deduct one month's maintenance fee for that unit inclusive of all taxes and other fees if repairs:
 - b. Are not started within three business days
 - c. Are not staffed in accordance with the accepted industry practice
 - d. Completion is unreasonably delayed by Contractor according to accepted industry practice determined by the Elevator Consultant

G. TRAVEL

1. It is understood that no travel time shall be charged under this Contract for normal working hours or for emergency call back service.

1.6 CANCELLATION

A. CANCELLATION

1. Owner has the right to cancel this maintenance agreement at any time with cause at its discretion with 30 days written notice to the Contractor for the duration of this contract, including the month-to-month period following the expiration of the initial period.
2. Owner has the right to cancel this maintenance agreement upon at least 5 days written notice to Contractor of Owner's election to have major repair, alteration or upgrade work performed on any elevator to the extent that this work shall be competitively bid.
3. The violation by Contractor of any of the covenants, agreements, terms, provisions, and conditions contained in this maintenance contract shall be deemed a substantial default under the terms of this agreement. Should Contractor fail to observe and perform any of its obligations, duties or responsibilities under the terms of this contract, then, in such event, Owner, in addition to any and all remedies afforded to it by law or inequity, may stop payment of any amounts due hereunder and/or terminate that contract upon written notice to Contractor.
4. The Owner shall have the right to cancel this Contract upon at least thirty (30) days prior written notice to the Contractor of its election to do so without penalty for the following:
 - a. Elective modernization of elevator or elevator systems awarded to another vendor.
 - b. Substandard services and/or poor maintenance practices as confirmed by the Consultant or other qualified professional.
 - c. Failure to comply with governing authority directives and/or citations.
 - d. Annual cost analysis completed prior to expiration date.
5. In addition to the rights provided hereunder, Owner shall have the right to cancel this Contract immediately, by oral or verbal notice subject to written confirmation, upon the occurrence of any of the following contingencies:
 - a. Bankruptcy of the Owner or Contractor;
 - b. Mortgage Foreclosure;
 - c. Condemnation, Destruction or Transfer or Conveyance of Title to the property in which the subject equipment is located.
 - d. The premises in which the subject equipment is located is rendered unusable in the opinion of the Owner.
 - e. Contractors failure to comply with its obligations hereunder on two (2) or more occasions in a twelve (12) month period will result in contract cancellation.
6. Cancellation of this agreement prior to the expiration date shall entitle the Contractor to payment for services rendered up to and including the date of cancellation; the Owner shall not be responsible for any expenses or subsequent costs that may be incurred by the Contractor as a result of an early cancellation or standard contract agreement expiration.

1.7 SIGNATURE PAGE

A. FOR THE CONTRACTOR:

1. Name:
2. Title and Date:
3. Company:
4. Address:
5. Authorized Signature:

B. FOR THE OWNER:

1. Name:
2. Title and Date:
3. Company:
4. Address:
5. Authorized Signature:

C. DATE: This day of 20

D. WITNESS:

E. Appendix is attached and made part of this Contract

1.8 APPENDIX

A. BILLING RATES

1. The following unit costs for labor shall be used for all work not covered under the scope of this Contract. The difference between straight time and overtime rates shall be used when work that is covered during regular hours is performed on overtime.
2. Prior written approval is required for all extra work

TIME	HELPER	MECHANIC	TEAM	SUPERVISOR
STRAIGHT	\$ /hour	\$ /hour	\$ /hour	\$ /hour
OVERTIME	\$ /hour	\$ /hour	\$ /hour	\$ /hour
DOUBLE	\$ /hour	\$ /hour	\$ /hour	\$ /hour
PREMIUM	\$ /hour	\$ /hour	\$ /hour	\$ /hour

B. PERFORMANCE STANDARDS

1. MEASUREMENTS AND STANDARDS

a. Adjust the elevator to meet the following performance requirements:

- 1) Contract Speed: +/- 5% (Max)
- 2) Leveling Accuracy: +/- 1/2"
- 3) Floor-to-Floor Time: 12 Seconds
- 4) Door Opening Time: 2.4 Seconds
- 5) Door Closing Time: 3.5 Seconds
- 6) Dwell Time (Car Call): 3.0 Seconds (adjustable to 10 seconds)
- 7) Dwell Time (Hall Call): 5.0 Seconds (adjustable to 20 seconds)
- 8) Reduced Dwell Time: 1.0 Seconds (adjustable to 10 seconds)
- 9) Lobby Dispatch Time: 5.0 Seconds (adjustable to 60 seconds)
- 10) Nudging Time: More than 20 Seconds
- 11) Door Closing Force: Less than 30 Pounds
- 12) Horizontal Vibration: 25.0 milli-g
- 13) Vertical Vibration: 25.0 milli-g
- 14) Noise Level: 67 dBA (inside car)

END OF SECTION 140120

SECTION 142123 - ELECTRIC TRACTION PASSENGER ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

Section includes installing a completely new elevator that is compliant with current code. Elevator contractor shall perform all work necessary to achieve the intent of this project, including but not necessarily limited to the work specified herein.

A. Passenger Elevator Summary

No. of Elevators:	One (1)
1. Classification:	Passenger
2. Identification No.:	Rotunda #2
3. Rated Capacity:	
Existing:	1,500 pounds
a. Adjustment:	2,500 pounds
Rated Speed:	200 feet/minute
4. Operational Control:	Simplex / collective-selective
5. Floors Served:	G, 1 through 4
6. No. of Openings:	Five (5)
7. Car Door:	
Existing:	Single speed center opening
a. Adjustment:	Single speed side opening
Hall Door:	
Existing:	Single speed center opening
b. Adjustment:	Single speed side opening
Driving Machine:	
Existing:	Basement geared traction
c. Adjustment:	Overhead gearless traction
Control System:	
Existing:	Relay-logic
d. Adjustment:	Microprocessor, non-proprietary
Roping:	1:1

1.2

1.3 DEFINITIONS

Consultant: CBA Elevator Consultants, 190 Main Street, Suite 402, Hackensack, NJ 07601.

- A. Contractor: Shall mean the person, firm, entity or corporation named in the Contract Documents who will execute the work. It shall include all his employees, subcontractors and suppliers.
- B. Cab Company: Company that will furnish and install the cab interior.
- C. Code: All applicable laws and codes, including but not limited to the electrical, fire, building, and elevator codes designated by any authority having jurisdiction.
- D. Work: Shall mean the services, materials, labor, and all other equipment required for complete and proper installation by the elevator contractor.
- E. Provide: Shall mean to supply, install and connect up complete and ready for safe and regular operation particular work referred to unless specifically indicated otherwise by the consultant.
- F. Approved/Accepted/Reviewed: As applied to materials, products and workmanship shall mean that acceptance or review by the consultant is required.
- G. Install: Shall mean to erect, mount, and connect complete with related accessories.
- H. Supply/furnish: Shall mean to purchase, procure, acquire, and deliver new, complete with related accessories.
- I. Wiring: Shall mean conduit, fittings, wire, junction and outlet boxes, switches, cutouts, receptacles and related items.
- J. Concealed: Shall mean in masonry or other construction, installed in furred spaces, within double partitions, or hung ceilings, in trenches, in crawl spaces or in enclosures.
- K. Exposed: Shall mean not installed underground or "concealed" as defined above.
- L. Current Issues/Current Editions: As applied to reference standards and governing codes shall mean the latest published issue or edition available during the bidding period.
- M. Best/First-Class/First-Grade/Similar: As applied to materials, products and workmanship shall mean that, in the consultant's opinion, there are no superior qualities of materials or products on the market, and there is no better class of workmanship.
- N. Substantial Completion/Beneficial Use: Shall mean that the progress of the work, or on any portion of the work, is sufficiently complete in accordance with the Contract Documents, and as reviewed by the consultant, so that the owner can utilize the work for its intended purpose.
- O. Notice-To-Proceed: Shall mean a written document from the consultant or owner allowing the elevator contractor to commence only that portion of the work stated in the written document.

1.4 ACTION SUBMITTALS

Product Data: Include names and addresses of the manufacturers, together with catalog information or other identifying description for all items specified.

- A. Shop Drawings: Show material type and gauge, general dimensions, methods of attachment, location, and size of reinforcements and openings, and a general arrangement of components. Matter submitted for review shall be accompanied by complete information concerning the material, articles and/or design proposed for use in sufficient detail to show compliance with the Contract Documents, and shall be reviewed without exceptions before incorporation into the work. Each drawing submitted shall provide a clear space approximately 4 inches x 4 inches for consultant's use and stamp. Review thereof will not be construed as relieving the elevator contractor of compliance with the Contract Documents, even if such review is made in writing, unless the attention of the consultant is called to the noncomplying features by letter accompanying the submitted matter. Review of drawings, cuts and samples by the consultant shall not be construed as a complete check or approval of the detailed dimensions, weights, gauges and similar details of the proposed articles. The conformance of such details with the contract requirements, together with the necessary coordination of dimensions and details between the various elements of the work, and between the various subcontractors and suppliers, shall be solely the responsibility of the elevator contractor, approval of submitted matter notwithstanding. All submitted material shall be tendered complete, and at one time. **PARTIAL SUBMITTALS WILL NOT BE CONSIDERED.** In general, the items to be submitted shall include but shall not be necessarily limited to the following:

Provide company organizational chart with phone numbers.

1. Schedule of work showing commencement and completion dates and phasing, for each elevator.
2. Elevator car and hall fixture drawings.
3. Cab enclosure drawings.
4. Review of drawings, schedules and other submitted matter will be general and shall not be construed as:

Permitting any departure from the contract requirements

- a. Relieving the elevator contractor of the responsibility for any errors, including details, dimensions, materials, etc.
- b. Approving departures from details furnished by the consultant.

Hoistway and Machine Room/Space plan and section drawings: Fully detailed elevator layout drawings are required on ALL elevator modernizations or installations even if the Authority Having Jurisdiction (AHJ) does not require it. The drawing set shall include:

Machine Room Plans.

5. Overhead.
6. Shaft/Hoistway Plan.
7. Inside Cab Dimensions.
8. Pit Plan.
9. Hoistway Section.
10. Machine Mounting Details.
11. All Reactions including structural loads, electrical loads, heating.

Permit Application Forms.

- B. Variations: If drawings, schedules or other submitted matter show variations from the contract requirements because of standard shop practice or for other reasons, the elevator contractor shall describe such variations in his letter of transmittal. If acceptable, the consultant may accept in writing, any or all such variations. If the elevator contractor fails to describe such variations, and does not have the consultant's acceptance in writing, he shall not be relieved of the responsibility for executing the work in accordance with the contract, even though such drawings or schedules may have been accepted.

- C. Samples: Where submissions are called for in the specifications, or when otherwise required by the consultant, the elevator contractor shall submit duplicate samples of materials, appliances, finish or other items included in the work. Such samples shall be in all respects equal to that to be provided for the work and shall be approved by the consultant before the work is executed. Samples shall be submitted in ample time before work is installed, to permit sufficient time for consultant's consideration. Samples shall be accompanied by a label, or shall be properly marked, indicating the type and brand of material, its place of origin, the name of the producer and address, serial numbers, the elevator contractor's name and the name of the project for which the material is intended.

1.5 CLOSEOUT SUBMITTALS

Instruction to owner's personnel: At the owner and/or elevator consultant's request, the elevator contractor shall provide a competent instructor who together with a representative from the elevator consultant's office, shall meet with the owner's personnel to fully and adequately instruct the owner's personnel in the proper operation of all equipment installed by the elevator contractor.

- A. The following printed information shall be furnished upon completion:

Three (3) sets, neatly bound instructions explaining all operating features, including all apparatus in the car control panels and elevator monitoring apparatus.

1. Three (3) sets of printed instructions and recommendations for maintenance of all elevator equipment.
2. Three (3) lubrication charts, indicating all lubrication points and type of lubrication recommended for all equipment.
3. One complete parts catalog for all replaceable parts.
4. Three complete sets of as-built controller prints.
5. Three complete sets of all wiring diagrams.
6. Diagnostic test device complete with access codes, adjusters manuals and setup manuals for adjustment, diagnosis and troubleshooting of elevator system and performance of routine safety tests. Manufacturer of diagnostic test device shall update, reprogram, recharge, etc., device for as long as the controls remain in place. Further, elevator contractor warrants, by submitting their bid that any SIM card or related device shall remain with the control system, and that elevator contractor's personnel shall never remove such a device from the control system under any circumstances. This requirement shall remain in effect for the lifetime of the elevator control equipment.

1.6 MAINTENANCE MATERIAL SUBMITTALS

Provide the following extra parts:

Three sets of keys to operate all keyed switches and locks shall be furnished upon completion of the work.

1. Elevator contractor shall provide a list of extra parts inventory (fuses, brushes, spare wires, and other typically consumed parts, etc.). Elevator contractor shall furnish all inventory listed to owner.

1.7 STORAGE OF EQUIPMENT AND MATERIALS

In the event that it is necessary for elevator contractor to stockpile or to store quantities of material or equipment on the job site, elevator contractor shall inform owner of such necessity and owner shall offer available space, if any is available, for storage of such materials or equipment. Elevator contractor shall use said

space only for such purpose. Any and all materials which may be stored in such space or which may be brought onto the job site at any time by elevator contractor shall be left at elevator contractor's sole risk. The owner shall not be responsible to elevator contractor for loss of or damage to said materials or equipment for any cause whatsoever. It is expressly understood and agreed that elevator contractor assumes all risk of loss or damage to such materials and equipment, except as heretofore provided, and that owner shall not require to furnish or supply watchmen at any time. Elevator contractor shall take necessary measures to protect any such storage area and shall be responsible for any and all damages. Provide suitable storage space for tools and materials brought to the site by the elevator contractor. Elevator contractor must specify at the beginning of the project the details of storage space required. Storage space requested shall be reasonable and in accordance with the projected schedule.

- A. The elevator contractor shall confine storage of materials to limits approved by the owner and he shall not necessarily encumber the premises or overload any portion of it with materials to a greater extent than it is calculated to bear. Elevator contractor shall not store hazardous materials such as solvents, paints, thinners, etc., unless in approved containers.

1.8 OWNER RESPONSIBILITIES

Open Violations

It is the owner's responsibility to confirm that the elevator is current with all mandated inspections and tests. The elevator contractor shall verify with the Authority Having Jurisdiction the status of all mandated inspections, tests, and any outstanding violations or fines incurred.

1.9 WARRANTY AND GUARANTEE

Provide special project warranty effective starting with the acceptance of the conveying system and continuing for one year after acceptance of the last elevator by the owner, which shall be signed by elevator contractor, Installer, and Manufacturer, agreeing to replace/repair/restore defective materials and workmanship of the elevator work during warranty period. "Defective" is hereby defined to include, but not by way of limitation, operation or control system failures, performances below required minimums, excessive wear, unusual deterioration or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise or vibration, and similar unusual, unexpected and unsatisfactory conditions.

- A. The elevator contractor shall guarantee that the materials and workmanship installed, refurbished, and repaired, under this contract, shall be free of all faults, imperfections, flaws, and damage in every respect. The elevator contractor also assures and warrants that he will make good any defect, which may develop within one (1) year from the date of final acceptance of the completed installation. Such guarantee shall be delivered in writing, to the owner, before final payment will be made. Neither final payment nor any provision of the contract documents shall relieve the elevator contractor of his responsibility to remedy faulty materials or workmanship and to pay all expenses for damages to other work resulting therefrom.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

Codes and Ordinances: All the work covered by these specifications is to be done in full accord with all federal, state and local codes, ordinances, and elevator safety orders as are in effect at the time of the execution of the contract. All of the requirements of the local Authority Having Jurisdiction (AHJ) are to form a part

of these general conditions and are to be fulfilled by the elevator contractor and his subcontractors. The entire elevator system, including all elevator equipment and work, shall be in accordance with the latest requirements:

ASME A17.1: Safety Code for Elevators and Escalators.

1. ASME A17.2: Guide for Inspection of Elevators, Escalators, and Moving Walks.
2. ASME A17.3: Safety Code for Existing Elevators and Escalators.
3. ANSI A117.1: Accessible and Usable Buildings and Facilities.
4. ADA: The Americans with Disabilities Act, Civil Rights Law - Title III.
5. NFPA 70: National Electric Code (NEC).
6. OSHA: Occupational Safety and Health Administration.

Code Compliance: The following code shall be the applicable code for this project and shall be identified on all required municipal permits:

ASME A17.1-2013, A17.7-2007 and IBC-2015 NJ Edition and Chapter 30.

Work is to comply with all applicable Local Laws. All of the work covered by the specifications, including design, clearance, construction, workmanship and quality is to be done in strict accordance with all national, state and local codes, ordinances and elevator safety orders in effect at the time a contract for this work is executed. For any discrepancies, the code shall take precedent. Compliance is not limited to any changes or amendments imposed by the appropriate authorities to all laws specified.

- B. The elevator contractor shall immediately inform the owner of any work or materials which violate any of the above laws and regulations and any work done by the elevator contractor causing such violations shall be corrected by the elevator contractor at his own expense.
- C. Upon completion of the elevator and prior to the acceptance test and subsequent turnover to use by the owner and the building adjust the elevator to meet the following performance requirements.

Contract Speed:	+/- 5 percent (Max)
1. Leveling Accuracy:	+/- 1/2 inch.
2. Floor-to-Floor Time:	12.0 Seconds.
3. Door Opening Time:	2.40 Seconds.
4. Door Closing Time:	3.50 Seconds.
5. Dwell Time (Car Call):	3.0 Seconds (adjustable to 10 seconds).
6. Dwell Time (Hall Call):	5.0 Seconds (adjustable to 20 seconds).
7. Reduced Dwell Time:	1.0 Seconds (adjustable to 10 seconds).
8. Lobby Dispatch Time:	5.0 Seconds (adjustable to 60 seconds).
9. Nudging Time:	More than 20 Seconds.
10. Door Closing Force:	Less than 30 Pounds.
11. Horizontal Vibration:	25.0 milli-g.
12. Vertical Vibration:	25.0 milli-g.
13. Noise Level:	67 dBA (inside car).

2.2 SIGNAGE

Signage:

Machine Room Temperature and Humidity - Provide a sign in the machine room stating the range of temperature and humidity as specified by the equipment manufacturer and as required by A17.1.

1. Counterweight Runby - Provide a permanent data plate in the vicinity of the counterweight buffer indicating the maximum designed counterweight runby as required by A17.1.
2. Medical Emergency Services - Identify the designated medical emergency services elevator with

- 3" high international symbol at each elevator entrance on both side of the jamb (if required).
3. Crosshead Data Plate - Provide a crosshead data plate that lists the rated capacity and rated speed of the elevator and complies with A17.1.
 4. Safety Data Plate - Provide a safety data plate on or adjacent to the elevator safeties complying with A17.1.
 5. Buffer Data Plate - Provide a permanent buffer marking plate indicating the manufacturer's name, identification number, rated impact speed and stroke on or adjacent to the buffers and complying with A17.1.
 6. Car / Hoistway Door Bypass - Provide a warning sign adjacent to the car and hoistway door bypass switches "Jumpers shall not be used to bypass hoistway door or car-door electric contacts."
 7. Floor Numbers - Provide new 4 inch floor numbering on the hoistway side of the hoistway doors and/or walls at intervals as require by Code.
 8. Refuge Areas - Clearly mark using code complaint tape or paint indicating where the refuge areas are and where there are any striking hazards.

Identification of Equipment

In buildings with more than one elevator, each elevator in the building shall be assigned a unique alphabetical or numerical identification. Properly identify the following equipment with the car number assigned to it. Paint, engrave, or securely attach the number on:

Driving Machine:	2 inches.
a. Motor-Generator:	2 inches.
b. Controller:	2 inches.
c. Transformers:	2 inches.
d. Governors:	2 inches.
e. Buffers:	2 inches.
f. Main Disconnect:	2 inches.
g. Crosshead:	2 inches.
h. Car Operating Panel:	½ inch.
i. Main Egress:	3 inches.
j. Hoistway Doors:	4 inches (shaft side).

ADA Accessibility Requirements - Confirm that the elevator shall conform to the Elevator Code, Municipal Code, and ADA Accessibility requirements and include:

Provide markings on the car operating panel (COP) adjacent to the floor and control buttons on a contrasting color background to the left of the buttons. Letters and numbers shall be a minimum of 5/8 inch and raised 0.03-inch with Braille indications.

9. Provide floor designations at each entrance on both sides of jamb at a height of 60 inches above the floor. Designations shall be 2 inches high, raised 0.03-inch with Braille indications and shall be as selected and approved by the owner. Provide samples for approval.
10. The centerline of the new hall push button station shall be 42 inches above the floor line.
11. Provide an audible signal to tell passengers that the car is stopping or passing a floor served by the elevator. See VOICE ENUNCIATION for further details.
12. Provide control non-interference door dwell timing features in accordance with ADA requirements. See PERFORMANCE REQUIREMENTS for further details.

2.3 CAB ENCLOSURE

Provide new cab enclosure with new finishes. The owner and/or his representatives shall select the finish and design of the cab enclosure. Construct elevator cab to accommodate the door operator, hangers, interlocks and all accessory equipment provided under other sections of these specifications, including firefighter phones, card readers and CCTV. .

2.4 PROTECTIVE PADS

Provide one set of heavy duty pads with rubber coated eyelets to hang from pad buttons.

2.5 CCTV (SECURITY) CAMERA

The CCTV camera shall be provided by either the owner or the security contractor and installed by the elevator contractor. The security contractor shall provide supervision, wiring details and installation diagrams to the elevator contractor. The exact CCTV camera locations shall be specified by the owner or his representative.

2.6 CAR SILL

Material:

Nickel-Silver.

2.7 CAB FLOORING

Color, finish and design selected by the owner or his representatives and installed by elevator contractor.

2.8 CAR OPERATING PANEL

The car station shall contain a series of push buttons to correspond to the landings served. The push buttons shall illuminate individually when pressing a button for the desired floor. These lights shall extinguish after answering the call. The main panel shall include on the cover:

Key-operated stop switch, that when activated shall remove electric power from the driving-machine motor and brake. Activation of the key-operated stop switch shall not cancel registered car or corridor calls, and after releasing the switch, the car shall continue to answer its registered calls.

1. An illuminated alarm button connected to a bell under or on top of the car.
2. Door open button.
3. Door close button.
4. In a separate locked service panel include the following:

Car light key switch.

- a. Fan key switch.
- b. Inspection key switch for use with access operation and the top-of-car operating station.
- c. Independent key switch.
- d. Emergency light test button.
- e. GFCI duplex receptacle.

Incorporate the emergency lighting, fire controls, auxiliary signals, and mandated engraving to comply with all applicable elevator and fire codes as well as ADA requirements.

2.9 VOICE ENUNCIATION

Digitized floor annunciation to indicate the floor at which the car is about to stop. The verbal announcement indicating the floor shall complete prior to the initiation of the door opening. Shall comply with all

current code requirements. Incorporate or locate this in either the car station or the car position indicator.

2.10 EMERGENCY TELEPHONE

Provide an automatic dialing, hands-free telephone in the car-operating panel. The system shall comply with ADA requirements. See the article entitled "emergency communication" for detailed requirements.

2.11 EMERGENCY LIGHTING

Provide an emergency light unit

A minimum of two (2) bulbs or LED's of approximately equal wattage.

1. Illumination for a minimum of four (4) hours.
2. Not less than 0.2 fc when measured 48 inches above the car floor and 12 inches in front of car operating panel.
3. A permanent connection to the car light branch circuit.

Location:

Integral part of the car operating panel

2.12 CAR POSITION INDICATOR

Location:

Incorporate/include in car operating panel (COP)/car station detailed above.

Provide LED type readout in the car station to show floor locations. The LED characters shall be 2" high with a screen flush with panel surface of the fixture cover. Install one transmitter per elevator to supply digital position indicator.

2.13 EMERGENCY COMMUNICATIONS

General Information:

Provide two-way communications system between the car and a location staffed by authorized personnel and that complies with Section 2.27 of the A17.1 Elevator Code and Section 407.4.10 of the A117.1 Accessibility Code.

1. When the two-way communications location is not staffed 24 hours a day, by authorized personnel, the means of two-way communications shall automatically be directed within 30 seconds to an additional on- or off-site location, staffed by authorized personnel, where an appropriate response can be taken.
2. Install interface unit and phone handset in the machine room to allow for communication between the machine room and the elevator. Interface unit shall be Electronic Micro Systems, Ring Communications, or equal.

Emergency Telephone (In-Car):

Provide an automatic dialing, hands-free telephone in the car, mounted as an integral part of the car operating panel.

3. Pressing the emergency alarm button or HELP push button in the car panel shall initial the telephone. It shall automatically dial a programmed number to alert the security personnel that there is a problem in the elevator. Calls shall terminate externally and not from within the car. Pressing any button that initiates the call twice shall NOT stop placing the call.
4. If the first number dialed does not answer, the auto dialer shall dial a second programmable number.
5. The system shall have a ring-back feature to allow placing calls to the elevator. It shall answer the incoming call automatically and shut off after an adjustable programmed time.
6. Provide an audible and visual signal once establishing the communication link.
7. Rechargeable batteries shall ensure operation under all conditions. The alternate power source shall be capable of providing power for the means of emergency communications for at least 4 hours.
8. Install the communication unit in the elevator and wiring within the hoistway, terminating the wiring in the elevator machine room. Install a suitable and identifiable junction box in the machine room.
9. The emergency telephone system shall require a maximum of one telephone line.
10. The system must provide line sharing capability to eliminate the need for a dedicated telephone line.
11. The line sharing function must ensure that the emergency telephones always receive dialing priority even if the line is in use and that the emergency telephones can be called into from an on-site location.

2.14 VIDEO MONITORING

Provide a complete video monitoring system including all necessary cameras and LCD monitors. Cameras shall provide the necessary point of view of the machine and governor in the overhead. The system shall convey the following information about the elevator simultaneously:

The direction of movement.

1. When the elevator is reaching a position with the door unlocking zone
2. An indication of the speed.
3. The video system shall have an alternate power source during a failure of the normal building power supply.
4. System shall be either one system for all the elevators or a separate system for each elevator.

2.15 MACHINE ROOM/SPACE ENCLOSURE

Equipment:

All elevator machinery and control equipment shall be located in the machine room/space.

1. Any work required facilitating removal of existing equipment and installation of new equipment in the machine room and overhead sheave room and repair thereof shall be the responsibility of the elevator contractor.
2. The placement of any new equipment shall meet all current and applicable codes including, but not limited to, ASME A17.1 and all local codes and ordinances.

Electrical System:

Provide new electric wiring from the main disconnect switch to the terminals of the new elevator controller in its location as shown on the approved layout drawing, inclusive of a normal/standby 120 VAC, 15 Amp supply at each controller.

3. If necessary for code compliance, provide auxiliary main line disconnect switch to maintain line of sight of any controller and moving equipment.

Overhead:

Install new overhead stop switch as per code requirements.

4. Install new safety switch to disconnect power from driving machine while in the machine space.
5. Provide new aluminum diamond plate flooring.

Machine Beams:

Shall be supplied and installed by the general contractor.

6. Elevator contractor shall furnish and install any additional angles, plates, bearing plates, blocking steel members and frames to support the following

Machine

- a. Governor
- b. Deflector sheave

2.16 EQUIPMENT ISOLATION

Vibration:

Provide sound-reducing vibration isolation elements at all support points of elevator controllers, solid-state motor drives, isolation transformers and hoisting motors. All bolts through isolation elements, where necessary, are to incorporate resilient washers and bushings.

1. The elements for controllers, motion control, and isolation transformers shall be similar to ribbed neoprene pads, type mini super w pads, as manufactured by Mason Industries or approved equal, at 45 durometer.
2. Elements between the hoisting machine and machine support beams or between car sling and platform shall be similar to triple (3) layer ribbed neoprene pads, separated by appropriate steel shims as manufactured by Mason Industries or approved equal, type Super W pads, at 50 durometer, loaded for 180 psi.

Electrical:

Provide electrical isolation as necessary to maintain the harmonic distortion and electrical noise within acceptable levels permitted by the appropriate governing authorities.

3. Provide transformers, chokes, and filters as needed in order to minimize audible noise and radio frequency interference to acceptable levels.

2.17 OPERATIONAL CONTROL SYSTEM

Approved Manufacturers:

GAL.

1. MCE.
2. SmartRise.
3. Approved Equal (must be non-proprietary).
4. A "Non-proprietary" controller product is one that is regularly sold by the manufacturer to other installers and one for which the manufacturer will provide technical support to other elevator contractors maintaining the product.
5. The owner / consultant shall retain the right to change or assign a controller manufacturer or product to the elevator contractor.

General Information:

- Provide new solid-state microprocessor controller[s] designed to the applicable ASME code as adopted and/or modified by local and state law or the local authority having jurisdiction.
6. Paint all machine room enclosures provided by the control manufacturer (control cabinet, isolation transformers, ripple filters, resistor boxes, etc.) the same color.
 7. Provide rubber floor mats at the front and at the rear of controller (if serviceable parts are located in the rear).

Machine Display:

- Provide a monitor or an LCD display in the machine room that allows troubleshooting and can display the status of the elevators. The monitor display shall display car position, registered hall and car calls, and status of the car, etc. The troubleshooting functions should include the ability to register car calls and hall calls. Controller shall include security features in order to allow any elevator contractor to lockout car calls or hall calls on an individual basis without software changes. Fire service shall override all lockouts, as required by Code.
8. Elevator contractor shall provide any passwords or passcodes set on either the LCD display or the control system in writing to the building owner and consultant. Anytime making changes to passwords or passcodes, elevator contractor shall give in writing all new updates to building owner and consultant.

Car Controller:

Design:

Electromechanical relays shall be used on safety circuits as required by the Code.

- a. Relays shall be designed to insure long life and quiet reliable operation without overheating or excessive wear. Provide contacts supplying highly inductive loads with arc deflectors or suppressers.
- b. Mount large resistors so that heat generated is dissipated from the enclosure without heating other components or wiring.
- c. All controller wiring shall be copper and done in a neat workmanlike manner. Make all connections to studs or terminals by means of solder-less connections lugs or similar connections. Label all studs and terminals for connections of board and external wiring.
- d. Symbols or letters shall identify all devices on the controller, either permanently marked on or adjacent to each device. All fuse holders shall be permanently marked with ampere rating.

Programming:

Provide equipment to protect the drive motor and solid-state motor drive as applicable against overload, phase reversal, low voltage, and single phase in all three phases.

- e. Controller shall regulate car speed to +/- 5% of contract velocity in either direction with any load up to full load.
- f. Calls shall register after establishing the direction of travel and only register in that direction.
- g. Parking shall be adjustable to allow each car to park at any floor.
- h. All date-sensitive functions of the elevator control system shall use a 4-digit year-tracking system.
- i. Controller shall provide efficient, smooth operation with step-less acceleration and deceleration of the elevator-driving machine independent of the load in the car.
- j. All memory chips shall be of the non-volatile type to provide for an automatic restart on power-up conditions.

Special Services: the controller(s) shall include the following programming with necessary outputs and inputs, even if not used at present:

Fire Emergency Operation: Shall meet all national and local code requirements.

- k. Emergency Power Operation.
- l. Emergency Terminal Stopping
- m. Emergency Terminal Speed Limiting

For use with reduced stroke buffers; shall include all necessary circuitry, components, and control systems for reduced stroke buffers and emergency terminal limiting.

Independent Service Operation:

Each car operating station shall be equipped with a key-operated switch labeled "IND". When placed in the "on" position, this switch shall cause the elevator to bypass all corridor calls and to travel directly to any floor chosen by registration of a car call. During Independent Service Operation, the elevator doors shall remain open at any landing until applying continuous pressure to the "door close" push button.

- 1) In case elevator is operating on the Independent Service mode and the Fire Emergency Recall system becomes activated, following a period not less than 10 seconds nor more than 30 seconds, the elevator shall automatically override Independent Service Operation and engage Phase I - Fire Emergency Recall Operation.

2.18 MOTION CONTROL SYSTEM

AC VVVF Solid-State Non-Regenerative Drive:

Design:

Drive shall include adjustable speed control and velocity profile in a dual-loop feedback system based on car position and speed. The VVVF drive system shall be a low-noise, flux-vector inverter device with the capability of varying the torque on the motor during acceleration and deceleration. It shall be capable of programming the volts per hertz and changing the acceleration deceleration profiles while utilizing velocity feedback digital encoding to permit a higher level of control.

- a. Include a digital LED readout and touch-key pad to facilitate software parameter adjustments, monitor system operation and display fault codes.
- b. Be configured as a complete digital drive system and be totally software configurable through high level language.
- c. Interface with external equipment/signals via either discrete local I/O connections or high speed Local Area Network (LAN).
- d. Provide fully programmable and adjustable carrier frequency to 16 KHz with an output frequency of 0 - 500 Hz.
- e. Be located within the limits of the control cabinet (where system size allows) or separately mounted in an appropriate chassis with hinged swing-out doors with clearances equal to the cabinet width dimensions.
- f. Provide programmable linear or S-curve acceleration and deceleration with controlled reversing.

Non-Regenerative Drive:

Provide a separate dynamic braking module to control overhauling motor speed, reduce hoist motor deceleration time and dissipate regenerated power. A resistor bank to absorb power

regenerated by the hoist motor. A 3-phase AC contactor rated for proper HP with overload protection to disconnect the inverter from the hoist motor whenever the elevator is stopped.

Noise Reduction:

Design and configure the solid-state drive system to include the following countermeasures for noise generated by the pulse-width modulated (PWM) inverters: control of radiated noise via inverter and/or motor cables, conducted noise through power lines, and induction and ground noise.

- g. A noise filter for the input power line shall be provided to prevent penetration into radios, wireless equipment and smoke detectors.
- h. Inverter shall be encased in metal and independently grounded.

Operating and Environmental Conditions:

Have a service factor of 1.0.

- i. Rated for continuous duty.
- j. Humidity - 90% rated humidity non condensing.
- k. Cooling - forced air when required.
- l. Temperature - 0-40 degrees Celsius (104 degrees Fahrenheit) for UL Listing.

Protective Features:

Motor overspeed.

- m. Adjustable current limit.
- n. Isolated control circuitry.
- o. Digital display of fault conditions.
- p. Selectable automatic restart at momentary power loss.
- q. Manual restart.
- r. Over/Under Voltage.
- s. Line to line and line to ground faults.
- t. Over-temperature.

2.19 DRIVING MACHINE

Location:

Overhead Machine Space.

Installation:

Remove existing hoist machine and motor in their entirety. Make all required modifications to support beams and reinforce beams and beam supports as necessary to accommodate the new hoist machine. Provide and install any additional structural steel needed to tie in the new hoist machine mounting points to the machine beam locations. Permanently fasten the new hoist machine assemblies to the machine beams. Expansion shields will not be permitted.

New Gearless AC Machine/Motor:

The new hoist machine shall be a Permanent Magnet, Synchronous Design, 1:1 roped, AC Gearless Traction Machine, as manufactured by Imperial Electric, Hollister-Whitney, or approved equal specially designed and manufactured for elevator service. The traction driving sheave and brake drum shall be bolted and pinned and press fit securely to the main shaft. Securely mount the

machine frame, including motor fields, bearing stands and brake on a heavy structural steel bedplate. The main shaft shall be supported by ball bearings.

1. The gearless machine shall be of sufficient capacity to operate elevator with rated load at rated speed without overheating. Insulation of all windings shall be impregnated and baked to prevent absorption of moisture and oil. The insulation resistance between motor frame and windings shall not be less than one Megohm. The motor windings shall stand a dielectric test of twice the normal voltage plus 1000 RMS volts of 60 Hertz alternating current for one minute.
2. Bedplate shall be of heavy structural steel shapes and welded together. Bedplate shall be heavily ribbed or reinforced for rigidity required to maintain accurate alignment of parts. Use of brackets or other extensions bolted to the bed plate as supports for principal parts will not be permitted. Tapered dowels shall be used to locate parts accurately. All protruding edges of machine beams, bedplate or other support steel shall have a rounded off radius. (NOTE: Any bedplates that are made in sections (2 sections maximum) shall be provided with alignment holes from the factory. Tapered dowels shall be used to locate the sections accurately. Once the sections are re-aligned, they shall be welded together (continuous weld) by a licensed welder.
3. Bearings: Bearing mounting shall be such as to ensure accurate bearing alignment. Bearings and lubricant reservoirs shall be dust-tight, and shall incorporate sufficient lubricant seals or other means to prevent lubricant leakage. Neither Babbited nor plain cast iron bearings shall be permitted. Ball and roller bearings shall be arranged for grease lubrication, and be fitted with grease gun connection and drain plugs. Ball bearings that are the lubricated for life type do not need to be arranged for lubrication. The machine shall have highest grade, double-acting bearing of the ball or roller type. Bearing shall have two sets of balls or rollers and shall be removable without dismantling machine.
4. Vibration: Vibration isolating machine foundation shall be furnished and installed and shall effectively prevent transmission of machine vibration to the building structure. Location and deflection characteristics of the vibration isolation units used shall be such as to produce an approximately uniform and non-excessive loading on the units under all operating conditions from minimum to maximum rated elevator load lifting capacity. The foundation shall incorporate positive means to prevent lateral displacement of the machine. (See Equipment Isolation Section for details)

B. New Brake:

Provide machine with a spring applied and electrically released electromechanical drum/disc brake and shall be so designed as to be effective to the extent of stopping and holding the car under all conditions of loading or operation. Brake shoes shall be applied to the braking surface simultaneously and with equal pressure by means of helical compression springs. Design brake electromagnet for quick release to provide smooth and gradual application of the brake shoes. Each brake arm is to be individually controlled and able to hold 125% of rated capacity.

1. The brake disc/drum must be carefully balanced, and have the wearing surface and edge of flange turned smooth, and the wearing surface must run true within a minimum variation of 0.005 inch. Allowable clearance shall be a minimum of 0.5 inch between the brake stand assembly and traction drive sheave to prevent any contact with the brake stand or any part thereof. Brake shoes are to be lined with non-asbestos bonded type linings. Brake plunger rods shall be polished cold rolled steel with surface free of machine marks.

C. New Traction Sheave:

The demountable drive sheave shall be cast from the best grade of hard cast iron, semi-steel or cast steel of approved composition and shall be machined with grooves, providing maximum traction with a minimum of cable and sheave wear. The surface of sheave shall be tested individually for hardness and the actual hardness to be plainly stamped next to the grooves on the sheave rim. The hardness must measure between 220 and 240 Brinell. The test MUST be performed with a TELEBRINELLER instrument. Traction sheave shall be progressively grooved to produce required traction and shall be of sufficient thickness to provide for future groove undercut. Provide

new rope guard at front and rear of sheave.

2.20 HOIST ROPES

Provide new pre-formed traction steel wire rope specifically constructed for elevator applications for suspension of the elevator car and counterweight assembly.

Elevator contractor shall verify new hoist ropes shall be of proper size and number to insure long life of cables and drive sheave.

1. A metal tag shall identify the type, strength, number of strands and date of installation of the hoist ropes. Classification of new hoist ropes shall be for use with American steel traction sheaves.

2.21 ANCILLARY SHEAVES

Applicable Equipment:

Deflector.

Provide new sheaves as required for proper display of ropes leading to car and counterweight hoisting locations. The new sheave shall be of hard alloy cast iron, semi-steel or cast steel of approved composition, with proper grooves for deflection. Surface of sheave shall have a hardness between 220 and 240 Brinell and shall be plainly stamped. Test MUST be performed with a TELEBRINELLER instrument. The diameter of the sheave shall not be less than 40 times the diameter of the hoisting rope. Provide standard ball bearing sheaves on steel shaft.

Provide appropriate rope guards and rope retainers

2.22 GOVERNOR

Install a new Hollister Whitney governor.

Elevator contractor shall clean, confirm calibration, and install governor level and plumb.

1. Provide an electrical overspeed protective device that when operated, shall disconnect power from the driving machine motor and brake before or at the application of the safety. This switch shall operate in both directions of travel. The setting for the overspeed switches shall be as prescribed in the ASME Code.
2. The governor shall meet all applicable code requirements including, but not limited to, ASME 17.1 and all applicable local codes and ordinances.

2.23 GOVERNOR ROPE

Provide necessary new pre-formed traction steel wire rope specifically constructed for elevator governor rope applications.

Governor rope shall pass over top of the governor sheave in the machine room and underneath the tension sheave located in the pit.

1. Both ends of the governor rope shall attach to the safety release carrier.
2. Governor rope diameter and method of fastening shall be in accordance with ASME A17.1 elevator safety code and codes and standards accepted by the authority having jurisdiction.

2.24 ASCENDING OVERSPEED, UNINTENDED MOVEMENT, EMERGENCY BRAKE

Approved Manufacturers:

Hollister-Whitney.

1. Draka.
2. Hilliard Braking Systems.
3. Wittur.
4. Atwell International
5. Approved Equal (must be non-proprietary).

A dual coil brake shall be utilized to satisfy the emergency brake, unintended car movement, ascending overspeed code requirements.

If required by the gearless machine manufacturer then provide both dual coil brake and a separate rope brake for code compliance; if the OEM states it is not required then this shall be removed and the cost deducted from the project.

The elevator contractor's bid shall include any structural engineering required to validate the ability of the building structure to accommodate the rope brake or other such device used to meet ascending car overspeed, unintended car movement requirement, or emergency brake requirements. All devices shall meet the requirements of Section 2.19 of the ASME A17.1 Elevator Safety Code.

B. Ascending Car Overspeed

Provide a device designed to prevent an ascending elevator from striking the hoistway overhead structure because of a failure in the electric driving-machine motor, brake, coupling, shaft, or gearing, the control system, and any other component upon which the speed of the car depends, except the suspension ropes and the drive sheave of the traction machine. The device shall decelerate the car with any load up to the rated capacity by applying an emergency brake.

1. The device shall detect an ascending car overspeed condition of not greater than 10% higher than the speed that the car governor is set to trip.
2. The device, when activated, shall prevent operation of the car until manually resetting the device.

Unintended Car Movement Protection

Provide a protection device to prevent the unintended car movement away from the landing when the hoistway and car doors are not in the closed and locked position and the car door is not in the closed position.

3. The device shall prevent such movement in the event of failure of the electric driving machine motor, brake, coupling, shaft or gearing, control system, and any other component upon which the speed of the car depends, except the suspension ropes and the drive sheave of the traction machine.
4. The device, when activated, shall prevent operation of the car until manually resetting the device.

Emergency Brake

Provide a mechanical device, independent of the normal braking system that will stop the elevator should it overspeed or move in an unintended manner. The device used may apply force to the car or counterweight rails, suspension or compensation ropes, drive sheave, or brake drum.

2.25 CAR TOP GUARD RAILINGS

Provide car top guard rails per local and state code requirements.

2.26 ALARM BELLS

Provide one (1) new alarm bell per elevator. Locate the bell either underneath the platform or on top of the car.

Alarm bell shall ring when operating the Alarm Button inside the elevator.

2.27 SELECTOR / LEVELING DEVICE

Incorporate the solid-state selector into the new microprocessor based operational controls. The selector / leveling device shall:

It shall determine the position in the hoistway through either a fixed tape or by an encoder.

1. It shall provide accurate control, rapid acceleration, and retardation without discomfort to the rider.
2. It shall include absolute floor encoding; that during the elevator power up sequence causes the elevator to move to the closest floor to identify its position.
3. It shall automatically bring the car to a stop within 1/4 of an inch of the floor for which a stop has been initiated under all conditions of load for both "up" and "down" travel. This system shall correct for overtravel, undertravel, and rope stretch.

2.28 DOOR REOPENING DEVICE

Provide a new infrared matrix door reopening device system with independent power supplies.

Approved manufacturers: Janus, Tri-tronics, or equal.

1. Provide protection in line with doors and in front of door path; 3D type with visual indicators when doors are in motion.
2. Protective field not less than 71" above the car sill
3. A minimum of 47 light beams and positioned correctly to conform to applicable codes, A17.1 and A117.1
4. The door protection system shall have a modular design to permit on board test operation and replacement of all circuit boards without removing the complete unit.
5. If the power to the unit fails, the doors shall remain open.
6. Nudging Action: In the event continually obstructing a detector edge for a predetermined time interval (no less than 20 seconds) after initiating automatic door closing, a buzzer shall sound and the doors shall close at a gentle reduced speed. Timers shall be individually adjustable. This feature must be adjustable for reduced car door closing force. This feature shall also have the capability of being turned off on demand.

2.29 TOP OF CAR STATION

Top of car run box shall have an inspection switch that overrides all other inspection switches, with up, down, and enable push buttons and a stop switch. Install a guarded light on top of the car. The inspection station shall comply with all current code requirements, including operational and labeling requirements.

The top of car run box may contain a lighting fixture for the top of the car and an approved 120 Volt

grounded GFCI duplex receptacle.

2.30 LOAD WEIGHING

System accuracy of plus or minus 4% of the elevator capacity

Types of devices allowed:

A device to measure the tension in the elevator hoist ropes and thus determine the load in the car.

- a. A strain gauge device located on the crosshead, arranged to measure the deflection of the crosshead and thus determine the load in the car.

Shall perform the following:

Provide an input to the signal and motor control systems for pre-torque of the hoisting machine motors, where applicable.

- b. Bypass hall calls when the elevator is fully loaded.
- c. Dispatch from the Lobby without additional delay when the elevator becomes fully loaded.
- d. Provide audible and visual signals for use as an "overload" device.

2.31 CAR GUIDE RAILS

Install new car guide rails, brackets, fishplates, backings support, and related attachments only for the lower power in the new pit.

Align to +/- 1/8-inch plumb to produce a smooth, quiet ride and to achieve the ride quality criteria stated herein.

1. Provide the guide rail inserts to the General Contractor for installation.

Reuse existing car guide rails (remaining portion of the hoistway - above the pit), brackets, fishplates, backings support, and related attachments. Inspect to determine if any unfavorable conditions exist that diminish the structural integrity of any component.

Inspect each rail stack to determine if excessive compression has occurred from the building settlement. If such conditions exist then cut off sufficient from each affected stack to relieve the pressure and provide jacking bolts underneath each stack of both car and counterweight guide rails.

2. Thoroughly clean all guide rails of grease, oil and other foreign substances, file and remove all rough edges and surfaces.
3. Tighten bracket bolts and guide clips for smooth and quiet operation of car.
4. Realign to +/- 1/8-inch plumb to produce a smooth, quiet ride and to achieve the ride quality criteria stated herein.

2.32 COUNTERWEIGHT GUIDE RAILS

Install new counterweight guide rails, brackets, fishplates, backings support, and related attachments.

Align to +/- 1/8-inch plumb to produce a smooth, quiet ride and to achieve the ride quality criteria stated herein.

1. Provide the guide rail inserts to the General Contractor for installation.

2.33 CAR GUIDE SHOES

Approved Manufacturers / Model:

ELSCO.

1. HW.
2. Approved equal.

Roller guides shall have an adjustable metal base, rigidly bolted to the top and bottom of each side of the car.

Roller guide design shall provide continuous contact of all rollers with the guide rail surfaces under all conditions of load and operation.

3. The roller guides shall consist of a set of sound reducing neoprene wheels in precision bearings held in contact with the three finished rail surfaces by adjustable stabilizing springs.
4. Provide grease fittings for lubrication of the bearings.
5. Equip roller guides with adjustable stops to control float.
6. Equip roller guides with 16-gauge steel guards.
7. Prior to the installation of the roller guides, wash down the rails, check and repair rail joints for proper mesh.

2.34 COUNTERWEIGHT GUIDE SHOES

Approved Manufacturers / Model:

ELSCO.

1. HW.
2. Approved equal.

Roller guides shall have an adjustable metal base, rigidly bolted to the top and bottom of each side of the counterweight frame.

Roller guide design shall provide continuous contact of all rollers with the guide rail surfaces under all conditions of load and operation.

3. The roller guides shall consist of a set of sound reducing neoprene wheels in precision bearings held in contact with the three finished rail surfaces by adjustable stabilizing springs.
4. Provide grease fittings for lubrication of the bearings.
5. Equip roller guides with adjustable stops to control float.
6. Equip roller guides with 16-gauge steel guards.
7. Prior to the installation of the roller guides, wash down the rails, check and repair rail joints for proper mesh.

2.35 DOOR OPERATOR

Approved Manufacturers:

GAL.

1. Approved equal.

Model

MOVFR - heavy-duty closed-loop door operator

The unit shall have the ability to adjust torque, opening speeds, closing speeds, nudging speed and soft start. It shall have proper filtering to eliminate audible noises.

The door operator shall have the capability to operate at an average opening speed of 2 feet per second.

This type of operator shall have the designation of a high-speed operator. Automatic closing of the car and hoistway door shall be required, and the closing speed shall be approximately 1 foot per second. This closing speed shall reduce as required to limit the kinetic energy of the closing doors to the values permitted by the ASME Code.

2. The doors shall operate smoothly without slamming in either the opening and closing direction. They shall cushion their final movement in both directions of travel either by individual dashpots or by other equally effective approved methods. Electrical power shall open and close doors.
3. In case of interruption or failure of electric power from any cause, the door operating mechanism shall instantly permit emergency manual operation of both the car door and the hoistway door within the floor landing zones, and the hoistway door shall continue during emergency operation to be self-locking and self-closing. The door operator shall operate in conjunction with or be equipped with all interlocks and safety contacts specified.
4. All car-door linkage construction shall be of heavy steel members. All pivot points shall have either ball or roller bearings, or bronze-bushed bearings of ample size. All brackets and other supports required to support door-operating mechanism shall be furnished and installed.
5. The door operation shall be adjustable to allow for adjustment of the premature door opening time within the landing zone. Either the door operator or the door reopening device shall control the amount of time the door remains open.
6. Controls shall automatically compensate for load changes such as: wind conditions, different weight door panels, or other unique conditions.
7. Provide nudging to limit speed and torque in conjunction with door close signaling/closing and timing devices as permitted by ASME A17.1 and/or otherwise modified by the AHJ. The signal control system shall initiate nudging operation and not the door protective device.

2.36 CAR DOOR CONTACT

A new electrical contact shall be provided and arranged to operate with the car doors so that the elevator cannot operate unless the doors are closed or within the tolerance allowed by ASME Code. The car door contact/switch shall not be accessible by passengers inside the car.

2.37 CAR DOOR HANGERS

New car door hangers shall be compatible with the new door operator.

2.38 CAR DOOR TRACK

New car door hangers shall be compatible with the new door operator.

2.39 CAR DOOR CLUTCH

Provide a new car door clutch assembly that is compatible with new release roller assembly and includes a door restrictor compatible with applicable code.

2.40 HOISTWAY DOOR FRAMES

Applicable floors:

All floors.

Material (14 gauge):

Stainless steel.

Finish:

Brushed #4 (Satin).

Jambs with 2 inches wide square jamb profile with standard configuration.

A. Frame assembly: Knocked-down frame with butt joint with flush head.

The frames shall set flush with the edge of the sill on the hoistway side and shall be mortised and reinforced for all necessary hardware.

1. The frame shall have the surfaces coated with an acid and water resisting filler. All voids between the wall and buck on the hoistway side shall be filled, made smooth and finished to match adjacent surfaces. The front face of the jambs shall aesthetically cover the existing wall cutouts and adjoin the surrounding wall with no gaps. Include all filler strips, molding, etc., as required to provide for a finished installation.

2.41 HOISTWAY DOOR PANELS

Applicable floors:

All floors.

Material (14 gauge):

Stainless steel.

Finish:

Brushed #4 (Satin).

Flush hollow metal door panel with 1 -1/2 hour fire rating and UL label.

Panel surfaces coated with an acid and water resisting filler

1. Panels shall include continuous vertical members for reinforcing and shall have sound deadening material inside
2. New sight guards shall match hoistway door finish
3. Panel shall include two removable door gibs to run in existing sill grooves with a minimum code-compliant clearance. The gibs mounting shall permit their replacement without removing the door panels from the hangers.
4. Provide escutcheons with metal ferrules at each opening. Sample requires approval by owner or owner's representative.
5. Provide new rubber hoistway door astragals as required by panel design.

2.42 HOISTWAY SILL

Applicable Floors:

All floors

Type:

Aluminum.

Provide proper supports and grout in all gaps and voids under the sills.

2.43 HOISTWAY DOOR HANGER

Provide new hangers for hoistway doors of the heavy-duty sheave type, consisting of two (2) ball bearing sheaves not less than 3-1/2 inches in diameter enclosed in steel housings.

All sheave wheels shall rotate in grease packed precision ball bearing.

1. Each hanger shall be equipped with two (2) ball bearing upthrust rollers not less than 1 inch in diameter with eccentric adjustment.

2.44 HOISTWAY DOOR TRACK

Provide new tracks not less than 3-1/2 inches in height, and shall be of high carbon cold rolled or drawn steel, shaped, and finished to permit free movement of sheaves.

2.45 HOISTWAY DOOR ROLLER

Provide new rollers for the hoistway doors of the heavy-duty sheave type, consisting of ball bearing sheaves enclosed in steel housings.

All sheave wheels shall rotate in grease packed precision ball bearing.

2.46 HOISTWAY DOOR INTERLOCK

Approved manufacturers:

GAL.

1. Approved equal.

Provide new, positive electro-mechanical interlock. Interlock release roller assembly will include one fixed roller attached to the door mounting plate and one moveable roller that activate the interlock release assembly.

Interlock shall prevent operation of elevator by normal operating devices, unless all hoistway doors are locked in the closed position. Interlock shall also prevent opening of hoistway doors from landing side, unless car is within that landing zone and is either stopping or stopped. Interlocks shall be unlockable from elevator car in case of power failure, only within the landing zone. Entrances with center-parting doors shall be provided with interlock keeper mounted to both fast door panels.

2.47 HOISTWAY DOOR CLOSER

Install new mechanical closers to assure self-closing of all shaft doors, independently and irrespective of the position of the car.

Closers shall have a similar mounting as at present. Each hall door panel shall be equipped with a mechanical closer.

2.48 HOISTWAY DOOR GIB

Provide each door panel with two new removable plastic composition guides, arranged to run in sill grooves with a minimum clearance. The guide mounting shall permit their replacement without removing the door from the hangers.

2.49 HOISTWAY DOOR SAFETY RETAINER

Provide one new steel safety retainer (aka: "Z bar" or "fire gib") guide on the underside of all doors and securely fasten to the underside of the door with steel countersunk machine screws. Mount the safety retainer adjacent to and in between the removable guides. The safety retainer shall meet all local code requirements for size and location. Provide new safety retainer as described in ASME A17.1 on all openings.

2.50 COUNTERWEIGHT

The existing counterweight assembly shall be removed and replaced with a new counterweight frame and filler weights.

Install a new Hollister-Whitney counterweight frame and filler weights of the appropriate size and weight for the elevator. Frame shall have proper mounting plates for roller guide attachment.

The elevator shall be suitably counterbalanced for smooth and economical operation. Counterweights shall be equal to the dead weight of elevator cab plus 40 - 42% of the rated capacity (or % required by driving machine manufacturer).

2.51 HOISTWAY LIMITS

Non-contact type for normal and emergency terminal slowdown, normal terminal stopping, final limits and access limits

Terminal stopping devices that are not mechanically operated shall be provided by the manufacturer of the control equipment, intended for use as a terminal limit, and designed for reliable operation in the hoistway environment.

Final limits shall be mechanically operated and then pinned to prevent movement after final adjustment

2.52 WIRING AND CONDUIT

Provide new wiring in the hoistway, pit, and machine room adequate for the proper operation of the elevator. All material used and method of installation shall conform to the National Electrical Code (NFPA 70) and/or

local Building Code.

Conductors shall be copper. The minimum size of conductors, exclusive of those that form an integral part of control devices and/or cabinets, shall be a minimum no. 14 for lighting or power circuits and no. 18 for operating, control and signal circuits.

1. Provide ten percent (10%) spare wires and not less than two (2) spare wires between the controller, selector, hoistway junction box, and starter panel. Properly tag or clearly and indelibly mark all spares.
2. All wiring shall be labeled and identified at the terminal in the machine room, shaft box, elevator cab junction box, and push-button stations within the cab and shall agree with the submitted wiring diagrams.
3. Install strain boxes no more than 80 feet apart.
4. Flexible metal conduit may be used for short connections if it is not subject to moisture, oil, or embedment in concrete.
5. Connections to the controller and/or drive shall be made in a manner that minimizes transmission of vibration or noise to the building.
6. Do not use threadless (compression) fittings with rigid galvanized steel conduit. Electrical connections to machinery shall allow for one foot of lateral motion.
7. Remove all abandoned or unused electrical conduit from the hoistway, pit, and machine room.
8. Existing wire raceway may be reused.
9. New wire raceway shall be zinc-coated rigid steel conduit, intermediate electrical conduit, electrical metallic tubing (EMT), or metal wireways and outlet boxes.

2.53 TRAVELING CABLES

Provide new traveling cables designed for elevator service compliant with current elevator and electrical codes and shall be sufficiently flexible to readily adapt to all changes in the position of the elevator cab and hang straight without twist. The cables shall be capable of bending 360 degrees with an inside radius of one (1) foot without any permanent set and without cracking of the outer covering. The open loop shall show no tendency to twist upon itself. Traveling cables shall contain shielded wires for the intercommunication system and sufficient coaxial cable for a CCTV system.

Conductors shall be copper. The minimum size of conductors shall be a minimum no. 14 for lighting or power circuits and no. 18 for operating, control and signal circuits.

1. Traveling cable(s) shall contain at least:
 - Four (4) shielded pairs for a total of 8 wires
 - a. One (1) coaxial cable
 - b. Ten percent (10%) spare wires for each wire size and not less than two (2) spare wires for each wire size in each traveling cable. Properly tag or clearly and indelibly mark all spares.

Terminating Coaxial Cable

Terminate one end on one of the top corners of the elevator cab along with a duplex GFCI outlet dedicated for camera power only.

- c. Terminate one end of the coaxial cable in the machine room, in a separately identified box.

Directly suspend traveling cables exceeding 100 feet in length from the steel supporting core cables to relieve the conductors from strain.

2. Install beam pads as necessary to prevent chafing of traveling cables.

2.54 CONVENTIONAL DISPATCHING HALL STATIONS

Applicable Floors

All floors.

Provide new flush-mounted hall button stations.

Stations shall include new up and down pushbuttons at all intermediate landings and single button at terminal landings. All buttons shall have acknowledge lights.

1. Hall button stations shall be ADA compliant.
2. Elevator contractor shall not use surface mounted hall button stations.
3. Elevator contractor may use extended plates, but must remove old covers and boxes completely.

New main lobby <1st Floor> <other designation> floor hall pushbutton station[s] shall include:

Pushbuttons.

4. Fire service signals and key switches.

2.55 HALL POSITION INDICATOR

Applicable Floors:

All floors.

Location:

Incorporate in the hall station.

- A. Provide 1/2 inch LED digital position indicator to show floor landings.

LED characters shall have a screen flush with fixture cover.

2.56 CONVENTIONAL DISPATCHING HALL LANTERNS AND GONGS

Applicable Floors

All floors.

The hall lantern shall indicate which car will stop in response to the corridor call and indicate the direction that the car is traveling five (5) seconds before arrival. The lantern shall remain illuminated until the doors start to close.

Incorporate a new multi-stroke gong in the new lantern fixture to sound when illuminating the lantern to call the attention to the waiting passengers and to meet handicapped requirements.

1. Intermediate floor fixtures shall have both "up" and "down" indications. The terminal floors shall have only one (1) indication.
2. New hall lanterns and gongs shall meet all A.D.A. compliance requirements.

2.57 HALL ACCESS STATION

Applicable Floors

G and 4th Floor.

Install an approved five-pin or five-disk key switch at the location(s) indicated above to permit moving the elevator at inspection speed with the hoistway doors open at that particular landing only. The car will only travel a distance necessary for authorized persons to obtain access to the top of car or pit area.

2.58 PIT DOOR

Refurbish pit door and confirm that it conforms with the following requirements or adjust to comply:

Install an electric contact to prevent operation of the elevator when the door is open.

1. The door shall have a minimum opening 29.5 inches in width and 72 inches in height.
2. Install a barrier if the door sill is more than 12 inches above the pit floor. Barrier shall comply with Rule 2.11.1.2 (i).
3. The barrier shall be hinged and self-closing and independent of the pit door.
4. It shall be installed horizontally across the entrance of the hoistway side at a height of 42 inches.
5. The barrier shall not open into the hoistway.
6. Door shall be self-closing, self-locking and have a key lock that is compliant with Group 1 Security, and shall be labeled "DANGER, ELEVATOR PIT" with letters not height.

2.59 TENSION SHEAVE

Install a new Hollister Whitney tension weight.

Elevator contractor shall clean and install tension weight level and plumb.

1. The tension weight shall meet all applicable code requirements including, but not limited to, ASME 17.1 and all applicable local codes and ordinances.

2.60 SPRING BUFFERS

Furnish and install new spring buffers as manufactured by Hollister Whitney or approved equal.

Clean and paint all supporting steel.

1. Attach the buffers to the pit channel or pit plate with removable helical coil springs with internal stop pipes.
2. Install all necessary buffer support steel, hardware, and inspection platforms as required by code.

2.61 PIT STOP SWITCHES

Provide new pit stop switches as per code requirements.

2.62 COUNTERWEIGHT GUARD

Provide new counterweight guard and solidly mount with hardware. Clean and paint as necessary. The guard

shall meet the following code requirements:

Extend from the lowest part of the counterweight assembly when the counterweight is resting on the fully compressed buffer to a point not less than 83 in. and not more than 96 in. above the pit floor.

1. Be the full width of the area being guarded.
2. Not prevent determination of the counterweight runby.
3. Be fastened to a metal frame reinforced and braced to be at least equal in strength and stiffness to 0.074 in. thick sheet steel.
4. If perforated, reject a ball 1 in. in diameter.

2.63 CAR FRAME

Provide new car frame of required size with new rubber isolation pads.

Car frame shall be painted with rust inhibitor type paint.

2.64 PLATFORM

Provide new isolated platform.

The car platform shall consist of a steel frame with necessary steel stringers all securely welded together.

1. The isolation frame and platform shall be so braced and reinforced that no strain will be transmitted to the elevator car.
2. Provide platform with two layers of 3/4 inch exterior grade plywood. Cover the underside of the car platform with sheet steel.
3. Provide a NEW code-compliant platform or toe guard at each car entrance opening to extend below the car opening for safety.

2.65 SAFETY

Type

B: Flexible Guide.

Provide new Hollister Whitney or approved equal governor actuated car safety device. This device and settings shall comply with all current code requirements.

New safety device shall have safety-operated switch (plank switch) installed and adjusted for proper operation.

1. See signage section for signage requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

Measurements and Inspection: Complete responsibility for detailed dimensions lies with the elevator contractor. In the execution of the work, the elevator contractor must verify all dimensions with the actual conditions.

Prepare written report, endorsed by elevator contractor, listing conditions detrimental to performance of the work.

1. Proceed with work only after unsatisfactory conditions have been corrected.
2. The elevator contractor shall verify with the Authority Having Jurisdiction the status of all mandated inspections, tests, and any outstanding violations or fines incurred.

3.2 INSTALLATION

Complete the work with skilled workers in strict accordance with the accepted shop drawings and other submittals.

- A. Comply with the code, manufacturer's instructions and recommendations.
- B. Coordinate work with the work of other trades for proper time and sequence to avoid construction delays and to insure right-of-way system. Use lines and levels to insure dimensional coordination of the work.
- C. Accurately and rigidly secure supporting elements within the hoistway to within the tolerance established.
- D. Provide and install motors, switches, controls, safety and all operating devices in strict accordance with the submitted wiring diagrams and applicable codes and regulations having jurisdiction.
- E. After installation, touch up in the field surfaces of shop primed elements, which have become scratched or damaged.
- F. Lubricate operating parts of system, as recommended by the manufacturer.
- G. Bevel any ledges, setback, recess, or projection in the hoistway that measures 4 inches or more in width shall be beveled at an angle of not less than 75 degrees from horizontal. Each bevel plate shall be constructed to conform to ASME A17.1 elevator safety code. Provide patching of hoistway walls.
- H. Elevator contractor is responsible for cutting and patching of walls and floors.

3.3 PAINTING OF COMPONENTS / EQUIPMENT

Before shipment, all parts made of structural steel section and plates shall be thoroughly cleaned to remove all loose mill scale, rust and foreign matter. Except where encased in concrete, all these parts shall be given one coat of rustproof paint, applied thoroughly and evenly, and well worked into the joints and other spaces. Parts that will be inaccessible after assembly shall be given two shop coats.

Machine finished surfaces shall be protected against corrosion by effective means approved by the owner as soon as the machining is completed. All new machinery and equipment shall be given a shop finish of the best quality paint normally used by the manufacturer of the machinery or equipment. After final adjustment of all machinery, work, metal fittings, etc., exposed in the hoistways or elsewhere, all shall be painted one coat in the field. All machinery, cabinets, etc., shall be painted the same color and numbered as required by code. All surface holes and imperfections shall be filled with iron filler thoroughly rubbed in and smoothed off. Upon completion of the installation, all equipment, new and existing, shall be thoroughly cleaned and touched-up as required, and given two additional coats of machine enamel and a coat of high-grade waterproof varnish.

- A. Completely clean and paint the following areas:

The machine room and pit area shall be painted by the elevator contractor at the completion of the project, using an appropriate paint approved by the owner.

3.4 STATIC BALANCE CAB

The elevator contractor shall statically balance cab, with the car guides removed. Include all costs associated with coordination of cab related work in the base bid including static and dynamic balancing. This work shall include the following:

Perform static balancing prior to dynamic balancing of the counterweight frames.

1. Perform static balance test in the presence of the consultant prior to or during the Final Acceptance.
2. Elevator contractor shall verify the dynamic balancing of 40 - 42% (or % required by hoist machine manufacturer) in the presence of the consultant.

The elevator contractor shall re-adjust the load weighing sensors to account for any net change in existing cab weight.

- B. The elevator contractor shall be responsible for ensuring that any weight added to the cab does not result in exceeding the maximum permissible weight limits of the elevator hoist machine sheave shaft. If the cab weight does exceed the maximum permissible shaft loading, then the elevator contractor must notify the consultant immediately and take whatever action is necessary to lower the cab weight to a permissible level.

3.5 FINAL CLEAN-UP

Upon completion of the work covered by the contract, the elevator contractor shall leave the completed Project ready for use without the need of further cleaning of any kind and with all work in perfect order. In addition, upon completion of all work the elevator contractor shall remove from the vicinity of the work and from the building's rubbish, unused materials, and other materials belonging to him or used under his direction during construction and legally dispose of same. If during this period, he impairs the use or appearance of the property, he shall restore such areas, affected by the work, to their original condition. In the event of his failure to do so, the same shall be removed by the owner at the expense of the elevator contractor, and he and his guarantee shall be liable therefore.

- A. Upon completion of modernization for the elevator thoroughly clean the elevator motor room and hoistway enclosures including overheads, secondaries, hoistway enclosures, setbacks, sills, pits, car tops and all related elevator equipment.

3.6 ACCEPTANCE AND TURNOVER

Testing and Inspection:

The elevator contractor shall secure and pay for all inspections and tests required for the work. Provide proper facilities, at all times, for inspections and tests of work by consultant and authorities having jurisdiction. Furnish labor, equipment, materials and services necessary to conduct all tests and inspections.

1. Upon completion of installation of all equipment and when same is in full operating condition, coordinate with the owner to completely test all equipment, both for the governing authorities and for compliance with the requirements of the Contract Documents. All necessary equipment for testing and the cost of same shall be included as part of this contract. All tests shall be performed

- in accordance with the requirements of the governing code.
2. If tests show that the equipment is in any way defective, of poor workmanship, at variance with the requirements of the Contract Documents, or dangerous or objectionable in operation, the elevator contractor shall make all necessary changes and remedy all defects at his expense, to the satisfaction of the consultant, and also pay, as hereinbefore noted, for all subsequent tests until all equipment is acceptable.
 3. Upon completion of satisfactory tests, secure and furnish to the consultant certificates from all authorities having jurisdiction, that the conveying systems and related equipment have been inspected and approved.
 4. Review and acceptance of equipment by the consultant is contingent upon prior approval of the above referenced authorities and compliance by the elevator contractor with all requirements of such authorities and the Contract Documents.
 5. Elevator contractor shall provide at least TEN (10) DAYS prior written notice to the owner and consultant regarding the exact date on which work will be tested by the authority having jurisdiction.

END OF SECTION 142123

SECTION 210517 - SLEEVES AND SLEEVE SEALS FOR FIRE-SUPPRESSION PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sleeves.
 - 2. Stack-sleeve fittings.
 - 3. Grout.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.
- C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.
- D. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- F. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.
- G. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

2.2 STACK-SLEEVE FITTINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Smith, Jay R. Mfg. Co.
 2. Zurn Industries, LLC.
- B. Description: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring, bolts, and nuts for membrane flashing.
1. Underdeck Clamp: Clamping ring with setscrews.

2.3 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
1. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.
 2. Cut sleeves to length for mounting flush with both surfaces.
 3. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
- C. Install sleeves for pipes passing through interior partitions.
1. Cut sleeves to length for mounting flush with both surfaces.
 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Section 079200 "Joint Sealants."
- D. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

END OF SECTION 210517

September 7, 2017
Bid Issue

Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower-Internal Stair
Elizabeth, New Jersey

SECTION 210518 - ESCUTCHEONS FOR FIRE-SUPPRESSION PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.
 - 2. Floor plates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

- A. One-Piece, Cast-Brass Type: With polished, chrome-plated and rough-brass finish and setscrew fastener.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.
- C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.
- D. Split-Casting Brass Type: With polished, chrome-plated and rough-brass finish and with concealed hinge and setscrew.
- E. Split-Plate, Stamped-Steel Type: With chrome-plated finish, concealed and exposed-rivet hinge, and spring-clip fasteners.

2.2 FLOOR PLATES

- A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.
- B. Split-Casting Floor Plates: Cast brass with concealed hinge.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. Escutcheons for New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
 - b. Chrome-Plated Piping: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - c. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - e. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - f. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - g. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass or split-casting brass type with rough-brass finish.
 - h. Bare Piping in Unfinished Service Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - i. Bare Piping in Equipment Rooms: One-piece, cast-brass or split-casting brass type with rough-brass finish.
 - j. Bare Piping in Equipment Rooms: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
- C. Install floor plates for piping penetrations of equipment-room floors.
- D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. New Piping: One-piece, floor-plate type.

3.2 FIELD QUALITY CONTROL

- A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 210518

SECTION 210548 - VIBRATION AND SEISMIC CONTROLS FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Pipe-riser resilient supports.
2. Resilient pipe guides.
3. Elastomeric hangers.
4. Snubbers.
5. Restraint channel bracings.
6. Seismic-restraint accessories.
7. Mechanical anchor bolts.
8. Adhesive anchor bolts.

B. Related Requirements:

1. Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment" for devices for plumbing equipment and systems.
2. Section 230548 "Vibration and Seismic Controls for HVAC" for devices for HVAC equipment and systems.

1.3 DEFINITIONS

- A. IBC: International Building Code.
- B. ICC-ES: ICC-Evaluation Service.
- C. OSHPD: Office of Statewide Health Planning & Development (for the State of California).

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of vibration isolation device and seismic-restraint component required.

- a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an agency acceptable to authorities having jurisdiction.
 - b. Annotate to indicate application of each product submitted and compliance with requirements.
3. Interlocking Snubbers: Include ratings for horizontal, vertical, and combined loads.
- B. Delegated-Design Submittal: For each vibration isolation and seismic-restraint device.
1. Include design calculations and details for selecting vibration isolators and seismic restraints complying with performance requirements, design criteria, and analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 2. Design Calculations: Calculate static and dynamic loading due to equipment weight and operation, due to seismic forces required to select vibration isolators, and due to seismic restraints.
 3. Riser Supports: Include riser diagrams and calculations showing anticipated expansion and contraction at each support point, initial and final loads on building structure, spring deflection changes, and seismic loads. Include certification that riser system was examined for excessive stress and that none exists.
 4. Seismic-Restraint Details:
 - a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.
 - b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
 - c. Coordinate seismic-restraint and vibration isolation details with wind-restraint details required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.
 - d. Preapproval and Evaluation Documentation: By an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).
- 1.5 INFORMATIONAL SUBMITTALS
- A. Coordination Drawings: Show coordination of vibration isolation device installation and seismic bracing for fire-suppression piping and equipment with other systems and equipment in the vicinity, including other supports and restraints, if any.
 - B. Qualification Data: For professional engineer and testing agency.
 - C. Welding certificates.
 - D. Field quality-control reports.
- 1.6 QUALITY ASSURANCE
- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7 and that is acceptable to authorities having jurisdiction.

- B. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- D. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are unavailable, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic-Restraint Loading:
 - 1. Site Class as Defined in the IBC.
 - 2. Assigned Seismic Use Group or Building Category as Defined in the IBC.
 - 3. Design Spectral Response Acceleration at Short Periods (0.2 Second).
 - 4. Design Spectral Response Acceleration at 1.0-Second Period.
 - 5. Rated strengths, features, and applications shall be as defined in reports by an agency acceptable to authorities having jurisdiction.
 - a. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they are subjected.

2.2 PIPE-RISER RESILIENT SUPPORT

- A. Description: All-directional, acoustical pipe anchor consisting of two steel tubes separated by a minimum 1/2-inch-thick neoprene.
 - 1. Vertical-Limit Stops: Steel and neoprene vertical-limit stops arranged to prevent vertical travel in both directions.
 - 2. Maximum Load Per Support: 500 psigon isolation material providing equal isolation in all directions.

2.3 RESILIENT PIPE GUIDES

- A. Description: Telescopic arrangement of two steel tubes or post-and-sleeve arrangement separated by a minimum 1/2-inch-thick neoprene.
 - 1. Factory-Set Height Guide with Shear Pin: Shear pin shall be removable and reinsertable to allow for selection of pipe movement. Guides shall be capable of motion to meet location requirements.

2.4 ELASTOMERIC HANGERS

A. Elastomeric Mount in a Steel Frame with Upper and Lower Steel Hanger Rods:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Ace Mountings Co., Inc.
 - b. California Dynamics Corporation.
 - c. Isolation Technology, Inc.
 - d. Kinetics Noise Control, Inc.
 - e. Mason Industries, Inc.
 - f. Vibration Eliminator Co., Inc.
 - g. Vibration Mountings & Controls, Inc.
2. Frame: Steel, fabricated with a connection for an upper threaded hanger rod and an opening on the underside to allow for a maximum of 30 degrees of angular lower hanger-rod misalignment without binding or reducing isolation efficiency.
3. Dampening Element: Molded, oil-resistant rubber, neoprene, or other elastomeric material with a projecting bushing for the underside opening preventing steel to steel contact.

2.5 SNUBBERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Kinetics Noise Control, Inc.
2. Mason Industries, Inc.
3. Vibration Mountings & Controls, Inc.

B. Description: Factory fabricated using welded structural-steel shapes and plates, anchor bolts, and replaceable resilient isolation washers and bushings.

1. Anchor bolts for attaching to concrete shall be seismic-rated, drill-in, and stud-wedge or female-wedge type.
2. Resilient Isolation Washers and Bushings: Oil- and water-resistant neoprene.
3. Maximum 1/4-inch air gap, and minimum 1/4-inch-thick resilient cushion.

2.6 RESTRAINT CHANNEL BRACINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. B-line, an Eaton business.
2. Hilti, Inc.
3. Mason Industries, Inc.
4. Unistrut; Part of Atkore International.

B. Description: MFMA-4, shop- or field-fabricated bracing assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and

other matching components and with corrosion-resistant coating; rated in tension, compression, and torsion forces.

2.7 SEISMIC-RESTRAINT ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. B-line, an Eaton business.
 2. Kinetics Noise Control, Inc.
 3. Mason Industries, Inc.
 4. TOLCO.
- B. Hanger-Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod.
- C. Hinged and Swivel Brace Attachments: Multifunctional steel connectors for attaching hangers to rigid channel bracings.
- D. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchor bolts and studs.
- E. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices used.
- F. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

2.8 MECHANICAL ANCHOR BOLTS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. B-line, an Eaton business.
 2. Hilti, Inc.
 3. Kinetics Noise Control, Inc.
 4. Mason Industries, Inc.
- B. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.9 ADHESIVE ANCHOR BOLTS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Hilti, Inc.
 2. Kinetics Noise Control, Inc.
 3. Mason Industries, Inc.

- B. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing PVC or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

- A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.
- B. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.
- C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength is adequate to carry present and future static and seismic loads within specified loading limits.

3.3 VIBRATION CONTROL AND SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Section 033000 "Cast-in-Place Concrete."
- B. Installation of vibration isolators must not cause any change of position of equipment, piping, or ductwork resulting in stresses or misalignment.
- C. Comply with requirements in Section 077200 "Roof Accessories" for installation of equipment supports and roof penetrations.
- D. Equipment Restraints:
 - 1. Install seismic snubbers on fire-suppression equipment mounted on vibration isolators. Locate snubbers as close as possible to vibration isolators and bolt to equipment base and supporting structure.
 - 2. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
 - 3. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction that provides required submittals for component.

- E. Piping Restraints:
 - 1. Comply with requirements in MSS SP-127.
 - 2. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
 - 3. Brace a change of direction longer than 12 feet.
- F. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction that provides required submittals for component.
- G. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.
- H. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- I. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- J. Drilled-in Anchors:
 - 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 - 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 - 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
 - 4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
 - 5. Set anchors to manufacturer's recommended torque, using a torque wrench.
 - 6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Install flexible connections in piping where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment. Comply with requirements in Section 211200 "Fire-Suppression Standpipes," Section 211313 "Wet-Pipe Sprinkler Systems," and Section 211316 "Dry-Pipe Sprinkler Systems" for piping flexible connections.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform tests and inspections.
- C. Tests and Inspections:

1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
 2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
 3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
 4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
 5. Test to 90 percent of rated proof load of device.
 6. Measure isolator restraint clearance.
 7. Measure isolator deflection.
 8. Verify snubber minimum clearances.
- D. Remove and replace malfunctioning units and retest as specified above.
- E. Prepare test and inspection reports.

END OF SECTION 210548

SECTION 210553 - IDENTIFICATION FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Equipment labels.
 - 2. Warning signs and labels.
 - 3. Pipe labels.
 - 4. Stencils.
 - 5. Valve tags.
 - 6. Warning tags.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment-Label Schedule: Include a listing of all equipment to be labeled and the proposed content for each label.
- D. Valve Schedules: Valve numbering scheme.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Metal Labels for Equipment:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Brimar Industries, Inc.
 - c. Carlton Industries, LP.
 - d. Champion America.
 - e. Craftmark Pipe Markers.
 - f. emedco.

- g. Kolbi Pipe Marker Co.
 - h. LEM Products Inc.
 - i. Marking Services, Inc.
 - j. Seton Identification Products.
- 2. Material and Thickness: Brass, 0.032 inch thick, with predrilled holes for attachment hardware.
 - 3. Letter Color: Black.
 - 4. Background Color: Red.
 - 5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 - 6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
 - 7. Fasteners: Stainless-steel self-tapping screws.
 - 8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

2.2 WARNING SIGNS AND LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Brady Corporation.
 - 2. Brimar Industries, Inc.
 - 3. Carlton Industries, LP.
 - 4. Champion America.
 - 5. Craftmark Pipe Markers.
 - 6. emedco.
 - 7. LEM Products Inc.
 - 8. Marking Sevices Inc.
 - 9. National Marker Company.
 - 10. Seton Identification Products.
 - 11. Stranco, Inc.
- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, with predrilled holes for attachment hardware.
- C. Letter Color: Black.
- D. Background Color: Yellow.
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- F. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- G. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- H. Fasteners: Stainless-steel rivets or self-tapping screws.
- I. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

- J. Label Content: Include caution and warning information, plus emergency notification instructions.

2.3 PIPE LABELS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Actioncraft Products, Inc.; a division of Industrial Test Equipment Co., Inc.
2. Brady Corporation.
3. Brimar Industries, Inc.
4. Carlton Industries, LP.
5. Champion America.
6. Craftmark Pipe Markers.
7. emedco.
8. Kolbi Pipe Marker Co.
9. LEM Products Inc.
10. Marking Sevices Inc.
11. Seton Identification Products.

- B. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service and showing flow direction according to ASME A13.1.

- C. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.

- D. Self-adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

- E. Pipe-Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with piping-system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
2. Lettering Size: At least 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances.

- F. Pipe-Label Colors:

1. Background Color: Safety Red.
2. Letter Color: White.

2.4 STENCILS

- A. Stencils for Piping:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brimar Industries, Inc.
 - b. Carlton Industries, LP.
 - c. Champion America.
 - d. Craftmark Pipe Markers.
 - e. Kolbi Pipe Marker Co.

f. Marking Sevices Inc.

2. Lettering Size: At least 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances.
3. Stencil Material: Fiberboard or metal.
4. Stencil Paint: Safety Red, exterior, gloss, alkyd enamel. Paint may be in pressurized spray-can form.
5. Identification Paint: White, exterior, alkyd enamel. Paint may be in pressurized spray-can form.

2.5 VALVE TAGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Actioncraft Products, Inc.; a division of Industrial Test Equipment Co., Inc.
2. Brady Corporation.
3. Brimar Industries, Inc.
4. Carlton Industries, LP.
5. Champion America.
6. Craftmark Pipe Markers.
7. emedco.
8. Kolbi Pipe Marker Co.
9. LEM Products Inc.
10. Marking Sevices Inc.
11. Seton Identification Products.

B. Description: Stamped or engraved with 1/4-inch letters for piping-system abbreviation and 1/2-inch numbers.

1. Tag Material: Brass, 0.032 inch thick, with predrilled holes for attachment hardware.
2. Fasteners: Brass beaded chain or S-hook.
3. Valve-Tag Color: Safety Red.
4. Letter Color: White.

C. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.

1. Valve-tag schedule shall be included in operation and maintenance data.

2.6 WARNING TAGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Brady Corporation.
2. Brimar Industries, Inc.
3. Carlton Industries, LP.
4. Champion America.
5. Craftmark Pipe Markers.

6. emedco.
7. Kolbi Pipe Marker Co.
8. LEM Products Inc.
9. Marking Sevices Inc.
10. Seton Identification Products.

- B. Description: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.
1. Size: 3 by 5-1/4 inches minimum.
 2. Fasteners: Brass grommet and wire.
 3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
 4. Color: Safety Yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of incompatible primers, paints, and encapsulants, as well as dirt, oil, grease, release agents, and other substances that could impair bond of identification devices.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be installed.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

3.3 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

3.4 PIPE LABEL INSTALLATION

- A. Piping: Painting of piping is specified in Section 099123 "Interior Painting."
- B. Stenciled Pipe-Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1, on each piping system.
1. Identification Paint: Use for contrasting background.
 2. Stencil Paint: Use for pipe marking.

- C. Pipe-Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 - 1. Near each valve and control device.
 - 2. Near each branch connection excluding short takeoffs. Where flow pattern is not obvious, mark each pipe at branch.
 - 3. Near penetrations and on both sides of through walls, floors, ceilings, and inaccessible enclosures.
 - 4. At access doors, manholes, and similar access points that permit a view of concealed piping.
 - 5. Near major equipment items and other points of origination and termination.
 - 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 - 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.

- D. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes including pipes where flow is allowed in both directions.

3.5 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in fire-suppression piping systems. List tagged valves in a valve-tag schedule.

- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and with captions similar to those indicated in "Valve-Tag Size and Shape" Subparagraph below:
 - 1. Valve-Tag Size and Shape:
 - a. Fire-Suppression Standpipe: 1-1/2 inches round.
 - b. Wet-Pipe Sprinkler System: 1-1/2 inches round.
 - c. Clean-Agent Fire-Extinguishing System: 1-1/2 inches round.

3.6 WARNING-TAG INSTALLATION

- A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 210553

SECTION 211200 - FIRE-SUPPRESSION STANDPIPES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Pipes, fittings, and specialties.
2. Fire-protection specialty valves.
3. Hose connections.
4. Alarm devices.
5. Pressure gages.

- B. Related Requirements:

1. Section 210523 "General-Duty Valves for Water-Based Fire-Suppression Piping."
2. Section 211313 "Wet-Pipe Sprinkler Systems" for wet-pipe sprinkler piping.

1.3 DEFINITIONS

- A. High-Pressure Standpipe Piping: Fire-suppression standpipe piping designed to operate at working pressure higher than standard 175 psig, but not higher than 250 psig.
- B. Standard-Pressure Standpipe Piping: Fire-suppression standpipe piping designed to operate at working pressure 175 psig maximum.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For fire-suppression standpipes.
 1. Include plans, elevations, sections, and attachment details.
 2. Include diagrams for power, signal, and control wiring.
- C. Delegated-Design Submittal: For standpipe systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Fire-suppression standpipes, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Domestic water piping.
 - 2. HVAC hydronic piping.
 - 3. HVAC Ductwork
- B. Qualification Data: For Installer and professional engineer.
- C. Approved Standpipe Drawings: Working plans, prepared according to NFPA 14, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.
- D. Welding certificates.
- E. Fire-hydrant flow test report.
- F. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 14. Include "Contractor's Material and Test Certificate for Aboveground Piping" and "Contractor's Material and Test Certificate for Underground Piping."
- G. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire-suppression standpipes specialties to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer's responsibilities include designing, fabricating, and installing fire-suppression standpipes and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.
 - a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer.
- B. Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. NFPA Standards: Fire-suppression standpipe equipment, specialties, accessories, installation, and testing shall comply with NFPA 14.

1.8 PROJECT CONDITIONS

- A. Interruption of Existing Fire-Suppression Standpipe Service: Do not interrupt fire-suppression standpipe service to facilities occupied by Owner or others unless permitted under the following conditions and then

only after arranging to provide temporary fire-suppression standpipe service according to requirements indicated:

1. Notify Construction Manager no fewer than two days in advance of proposed interruption of fire-suppression standpipe service.
2. Do not proceed with interruption of fire-suppression standpipe service without Construction Manager's written permission.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTIONS

- A. Automatic Wet-Type, Class I Standpipe System: Includes NPS 2-1/2 hose connections. Has open water-supply valve with pressure maintained and is capable of supplying water demand.

2.2 PERFORMANCE REQUIREMENTS

- A. Standard-Pressure, Fire-Suppression Standpipe System Component: Listed for 175-psig minimum working pressure.
- B. High-Pressure, Fire-Suppression Standpipe System Component: Listed for 250-psig minimum working pressure.
- C. Delegated Design: Design fire-suppression standpipes, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

1. Provide available fire-hydrant flow test records indicate the following conditions:

- a. Date:
- b. Time:
- c. Performed by:
- d. Location of Residual Fire Hydrant R:
- e. Location of Flow Fire Hydrant F:
- f. Static Pressure at Residual Fire Hydrant R:
- g. Measured Flow at Flow Fire Hydrant F:
- h. Residual Pressure at Residual Fire Hydrant R:

- D. Fire-suppression standpipe design shall be approved by authorities having jurisdiction.

1. Minimum residual pressure at each hose-connection outlet is as follows:

- a. NPS 2-1/2 Hose Connections: 100 psig.

- E. Seismic Performance: Fire-suppression standpipes shall withstand the effects of earthquake motions determined according to NFPA 13 and ASCE/SEI 7.

2.3 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials and for joining methods for specific services, service locations, and pipe sizes.

2.4 BLACK STEEL PIPE AND ASSOCIATED FITTINGS

- A. Schedule 40: ASTM A 53/A 53M, Type E, Grade B; with factory- or field-formed ends to accommodate joining method.
- B. Schedule 40: ASTM A 135/A 135M, Grade A; with factory- or field-formed ends to accommodate joining method.
- C. Schedule 40: ASTM A 795/A 795M, Type E, Grade A; with factory- or field-formed ends to accommodate joining method.
- D. Uncoated, Steel Couplings: ASTM A 865/A 865M, threaded.
- E. Uncoated, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- F. Malleable- or Ductile-Iron Unions: UL 860.
- G. Cast-Iron Flanges: ASME B16.1, Class 125.
- H. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.
- I. Steel Welding Fittings: ASTM A 234/A 234M and ASME B16.9.
- J. Grooved-Joint, Steel-Pipe Appurtenances:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Anvil International.
 - b. Corcoran Piping System Co.
 - c. National Fittings, Inc.
 - d. Shurjoint Piping Products.
 - e. Smith-Cooper International.
 - f. Tyco Fire & Building Products LP.
 - g. Victaulic Company.
 - 2. Pressure Rating: 250 psig minimum.
 - 3. Galvanized and Uncoated, Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
 - 4. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213, rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

2.5 GALVANIZED-STEEL PIPE AND ASSOCIATED FITTINGS

- A. Schedule 40: ASTM A 53/A 53M, Type E, Grade B; with factory- or field-formed ends to accommodate joining method.
- B. Schedule 40: ASTM A 135/A 135M, Grade A; with factory- or field-formed ends to accommodate joining method.
- C. Schedule 40: ASTM A 795/A 795M, Type E, Grade A; with factory- or field-formed ends to accommodate joining method.

- D. Galvanized-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106/A 106M, Standard Weight, seamless steel pipe with threaded ends.
- E. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- F. Malleable-Iron Unions:
 - 1. ASME B16.39, Class 150.
 - 2. Hexagonal-stock body.
 - 3. Ball-and-socket, metal-to-metal, bronze seating surface.
 - 4. Threaded ends.
- G. Flanges: ASME B16.1, Class 125, cast iron.
- H. Appurtenances for Grooved-End, Galvanized-Steel Pipe:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Anvil International.
 - b. Grinnell Mechanical Products.
 - c. Shurjoint Piping Products.
 - d. Victaulic Company.
 - 2. Fittings for Grooved-End, Galvanized-Steel Pipe: Galvanized, ASTM A 47/A 47M, malleable-iron casting; ASTM A 106/A 106M, steel pipe; or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
 - 3. Fittings for Grooved-End, Galvanized-Steel Pipe:
 - a. AWWA C606 for steel-pipe dimensions.
 - b. Ferrous housing sections.
 - c. EPDM-rubber gaskets suitable for hot and cold water.
 - d. Bolts and nuts.
 - e. Minimum Pressure Rating:
 - 1) NPS 8 and Smaller: 600 psig.

2.6 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free.
 - 1. Class 125, Cast-Iron Flanges and Class 150, Bronze Flat-Face Flanges: Full-face gaskets.
 - 2. Class 250, Cast-Iron Flanges and Class 300, Steel Raised-Face Flanges: Ring-type gaskets.
- B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- C. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.
- D. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.7 SPECIALTY VALVES

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or FM Global's "Approval Guide."
2. Pressure Rating:
 - a. Standard-Pressure Piping Specialty Valves: 175 psig minimum.
 - b. High-Pressure Piping Specialty Valves: 250 psig minimum.
3. Body Material: Cast or ductile iron.
4. Size: Same as connected piping.
5. End Connections: Flanged or grooved.

B. Alarm Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Globe Fire Sprinkler Corporation.
 - b. Kidde Fire Fighting; A UTC Business Unit.
 - c. Reliable Automatic Sprinkler Co., Inc. (The).
 - d. Tyco Fire & Building Products LP.
 - e. Venus Fire Protection Ltd.
 - f. Victaulic Company.
 - g. Viking Corporation.
2. Standard: UL 193.
3. Design: For horizontal or vertical installation.
4. Include trim sets for bypass, drain, electrical sprinkler alarm switch, pressure gages,[retarding chamber,] and fill-line attachment with strainer.
5. Drip Cup Assembly: Pipe drain without valves and separate from main drain piping.
6. Drip Cup Assembly: Pipe drain with check valve to main drain piping.

C. Pressure-Reducing Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CLA-VAL Automatic Control Valves.
 - b. Elkhart Brass Mfg. Co., Inc.
 - c. Fire Protection Products, Inc.
 - d. Fire-End & Croker Corporation.
 - e. GMR International Equipment Corporation.
 - f. Guardian Fire Equipment, Inc.
 - g. Kidde Fire Fighting; A UTC Business Unit.
 - h. OCV Control Valves.
 - i. Potter Roemer LLC.
 - j. Tyco Fire & Building Products LP.
 - k. Wilson & Cousins Inc.
 - l. Zurn Industries, LLC.
2. UL 668 hose valve, with integral UL 1468 reducing device.
3. Pressure Rating: 300 psig minimum.

4. Material: Brass or bronze.
5. Inlet: Female pipe threads.
6. Outlet: Threaded with or without adapter having male hose threads.
7. Pattern: Angle or gate.
8. Finish: Polished chrome-plated.

2.8 ALARM DEVICES

A. Water-Flow Indicators:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ADT Security Services, Inc.
 - b. McDonnell & Miller.
 - c. Potter Electric Signal Company, LLC.
 - d. System Sensor.
 - e. Viking Corporation.
 - f. Watts; a Watts Water Technologies company.
2. Standard: UL 346.
3. Water-Flow Detector: Electrically supervised.
4. Components: Two single-pole, double-throw circuit switches for isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal if removed.
5. Type: Paddle operated.
6. Pressure Rating: 250 psig.
7. Design Installation: Horizontal or vertical.

B. Pressure Switches:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Barksdale, Inc.
 - b. Detroit Switch, Inc.
 - c. Kidde Fire Fighting; A UTC Business Unit.
 - d. Potter Electric Signal Company, LLC.
 - e. System Sensor.
 - f. Tyco Fire & Building Products LP.
 - g. United Electric Controls Co.
 - h. Viking Corporation.
2. Standard: UL 346.
3. Type: Electrically supervised water-flow switch with retard feature.
4. Components: Single-pole, double-throw switch with normally closed contacts.
5. Design Operation: Rising pressure signals water flow.

C. Valve Supervisory Switches:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Fire-Lite Alarms, Inc.; a Honeywell International company.
 - b. Kennedy Valve Company; a division of McWane, Inc.
 - c. Potter Electric Signal Company, LLC.
 - d. System Sensor.
2. Standard: UL 346.
 3. Type: Electrically supervised.
 4. Components: Single-pole, double-throw switch with normally closed contacts.
 5. Design: Signals that controlled valve is in other than fully open position.

2.9 PRESSURE GAGES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. AMETEK, Inc.
 2. Ashcroft Inc.
 3. Brecco Corporation.
 4. WIKA Instrument Corporation.
- B. Standard: UL 393.
- C. Dial Size: 3-1/2- to 4-1/2-inch diameter.
- D. Pressure Gage Range: Zero to 250 psig minimum.
- E. Water System Piping Gage: Include "WATER" or "AIR/WATER" label on dial face.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Perform fire-hydrant flow test according to NFPA 14 and NFPA 291. Use results for system design calculations required in "Quality Assurance" Article.
- B. Report test results promptly and in writing.

3.2 EXAMINATION

- A. Examine roughing-in for hose connections and stations to verify actual locations of piping connections before installation.
- B. Examine walls and partitions for suitable thickness, fire- and smoke-rated construction, framing for hose-station cabinets, and other conditions where hose connections and stations are to be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 SERVICE-ENTRANCE PIPING

- A. Connect fire-suppression standpipe piping to water-service piping at service entrance into building. Comply with requirements for exterior piping in Section 211100 "Facility Fire-Suppression Water-Service Piping."
- B. Install shutoff valve, pressure gage, drain, and other accessories at connection to fire-suppression water-service piping.
- C. Install shutoff valve, check valve, pressure gage, and drain at connection to water service.

3.4 PIPING INSTALLATION

- A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.
 - 1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
- B. Piping Standard: Comply with requirements in NFPA 14 for installation of fire-suppression standpipe piping.
- C. Install seismic restraints on piping. Comply with requirements in NFPA 13 for seismic-restraint device materials and installation.
- D. Install listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- E. Install alarm devices in piping systems.
- F. Install hangers and supports for standpipe system piping according to NFPA 14. Comply with requirements in NFPA 13 for hanger materials.
- G. Install pressure gages on riser or feed main and at top of each standpipe. Include pressure gages with connection not less than NPS 1/4 and with soft-metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they are not subject to freezing.
- H. Fill wet-type standpipe system piping with water.
- I. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- J. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 210518 "Escutcheons for Fire-Suppression Piping."

3.5 JOINT CONSTRUCTION

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Install unions adjacent to each valve in pipes NPS 2 and smaller.

- C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- D. Ream ends of pipes and tubes, and remove burrs. Bevel plain ends of steel pipe.
- E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.
- G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- H. Steel-Piping, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe joints.
- I. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe grooved joints.
- J. Welded Joints: Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators according to "Quality Assurance" Article.
 - 1. Shop weld pipe joints where welded piping is indicated. Do not use welded joints for galvanized-steel pipe.
- K. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.6 VALVE AND SPECIALTIES INSTALLATION

- A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 14 and authorities having jurisdiction.
- B. Install listed fire-protection shutoff valves supervised-open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.
- C. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water-supply sources.
- D. Specialty Valves:
 - 1. General Requirements: Install in vertical position for proper direction of flow, in main supply to system.
 - 2. Alarm Valves: Install bypass check valve and retarding chamber drain-line connection.

3.7 IDENTIFICATION

- A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 14.
- B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.8 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 3. Flush, test, and inspect standpipe systems according to NFPA 14, "System Acceptance" Chapter.
 - 4. Energize circuits to electrical equipment and devices.
 - 5. Start and run air compressors.
 - 6. Coordinate with fire-alarm tests. Operate as required.
 - 7. Coordinate with fire-pump tests. Operate as required.
 - 8. Verify that equipment hose threads are same as local fire-department equipment.
- C. Fire-suppression standpipe system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.9 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain specialty valves.

3.10 PIPING SCHEDULE

- A. Standard-pressure, wet-type fire-suppression standpipe piping, NPS 4 and smaller, shall be the following:
 - 1. Schedule 40, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
- B. Standard-pressure, wet-type fire-suppression standpipe piping, NPS 5 to NPS 8, shall be the following:
 - 1. Schedule 40, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
- C. High-pressure, wet-type fire-suppression standpipe piping, NPS 4 and smaller, shall be the following:
 - 1. Schedule 40, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
- D. High-pressure, wet-type fire-suppression standpipe piping, NPS 5 and larger, shall be the following:
 - 1. Schedule 40, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.

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END OF SECTION 211200

SECTION 211313 - WET-PIPE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Pipes, fittings, and specialties.
2. Fire-protection valves.
3. Sprinklers.
4. Alarm devices.
5. Manual control stations.
6. Control panels.
7. Pressure gages.

- B. Related Sections:

1. Section 211200 "Fire-Suppression Standpipes" for standpipe piping.

1.3 DEFINITIONS

- A. High-Pressure Sprinkler Piping: Wet-pipe sprinkler system piping designed to operate at working pressure higher than standard 175 psig, but not higher than 300 psig.
- B. Standard-Pressure Sprinkler Piping: Wet-pipe sprinkler system piping designed to operate at working pressure of 175 psig maximum.

1.4 SYSTEM DESCRIPTIONS

- A. Wet-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing water and that is connected to water supply through alarm valve. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device. Hose connections are included if indicated.

1.5 PERFORMANCE REQUIREMENTS

- A. Standard-Pressure Piping System Component: Listed for 175-psig minimum working pressure.
- B. High-Pressure Piping System Component: Listed for 300-psig working pressure.

- C. Delegated Design: Design sprinkler system(s), including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
1. Provide available fire-hydrant flow test records indicate the following conditions:
 - a. Date:
 - b. Time:
 - c. Performed by:
 - d. Location of Residual Fire Hydrant R:
 - e. Location of Flow Fire Hydrant F:
 - f. Static Pressure at Residual Fire Hydrant R:
 - g. Measured Flow at Flow Fire Hydrant F:
 - h. Residual Pressure at Residual Fire Hydrant R:
- D. Sprinkler system design shall be approved by authorities having jurisdiction.
1. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water-service piping, valves, and backflow preventers.
 2. Sprinkler Occupancy Hazard Classifications:
 - a. Office and Public Areas: Light Hazard.
 3. Minimum Density for Automatic-Sprinkler Piping Design:
 - a. Light-Hazard Occupancy: 0.10 gpm over 1500-sq. ft. area.
 4. Maximum Protection Area per Sprinkler: Per UL listing.
 5. Maximum Protection Area per Sprinkler:
 - a. Office Spaces: 225 sq. ft..
 - b. Storage Areas: 130 sq. ft..
 - c. Mechanical Equipment Rooms: 130 sq. ft..
 - d. Electrical Equipment Rooms: 130 sq. ft..
 - e. Other Areas: According to NFPA 13 recommendations unless otherwise indicated.
 6. Total Combined Hose-Stream Demand Requirement: According to NFPA 13 unless otherwise indicated:
 - a. Light-Hazard Occupancies: 100 gpm for 30 minutes.
- E. Seismic Performance: Sprinkler piping shall withstand the effects of earthquake motions determined according to NFPA 13 and ASCE/SEI 7.

1.6 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For wet-pipe sprinkler systems. Include plans, elevations, sections, details, and attachments to other work.
1. Wiring Diagrams: For power, signal, and control wiring.

- C. Delegated-Design Submittal: For sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Coordination Drawings: Sprinkler systems, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Domestic water piping.
 - 2. HVAC hydronic piping.
 - 3. Items penetrating finished ceiling include the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
- E. Qualification Data: For qualified Installer and professional engineer.
- F. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.
- G. Welding certificates.
- H. Fire-hydrant flow test report.
- I. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."
- J. Field quality-control reports.
- K. Operation and Maintenance Data: For sprinkler specialties to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.
 - a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer.
- B. Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. NFPA Standards: Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:

1. NFPA 13, "Installation of Sprinkler Systems."

1.8 PROJECT CONDITIONS

- A. Interruption of Existing Sprinkler Service: Do not interrupt sprinkler service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary sprinkler service according to requirements indicated:
 1. Notify Construction Manager no fewer than two days in advance of proposed interruption of sprinkler service.
 2. Do not proceed with interruption of sprinkler service without Construction Manager's written permission.

1.9 COORDINATION

- A. Coordinate layout and installation of sprinklers with other construction that penetrates ceilings, including light fixtures, HVAC equipment, and partition assemblies.

1.10 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Sprinkler Cabinets: Finished, wall-mounted, steel cabinet with hinged cover, and with space for minimum of six spare sprinklers plus sprinkler wrench. Include number of sprinklers required by NFPA 13 and sprinkler wrench. Include separate cabinet with sprinklers and wrench for each type of sprinkler used on Project.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

2.2 STEEL PIPE AND FITTINGS

- A. Standard Weight, Galvanized and Black-Steel Pipe: ASTM A 53/A 53M, Type E Grade B. Pipe ends may be factory or field formed to match joining method.
- B. Galvanized and Black-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard-weight, seamless steel pipe with threaded ends.
- C. Galvanized and Uncoated, Steel Couplings: ASTM A 865, threaded.
- D. Galvanized and Uncoated, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.

- E. Malleable- or Ductile-Iron Unions: UL 860.
- F. Cast-Iron Flanges: ASME 16.1, Class 125.
- G. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.
- H. Steel Welding Fittings: ASTM A 234/A 234M and ASME B16.9.
- I. Grooved-Joint, Steel-Pipe Appurtenances:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. Corcoran Piping System Co.
 - c. National Fittings, Inc.
 - d. Shurjoint Piping Products.
 - e. Smith-Cooper International.
 - f. Tyco Fire & Building Products LP.
 - g. Victaulic Company.
 - 2. Pressure Rating: 250 psig minimum.
 - 3. Galvanized and Uncoated, Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
 - 4. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213, rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

2.3 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free.
 - 1. Class 125, Cast-Iron Flanges and Class 150, Bronze Flat-Face Flanges: Full-face gaskets.
 - 2. Class 250, Cast-Iron Flanges and Class 300, Steel Raised-Face Flanges: Ring-type gaskets.
- B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- C. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.4 LISTED FIRE-PROTECTION VALVES

- A. General Requirements:
 - 1. Valves shall be UL listed or FM approved.
 - 2. Minimum Pressure Rating for Standard-Pressure Piping: 175 psig.
 - 3. Minimum Pressure Rating for High-Pressure Piping: 250 psig.
- B. Ball Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. Victaulic Company.
 2. Standard: UL 1091 except with ball instead of disc.
 3. Valves NPS 1-1/2 and Smaller: Bronze body with threaded ends.
 4. Valves NPS 2 and NPS 2-1/2: Bronze body with threaded ends or ductile-iron body with grooved ends.
 5. Valves NPS 3: Ductile-iron body with grooved ends.
- C. Bronze Butterfly Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fivalco Inc.
 - b. Global Safety Products, Inc.
 - c. Milwaukee Valve Company.
 2. Standard: UL 1091.
 3. Pressure Rating: 175 psig.
 4. Body Material: Bronze.
 5. End Connections: Threaded.
- D. Iron Butterfly Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. Fivalco Inc.
 - c. Global Safety Products, Inc.
 - d. Kennedy Valve Company; a division of McWane, Inc.
 - e. Milwaukee Valve Company.
 - f. NIBCO INC.
 - g. Pratt, Henry Company.
 - h. Shurjoint Piping Products.
 - i. Tyco Fire & Building Products LP.
 - j. Victaulic Company.
 2. Standard: UL 1091.
 3. Pressure Rating: 175 psig.
 4. Body Material: Cast or ductile iron.
 5. Style: Lug or wafer.
 6. End Connections: Grooved.
- E. Check Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Cast Iron Pipe Company.
 - b. Anvil International.
 - c. Clow Valve Company; a subsidiary of McWane, Inc.
 - d. Crane; Crane Energy Flow Solutions.
 - e. Fire Protection Products, Inc.
 - f. Fire-End & Croker Corporation.
 - g. Fivalco Inc.
 - h. Globe Fire Sprinkler Corporation.
 - i. Groeniger & Company.
 - j. Kennedy Valve Company; a division of McWane, Inc.
 - k. Matco-Norca.
 - l. Metraflex Company (The).
 - m. Milwaukee Valve Company.
 - n. Mueller Co.
2. Standard: UL 312.
3. Pressure Rating: 250 psig minimum.
4. Type: Swing check.
5. Body Material: Cast iron.
6. End Connections: Flanged or grooved.

F. Bronze OS&Y Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Crane; Crane Energy Flow Solutions.
 - b. Milwaukee Valve Company.
 - c. NIBCO INC.
 - d. United Brass Works, Inc.
2. Standard: UL 262.
3. Pressure Rating: 175 psig.
4. Body Material: Bronze.
5. End Connections: Threaded.

G. Iron OS&Y Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Cast Iron Pipe Company.
 - b. American Valve, Inc.
 - c. Clow Valve Company; a subsidiary of McWane, Inc.
 - d. Crane; Crane Energy Flow Solutions.
 - e. Hammond Valve.
 - f. Milwaukee Valve Company.
 - g. Mueller Co.

- h. NIBCO INC.
 - i. Shurjoint Piping Products.
 - j. Tyco Fire & Building Products LP.
 - k. United Brass Works, Inc.
 - l. Watts; a Watts Water Technologies company.
 2. Standard: UL 262.
 3. Pressure Rating: 250 psig minimum.
 4. Body Material: Cast or ductile iron.
 5. End Connections: Flanged or grooved.
- H. Indicating-Type Butterfly Valves:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. Fivalco Inc.
 - c. Global Safety Products, Inc.
 - d. Kennedy Valve Company; a division of McWane, Inc.
 - e. Milwaukee Valve Company.
 - f. NIBCO INC.
 - g. Shurjoint Piping Products.
 - h. Tyco Fire & Building Products LP.
 - i. Victaulic Company.
 2. Standard: UL 1091.
 3. Pressure Rating: 175 psig minimum.
 4. Valves NPS 2 and Smaller:
 - a. Valve Type: Ball or butterfly.
 - b. Body Material: Bronze.
 - c. End Connections: Threaded.
 5. Valves NPS 2-1/2 and Larger:
 - a. Valve Type: Butterfly.
 - b. Body Material: Cast or ductile iron.
 - c. End Connections: Flanged, grooved, or wafer.
 6. Valve Operation: Integral electrical, 115-V ac, prewired, single-circuit, supervisory switch indicating device.
- I. NRS Gate Valves:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Cast Iron Pipe Company.
 - b. American Valve, Inc.
 - c. Clow Valve Company; a subsidiary of McWane, Inc.

- d. Crane; Crane Energy Flow Solutions.
 - e. Kennedy Valve Company; a division of McWane, Inc.
 - f. Mueller Co.
 - g. NIBCO INC.
 - h. Tyco Fire & Building Products LP.
2. Standard: UL 262.
 3. Pressure Rating: 250 psig minimum.
 4. Body Material: Cast iron with indicator post flange.
 5. Stem: Nonrising.
 6. End Connections: Flanged or grooved.
- J. Indicator Posts:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Cast Iron Pipe Company.
 - b. American Valve, Inc.
 - c. Clow Valve Company; a subsidiary of McWane, Inc.
 - d. Crane; Crane Energy Flow Solutions.
 - e. Kennedy Valve Company; a division of McWane, Inc.
 - f. Mueller Co.
 - g. NIBCO INC.
 - h. Tyco Fire & Building Products LP.
 2. Standard: UL 789.
 3. Type: Horizontal for wall mounting.
 4. Body Material: Cast iron with extension rod and locking device.
 5. Operation: Hand wheel.
- 2.5 TRIM AND DRAIN VALVES
- A. General Requirements:
1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
 2. Pressure Rating: 175 psig minimum.
- B. Angle Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fire Protection Products, Inc.
 - b. United Brass Works, Inc.
- C. Ball Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Affiliated Distributors.
 - b. Anvil International.
 - c. Barnett.
 - d. Conbraco Industries, Inc.
 - e. Fire Protection Products, Inc.
 - f. Fire-End & Croker Corporation.
 - g. Flowserve Corporation.
 - h. FNW; Ferguson Enterprises, Inc.
 - i. Jomar Valve.
 - j. Kennedy Valve Company; a division of McWane, Inc.
 - k. KITZ Corporation.
 - l. Legend Valve & Fitting, Inc.
 - m. M. A. Stewart and Sons Ltd.
 - n. Metso Automation USA Inc.
 - o. Milwaukee Valve Company.
 - p. NIBCO INC.
 - q. Potter Roemer LLC.
 - r. Red-White Valve Corporation.
 - s. Southern Manufacturing Group.
 - t. Tyco Fire & Building Products LP.
 - u. Victaulic Company.
 - v. Watts; a Watts Water Technologies company.

D. Globe Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fire Protection Products, Inc.
 - b. United Brass Works, Inc.

E. Plug Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Southern Manufacturing Group.

2.6 SPECIALTY VALVES

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating:
 - a. Standard-Pressure Piping Specialty Valves: 175 psig minimum.
 - b. High-Pressure Piping Specialty Valves: 250 psig minimum.
3. Body Material: Cast or ductile iron.

4. Size: Same as connected piping.
5. End Connections: Flanged or grooved.

B. Alarm Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Globe Fire Sprinkler Corporation.
 - b. Reliable Automatic Sprinkler Co., Inc. (The).
 - c. Tyco Fire & Building Products LP.
 - d. Venus Fire Protection Ltd.
 - e. Victaulic Company.
 - f. Viking Corporation.
2. Standard: UL 193.
3. Design: For horizontal or vertical installation.
4. Include trim sets for bypass, drain, electrical sprinkler alarm switch, pressure gages, and fill-line attachment with strainer.
5. Drip Cup Assembly: Pipe drain without valves and separate from main drain piping.
6. Drip Cup Assembly: Pipe drain with check valve to main drain piping.

C. Deluge Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BERMAD Control Valves.
 - b. CLA-VAL Automatic Control Valves.
 - c. Globe Fire Sprinkler Corporation.
 - d. Kidde Fire Fighting; A UTC Business Unit.
 - e. OCV Control Valves.
 - f. Reliable Automatic Sprinkler Co., Inc. (The).
 - g. Tyco Fire & Building Products LP.
 - h. Venus Fire Protection Ltd.
 - i. Victaulic Company.
 - j. Viking Corporation.
2. Standard: UL 260.
3. Design: Hydraulically operated, differential-pressure type.
4. Include trim sets for bypass, drain, electrical sprinkler alarm switch, pressure gages, drip cup assembly piped without valves and separate from main drain line, fill-line attachment with strainer, and push-rod chamber supply connection.
5. Wet, Pilot-Line Trim Set: Include gage to read push-rod chamber pressure, globe valve for manual operation of deluge valve, and connection for actuation device.

D. Automatic (Ball Drip) Drain Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Reliable Automatic Sprinkler Co., Inc. (The).
 - b. Tyco Fire & Building Products LP.
2. Standard: UL 1726.
 3. Pressure Rating: 175 psig minimum.
 4. Type: Automatic draining, ball check.
 5. Size: NPS 3/4.
 6. End Connections: Threaded.

2.7 SPRINKLER SPECIALTY PIPE FITTINGS

A. Branch Outlet Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. National Fittings, Inc.
 - c. Shurjoint Piping Products.
 - d. Tyco Fire & Building Products LP.
 - e. Victaulic Company.
2. Standard: UL 213.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.
5. Type: Mechanical-T and -cross fittings.
6. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
7. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.
8. Branch Outlets: Grooved, plain-end pipe, or threaded.

B. Flow Detection and Test Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AGF Manufacturing Inc.
 - b. Reliable Automatic Sprinkler Co., Inc. (The).
 - c. Tyco Fire & Building Products LP.
 - d. Victaulic Company.
2. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Cast- or ductile-iron housing with orifice, sight glass, and integral test valve.
5. Size: Same as connected piping.
6. Inlet and Outlet: Threaded.

C. Branch Line Testers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Elkhart Brass Mfg. Co., Inc.
 - b. Fire-End & Croker Corporation.
 - c. Potter Roemer LLC.
2. Standard: UL 199.
3. Pressure Rating: 175 psig.
4. Body Material: Brass.
5. Size: Same as connected piping.
6. Inlet: Threaded.
7. Drain Outlet: Threaded and capped.
8. Branch Outlet: Threaded, for sprinkler.

D. Sprinkler Inspector's Test Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AGF Manufacturing Inc.
 - b. Triple R Specialty.
 - c. Tyco Fire & Building Products LP.
 - d. Victaulic Company.
 - e. Viking Corporation.
2. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Cast- or ductile-iron housing with sight glass.
5. Size: Same as connected piping.
6. Inlet and Outlet: Threaded.

E. Adjustable Drop Nipples:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aegis Technologies, Inc.
 - b. CECA, LLC.
 - c. Corcoran Piping System Co.
 - d. Merit Manufacturing.
2. Standard: UL 1474.
3. Pressure Rating: 250 psig minimum.
4. Body Material: Steel pipe with EPDM-rubber O-ring seals.
5. Size: Same as connected piping.
6. Length: Adjustable.
7. Inlet and Outlet: Threaded.

F. Flexible, Sprinkler Hose Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fivalco Inc.
 - b. FlexHead Industries, Inc.
 - c. Gateway Tubing, Inc.
 - d. Victaulic Company.
2. Standard: UL 1474.
3. Type: Flexible hose for connection to sprinkler, and with bracket for connection to ceiling grid.
4. Pressure Rating: 175 psig minimum.
5. Size: Same as connected piping, for sprinkler.

2.8 SPRINKLERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Globe Fire Sprinkler Corporation.
2. Reliable Automatic Sprinkler Co., Inc. (The).
3. Tyco Fire & Building Products LP.
4. Venus Fire Protection Ltd.
5. Victaulic Company.
6. Viking Corporation.

B. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating for Residential Sprinklers: 175 psig maximum.
3. Pressure Rating for Automatic Sprinklers: 175 psig minimum.
4. Pressure Rating for High-Pressure Automatic Sprinklers: 250 psig minimum.

C. Automatic Sprinklers with Heat-Responsive Element:

1. Early-Suppression, Fast-Response Applications: UL 1767.
2. Nonresidential Applications: UL 199.
3. Characteristics: Nominal 1/2-inch orifice with Discharge Coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or required by application.

D. Open Sprinklers with Heat-Responsive Element Removed: UL 199.

1. Characteristics:
 - a. Nominal 1/2-inch Orifice: With Discharge Coefficient K between 5.3 and 5.8.

E. Sprinkler Finishes:

1. Chrome plated.
2. Bronze.

3. Painted.

F. Special Coatings:

1. Wax.
2. Lead.
3. Corrosion-resistant paint.

G. Sprinkler Escutcheons: Materials, types, and finishes for the following sprinkler mounting applications. Escutcheons for concealed, flush, and recessed-type sprinklers are specified with sprinklers.

1. Ceiling Mounting: Chrome-plated steel, one piece, flat.
2. Sidewall Mounting: Chrome-plated steel, one piece, flat.

H. Sprinkler Guards:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Reliable Automatic Sprinkler Co., Inc. (The).
 - b. Tyco Fire & Building Products LP.
 - c. Victaulic Company.
 - d. Viking Corporation.
2. Standard: UL 199.
3. Type: Wire cage with fastening device for attaching to sprinkler.

2.9 ALARM DEVICES

A. Water-Flow Indicators:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ADT Security Services, Inc.
 - b. McDonnell & Miller.
 - c. Potter Electric Signal Company, LLC.
 - d. System Sensor.
 - e. Viking Corporation.
 - f. Watts; a Watts Water Technologies company.
2. Standard: UL 346.
3. Water-Flow Detector: Electrically supervised.
4. Components: Two single-pole, double-throw circuit switches for isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal if removed.
5. Type: Paddle operated.
6. Pressure Rating: 250 psig.
7. Design Installation: Horizontal or vertical.

B. Pressure Switches:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Barksdale, Inc.
 - b. Detroit Switch, Inc.
 - c. Potter Electric Signal Company, LLC.
 - d. System Sensor.
 - e. Tyco Fire & Building Products LP.
 - f. United Electric Controls Co.
 - g. Viking Corporation.
2. Standard: UL 346.
3. Type: Electrically supervised water-flow switch with retard feature.
4. Components: Single-pole, double-throw switch with normally closed contacts.
5. Design Operation: Rising pressure signals water flow.

C. Valve Supervisory Switches:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fire-Lite Alarms, Inc.; a Honeywell International company.
 - b. Kennedy Valve Company; a division of McWane, Inc.
 - c. Potter Electric Signal Company, LLC.
 - d. System Sensor.
2. Standard: UL 346.
3. Type: Electrically supervised.
4. Components: Single-pole, double-throw switch with normally closed contacts.
5. Design: Signals that controlled valve is in other than fully open position.

2.10 PRESSURE GAGES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AGF Manufacturing Inc.
2. AMETEK, Inc.
3. Ashcroft Inc.
4. Brecco Corporation.
5. WIKA Instrument Corporation.

B. Standard: UL 393.

C. Dial Size: 3-1/2- to 4-1/2-inch diameter.

D. Pressure Gage Range: 0 to 250 psig minimum.

E. Water System Piping Gage: Include "WATER" or "AIR/WATER" label on dial face.

- F. Air System Piping Gage: Include "AIR" or "AIR/WATER" label on dial face.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Perform fire-hydrant flow test according to NFPA 13 and NFPA 291. Use results for system design calculations required in "Quality Assurance" Article.
- B. Report test results promptly and in writing.

3.2 WATER-SUPPLY CONNECTIONS

- A. Connect sprinkler piping to building's interior water-distribution piping. Comply with requirements for interior piping in Section 221116 "Domestic Water Piping."
- B. Install shutoff valve, pressure gage, drain, and other accessories indicated at connection to water-distribution piping.
- C. Install shutoff valve, check valve, pressure gage, and drain at connection to water supply.

3.3 PIPING INSTALLATION

- A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.
 - 1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
- B. Piping Standard: Comply with requirements for installation of sprinkler piping in NFPA 13.
- C. Install seismic restraints on piping. Comply with requirements for seismic-restraint device materials and installation in NFPA 13.
- D. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- E. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- F. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- G. Install "Inspector's Test Connections" in sprinkler system piping, complete with shutoff valve, and sized and located according to NFPA 13.
- H. Install sprinkler piping with drains for complete system drainage.
- I. Install sprinkler control valves, test assemblies, and drain risers adjacent to standpipes when sprinkler piping is connected to standpipes.

- J. Install automatic (ball drip) drain valve at each check valve for fire-department connection, to drain piping between fire-department connection and check valve. Install drain piping to and spill over floor drain or to outside building.
- K. Install alarm devices in piping systems.
- L. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements for hanger materials in NFPA 13.
- M. Install pressure gages on riser or feed main, at each sprinkler test connection, and at top of each standpipe. Include pressure gages with connection not less than NPS 1/4 and with soft metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they will not be subject to freezing.
- N. Fill sprinkler system piping with water.
- O. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- P. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 210518 "Escutcheons for Fire-Suppression Piping."

3.4 JOINT CONSTRUCTION

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.
- G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- H. Twist-Locked Joints: Insert plain end of steel pipe into plain-end-pipe fitting. Rotate retainer lugs one-quarter turn or tighten retainer pin.
- I. Steel-Piping, Pressure-Sealed Joints: Join lightwall steel pipe and steel pressure-seal fittings with tools recommended by fitting manufacturer.

- J. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.
 - 1. Shop weld pipe joints where welded piping is indicated. Do not use welded joints for galvanized-steel pipe.
- K. Steel-Piping, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe joints.
- L. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe grooved joints.
- M. Steel-Piping, Pressure-Sealed Joints: Join Schedule 5 steel pipe and steel pressure-seal fittings with tools recommended by fitting manufacturer.
- N. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.5 VALVE AND SPECIALTIES INSTALLATION

- A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 13 and authorities having jurisdiction.
- B. Install listed fire-protection shutoff valves supervised open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.
- C. Install check valve in each water-supply connection.
- D. Specialty Valves:
 - 1. General Requirements: Install in vertical position for proper direction of flow, in main supply to system.
 - 2. Alarm Valves: Include bypass check valve and retarding chamber drain-line connection.

3.6 SPRINKLER INSTALLATION

- A. Install sprinklers in suspended ceilings in center of acoustical ceiling panels.
- B. Install sprinklers into flexible, sprinkler hose fittings and install hose into bracket on ceiling grid.

3.7 IDENTIFICATION

- A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13.
- B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.8 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
 - 4. Energize circuits to electrical equipment and devices.
 - 5. Coordinate with fire-alarm tests. Operate as required.
 - 6. Coordinate with fire-pump tests. Operate as required.
 - 7. Verify that equipment hose threads are same as local fire-department equipment.
- C. Sprinkler piping system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.9 CLEANING

- A. Clean dirt and debris from sprinklers.
- B. Remove and replace sprinklers with paint other than factory finish.

3.10 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain specialty valves.

3.11 PIPING SCHEDULE

- A. Sprinkler specialty fittings may be used, downstream of control valves, instead of specified fittings.
- B. Standard-pressure, wet-pipe sprinkler system, NPS 2 and smaller, shall be the following:
 - 1. Standard-weight, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
 - 2. Standard-weight, black-steel pipe with cut- or roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
- C. Standard-pressure, wet-pipe sprinkler system, NPS 2-1/2 to NPS 4, shall be the following:
 - 1. Standard-weight, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
 - 2. Standard-weight, black-steel pipe with cut- or roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
- D. High-pressure, wet-pipe sprinkler system, NPS 4 and smaller, shall be the following:

1. Standard-weight, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.
2. Standard-weight, galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

3.12 SPRINKLER SCHEDULE

A. Use sprinkler types in subparagraphs below for the following applications:

1. Rooms without Ceilings: Upright sprinklers.
2. Rooms with Suspended Ceilings: Concealed sprinklers.
3. Wall Mounting: Sidewall sprinklers.

B. Provide sprinkler types in subparagraphs below with finishes indicated.

1. Concealed Sprinklers: Rough brass, with factory-painted white cover plate.
2. Flush Sprinklers: Bright chrome, with painted white escutcheon.
3. Recessed Sprinklers: Bright chrome, with bright chrome escutcheon.
4. Upright Pendent and Sidewall Sprinklers: Chrome plated in finished spaces exposed to view; rough bronze in unfinished spaces not exposed to view; wax coated where exposed to acids, chemicals, or other corrosive fumes.

END OF SECTION 211313

SECTION 220517 - SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sleeves.
 - 2. Stack-sleeve fittings.
 - 3. Sleeve-seal systems.
 - 4. Sleeve-seal fittings.
 - 5. Grout.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.
- C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.
- D. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- F. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.
- G. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

2.2 STACK-SLEEVE FITTINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Jay R. Smith Mfg. Co.
 2. Zurn Industries, LLC.
- B. Description: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring, bolts, and nuts for membrane flashing.
1. Underdeck Clamp: Clamping ring with setscrews.

2.3 SLEEVE-SEAL SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Advance Products & Systems, Inc.
 2. CALPICO, Inc.
 3. Metraflex Company (The).
 4. Pipeline Seal and Insulator, Inc.
 5. Proco Products, Inc.
- B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 2. Pressure Plates: Carbon steel.
 3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.4 SLEEVE-SEAL FITTINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. HOLDRITE.
- B. Description: Manufactured plastic, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall. Unit has plastic or rubber waterstop collar with center opening to match piping OD.

2.5 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.

- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
 - 1. Sleeves are not required for core-drilled holes.
- C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
 - 1. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.
 - 2. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
 - 3. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
- D. Install sleeves for pipes passing through interior partitions.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Section 079200 "Joint Sealants."
- E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.2 STACK-SLEEVE-FITTING INSTALLATION

- A. Install stack-sleeve fittings in new slabs as slabs are constructed.
 - 1. Install fittings that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 2. Secure flashing between clamping flanges for pipes penetrating floors with membrane waterproofing. Comply with requirements for flashing specified in Section 076200 "Sheet Metal Flashing and Trim."
 - 3. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level.
 - 4. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
 - 5. Using grout, seal the space around outside of stack-sleeve fittings.
- B. Fire-Barrier Penetrations: Maintain indicated fire rating of floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.3 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.4 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

3.5 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
 - 1. Interior Partitions:
 - a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
 - b. Piping NPS 6 and Larger: Galvanized-steel-sheet sleeves.

END OF SECTION 220517

SECTION 220518 - ESCUTCHEONS FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.
 - 2. Floor plates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

- A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.
- C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.
- D. Split-Casting Brass Type: With polished, chrome-plated finish and with concealed hinge and setscrew.
- E. Split-Plate, Stamped-Steel Type: With chrome-plated finish, concealed and exposed-rivet hinge, and spring-clip fasteners.

2.2 FLOOR PLATES

- A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.
- B. Split-Casting Floor Plates: Cast brass with concealed hinge.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of insulated piping and with OD that completely covers opening.
 - 1. Escutcheons for New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
 - b. Chrome-Plated Piping: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - c. Insulated Piping: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - e. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - f. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass or split-casting brass type with rough-brass finish.
 - g. Bare Piping in Equipment Rooms: One-piece, cast-brass or split-casting brass type with rough-brass finish.
 - 2. Escutcheons for Existing Piping:
 - a. Chrome-Plated Piping: Split-casting brass type with polished, chrome-plated finish.
 - b. Insulated Piping: Split-plate, stamped-steel type with concealed hinge.
 - c. Bare Piping at Wall and Floor Penetrations in Finished Spaces: Split-plate, stamped-steel type with concealed hinge.
 - d. Bare Piping at Ceiling Penetrations in Finished Spaces: Split-plate, stamped-steel type with concealed hinge.
 - e. Bare Piping in Unfinished Service Spaces: Split-casting brass type with rough-brass finish.
 - f. Bare Piping in Equipment Rooms: Split-casting brass type with rough-brass finish.
- C. Install floor plates for piping penetrations of equipment-room floors.
- D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. New Piping: One-piece, floor-plate type.
 - 2. Existing Piping: Split-casting, floor-plate type.

3.2 FIELD QUALITY CONTROL

- A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 220518

SECTION 220523.12 - BALL VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Brass ball valves.
 - 2. Steel ball valves.

1.3 DEFINITIONS

- A. CWP: Cold working pressure.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of valve.
 - 1. Certification that products comply with NSF 61 Annex G and NSF 372.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads, flange faces, and soldered ends.
 - 3. Set ball valves open to minimize exposure of functional surfaces.
- B. Use the following precautions during storage:
 - 1. Maintain valve end protection.
 - 2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use operating handles or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 - 1. ASME B1.20.1 for threads for threaded end valves.
 - 2. ASME B16.1 for flanges on iron valves.
 - 3. ASME B16.5 for flanges on steel valves.
 - 4. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 5. ASME B16.18 for solder-joint connections.
 - 6. ASME B31.9 for building services piping valves.
- C. NSF Compliance: NSF 61 Annex G and NSF 372 for valve materials for potable-water service.
- D. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.
- E. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- F. Valve Sizes: Same as upstream piping unless otherwise indicated.
- G. Valve Actuator Types:
 - 1. Gear Actuator: For quarter-turn valves NPS 4 and larger.
 - 2. Handlever: For quarter-turn valves smaller than NPS 4.
- H. Valves in Insulated Piping:
 - 1. Include 2-inch stem extensions.
 - 2. Extended operating handles of nonthermal-conductive material and protective sleeves that allow operation of valves without breaking vapor seals or disturbing insulation.
 - 3. Memory stops that are fully adjustable after insulation is applied.

2.2 BRASS BALL VALVES

- A. One-Piece, Brass Ball Valves:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. KITZ Corporation.
 - 2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 400 psig.
 - c. Body Design: One piece.
 - d. Body Material: Forged brass or bronze.

- e. Ends: Threaded and soldered.
- f. Seats: PTFE.
- g. Stem: Brass or stainless steel.
- h. Ball: Chrome-plated brass or stainless steel.
- i. Port: Reduced.

B. Two-Piece, Brass Ball Valves with Full Port and Brass Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. American Valve, Inc.
- b. Conbraco Industries, Inc.
- c. Crane; Crane Energy Flow Solutions.
- d. DynaQuip Controls.
- e. Hammond Valve.
- f. Jomar Valve.
- g. KITZ Corporation.
- h. Legend Valve & Fitting, Inc.
- i. Marwin Valve; Richards Industries.
- j. Milwaukee Valve Company.
- k. NIBCO INC.
- l. Red-White Valve Corporation.
- m. Stockham; Crane Energy Flow Solutions.
- n. Watts; a Watts Water Technologies company.

2. Description:

- a. Standard: MSS SP-110.
- b. CWP Rating: 600 psig.
- c. Body Design: Two piece.
- d. Body Material: Forged brass.
- e. Ends: Threaded and soldered.
- f. Seats: PTFE.
- g. Stem: Brass.
- h. Ball: Chrome-plated brass.
- i. Port: Full.

C. Two-Piece, Brass Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Jomar Valve.
- b. KITZ Corporation.
- c. Marwin Valve; Richards Industries.
- d. Milwaukee Valve Company.

2. Description:

- a. Standard: MSS SP-110.
- b. CWP Rating: 600 psig.
- c. Body Design: Two piece.
- d. Body Material: Forged brass.

- e. Ends: Threaded and soldered.
- f. Seats: PTFE.
- g. Stem: Stainless steel.
- h. Ball: Stainless steel, vented.
- i. Port: Full.

D. Two-Piece, Brass Ball Valves with Regular Port and Brass Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Hammond Valve.
 - b. Legend Valve & Fitting, Inc.
 - c. Milwaukee Valve Company.
 - d. NIBCO INC.
 - e. Watts; a Watts Water Technologies company.
2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: Two piece.
 - d. Body Material: Forged brass.
 - e. Ends: Threaded and soldered.
 - f. Seats: PTFE.
 - g. Stem: Brass.
 - h. Ball: Chrome-plated brass.
 - i. Port: Regular.

E. Two-Piece, Brass Ball Valves with Regular Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Jamesbury; Metso.
2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: Two piece.
 - d. Body Material: Brass or bronze.
 - e. Ends: Threaded and soldered.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Regular.

F. Three-Piece, Brass Ball Valves with Full Port and Brass Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Jomar Valve.

- b. KITZ Corporation.
- c. Watts; a Watts Water Technologies company.

2. Description:

- a. Standard: MSS SP-110.
- b. CWP Rating: 600 psig.
- c. Body Design: Three piece.
- d. Body Material: Forged brass.
- e. Ends: Threaded and soldered.
- f. Seats: PTFE.
- g. Stem: Brass.
- h. Ball: Chrome-plated brass.
- i. Port: Full.

G. Three-Piece, Brass Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Marwin Valve; Richards Industries.

2. Description:

- a. Standard: MSS SP-110.
- b. CWP Rating: 600 psig.
- c. Body Design: Three piece.
- d. Body Material: Forged brass.
- e. Ends: Threaded and soldered.
- f. Seats: PTFE.
- g. Stem: Stainless steel.
- h. Ball: Stainless steel, vented.
- i. Port: Full.

2.3 STEEL BALL VALVES

A. Class 150, Steel Ball Valves with Full Port:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Conbraco Industries, Inc.
- b. Jamesbury; Metso.
- c. NIBCO INC.

2. Description:

- a. Standard: MSS SP-72.
- b. CWP Rating: 285 psig.
- c. Body Design: Split body.
- d. Body Material: Carbon steel, ASTM A 216, Type WCB.
- e. Ends: Flanged or threaded.
- f. Seats: PTFE.

- g. Stem: Stainless steel.
- h. Ball: Stainless steel, vented.
- i. Port: Full.

B. Class 150, Steel Ball Valves with Regular Port:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Conbraco Industries, Inc.
 - b. Jamesbury; Metso.
 - c. NIBCO INC.
2. Description:
 - a. Standard: MSS SP-72.
 - b. CWP Rating: 285 psig.
 - c. Body Design: Uni-body.
 - d. Body Material: Carbon steel, ASTM A 216, Type WCB.
 - e. Ends: Flanged or threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Regular.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.

- D. Install valves in position to allow full stem movement.
- E. Install valve tags. Comply with requirements in Section 220553 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

3.3 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valves with specified CWP ratings are unavailable, the same types of valves with higher CWP ratings may be substituted.
- B. Select valves with the following end connections:
 - 1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
 - 2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 3. For Copper Tubing, NPS 5 and Larger: Flanged ends.
 - 4. For Steel Piping, NPS 2 and Smaller: Threaded ends.
 - 5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 6. For Steel Piping, NPS 5 and Larger: Flanged ends.

3.4 DOMESTIC HOT- AND COLD-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller:
 - 1. Bronze Valves: May be provided with solder-joint ends instead of threaded ends.
 - 2. One piece, brass ball valve.
 - 3. One piece, bronze ball valve with stainless-steel trim.
 - 4. Two-piece, brass ball valves with full port and brass trim.
 - 5. Two-piece, bronze ball valves with full port and bronze or brass trim.
 - 6. Three-piece, brass ball valves with full port and brass trim.
 - 7. Three-piece, bronze ball valves with full port and bronze or brass trim.
 - 8. Two-piece, bronze ball valves with regular port and bronze trim.
- B. Pipe NPS 2-1/2 and Larger:
 - 1. Steel and Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
 - 2. Class 150, steel ball valves with full port.
 - 3. Class 150, iron ball valves.

END OF SECTION 220523.12

SECTION 220529 - HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Metal pipe hangers and supports.
2. Trapeze pipe hangers.
3. Thermal-hanger shield inserts.
4. Fastener systems.

- B. Related Sections:

1. Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment" for vibration isolation devices.

1.3 DEFINITIONS

- A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
 1. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.6 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.7 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
 - 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 - 2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
 - 3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
 - 4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
 - 5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
- B. Stainless-Steel Pipe Hangers and Supports:
 - 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 - 2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
 - 3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.
- C. Copper Pipe Hangers:
 - 1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
 - 2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel.

2.2 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 THERMAL-HANGER SHIELD INSERTS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Carpenter & Paterson, Inc.
 - 2. Clement Support Services.
 - 3. ERICO International Corporation.
 - 4. National Pipe Hanger Corporation.
 - 5. PHS Industries, Inc.
 - 6. Pipe Shields Inc.
 - 7. Piping Technology & Products, Inc.

8. Rilco Manufacturing Co., Inc.
9. Value Engineered Products, Inc.

- B. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig minimum compressive strength and vapor barrier.
- C. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig minimum compressive strength.
- D. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
- E. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- F. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.4 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.5 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
 1. Properties: Nonstaining, noncorrosive, and nongaseous.
 2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
 2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

- D. Fastener System Installation:
1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- E. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- F. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- G. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- H. Install lateral bracing with pipe hangers and supports to prevent swaying.
- I. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- J. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- K. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- L. Insulated Piping:
1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 4. Shield Dimensions for Pipe: Not less than the following:

- a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
 - b. NPS 4: 12 inches long and 0.06 inch thick.
 - c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
 - d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
 - e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
 6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Section 099123 "Interior Painting."
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.5 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports and attachments for general service applications.
- F. Use stainless-steel pipe hangers and stainless-steel attachments for hostile environment applications.
- G. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.
- H. Use padded hangers for piping that is subject to scratching.
- I. Use thermal-hanger shield inserts for insulated piping and tubing.
- J. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
 - 2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F, pipes NPS 4 to NPS 24, requiring up to 4 inches of insulation.
 - 3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.
 - 4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 if little or no insulation is required.
 - 5. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
 - 6. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8.
 - 7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 - 8. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 - 9. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 - 10. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
 - 11. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
 - 12. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
 - 13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
 - 14. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
 - 15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
 - 16. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes NPS 2-1/2 to NPS 36 if vertical adjustment is required, with steel-pipe base stanchion support and cast-iron floor flange.
 - 17. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
 - 18. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes NPS 2-1/2 to NPS 24, from single rod if horizontal movement caused by expansion and contraction might occur.
 - 19. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
 - 20. Pipe Roll and Plate Units (MSS Type 45): For support of pipes NPS 2 to NPS 24 if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.

21. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes NPS 2 to NPS 30 if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.
- K. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- L. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
 2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
 3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- M. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 6. C-Clamps (MSS Type 23): For structural shapes.
 7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb.
 - b. Medium (MSS Type 32): 1500 lb.
 - c. Heavy (MSS Type 33): 3000 lb.
 13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- N. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- O. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
 2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
 3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
 4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
 5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
 6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
 7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
 8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:
 - a. Horizontal (MSS Type 54): Mounted horizontally.
 - b. Vertical (MSS Type 55): Mounted vertically.
 - c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.
- P. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- Q. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.
- R. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.
- S. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION 220529

SECTION 220553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Equipment labels.
 - 2. Warning signs and labels.
 - 3. Pipe labels.
 - 4. Stencils.
 - 5. Valve tags.
 - 6. Warning tags.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
- D. Valve numbering scheme.
- E. Valve Schedules: For each piping system to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Metal Labels for Equipment:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Brimar Industries, Inc.
 - c. Carlton Industries, LP.
 - d. Champion America.
 - e. Craftmark Pipe Markers.

- f. emedco.
 - g. Kolbi Pipe Marker Co.
 - h. LEM Products Inc.
 - i. Marking Services, Inc.
 - j. Seton Identification Products.
2. Material and Thickness: Brass, 0.032-inch or anodized aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 3. Letter Color: Black.
 4. Background Color: Yellow.
 5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
 7. Fasteners: Stainless-steel self-tapping screws.
 8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

2.2 WARNING SIGNS AND LABELS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 1. Brady Corporation.
 2. Brimar Industries, Inc.
 3. Carlton Industries, LP.
 4. Champion America.
 5. Craftmark Pipe Markers.
 6. emedco.
 7. LEM Products Inc.
 8. Marking Sevices Inc.
 9. National Marker Company.
 10. Seton Identification Products.
 11. Stranco, Inc.
- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- C. Letter Color: Black.
- D. Background Color: Yellow.
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- F. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- G. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
- H. Fasteners: Stainless-steel self-tapping screws.
- I. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

- J. Label Content: Include caution and warning information plus emergency notification instructions.

2.3 PIPE LABELS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Actioncraft Products, Inc.; a division of Industrial Test Equipment Co., Inc.
 2. Brady Corporation.
 3. Brimar Industries, Inc.
 4. Carlton Industries, LP.
 5. Champion America.
 6. Craftmark Pipe Markers.
 7. emedco.
 8. Kolbi Pipe Marker Co.
 9. LEM Products Inc.
 10. Marking Sevices Inc.
 11. Seton Identification Products.
- B. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- C. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- D. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- E. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings; also include pipe size and an arrow indicating flow direction.
1. Flow-Direction Arrows: Integral with piping-system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
 2. Lettering Size: Size letters according to ASME A13.1 for piping.

2.4 STENCILS

- A. Stencils for Piping:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brimar Industries, Inc.
 - b. Carlton Industries, LP.
 - c. Champion America.
 - d. Craftmark Pipe Markers.
 - e. Kolbi Pipe Marker Co.
 - f. Marking Sevices Inc.
 2. Lettering Size: Size letters according to ASME A13.1 for piping.
 3. Stencil Material: Aluminum.
 4. Stencil Paint: Exterior, gloss, alkyd enamel in colors complying with recommendations in ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.

5. Identification Paint: Exterior, alkyd enamel in colors according to ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.

2.5 VALVE TAGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 1. Actioncraft Products, Inc.; a division of Industrial Test Equipment Co., Inc.
 2. Brady Corporation.
 3. Brimar Industries, Inc.
 4. Carlton Industries, LP.
 5. Champion America.
 6. Craftmark Pipe Markers.
 7. emedco.
 8. Kolbi Pipe Marker Co.
 9. LEM Products Inc.
 10. Marking Sevices Inc.
 11. Seton Identification Products.
- B. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.
 1. Tag Material: Brass, 0.032-inch or anodized aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 2. Fasteners: Brass wire-link chain or beaded chain.
- C. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
 1. Valve-tag schedule shall be included in operation and maintenance data.

2.6 WARNING TAGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 1. Brady Corporation.
 2. Brimar Industries, Inc.
 3. Carlton Industries, LP.
 4. Champion America.
 5. Craftmark Pipe Markers.
 6. emedco.
 7. Kolbi Pipe Marker Co.
 8. LEM Products Inc.
 9. Marking Sevices Inc.
 10. Seton Identification Products.
- B. Description: Preprinted or partially preprinted accident-prevention tags of plasticized card stock with matte finish suitable for writing.

1. Size: Approximately 4 by 7 inches.
2. Fasteners: Brass grommet and wire.
3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
4. Color: Safety yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

3.3 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

3.4 PIPE LABEL INSTALLATION

- A. Piping Color Coding: Painting of piping is specified in Section 099123 "Interior Painting."
- B. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1, with painted, color-coded bands or rectangles on each piping system.
 1. Identification Paint: Use for contrasting background.
 2. Stencil Paint: Use for pipe marking.
- C. Pipe Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 1. Near each valve and control device.
 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 5. Near major equipment items and other points of origination and termination.

6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- D. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.
- E. Pipe Label Color Schedule:
1. Domestic Water Piping
 - a. Background: Safety green.
 - b. Letter Colors: White.
 2. Sanitary Waste Piping:
 - a. Background Color: Safety black.
 - b. Letter Color: White.

3.5 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units, shutoff valves, faucets, convenience and lawn-watering hose connections, and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:
1. Valve-Tag Size and Shape:
 - a. Cold Water: 2 inches, round.
 - b. Hot Water: 2 inches, round.
 2. Valve-Tag Colors:
 - a. Cold Water: Natural.
 - b. Hot Water: Safety green.
 3. Letter Colors:
 - a. Cold Water: White.
 - b. Hot Water: White.

3.6 WARNING-TAG INSTALLATION

- A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 220553

SECTION 220719 - PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes insulating the following plumbing piping services:

- 1. Domestic cold-water piping.
- 2. Domestic hot-water piping.

- B. Related Sections:

- 1. Section 220716 "Plumbing Equipment Insulation."

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied, if any).

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.7 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate installation and testing of heat tracing.

1.8 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Pittsburgh Corning Corporation.
 2. Block Insulation: ASTM C 552, Type I.
 3. Special-Shaped Insulation: ASTM C 552, Type III.
 4. Preformed Pipe Insulation without Jacket: Comply with ASTM C 552, Type II, Class 1.
 5. Preformed Pipe Insulation with Factory-Applied ASJ: Comply with ASTM C 552, Type II, Class 2.
 6. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.
- G. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC.
 - c. K-Flex USA.
- H. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Eagle Bridges - Marathon Industries.
 - c. Foster Brand; H. B. Fuller Construction Products.
 - d. Mon-Eco Industries, Inc.
 2. <Double click to insert sustainable design text for adhesive for ASJ and FSK jackets VOC content.>
 3. <Double click to insert sustainable design text for low-emitting adhesives and sealants.>
- I. PVC Jacket Adhesive: Compatible with PVC jacket.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Dow Corning Corporation.
 - b. Johns Manville; a Berkshire Hathaway company.
 - c. P.I.C. Plastics, Inc.
 - d. Speedline Corporation.
- J. FSK and Metal Jacket Flashing Sealants:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Eagle Bridges - Marathon Industries.
 - c. Foster Brand; H. B. Fuller Construction Products.
 - d. Mon-Eco Industries, Inc.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.

K. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.

2.2 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.3 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Johns Manville; a Berkshire Hathaway company.
 - b. P.I.C. Plastics, Inc.
 - c. Proto Corporation.
 - d. Speedline Corporation.
2. Adhesive: As recommended by jacket material manufacturer.
3. Color: White.
4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
 - a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

2.4 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Avery Dennison Corporation, Specialty Tapes Division.
 - b. Compac Corporation.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
 - e. Venture Tape.
 2. Width: 3 inches.
 3. Thickness: 11.5 mils.
 4. Adhesion: 90 ounces force/inch in width.
 5. Elongation: 2 percent.
 6. Tensile Strength: 40 lbf/inch in width.
 7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.
- B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Avery Dennison Corporation, Specialty Tapes Division.
 - b. Compac Corporation.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
 - e. Venture Tape.
 2. Width: 3 inches.
 3. Thickness: 6.5 mils.
 4. Adhesion: 90 ounces force/inch in width.
 5. Elongation: 2 percent.
 6. Tensile Strength: 40 lbf/inch in width.
 7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.
- C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Compac Corporation.
 - b. Ideal Tape Co., Inc., an American Biltrite Company.
 - c. Venture Tape.
 2. Width: 2 inches.

3. Thickness: 6 mils.
4. Adhesion: 64 ounces force/inch in width.
5. Elongation: 500 percent.
6. Tensile Strength: 18 lbf/inch in width.

D. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Avery Dennison Corporation, Specialty Tapes Division.
 - b. Compac Corporation.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
 - e. Venture Tape.
2. Width: 2 inches.
3. Thickness: 3.7 mils.
4. Adhesion: 100 ounces force/inch in width.
5. Elongation: 5 percent.
6. Tensile Strength: 34 lbf/inch in width.

2.5 SECUREMENTS

A. Bands:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. RPR Products, Inc.
2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304; 0.015 inch thick, 3/4 inch wide with wing seal.
3. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 3/4 inch wide with wing seal.

B. Staples: Outward-clinching insulation staples, nominal 3/4-inch-wide, stainless steel or Monel.

C. Wire: 0.080-inch nickel-copper alloy.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. C & F Wire.

2.6 PROTECTIVE SHIELDING GUARDS

A. Protective Shielding Pipe Covers,:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Engineered Brass Company.
 - b. Insul-Tect Products Co.
 - c. McGuire Manufacturing.
 - d. Plumberex Specialty Products, Inc.
 - e. Truebro.
 - f. Zurn Industries, LLC.
2. Description: Manufactured plastic wraps for covering plumbing fixture hot-water supply hot- and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.
- B. Protective Shielding Piping Enclosures,:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Truebro.
 - b. Zurn Industries, LLC.
 2. Description: Manufactured plastic enclosure for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with ADA requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 1. Verify that systems to be insulated have been tested and are free of defects.
 2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:
 1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
 2. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
- C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

- D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
 - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
 - 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth.
 - 2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
 - a. For below-ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- P. For above-ambient services, do not install insulation to the following:
1. Vibration-control devices.
 2. Testing agency labels and stamps.
 3. Nameplates and data plates.
 4. Cleanouts.

3.4 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.
- C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 4. Seal jacket to wall flashing with flashing sealant.
- D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.

F. Insulation Installation at Floor Penetrations:

1. Pipe: Install insulation continuously through floor penetrations.
2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Install removable insulation covers at locations indicated. Installation shall conform to the following:

1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.6 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- B. Insulation Installation on Pipe Flanges:
 1. Install pipe insulation to outer diameter of pipe flange.
 2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
 3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
 4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- C. Insulation Installation on Pipe Fittings and Elbows:
 1. Install mitered sections of pipe insulation.
 2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- D. Insulation Installation on Valves and Pipe Specialties:
 1. Install preformed valve covers manufactured of same material as pipe insulation when available.
 2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
 3. Install insulation to flanges as specified for flange insulation application.
 4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.7 FIELD-APPLIED JACKET INSTALLATION

- A. Where glass-cloth jackets are indicated, install directly over bare insulation or insulation with factory-applied jackets.

1. Draw jacket smooth and tight to surface with 2-inch overlap at seams and joints.
2. Embed glass cloth between two 0.062-inch-thick coats of lagging adhesive.
3. Completely encapsulate insulation with coating, leaving no exposed insulation.

B. Where FSK jackets are indicated, install as follows:

1. Draw jacket material smooth and tight.
2. Install lap or joint strips with same material as jacket.
3. Secure jacket to insulation with manufacturer's recommended adhesive.
4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch-wide joint strips at end joints.
5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

C. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.

1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

D. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

3.8 FINISHES

A. Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.

a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

C. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

D. Do not field paint aluminum or stainless-steel jackets.

3.9 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:

1. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings,

two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

- D. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.10 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 - 1. Drainage piping located in crawl spaces.
 - 2. Underground piping.
 - 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.11 INDOOR PIPING INSULATION SCHEDULE

- A. Roof Drains Piping:
 - 1. NPS 2 and Larger: Insulation shall be one of the following:
 - a. Cellular Glass: 1 inch thick.
- B. Roof Drains:
 - 1. NPS 2 and Larger: Insulation shall be one of the following:
 - a. Cellular Glass: 1 inch thick.
- C. Air Conditioning Condensate Pipes:
 - 1. NPS 2 and Smaller: Insulation shall be one of the following:
 - a. Cellular Glass: 1 inch thick.

3.12 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Piping, Concealed:
 - 1. None.
- D. Piping, Exposed:

September 7, 2017
Bid Issue

Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower-Internal Stair
Elizabeth, New Jersey

1. PVC: 20 mils thick.

SECTION 221116 - DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Under-building-slab and aboveground domestic water pipes, tubes, and fittings inside buildings.
 - 2. Air conditioning condensate piping.
 - 3. Encasement for piping.
- B. Related Requirements:
 - 1. Section 221113 "Facility Water Distribution Piping" for water-service piping outside the building from source to the point where water-service piping enters the building.

1.3 ACTION SUBMITTALS

- A. Product Data: For transition fittings and dielectric fittings.

1.4 INFORMATIONAL SUBMITTALS

- A. System purging and disinfecting activities report.
- B. Field quality-control reports.

1.5 FIELD CONDITIONS

- A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
 - 1. Notify Construction Manager no fewer than two days in advance of proposed interruption of water service.
 - 2. Do not interrupt water service without Construction Manager's written permission.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.
- B. Potable-water piping and components shall comply with NSF 14 and NSF 61 Annex G. Plastic piping components shall be marked with "NSF-pw."

2.2 COPPER TUBE AND FITTINGS

- A. Hard Copper Tube: ASTM B 88, Type L and ASTM B 88, Type M water tube, drawn temper.
- B. Soft Copper Tube: ASTM B 88, Type K and ASTM B 88, Type L water tube, annealed temper.
- C. Cast-Copper, Solder-Joint Fittings: ASME B16.18, pressure fittings.
- D. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
- E. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.
- F. Copper Unions:
 - 1. MSS SP-123.
 - 2. Cast-copper-alloy, hexagonal-stock body.
 - 3. Ball-and-socket, metal-to-metal seating surfaces.
 - 4. Solder-joint or threaded ends.
- G. Copper Pressure-Seal-Joint Fittings:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Elkhart Products Corporation.
 - b. NIBCO INC.
 - c. Viega LLC.
 - 2. Fittings for NPS 2 and Smaller: Wrought-copper fitting with EPDM-rubber, O-ring seal in each end.
 - 3. Fittings for NPS 2-1/2 to NPS 4: Cast-bronze or wrought-copper fitting with EPDM-rubber, O-ring seal in each end.
- H. Copper Push-on-Joint Fittings:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Victaulic Company.
 - 2. Description:

- a. Cast-copper fitting complying with ASME B16.18 or wrought-copper fitting complying with ASME B 16.22.
- b. Stainless-steel teeth and EPDM-rubber, O-ring seal in each end instead of solder-joint ends.

I. Copper-Tube, Extruded-Tee Connections:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. T-DRILL Industries Inc.
2. Description: Tee formed in copper tube according to ASTM F 2104.

J. Appurtenances for Grooved-End Copper Tubing:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Anvil International.
 - b. Grinnell Mechanical Products.
 - c. Shurjoint Piping Products.
 - d. Victaulic Company.
2. Bronze Fittings for Grooved-End, Copper Tubing: ASTM B 75 copper tube or ASTM B 584 bronze castings.
3. Mechanical Couplings for Grooved-End Copper Tubing:
 - a. Copper-tube dimensions and design similar to AWWA C606.
 - b. Ferrous housing sections.
 - c. EPDM-rubber gaskets suitable for hot and cold water.
 - d. Bolts and nuts.
 - e. Minimum Pressure Rating: 300 psig.

2.3 DUCTILE-IRON PIPE AND FITTINGS

A. Mechanical-Joint, Ductile-Iron Pipe:

1. AWWA C151/A21.51, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

B. Standard-Pattern, Mechanical-Joint Fittings:

1. AWWA C110/A21.10, ductile or gray iron.
2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

C. Compact-Pattern, Mechanical-Joint Fittings:

1. AWWA C153/A21.53, ductile iron.
2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

- D. Push-on-Joint, Ductile-Iron Pipe:
 - 1. AWWA C151/A21.51.
 - 2. Push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated.

- E. Standard-Pattern, Push-on-Joint Fittings:
 - 1. AWWA C110/A21.10, ductile or gray iron.
 - 2. Gaskets: AWWA C111/A21.11, rubber.

- F. Compact-Pattern, Push-on-Joint Fittings:
 - 1. AWWA C153/A21.53, ductile iron.
 - 2. Gaskets: AWWA C111/A21.11, rubber.

- G. Plain-End, Ductile-Iron Pipe: AWWA C151/A21.51.

- H. Appurtenances for Grooved-End, Ductile-Iron Pipe:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Shurjoint Piping Products.
 - b. Smith-Cooper International.
 - c. Star Pipe Products.
 - d. Victaulic Company.
 - 2. Fittings for Grooved-End, Ductile-Iron Pipe: ASTM A 47/A 47M, malleable-iron castings or ASTM A 536, ductile-iron castings with dimensions that match pipe.
 - 3. Mechanical Couplings for Grooved-End, Ductile-Iron-Piping:
 - a. AWWA C606 for ductile-iron-pipe dimensions.
 - b. Ferrous housing sections.
 - c. EPDM-rubber gaskets suitable for hot and cold water.
 - d. Bolts and nuts.
 - e. Minimum Pressure Rating:
 - 1) NPS 14 to NPS 18: 250 psig.
 - 2) NPS 20 to NPS 46: 150 psig.

2.4 GALVANIZED-STEEL PIPE AND FITTINGS

- A. Galvanized-Steel Pipe:
 - 1. ASTM A 53/A 53M, Type E, Grade B, Standard Weight.
 - 2. Include ends matching joining method.

- B. Galvanized-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106/A 106M, Standard Weight, seamless steel pipe with threaded ends.

- C. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.

- D. Malleable-Iron Unions:

1. ASME B16.39, Class 150.
2. Hexagonal-stock body.
3. Ball-and-socket, metal-to-metal, bronze seating surface.
4. Threaded ends.

E. Flanges: ASME B16.1, Class 125, cast iron.

F. Appurtenances for Grooved-End, Galvanized-Steel Pipe:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Anvil International.
 - b. Grinnell Mechanical Products.
 - c. Shurjoint Piping Products.
 - d. Victaulic Company.
2. Fittings for Grooved-End, Galvanized-Steel Pipe: Galvanized, ASTM A 47/A 47M, malleable-iron casting; ASTM A 106/A 106M, steel pipe; or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
3. Fittings for Grooved-End, Galvanized-Steel Pipe:
 - a. AWWA C606 for steel-pipe dimensions.
 - b. Ferrous housing sections.
 - c. EPDM-rubber gaskets suitable for hot and cold water.
 - d. Bolts and nuts.
 - e. Minimum Pressure Rating:
 - 1) NPS 8 and Smaller: 600 psig.
 - 2) NPS 10 and NPS 12: 400 psig.
 - 3) NPS 14 to NPS 24: 250 psig.

2.5 STAINLESS-STEEL PIPING

A. Potable-water piping and components shall comply with NSF 61 Annex G.

B. Stainless-Steel Pipe: ASTM A 312/A 312M, Schedule 40.

C. Stainless-Steel Pipe Fittings: ASTM A 815/A 815M.

D. Appurtenances for Grooved-End, Stainless-Steel Pipe:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Anvil International.
 - b. Grinnell Mechanical Products.
 - c. Shurjoint Piping Products.
 - d. Victaulic Company.
2. Fittings for Grooved-End, Stainless-Steel Pipe: Stainless-steel casting with dimensions matching stainless-steel pipe.
3. Mechanical Couplings for Grooved-End, Stainless-Steel Pipe:

- a. AWWA C606 for stainless-steel-pipe dimensions.
- b. Stainless-steel housing sections.
- c. Stainless-steel bolts and nuts.
- d. EPDM-rubber gaskets suitable for hot and cold water.
- e. Minimum Pressure Rating:
 - 1) NPS 8 and Smaller: 600 psig.
 - 2) NPS 10 and NPS 12: 400 psig.
 - 3) NPS 14 to NPS 24: 250 psig.

2.6 PVC PIPE AND FITTINGS

- A. PVC Pipe: ASTM D 1785, Schedule 40 and Schedule 80.
- B. PVC Socket Fittings: ASTM D 2466 for Schedule 40 and ASTM D 2467 for Schedule 80.
- C. PVC Schedule 80 Threaded Fittings: ASTM D 2464.

2.7 PP PIPE AND FITTINGS

- A. PP Pipe: ASTM F 2389, SDR 7.4 and SDR 11.
- B. PVC Socket Fittings: ASTM F 2389.

2.8 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials:
 1. AWWA C110/A21.10, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free unless otherwise indicated.
 2. Full-face or ring type unless otherwise indicated.
- B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- C. Solder Filler Metals: ASTM B 32, lead-free alloys.
- D. Flux: ASTM B 813, water flushable.
- E. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.
- F. Plastic, Pipe-Flange Gaskets, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.9 TRANSITION FITTINGS

- A. General Requirements:
 1. Same size as pipes to be joined.
 2. Pressure rating at least equal to pipes to be joined.

3. End connections compatible with pipes to be joined.
- B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
- C. Sleeve-Type Transition Coupling: AWWA C219.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cascade Waterworks Mfg. Co.
 - b. Dresser, Inc.
 - c. Ford Meter Box Company, Inc. (The).
 - d. Jay R. Smith Mfg. Co.
 - e. JCM Industries, Inc.
 - f. Romac Industries, Inc.
 - g. Smith-Blair, Inc.
 - h. Viking Johnson.
- D. Plastic-to-Metal Transition Fittings:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Charlotte Pipe and Foundry Company.
 - b. Harvel Plastics, Inc.
 - c. Spears Manufacturing Company.
 - d. Uponor.
 2. Description:
 - a. PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions.
 - b. One end with threaded brass insert and one solvent-cement-socket or threaded end.
- E. Plastic-to-Metal Transition Unions:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Colonial Engineering, Inc.
 - b. NIBCO INC.
 - c. Spears Manufacturing Company.
 2. Description:
 - a. PVC four-part union.
 - b. Brass or stainless-steel threaded end.
 - c. Solvent-cement-joint or threaded plastic end.
 - d. Rubber O-ring.
 - e. Union nut.

2.10 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
- B. Dielectric Unions:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. A. Y. McDonald Mfg. Co.
 - b. Capitol Manufacturing Company.
 - c. Central Plastics Company.
 - d. HART Industrial Unions, LLC.
 - e. Jomar Valve.
 - f. Matco-Norca.
 - g. Watts; a Watts Water Technologies company.
 - h. Wilkins.
 - i. Zurn Industries, LLC.
 2. Standard: ASSE 1079.
 3. Pressure Rating: 125 psig minimum at 180 deg F.
 4. End Connections: Solder-joint copper alloy and threaded ferrous.
- C. Dielectric Flanges:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Capitol Manufacturing Company.
 - b. Central Plastics Company.
 - c. Matco-Norca.
 - d. Watts; a Watts Water Technologies company.
 - e. Wilkins.
 - f. Zurn Industries, LLC.
 2. Standard: ASSE 1079.
 3. Factory-fabricated, bolted, companion-flange assembly.
 4. Pressure Rating: 150 psig 175 psig 300 psig.
 5. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
- D. Dielectric-Flange Insulating Kits:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Central Plastics Company.
 - d. Pipeline Seal and Insulator, Inc.
 2. Nonconducting materials for field assembly of companion flanges.

3. Pressure Rating: 150 psig.
4. Gasket: Neoprene or phenolic.
5. Bolt Sleeves: Phenolic or polyethylene.
6. Washers: Phenolic with steel backing washers.

E. Dielectric Nipples:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Elster Perfection Corporation.
 - b. Grinnell Mechanical Products.
 - c. Matco-Norca.
 - d. Precision Plumbing Products.
 - e. Victaulic Company.
2. Standard: IAPMO PS 66.
3. Electroplated steel nipple complying with ASTM F 1545.
4. Pressure Rating and Temperature: 300 psig at 225 deg F.
5. End Connections: Male threaded or grooved.
6. Lining: Inert and noncorrosive, propylene.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install shutoff valve immediately upstream of each dielectric fitting.
- C. Install water-pressure-reducing valves downstream from shutoff valves. Comply with requirements for pressure-reducing valves in Section 221119 "Domestic Water Piping Specialties."
- D. Install domestic water piping level with 0.25 percent slope downward toward drain and plumb.
- E. Rough-in domestic water piping for water-meter installation according to utility company's requirements.
- F. Install seismic restraints on piping. Comply with requirements for seismic-restraint devices in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- G. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- H. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- I. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.

- J. Install piping to permit valve servicing.
- K. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.
- L. Install piping free of sags and bends.
- M. Install fittings for changes in direction and branch connections.
- N. Install PEX piping with loop at each change of direction of more than 90 degrees.
- O. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
- P. Install pressure gages on suction and discharge piping for each plumbing pump and packaged booster pump. Comply with requirements for pressure gages in Section 220519 "Meters and Gages for Plumbing Piping."
- Q. Install thermostats in hot-water circulation piping. Comply with requirements for thermostats in Section 221123 "Domestic Water Pumps."
- R. Install thermometers on inlet and outlet piping from each water heater. Comply with requirements for thermometers in Section 220519 "Meters and Gages for Plumbing Piping."
- S. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- T. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- U. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.2 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- D. Brazed Joints for Copper Tubing: Comply with CDA's "Copper Tube Handbook," "Braze Joints" chapter.
- E. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."
- F. Pressure-Sealed Joints for Copper Tubing: Join copper tube and pressure-seal fittings with tools recommended by fitting manufacturer.

- G. Push-on Joints for Copper Tubing: Clean end of tube. Measure insertion depth with manufacturer's depth gage. Join copper tube and push-on-joint fittings by inserting tube to measured depth.
- H. Extruded-Tee Connections: Form tee in copper tube according to ASTM F 2014. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.
- I. Joint Construction for Grooved-End Copper Tubing: Make joints according to AWWA C606. Roll groove ends of tubes. Lubricate and install gasket over ends of tubes or tube and fitting. Install coupling housing sections over gasket with keys seated in tubing grooves. Install and tighten housing bolts.
- J. Joint Construction for Grooved-End, Ductile-Iron Piping: Make joints according to AWWA C606. Cut round-bottom grooves in ends of pipe at gasket-seat dimension required for specified (flexible or rigid) joint. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections over gasket with keys seated in piping grooves. Install and tighten housing bolts.
- K. Joint Construction for Grooved-End Steel Piping: Make joints according to AWWA C606. Square cut groove ends of pipe as specified. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections over gasket with keys seated in piping grooves. Install and tighten housing bolts.
- L. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.
- M. Joint Construction for Solvent-Cemented Plastic Piping: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements. Apply primer.
 - 2. PVC Piping: Join according to ASTM D 2855.
- N. Joints for Dissimilar-Material Piping: Make joints using adapters compatible with materials of both piping systems.

3.3 TRANSITION FITTING INSTALLATION

- A. Install transition couplings at joints of dissimilar piping.
- B. Transition Fittings in Underground Domestic Water Piping:
 - 1. Fittings for NPS 1-1/2 and Smaller: Fitting-type coupling.
 - 2. Fittings for NPS 2 and Larger: Sleeve-type coupling.
- C. Transition Fittings in Aboveground Domestic Water Piping NPS 2 and Smaller: Plastic-to-metal transition unions.

3.4 DIELECTRIC FITTING INSTALLATION

- A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
- B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric unions.
- C. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric flange kits.

- D. Dielectric Fittings for NPS 5 and Larger: Use dielectric flange kits.

3.5 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for seismic-restraint devices in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- B. Comply with requirements for pipe hanger, support products, and installation in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
 - 1. Vertical Piping: MSS Type 8 or 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
 - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.
- E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
 - 2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
 - 3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
 - 4. NPS 2-1/2: 108 inches with 1/2-inch rod.
 - 5. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
 - 6. NPS 6: 10 feet with 5/8-inch rod.
 - 7. NPS 8: 10 feet with 3/4-inch rod.
- F. Install supports for vertical copper tubing every 10 feet.
- G. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/4 and Smaller: 84 inches with 3/8-inch rod.
 - 2. NPS 1-1/2: 108 inches with 3/8-inch rod.
 - 3. NPS 2: 10 feet with 3/8-inch rod.
 - 4. NPS 2-1/2: 11 feet with 1/2-inch rod.
 - 5. NPS 3 and NPS 3-1/2: 12 feet with 1/2-inch rod.
 - 6. NPS 4 and NPS 5: 12 feet with 5/8-inch rod.
 - 7. NPS 6: 12 feet with 3/4-inch rod.
 - 8. NPS 8 to NPS 12: 12 feet with 7/8-inch rod.
- H. Install supports for vertical steel piping every 15 feet.
- I. Install hangers for stainless-steel piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/4 and Smaller: 84 inches with 3/8-inch rod.
 2. NPS 1-1/2: 108 inches with 3/8-inch rod.
 3. NPS 2: 10 feet with 3/8-inch rod.
 4. NPS 2-1/2: 11 feet with 1/2-inch rod.
 5. NPS 3 and NPS 3-1/2: 12 feet with 1/2-inch rod.
 6. NPS 4 and NPS 5: 12 feet with 5/8-inch rod.
 7. NPS 6: 12 feet with 3/4-inch rod.
 8. NPS 8 to NPS 12: 12 feet with 7/8-inch rod.
- J. Install supports for vertical stainless-steel piping every 15 feet.
- K. Install vinyl-coated hangers for CPVC piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1 and Smaller: 36 inches with 3/8-inch rod.
 2. NPS 1-1/4 to NPS 2: 48 inches with 3/8-inch rod.
 3. NPS 2-1/2 to NPS 3-1/2: 48 inches with 1/2-inch rod.
 4. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.
 5. NPS 6: 48 inches with 3/4-inch rod.
 6. NPS 8: 48 inches with 7/8-inch rod.
- L. Install supports for vertical CPVC piping every 60 inches for NPS 1 and smaller, and every 72 inches for NPS 1-1/4 and larger.
- M. Install vinyl-coated hangers for PEX piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1 and Smaller: 32 inches with 3/8-inch rod.
- N. Install hangers for vertical PEX piping every 48 inches.
- O. Install vinyl-coated hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 2 and Smaller: 48 inches with 3/8-inch rod.
 2. NPS 2-1/2 to NPS 3-1/2: 48 inches with 1/2-inch rod.
 3. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.
 4. NPS 6: 48 inches with 3/4-inch rod.
 5. NPS 8: 48 inches with 7/8-inch rod.
- P. Install supports for vertical PVC piping every 48 inches.
- Q. Install vinyl-coated hangers for PP piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1 and Smaller: 36 inches with 3/8-inch rod.
 2. NPS 1-1/4 to NPS 2: 48 inches with 3/8-inch rod.
 3. NPS 2-1/2 to NPS 3-1/2: 48 inches with 1/2-inch rod.
 4. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.
 5. NPS 6: 48 inches with 3/4-inch rod.
 6. NPS 8: 48 inches with 7/8-inch rod.
- R. Install supports for vertical PP piping every 60 inches for NPS 1 and smaller, and every 72 inches for NPS 1-1/4 and larger.

- S. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

3.6 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.
- C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
- D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:
 - 1. Domestic Water Booster Pumps: Cold-water suction and discharge piping.
 - 2. Water Heaters: Cold-water inlet and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
 - 3. Plumbing Fixtures: Cold- and hot-water-supply piping in sizes indicated, but not smaller than that required by plumbing code.
 - 4. Equipment: Cold- and hot-water-supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.7 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification materials and installation in Section 220553 "Identification for Plumbing Piping and Equipment."
- B. Label pressure piping with system operating pressure.

3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Piping Inspections:
 - a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
 - b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
 - 1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
 - 2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
 - c. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
 - d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
 - 2. Piping Tests:

- a. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
- b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
- c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
- d. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
- e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
- f. Prepare reports for tests and for corrective action required.

B. Domestic water piping will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.9 ADJUSTING

A. Perform the following adjustments before operation:

1. Close drain valves, hydrants, and hose bibbs.
2. Open shutoff valves to fully open position.
3. Open throttling valves to proper setting.
4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
 - a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
 - b. Adjust calibrated balancing valves to flows indicated.
5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
6. Remove and clean strainer screens. Close drain valves and replace drain plugs.
7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
8. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.10 CLEANING

A. Clean and disinfect potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Fill and isolate system according to either of the following:
 - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.

- 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
 - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
 - d. Repeat procedures if biological examination shows contamination.
 - e. Submit water samples in sterile bottles to authorities having jurisdiction.
- B. Clean non-potable domestic water piping as follows:
1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
 2. Use purging procedures prescribed by authorities having jurisdiction or; if methods are not prescribed, follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.
- C. Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from authorities having jurisdiction.
- D. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.11 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.
- D. Aboveground domestic water piping, NPS 2-1/2 to NPS 4, shall be one of the following:
 1. Hard copper tube, ASTM B 88, Type L; cast-copper, solder-joint fittings; and soldered joints.
 2. Hard copper tube, ASTM B 88, Type L; copper pressure-seal-joint fittings; and pressure-sealed joints.
 3. Hard copper tube, ASTM B 88, Type L; grooved-joint, copper-tube appurtenances; and grooved joints.
- E. Aboveground, combined domestic water-service and fire-service-main piping, NPS 6 to NPS 12, shall be one of the following:
 1. Plain-end, ductile-iron pipe; grooved-joint, ductile-iron-pipe appurtenances; and grooved joints.
 2. Galvanized-steel pipe and nipples; galvanized, gray-iron threaded fittings; and threaded joints.
 3. Galvanized-steel pipe; grooved-joint, galvanized-steel-pipe appurtenances; and grooved joints.
 4. Stainless-steel Schedule 40 pipe, grooved-joint fittings, and grooved joints.
- F. Aboveground, air conditioning condensate piping NPS 2" and smaller, shall be one of the following:
 1. Hard copper tube, ASTM B 88, Type L; wrought-copper, solder-joint fittings; and soldered joints.
 2. Hard copper tube, ASTM B 88, Type L; copper pressure-seal-joint fittings; and soldered joints.

3.12 VALVE SCHEDULE

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
 - 1. Shutoff Duty: Use ball or gate valves for piping NPS 2 and smaller. Use butterfly, ball, or gate valves with flanged ends for piping NPS 2-1/2 and larger.
 - 2. Throttling Duty: Use ball or globe valves for piping NPS 2 and smaller. Use butterfly or ball valves with flanged ends for piping NPS 2-1/2 and larger.
 - 3. Hot-Water Circulation Piping, Balancing Duty: Calibrated balancing valves.
 - 4. Drain Duty: Hose-end drain valves.
- B. Use check valves to maintain correct direction of domestic water flow to and from equipment.
- C. Iron grooved-end valves may be used with grooved-end piping.

END OF SECTION 221116

SECTION 221119 - DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Backflow preventers.
 - 2. Water pressure-reducing valves.
 - 3. Balancing valves.
 - 4. Temperature-actuated, water mixing valves.
 - 5. Strainers.
 - 6. Drain valves.
 - 7. Water-hammer arresters.
 - 8. Air vents.
 - 9. Trap-seal primer valves.
 - 10. Trap-seal primer systems.
 - 11. Specialty valves.
 - 12. Flexible connectors.
- B. Related Requirements:
 - 1. Section 220519 "Meters and Gages for Plumbing Piping" for thermometers, pressure gages, and flow meters in domestic water piping.
 - 2. Section 221116 "Domestic Water Piping" for water meters.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

- A. Potable-water piping and components shall comply with NSF 61 Annex G and NSF 14.

2.2 PERFORMANCE REQUIREMENTS

- A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig unless otherwise indicated.

2.3 BACKFLOW PREVENTERS

- A. Intermediate Atmospheric-Vent Backflow Preventers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cash Acme.
 - b. Conbraco Industries, Inc.
 - c. FEBCO.
 - d. Honeywell Water Controls.
 - e. Legend Valve & Fitting, Inc.
 - f. Watts; a Watts Water Technologies company.
 - g. Zurn Industries, LLC.
2. Standard: ASSE 1012.
3. Operation: Continuous-pressure applications.
4. Size: NPS 1/2.
5. Body: Bronze.
6. End Connections: Union, solder joint.
7. Finish: Chrome plated.

- B. Reduced-Pressure-Principle Backflow Preventers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Ames Co.
 - b. Ames Fire & Waterworks.
 - c. Conbraco Industries, Inc.
 - d. FEBCO.
 - e. Flomatic Corporation.
 - f. Watts; a Watts Water Technologies company.
 - g. Zurn Industries, LLC.
2. Standard: ASSE 1013.
3. Operation: Continuous-pressure applications.
4. Pressure Loss: 12 psig maximum, through middle third of flow range.

5. Body: Bronze for NPS 2 and smaller; cast iron with interior lining that complies with AWWA C550 or that is FDA approved for NPS 2-1/2 and larger.
6. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
7. Configuration: Designed for horizontal, straight-through flow.
8. Accessories:
 - a. Valves NPS 2 and Smaller: Ball type with threaded ends on inlet and outlet.
 - b. Valves NPS 2-1/2 and Larger: Outside-screw and yoke-gate type with flanged ends on inlet and outlet.
 - c. Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection.

C. Double-Check, Backflow-Prevention Assemblies:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Ames Co.
 - b. Ames Fire & Waterworks.
 - c. Conbraco Industries, Inc.
 - d. FEBCO.
 - e. Flomatic Corporation.
 - f. Watts; a Watts Water Technologies company.
 - g. Zurn Industries, LLC.
2. Standard: ASSE 1015.
3. Operation: Continuous-pressure applications unless otherwise indicated.
4. Pressure Loss: 5 psig maximum, through middle third of flow range.
5. Body: Bronze for NPS 2 and smaller; cast iron with interior lining that complies with AWWA C550 or that is FDA approved for NPS 2-1/2 and larger.
6. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
7. Configuration: Designed for horizontal, straight-through flow.
8. Accessories:
 - a. Valves NPS 2 and Smaller: Ball type with threaded ends on inlet and outlet.
 - b. Valves NPS 2-1/2 and Larger: Outside-screw and yoke-gate type with flanged ends on inlet and outlet.

D. Beverage-Dispensing-Equipment Backflow Preventers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Conbraco Industries, Inc.
 - b. Watts; a Watts Water Technologies company.
 - c. Zurn Industries, LLC.
2. Standard: ASSE 1022.
3. Operation: Continuous-pressure applications.
4. Size: NPS 1/4 or NPS 3/8.
5. Body: Stainless steel.
6. End Connections: Threaded.

E. Dual-Check-Valve Backflow Preventers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. A.Y. McDonald Mfg. Co.
 - b. Cash Acme.
 - c. Conbraco Industries, Inc.
 - d. FEBCO.
 - e. Flomatic Corporation.
 - f. Ford Meter Box Company, Inc. (The).
 - g. Honeywell Water Controls.
 - h. Legend Valve & Fitting, Inc.
 - i. Mueller Co.
 - j. Watts; a Watts Water Technologies company.
 - k. Zurn Industries, LLC.
2. Standard: ASSE 1024.
3. Operation: Continuous-pressure applications.
4. Size: NPS 3/4.
5. Body: Bronze with union inlet.

F. Carbonated-Beverage-Dispenser, Dual-Check-Valve Backflow Preventers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cash Acme.
 - b. Lancer Corporation.
 - c. Watts; a Watts Water Technologies company.
2. Standard: ASSE 1032.
3. Operation: Continuous-pressure applications.
4. Size: NPS 1/4 or NPS 3/8.
5. Body: Stainless steel.
6. End Connections: Threaded.

G. Reduced-Pressure-Detector, Fire-Protection, Backflow-Preventer Assemblies:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Ames Co.
 - b. Ames Fire & Waterworks.
 - c. Conbraco Industries, Inc.
 - d. FEBCO.
 - e. Watts; a Watts Water Technologies company.
 - f. Zurn Industries, LLC.
2. Standard: ASSE 1047 and is FM Global approved or UL listed.
3. Operation: Continuous-pressure applications.

4. Pressure Loss: 12 psig maximum, through middle third of flow range.
5. Body: Cast iron with interior lining that complies with AWWA C550 or that is FDA approved.
6. End Connections: Flanged.
7. Configuration: Designed for horizontal, straight-through flow.
8. Accessories:
 - a. Valves: Outside-screw and yoke-gate type with flanged ends on inlet and outlet.
 - b. Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection.
 - c. Bypass: With displacement-type water meter, shutoff valves, and reduced-pressure backflow preventer.

H. Double-Check, Detector-Assembly Backflow Preventers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Ames Co.
 - b. Ames Fire & Waterworks.
 - c. Conbraco Industries, Inc.
 - d. FEBCO.
 - e. Watts; a Watts Water Technologies company.
 - f. Zurn Industries, LLC.
2. Standard: ASSE 1048 and is FM Global approved or UL listed.
3. Operation: Continuous-pressure applications.
4. Pressure Loss: 5 psig maximum, through middle third of flow range.
5. Body: Cast iron with interior lining that complies with AWWA C550 or that is FDA approved.
6. End Connections: Flanged.
7. Configuration: Designed for horizontal, straight-through flow.
8. Accessories:
 - a. Valves: Outside-screw and yoke-gate type with flanged ends on inlet and outlet.
 - b. Bypass: With displacement-type water meter, shutoff valves, and reduced-pressure backflow preventer.

I. Hose-Connection Backflow Preventers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Conbraco Industries, Inc.
 - b. Watts; a Watts Water Technologies company.
 - c. Woodford Manufacturing Company.
2. Standard: ASSE 1052.
3. Operation: Up to 10-foot head of water back pressure.
4. Inlet Size: NPS 1/2 or NPS 3/4.
5. Outlet Size: Garden-hose thread complying with ASME B1.20.7.
6. Capacity: At least 3-gpm flow.

J. Backflow-Preventer Test Kits:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Conbraco Industries, Inc.
 - b. FEBCO.
 - c. Flomatic Corporation.
 - d. Watts; a Watts Water Technologies company.
 - e. Zurn Industries, LLC.
2. Description: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.

2.4 WATER PRESSURE-REDUCING VALVES

A. Water Regulators:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cash Acme.
 - b. Conbraco Industries, Inc.
 - c. Honeywell Water Controls.
 - d. Watts; a Watts Water Technologies company.
 - e. Zurn Industries, LLC.
2. Standard: ASSE 1003.
3. Pressure Rating: Initial working pressure of 150 psig.
4. Body: Bronze with chrome-plated finish for NPS 2 and smaller; cast iron with interior lining that complies with AWWA C550 or that is FDA approved for NPS 2-1/2 and NPS 3.
5. Valves for Booster Heater Water Supply: Include integral bypass.
6. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and NPS 3.

B. Water-Control Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. CLA-VAL Automatic Control Valves.
 - b. Flomatic Corporation.
 - c. Watts; a Watts Water Technologies company.
 - d. Zurn Industries, LLC.
2. Description: Pilot-operated, diaphragm-type, single-seated, main water-control valve.
3. Pressure Rating: Initial working pressure of 150 psig minimum with AWWA C550 or FDA-approved, interior epoxy coating. Include small pilot-control valve, restrictor device, specialty fittings, and sensor piping.
4. Main Valve Body: Cast- or ductile-iron body with AWWA C550 or FDA-approved, interior epoxy coating; or stainless-steel body.
 - a. Pattern: Angle-valve design.
 - b. Trim: Stainless steel.

5. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.

2.5 BALANCING VALVES

A. Copper-Alloy Calibrated Balancing Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Armstrong International, Inc.
 - b. Flo Fab inc.
 - c. ITT Corporation.
 - d. NIBCO INC.
 - e. Schneider Electric USA, Inc.
 - f. TACO Incorporated.
 - g. Watts; a Watts Water Technologies company.
2. Type: Ball valve with two readout ports and memory-setting indicator.
3. Body: Brass.
4. Size: Same as connected piping, but not larger than NPS 2.
5. Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

B. Cast-Iron Calibrated Balancing Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Armstrong International, Inc.
 - b. Flo Fab inc.
 - c. ITT Corporation.
 - d. NIBCO INC.
 - e. Schneider Electric USA, Inc.
 - f. Watts; a Watts Water Technologies company.
2. Type: Adjustable with Y-pattern globe valve, two readout ports, and memory-setting indicator.
3. Size: Same as connected piping, but not smaller than NPS 2-1/2.

C. Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

D. Memory-Stop Balancing Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Conbraco Industries, Inc.
 - b. Crane; Crane Energy Flow Solutions.
 - c. Hammond Valve.
 - d. Jenkins Valves; Crane Energy Flow Solutions.
 - e. Milwaukee Valve Company.
 - f. NIBCO INC.
 - g. Red-White Valve Corporation.

- h. Stockham; Crane Energy Flow Solutions.
 2. Standard: MSS SP-110 for two-piece, copper-alloy ball valves.
 3. Pressure Rating: 400-psig minimum CWP.
 4. Size: NPS 2 or smaller.
 5. Body: Copper alloy.
 6. Port: Standard or full port.
 7. Ball: Chrome-plated brass.
 8. Seats and Seals: Replaceable.
 9. End Connections: Solder joint or threaded.
 10. Handle: Vinyl-covered steel with memory-setting device.
- 2.6 TEMPERATURE-ACTUATED, WATER MIXING VALVES
- A. Water-Temperature Limiting Devices:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Armstrong International, Inc.
 - b. Cash Acme.
 - c. Conbraco Industries, Inc.
 - d. Honeywell Water Controls.
 - e. Legend Valve & Fitting, Inc.
 - f. Leonard Valve Company.
 - g. Powers.
 - h. Symmons Industries, Inc.
 - i. TACO Incorporated.
 - j. Watts; a Watts Water Technologies company.
 - k. Zurn Industries, LLC.
 2. Standard: ASSE 1017.
 3. Pressure Rating: 125 psig.
 4. Type: Thermostatically controlled, water mixing valve.
 5. Material: Bronze body with corrosion-resistant interior components.
 6. Connections: Threaded union inlets and outlet.
 7. Accessories: Check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.
 8. Valve Finish: Chrome plated.
- B. Primary, Thermostatic, Water Mixing Valves:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Armstrong International, Inc.
 - b. Lawler Manufacturing Company, Inc.
 - c. Leonard Valve Company.
 - d. Powers.
 - e. Symmons Industries, Inc.
 - f. Zurn Industries, LLC.

2. Standard: ASSE 1017.
3. Pressure Rating: 125 psig minimum unless otherwise indicated.
4. Type: Cabinet-type, thermostatically controlled, water mixing valve.
5. Material: Bronze body with corrosion-resistant interior components.
6. Connections: Threaded union inlets and outlet.
7. Accessories: Manual temperature control, check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.
8. Valve Finish: Chrome plated.
9. Piping Finish: Chrome plated.
10. Cabinet: Factory fabricated, stainless steel, for recessed mounting and with hinged, stainless-steel door.

C. Manifold, Thermostatic, Water Mixing-Valve Assemblies:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Leonard Valve Company.
 - b. Powers.
 - c. Symmons Industries, Inc.
2. Description: Factory-fabricated, cabinet-type, thermostatically controlled, water mixing-valve assembly in two-valve parallel arrangement.
3. Large-Flow Parallel: Thermostatic, water mixing valve and downstream-pressure regulator with pressure gages on inlet and outlet.
4. Intermediate-Flow Parallel: Thermostatic, water mixing valve and downstream-pressure regulator with pressure gages on inlet and outlet.
5. Small-Flow Parallel: Thermostatic, water mixing valve.
6. Thermostatic Mixing Valves: Comply with ASSE 1017. Include check stops on hot- and cold-water inlets and shutoff valve on outlet.
7. Water Regulator(s): Comply with ASSE 1003. Include pressure gage on inlet and outlet.
8. Pressure Rating: 125 psig minimum unless otherwise indicated.
9. Cabinet: Factory fabricated, stainless steel, for recessed mounting and with hinged, stainless-steel door.
10. Thermostatic Mixing Valve and Water Regulator Finish: Chrome plated.
11. Piping Finish: Chrome plated.

D. Photographic-Process, Thermostatic, Water Mixing-Valve Assemblies:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Lawler Manufacturing Company, Inc.
 - b. Leonard Valve Company.
 - c. Powers.
 - d. Symmons Industries, Inc.
2. Standard: ASSE 1017, thermostatically controlled, water mixing valve made for precise, process-water temperature control.
3. Pressure Rating: 125 psig minimum unless otherwise indicated.
4. Body: Bronze with corrosion-resistant interior components.
5. Connections: Threaded inlets and outlet.

6. Accessories: Manual temperature control, check stops on hot- and cold-water supplies, thermometer, shutoff valve, and adjustable, temperature-control handle.
7. Cabinet: Factory fabricated, stainless steel, for surface mounting; with controls and thermometer mounted on front.

E. Individual-Fixture, Water Tempering Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cash Acme.
 - b. Conbraco Industries, Inc.
 - c. Honeywell Water Controls.
 - d. Lawler Manufacturing Company, Inc.
 - e. Leonard Valve Company.
 - f. Powers.
 - g. Watts; a Watts Water Technologies company.
 - h. Zurn Industries, LLC.
2. Standard: ASSE 1016, thermostatically controlled, water tempering valve.
3. Pressure Rating: 125 psig minimum unless otherwise indicated.
4. Body: Bronze body with corrosion-resistant interior components.
5. Temperature Control: Adjustable.
6. Inlets and Outlet: Threaded.
7. Finish: Rough or chrome-plated bronze.

F. Primary Water Tempering Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Heat-Timer Corporation.
 - b. Holby Valve Inc.
 - c. Uponor.
2. Standard: ASSE 1017, thermostatically controlled, water tempering valve, listed as tempering valve.
3. Pressure Rating: 125 psig minimum unless otherwise indicated.
4. Body: Bronze.
5. Temperature Control: Manual.
6. Inlets and Outlet: Threaded.
7. Valve Finish: Rough bronze.

2.7 STRAINERS FOR DOMESTIC WATER PIPING

A. Y-Pattern Strainers:

1. Pressure Rating: 125 psig minimum unless otherwise indicated.
2. Body: Bronze for NPS 2 and smaller; cast iron with interior lining that complies with AWWA C550 or that is FDA approved, epoxy coated and for NPS 2-1/2 and larger.
3. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
4. Screen: Stainless steel with round perforations unless otherwise indicated.

5. Perforation Size:
 - a. Strainers NPS 2 and Smaller: 0.020 inch.
 - b. Strainers NPS 2-1/2 to NPS 4: 0.045 inch.
 - c. Strainers NPS 5 and Larger: 0.10 inch.
6. Drain: Pipe plug.

2.8 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves:

1. Standard: MSS SP-110 for standard-port, two-piece ball valves.
2. Pressure Rating: 400-psig minimum CWP.
3. Size: NPS 3/4.
4. Body: Copper alloy.
5. Ball: Chrome-plated brass.
6. Seats and Seals: Replaceable.
7. Handle: Vinyl-covered steel.
8. Inlet: Threaded or solder joint.
9. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

B. Gate-Valve-Type, Hose-End Drain Valves:

1. Standard: MSS SP-80 for gate valves.
2. Pressure Rating: Class 125.
3. Size: NPS 3/4.
4. Body: ASTM B 62 bronze.
5. Inlet: NPS 3/4 threaded or solder joint.
6. Outlet: Garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

C. Stop-and-Waste Drain Valves:

1. Standard: MSS SP-110 for ball valves or MSS SP-80 for gate valves.
2. Pressure Rating: 200-psig minimum CWP or Class 125.
3. Size: NPS 3/4.
4. Body: Copper alloy or ASTM B 62 bronze.
5. Drain: NPS 1/8 side outlet with cap.

2.9 WATER-HAMMER ARRESTERS

A. Water-Hammer Arresters:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. AMTROL, Inc.
 - b. Jay R. Smith Mfg. Co.
 - c. Josam Company.
 - d. MIFAB, Inc.
 - e. Precision Plumbing Products.

- f. Sioux Chief Manufacturing Company, Inc.
- g. Tyler Pipe; a subsidiary of McWane Inc.
- h. Watts; a Watts Water Technologies company.
- i. Zurn Industries, LLC.

2. Standard: ASSE 1010 or PDI-WH 201.
3. Type: Metal bellows.
4. Size: ASSE 1010, Sizes AA and A through F, or PDI-WH 201, Sizes A through F.

2.10 AIR VENTS

A. Bolted-Construction Automatic Air Vents:

1. Body: Bronze.
2. Pressure Rating and Temperature: 125-psig minimum pressure rating at 140 deg F.
3. Float: Replaceable, corrosion-resistant metal.
4. Mechanism and Seat: Stainless steel.
5. Size: NPS 1/2 minimum inlet.
6. Inlet and Vent Outlet End Connections: Threaded.

B. Welded-Construction Automatic Air Vents:

1. Body: Stainless steel.
2. Pressure Rating: 150-psig minimum pressure rating.
3. Float: Replaceable, corrosion-resistant metal.
4. Mechanism and Seat: Stainless steel.
5. Size: NPS 3/8 minimum inlet.
6. Inlet and Vent Outlet End Connections: Threaded.

2.11 TRAP-SEAL PRIMER DEVICE

A. Supply-Type, Trap-Seal Primer Device:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Jay R. Smith Mfg. Co.
 - b. MIFAB, Inc.
 - c. Precision Plumbing Products.
 - d. Sioux Chief Manufacturing Company, Inc.
 - e. Watts; a Watts Water Technologies company.
 - f. Zurn Industries, LLC.
2. Standard: ASSE 1018.
3. Pressure Rating: 125 psig minimum.
4. Body: Bronze.
5. Inlet and Outlet Connections: NPS 1/2 threaded, union, or solder joint.
6. Gravity Drain Outlet Connection: NPS 1/2 threaded or solder joint.
7. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

B. Drainage-Type, Trap-Seal Primer Device:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Jay R. Smith Mfg. Co.
2. Standard: ASSE 1044, lavatory P-trap with NPS 3/8 minimum, trap makeup connection.
3. Size: NPS 1-1/4 minimum.
4. Material: Chrome-plated, cast brass.

2.12 TRAP-SEAL PRIMER SYSTEMS

A. Trap-Seal Primer Systems:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Precision Plumbing Products.
 - b. Zurn Industries, LLC.
2. Standard: ASSE 1044.
3. Piping: NPS 3/4, ASTM B 88, Type L; copper, water tubing.
4. Cabinet: Recessed-mounted steel box with stainless-steel cover.
5. Electric Controls: 24-hour timer, solenoid valve, and manual switch for 120-V ac power.
 - a. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
6. Vacuum Breaker: ASSE 1001.
7. Number Outlets: Four.
8. Size Outlets: NPS 5/8.

2.13 SPECIALTY VALVES

A. Comply with requirements for general-duty metal valves in Section 220523.12 "Ball Valves for Plumbing Piping," Section 220523.13 "Butterfly Valves for Plumbing Piping," Section 220523.14 "Check Valves for Plumbing Piping," and Section 220523.15 "Gate Valves for Plumbing Piping."

B. CPVC Union Ball Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. American Valve, Inc.
 - b. Asahi/America.
 - c. Colonial Engineering, Inc.
 - d. Georg Fischer Inc.
 - e. Hayward Flow Control; a division of Hayward Industries, Inc.
 - f. IPEX USA LLC.

- g. NIBCO INC.
- h. Spears Manufacturing Company.
- i. Thermoplastic Valves, Inc.

2. Description:

- a. Standard: MSS SP-122.
- b. Pressure Rating and Temperature: 150 psig at 73 deg F.
- c. Body Material: CPVC.
- d. Body Design: Union type.
- e. End Connections for Valves NPS 2 and Smaller: Detachable, threaded.
- f. End Connections for Valves NPS 2-1/2 to NPS 4: Detachable, flanged.
- g. Ball: CPVC; full port.
- h. Seals: PTFE or EPDM-rubber O-rings.
- i. Handle: Tee shaped.

C. PVC Union Ball Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. A.Y. McDonald Mfg. Co.
- b. American Valve, Inc.
- c. Asahi/America.
- d. Colonial Engineering, Inc.
- e. Georg Fischer Inc.
- f. Hayward Flow Control; a division of Hayward Industries, Inc.
- g. IPEX USA LLC.
- h. Jomar Valve.
- i. KBI (King Bros. Industries).
- j. Legend Valve & Fitting, Inc.
- k. Spears Manufacturing Company.

2. Description:

- a. Standard: MSS SP-122.
- b. Pressure Rating and Temperature: 150 psig at 73 deg F.
- c. Body Material: PVC.
- d. Body Design: Union type.
- e. End Connections for Valves NPS 2 and Smaller: Detachable, threaded.
- f. End Connections for Valves NPS 2-1/2 to NPS 4: Detachable, flanged.
- g. Ball: PVC; full port.
- h. Seals: PTFE or EPDM-rubber O-rings.
- i. Handle: Tee shaped.

D. CPVC Non-union Ball Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. American Valve, Inc.
- b. Asahi/America.
- c. KBI (King Bros. Industries).
- d. Legend Valve & Fitting, Inc.

- e. NIBCO INC.
- f. Spears Manufacturing Company.
- g. Thermoplastic Valves, Inc.

2. Description:

- a. Standard: MSS SP-122.
- b. Pressure Rating and Temperature: 150 psig at 73 deg F.
- c. Body Material: CPVC.
- d. Body Design: Non-union type.
- e. End Connections: Socket or threaded.
- f. Ball: CPVC; full or reduced port.
- g. Seals: PTFE or EPDM-rubber O-rings.
- h. Handle: Tee shaped.

E. PVC Non-union Ball Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. A.Y. McDonald Mfg. Co.
- b. American Valve, Inc.
- c. Asahi/America.
- d. Colonial Engineering, Inc.
- e. Georg Fischer Inc.
- f. Hayward Flow Control; a division of Hayward Industries, Inc.
- g. IPEX USA LLC.
- h. Jomar Valve.
- i. KBI (King Bros. Industries).
- j. Legend Valve & Fitting, Inc.
- k. NIBCO INC.
- l. Spears Manufacturing Company.
- m. Thermoplastic Valves, Inc.

2. Description:

- a. Standard: MSS SP-122.
- b. Pressure Rating and Temperature: 150 psig at 73 deg F.
- c. Body Material: PVC.
- d. Body Design: Non-union type.
- e. End Connections: Socket or threaded.
- f. Ball: PVC; full or reduced port.
- g. Seals: PTFE or EPDM-rubber O-rings.
- h. Handle: Tee shaped.

F. CPVC Butterfly Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Georg Fischer Inc.
- b. Hayward Flow Control; a division of Hayward Industries, Inc.
- c. NIBCO INC.
- d. Spears Manufacturing Company.

- e. Thermoplastic Valves, Inc.
2. Description:
- a. Pressure Rating and Temperature: 150 psig at 73 deg F.
 - b. Body Material: CPVC.
 - c. Body Design: Lug or wafer type.
 - d. Seat: EPDM rubber.
 - e. Seals: PTFE or EPDM-rubber O-rings.
 - f. Disc: CPVC.
 - g. Stem: Stainless steel.
 - h. Handle: Lever.
- G. PVC Butterfly Valves:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
- a. American Valve, Inc.
 - b. Asahi/America.
 - c. Colonial Engineering, Inc.
 - d. Georg Fischer Inc.
 - e. Hayward Flow Control; a division of Hayward Industries, Inc.
 - f. IPEX USA LLC.
 - g. Legend Valve & Fitting, Inc.
 - h. NIBCO INC.
 - i. Spears Manufacturing Company.
 - j. Thermoplastic Valves, Inc.
2. Description:
- a. Pressure Rating and Temperature: 150 psig at 73 deg F.
 - b. Body Material: PVC.
 - c. Body Design: Lug or wafer type.
 - d. Seat: EPDM rubber.
 - e. Seals: PTFE or EPDM-rubber O-rings.
 - f. Disc: PVC.
 - g. Stem: Stainless steel.
 - h. Handle: Lever.
- H. CPVC Ball Check Valves:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
- a. American Valve, Inc.
 - b. Asahi/America.
 - c. Colonial Engineering, Inc.
 - d. Georg Fischer Inc.
 - e. Hayward Flow Control; a division of Hayward Industries, Inc.
 - f. IPEX USA LLC.
 - g. NIBCO INC.
 - h. Spears Manufacturing Company.
 - i. Thermoplastic Valves, Inc.

2. Description:
 - a. Pressure Rating and Temperature: 150 psig at 73 deg F.
 - b. Body Material: CPVC.
 - c. Body Design: Union-type ball check.
 - d. End Connections for Valves NPS 2 and Smaller: Detachable, threaded.
 - e. End Connections for Valves NPS 2-1/2 to NPS 4: Detachable, flanged.
 - f. Ball: CPVC.
 - g. Seals: EPDM- or FKM-rubber O-rings.

I. PVC Ball Check Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. American Valve, Inc.
 - b. Asahi/America.
 - c. Colonial Engineering, Inc.
 - d. Georg Fischer Inc.
 - e. Hayward Flow Control; a division of Hayward Industries, Inc.
 - f. IPEX USA LLC.
 - g. Legend Valve & Fitting, Inc.
 - h. NIBCO INC.
 - i. Spears Manufacturing Company.
 - j. Thermoplastic Valves, Inc.

2. Description:
 - a. Pressure Rating and Temperature: 150 psig at 73 deg F.
 - b. Body Material: PVC.
 - c. Body Design: Union-type ball check.
 - d. End Connections for Valves NPS 2 and Smaller: Detachable, threaded.
 - e. End Connections for Valves NPS 2-1/2 to NPS 4: Detachable, flanged.
 - f. Ball: PVC.
 - g. Seals: EPDM- or FKM-rubber O-rings.

J. CPVC Gate Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Georg Fischer Inc.
 - b. Spears Manufacturing Company.
2. Description:
 - a. Pressure Rating and Temperature: 150 psig at 73 deg F.
 - b. Body Material: CPVC.
 - c. Body Design: Nonrising stem.
 - d. End Connections for Valves NPS 2 and Smaller: threaded.
 - e. End Connections for Valves NPS 2-1/2 to NPS 4: Flanged.
 - f. Gate and Stem: Plastic.
 - g. Seals: EPDM rubber.
 - h. Handle: Wheel.

K. PVC Gate Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Asahi/America.
 - b. Georg Fischer Inc.
 - c. KBI (King Bros. Industries).
 - d. Spears Manufacturing Company.
2. Description:
 - a. Pressure Rating and Temperature: 150 psig at 73 deg F.
 - b. Body Material: PVC.
 - c. Body Design: Nonrising stem.
 - d. End Connections for Valves NPS 2 and Smaller: threaded.
 - e. End Connections for Valves NPS 2-1/2 to NPS 4: Flanged.
 - f. Gate and Stem: Plastic.
 - g. Seals: EPDM rubber.
 - h. Handle: Wheel.

2.14 FLEXIBLE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 1. Flex Pression Ltd.
 2. Flex-Hose Co., Inc.
 3. Flexicraft Industries.
 4. Flex-Weld, Inc.
 5. Hyspan Precision Products, Inc.
 6. Mercer Gasket & Shim, Inc.
 7. Metraflex Company (The).
 8. Proco Products, Inc.
 9. Tozen Corporation.
 10. Unaflex.
 11. Universal Metal Hose.
- B. Bronze-Hose Flexible Connectors: Corrugated-bronze tubing with bronze wire-braid covering and ends brazed to inner tubing.
 1. Working-Pressure Rating: Minimum 250 psig.
 2. End Connections NPS 2 and Smaller: Threaded copper pipe or plain-end copper tube.
 3. End Connections NPS 2-1/2 and Larger: Flanged copper alloy.
- C. Stainless-Steel-Hose Flexible Connectors: Corrugated-stainless-steel tubing with stainless-steel wire-braid covering and ends welded to inner tubing.
 1. Working-Pressure Rating: Minimum 250 psig.
 2. End Connections NPS 2 and Smaller: Threaded steel-pipe nipple.
 3. End Connections NPS 2-1/2 and Larger: Flanged steel nipple.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.
 - 1. Locate backflow preventers in same room as connected equipment or system.
 - 2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe-to-floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are unacceptable for this application.
 - 3. Do not install bypass piping around backflow preventers.
- B. Install water regulators with inlet and outlet shutoff valves. Install pressure gages on inlet and outlet.
- C. Install water-control valves with inlet and outlet shutoff valves. Install pressure gages on inlet and outlet.
- D. Install balancing valves in locations where they can easily be adjusted.
- E. Install temperature-actuated, water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.
 - 1. Install cabinet-type units recessed in or surface mounted on wall as specified.
- F. Install Y-pattern strainers for water on supply side of each pump.
- G. Install water-hammer arresters in water piping according to PDI-WH 201.
- H. Install air vents at high points of water piping. Install drain piping and discharge onto floor drain.
- I. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.
- J. Install drainage-type, trap-seal primer valves as lavatory trap with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting.
- K. Install trap-seal primer systems with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust system for proper flow.

3.2 CONNECTIONS

- A. Comply with requirements for ground equipment in Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Fire-retardant-treated-wood blocking is specified in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for electrical connections.

3.3 LABELING AND IDENTIFYING

- A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
1. Pressure vacuum breakers.
 2. Intermediate atmospheric-vent backflow preventers.
 3. Reduced-pressure-principle backflow preventers.
 4. Double-check, backflow-prevention assemblies.
 5. Carbonated-beverage-machine backflow preventers.
 6. Dual-check-valve backflow preventers.
 7. Reduced-pressure-detector, fire-protection, backflow-preventer assemblies.
 8. Double-check, detector-assembly backflow preventers.
 9. Water pressure-reducing valves.
 10. Calibrated balancing valves.
 11. Primary, thermostatic, water mixing valves.
 12. Manifold, thermostatic, water mixing-valve assemblies.
 13. Photographic-process, thermostatic, water mixing-valve assemblies.
 14. Primary water tempering valves.
 15. Outlet boxes.
 16. Hose stations.
 17. Supply-type, trap-seal primer valves.
 18. Trap-seal primer systems.
- B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

- A. Domestic water piping specialties will be considered defective if they do not pass tests and inspections.
- B. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Set field-adjustable pressure set points of water pressure-reducing valves.
- B. Set field-adjustable flow set points of balancing valves.
- C. Set field-adjustable temperature set points of temperature-actuated, water mixing valves.

END OF SECTION 221119

SECTION 221316 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe, tube, and fittings.
 - 2. Specialty pipe fittings.

1.3 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:
 - 1. Soil, Waste, and Vent Piping: 10-foot head of water.
 - 2. Waste, Force-Main Piping: 50 psig.
- B. Seismic Performance: Soil, waste, and vent piping and support and installation shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.5 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Certificates: For waste and vent piping, accessories, and components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Detailed description of piping anchorage devices on which the certification is based and their installation requirements.
- B. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

- B. Comply with NSF/ANSI 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping and "NSF-sewer" for plastic sewer piping.

1.7 PROJECT CONDITIONS

- A. Interruption of Existing Sanitary Waste Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
 - 1. Notify Construction Manager no fewer than two days in advance of proposed interruption of sanitary waste service.
 - 2. Do not proceed with interruption of sanitary waste service without Construction Manager's written permission.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 74, Service and Extra Heavy class(es).
- B. Gaskets: ASTM C 564, rubber.
- C. Calking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

2.3 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. Sovent Stack Fittings: ASME B 16.45 or ASSE 1043, hubless, cast-iron aerator and deaerator drainage fittings.
- C. CISPI, Hubless-Piping Couplings:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. ANACO-Husky.
 - b. Charlotte Pipe and Foundry Company.
 - c. Dallas Specialty & Mfg. Co.
 - d. Fernco Inc.
 - e. Matco-Norca.
 - f. MIFAB, Inc.
 - g. Mission Rubber Company, LLC; a division of MCP Industries.
 - h. NewAge Casting.

- i. Stant.
 - j. Tyler Pipe; a subsidiary of McWane Inc.
 2. Standards: ASTM C 1277 and CISPI 310.
 3. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.
 - D. Heavy-Duty, Hubless-Piping Couplings:
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. ANACO-Husky.
 - b. Charlotte Pipe and Foundry Company.
 - c. Clamp-All Corp.
 - d. Dallas Specialty & Mfg. Co.
 - e. MIFAB, Inc.
 - f. Mission Rubber Company, LLC; a division of MCP Industries.
 - g. NewAge Casting.
 - h. Stant.
 - i. Tyler Pipe; a subsidiary of McWane Inc.
 2. Standards: ASTM C 1277 and ASTM C 1540.
 3. Description: Stainless-steel shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.
 - E. Cast-Iron, Hubless-Piping Couplings:
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Charlotte Pipe and Foundry Company.
 - b. MG Piping Products Company.
 2. Standard: ASTM C 1277.
 3. Description: Two-piece ASTM A 48/A 48M, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve with integral, center pipe stop.
- 2.4 GALVANIZED-STEEL PIPE AND FITTINGS
- A. Galvanized-Steel Pipe: ASTM A 53/A 53M, Type E, Standard Weight class. Include square-cut-grooved or threaded ends matching joining method.
 - B. Galvanized-Cast-Iron Drainage Fittings: ASME B16.12, threaded.
 - C. Steel Pipe Pressure Fittings:
 1. Galvanized-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106/A 106M, Schedule 40, seamless steel pipe. Include ends matching joining method.

2. Malleable-Iron Unions: ASME B16.39; Class 150; hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface; and female threaded ends.
3. Galvanized-Gray-Iron, Threaded Fittings: ASME B16.4, Class 125, standard pattern.

D. Cast-Iron Flanges: ASME B16.1, Class 125.

1. Flange Gasket Materials: ASME B16.21, full-face, flat, nonmetallic, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
2. Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

E. Grooved-Joint, Galvanized-Steel-Pipe Appurtenances:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Anvil International.
 - b. Grinnell Mechanical Products.
 - c. Shurjoint Piping Products.
 - d. Smith-Cooper International.
 - e. Victaulic Company.
2. Galvanized, Grooved-End Fittings for Galvanized-Steel Piping: ASTM A 536 ductile-iron castings, ASTM A 47/A 47M malleable-iron castings, ASTM A 234/A 234M forged steel fittings, or ASTM A 106/A 106M steel pipes with dimensions matching ASTM A 53/A 53M steel pipe, and complying with AWWA C606 for grooved ends.
3. Grooved Mechanical Couplings for Galvanized-Steel Piping: ASTM F 1476, Type I. Include ferrous housing sections with continuous curved keys; EPDM-rubber gasket suitable for hot and cold water; and bolts and nuts.

2.5 STAINLESS-STEEL PIPE AND FITTINGS

- A. Pipe and Fittings: ASME A112.3.1, drainage pattern with socket and spigot ends.
- B. Internal Sealing Rings: Elastomeric gaskets shaped to fit socket groove.

2.6 DUCTILE-IRON PIPE AND FITTINGS

A. Ductile-Iron, Mechanical-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
2. Ductile-Iron Fittings: AWWA C110/A21.10, mechanical-joint, ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.
3. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

B. Ductile-Iron, Push-on-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51, with push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated.
2. Ductile-Iron Fittings: AWWA C110/A21.10, push-on-joint ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.

3. Gaskets: AWWA C111/A21.11, rubber.

C. Ductile-Iron, Grooved-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51 with round-cut-grooved ends according to AWWA C606.
2. Ductile-Iron-Pipe Appurtenances:
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Anvil International.
 - 2) Shurjoint Piping Products.
 - 3) Smith-Cooper International.
 - 4) Star Pipe Products.
 - 5) Victaulic Company.
 - b. Grooved-End, Ductile-Iron Fittings: ASTM A 536 ductile-iron castings with dimensions matching AWWA C110/A 21.10 ductile-iron pipe or AWWA C153/A 21.53 ductile-iron fittings and complying with AWWA C606 for grooved ends.
 - c. Grooved Mechanical Couplings for Ductile-Iron Pipe: ASTM F 1476, Type I. Include ferrous housing sections with continuous curved keys; EPDM-rubber center-leg gasket suitable for hot and cold water; and bolts and nuts.

2.7 COPPER TUBE AND FITTINGS

- A. Copper DWV Tube: ASTM B 306, drainage tube, drawn temper.
- B. Copper Drainage Fittings: ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings.
- C. Hard Copper Tube: ASTM B 88, Type L and Type M, water tube, drawn temper.
- D. Soft Copper Tube: ASTM B 88, Type L, water tube, annealed temper.
- E. Copper Pressure Fittings:
 1. Copper Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.
 2. Copper Unions: MSS SP-123, copper-alloy, hexagonal-stock body with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.
- F. Copper Flanges: ASME B16.24, Class 150, cast copper with solder-joint end.
 1. Flange Gasket Materials: ASME B16.21, full-face, flat, nonmetallic, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 2. Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- G. Solder: ASTM B 32, lead free with ASTM B 813, water-flushable flux.

2.8 ABS PIPE AND FITTINGS

- A. Solid-Wall ABS Pipe: ASTM D 2661, Schedule 40.

- B. Cellular-Core ABS Pipe: ASTM F 628, Schedule 40.
- C. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311, drain, waste, and vent patterns.
- D. Solvent Cement: ASTM D 2235.
 - 1. ABS solvent cement shall have a VOC content of 325 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Solvent cement shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.9 PVC PIPE AND FITTINGS

- A. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.
- B. Cellular-Core PVC Pipe: ASTM F 891, Schedule 40.
- C. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.
- D. Adhesive Primer: ASTM F 656.
 - 1. Adhesive primer shall have a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. Solvent Cement: ASTM D 2564.
 - 1. PVC solvent cement shall have a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Solvent cement shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.10 SPECIALTY PIPE FITTINGS

- A. Transition Couplings:
 - 1. General Requirements: Fitting or device for joining piping with small differences in OD's or of different materials. Include end connections same size as and compatible with pipes to be joined.
 - 2. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
 - 3. Unshielded, Nonpressure Transition Couplings:
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Dallas Specialty & Mfg. Co.
 - 2) Fernco Inc.
 - 3) Froet Industries LLC.

- 4) Mission Rubber Company, LLC; a division of MCP Industries.
- 5) Plastic Oddities.
- b. Standard: ASTM C 1173.
- c. Description: Elastomeric, sleeve-type, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
- d. Sleeve Materials:
 - 1) For Cast-Iron Soil Pipes: ASTM C 564, rubber.
 - 2) For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
 - 3) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
4. Shielded, Nonpressure Transition Couplings:
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Cascade Waterworks Mfg. Co.
 - 2) Mission Rubber Company, LLC; a division of MCP Industries.
 - b. Standard: ASTM C 1460.
 - c. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
5. Pressure Transition Couplings:
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Cascade Waterworks Mfg. Co.
 - 2) Dresser, Inc.
 - 3) EBAA Iron, Inc.
 - 4) Ford Meter Box Company, Inc. (The).
 - 5) Jay R. Smith Mfg. Co.
 - 6) JCM Industries, Inc.
 - 7) Romac Industries, Inc.
 - 8) Viking Johnson.
 - b. Standard: AWWA C219.
 - c. Description: Metal, sleeve-type same size as, with pressure rating at least equal to, and ends compatible with, pipes to be joined.
 - d. Center-Sleeve Material: Carbon steel.
 - e. Gasket Material: Natural or synthetic rubber.
 - f. Metal Component Finish: Corrosion-resistant coating or material.
- B. Dielectric Fittings:
 1. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
 2. Dielectric Unions:

- a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) A.Y. McDonald Mfg. Co.
 - 2) Capitol Manufacturing Company.
 - 3) Central Plastics Company.
 - 4) HART Industrial Unions, LLC.
 - 5) Jomar Valve.
 - 6) Matco-Norca.
 - 7) Watts; a Watts Water Technologies company.
 - 8) Wilkins.
 - 9) Zurn Industries, LLC.
 - b. Description:
 - 1) Standard: ASSE 1079.
 - 2) Pressure Rating: 125 psig minimum at 180 deg F.
 - 3) End Connections: Solder-joint copper alloy and threaded ferrous.
3. Dielectric Flanges:
- a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Capitol Manufacturing Company.
 - 2) Central Plastics Company.
 - 3) Matco-Norca.
 - 4) Watts; a Watts Water Technologies company.
 - 5) Wilkins.
 - 6) Zurn Industries, LLC.
 - b. Description:
 - 1) Standard: ASSE 1079.
 - 2) Factory-fabricated, bolted, companion-flange assembly.
 - 3) Pressure Rating: 125 psig minimum at 180 deg F.
 - 4) End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
4. Dielectric-Flange Insulating Kits:
- a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Advance Products & Systems, Inc.
 - 2) Calpico, Inc.
 - 3) Central Plastics Company.
 - 4) Pipeline Seal and Insulator, Inc.
 - b. Description:
 - 1) Nonconducting materials for field assembly of companion flanges.
 - 2) Pressure Rating: 150 psig.
 - 3) Gasket: Neoprene or phenolic.

- 4) Bolt Sleeves: Phenolic or polyethylene.
 - 5) Washers: Phenolic with steel backing washers.
5. Dielectric Nipples:
- a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Elster Perfection Corporation.
 - 2) Grinnell Mechanical Products.
 - 3) Matco-Norca.
 - 4) Precision Plumbing Products.
 - 5) Victaulic Company.
 - b. Description:
 - 1) Standard: IAPMO PS 66
 - 2) Electroplated steel nipple.
 - 3) Pressure Rating: 300 psig at 225 deg F.
 - 4) End Connections: Male threaded or grooved.
 - 5) Lining: Inert and noncorrosive, propylene.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Install seismic restraints on piping. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."

- K. Install soil and waste drainage and vent piping at the following minimum slopes unless otherwise indicated:
 - 1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
 - 2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
 - 3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

- L. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 - 1. Install encasement on underground piping according to ASTM A 674 or AWWA C105/A 21.5.

- M. Install steel piping according to applicable plumbing code.

- N. Install stainless-steel piping according to ASME A112.3.1 and applicable plumbing code.

- O. Install aboveground copper tubing according to CDA's "Copper Tube Handbook."

- P. Install aboveground ABS piping according to ASTM D 2661.

- Q. Install aboveground PVC piping according to ASTM D 2665.

- R. Install engineered soil and waste drainage and vent piping systems as follows:
 - 1. Combination Waste and Vent: Comply with standards of authorities having jurisdiction.
 - 2. Solvent Drainage System: Comply with ASSE 1043 and solvent fitting manufacturer's written installation instructions.
 - 3. Reduced-Size Venting: Comply with standards of authorities having jurisdiction.

- S. Plumbing Specialties:
 - 1. Install backwater valves in sanitary waster gravity-flow piping. Comply with requirements for backwater valves specified in Section 221319 "Sanitary Waste Piping Specialties."
 - 2. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers in sanitary drainage gravity-flow piping. Install cleanout fitting with closure plug inside the building in sanitary drainage force-main piping. Comply with requirements for cleanouts specified in Section 221319 "Sanitary Waste Piping Specialties."
 - 3. Install drains in sanitary drainage gravity-flow piping. Comply with requirements for drains specified in Section 221319 "Sanitary Waste Piping Specialties."

- T. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

- U. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."

- V. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."

- W. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.2 JOINT CONSTRUCTION

- A. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
- B. Join hub-and-spigot, cast-iron soil piping with calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead-and-oakum calked joints.
- C. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.
- D. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- E. Join stainless-steel pipe and fittings with gaskets according to ASME A112.3.1.
- F. Join copper tube and fittings with soldered joints according to ASTM B 828. Use ASTM B 813, water-flushable, lead-free flux and ASTM B 32, lead-free-alloy solder.
- G. Grooved Joints: Cut groove ends of pipe according to AWWA C606. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections, over gasket, with keys seated in piping grooves. Install and tighten housing bolts.
- H. Flanged Joints: Align bolt holes. Select appropriate gasket material, size, type, and thickness. Install gasket concentrically positioned. Use suitable lubricants on bolt threads. Torque bolts in cross pattern.
- I. Plastic, Nonpressure-Piping, Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
 - 3. PVC Piping: Join according to ASTM D 2855 and ASTM D 2665 Appendixes.

3.3 SPECIALTY PIPE FITTING INSTALLATION

- A. Transition Couplings:
 - 1. Install transition couplings at joints of piping with small differences in OD's.
 - 2. In Drainage Piping: Shielded, nonpressure transition couplings.
 - 3. In Aboveground Force Main Piping: Fitting-type transition couplings.
 - 4. In Underground Force Main Piping:
 - a. NPS 1-1/2 and Smaller: Fitting-type transition couplings.
 - b. NPS 2 and Larger: Pressure transition couplings.
- B. Dielectric Fittings:

1. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
2. Dielectric Fittings for NPS 2 and Smaller: Use dielectric unions.
3. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric flanges.
4. Dielectric Fittings for NPS 5 and Larger: Use dielectric flange kits.

3.4 VALVE INSTALLATION

- A. General valve installation requirements are specified in Section 220523.12 "Ball Valves for Plumbing Piping," Section 220523.13 "Butterfly Valves for Plumbing Piping," Section 220523.14 "Check Valves for Plumbing Piping," and Section 220523.15 "Gate Valves for Plumbing Piping."
- B. Shutoff Valves:
 1. Install shutoff valve on each sewage pump discharge.
 2. Install gate or full-port ball valve for piping NPS 2 and smaller.
 3. Install gate valve for piping NPS 2-1/2 and larger.
- C. Check Valves: Install swing check valve, between pump and shutoff valve, on each sewage pump discharge.
- D. Backwater Valves: Install backwater valves in piping subject to backflow.
 1. Horizontal Piping: Horizontal backwater valves. Use normally closed type unless otherwise indicated.
 2. Floor Drains: Drain outlet backwater valves unless drain has integral backwater valve.
 3. Install backwater valves in accessible locations.
 4. Comply with requirements for backwater valve specified in Section 221319 "Sanitary Waste Piping Specialties."

3.5 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- B. Comply with requirements for pipe hanger and support devices and installation specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
 1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
 2. Install stainless-steel pipe hangers for horizontal piping in corrosive environments.
 3. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
 4. Install stainless-steel pipe support clamps for vertical piping in corrosive environments.
 5. Vertical Piping: MSS Type 8 or Type 42, clamps.
 6. Install individual, straight, horizontal piping runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
 7. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 8. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Support horizontal piping and tubing within 12 inches of each fitting, valve, and coupling.

- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.
- F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
 - 2. NPS 3: 60 inches with 1/2-inch rod.
 - 3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
 - 4. NPS 6 and NPS 8: 60 inches with 3/4-inch rod.
 - 5. NPS 10 and NPS 12: 60 inches with 7/8-inch rod.
 - 6. Spacing for 10-foot lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.
- G. Install supports for vertical cast-iron soil piping every 15 feet.
- H. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/4: 84 inches with 3/8-inch rod.
 - 2. NPS 1-1/2: 108 inches with 3/8-inch rod.
 - 3. NPS 2: 10 feet with 3/8-inch rod.
 - 4. NPS 2-1/2: 11 feet with 1/2-inch rod.
 - 5. NPS 3: 12 feet with 1/2-inch rod.
 - 6. NPS 4 and NPS 5: 12 feet with 5/8-inch rod.
 - 7. NPS 6 and NPS 8: 12 feet with 3/4-inch rod.
 - 8. NPS 10 and NPS 12: 12 feet with 7/8-inch rod.
- I. Install supports for vertical steel piping every 15 feet.
- J. Install hangers for stainless-steel piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 2: 84 inches with 3/8-inch rod.
 - 2. NPS 3: 96 inches with 1/2-inch rod.
 - 3. NPS 4: 108 inches with 1/2-inch rod.
 - 4. NPS 6: 10 feet with 5/8-inch rod.
- K. Install supports for vertical stainless-steel piping every 10 feet.
- L. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/4: 72 inches with 3/8-inch rod.
 - 2. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
 - 3. NPS 2-1/2: 108 inches with 1/2-inch rod.
 - 4. NPS 3 and NPS 5: 10 feet with 1/2-inch rod.
 - 5. NPS 6: 10 feet with 5/8-inch rod.
 - 6. NPS 8: 10 feet with 3/4-inch rod.
- M. Install supports for vertical copper tubing every 10 feet.
- N. Install hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/2 and NPS 2: 48 inches with 3/8-inch rod.
 - 2. NPS 3: 48 inches with 1/2-inch rod.

3. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.
4. NPS 6 and NPS 8: 48 inches with 3/4-inch rod.
5. NPS 10 and NPS 12: 48 inches with 7/8-inch rod.

- O. Install supports for vertical PVC piping every 48 inches.
- P. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.6 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect drainage and vent piping to the following:
1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
 4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.
 5. Install horizontal backwater valves with cleanout cover flush with floor.
 6. Comply with requirements for backwater valves cleanouts and drains specified in Section 221319 "Sanitary Waste Piping Specialties."
 7. Equipment: Connect drainage piping as indicated. Provide shutoff valve if indicated and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.
- D. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.
- E. Make connections according to the following unless otherwise indicated:
1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.7 IDENTIFICATION

- A. Identify exposed sanitary waste and vent piping. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.8 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.

2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
 - C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
 - D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
 1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping except outside leaders on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
 4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
 5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 6. Prepare reports for tests and required corrective action.

3.9 CLEANING AND PROTECTION

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.
- D. Exposed PVC Piping: Protect plumbing vents exposed to sunlight with two coats of water-based latex paint.

3.10 PIPING SCHEDULE

- A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.
- B. Aboveground, soil and waste piping NPS 4 and smaller shall be any of the following:
 1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings and solvent stack fittings; hubless-piping couplings; and coupled joints.
 3. Galvanized-steel pipe, drainage fittings, and threaded joints.
 4. Stainless-steel pipe and fittings, sealing rings, and gasketed joints.

5. Copper DWV tube, copper drainage fittings, and soldered joints.
 6. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 7. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- C. Aboveground, soil and waste piping NPS 5 and larger shall be any of the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings and solvent stack fittings; hubless-piping couplings; and coupled joints.
 3. Galvanized-steel pipe, drainage fittings, and threaded joints.
 4. Stainless-steel pipe and fittings, sealing rings, and gasketed joints.
 5. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 6. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- D. Aboveground, vent piping NPS 4 and smaller shall be any of the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 3. Galvanized-steel pipe, drainage fittings, and threaded joints.
 4. Stainless-steel pipe and fittings gaskets, and gasketed joints.
 5. Copper DWV tube, copper drainage fittings, and soldered joints.
 - a. Option for Vent Piping, NPS 2-1/2 and NPS 3-1/2: Hard copper tube, Type M; copper pressure fittings; and soldered joints.
 6. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 7. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- E. Aboveground, vent piping NPS 5 and larger shall be any of the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 3. Galvanized-steel pipe, drainage fittings, and threaded joints.
 4. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 5. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.

END OF SECTION 221316

SECTION 221319 - SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Backwater valves.
 - 2. Cleanouts.
 - 3. Floor drains.
 - 4. Trench drains.
 - 5. Air-admittance valves.
 - 6. Roof flashing assemblies.
 - 7. Through-penetration firestop assemblies.
 - 8. Miscellaneous sanitary drainage piping specialties.
 - 9. Flashing materials.

1.3 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. FOG: Fats, oils, and greases.
- C. FRP: Fiberglass-reinforced plastic.
- D. HDPE: High-density polyethylene plastic.
- E. PE: Polyethylene plastic.
- F. PP: Polypropylene plastic.
- G. PVC: Polyvinyl chloride plastic.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For drainage piping specialties to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic sanitary piping specialty components.

1.6 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Section 033053 "Miscellaneous Cast-in-Place Concrete."
- B. Coordinate size and location of roof penetrations.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Cultures: Provide 1-gal. bottles of bacteria culture recommended by manufacturer of FOG disposal systems equal to 200 percent of amount installed, but no fewer than 2 1-gal. bottles.

PART 2 - PRODUCTS

2.1 BACKWATER VALVES

- A. Horizontal, Cast-Iron Backwater Valves:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Jay R. Smith Mfg. Co.
 - b. Josam Company.
 - c. MIFAB, Inc.
 - d. Tyler Pipe; a subsidiary of McWane Inc.
 - e. Watts; a Watts Water Technologies company.
 - f. Zurn Industries, LLC.
 - 2. Standard: ASME A112.14.1.
 - 3. Size: Same as connected piping.
 - 4. Body: Cast iron.
 - 5. Cover: Cast iron with bolted access check valve.
 - 6. End Connections: Hub and spigot or hubless.
 - 7. Type Check Valve: Removable, bronze, swing check, factory assembled or field modified to hang closed.
 - 8. Extension: ASTM A 74, Service class; full-size, cast-iron, soil-pipe extension to field-installed cleanout at floor; replaces backwater valve cover.
- B. Drain-Outlet Backwater Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Jay R. Smith Mfg. Co.
 - b. Josam Company.
 - c. Watts; a Watts Water Technologies company.
 - d. Zurn Industries, LLC.
2. Size: Same as floor drain outlet.
3. Body: Cast iron or bronze made for vertical installation in bottom outlet of floor drain.
4. Check Valve: Removable ball float.
5. Inlet: Threaded.
6. Outlet: Threaded or spigot.

C. Horizontal, Plastic Backwater Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Canplas LLC.
 - b. IPS Corporation.
 - c. NDS Inc.
 - d. Oatey.
 - e. Plastic Oddities.
 - f. Sioux Chief Manufacturing Company, Inc.
 - g. Zurn Industries, LLC.
2. Size: Same as connected piping.
3. Body: PVC.
4. Cover: Same material as body with threaded access to check valve.
5. Check Valve: Removable swing check.
6. End Connections: Socket type.

2.2 CLEANOUTS

A. Exposed Metal Cleanouts:

1. ASME A112.36.2M, Cast-Iron Cleanouts:
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Jay R. Smith Mfg. Co.
 - 2) Josam Company.
 - 3) MIFAB, Inc.
 - 4) Tyler Pipe; a subsidiary of McWane Inc.
 - 5) Watts; a Watts Water Technologies company.
 - 6) Zurn Industries, LLC.
2. ASME A112.3.1, Stainless-Steel Cleanouts:

- a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Josam Company.
 3. Standard: ASME A112.36.2M for cast iron for cleanout test tee.
 4. Size: Same as connected drainage piping
 5. Body Material: Hub-and-spigot, cast-iron soil pipe T-branch as required to match connected piping.
 6. Closure: Countersunk, cast-iron plug.
 7. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
 8. Closure: Stainless-steel plug with seal.
- B. Metal Floor Cleanouts:
1. ASME A112.36.2M, Cast-Iron Cleanouts:
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Jay R. Smith Mfg. Co.
 - 2) Josam Company.
 - 3) Oatey.
 - 4) Sioux Chief Manufacturing Company, Inc.
 - 5) Tyler Pipe; a subsidiary of McWane Inc.
 - 6) Watts; a Watts Water Technologies company.
 - 7) Zurn Industries, LLC.
 2. ASME A112.36.2M, Stainless-Steel Cleanouts:
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Jay R. Smith Mfg. Co.
 - 2) Josam Company.
 - 3) Kusel Equipment Co.
 - 4) Zurn Industries, LLC.
 3. ASME A112.3.1, Stainless-Steel Cleanouts:
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Josam Company.
 - 2) Kusel Equipment Co.
 - 3) Zurn Industries, LLC.
 4. Standard: ASME A112.36.2M for adjustable housing cleanout.
 5. Size: Same as connected branch.
 6. Type: Adjustable housing.
 7. Body or Ferrule: Cast iron.
 8. Clamping Device: Required.
 9. Outlet Connection: Spigot.
 10. Closure: Cast-iron plug.

11. Adjustable Housing Material: Cast iron with threads.
12. Frame and Cover Material and Finish: Painted cast iron.
13. Frame and Cover Shape: Round.
14. Top Loading Classification: Heavy Duty.
15. Riser: ASTM A 74, Extra-Heavy class, cast-iron drainage pipe fitting and riser to cleanout.
16. Standard: ASME A112.3.1.
17. Size: Same as connected branch.
18. Housing: Stainless steel.
19. Closure: Stainless steel with seal.
20. Riser: Stainless-steel drainage pipe fitting to cleanout.

C. Cast-Iron Wall Cleanouts:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Jay R. Smith Mfg. Co.
 - b. Josam Company.
 - c. MIFAB, Inc.
 - d. Tyler Pipe; a subsidiary of McWane Inc.
 - e. Watts; a Watts Water Technologies company.
 - f. Zurn Industries, LLC.
2. Standard: ASME A112.36.2M. Include wall access.
3. Size: Same as connected drainage piping.
4. Body: Hub-and-spigot, cast-iron soil pipe T-branch as required to match connected piping.
5. Closure: Countersunk, cast-iron plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
7. Wall Access: Round, deep, chrome-plated bronze cover plate with screw.
8. Wall Access: Round, nickel-bronze, copper-alloy, or stainless-steel wall-installation frame and cover.

2.3 FLOOR DRAINS

A. Cast-Iron Floor Drains:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Commercial Enameling Company.
 - b. Jay R. Smith Mfg. Co.
 - c. Josam Company.
 - d. MIFAB, Inc.
 - e. Prier Products, Inc.
 - f. Tyler Pipe; a subsidiary of McWane Inc.
 - g. Watts; a Watts Water Technologies company.
 - h. Zurn Industries, LLC.
2. Standard: ASME A112.6.3 with backwater valve.
3. Pattern: Floor drain.
4. Body Material: Gray iron.
5. Seepage Flange: Not required.

6. Anchor Flange: Required.
7. Clamping Device: Required.
8. Outlet: Bottom.
9. Backwater Valve: Drain-outlet type.
10. Coating on Interior and Exposed Exterior Surfaces: Acid-resistant enamel.
11. Sediment Bucket: Not required.
12. Top or Strainer Material: Bronze.
13. Top of Body and Strainer Finish: Rough bronze.
14. Top Shape: Round.
15. Top Loading Classification: Heavy Duty.
16. Funnel: Not required.
17. Inlet Fitting: Not required.
18. Trap Material: Bronze.
19. Trap Pattern: Deep-seal P-trap.
20. Trap Features: Cleanout and trap-seal primer valve drain connection.

2.4 TRENCH DRAINS

A. Trench Drains:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Jay R. Smith Mfg. Co.
 - b. Josam Company.
 - c. MIFAB, Inc.
 - d. Tyler Pipe; a subsidiary of McWane Inc.
 - e. Watts; a Watts Water Technologies company.
 - f. Zurn Industries, LLC.
2. Standard: ASME A112.6.3 for trench drains.
3. Material: Ductile or gray iron.
4. Flange: Anchor.
5. Clamping Device: Not required.
6. Outlet: Bottom.
7. Grate Material: Ductile iron.
8. Grate Finish: Painted.
9. Top Loading Classification: Heavy Duty.
10. Trap Material: Cast iron.
11. Trap Pattern: Standard P-trap.

2.5 AIR-ADMITTANCE VALVES

A. Fixture Air-Admittance Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Ayrlett, LLC.
 - b. Durgo, Inc.
 - c. Oatey.

- d. ProSet Systems Inc.
 - e. RectorSeal.
 - f. Studor, Inc.
2. Standard: ASSE 1051, Type A for single fixture or Type B for branch piping.
 3. Housing: Plastic.
 4. Operation: Mechanical sealing diaphragm.
 5. Size: Same as connected fixture or branch vent piping.
- B. Stack Air-Admittance Valves:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Durgo, Inc.
 - b. Oatey.
 - c. Studor, Inc.
 2. Standard: ASSE 1050 for vent stacks.
 3. Housing: Plastic.
 4. Operation: Mechanical sealing diaphragm.
 5. Size: Same as connected stack vent or vent stack.
- C. Wall Box:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Durgo, Inc.
 - b. Oatey.
 - c. RectorSeal.
 - d. Studor, Inc.
 - e. Zurn Industries, LLC.
 2. Description: White plastic housing with white plastic grille, made for recessed installation. Include bottom pipe connection and space to contain one air-admittance valve.
 3. Size: About 9 inches wide by 8 inches high by 4 inches deep.

2.6 ROOF FLASHING ASSEMBLIES

- A. Roof Flashing Assemblies:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Acorn Engineering Company.
 - b. Thaler Metal Industries Ltd.
 - c. Zurn Industries, LLC.

2. Description: Manufactured assembly made of 6.0-lb/sq. ft., 0.0938-inch- thick, lead flashing collar and skirt extending at least 8 inches from pipe, with galvanized-steel boot reinforcement and counterflashing fitting.
 - a. Open-Top Vent Cap: Without cap.
 - b. Low-Silhouette Vent Cap: With vandal-proof vent cap.
 - c. Extended Vent Cap: With field-installed, vandal-proof vent cap.

2.7 THROUGH-PENETRATION FIRESTOP ASSEMBLIES

A. Through-Penetration Firestop Assemblies:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. ProSet Systems Inc.
2. Standard: UL 1479 assembly of sleeve and stack fitting with firestopping plug.
3. Size: Same as connected soil, waste, or vent stack.
4. Sleeve: Molded PVC plastic, of length to match slab thickness and with integral nailing flange on one end for installation in cast-in-place concrete slabs.
5. Stack Fitting: ASTM A 48/A 48M, gray-iron, hubless-pattern, wye branch with neoprene O-ring at base and gray-iron plug in thermal-release harness. Include PVC protective cap for plug.
6. Special Coating: Corrosion resistant on interior of fittings.

2.8 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Open Drains:

1. Description: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, cast-iron, soil-pipe fittings. Include P-trap, hub-and-spigot riser section; and where required, increaser fitting joined with ASTM C 564, rubber gaskets.
2. Size: Same as connected waste piping.

B. Deep-Seal Traps:

1. Description: Cast-iron or bronze casting, with inlet and outlet matching connected piping and cleanout trap-seal primer valve connection.
2. Size: Same as connected waste piping.
 - a. NPS 2: 4-inch-minimum water seal.
 - b. NPS 2-1/2 and Larger: 5-inch-minimum water seal.

C. Floor-Drain, Trap-Seal Primer Fittings:

1. Description: Cast iron, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection.
2. Size: Same as floor drain outlet with NPS 1/2 side inlet.

D. Air-Gap Fittings:

1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.
2. Body: Bronze or cast iron.
3. Inlet: Opening in top of body.
4. Outlet: Larger than inlet.
5. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.

E. Sleeve Flashing Device:

1. Description: Manufactured, cast-iron fitting, with clamping device, that forms sleeve for pipe floor penetrations of floor membrane. Include galvanized-steel pipe extension in top of fitting that will extend 2 inches above finished floor and galvanized-steel pipe extension in bottom of fitting that will extend through floor slab.
2. Size: As required for close fit to riser or stack piping.

F. Stack Flashing Fittings:

1. Description: Counterflashing-type, cast-iron fitting, with bottom recess for terminating roof membrane, and with threaded or hub top for extending vent pipe.
2. Size: Same as connected stack vent or vent stack.

G. Vent Caps:

1. Description: Cast-iron body with threaded or hub inlet and vandal-proof design. Include vented hood and setscrews to secure to vent pipe.
2. Size: Same as connected stack vent or vent stack.

H. Frost-Resistant Vent Terminals:

1. Description: Manufactured or shop-fabricated assembly constructed of copper, lead-coated copper, or galvanized steel.
2. Design: To provide 1-inch enclosed air space between outside of pipe and inside of flashing collar extension, with counterflashing.

I. Expansion Joints:

1. Standard: ASME A112.21.2M.
2. Body: Cast iron with bronze sleeve, packing, and gland.
3. End Connections: Matching connected piping.
4. Size: Same as connected soil, waste, or vent piping.

2.9 FLASHING MATERIALS

A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:

1. General Use: 4.0-lb/sq. ft., 0.0625-inch thickness.
2. Vent Pipe Flashing: 3.0-lb/sq. ft., 0.0469-inch thickness.
3. Burning: 6-lb/sq. ft., 0.0938-inch thickness.

B. Copper Sheet: ASTM B 152/B 152M, of the following minimum weights and thicknesses, unless otherwise indicated:

1. General Applications: 12 oz./sq. ft..
 2. Vent Pipe Flashing: 8 oz./sq. ft..
- C. Zinc-Coated Steel Sheet: ASTM A 653/A 653M, with 0.20 percent copper content and 0.04-inch minimum thickness, unless otherwise indicated. Include G90 hot-dip galvanized, mill-phosphatized finish for painting if indicated.
- D. Elastic Membrane Sheet: ASTM D 4068, flexible, chlorinated polyethylene, 40-mil minimum thickness.
- E. Fasteners: Metal compatible with material and substrate being fastened.
- F. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.
- G. Solder: ASTM B 32, lead-free alloy.
- H. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Equipment Mounting:
1. Comply with requirements for vibration isolation and seismic control devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
 2. Comply with requirements for vibration isolation devices specified in Section 220548.13 "Vibration Controls for Plumbing Piping and Equipment."
- B. Install backwater valves in building drain piping. For interior installation, provide cleanout deck plate flush with floor and centered over backwater valve cover, and of adequate size to remove valve cover for servicing.
- C. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
 2. Locate at each change in direction of piping greater than 45 degrees.
 3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
 4. Locate at base of each vertical soil and waste stack.
- D. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
- E. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.
- F. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
1. Position floor drains for easy access and maintenance.
 2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:

- a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
 - b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
 - c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.
3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
 4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- G. Install trench drains at low points of surface areas to be drained. Set grates of drains flush with finished surface, unless otherwise indicated.
- H. Install fixture air-admittance valves on fixture drain piping.
- I. Install stack air-admittance valves at top of stack vent and vent stack piping.
- J. Install air-admittance-valve wall boxes recessed in wall.
- K. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof.
- L. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof.
- M. Install through-penetration firestop assemblies in plastic conductors and stacks at floor penetrations.
- N. Assemble open drain fittings and install with top of hub 2 inches above floor.
- O. Install deep-seal traps on floor drains and other waste outlets, if indicated.
- P. Install floor-drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.
1. Exception: Fitting may be omitted if trap has trap-seal primer connection.
 2. Size: Same as floor drain inlet.
- Q. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.
- R. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.
- S. Install vent caps on each vent pipe passing through roof.
- T. Install frost-resistant vent terminals on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.
- U. Install expansion joints on vertical stacks and conductors. Position expansion joints for easy access and maintenance.
- V. Install frost-proof vent caps on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.
- W. Assemble components of FOG disposal systems and install on floor. Install trap, vent, fresh-air inlet, and flow-control fitting according to authorities having jurisdiction. Install shelf fastened to reinforcement in wall

construction and adjacent to unit, unless otherwise indicated. Install culture bottle, culture metering pump, timer, and control on shelf. Install tubing between culture bottle, metering pump, and chamber.

- X. Install grease interceptors, including trapping, venting, and flow-control fitting, according to authorities having jurisdiction and with clear space for servicing.
 - 1. Above-Floor Installation: Set unit with bottom resting on floor, unless otherwise indicated.
 - 2. Flush with Floor Installation: Set unit and extension, if required, with cover flush with finished floor.
 - 3. Recessed Floor Installation: Set unit in receiver housing having bottom or cradle supports, with receiver housing cover flush with finished floor.
 - 4. Install cleanout immediately downstream from interceptors not having integral cleanout on outlet.
- Y. Install grease removal devices on floor. Install trap, vent, and flow-control fitting according to authorities having jurisdiction. Install control panel adjacent to unit, unless otherwise indicated.
- Z. Install oil interceptors, including trapping, venting, and flow-control fitting, according to authorities having jurisdiction and with clear space for servicing. Coordinate oil-interceptor storage tank and gravity drain with Section 231113 "Facility Fuel-Oil Piping."
- AA. Install solids interceptors with cleanout immediately downstream from interceptors that do not have integral cleanout on outlet. Install trap on interceptors that do not have integral trap and are connected to sanitary drainage and vent systems.
- BB. Install wood-blocking reinforcement for wall-mounting-type specialties.
- CC. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

3.2 CONNECTIONS

- A. Comply with requirements in Section 221316 "Sanitary Waste and Vent Piping" for piping installation requirements. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment to allow service and maintenance.
- C. FOG Disposal Systems: Connect inlet and outlet to unit, connect flow-control fitting and fresh-air inlet piping to unit inlet piping, and connect vent piping between trap and media chamber. Connect electrical power.
- D. Grease Interceptors: Connect inlet and outlet to unit, and connect flow-control fitting and vent to unit inlet piping. Install valve on outlet of automatic drawoff-type unit.
- E. Grease Removal Devices: Connect controls, electrical power, factory-furnished accessories, and inlet, outlet, and vent piping to unit.
- F. Oil Interceptors: Connect inlet, outlet, vent, and gravity drawoff piping to unit; flow-control fitting and vent to unit inlet piping; and gravity drawoff and suction piping to oil storage tank.
- G. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
- H. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.3 FLASHING INSTALLATION

- A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:
 - 1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft., 0.0938-inch thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft., 0.0625-inch thickness or thinner.
 - 2. Copper Sheets: Solder joints of copper sheets.
- B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
 - 1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.
 - 2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
 - 3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.
- C. Set flashing on floors and roofs in solid coating of bituminous cement.
- D. Secure flashing into sleeve and specialty clamping ring or device.
- E. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Section 076200 "Sheet Metal Flashing and Trim."
- F. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.
- G. Fabricate and install flashing and pans, sumps, and other drainage shapes.

3.4 LABELING AND IDENTIFYING

- A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
 - 1. FOG disposal systems.
 - 2. Grease interceptors.
 - 3. Grease removal devices.
 - 4. Oil interceptors.
 - 5. Solids interceptors.
- B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.5 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 - 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.6 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 221319

SECTION 230130.51 - HVAC AIR-DISTRIBUTION SYSTEM CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cleaning HVAC air-distribution equipment, ducts, plenums, and system components.

1.3 DEFINITIONS

- A. ASCS: Air systems cleaning specialist.
- B. NADCA: National Air Duct Cleaners Association.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For an ASCS.
- B. Strategies and procedures plan.
- C. Cleanliness verification report.

1.5 QUALITY ASSURANCE

- A. ASCS Qualifications: A certified member of NADCA.
 - 1. Certification: Employ an ASCS certified by NADCA on a full-time basis.
 - 2. Supervisor Qualifications: Certified as an ASCS by NADCA.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine HVAC air-distribution equipment, ducts, plenums, and system components to determine appropriate methods, tools, and equipment required for performance of the Work.
- B. Perform "Project Evaluation and Recommendation" according to NADCA ACR 2006.

- C. Prepare written report listing conditions detrimental to performance of the Work.
- D. Proceed with work only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare a written plan that includes strategies and step-by-step procedures. At a minimum, include the following:
 - 1. Supervisor contact information.
 - 2. Work schedule including location, times, and impact on occupied areas.
 - 3. Methods and materials planned for each HVAC component type.
 - 4. Required support from other trades.
 - 5. Equipment and material storage requirements.
 - 6. Exhaust equipment setup locations.
- B. Use the existing service openings, as required for proper cleaning, at various points of the HVAC system for physical and mechanical entry and for inspection.
- C. Comply with NADCA ACR 2006, "Guidelines for Constructing Service Openings in HVAC Systems" Section.

3.3 CLEANING

- A. Comply with NADCA ACR 2006.
- B. Remove visible surface contaminants and deposits from within the HVAC system.
- C. Systems and Components to Be Cleaned:
 - 1. Air devices for supply and return air.
 - 2. Air-terminal units.
 - 3. Ductwork:
 - a. Supply-air ducts, including turning vanes and reheat coils, to the air-handling unit.
 - b. Return-air ducts to the air-handling unit.
 - c. Exhaust-air ducts.
 - 4. Air-Handling Units:
 - a. Interior surfaces of the unit casing.
 - b. Coil surfaces compartment.
 - c. Condensate drain pans.
 - d. Fans, fan blades, and fan housings.
 - 5. Filters and filter housings.
- D. Collect debris removed during cleaning. Ensure that debris is not dispersed outside the HVAC system during the cleaning process.
- E. Particulate Collection:

1. For particulate collection equipment, include adequate filtration to contain debris removed. Locate equipment downwind and away from all air intakes and other points of entry into the building.
 2. HEPA filtration with 99.97 percent collection efficiency for particles sized 0.3 micrometer or larger shall be used where the particulate collection equipment is exhausting inside the building,
- F. Control odors and mist vapors during the cleaning and restoration process.
- G. Mark the position of manual volume dampers and air-directional mechanical devices inside the system prior to cleaning. Restore them to their marked position on completion of cleaning.
- H. System components shall be cleaned so that all HVAC system components are visibly clean. On completion, all components must be returned to those settings recorded just prior to cleaning operations.
- I. Clean all air-distribution devices, registers, grilles, and diffusers.
- J. Clean visible surface contamination deposits according to NADCA ACR 2006 and the following:
1. Clean air-handling units, airstream surfaces, components, condensate collectors, and drains.
 2. Ensure that a suitable operative drainage system is in place prior to beginning wash-down procedures.
 3. Clean evaporator coils, reheat coils, and other airstream components.
- K. Duct Systems:
1. Create service openings in the HVAC system as necessary to accommodate cleaning.
 2. Mechanically clean duct systems specified to remove all visible contaminants so that the systems are capable of passing the HVAC System Cleanliness Tests (see NADCA ACR 2006).
- L. Debris removed from the HVAC system shall be disposed of according to applicable Federal, state, and local requirements.
- M. Mechanical Cleaning Methodology:
1. Source-Removal Cleaning Methods: The HVAC system shall be cleaned using source-removal mechanical cleaning methods designed to extract contaminants from within the HVAC system and to safely remove these contaminants from the facility. No cleaning method, or combination of methods, shall be used that could potentially damage components of the HVAC system or negatively alter the integrity of the system.
 - a. Use continuously operating vacuum-collection devices to keep each section being cleaned under negative pressure.
 - b. Cleaning methods that require mechanical agitation devices to dislodge debris that is adhered to interior surfaces of HVAC system components shall be equipped to safely remove these devices. Cleaning methods shall not damage the integrity of HVAC system components or damage porous surface materials such as duct and plenum liners.
 2. Cleaning Mineral-Fiber Insulation Components:
 - a. Fibrous-glass thermal or acoustical insulation elements present in equipment or ductwork shall be thoroughly cleaned with HEPA vacuuming equipment while the HVAC system is under constant negative pressure and shall not be permitted to get wet according to NADCA ACR 2006.
 - b. Cleaning methods used shall not cause damage to fibrous-glass components and will render the system capable of passing the HVAC System Cleanliness Tests (see NADCA ACR 2006).
 - c. Fibrous materials that become wet shall be discarded and replaced.

N. Antimicrobial Agents and Coatings:

1. Apply antimicrobial agents and coatings if active fungal growth is reasonably suspected or where unacceptable levels of fungal contamination have been verified. Apply antimicrobial agents and coatings according to manufacturer's written recommendations and EPA registration listing after the removal of surface deposits and debris.
2. When used, antimicrobial treatments and coatings shall be applied after the system is rendered clean.
3. Apply antimicrobial agents and coatings directly onto surfaces of interior ductwork.
4. Sanitizing agent products shall be registered by the EPA as specifically intended for use in HVAC systems and ductwork.

3.4 CLEANLINESS VERIFICATION

- A. Verify cleanliness according to NADCA ACR 2006, "Verification of HVAC System Cleanliness" Section.
- B. Verify HVAC system cleanliness after mechanical cleaning and before applying any treatment or introducing any treatment-related substance to the HVAC system, including biocidal agents and coatings.
- C. Perform visual inspection for cleanliness. If no contaminants are evident through visual inspection, the HVAC system shall be considered clean. If visible contaminants are evident through visual inspection, those portions of the system where contaminants are visible shall be re-cleaned and subjected to re-inspection for cleanliness.
- D. Additional Verification:
 1. Perform surface comparison testing or NADCA vacuum test.
 2. Conduct NADCA vacuum gravimetric test analysis for nonporous surfaces.
- E. Prepare a written cleanliness verification report. At a minimum, include the following:
 1. Written documentation of the success of the cleaning.
 2. Site inspection reports, initialed by supervisor, including notation on areas of inspection, as verified through visual inspection.
 3. Surface comparison test results if required.
 4. Gravimetric analysis (nonporous surfaces only).
 5. System areas found to be damaged.
- F. Photographic Documentation: Comply with requirements in Section 013233 "Photographic Documentation."

3.5 RESTORATION

- A. Restore and repair HVAC air-distribution equipment, ducts, plenums, and components according to NADCA ACR 2006, "Restoration and Repair of Mechanical Systems" Section.
- B. Restore service openings capable of future reopening. Comply with requirements in Section 233113 "Metal Ducts." Include location of service openings in Project closeout report.
- C. Replace fibrous-glass materials that cannot be restored by cleaning or resurfacing. Comply with requirements in Section 233113 "Metal Ducts" and Section 233116 "Nonmetal Ducts."
- D. Replace damaged insulation according to Section 230713 "Duct Insulation."
- E. Ensure that closures do not hinder or alter airflow.

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- F. New closure materials, including insulation, shall match opened materials and shall have removable closure panels fitted with gaskets and fasteners.
- G. Reseal fibrous-glass ducts. Comply with requirements in Section 233116 "Nonmetal Ducts."

END OF SECTION 230130.51

SECTION 230513 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.3 COORDINATION

- A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:
 - 1. Motor controllers.
 - 2. Torque, speed, and horsepower requirements of the load.
 - 3. Ratings and characteristics of supply circuit and required control sequence.
 - 4. Ambient and environmental conditions of installation location.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

- A. Comply with NEMA MG 1 unless otherwise indicated.
- B. Comply with IEEE 841 for severe-duty motors.

2.2 MOTOR CHARACTERISTICS

- A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.
- B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.3 POLYPHASE MOTORS

- A. Description: NEMA MG 1, Design B, medium induction motor.
- B. Efficiency: Energy efficient, as defined in NEMA MG 1.

- C. Service Factor: 1.15.
- D. Multispeed Motors: Variable torque.
 - 1. For motors with 2:1 speed ratio, consequent pole, single winding.
 - 2. For motors with other than 2:1 speed ratio, separate winding for each speed.
- E. Multispeed Motors: Separate winding for each speed.
- F. Rotor: Random-wound, squirrel cage.
- G. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.
- H. Temperature Rise: Match insulation rating.
- I. Insulation: Class F.
- J. Code Letter Designation:
 - 1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
 - 2. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.
- K. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

2.4 POLYPHASE MOTORS WITH ADDITIONAL REQUIREMENTS

- A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.
- B. Motors Used with Variable Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.
 - 1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
 - 2. Energy- and Premium-Efficient Motors: Class B temperature rise; Class F insulation.
 - 3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
 - 4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.
- C. Severe-Duty Motors: Comply with IEEE 841, with 1.15 minimum service factor.

2.5 ADDITIONAL REQUIREMENTS FOR POLYPHASE MOTORS

- A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.
- B. Motors Used with Variable-Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.

1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width-modulated inverters.
 2. Premium-Efficient Motors: Class B temperature rise; Class F insulation.
 3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
 4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.
- C. Severe-Duty Motors: Comply with IEEE 841, with 1.15 minimum service factor.

2.6 SINGLE-PHASE MOTORS

- A. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:
1. Permanent-split capacitor.
 2. Split phase.
 3. Capacitor start, inductor run.
 4. Capacitor start, capacitor run.
- B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.
- C. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.
- D. Motors 1/20 HP and Smaller: Shaded-pole type.
- E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 230513

SECTION 230517 – SLEEVES & SLEEVE SEALS FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sleeves.
 - 2. Sleeve-seal systems.
 - 3. Sleeve-seal fittings.
 - 4. Grout.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

2.2 SLEEVE-SEAL SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Advance Products & Systems, Inc.
 - 2. CALPICO, Inc.
 - 3. Metraflex Company (The).
 - 4. Pipeline Seal and Insulator, Inc.
 - 5. Proco Products, Inc.
- B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.

1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
2. Pressure Plates: Carbon steel.
3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.3 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
 1. Sleeves are not required for core-drilled holes.
- C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
 1. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
 2. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
- D. Install sleeves for pipes passing through interior partitions.
 1. Cut sleeves to length for mounting flush with both surfaces.
 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Division 07 Section "Joint Sealants."
- E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Division 07 Section "Penetration Firestopping."

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

3.4 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
 - 1. Exterior Concrete Walls above Grade:
 - a. Piping Smaller Than NPS 6: Sleeve-seal fittings.
 - 2. Interior Partitions:
 - a. Piping Smaller Than NPS 4: Galvanized-steel-pipe sleeves.

END OF SECTION 230517

SECTION 230518 - ESCUTCHEONS FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.
 - 2. Floor plates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

- A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.
- C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.
- D. Split-Casting Brass Type: With polished, chrome-plated finish and with concealed hinge and setscrew.
- E. Split-Plate, Stamped-Steel Type: With chrome-plated finish, concealed hinge, and spring-clip fasteners.

2.2 FLOOR PLATES

- A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.
- B. Split-Casting Floor Plates: Cast brass with concealed hinge.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. Escutcheons for New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
 - b. Chrome-Plated Piping: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - c. Insulated Piping: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - e. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - f. Bare Piping in Unfinished Service Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - g. Bare Piping in Equipment Rooms: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - h. Bare Piping in Equipment Rooms: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - 2. Escutcheons for Existing Piping:
 - a. Chrome-Plated Piping: Split-casting brass type with polished, chrome-plated finish.
 - b. Insulated Piping: Split-plate, stamped-steel type with concealed hinge.
 - c. Bare Piping at Wall and Floor Penetrations in Finished Spaces: Split-plate, stamped-steel type with concealed hinge.
 - d. Bare Piping at Ceiling Penetrations in Finished Spaces: Split-plate, stamped-steel type with concealed hinge.
 - e. Bare Piping in Unfinished Service Spaces: Split-plate, stamped-steel type with concealed hinge.
 - f. Bare Piping in Equipment Rooms: Split-plate, stamped-steel type with concealed hinge.
- C. Install floor plates for piping penetrations of equipment-room floors.
- D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. New Piping: One-piece, floor-plate type.
 - 2. Existing Piping: Split-casting, floor-plate type.

3.2 FIELD QUALITY CONTROL

- A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 230518

SECTION 230519 – METERS & GAGES FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Liquid-in-glass thermometers.
 - 2. Dial-type pressure gages.
 - 3. Gage attachments.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Wiring Diagrams: For power, signal, and control wiring.
- C. Product Certificates: For each type of meter and gage, from manufacturer.
- D. Operation and Maintenance Data: For meters and gages to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 LIQUID-IN-GLASS THERMOMETERS

- A. Metal-Case, Compact-Style, Liquid-in-Glass Thermometers:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Terice, H. O. Co.
 - b. Weiss Instruments, Inc.
 - 2. Standard: ASME B40.200.
 - 3. Case: Cast aluminum; 5½ -inch nominal size.
 - 4. Case Form: Back angle unless otherwise indicated.
 - 5. Tube: Glass with magnifying lens and blue or red organic liquid.
 - 6. Tube Background: Nonreflective aluminum with permanently etched scale markings graduated in deg F and deg C.
 - 7. Window: Glass or plastic.
 - 8. Stem: Aluminum or brass and of length to suit installation.

- a. Design for Air-Duct Installation: With ventilated shroud.
 - b. Design for Thermowell Installation: Bare stem.
9. Connector: 1/2 inch, with ASME B1.1 screw threads.
 10. Accuracy: Plus or minus 1 percent of scale range or one scale division, to a maximum of 1.5 percent of scale range.

2.2 PRESSURE GAGES

A. Direct-Mounted, Metal-Case, Dial-Type Pressure Gages:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. AMETEK, Inc.; U.S. Gauge.
 - b. Ashcroft Inc.
 - c. Ernst Flow Industries.
 - d. Flo Fab Inc.
 - e. Marsh Bellofram.
 - f. Miljoco Corporation.
 - g. Noshok.
 - h. Palmer Wahl Instrumentation Group.
 - i. REOTEMP Instrument Corporation.
 - j. Tel-Tru Manufacturing Company.
 - k. Terice, H. O. Co.
 - l. Watts Regulator Co.; a div. of Watts Water Technologies, Inc.
 - m. Weiss Instruments, Inc.
 - n. WIKA Instrument Corporation - USA.
 - o. Winters Instruments - U.S.
2. Standard: ASME B40.100.
3. Case: Liquid-filled type(s); cast aluminum or drawn steel 2-1/2-inch nominal diameter.
4. Pressure-Element Assembly: Bourdon tube unless otherwise indicated.
5. Pressure Connection: Brass, with NPS 1/4 or, ASME B1.20.1 pipe threads and bottom-outlet type unless back-outlet type is indicated.
6. Movement: Mechanical, with link to pressure element and connection to pointer.
7. Dial: Nonreflective aluminum with permanently etched scale markings graduated in psi and kPa.
8. Pointer: Dark-colored metal.
9. Window: Glass.
10. Ring: Stainless steel.
11. Accuracy: Grade B, plus or minus 2 percent of middle half of scale range.

2.3 GAGE ATTACHMENTS

- A. Snubbers: ASME B40.100, brass; with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and piston-type surge-dampening device. Include extension for use on insulated piping.
- B. Siphons: Loop-shaped section of brass pipe with NPS 1/4 or NPS 1/2 pipe threads.
- C. Valves: Brass ball, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads.

2.4 TEST PLUGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Flow Design, Inc.
 2. Miljoco Corporation.
 3. National Meter, Inc.
 4. Peterson Equipment Co., Inc.
 5. Sisco Manufacturing Company, Inc.
 6. Trerice, H. O. Co.
 7. Watts Regulator Co.; a div. of Watts Water Technologies, Inc.
 8. Weiss Instruments, Inc.
- B. Description: Test-station fitting made for insertion into piping tee fitting.
- C. Body: Brass or stainless steel with core inserts and gasketed and threaded cap. Include extended stem on units to be installed in insulated piping.
- D. Thread Size: NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe thread.
- E. Minimum Pressure and Temperature Rating: 500 psig at 200 deg F.
- F. Core Inserts: EPDM self-sealing rubber.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install thermowells with socket extending one-third of pipe diameter and in vertical position in piping tees.
- B. Install thermowells of sizes required to match thermometer connectors. Include bushings if required to match sizes.
- C. Install thermowells with extension on insulated piping.
- D. Fill thermowells with heat-transfer medium.
- E. Install direct-mounted thermometers in thermowells and adjust vertical and tilted positions.
- F. Install direct-mounted pressure gages in piping tees with pressure gage located on pipe at the most readable position.
- G. Install valve and snubber in piping for each pressure gage for fluids (except steam).
- H. Install valve and syphon fitting in piping for each pressure gage for steam.
- I. Install test plugs in piping tees.
- J. Assemble and install connections, tubing, and accessories between flow-measuring elements and flowmeters according to manufacturer's written instructions.

- K. Install connection fittings in accessible locations for attachment to portable indicators.
- L. Install thermometers in the following locations:
 - 1. Inlet and outlet of each hydronic zone.
 - 2. Two inlets and two outlets of each hydronic pump.
- M. Install pressure gages in the following locations:
 - 1. Discharge of each pressure-reducing valve.
 - 2. Inlet and outlet of each chilled-water connection.
 - 3. Suction and discharge of each pump.

3.2 ADJUSTING

- A. After installation, calibrate meters according to manufacturer's written instructions.
- B. Adjust faces of meters and gages to proper angle for best visibility.
- C. Thermometers at inlets and outlets of each hot/glycol coil shall be one of the following:
 - 1. Liquid-filled, bimetallic-actuated type.
- D. Thermometer stems shall be of length to match thermowell insertion length.

3.3 THERMOMETER SCALE-RANGE SCHEDULE

- A. Scale Range for Hot -Water Piping: 40 to 260 deg F with 2 deg F divisions.

3.4 PRESSURE-GAGE SCHEDULE

- A. Pressure gages at inlet and outlet of each hot/glycol-water coil.
 - 1. Liquid-filled direct-mounted, metal case.
 - 2. Test plug with EPDM self-sealing rubber inserts.

3.5 PRESSURE-GAGE SCALE-RANGE SCHEDULE

- A. Scale Range for Hot-Water Piping: 0 to 60 psi.

END OF SECTION 230519

SECTION 230523.11 - GLOBE VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Bronze angle valves.
 - 2. Bronze globe valves.
 - 3. Iron globe valves.

1.3 DEFINITIONS

- A. CWP: Cold working pressure.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of valve.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads, flange faces, grooves, and weld ends.
 - 3. Set angle and globe valves closed to prevent rattling.
- B. Use the following precautions during storage:
 - 1. Maintain valve end protection.
 - 2. Store valves indoors and maintain at higher-than-ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 - 1. ASME B1.20.1 for threads for threaded-end valves.
 - 2. ASME B16.1 for flanges on iron valves.
 - 3. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 4. ASME B16.18 for solder joint.
 - 5. ASME B31.1 for power piping valves.
 - 6. ASME B31.9 for building services piping valves.
- C. Refer to HVAC valve schedule articles for applications of valves.
- D. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- E. Valve Sizes: Same as upstream piping unless otherwise indicated.
- F. Valves in Insulated Piping: With 2-inch stem extensions.

2.2 BRONZE ANGLE VALVES

- A. Class 125 Bronze Angle Valves:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. American Valve, Inc.
 - b. Hammond Valve.
 - c. Milwaukee Valve Company.
 - d. NIBCO INC.
 - 2. Description:
 - a. Standard: MSS SP-80, Type 1.
 - b. CWP Rating: 200 psig.
 - c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
 - d. Ends: Threaded.
 - e. Stem and Disc: Bronze.
 - f. Packing: Asbestos free.
 - g. Handwheel: Malleable iron, bronze, or aluminum.
- B. Class 150 Bronze Angle Valves:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. KITZ Corporation.

b. Stockham; Crane Energy Flow Solutions.

2. Description:

- a. Standard: MSS SP-80, Type 1.
- b. CWP Rating: 300 psig.
- c. Body Material: ASTM B 62, bronze with integral seat and union-ring bonnet.
- d. Ends: Threaded.
- e. Stem and Disc: Bronze.
- f. Packing: Asbestos free.
- g. Handwheel: Malleable iron, bronze, or aluminum.

2.3 BRONZE GLOBE VALVES

A. Class 125 Bronze Globe Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Crane; Crane Energy Flow Solutions.
- b. Hammond Valve.
- c. Jomar Valve.
- d. KITZ Corporation.
- e. Milwaukee Valve Company.
- f. NIBCO INC.
- g. Powell Valves.
- h. Red-White Valve Corporation.
- i. Stockham; Crane Energy Flow Solutions.
- j. Valve Solutions, Inc.
- k. Watts; a Watts Water Technologies company.

2. Description:

- a. Standard: MSS SP-80, Type 1.
- b. CWP Rating: 200 psig.
- c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
- d. Ends: Threaded or solder joint.
- e. Stem and Disc: Bronze.
- f. Packing: Asbestos free.
- g. Handwheel: Malleable iron, bronze, or aluminum.

B. Class 150 Bronze Globe Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Crane; Crane Energy Flow Solutions.
- b. Hammond Valve.
- c. KITZ Corporation.
- d. Milwaukee Valve Company.
- e. NIBCO INC.
- f. Powell Valves.
- g. Red-White Valve Corporation.

- h. Valve Solutions, Inc.
- i. Watts; a Watts Water Technologies company.

2. Description:

- a. Standard: MSS SP-80, Type 2.
- b. CWP Rating: 300 psig.
- c. Body Material: ASTM B 62, bronze with integral seat and union-ring bonnet.
- d. Ends: Threaded.
- e. Stem: Bronze.
- f. Disc: Bronze.
- g. Packing: Asbestos free.
- h. Handwheel: Malleable iron, bronze, or aluminum.

2.4 IRON GLOBE VALVES

A. Class 125 Iron Globe Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Crane; Crane Energy Flow Solutions.
- b. Hammond Valve.
- c. Jenkins Valves; Crane Energy Flow Solutions.
- d. KITZ Corporation.
- e. Milwaukee Valve Company.
- f. NIBCO INC.
- g. Powell Valves.
- h. Red-White Valve Corporation.
- i. Stockham; Crane Energy Flow Solutions.
- j. Valve Solutions, Inc.
- k. Watts; a Watts Water Technologies company.

2. Description:

- a. Standard: MSS SP-85, Type I.
- b. CWP Rating: 200 psig.
- c. Body Material: ASTM A 126, gray iron with bolted bonnet.
- d. Ends: Flanged.
- e. Trim: Bronze.
- f. Packing and Gasket: Asbestos free.
- g. Operator: Handwheel or chainwheel.

B. Class 250 Iron Globe Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Crane; Crane Energy Flow Solutions.
- b. Hammond Valve.
- c. Jenkins Valves; Crane Energy Flow Solutions.
- d. Milwaukee Valve Company.
- e. NIBCO INC.

- f. Stockham; Crane Energy Flow Solutions.
 - g. Watts; a Watts Water Technologies company.
2. Description:
- a. Standard: MSS SP-85, Type I.
 - b. CWP Rating: 500 psig.
 - c. Body Material: ASTM A 126, gray iron with bolted bonnet.
 - d. Ends: Flanged.
 - e. Trim: Bronze.
 - f. Packing and Gasket: Asbestos free.
 - g. Operator: Handwheel or chainwheel.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement.
- E. Install chainwheels on operators for globe valves NPS 4 and larger and more than 96 inches above floor. Extend chains to 60 inches above finished floor.
- F. Install valve tags. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for valve tags and schedules.

3.3 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.4 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valve applications are not indicated, use the following:
 - 1. Throttling Service except Steam: Globe or angle valves.
- B. If valves with specified CWP ratings are unavailable, the same types of valves with higher CWP ratings may be substituted.
- C. Select valves with the following end connections:
 - 1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules.
 - 2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules.
 - 3. For Copper Tubing, NPS 5 and Larger: Flanged ends.
 - 4. For Steel Piping, NPS 2 and Smaller: Threaded ends.
 - 5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules.
 - 6. For Steel Piping, NPS 5 and Larger: Flanged ends.

3.5 CHILLED-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller: Bronze angle or globe valves, Class 150, bronze disc, with soldered ends.
- B. Pipe NPS 2-1/2 and Larger: Iron globe valves, Class 250 with flanged ends.

3.6 HEATING-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller: Bronze angle or globe valves, Class 150, bronze disc, with soldered ends.
- B. Pipe NPS 2-1/2 and Larger: Iron globe valves, Class 250 with flanged ends.

END OF SECTION 230523.11

SECTION 230523.12 - BALL VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Brass ball valves.
2. Bronze ball valves.
3. Steel ball valves.
4. Iron ball valves.

1.3 DEFINITIONS

- A. CWP: Cold working pressure.
- B. SWP: Steam working pressure.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of valve.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 1. Protect internal parts against rust and corrosion.
 2. Protect threads, flange faces, and weld ends.
 3. Set ball valves open to minimize exposure of functional surfaces.
- B. Use the following precautions during storage:
 1. Maintain valve end protection.
 2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use operating handles or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 - 1. ASME B1.20.1 for threads for threaded-end valves.
 - 2. ASME B16.1 for flanges on iron valves.
 - 3. ASME B16.5 for flanges on steel valves.
 - 4. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 5. ASME B16.18 for solder-joint connections.
 - 6. ASME B31.1 for power piping valves.
 - 7. ASME B31.9 for building services piping valves.
- C. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.
- D. Refer to HVAC valve schedule articles for applications of valves.
- E. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- F. Valve Sizes: Same as upstream piping unless otherwise indicated.
- G. Valves in Insulated Piping:
 - 1. Include 2-inch stem extensions.
 - 2. Extended operating handle of nonthermal-conductive material, and protective sleeves that allow operation of valves without breaking the vapor seals or disturbing insulation.
 - 3. Memory stops that are fully adjustable after insulation is applied.
- H. Valve Bypass and Drain Connections: MSS SP-45.

2.2 BRASS BALL VALVES

- A. One-Piece Brass Ball Valves:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. KITZ Corporation.
 - 2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 400 psig.
 - c. Body Design: One piece.
 - d. Body Material: Forged brass.
 - e. Ends: Threaded.
 - f. Seats: PTFE.

- g. Stem: Brass.
- h. Ball: Chrome-plated brass.
- i. Port: Reduced.

B. Two-Piece Brass Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Crane; Crane Energy Flow Solutions.
 - b. Flow-Tek, Inc.
 - c. Hammond Valve.
 - d. Jamesbury; Metso.
 - e. Jenkins Valves; Crane Energy Flow Solutions.
 - f. KITZ Corporation.
 - g. Marwin Valve; Richards Industries.
 - h. Milwaukee Valve Company.
 - i. RuB Inc.
2. Description:
 - a. Standard: MSS SP-110.
 - b. SWP Rating: 150 psig.
 - c. CWP Rating: 600 psig.
 - d. Body Design: Two piece.
 - e. Body Material: Forged brass.
 - f. Ends: Threaded.
 - g. Seats: PTFE.
 - h. Stem: Stainless steel.
 - i. Ball: Stainless steel, vented.
 - j. Port: Full.

C. Three-Piece Brass Ball Valves with Full Port and Brass Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Jomar Valve.
 - b. KITZ Corporation.
 - c. Red-White Valve Corporation.
 - d. Watts; a Watts Water Technologies company.
2. Description:
 - a. Standard: MSS SP-110.
 - b. SWP Rating: 150 psig.
 - c. CWP Rating: 600 psig.
 - d. Body Design: Three piece.
 - e. Body Material: Forged brass.
 - f. Ends: Threaded.
 - g. Seats: PTFE.
 - h. Stem: Brass.
 - i. Ball: Chrome-plated brass.
 - j. Port: Full.

D. Three-Piece Brass Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Jomar Valve.
 - b. KITZ Corporation.
 - c. Marwin Valve; Richards Industries.
 - d. Watts; a Watts Water Technologies company.
2. Description:
 - a. Standard: MSS SP-110.
 - b. SWP Rating: 150 psig.
 - c. CWP Rating: 600 psig.
 - d. Body Design: Three piece.
 - e. Body Material: Forged brass.
 - f. Ends: Threaded.
 - g. Seats: PTFE.
 - h. Stem: Stainless steel.
 - i. Ball: Stainless steel, vented.
 - j. Port: Full.

2.3 BRONZE BALL VALVES

A. One-Piece Bronze Ball Valves with Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Conbraco Industries, Inc.
 - b. NIBCO INC.
 - c. Watts; a Watts Water Technologies company.
2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: One piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Reduced.

B. Two-Piece Bronze Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Conbraco Industries, Inc.
 - b. Crane; Crane Energy Flow Solutions.

- c. Hammond Valve.
- d. Lance Valves.
- e. Milwaukee Valve Company.
- f. NIBCO INC.
- g. Watts; a Watts Water Technologies company.

2. Description:

- a. Standard: MSS SP-110.
- b. SWP Rating: 150 psig.
- c. CWP Rating: 600 psig.
- d. Body Design: Two piece.
- e. Body Material: Bronze.
- f. Ends: Threaded.
- g. Seats: PTFE.
- h. Stem: Stainless steel.
- i. Ball: Stainless steel, vented.
- j. Port: Full.

C. Three-Piece Bronze Ball Valves with Full Port Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Conbraco Industries, Inc.
- b. Hammond Valve.
- c. Milwaukee Valve Company.
- d. NIBCO INC.
- e. Watts; a Watts Water Technologies company.

2. Description:

- a. Standard: MSS SP-110.
- b. SWP Rating: 150 psig.
- c. CWP Rating: 600 psig.
- d. Body Design: Three piece.
- e. Body Material: Bronze.
- f. Ends: Threaded.
- g. Seats: PTFE.
- h. Stem: Stainless steel.
- i. Ball: Stainless steel, vented.
- j. Port: Full.

2.4 STEEL BALL VALVES

A. Class 150 Steel Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Conbraco Industries, Inc.
- b. Jamesbury; Metso.
- c. NIBCO INC.

2. Description:
 - a. Standard: MSS SP-72.
 - b. CWP Rating: 285 psig.
 - c. Body Design: Split body.
 - d. Body Material: Carbon steel, ASTM A 216, Type WCB.
 - e. Ends: Flanged.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.

B. Class 300 Steel Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Conbraco Industries, Inc.
- b. Jamesbury; Metso.
- c. NIBCO INC.

2. Description:

- a. Standard: MSS SP-72.
- b. CWP Rating: 720 psig.
- c. Body Design: Split body.
- d. Body Material: Carbon steel, ASTM A 216, Type WCB.
- e. Ends: Flanged.
- f. Seats: PTFE.
- g. Stem: Stainless steel.
- h. Ball: Stainless steel, vented.
- i. Port: Full.

2.5 IRON BALL VALVES

A. Class 125 Iron Ball Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. American Valve, Inc.
- b. Conbraco Industries, Inc.
- c. KITZ Corporation.
- d. Sure Flow Equipment Inc.
- e. Watts; a Watts Water Technologies company.

2. Description:

- a. Standard: MSS SP-72.
- b. CWP Rating: 200 psig.
- c. Body Design: Split body.
- d. Body Material: ASTM A 126, gray iron.
- e. Ends: Flanged.

- f. Seats: PTFE.
- g. Stem: Stainless steel.
- h. Ball: Stainless steel.
- i. Port: Full.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement.
- E. Install valve tags. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for valve tags and schedules.

3.3 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valves with specified SWP classes or CWP ratings are unavailable, the same types of valves with higher SWP classes or CWP ratings may be substituted.
- B. Select valves with the following end connections:
 - 1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
 - 2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 3. For Copper Tubing, NPS 5 and Larger: Flanged ends.
 - 4. For Steel Piping, NPS 2 and Smaller: Threaded ends.

5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
6. For Steel Piping, NPS 5 and Larger: Flanged ends.

3.4 CHILLED-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller: Two piece, full port, brass or bronze with stainless-steel trim.
 1. Valves may be provided with solder-joint ends instead of threaded ends.
- B. Pipe NPS 2-1/2 and Larger: Iron ball valves.
 1. Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
 2. Steel Ball Valves: Class 150.
- C. Pipe NPS 2-1/2 and Larger:
 1. Iron ball valves.
 - a. Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
 2. Class 150 steel ball valves.

3.5 CONDENSER-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller: Two piece, full port, brass or bronze with stainless-steel trim.
 1. Valves may be provided with solder-joint ends instead of threaded ends.
- B. Pipe NPS 2-1/2 and Larger:
 1. Iron ball valves.
 - a. Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
 2. Class 150 steel ball valves.

3.6 HEATING-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller: Two piece, full port, brass or bronze with stainless-steel trim.
 1. Valves may be provided with solder-joint ends instead of threaded ends.
- B. Pipe NPS 2-1/2 and Larger:
 1. Iron ball valves.
 - a. Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.

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Bid Issue

Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower-Internal Stair
Elizabeth, New Jersey

2. Class 150 steel ball valves.

END OF SECTION 230523.12

SECTION 230523.13 - BUTTERFLY VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Iron, single-flange butterfly valves.
 - 2. Iron, grooved-end butterfly valves.

1.3 DEFINITIONS

- A. CWP: Cold working pressure.
- B. EPDM: Ethylene propylene copolymer rubber.
- C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
- D. SWP: Steam working pressure.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of valve.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads, flange faces, grooves, and weld ends.
 - 3. Set butterfly valves closed or slightly open.
- B. Use the following precautions during storage:
 - 1. Maintain valve end protection.
 - 2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 - 1. ASME B16.1 for flanges on iron valves.
 - 2. ASME B16.5 for pipe flanges and flanged fittings, NPS 1/2 through NPS 24.
 - 3. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 4. ASME B31.1 for power piping valves.
 - 5. ASME B31.9 for building services piping valves.
- C. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.
- D. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- E. Valve Sizes: Same as upstream piping unless otherwise indicated.
- F. Valve Actuator Types:
 - 1. Handlever: For valves NPS 6 and smaller.
- G. Valves in Insulated Piping: With 2-inch stem extensions with extended necks.

2.2 IRON, SINGLE-FLANGE BUTTERFLY VALVES

- A. Iron, Single-Flange Butterfly Valves with Aluminum-Bronze Disc:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Valves; Conbraco Industries, Inc.
 - b. NIBCO INC.
 - c. Tyco Valves & Controls.
 - d. WATTS.
 - 2. Description:
 - a. Standard: MSS SP-67, Type I.
 - b. CWP Rating: 150 psig.
 - c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
 - d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
 - e. Seat: EPDM.
 - f. Stem: One- or two-piece stainless steel.
 - g. Disc: Aluminum bronze.
- B. Iron, Single-Flange Butterfly Valves with Stainless-Steel Disc:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Apollo Valves; Conbraco Industries, Inc.
- b. NIBCO INC.
- c. Tyco Valves & Controls.
- d. WATTS.

2. Description:

- a. Standard: MSS SP-67, Type I.
- b. CWP Rating: 150 psig
- c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
- d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
- e. Seat: EPDM
- f. Stem: One- or two-piece stainless steel.
- g. Disc: Stainless steel.

2.3 DUCTILE-IRON, GROOVED-END BUTTERFLY VALVES

A. Iron, Grooved-End Butterfly Valves, 175 CWP:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Grinnell Mechanical Products.
- b. Kennedy Valve Company; a division of McWane, Inc.
- c. Tyco Fire Products LP.
- d. Victaulic Company.

2. Description:

- a. Standard: MSS SP-67, Type I.
- b. CWP Rating: 175 psig.
- c. Body Material: Coated, ductile iron.
- d. Stem: Two-piece stainless steel.
- e. Disc: Coated, ductile iron.
- f. Seal: EPDM.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine mating flange faces for damage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- D. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement.
- E. Install valve tags. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for valve tags and schedules.

3.3 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.4 CHILLED-WATER VALVE SCHEDULE

- A. Pipe NPS 2-1/2 and Larger:
 - 1. Iron, Single-Flange Butterfly Valves, NPS 2-1/2 to NPS 6 Aluminum-bronze or Stainless-steel disc, 200 CWP, and EPDM seat.
 - 2. Iron, Grooved-End Butterfly Valves, NPS 2-1/2 to NPS 6:175 CWP.

END OF SECTION 230523.13

SECTION 230529 – HANGERS & SUPPORTS FOR HVAC PIPING & EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Metal pipe hangers and supports.
 - 2. Trapeze pipe hangers.
 - 3. Thermal hangers shield inserts.
 - 4. Fastener systems.
- B. Related Sections:
 - 1. Division 23 Section(s) "Metal Ducts" for duct hangers and supports.

1.3 DEFINITIONS

- A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for HVAC piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
 - 1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
 - 2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components:
 - 1. Trapeze pipe hangers.

2. Pipe stands.
3. Equipment supports.

C. Welding certificates.

1.6 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

2.2 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 THERMAL-HANGER SHIELD INSERTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Carpenter & Paterson, Inc.
2. Clement Support Services.
3. ERICO International Corporation.
4. National Pipe Hanger Corporation.
5. PHS Industries, Inc.
6. Pipe Shields, Inc.; a subsidiary of Piping Technology & Products, Inc.
7. Piping Technology & Products, Inc.
8. Rilco Manufacturing Co., Inc.
9. Value Engineered Products, Inc.

B. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig minimum compressive strength.

- C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
- D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- E. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.4 FASTENER SYSTEMS

- A. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.5 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
 - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
 - 2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
 - 2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- D. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- E. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- F. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- G. Install lateral bracing with pipe hangers and supports to prevent swaying.

- H. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- I. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- J. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- K. Insulated Piping:
 - 1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
 - 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 3. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
 - b. NPS 4: 12 inches long and 0.06 inch thick.
 - c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
 - d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
 - e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
 - 4. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.4 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Division 09 painting Sections.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.6 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports and attachments for general service applications.
- F. Use thermal-hanger shield inserts for insulated piping and tubing.
- G. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
- H. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- I. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
 2. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 3. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- J. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
- K. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

END OF SECTION 230529

SECTION 230533 – IDENTIFICATION FOR HVAC PIPING & EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Equipment labels.
 - 2. Pipe labels.
 - 3. Valve tags.
 - 4. Warning tags.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
- D. Valve numbering scheme.
- E. Valve Schedules: For each piping system to include in maintenance manuals.

1.4 COORDINATION

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Metal Labels for Equipment: (Except fan coils)

1. Material and Thickness: Stainless steel, 0.025-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
 4. Fasteners: Stainless-steel self-tapping screws.
 5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.
- C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 PIPE LABELS

- A. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- B. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
 2. Lettering Size: At least 1-1/2 inches high.

2.3 VALVE TAGS

- A. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.
1. Tag Material: Brass, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 2. Fasteners: Brass wire-link or beaded chain; or S-hook.
- B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
1. Valve-tag schedule shall be included in operation and maintenance data.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

- A. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 - 1. Near each valve and control device.
 - 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 - 3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
 - 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 - 5. Near major equipment items and other points of origination and termination.
 - 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 - 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- B. Pipe Label Color Schedule:
 - 1. Heating Water Piping:
 - a. Background Color: Yellow.
 - b. Letter Color: Black.
 - 2. Chilled-Water Piping:
 - a. Background Color: Green
 - b. Letter Color: White

3.4 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and lawn-watering hose connections; and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:

1. Valve-Tag Size and Shape:

a. All: 1-1/2 inches round.

2. Valve-Tag Color:

a. All: Natural.

3. Lettering Color:

a. All: Black.

3.5 WARNING-TAG INSTALLATION

A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 230553

SECTION 250593 – TESTING ADJUSTING & BALANCING HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Balancing Air Systems:

- a. Constant-volume air systems.
 - b. Variable-volume air systems.

- 2. Balancing Hydronic Piping Systems:

- a. Constant-flow hydronic systems.
 - b. Variable-flow hydronic systems.

1.3 DEFINITIONS

- A. AABC: Associated Air Balance Council.
- B. NEBB: National Environmental Balancing Bureau.
- C. TAB: Testing, Adjusting and Balancing.

1.4 SUBMITTALS

- A. Qualification Data: Within 45 days of Contractor's Notice to Proceed, submit documentation that the TAB contractor and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.
- B. Contract Documents Examination Report: Within 45 days of Contractor's Notice to Proceed, submit the Contract Documents review report as specified in Part 3.
- C. Strategies and Procedures Plan: Within 60 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.
- D. Certified TAB reports.
- E. Sample report forms.
- F. Instrument calibration reports, to include the following:

1. Instrument type and make.
2. Serial number.
3. Application.
4. Dates of use.
5. Dates of calibration.

1.5 QUALITY ASSURANCE

- A. TAB Contractor Qualifications: Engage a TAB entity certified by NEBB.
1. TAB Field Supervisor: Employee of the TAB contractor and certified by NEBB.
 2. TAB Technician: Employee of the TAB contractor and who is certified by NEBB as a TAB technician.
- B. TAB Conference: Meet with Construction Manager on approval of the TAB strategies and procedures plan to develop a mutual understanding of the details. Require the participation of the TAB field supervisor and technicians. Provide seven days' advance notice of scheduled meeting time and location.
1. Agenda Items:
 - a. The Contract Documents examination report.
 - b. The TAB plan.
 - c. Coordination and cooperation of trades and subcontractors.
 - d. Coordination of documentation and communication flow.
- C. Certify TAB field data reports and perform the following:
1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
 2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.
- D. TAB Report Forms: Use standard TAB contractor's forms approved by Construction Manager.
- E. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.6 PROJECT CONDITIONS

- A. Partial Owner Occupancy: Owner may occupy completed areas of building before Substantial Completion. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

1.7 COORDINATION

- A. Notice: Provide seven days' advance notice for each test. Include scheduled test dates and times.
- B. Perform TAB after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 TAB SPECIALISTS

- A. Subject to compliance with requirements, available TAB contractors that may be engaged include, but are not limited to, the following:

1. Technical air flow.

3.2 EXAMINATION

- A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.
- B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are accessible.
- C. Examine the approved submittals for HVAC systems and equipment.
- D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.
- E. Examine ceiling plenums used for supply, return, or relief air to verify that they meet the leakage class of connected ducts as specified in Division 23 Section "Metal Ducts" and are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.
- F. Examine equipment performance data including fan and pump curves.
1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
 2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.
- G. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.
- H. Examine test reports specified in individual system and equipment Sections.
- I. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
- J. Examine strainers. Verify that startup screens are replaced by permanent screens with indicated perforations.
- K. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

- L. Examine system pumps to ensure absence of entrained air in the suction piping.
- M. Examine operating safety interlocks and controls on HVAC equipment.
- N. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.3 PREPARATION

- A. Prepare a TAB plan that includes strategies and step-by-step procedures.
- B. Complete system-readiness checks and prepare reports. Verify the following:
 - 1. Permanent electrical-power wiring is complete.
 - 2. Hydronic systems are filled, clean, and free of air.
 - 3. Automatic temperature-control systems are operational.
 - 4. Equipment and duct access doors are securely closed.
 - 5. Balance, smoke, and fire dampers are open.
 - 6. Isolating and balancing valves are open and control valves are operational.
 - 7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
 - 8. Windows and doors can be closed so indicated conditions for system operations can be met.

3.4 GENERAL PROCEDURES FOR TESTING AND BALANCING

- A. Perform testing and balancing procedures on each system according to the procedures contained in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and in this Section.
 - 1. Comply with requirements in ASHRAE 62.1-2007, Section 7.2.2, "Air Balancing."
- B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.
 - 1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
 - 2. After testing and balancing, install test ports and duct access doors that comply with requirements in Division 23 Section "Air Duct Accessories."
 - 3. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Division 23 Section "HVAC Insulation."
- C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.5 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

- B. Prepare schematic diagrams of systems' "as-built" duct layouts.
- C. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.
- D. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.
- E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- F. Verify that motor starters are equipped with properly sized thermal protection.
- G. Check dampers for proper position to achieve desired airflow path.
- H. Check for airflow blockages.
- I. Check condensate drains for proper connections and functioning.
- J. Check for proper sealing of air-handling-unit components.
- K. Verify that air duct system is sealed as specified in Division 23 Section "Metal Ducts."

3.6 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

- A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
 - 1. Measure total airflow.
 - a. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow.
 - 2. Measure fan static pressures as follows to determine actual static pressure:
 - a. Measure outlet static pressure as far downstream from the fan as practical and upstream from restrictions in ducts such as elbows and transitions.
 - b. Measure static pressure directly at the fan outlet or through the flexible connection.
 - c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.
 - d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.
 - 3. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.
 - a. Report the cleanliness status of filters and the time static pressures are measured.
 - 4. Measure static pressures entering and leaving other devices, such as sound traps, heat-recovery equipment, and air washers, under final balanced conditions.
 - 5. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.

6. Obtain approval from Construction Manager for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in Division 23 Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.
 7. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.
- B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.
1. Measure airflow of submain and branch ducts.
 - a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.
 2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.
 3. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.
- C. Measure air outlets and inlets without making adjustments.
1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.
- D. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.
1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
 2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.7 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS

- A. Adjust the variable-air-volume systems as follows:
1. Verify that the system static pressure sensor is located two-thirds of the distance down the duct from the fan discharge.
 2. Verify that the system is under static pressure control.
 3. Select the terminal unit that is most critical to the supply-fan airflow. Measure inlet static pressure, and adjust system static pressure control set point so the entering static pressure for the critical terminal unit is not less than the sum of the terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
 4. Calibrate and balance each terminal unit for maximum and minimum design airflow as follows:
 - a. Adjust controls so that terminal is calling for maximum airflow. Some controllers require starting with minimum airflow. Verify calibration procedure for specific project.
 - b. Measure airflow and adjust calibration factor as required for design maximum airflow. Record calibration factor.
 - c. When maximum airflow is correct, balance the air outlets downstream from terminal units.

- d. Adjust controls so that terminal is calling for minimum airflow.
 - e. Measure airflow and adjust calibration factor as required for design minimum airflow. Record calibration factor. If no minimum calibration is available, note any deviation from design airflow.
 - f. When in full cooling or full heating, ensure that there is no mixing of hot-deck and cold-deck airstreams unless so designed.
 - g. On constant volume terminals, in critical areas where room pressure is to be maintained, verify that the airflow remains constant over the full range of full cooling to full heating. Note any deviation from design airflow or room pressure.
5. After terminals have been calibrated and balanced, test and adjust system for total airflow. Adjust fans to deliver total design airflows within the maximum allowable fan speed listed by fan manufacturer.
- a. Set outside-air, return-air, and relief-air dampers for proper position that simulates minimum outdoor-air conditions.
 - b. Set terminals for maximum airflow. If system design includes diversity, adjust terminals for maximum and minimum airflow so that connected total matches fan selection and simulates actual load in the building.
 - c. Where duct conditions allow, measure airflow by Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses to obtain total airflow.
 - d. Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
 - e. If a reliable Pitot-tube traverse or coil traverse is not possible, measure airflow at terminals and calculate the total airflow.
6. Measure fan static pressures as follows:
- a. Measure static pressure directly at the fan outlet or through the flexible connection.
 - b. Measure static pressure directly at the fan inlet or through the flexible connection.
 - c. Measure static pressure across each component that makes up the air-handling system.
 - d. Report any artificial loading of filters at the time static pressures are measured.
7. Set final return and outside airflow to the fan while operating at maximum return airflow and minimum outdoor airflow.
- a. Balance the return-air ducts and inlets the same as described for constant-volume air systems.
 - b. Verify that terminal units are meeting design airflow under system maximum flow.
8. Re-measure the inlet static pressure at the most critical terminal unit and adjust the system static pressure set point to the most energy-efficient set point to maintain the optimum system static pressure. Record set point and give to controls contractor.
9. Verify final system conditions as follows:
- a. Re-measure and confirm that minimum outdoor, return, and relief airflows are within design. Readjust to match design if necessary.
 - b. Re-measure and confirm that total airflow is within design.
 - c. Re-measure final fan operating data, rpms, volts, amps, and static profile.
 - d. Mark final settings.
 - e. Test system in economizer mode. Verify proper operation and adjust if necessary. Measure and record all operating data.
 - f. Verify tracking between supply and return fans.

3.8 GENERAL PROCEDURES FOR HYDRONIC SYSTEMS

- A. Prepare test reports with pertinent design data, and number in sequence starting at pump to end of system. Check the sum of branch-circuit flows against the approved pump flow rate. Correct variations that exceed plus or minus 5 percent.
- B. Prepare schematic diagrams of systems' "as-built" piping layouts.
- C. Prepare hydronic systems for testing and balancing according to the following, in addition to the general preparation procedures specified above:
 - 1. Open all manual valves for maximum flow.
 - 2. Check liquid level in expansion tank.
 - 3. Check makeup water-station pressure gage for adequate pressure for highest vent.
 - 4. Check flow-control valves for specified sequence of operation, and set at indicated flow.
 - 5. Set differential-pressure control valves at the specified differential pressure. Do not set at fully closed position when pump is positive-displacement type unless several terminal valves are kept open.
 - 6. Set system controls so automatic valves are wide open to heat exchangers.
 - 7. Check pump-motor load. If motor is overloaded, throttle main flow-balancing device so motor nameplate rating is not exceeded.
 - 8. Check air vents for a forceful liquid flow exiting from vents when manually operated.

3.9 PROCEDURES FOR CONSTANT-FLOW HYDRONIC SYSTEMS

- A. Measure water flow at pumps. Use the following procedures except for positive-displacement pumps:
 - 1. Verify impeller size by operating the pump with the discharge valve closed. Read pressure differential across the pump. Convert pressure to head and correct for differences in gage heights. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.
 - a. If impeller sizes must be adjusted to achieve pump performance, obtain approval from Construction Manager and comply with requirements in Division 23 Section "Hydronic Pumps."
 - 2. Check system resistance. With all valves open, read pressure differential across the pump and mark pump manufacturer's head-capacity curve. Adjust pump discharge valve until indicated water flow is achieved.
 - a. Monitor motor performance during procedures and do not operate motors in overload conditions.
 - 3. Verify pump-motor brake horsepower. Calculate the intended brake horsepower for the system based on pump manufacturer's performance data. Compare calculated brake horsepower with nameplate data on the pump motor. Report conditions where actual amperage exceeds motor nameplate amperage.
 - 4. Report flow rates that are not within plus or minus 10 percent of design.
- B. Measure flow at all automatic flow control valves to verify that valves are functioning as designed.
- C. Measure flow at all pressure-independent characterized control valves, with valves in fully open position, to verify that valves are functioning as designed.

- D. Set calibrated balancing valves, if installed, at calculated presettings.
- E. Measure flow at all stations and adjust, where necessary, to obtain first balance.
 - 1. System components that have Cv rating or an accurately cataloged flow-pressure-drop relationship may be used as a flow-indicating device.
- F. Measure flow at main balancing station and set main balancing device to achieve flow that is 5 percent greater than indicated flow.
- G. Adjust balancing stations to within specified tolerances of indicated flow rate as follows:
 - 1. Determine the balancing station with the highest percentage over indicated flow.
 - 2. Adjust each station in turn, beginning with the station with the highest percentage over indicated flow and proceeding to the station with the lowest percentage over indicated flow.
 - 3. Record settings and mark balancing devices.
- H. Measure pump flow rate and make final measurements of pump amperage, voltage, rpm, pump heads, and systems' pressures and temperatures including outdoor-air temperature.
- I. Measure the differential-pressure-control-valve settings existing at the conclusion of balancing.
- J. Check settings and operation of each safety valve. Record settings.

3.10 PROCEDURES FOR VARIABLE-FLOW HYDRONIC SYSTEMS

- A. Balance systems with automatic two- and three-way control valves by setting systems at maximum flow through heat-exchange terminals, and proceed as specified above for hydronic systems.
- B. Adjust the variable-flow hydronic system as follows:
 - 1. Verify that the differential-pressure sensor is located as indicated.
 - 2. Determine whether there is diversity in the system.
- C. For systems with no diversity:
 - 1. Adjust pumps to deliver total design gpm.
 - a. Measure total water flow.
 - 1) Position valves for full flow through coils.
 - 2) Measure flow by main flow meter, if installed.
 - 3) If main flow meter is not installed, determine flow by pump TDH or exchanger pressure drop.
 - b. Measure pump TDH as follows:
 - 1) Measure discharge pressure directly at the pump outlet flange or in discharge pipe prior to any valves.
 - 2) Measure inlet pressure directly at the pump inlet flange or in suction pipe prior to any valves or strainers.
 - 3) Convert pressure to head and correct for differences in gage heights.

- 4) Verify pump impeller size by measuring the TDH with the discharge valve closed. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.
 - 5) With valves open, read pump TDH. Adjust pump discharge valve until design water flow is achieved.
- c. Monitor motor performance during procedures and do not operate motor in an overloaded condition.
2. Adjust flow-measuring devices installed in mains and branches to design water flows.
 - a. Measure flow in main and branch pipes.
 - b. Adjust main and branch balance valves for design flow.
 - c. Re-measure each main and branch after all have been adjusted.
 3. Adjust flow-measuring devices installed at terminals for each space to design water flows.
 - a. Measure flow at terminals.
 - b. Adjust each terminal to design flow.
 - c. Re-measure each terminal after it is adjusted.
 - d. Position control valves to bypass the coil and adjust the bypass valve to maintain design flow.
 - e. Perform temperature tests after flows have been balanced.
 4. For systems with pressure-independent valves at terminals:
 - a. Measure differential pressure and verify that it is within manufacturer's specified range.
 - b. Perform temperature tests after flows have been verified.
 5. For systems without pressure-independent valves or flow-measuring devices at terminals:
 - a. Measure and balance coils by either coil pressure drop or temperature method.
 - b. If balanced by coil pressure drop, perform temperature tests after flows have been verified.
 6. Prior to verifying final system conditions, determine the system differential-pressure set point.
 7. If the pump discharge valve was used to set total system flow with variable-frequency controller at 60 Hz, at completion open discharge valve 100 percent and allow variable-frequency controller to control system differential-pressure set point. Record pump data under both conditions.
 8. Mark final settings and verify that all memory stops have been set.
 9. Verify final system conditions as follows:
 - a. Re-measure and confirm that total water flow is within design.
 - b. Re-measure final pumps' operating data, TDH, volts, amps, and static profile.
 - c. Mark final settings.
 10. Verify that memory stops have been set.
- D. For systems with diversity:
1. Determine diversity factor.
 2. Simulate system diversity by closing required number of control valves, as approved by the design engineer.
 3. Adjust pumps to deliver total design gpm.
 - a. Measure total water flow.

- 1) Position valves for full flow through coils.
 - 2) Measure flow by main flow meter, if installed.
 - 3) If main flow meter is not installed, determine flow by pump TDH or exchanger pressure drop.
- b. Measure pump TDH as follows:
- 1) Measure discharge pressure directly at the pump outlet flange or in discharge pipe prior to any valves.
 - 2) Measure inlet pressure directly at the pump inlet flange or in suction pipe prior to any valves or strainers.
 - 3) Convert pressure to head and correct for differences in gage heights.
 - 4) Verify pump impeller size by measuring the TDH with the discharge valve closed. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.
 - 5) With valves open, read pump TDH. Adjust pump discharge valve until design water flow is achieved.
- c. Monitor motor performance during procedures and do not operate motor in an overloaded condition.
4. Adjust flow-measuring devices installed in mains and branches to design water flows.
- a. Measure flow in main and branch pipes.
 - b. Adjust main and branch balance valves for design flow.
 - c. Re-measure each main and branch after all have been adjusted.
5. Adjust flow-measuring devices installed at terminals for each space to design water flows.
- a. Measure flow at terminals.
 - b. Adjust each terminal to design flow.
 - c. Re-measure each terminal after it is adjusted.
 - d. Position control valves to bypass the coil, and adjust the bypass valve to maintain design flow.
 - e. Perform temperature tests after flows have been balanced.
6. For systems with pressure-independent valves at terminals:
- a. Measure differential pressure, and verify that it is within manufacturer's specified range.
 - b. Perform temperature tests after flows have been verified.
7. For systems without pressure-independent valves or flow-measuring devices at terminals:
- a. Measure and balance coils by either coil pressure drop or temperature method.
 - b. If balanced by coil pressure drop, perform temperature tests after flows have been verified.
8. Open control valves that were shut. Close a sufficient number of control valves that were previously open to maintain diversity, and balance terminals that were just opened.
9. Prior to verifying final system conditions, determine system differential-pressure set point.
10. If the pump discharge valve was used to set total system flow with variable-frequency controller at 60 Hz, at completion open discharge valve 100 percent and allow variable-frequency controller to control system differential-pressure set point. Record pump data under both conditions.
11. Mark final settings and verify that memory stops have been set.
12. Verify final system conditions as follows:

- a. Re-measure and confirm that total water flow is within design.
- b. Re-measure final pumps' operating data, TDH, volts, amps, and static profile.
- c. Mark final settings.

13. Verify that memory stops have been set.

3.11 PROCEDURES FOR HEAT EXCHANGERS

- A. Measure water flow through all circuits.
- B. Adjust water flow to within specified tolerances.
- C. Measure inlet and outlet water temperatures.
- D. Measure inlet steam pressure.
- E. Check settings and operation of safety and relief valves. Record settings.

3.12 PROCEDURES FOR MOTORS

- A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:
 1. Manufacturer's name, model number, and serial number.
 2. Motor horsepower rating.
 3. Motor rpm.
 4. Efficiency rating.
 5. Nameplate and measured voltage, each phase.
 6. Nameplate and measured amperage, each phase.
 7. Starter thermal-protection-element rating.
- B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass of the controller to prove proper operation. Record observations including name of controller manufacturer, model number, serial number, and nameplate data.

3.13 PROCEDURES FOR HEAT-TRANSFER COILS

- A. Measure, adjust, and record the following data for each water coil:
 1. Entering- and leaving-water temperature.
 2. Water flow rate.
 3. Water pressure drop.
 4. Dry-bulb temperature of entering and leaving air.
 5. Wet-bulb temperature of entering and leaving air for cooling coils.
 6. Airflow.
 7. Air pressure drop.
- B. Measure, adjust, and record the following data for each electric heating coil:
 1. Nameplate data.
 2. Airflow.
 3. Entering- and leaving-air temperature at full load.

4. Voltage and amperage input of each phase at full load and at each incremental stage.
5. Calculated kilowatt at full load.
6. Fuse or circuit-breaker rating for overload protection.

C. Measure, adjust, and record the following data for each steam coil:

1. Dry-bulb temperature of entering and leaving air.
2. Airflow.
3. Air pressure drop.
4. Inlet steam pressure.

D. Measure, adjust, and record the following data for each refrigerant coil:

1. Dry-bulb temperature of entering and leaving air.
2. Wet-bulb temperature of entering and leaving air.
3. Airflow.
4. Air pressure drop.
5. Refrigerant suction pressure and temperature.

3.14 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

A. Perform a preconstruction inspection of existing equipment that is to remain and be reused.

1. Measure and record the operating speed, airflow, and static pressure of each fan.
2. Measure motor voltage and amperage. Compare the values to motor nameplate information.
3. Check the refrigerant charge.
4. Check the condition of filters.
5. Check the condition of coils.
6. Check the operation of the drain pan and condensate-drain trap.
7. Check bearings and other lubricated parts for proper lubrication.
8. Report on the operating condition of the equipment and the results of the measurements taken. Report deficiencies.

B. Before performing testing and balancing of existing systems, inspect existing equipment that is to remain and be reused to verify that existing equipment has been cleaned and refurbished. Verify the following:

1. New filters are installed.
2. Coils are clean and fins combed.
3. Drain pans are clean.
4. Fans are clean.
5. Bearings and other parts are properly lubricated.
6. Deficiencies noted in the preconstruction report are corrected.

C. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.

1. Compare the indicated airflow of the renovated work to the measured fan airflows, and determine the new fan speed and the face velocity of filters and coils.
2. Verify that the indicated airflows of the renovated work result in filter and coil face velocities and fan speeds that are within the acceptable limits defined by equipment manufacturer.
3. If calculations increase or decrease the air flow rates and water flow rates by more than 5 percent, make equipment adjustments to achieve the calculated rates. If increase or decrease is 5 percent or less, equipment adjustments are not required.

4. Balance each air outlet.

3.15 TOLERANCES

- A. Set HVAC system's air flow rates and water flow rates within the following tolerances:
 1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent.
 2. Air Outlets and Inlets: Plus or minus 10 percent.
 3. Heating-Water Flow Rate: Plus or minus 10 percent.
 4. Cooling-Water Flow Rate: Plus or minus 10 percent.

3.16 REPORTING

- A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.
- B. Status Reports: Prepare biweekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.17 FINAL REPORT

- A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.
 1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
 2. Include a list of instruments used for procedures, along with proof of calibration.
- B. Final Report Contents: In addition to certified field-report data, include the following:
 1. Pump curves.
 2. Fan curves.
 3. Manufacturers' test data.
 4. Field test reports prepared by system and equipment installers.
 5. Other information relative to equipment performance; do not include Shop Drawings and product data.
- C. General Report Data: In addition to form titles and entries, include the following data:
 1. Title page.
 2. Name and address of the TAB contractor.
 3. Project name.
 4. Project location.
 5. Architect's name and address.
 6. Engineer's name and address.
 7. Contractor's name and address.

8. Report date.
 9. Signature of TAB supervisor who certifies the report.
 10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
 11. Summary of contents including the following:
 - a. Indicated versus final performance.
 - b. Notable characteristics of systems.
 - c. Description of system operation sequence if it varies from the Contract Documents.
 12. Nomenclature sheets for each item of equipment.
 13. Data for terminal units, including manufacturer's name, type, size, and fittings.
 14. Notes to explain why certain final data in the body of reports vary from indicated values.
 15. Test conditions for fans and pump performance forms including the following:
 - a. Settings for outdoor-, return-, and exhaust-air dampers.
 - b. Conditions of filters.
 - c. Cooling coil, wet- and dry-bulb conditions.
 - d. Face and bypass damper settings at coils.
 - e. Fan drive settings including settings and percentage of maximum pitch diameter.
 - f. Inlet vane settings for variable-air-volume systems.
 - g. Settings for supply-air, static-pressure controller.
 - h. Other system operating conditions that affect performance.
- D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:
1. Quantities of outdoor, supply, return, and exhaust airflows.
 2. Water and steam flow rates.
 3. Duct, outlet, and inlet sizes.
 4. Pipe and valve sizes and locations.
 5. Terminal units.
 6. Balancing stations.
 7. Position of balancing devices.
- E. Air-Handling-Unit Test Reports: For air-handling units with coils, include the following:
1. Unit Data:
 - a. Unit identification.
 - b. Location.
 - c. Make and type.
 - d. Model number and unit size.
 - e. Manufacturer's serial number.
 - f. Unit arrangement and class.
 - g. Discharge arrangement.
 - h. Sheave make, size in inches, and bore.
 - i. Center-to-center dimensions of sheave, and amount of adjustments in inches.
 - j. Number, make, and size of belts.
 - k. Number, type, and size of filters.
 2. Motor Data:
 - a. Motor make, and frame type and size.

- b. Horsepower and rpm.
 - c. Volts, phase, and hertz.
 - d. Full-load amperage and service factor.
 - e. Sheave make, size in inches, and bore.
 - f. Center-to-center dimensions of sheave, and amount of adjustments in inches.
3. Test Data (Indicated and Actual Values):
- a. Total air flow rate in cfm.
 - b. Total system static pressure in inches wg.
 - c. Fan rpm.
 - d. Discharge static pressure in inches wg.
 - e. Filter static-pressure differential in inches wg.
 - f. Preheat-coil static-pressure differential in inches wg.
 - g. Cooling-coil static-pressure differential in inches wg.
 - h. Heating-coil static-pressure differential in inches wg.
 - i. Outdoor airflow in cfm.
 - j. Return airflow in cfm.
 - k. Outdoor-air damper position.
 - l. Return-air damper position.
 - m. Vortex damper position.
- F. Apparatus-Coil Test Reports:
1. Coil Data:
 - a. System identification.
 - b. Location.
 - c. Coil type.
 - d. Number of rows.
 - e. Fin spacing in fins per inch o.c.
 - f. Make and model number.
 - g. Face area in sq. ft..
 - h. Tube size in NPS.
 - i. Tube and fin materials.
 - j. Circuiting arrangement.
 2. Test Data (Indicated and Actual Values):
 - a. Air flow rate in cfm.
 - b. Average face velocity in fpm.
 - c. Air pressure drop in inches wg.
 - d. Outdoor-air, wet- and dry-bulb temperatures in deg F.
 - e. Return-air, wet- and dry-bulb temperatures in deg F.
 - f. Entering-air, wet- and dry-bulb temperatures in deg F.
 - g. Leaving-air, wet- and dry-bulb temperatures in deg F.
 - h. Water flow rate in gpm.
 - i. Water pressure differential in feet of head or psig.
 - j. Entering-water temperature in deg F.
 - k. Leaving-water temperature in deg F.
 - l. Refrigerant expansion valve and refrigerant types.
 - m. Refrigerant suction pressure in psig.
 - n. Refrigerant suction temperature in deg F.
 - o. Inlet steam pressure in psig.

- G. Fan Test Reports: For supply, return, and exhaust fans, include the following:
1. Fan Data:
 - a. System identification.
 - b. Location.
 - c. Make and type.
 - d. Model number and size.
 - e. Manufacturer's serial number.
 - f. Arrangement and class.
 - g. Sheave make, size in inches, and bore.
 - h. Center-to-center dimensions of sheave, and amount of adjustments in inches.
 2. Motor Data:
 - a. Motor make, and frame type and size.
 - b. Horsepower and rpm.
 - c. Volts, phase, and hertz.
 - d. Full-load amperage and service factor.
 - e. Sheave make, size in inches, and bore.
 - f. Center-to-center dimensions of sheave, and amount of adjustments in inches.
 - g. Number, make, and size of belts.
 3. Test Data (Indicated and Actual Values):
 - a. Total airflow rate in cfm.
 - b. Total system static pressure in inches wg.
 - c. Fan rpm.
 - d. Discharge static pressure in inches wg.
 - e. Suction static pressure in inches wg.
- H. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:
1. Report Data:
 - a. System and air-handling-unit number.
 - b. Location and zone.
 - c. Traverse air temperature in deg F.
 - d. Duct static pressure in inches wg.
 - e. Duct size in inches.
 - f. Duct area in sq. ft..
 - g. Indicated air flow rate in cfm.
 - h. Indicated velocity in fpm.
 - i. Actual air flow rate in cfm.
 - j. Actual average velocity in fpm.
 - k. Barometric pressure in psig.
- I. System-Coil Reports: For reheat coils and water coils of terminal units, include the following:
1. Unit Data:
 - a. System and air-handling-unit identification.
 - b. Location and zone.

- c. Room or riser served.
 - d. Coil make and size.
 - e. Flowmeter type.
 - 2. Test Data (Indicated and Actual Values):
 - a. Air flow rate in cfm.
 - b. Entering-water temperature in deg F.
 - c. Leaving-water temperature in deg F.
 - d. Water pressure drop in feet of head or psig.
 - e. Entering-air temperature in deg F.
 - f. Leaving-air temperature in deg F.
- J. Pump Test Reports: Calculate impeller size by plotting the shutoff head on pump curves and include the following:
 - 1. Unit Data:
 - a. Unit identification.
 - b. Location.
 - c. Service.
 - d. Make and size.
 - e. Model number and serial number.
 - f. Water flow rate in gpm.
 - g. Water pressure differential in feet of head or psig.
 - h. Required net positive suction head in feet of head or psig.
 - i. Pump rpm.
 - j. Impeller diameter in inches.
 - k. Motor make and frame size.
 - l. Motor horsepower and rpm.
 - m. Voltage at each connection.
 - n. Amperage for each phase.
 - o. Full-load amperage and service factor.
 - p. Seal type.
 - 2. Test Data (Indicated and Actual Values):
 - a. Static head in feet of head or psig.
 - b. Pump shutoff pressure in feet of head or psig.
 - c. Actual impeller size in inches.
 - d. Full-open flow rate in gpm.
 - e. Full-open pressure in feet of head or psig.
 - f. Final discharge pressure in feet of head or psig.
 - g. Final suction pressure in feet of head or psig.
 - h. Final total pressure in feet of head or psig.
 - i. Final water flow rate in gpm.
 - j. Voltage at each connection.
 - k. Amperage for each phase.
- K. Instrument Calibration Reports:
 - 1. Report Data:
 - a. Instrument type and make.

- b. Serial number.
- c. Application.
- d. Dates of use.
- e. Dates of calibration.

3.18 INSPECTIONS

A. Initial Inspection:

1. After testing and balancing are complete, operate each system and randomly check measurements to verify that the system is operating according to the final test and balance readings documented in the final report.
2. Check the following for each system:
 - a. Measure airflow of at least 10 percent of air outlets.
 - b. Measure water flow of at least 5 percent of terminals.
 - c. Measure room temperature at each thermostat/temperature sensor. Compare the reading to the set point.
 - d. Verify that balancing devices are marked with final balance position.
 - e. Note deviations from the Contract Documents in the final report.

B. Final Inspection:

1. After initial inspection is complete and documentation by random checks verifies that testing and balancing are complete and accurately documented in the final report, request that a final inspection be made by Construction Manager.
2. The TAB contractor's test and balance engineer shall conduct the inspection in the presence of Construction Manager.
3. Construction Manager shall randomly select measurements, documented in the final report, to be rechecked. Rechecking shall be limited to either 10 percent of the total measurements recorded or the extent of measurements that can be accomplished in a normal 8-hour business day.
4. If rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."
5. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.

C. TAB Work will be considered defective if it does not pass final inspections. If TAB Work fails, proceed as follows:

1. Recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection.
2. If the second final inspection also fails, Owner may contract the services of another TAB contractor to complete TAB Work according to the Contract Documents and deduct the cost of the services from the original TAB contractor's final payment.

D. Prepare test and inspection reports.

3.19 ADDITIONAL TESTS

- #### A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

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Bid Issue

Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower-Internal Stair
Elizabeth, New Jersey

- B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION 230593

SECTION 230713 – DUCT INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes insulating the following duct services:
 - 1. Indoor, concealed and exposed supply.
 - 2. Indoor, concealed and exposed return located in unconditioned space.
- B. Related Sections:
 - 1. Section 230719 "HVAC Piping Insulation."
 - 2. Section 233113 "Metal Ducts" for duct liners.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied if any).

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
- C. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.6 COORDINATION

- A. Coordinate clearance requirements with duct Installer for duct insulation application. Before preparing ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.7 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Duct Insulation Schedule, General," "Indoor Duct and Plenum Insulation Schedule," and "Aboveground, Outdoor Duct and Plenum Insulation Schedule" articles for where insulating materials shall be applied.

- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

- C. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- a. CertainTeed Corp.; SoftTouch Duct Wrap.
- b. Johns Manville; Microlite.
- c. Knauf Insulation; Friendly Feel Duct Wrap.
- d. Manson Insulation Inc.; Alley Wrap.
- e. Owens Corning; SOFTR All-Service Duct Wrap.

- D. Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IA or Type IB. For duct and plenum applications, provide insulation with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- a. CertainTeed Corp.; Commercial Board.
- b. Fibrex Insulations Inc.; FBX.
- c. Johns Manville; 800 Series Spin-Glas.
- d. Knauf Insulation; Insulation Board.

- e. Manson Insulation Inc.; AK Board.
- f. Owens Corning; Fiberglas 700 Series.

2.2 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-127.Eagle Bridges - Marathon Industries; 225.
 - b. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-60/85-70.Mon-Eco Industries, Inc.; 22-25.
 - 2. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 3. Adhesive shall comply with the testing and product requirements of the New Jersey Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-82.
 - b. Eagle Bridges - Marathon Industries; 225.
 - c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-50.Mon-Eco Industries, Inc.; 22-25.
 - 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 SEALANTS

- A. FSK and Metal Jacket Flashing Sealants:

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.Eagle Bridges - Marathon Industries; 405.
- b. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 95-44.

c. Mon-Eco Industries, Inc.: 44-05.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants shall comply with the testing and product requirements of the New Jersey Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
1. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.5 TAPES

- A. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ABI, Ideal Tape Division; 491 AWF FSK.
 - b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827.
 - c. Compac Corporation; 110 and 111.
 - d. Venture Tape; 1525 CW NT, 1528 CW, and 1528 CW/SQ.
 2. Width: 3 inches.
 3. Thickness: 6.5 mils.
 4. Adhesion: 90 ounces force/inch in width.
 5. Elongation: 2 percent.
 6. Tensile Strength: 40 lbf/inch in width.
 7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

2.6 SECUREMENTS

- A. Wire: 0.062-inch soft-annealed, galvanized steel.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. C & F Wire.

2.7 CORNER ANGLES

- A. Aluminum Corner Angles: 0.040 inch thick, minimum 1 by 1 inch, aluminum according to ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 - 1. Verify that systems to be insulated have been tested and are free of defects.
 - 2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.
- B. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Keep insulation materials dry during application and finishing.
- G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- H. Install insulation with least number of joints practical.
- I. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.

2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
- J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- K. Install insulation with factory-applied jackets as follows:
1. Draw jacket tight and smooth.
 2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.
 - a. For below ambient services, apply vapor-barrier mastic over staples.
 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct flanges and fittings.
- L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

3.4 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- C. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.
1. Comply with requirements in Section 078413 "Penetration Firestopping" firestopping and fire-resistive joint sealers.

D. Insulation Installation at Floor Penetrations:

1. Duct: For penetrations through fire-rated assemblies, terminate insulation at fire damper sleeves and externally insulate damper sleeve beyond floor to match adjacent duct insulation. Overlap damper sleeve and duct insulation at least 2 inches.
2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 INSTALLATION OF MINERAL-FIBER INSULATION

A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
2. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
 - a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
 - b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.
3. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
4. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.
5. Secure insulation by wrapping with wire at 12" on center intervals.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Inspect ductwork, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to four location(s) for each duct system defined in the "Duct Insulation Schedule, General" Article.

C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.7 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation:

1. Indoor, concealed supply and outdoor air.
2. Indoor, concealed return located in unconditioned space.

3. Indoor, exposed supply and outdoor air.
4. Indoor, exposed return located in unconditioned space.

B. Items Not Insulated:

1. Fibrous-glass ducts.
2. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
3. Factory-insulated flexible ducts.
4. Factory-insulated plenums and casings.
5. Flexible connectors.
6. Vibration-control devices.
7. Factory-insulated access panels and doors.

3.8 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

- A. Concealed, round and flat-oval, supply-air duct insulation shall be the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- B. Concealed, round and flat-oval, return-air duct insulation shall be the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- C. Concealed, round and flat-oval, outdoor-air duct insulation shall be the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- D. Concealed, round and flat-oval, exhaust-air duct insulation shall be the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- E. Concealed, rectangular, supply-air duct insulation shall be the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- F. Concealed, rectangular, return-air duct insulation shall be the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- G. Concealed, rectangular, outdoor-air duct insulation shall be the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- H. Concealed, rectangular, exhaust-air duct insulation between isolation damper and penetration of building exterior shall be the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- I. Concealed, return-air plenum insulation shall be the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- J. Concealed, outdoor-air plenum insulation shall be the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- K. Concealed, exhaust-air plenum insulation shall be the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- L. Exposed, round and flat-oval, supply-air duct insulation shall be the following:

1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- M. Exposed, round and flat-oval, return-air duct insulation shall be the following:
1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- MI. Exposed, round and flat-oval, outdoor-air duct insulation shall be the following:
1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- MII. Exposed, round and flat-oval, exhaust-air duct insulation shall be the following:
1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft nominal density.
- MIII. Exposed, rectangular, supply-air duct insulation shall be the following:
1. Mineral-Fiber Board: 2 inches thick and 2-lb/cu. ft. nominal density.
- MIV. Exposed, rectangular, return-air duct insulation shall be the following:
1. Mineral-Fiber Board: 2 inches thick and 2-lb/cu. ft. nominal density.
- MV. Exposed, rectangular, outdoor-air duct insulation shall be the following:
1. Mineral-Fiber Board: 2 inches thick and 2-lb/cu. ft. nominal density.
- MVI. Exposed, rectangular, exhaust-air duct insulation shall be the following:
1. Mineral-Fiber Board: 2 inches thick and 2-lb/cu. ft. nominal density.
- MVII. Exposed, supply-air plenum insulation shall be the following:
1. Mineral-Fiber Board: 2 inches thick and 2-lb/cu. ft. nominal density.
- MVIII. Exposed, return-air plenum insulation shall be the following:
1. Mineral-Fiber Board: 2 inches thick and 2-lb/cu. ft. nominal density.
- MIX. Exposed, outdoor-air plenum insulation shall be the following:
1. Mineral-Fiber Board: 2 inches thick and 2-lb/cu. ft. nominal density.
- MX. Exposed, exhaust-air plenum insulation shall be the following:
1. Mineral-Fiber Board: 2 inches thick and 2-lb/cu. ft. nominal density.

END OF SECTION 230713

SECTION 230719 – HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes insulating the following HVAC piping systems:

1. Condensate drain piping, indoors and outdoors.
2. Heating hot-water piping, indoors and outdoors.
3. Chilled-water and brine piping, indoors and outdoors.

- B. Related Sections:

1. Section 230713 "Duct Insulation."

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
2. Detail attachment and covering of heat tracing inside insulation.
3. Detail insulation application at pipe expansion joints for each type of insulation.
4. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
5. Detail removable insulation at piping specialties.
6. Detail application of field-applied jackets.
7. Detail application at linkages of control devices.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.

- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.7 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.8 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," and "Outdoor, Aboveground Piping Insulation Schedule," articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.

- D. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type II with factory-applied vinyl jacket, III with factory-applied ASJ jacket. Factory-applied requirements are specified in "Factory-Applied Jackets" Article.
- E. Mineral-Fiber, Preformed Pipe Insulation:
 - 1. Type I, 850 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ-SSL. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
- F. Phenolic:

2.2 INSULATING CEMENTS

- A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.
- B. Expanded or Exfoliated Vermiculite Insulating Cement: Comply with ASTM C 196.
- C. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449.

2.3 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
 - 1. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
 - 1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. PVC Jacket Adhesive: Compatible with PVC jacket.
 - 1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
 - 1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.
 - 1. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 - 2. Service Temperature Range: Minus 20 to plus 180 deg F.
 - 3. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 - 4. Color: White.

2.5 SEALANTS

- A. Joint Sealants:
 - 1. Joint Sealants for Cellular-Glass, Phenolic, and Polyisocyanurate Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.
 - b. - Marathon Industries; 405.
 - c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 30-45.
 - d. Mon-Eco Industries, Inc.; 44-05.
 - e. Pittsburgh Corning Corporation; Pittseal 444.
- B. FSK and Metal Jacket Flashing Sealants:
 - 1. Materials shall be compatible with insulation materials, jackets, and substrates.
 - 2. Fire- and water-resistant, flexible, elastomeric sealant.
 - 3. Service Temperature Range: Minus 40 to plus 250 deg F.
 - 4. Color: Aluminum.
 - 5. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 6. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:
 - 1. Materials shall be compatible with insulation materials, jackets, and substrates.
 - 2. Fire- and water-resistant, flexible, elastomeric sealant.
 - 3. Service Temperature Range: Minus 40 to plus 250 deg F.
 - 4. Color: White.
 - 5. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 6. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.6 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

2.7 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
- B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
1. Adhesive: As recommended by jacket material manufacturer.
 2. Color: Color-code jackets based on system. Color as selected by Architect.
 3. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
 - a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.
- C. Metal Jacket:
1. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
 - a. Factory cut and rolled to size.
 - b. Finish and thickness are indicated in field-applied jacket schedules.
 - c. Moisture Barrier for Indoor Applications: 1-mil- thick, heat-bonded polyethylene and kraft paper.
 - d. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.
 - e. Factory-Fabricated Fitting Covers:
 - 1) Same material, finish, and thickness as jacket.
 - 2) Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
 - 3) Tee covers.
 - 4) Flange and union covers.
 - 5) End caps.
 - 6) Beveled collars.
 - 7) Valve covers.
 - 8) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.
- D. Self-Adhesive Outdoor Jacket: 60-mil- thick, laminated vapor barrier and waterproofing membrane for installation over insulation located aboveground outdoors; consisting of a rubberized bituminous resin on a crosslaminated polyethylene film covered with white aluminum-foil facing.

2.8 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
1. Width: 3 inches.

2. Thickness: 11.5 mils.
3. Adhesion: 90 ounces force/inch in width.
4. Elongation: 2 percent.
5. Tensile Strength: 40 lbf/inch in width.
6. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.

1. Width: 2 inches.
2. Thickness: 6 mils.
3. Adhesion: 64 ounces force/inch in width.
4. Elongation: 500 percent.
5. Tensile Strength: 18 lbf/inch in width.

2.9 SECUREMENTS

A. Bands:

1. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304; 0.015 inch thick, 3/4 inch wide with closed seal.
2. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 3/4 inch wide with closed seal.
3. Springs: Twin spring set constructed of stainless steel with ends flat and slotted to accept metal bands. Spring size determined by manufacturer for application.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.

1. Verify that systems to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:

1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

2. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

1. Install insulation continuously through hangers and around anchor attachments.

2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.

3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.

4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth.

2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
 - a. For below-ambient services, apply vapor-barrier mastic over staples.
 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- P. For above-ambient services, do not install insulation to the following:
1. Vibration-control devices.
 2. Testing agency labels and stamps.
 3. Nameplates and data plates.
 4. Manholes.
 5. Handholes.
 6. Cleanouts.

3.4 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.
- C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 4. Seal jacket to wall flashing with flashing sealant.

- D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
 - 1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.
- F. Insulation Installation at Floor Penetrations:
 - 1. Pipe: Install insulation continuously through floor penetrations.
 - 2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
 - 1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
 - 2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
 - 3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
 - 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
 - 5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
 - 6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
 - 7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
 - 8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.

9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.
- D. Install removable insulation covers at locations indicated. Installation shall conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
 2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
 3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
 4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
 5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.6 INSTALLATION OF MINERAL-FIBER INSULATION

- A. Insulation Installation on Straight Pipes and Tubes:
1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
 2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
 3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward-clinched staples at 6 inches o.c.
 4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.
- B. Insulation Installation on Pipe Flanges:
1. Install preformed pipe insulation to outer diameter of pipe flange.
 2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
 3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
 4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.
- C. Insulation Installation on Pipe Fittings and Elbows:
1. Install preformed sections of same material as straight segments of pipe insulation when available.

2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.7 FIELD-APPLIED JACKET INSTALLATION

- A. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications. Seal with manufacturer's recommended adhesive.

1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

- B. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

3.8 FINISHES

- A. Pipe Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.

- a. Finish Coat Material: Interior, flat, latex-emulsion size.

- B. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

- C. Do not field paint aluminum or stainless-steel jackets.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

- B. Perform tests and inspections.

- C. Tests and Inspections:

1. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of

welded fittings, two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

- D. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.10 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 - 1. Drainage piping located in crawl spaces.
 - 2. Underground piping.
 - 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.11 INDOOR PIPING INSULATION SCHEDULE

- A. Heating-Hot-Water Supply and Return, 200 Deg F and Below:
 - 1. NPS 6 and Smaller: Insulation shall be the following:
 - a. Mineral-Fiber, Preformed Pipe, Type I: 2 inches thick.
- B. Chilled Water, 40 Deg F and below:
 - 1. NPS 5 and Smaller: Insulation shall be the following:
 - a. Mineral-Fiber, Preformed Pipe, Type I: 2 inches thick.

3.12 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Piping, Concealed:
 - 1. None.
- D. Piping, Exposed:
 - 1. PVC: 30 mils thick.

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Bid Issue

Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower-Internal Stair
Elizabeth, New Jersey

END OF SECTION 230719

SECTION 230993.11 - SEQUENCE OF OPERATIONS FOR HVAC DDC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes control sequences for HVAC systems, subsystems, and equipment.

1.3 DEFINITIONS

- A. DDC: Direct digital control.
- B. VAV: Variable air volume.

1.4 SEQUENCE OF OPERATIONS

- A. Refer to Mechanical Control Diagrams for Sequence of Operations.

1.5 SUBMITTALS

- A. BAS Contractor shall submit six (6) copies of engineered shop drawings and manufacturer's specification data sheets for all hardware and software to be provided. No work shall begin on any segment of this project until the Engineer and Owner have reviewed the control submittals for conformity with the plans, and specifications.
- B. Shop drawings shall be complete with point-to-point termination wiring diagrams, system sequences of operation, and all system hardware and model number technical data sheets.
- C. Provide overall BAS architecture depicting connected mechanical equipment, Network Panels, and field DDC controllers.

1.6 TRAINING

- A. Provide up to two (4) hour sessions for on-site BAS operator training, which shall be completed prior to the expiration of the one-year warranty period.

1.7 WARRANTY

A. Warrant all work as follows:

1. BAS system labor and materials shall be warranted free from defects for a period of twelve (12) months after final completion acceptance by the Owner. BAS failures during the warranty period shall be adjusted, repaired, or replaced at no charge to the Owner. The BAS manufacturer shall respond to the Owner's request for warranty service within 24 hours of the initiated call and will occur during normal business hours (8AM-5PM).
2. At the end of the final start-up/testing, if equipment and systems are operating satisfactorily to the Owner and Engineer, the Owner shall sign certificates certifying that the BAS is operational, and has been tested and accepted in accordance with the terms of this specification. The date of Owner's acceptance shall be the start of the warranty period.
3. Operator workstation software, project specific software, graphics, database, and firmware updates shall be provided to the Owner at no charge during the warranty period. Written authorization by the Owner must be granted prior to the installation of these updates.
4. The BAS manufacturer shall furnish and install a cellular modem during the warranty period that will permit remote access by service personnel without having to access owner's LAN.

1.8 SYSTEM IN-WARRANTY MAINTENANCE AGREEMENT

A. Perform Building Automation System preventative maintenance and support for a period of 1 year (beginning the date of substantial completion).

1. Make a minimum of 1 complete Building Automation System inspections (consisting of 1 man-day per visit), in addition to normal warranty requirements. Inspections to include:
 - i. System Review – Review the BAS to correct programming errors, failed points, points in alarm, and points that have been overridden manually.
 - ii. Seasonal Control Loop Tuning – Control loops are reviewed to reflect changing seasonal conditions and / or facility heating and cooling loads
 - iii. Sequence of operation verification – Systems all verified to be operating as designed and in automatic operation. Scheduling and setpoints are reviewed and modified.
 - iv. Database back-up
 - v. Operator training during site visit
 - vi. Technician shall review critical alarm log and advise owner of additional services that may be required.
 - vii. Technician shall provide a written report to owner after each inspection.
2. Do not assign or transfer maintenance service to agent or subcontractor without prior written consent of owner.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 230993

SECTION 232113 – HYDRONIC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes pipe and fitting materials, joining methods, special-duty valves, and specialties for the following:
 - 1. Hot-water heating piping.
 - 2. Chilled-water piping.
 - 3. Condensate-drain piping.
 - 4. Blowdown-drain piping.
 - 5. Air-vent piping.
- B. Related Sections include the following:
 - 1. Division 23 Section "Hydronic Pumps" for pumps, motors, and accessories for hydronic piping.

1.3 DEFINITIONS

- A. PTFE: Polytetrafluoroethylene.
- B. RTRF: Reinforced thermosetting resin (fiberglass) fittings.
- C. RTRP: Reinforced thermosetting resin (fiberglass) pipe.

1.4 PERFORMANCE REQUIREMENTS

- A. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature:
 - 1. Hot-Water Heating Piping: 125 psig at 200 deg F.
 - 2. Chilled-Water Piping: 150 psig at 73 deg F.
 - 3. Condensate-Drain Piping: 150 deg F.
 - 4. Blowdown-Drain Piping: 200 deg F.
 - 5. Air-Vent Piping: 200 deg F.

1.5 SUBMITTALS

- A. Product Data: For each type of the following:
 - 1. Plastic pipe and fittings with solvent cement.
 - 2. RTRP and RTRF with adhesive.

3. Pressure-seal fittings.
 4. Valves. Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves.
 5. Air control devices.
 6. Hydronic specialties.
- B. Shop Drawings: Detail, at 1/4 scale, the piping layout, fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to the building structure. Detail location of anchors, alignment guides, and expansion joints and loops.
- C. Welding certificates.
- D. Qualification Data: For Installer.
- E. Field quality-control test reports.
- F. Operation and Maintenance Data: For air control devices, hydronic specialties, and special-duty valves to include in emergency, operation, and maintenance manuals.
- G. Water Analysis: Submit a copy of the water analysis to illustrate water quality available at Project site.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications:
1. Installers of Pressure-Sealed Joints: Installers shall be certified by the pressure-seal joint manufacturer as having been trained and qualified to join piping with pressure-seal pipe couplings and fittings.
 2. Fiberglass Pipe and Fitting Installers: Installers of RTRF and RTRP shall be certified by the manufacturer of pipes and fittings as having been trained and qualified to join fiberglass piping with manufacturer-recommended adhesive.
- B. Steel Support Welding: Qualify processes and operators according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- C. Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX.
1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
 2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- D. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation. Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

1.7 EXTRA MATERIALS

- A. Water-Treatment Chemicals: Furnish enough chemicals for initial system startup.

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

- A. Drawn-Temper Copper Tubing: ASTM B 88, Type L.
- B. Wrought-Copper Fittings: ASME B16.22.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International, Inc.
 - b. S. P. Fittings; a division of Star Pipe Products.
 - c. Victaulic Company.
- C. Wrought-Copper Unions: ASME B16.22.

2.2 STEEL PIPE AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel with plain ends; type, grade, and wall thickness as indicated in Part 3 "Piping Applications" Article.
- B. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300 as indicated in Part 3 "Piping Applications" Article.
- C. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300 as indicated in Part 3 "Piping Applications" Article.
- D. Cast-Iron Pipe Flanges and Flanged Fittings: ASME B16.1, Classes 25, 125, and 250; raised ground face, and bolt holes spot faced as indicated in Part 3 "Piping Applications" Article.
- E. Wrought Cast- and Forged-Steel Flanges and Flanged Fittings: ASME B16.5, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
 - 1. Material Group: 1.1.
 - 2. End Connections: Butt welding.
 - 3. Facings: Raised face.
- F. Steel Pipe Nipples: ASTM A 733, made of same materials and wall thicknesses as pipe in which they are installed.

2.3 JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
 - 1. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
 - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.

- B. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- D. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for joining copper with copper; or BAg-1, silver alloy for joining copper with bronze or steel.
- E. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.4 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
- B. Dielectric Unions:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Capitol Manufacturing Company.
 - b. Central Plastics Company.
 - c. Hart Industries International, Inc.
 - d. Jomar International Ltd.
 - e. Matco-Norca, Inc.
 - f. McDonald, A. Y. Mfg. Co.
 - g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
 - h. Wilkins; a Zurn company.
 - 2. Description:
 - a. Standard: ASSE 1079.
 - b. Pressure Rating: 125 psig minimum at 180 deg F.
 - c. End Connections: Solder-joint copper alloy and threaded ferrous.
- C. Dielectric Flanges:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Capitol Manufacturing Company.
 - b. Central Plastics Company.
 - c. Matco-Norca, Inc.
 - d. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
 - e. Wilkins; a Zurn company.
 - 2. Description:
 - a. Standard: ASSE 1079.
 - b. Factory-fabricated, bolted, companion-flange assembly.
 - c. Pressure Rating: 125 psig minimum at 180 deg F.
 - d. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

D. Dielectric-Flange Insulating Kits:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Central Plastics Company.
 - d. Pipeline Seal and Insulator, Inc.
2. Description:
 - a. Nonconducting materials for field assembly of companion flanges.
 - b. Pressure Rating: 150 psig.
 - c. Gasket: Neoprene or phenolic.
 - d. Bolt Sleeves: Phenolic or polyethylene.
 - e. Washers: Phenolic with steel backing washers.

E. Dielectric Nipples:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Elster Perfection.
 - b. Grinnell Mechanical Products.
 - c. Matco-Norca, Inc.
 - d. Precision Plumbing Products, Inc.
 - e. Victaulic Company.
2. Description:
 - a. Standard: IAPMO PS 66
 - b. Electroplated steel nipple. complying with ASTM F 1545.
 - c. Pressure Rating: 300 psig at 225 deg F.
 - d. End Connections: Male threaded or grooved.
 - e. Lining: Inert and noncorrosive, propylene.

2.5 VALVES

- A. Gate, Globe, Check, Ball, and Butterfly Valves: Comply with requirements specified in Division 23 Section "Valves."
- B. Automatic Temperature-Control Valves, Actuators, and Sensors: Comply with requirements specified in Division 23 Section "HVAC Instrumentation and Controls."
- C. Bronze, Calibrated-Orifice, Balancing Valves:
 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Armstrong Pumps, Inc.
 - b. Bell & Gossett Domestic Pump; a division of ITT Industries.

- c. Flow Design Inc.
- d. Gerand Engineering Co.
- e. Griswold Controls.
- f. Taco.

3. Body: Bronze, ball or plug type with calibrated orifice or venturi.
4. Ball: Brass or stainless steel.
5. Plug: Resin.
6. Seat: PTFE.
7. End Connections: Threaded or socket.
8. Pressure Gage Connections: Integral seals for portable differential pressure meter.
9. Handle Style: Lever, with memory stop to retain set position.
10. CWP Rating: Minimum 125 psig.
11. Maximum Operating Temperature: 250 deg F.

D. Automatic Flow-Control Valves:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
3. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - a. Flow Design Inc.
 - b. Griswold Controls.
 - c. Danfoss
4. Body: Brass or ferrous metal.
5. Piston and Spring Assembly: Stainless steel, tamper proof, self cleaning, and removable.
6. Combination Assemblies: Include bronze or brass-alloy ball valve.
7. Identification Tag: Marked with zone identification, valve number, and flow rate.
8. Size: Same as pipe in which installed.
9. Performance: Maintain constant flow, plus or minus 5 percent over system pressure fluctuations.
10. Minimum CWP Rating: 300 psig.
11. Maximum Operating Temperature: 250 deg F.

2.6 AIR CONTROL DEVICES

A. Available Manufactures: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work included, but are not limited to, the following:

1. Amtrol, Inc.
2. Armstrong Pumps, Inc.
3. Bell & Gossett Domestic Pump; a division of ITT Industries.
4. Taco.

B. Manual Air Vents:

1. Body: Bronze.
2. Internal Parts: Nonferrous.
3. Operator: Screwdriver or thumbscrew.
4. Inlet Connection: NPS ½.

5. Discharge Connection: NPS 1/8.
6. CWP Rating: 150 psig.
7. Maximum Operating Temperature: 225 deg F.

C. Automatic Air Vents:

1. Body: Bronze or cast iron.
2. Internal Parts: Nonferrous.
3. Operator: Noncorrosive metal float.
4. Inlet Connection: NPS 1/2.
5. Discharge Connection: NPS 1/4
6. CWP Rating: 150 psig.
7. Maximum Operating Temperature: 240 deg F.

2.7 HYDRONIC PIPING SPECIALTIES

A. Y-Pattern Strainers:

1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
2. End Connections: Threaded ends for NPS 2 and smaller; flanged ends for NPS 2-1/2 and larger.
3. Strainer Screen: 40-mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
4. CWP Rating: 125 psig.

B. Basket Strainers:

1. Body: ASTM A 126, Class B, high-tensile cast iron with bolted cover and bottom drain connection.
2. End Connections: Threaded ends for NPS 2 and smaller; flanged ends for NPS 2-1/2 and larger.
3. Strainer Screen: 40-mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
4. CWP Rating: 125 psig.

C. Stainless-Steel Bellow, Flexible Connectors:

1. Body: Stainless-steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket.
2. End Connections: Threaded or flanged to match equipment connected.
3. Performance: Capable of 3/4-inch misalignment.
4. CWP Rating: 150 psig.
5. Maximum Operating Temperature: 250 deg F.

D. Expansion fittings are specified in Division 23 Section "Pipe Expansion Fittings and Loops."

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

A. Hot-water heating piping, aboveground, NPS 2 and smaller, shall be the following:

1. Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.

B. Hot-water heating piping, aboveground, NPS 2-1/2 and larger, shall be the following:

1. Schedule 40 steel pipe, wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, and welded and flanged joints.
- C. Chilled-water piping, aboveground, NPS 2 smaller, shall be the following:
 1. Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.
- D. Chilled-water piping, aboveground, NPS 2-1/2 and larger, shall be the following:
 1. Schedule 40 steel pipe, wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, and welded and flanged joints.
- E. Condensate-Drain Piping: Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.
- F. Blowdown-Drain Piping: Same materials and joining methods as for piping specified for the service in which blowdown drain is installed.
- G. Air-Vent Piping:
 1. Inlet: Same as service where installed with metal-to-plastic transition fittings for plastic piping systems according to the piping manufacturer's written instructions.
 2. Outlet: Type L, annealed-temper copper tubing with soldered or flared joints.

3.2 VALVE APPLICATIONS

- A. Install shutoff-duty valves at each branch connection to supply mains, and at supply connection to each piece of equipment.
- B. Install calibrated-orifice, balancing valves at each branch connection to return main.
- C. Install calibrated-orifice, balancing valves in the return pipe of each heating or cooling terminal.

3.3 PIPING INSTALLATIONS

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicate piping locations and arrangements if such were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- B. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.

- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Select system components with pressure rating equal to or greater than system operating pressure.
- K. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
- L. Install drains, consisting of a tee fitting, NPS 3/4 ball valve, and short NPS 3/4 threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
- M. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
- N. Reduce pipe sizes using eccentric reducer fitting installed with level side up.
- O. Install branch connections to mains using mechanically formed tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.
- P. Install valves according to Division 23 Section "Valves."
- Q. Install unions in piping, NPS 2 and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.
- R. Install flanges in piping, NPS 2-1/2 and larger, at final connections of equipment and elsewhere as indicated.
- S. Install strainers on inlet side of each control valve, pressure-reducing valve, solenoid valve, in-line pump, and elsewhere as indicated. Install NPS 3/4 nipple and ball valve in blowdown connection of strainers NPS 2 and larger. Match size of strainer blowoff connection for strainers smaller than NPS 2.
- T. Identify piping as specified in Division 23 Section "Mechanical Identification."
- U. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 23 Section "Sleeves and Sleeve Seals for HVAC Piping."
- V. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 23 Section "Sleeves and Sleeve Seals for HVAC Piping."
- W. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 23 Section "Escutcheons for HVAC Piping."

3.4 HANGERS AND SUPPORTS

- A. Hanger, support, and anchor devices are specified in Division 23 Section "Hangers and Supports." Comply with the following requirements for maximum spacing of supports.
- B. Seismic restraints are specified in Division 23 Section "Mechanical Vibration and Seismic Controls."
- C. Install the following pipe attachments:
 - 1. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet long.
 - 2. Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet or longer.
 - 3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet or longer, supported on a trapeze.

4. Spring hangers to support vertical runs.
5. Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
6. On plastic pipe, install pads or cushions on bearing surfaces to prevent hanger from scratching pipe.

D. Install hangers for steel piping with the following maximum spacing and minimum rod sizes:

1. NPS 3/4: Maximum span, 7 feet.
2. NPS 1: Maximum span, 7 feet.
3. NPS 1-1/2: Maximum span, 9 feet.
4. NPS 2: Maximum span, 10 feet.
5. NPS 2-1/2: Maximum span, 11 feet.
6. NPS 3 and Larger: Maximum span, 12 feet.

E. Install hangers for drawn-temper copper piping with the following maximum spacing and minimum rod sizes:

1. NPS 3/4: Maximum span, 5 feet; minimum rod size, 1/4 inch.
2. NPS 1: Maximum span, 6 feet; minimum rod size, 1/4 inch.
3. NPS 1-1/4: Maximum span, 7 feet; minimum rod size, 3/8 inch.
4. NPS 1-1/2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
5. NPS 2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
6. NPS 2-1/2: Maximum span, 9 feet; minimum rod size, 3/8 inch.
7. NPS 3 and Larger: Maximum span, 10 feet; minimum rod size, 3/8 inch.

3.5 PIPE JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.6 HYDRONIC SPECIALTIES INSTALLATION

- A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.
- B. Install automatic air vents at high points of system piping in mechanical equipment rooms only. Manual vents at heat-transfer coils and elsewhere as required for air venting.

3.7 TERMINAL EQUIPMENT CONNECTIONS

- A. Sizes for supply and return piping connections shall be the same as or larger than equipment connections.
- B. Install control valves in accessible locations close to connected equipment.
- C. Install bypass piping with globe valve around control valve. If parallel control valves are installed, only one bypass is required.
- D. Install ports for pressure gages and thermometers at coil inlet and outlet connections according to Division 23 Section "Meters and Gages."

3.8 FIELD QUALITY CONTROL

- A. Prepare hydronic piping according to ASME B31.9 and as follows:
 - 1. Leave joints, including welds, uninsulated and exposed for examination during test.
 - 2. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
 - 3. Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens.
 - 4. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
 - 5. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.
- B. Perform the following tests on hydronic piping:
 - 1. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
 - 2. While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
 - 3. Isolate expansion tanks and determine that hydronic system is full of water.
 - 4. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system's working pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times "SE" value in Appendix A in ASME B31.9, "Building Services Piping."
 - 5. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
 - 6. Prepare written report of testing.
- C. Perform the following before operating the system:

1. Open manual valves fully.
2. Inspect pumps for proper rotation.
3. Set makeup pressure-reducing valves for required system pressure.
4. Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
5. Set temperature controls so all coils are calling for full flow.
6. Inspect and set operating temperatures of hydronic equipment, such as boilers, chillers, cooling towers, to specified values.
7. Verify lubrication of motors and bearings.

END OF SECTION 232113

SECTION 232116 – HYDRONIC PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes special-duty valves and specialties for the following:
 - 1. Hot-water heating piping.
 - 2. Condensate-drain piping.
 - 3. Blowdown-drain piping.
 - 4. Air-vent piping.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of the following:
 - 1. Valves: Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves.
 - 2. Air-control devices.
 - 3. Hydronic specialties.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For air-control devices, hydronic specialties, and special-duty valves to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:
 - 1. Hot-Water Heating Piping: 150 psig at 200 deg F.
 - 2. Air-Vent Piping: 200 deg F.

2.2 VALVES

- A. Gate, Globe, Check, Ball, and Butterfly Valves: Comply with requirements specified in Section 230523 "General-Duty Valves for HVAC Piping." Section 15112 "General-Duty Valves for HVAC Piping."
- B. Automatic Temperature-Control Valves, Actuators, and Sensors: Comply with requirements specified in Section 230900 "Instrumentation and Control for HVAC."
- C. Bronze, Calibrated-Orifice, Balancing Valves:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Armstrong Pumps, Inc.
 - b. Bell & Gossett Domestic Pump.
 - c. Flow Design Inc.
 - d. Gerand Engineering Co.
 - e. Griswold Controls.
 - f. Nexus Valve, Inc.
 - g. Taco.
 - h. Tour & Andersson; available through Victaulic Company.
 2. Body: Bronze, ball or plug type with calibrated orifice or venturi.
 3. Ball: Brass or stainless steel.
 4. Plug: Resin.
 5. Seat: PTFE.
 6. End Connections: Threaded or socket.
 7. Pressure Gage Connections: Integral seals for portable differential pressure meter.
 8. Handle Style: Lever, with memory stop to retain set position.
 9. CWP Rating: Minimum 125 psig.
 10. Maximum Operating Temperature: 250 deg F.
- D. Automatic Flow-Control Valves:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Flow Design Inc.
 - b. Griswold Controls.
 - c. Nexus Valve, Inc.
 2. Body: Brass or ferrous metal.
 3. Piston and Spring Assembly: Stainless steel, tamper proof, self-cleaning, and removable.
 4. Combination Assemblies: Include bronze or brass-alloy ball valve.
 5. Identification Tag: Marked with zone identification, valve number, and flow rate.
 6. Size: Same as pipe in which installed.
 7. Performance: Maintain constant flow, plus or minus 5 percent over system pressure fluctuations.
 8. Minimum CWP Rating: 175 psig.
 9. Maximum Operating Temperature: 200 deg F.

2.3 AIR-CONTROL DEVICES

- A. Manual Air Vents:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Amtrol, Inc.
 - b. Armstrong Pumps, Inc.
 - c. Bell & Gossett Domestic Pump.
 - d. Nexus Valve, Inc.
 - e. Taco, Inc.
2. Body: Bronze.
3. Internal Parts: Nonferrous.
4. Operator: Screwdriver or thumbscrew.
5. Inlet Connection: NPS 1/2.
6. Discharge Connection: NPS 1/8.
7. CWP Rating: 150 psig.
8. Maximum Operating Temperature: 225 deg F.

2.4 HYDRONIC PIPING SPECIALTIES

A. Y-Pattern Strainers:

1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
2. End Connections: Threaded ends for NPS 2 and smaller; flanged ends for NPS 2-1/2 and larger.
3. Strainer Screen: Stainless-steel, 40-mesh strainer, or perforated stainless-steel basket.
4. CWP Rating: 125 psig.

B. Basket Strainers:

1. Body: ASTM A 126, Class B, high-tensile cast iron with bolted cover and bottom drain connection.
2. End Connections: Threaded ends for NPS 2 and smaller; flanged ends for NPS 2-1/2 and larger.
3. Strainer Screen: 40-mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
4. CWP Rating: 125 psig.

PART 3 - EXECUTION

3.1 VALVE APPLICATIONS

- A. Install shutoff-duty valves at each branch connection to supply mains and at supply connection to each piece of equipment.
- B. Install calibrated-orifice, balancing valves at each branch connection to return main.
- C. Install calibrated-orifice, balancing valves in the return pipe of each heating or cooling terminal.
- D. Install check valves at each pump discharge and elsewhere as required to control flow direction.
- E. Install safety valves at hot-water generators and elsewhere as required by ASME Boiler and Pressure Vessel Code. Install drip-pan elbow on safety-valve outlet and pipe without valves to the outdoors; pipe drain to nearest floor drain or as indicated on Drawings. Comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1, for installation requirements.

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3.2 HYDRONIC SPECIALTIES INSTALLATION

- A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.

END OF SECTION 232116

SECTION 232123 - HYDRONIC PUMPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Close-coupled, in-line centrifugal pumps.

1.3 DEFINITIONS

- A. Buna-N: Nitrile rubber.
- B. EPT: Ethylene propylene terpolymer.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of pump. Include certified performance curves and rated capacities, operating characteristics, furnished specialties, final impeller dimensions, and accessories for each type of product indicated. Indicate pump's operating point on curves.
- B. Shop Drawings: For each pump.
 - 1. Show pump layout and connections.
 - 2. Include setting drawings with templates for installing foundation and anchor bolts and other anchorages.
 - 3. Include diagrams for power, signal, and control wiring.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For pumps to include in emergency, operation, and maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Mechanical Seals: One mechanical seal(s) for each pump.

PART 2 - PRODUCTS

2.1 CLOSE-COUPLED, IN-LINE CENTRIFUGAL PUMPS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Armstrong Pumps, Inc.
2. Aurora Pump; Pentair Ltd.
3. Crane Pumps & Systems.
4. Flo Fab inc.
5. Flowserve Corporation.
6. Grundfos Pumps Corporation.
7. ITT Corporation.
8. Mepco, LLC.
9. PACO Pumps; Grundfos Pumps Corporation, USA.
10. Patterson Pump Company; a Gorman-Rupp company.
11. Peerless Pump Company.
12. TACO Incorporated.
13. Thrush Co. Inc.

B. Description: Factory-assembled and -tested, centrifugal, overhung-impeller, close-coupled, in-line pump as defined in HI 1.1-1.2 and HI 1.3; designed for installation with pump and motor shafts mounted horizontally or vertically.

C. Pump Construction:

1. Casing: Radially split, cast iron, with threaded gage tappings at inlet and outlet, replaceable bronze wear rings, and threaded companion-flange connections.
2. Impeller: ASTM B 584, cast bronze; statically and dynamically balanced, keyed to shaft, and secured with a locking cap screw. For constant-speed pumps, trim impeller to match specified performance.
3. Pump Shaft: Steel, with copper-alloy shaft sleeve.
4. Seal: Mechanical seal consisting of carbon rotating ring against a ceramic seat held by a stainless-steel spring, and Buna-N bellows and gasket. Include water slinger on shaft between motor and seal.
5. Seal: Packing seal consisting of stuffing box with a minimum of four rings of graphite-impregnated braided yarn with bronze lantern ring between center two graphite rings, and bronze packing gland.
6. Pump Bearings: Permanently lubricated ball bearings.

D. Motor: Single speed and rigidly mounted to pump casing.

1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
 - a. Enclosure: Open, dripproof.
 - b. Enclosure Materials: Cast aluminum.
 - c. Motor Bearings: Permanently lubricated ball bearings.
 - d. Efficiency: Premium efficient.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine equipment foundations and anchor-bolt locations for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before pump installation.
- C. Examine foundations and inertia bases for suitable conditions where pumps are to be installed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PUMP INSTALLATION

- A. Comply with HI 1.4 and HI 2.4.
- B. Install pumps to provide access for periodic maintenance including removing motors, impellers, couplings, and accessories.
- C. Independently support pumps and piping so weight of piping is not supported by pumps and weight of pumps is not supported by piping.
- D. Automatic Condensate Pump Units: Install units for collecting condensate and extend to open drain.
- E. Equipment Mounting: Install in-line pumps with continuous-thread hanger rods and spring hangers of size required to support weight of in-line pumps.
 - 1. Comply with requirements for seismic-restraint devices specified in Section 230548 "Vibration and Seismic Controls for HVAC."
 - 2. Comply with requirements for hangers and supports specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

3.3 ALIGNMENT

- A. Engage a factory-authorized service representative to perform alignment service.
- B. Comply with requirements in Hydronics Institute standards for alignment of pump and motor shaft. Add shims to the motor feet and bolt motor to base frame. Do not use grout between motor feet and base frame.
- C. Comply with pump and coupling manufacturers' written instructions.
- D. After alignment is correct, tighten foundation bolts evenly but not too firmly. Completely fill baseplate with nonshrink, nonmetallic grout while metal blocks and shims or wedges are in place. After grout has cured, fully tighten foundation bolts.

3.4 CONNECTIONS

- A. Comply with requirements for piping specified in Section 232213 "Steam and Condensate Heating Piping" and Section 232216 Steam and Condensate Piping Specialties." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Where installing piping adjacent to pump, allow space for service and maintenance.
- C. Connect piping to pumps. Install valves that are same size as piping connected to pumps.
- D. Install suction and discharge pipe sizes equal to or greater than diameter of pump nozzles.
- E. Install triple-duty valve on discharge side of pumps.
- F. Install Y-type strainer and shutoff valve on suction side of pumps.
- G. Install flexible connectors on suction and discharge sides of base-mounted pumps between pump casing and valves.
- H. Install pressure gages on pump suction and discharge or at integral pressure-gage tapping, or install single gage with multiple-input selector valve.
- I. Install check valve and gate or ball valve on each condensate pump unit discharge.
- J. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
- K. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.5 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Check piping connections for tightness.
 - 3. Clean strainers on suction piping.
 - 4. Perform the following startup checks for each pump before starting:
 - a. Verify bearing lubrication.
 - b. Verify that pump is free to rotate by hand and that pump for handling hot liquid is free to rotate with pump hot and cold. If pump is bound or drags, do not operate until cause of trouble is determined and corrected.
 - c. Verify that pump is rotating in the correct direction.
 - 5. Prime pump by opening suction valves and closing drains, and prepare pump for operation.
 - 6. Start motor.
 - 7. Open discharge valve slowly.

3.6 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain hydronic pumps.

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END OF SECTION 232123

SECTION 233113 – METAL DUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Single-wall rectangular ducts and fittings.
2. Single-wall round and flat-oval ducts and fittings.
3. Sheet metal materials.
4. Duct liner.
5. Sealants and gaskets.
6. Hangers and supports.

- B. Related Sections:

1. Division 23 Section "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.
2. Division 23 Section "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible".
- B. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

1.4 SUBMITTALS

- A. Product Data: For each type of the following products:

1. Liners and adhesives.
2. Sealants and gaskets.
3. Seismic-restraint devices.

- B. Shop Drawings:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Factory- and shop-fabricated ducts and fittings.

3. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.
4. Elevation of top of ducts.
5. Dimensions of main duct runs from building grid lines.
6. Fittings.
7. Reinforcement and spacing.
8. Seam and joint construction.
9. Penetrations through fire-rated and other partitions.
10. Equipment installation based on equipment being used on Project.
11. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
12. Hangers and supports, including methods for duct and building attachment[, seismic restraints,] and vibration isolation.

C. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Duct installation will be in both new and existing areas. It is important to field verify all existing areas to develop the coordinated drawings in these areas. Ducts must be coordinated with all existing field conditions.
2. Duct installation in congested spaces, indicating coordination with general construction, building components, and other building services. Indicate proposed changes to duct layout.
3. Suspended ceiling components.
4. Structural members to which duct will be attached.
5. Size and location of initial access modules for acoustical tile.
6. Penetrations of smoke barriers and fire-rated construction.
7. Items penetrating finished ceiling including the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - e. Access panels.
 - f. Perimeter moldings.

D. Welding certificates.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
- B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 05 - "Systems and Equipment" and Section 07 - "Construction and System Start-Up."
- C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."

PART 2 - PRODUCTS

2.1 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.2 SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Lindab Inc.
 - b. McGill AirFlow LLC.
 - c. SEMCO Incorporated.
 - d. Sheet Metal Connectors, Inc.
 - e. Spiral Manufacturing Co., Inc.
- B. Flat-Oval Ducts: Indicated dimensions are the duct width (major dimension) and diameter of the round sides connecting the flat portions of the duct (minor dimension).
- C. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
 - 1. Transverse Joints in Ducts Larger Than 60 Inches in Diameter: Flanged.
- D. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Fabricate round ducts larger than 90 inches in diameter with butt-welded longitudinal seams.
2. Fabricate flat-oval ducts larger than 72 inches in width (major dimension) with butt-welded longitudinal seams.

- E. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.3 SHEET METAL MATERIALS

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
1. Galvanized Coating Designation: G90.
- C. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.
- D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.4 DUCT LINER

- A. Fibrous-Glass Duct Liner: Comply with ASTM C 1071, NFPA 90A, or NFPA 90B; and with NAIMA AH124, "Fibrous Glass Duct Liner Standard."
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed Corporation; Insulation Group.
 - b. Johns Manville.
 - c. Knauf Insulation.
 - d. Owens Corning.
 - e. Maximum Thermal Conductivity:
 - 1) Type I, Flexible: 0.27 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature.
 2. Antimicrobial Erosion-Resistant Coating: Apply to the surface of the liner that will form the interior surface of the duct to act as a moisture repellent and erosion-resistant coating. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.
 3. Water-Based Liner Adhesive: Comply with NFPA 90A or NFPA 90B and with ASTM C 916.
 - a. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

- b. Adhesive shall comply with the testing and product requirements of the New Jersey Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Insulation Pins and Washers:

1. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.135-inch-diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.

C. Shop Application of Duct Liner: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 7-11, "Flexible Duct Liner Installation."

1. Adhere a single layer of indicated thickness of duct liner with at least 90 percent adhesive coverage at liner contact surface area. Attaining indicated thickness with multiple layers of duct liner is prohibited.
2. Apply adhesive to transverse edges of liner facing upstream that do not receive metal nosing.
3. Butt transverse joints without gaps, and coat joint with adhesive.
4. Fold and compress liner in corners of rectangular ducts or cut and fit to ensure butted-edge overlapping.
5. Do not apply liner in rectangular ducts with longitudinal joints, except at corners of ducts, unless duct size and dimensions of standard liner make longitudinal joints necessary.
6. Apply adhesive coating on longitudinal seams in ducts with air velocity of 2500 fpm.
7. Secure liner with mechanical fasteners 4 inches from corners and at intervals not exceeding 12 inches transversely; at 3 inches from transverse joints and at intervals not exceeding 18 inches longitudinally.
8. Secure transversely oriented liner edges facing the airstream with metal nosings that have either channel or "Z" profiles or are integrally formed from duct wall. Fabricate edge facings at the following locations:
 - a. Fan discharges.
 - b. Intervals of lined duct preceding unlined duct.
 - c. Upstream edges of transverse joints in ducts where air velocities are higher than 2500 fpm or where indicated.

2.5 SEALANT AND GASKETS

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

2.6 HANGERS AND SUPPORTS

- A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
- B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.
- C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."
- D. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- E. Trapeze and Riser Supports:
 - 1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.

2.7 SEISMIC-RESTRAINT DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2. Ductmate Industries, Inc.
 - 3. Hilti Corp.
 - 4. Kinetics Noise Control.
 - 5. Loos & Co.; Cableware Division.
 - 6. Mason Industries.
 - 7. TOLCO; a brand of NIBCO INC.
 - 8. Unistrut Corporation; Tyco International, Ltd.
- B. General Requirements for Restraint Components: Rated strengths, features, and applications shall be as defined in reports by an evaluation service member of the ICC Evaluation Service.
 - 1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.
- C. Channel Support System: Shop- or field-fabricated support assembly made of slotted steel channels rated in tension, compression, and torsion forces and with accessories for attachment to braced component at one end and to building structure at the other end. Include matching components and corrosion-resistant coating.
- D. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss

for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

- B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- C. Install round and flat-oval ducts in maximum practical lengths.
- D. Install ducts with fewest possible joints.
- E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections. No butt connection joints are permitted.
- F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.
- J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.
- K. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Division 23 Section "Air Duct Accessories" for fire and smoke dampers.
- L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."

3.2 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
 - 1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
 - 2. Outdoor, Supply-Air Ducts: Seal Class A.
 - 3. Outdoor, Exhaust Ducts: Seal Class C.
 - 4. Outdoor, Return-Air Ducts: Seal Class C.
 - 5. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
 - 6. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class A.
 - 7. Unconditioned Space, Exhaust Ducts: Seal Class C.
 - 8. Unconditioned Space, Return-Air Ducts: Seal Class B.
 - 9. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
 - 10. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.
 - 11. Conditioned Space, Exhaust Ducts: Seal Class B.

12. Conditioned Space, Return-Air Ducts: Seal Class C.

3.3 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
1. Where practical, install concrete inserts before placing concrete.
 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
 5. Do not use powder-actuated concrete fasteners for seismic restraints.
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Hangers Exposed to View: Threaded rod and angle or channel supports.
- E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
- F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.4 CONNECTIONS

- A. Make connections to equipment with flexible connectors complying with Division 23 Section "Air Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.5 PAINTING

- A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer. Paint materials and application requirements are specified in Division 09 painting Sections.

3.6 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Leakage Tests:

1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
 2. Test the following systems:
 - a. Supply Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections, selected by Architect from sections installed, totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - b. Return Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections, selected by Architect from sections installed, totaling no less than 50 percent of total installed duct area for each designated pressure class.
 3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
 4. Test for leaks before applying external insulation.
 5. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.
 6. Give seven days' advance notice for testing.
- C. Duct System Cleanliness Tests:
1. Visually inspect duct system to ensure that no visible contaminants are present.

3.7 START UP

- A. Air Balance: Comply with requirements in Division 23 Section "Testing, Adjusting, and Balancing for HVAC."
- B. Supply Ducts:
1. Ducts Connected to Constant-Volume Air-Handling Units:
 - a. Pressure Class: Positive 2-inch wg.
 - b. Minimum SMACNA Seal Class: B.
 - c. SMACNA Leakage Class for Rectangular: 24.
 - d. SMACNA Leakage Class for Round and Flat Oval: 12.
- C. Return Ducts:
1. Ducts Connected to Fan Coil Units, Furnaces, Heat Pumps, and Terminal Units:
 - a. Pressure Class: Positive or negative 2-inch wg.
 - b. Minimum SMACNA Seal Class: C.
 - c. SMACNA Leakage Class for Rectangular: 24.
 - d. SMACNA Leakage Class for Round and Flat Oval: 12.
- D. Exhaust Ducts:
1. Ducts Connected to Fans Exhausting (ASHRAE 62.1, Class 1 and 2) Air:
 - a. Pressure Class: Negative 2-inch wg.
 - b. Minimum SMACNA Seal Class: C if negative pressure, and A if positive pressure.
 - c. SMACNA Leakage Class for Rectangular: 24.
 - d. SMACNA Leakage Class for Round and Flat Oval: 12.

E. Liner:

1. Supply Air Ducts, installed for the first 20 feet: Fibrous glass, Type I 1 inch thick.
2. Return Air Ducts, installed for the first 20 feet: Fibrous glass, Type I 1 inch thick.

F. Elbow Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
 - a. Velocity 1000 fpm or Lower:
 - 1) Radius Type RE 1 with minimum 0.5 radius-to-diameter ratio.
 - 2) Mitered Type RE 4 without vanes.
 - b. Velocity 1000 to 1500 fpm:
 - 1) Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.
 - 2) Radius Type RE 3 with minimum 0.5 radius-to-diameter ratio and two vanes.
 - 3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
 - c. Velocity 1500 fpm or Higher:
 - 1) Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
 - 2) Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
 - 3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
2. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
 - a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
 - b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
 - c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
3. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "Round Duct Elbows."
 - a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.
 - 1) Velocity 1000 fpm or Lower: 0.5 radius-to-diameter ratio and three segments for 90-degree elbow.
 - 2) Velocity 1000 to 1500 fpm: 1.0 radius-to-diameter ratio and four segments for 90-degree elbow.
 - 3) Velocity 1500 fpm or Higher: 1.5 radius-to-diameter ratio and five segments for 90-degree elbow.
 - 4) Radius-to Diameter Ratio: 1.5.

- b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.

G. Branch Configuration:

- 1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-6, "Branch Connection."
 - a. Rectangular Main to Rectangular Branch: 45-degree entry.
 - b. Rectangular Main to Round Branch: Spin in Clinch.
- 2. Round and Flat Oval: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees." Saddle taps are permitted in existing duct.
 - a. Velocity 1000 fpm or Lower: 90-degree tap.
 - b. Velocity 1000 to 1500 fpm: Conical tap.
 - c. Velocity 1500 fpm or Higher: 45-degree lateral.

END OF SECTION 233113

SECTION 233300 – AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Manual volume dampers.
2. Fire dampers.
3. Combination fire and smoke dampers.
4. Flange connectors.
5. Turning vanes.
6. Duct-mounted access doors.
7. Flexible connectors.
8. Flexible ducts.
9. Duct accessory hardware.

- B. Related Sections:

1. Division 28 Section "Fire Detection and Alarm" for duct-mounted fire and smoke detectors.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

- B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.

1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:

- a. Special fittings.
- b. Manual volume damper installations.
- c. Fire-damper, smoke-damper, combination fire- and smoke-damper, including sleeves; and duct-mounted access doors and remote damper operators.
- d. Wiring Diagrams: For power, signal, and control wiring.

- C. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which ceiling-mounted access panels and access doors required for access to duct accessories are shown and coordinated with each other, using input from Installers of the items involved.

- D. Source quality-control reports.

- E. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with AMCA 500-D testing for damper rating.

1.5 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fusible Links: Furnish quantity equal to 10 percent of amount installed.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G90.

2.2 MANUAL VOLUME DAMPERS

- A. Standard, Steel, Manual Volume Dampers:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Air Balance Inc.; a division of Mestek, Inc.
 - b. American Warming and Ventilating; a division of Mestek, Inc.
 - c. Flexmaster U.S.A., Inc.
 - d. McGill AirFlow LLC.
 - e. METALAIRE, Inc.
 - f. Nailor Industries Inc.
 - g. Pottorff; a division of PCI Industries, Inc.
 - h. Ruskin Company.
 - i. Trox USA Inc.
 - j. Vent Products Company, Inc.
 - 2. Standard leakage rating, with linkage outside airstream.
 - 3. Suitable for horizontal or vertical applications.
 - 4. Frames:

- a. Hat-shaped, galvanized-steel channels, 0.064-inch minimum thickness.
 - b. Mitered and welded corners.
 - c. Flanges for attaching to walls and flangeless frames for installing in ducts.
5. Blades:
- a. Multiple or single blade.
 - b. Parallel- or opposed-blade design.
 - c. Stiffen damper blades for stability.
 - d. Galvanized-steel, 0.064 inch thick.
6. Blade Axles: Galvanized steel.
7. Bearings:
- a. Oil-impregnated bronze.
 - b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
8. Tie Bars and Brackets: Galvanized steel.
- B. Jackshaft:
1. Size: 1-inch diameter.
 2. Material: Galvanized-steel pipe rotating within pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.
 3. Length and Number of Mountings: As required to connect linkage of each damper in multiple-damper assembly.
- C. Damper Hardware:
1. Zinc-plated, die-cast core with dial and handle made of 3/32-inch- thick zinc-plated steel, and a 3/4-inch hexagon locking nut.
 2. Include center hole to suit damper operating-rod size.
 3. Include elevated platform for insulated duct mounting.

2.3 FIRE DAMPERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Air Balance Inc.; a division of Mestek, Inc.
 2. Arrow United Industries; a division of Mestek, Inc.
 3. Cesco Products; a division of Mestek, Inc.
 4. Greenheck Fan Corporation.
 5. McGill AirFlow LLC.
 6. METALAIRE, Inc.
 7. Nailor Industries Inc.
 8. NCA Manufacturing, Inc.
 9. PHL, Inc.
 10. Pottorff; a division of PCI Industries, Inc.
 11. Prefco; Perfect Air Control, Inc.
 12. Ruskin Company.
 13. Vent Products Company, Inc.

14. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Type: Static; rated and labeled according to UL 555 by an NRTL.
- C. Closing rating in ducts up to 4-inch wg static pressure class and minimum velocity.
- D. Fire Rating: 2000 fpm.
- E. Frame: Curtain type with blades outside airstream Multiple-blade type; fabricated with roll-formed, 0.034-inch-thick galvanized steel; with mitered and interlocking corners.
- F. Mounting Sleeve: Factory- or field-installed, galvanized sheet steel.
 1. Minimum Thickness: 0.052 or 0.138 inch thick, as indicated, and of length to suit application.
 2. Exception: Omit sleeve where damper-frame width permits direct attachment of perimeter mounting angles on each side of wall or floor; thickness of damper frame must comply with sleeve requirements.
- G. Mounting Orientation: Vertical or horizontal as indicated.
- H. Blades: Roll-formed, interlocking, 0.034-inch-thick, galvanized sheet steel. In place of interlocking blades, use full-length, 0.034-inch-thick, galvanized-steel blade connectors.
- I. Horizontal Dampers: Include blade lock and stainless-steel closure spring.
- J. Heat-Responsive Device: Replaceable, 212 deg F rated, fusible links.

2.4 COMBINATION FIRE AND SMOKE DAMPERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Air Balance Inc.; a division of Mestek, Inc.
 2. Cesco Products; a division of Mestek, Inc.
 3. Greenheck Fan Corporation.
 4. Nailor Industries Inc.
 5. Pottorff; a division of PCI Industries, Inc.
 6. Ruskin Company.
- B. Type: Dynamic; rated and labeled according to UL 555 and UL 555S by an NRTL.
- C. Closing rating in ducts up to 4-inch wg static pressure class and minimum 2000-fpm velocity.
- D. Fire Rating: 1-1/2 hours.
- E. Frame: Hat-shaped, 0.094-inch-thick, galvanized sheet steel, with interlocking, gusseted corners and mounting flange.
- F. Heat-Responsive Device: Replaceable, 212 deg F rated, fusible links.
- G. Heat-Responsive Device: Electric resettable link and switch package, factory installed, rated.
- H. Smoke Detector: Integral, factory wired for single-point connection.

- I. Blades: Roll-formed, horizontal, interlocking 0.034-inch-thick, galvanized sheet steel.
- J. Leakage: Class II.
- K. Rated pressure and velocity to exceed design airflow conditions.
- L. Mounting Sleeve: Factory-installed, 0.05-inch-thick, galvanized sheet steel; length to suit wall or floor application with factory-furnished silicone caulking.
- M. Master control panel for use in dynamic smoke-management systems.
- N. Damper Motors: two-position action.
- O. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
 - 1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
 - 2. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in Section 230923 "Direct Digital Control (DDC) System for HVAC."
 - 3. Permanent-Split-Capacitor or Shaded-Pole Motors: With oil-immersed and sealed gear trains.
 - 4. Spring-Return Motors: Equip with an integral spiral-spring mechanism where indicated. Enclose entire spring mechanism in a removable housing designed for service or adjustments. Size for running torque rating of 150 in. x lbf and breakaway torque rating of 150 in. x lbf.
 - 5. Electrical Connection: 115 V, single phase, 60 Hz.
- P. Accessories:
 - 1. Auxiliary switches for signaling.
 - 2. Momentary test switch, damper mounted.

2.5 FLANGE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Ductmate Industries, Inc.
 - 2. Nexus PDQ; Division of Shilco Holdings Inc.
 - 3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Description: Roll-formed, factory-fabricated, slide-on transverse flange connectors, gaskets, and components.
- C. Material: Galvanized steel.
- D. Gage and Shape: Match connecting ductwork.

2.6 TURNING VANES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ductmate Industries, Inc.
 2. Duro Dyne Inc.
 3. METALAIRE, Inc.
 4. SEMCO Incorporated.
 5. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.
- C. Manufactured Turning Vanes for Nonmetal Ducts: Fabricate curved blades of resin-bonded fiberglass with acrylic polymer coating; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
- D. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."
- E. Vane Construction: Double wall.

2.7 DUCT-MOUNTED ACCESS DOORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. American Warming and Ventilating; a division of Mestek, Inc.
 2. Cesco Products; a division of Mestek, Inc.
 3. Ductmate Industries, Inc.
 4. Flexmaster U.S.A., Inc.
 5. Greenheck Fan Corporation.
 6. McGill AirFlow LLC.
 7. Nailor Industries Inc.
 8. Pottorff; a division of PCI Industries, Inc.
 9. Ventfabrics, Inc.
 10. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Duct-Mounted Access Doors: Fabricate access panels according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 7-2, "Duct Access Doors and Panels," and 7-3, "Access Doors - Round Duct."
1. Door:
 - a. Double wall, rectangular.
 - b. Galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class.
 - c. Hinges and Latches: 1-by-1-inch butt or piano hinge and cam latches.
 - d. Fabricate doors airtight and suitable for duct pressure class.
 2. Frame: Galvanized sheet steel, with bend-over tabs and foam gaskets.
 3. Number of Hinges and Locks:
 - a. Access Doors Less Than 12 Inches Square: No hinges and two sash locks.
 - b. Access Doors up to 18 Inches Square: Two hinges and two sash locks.

- c. Access Doors up to 24 by 48 Inches: Three hinges and two compression latches with outside and inside handles.
- d. Access Doors Larger Than 24 by 48 Inches: Four hinges and two compression latches with outside and inside handles.

2.8 FLEXIBLE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Ductmate Industries, Inc.
 - 2. Duro Dyne Inc.
 - 3. Ventfabrics, Inc.
 - 4. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Materials: Flame-retardant or noncombustible fabrics.
- C. Coatings and Adhesives: Comply with UL 181, Class 1.
- D. Metal-Edged Connectors: Factory fabricated with a fabric strip 3-1/2 inches 5-3/4 inches wide attached to 2 strips of 2-3/4-inch- wide, 0.028-inch- thick, galvanized sheet steel or 0.032-inch- thick aluminum sheets. Provide metal compatible with connected ducts.
- E. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.
 - 1. Minimum Weight: 26 oz./sq. yd..
 - 2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
 - 3. Service Temperature: Minus 40 to plus 200 deg F.
- F. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone.
 - 1. Minimum Weight: 24 oz./sq. yd..
 - 2. Tensile Strength: 530 lbf/inch in the warp and 440 lbf/inch in the filling.
 - 3. Service Temperature: Minus 50 to plus 250 deg F.
- G. High-Temperature System, Flexible Connectors: Glass fabric coated with silicone rubber.
 - 1. Minimum Weight: 16 oz./sq. yd..
 - 2. Tensile Strength: 285 lbf/inch in the warp and 185 lbf/inch in the filling.
 - 3. Service Temperature: Minus 67 to plus 500 deg F.

2.9 FLEXIBLE DUCTS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Flexmaster U.S.A., Inc.
 - 2. McGill AirFlow LLC.
 - 3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

- B. Insulated, Flexible Duct: UL 181, Class 1, 2-ply vinyl film supported by helically wound, spring-steel wire; fibrous-glass insulation; fiberglass reinforced aluminized vapor-barrier film.
 - 1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
- C. Flexible Duct Connectors:
 - 1. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches, to suit duct size.

2.10 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.
- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.
- C. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
 - 1. Install steel volume dampers in steel ducts.
 - 2. Install aluminum volume dampers in aluminum ducts.
- D. Set dampers to fully open position before testing, adjusting, and balancing.
- E. Install test holes at fan inlets and outlets and elsewhere as indicated.
- F. Install fire and smoke dampers according to UL listing.
- G. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
 - 1. On both sides of duct coils.
 - 2. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links shall be pressure relief access doors and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.

3. Upstream from turning vanes.
4. Control devices requiring inspection.
5. Elsewhere as indicated.

H. Install access doors with swing against duct static pressure.

I. Access Door Sizes:

1. One-Hand or Inspection Access: 8 by 5 inches.
2. Two-Hand Access: 12 by 6 inches.
3. Head and Hand Access: 18 by 10 inches.
4. Head and Shoulders Access: 21 by 14 inches.
5. Body Access: 25 by 14 inches.
6. Body plus Ladder Access: 25 by 17 inches.

J. Label access doors according to Division 23 Section "Identification for HVAC Piping and Equipment" to indicate the purpose of access door.

K. Install flexible connectors to connect ducts to equipment.

L. For fans developing static pressures of 5-inch wg and more, cover flexible connectors with loaded vinyl sheet held in place with metal straps.

M. Connect diffusers or light troffer boots to ducts with maximum 60-inch lengths of flexible duct clamped or strapped in place.

N. Connect flexible ducts to metal ducts with draw bands.

O. Install duct test holes where required for testing and balancing purposes.

P. Install thrust limits at centerline of thrust, symmetrical on both sides of equipment. Attach thrust limits at centerline of thrust and adjust to a maximum of 1/4-inch movement during start and stop of fans.

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Operate dampers to verify full range of movement.
2. Inspect locations of access doors and verify that purpose of access door can be performed.
3. Operate fire, smoke, and combination fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.
4. Inspect turning vanes for proper and secure installation.
5. Operate remote damper operators to verify full range of movement of operator and damper.

END OF SECTION 233300

SECTION 233423 – HVAC POWER VENTILATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Centrifugal roof ventilators.
 - 2. In-line centrifugal fans.

1.3 PERFORMANCE REQUIREMENTS

- A. Project Altitude: Base fan-performance ratings on sea level.
- B. Operating Limits: Classify according to AMCA 99.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Also include the following:
 - 1. Certified fan performance curves with system operating conditions indicated.
 - 2. Certified fan sound-power ratings.
 - 3. Motor ratings and electrical characteristics, plus motor and electrical accessories.
 - 4. Material thickness and finishes, including color charts.
 - 5. Dampers, including housings, linkages, and operators.
 - 6. Roof curbs.
 - 7. Fan speed controllers.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Wiring Diagrams: For power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:
 - 1. Roof framing and support members relative to duct penetrations.
 - 2. Ceiling suspension assembly members.

3. Size and location of initial access modules for acoustical tile.
4. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.

B. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For power ventilators to include in emergency, operation, and maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Belts: One set(s) for each belt-driven unit.

1.8 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. AMCA Compliance: Fans shall have AMCA-Certified performance ratings and shall bear the AMCA-Certified Ratings Seal.
- C. UL Standards: Power ventilators shall comply with UL 705. Power ventilators for use for restaurant kitchen exhaust shall also comply with UL 762.

1.9 COORDINATION

- A. Coordinate size and location of structural-steel support members.
- B. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

PART 2 - PRODUCTS

2.1 CENTRIFUGAL ROOF VENTILATORS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Carnes Company.
 2. Greenheck Fan Corporation.
 3. Loren Cook Company.
 4. PennBarry.

- B. Housing: Removable, spun-aluminum, dome top and outlet baffle; square, one-piece, aluminum base with venturi inlet cone.
 - 1. Hinged Subbase: Galvanized-steel hinged arrangement permitting service and maintenance.
- C. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.
- D. Belt Drives:
 - 1. Resiliently mounted to housing.
 - 2. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.
 - 3. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
 - 4. Pulleys: Cast-iron, adjustable-pitch motor pulley.
 - 5. Fan and motor isolated from exhaust airstream.
- E. Accessories:
 - 1. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted inside fan housing, factory wired through an internal aluminum conduit.
 - 2. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.
 - 3. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base; factory set to close when fan stops.
- F. Roof Curbs: Galvanized steel; mitered and welded corners; 1-1/2-inch- thick, rigid, fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to suit roof opening and fan base.
 - 1. Configuration: Self-flashing without a cant strip, with mounting flange.
 - 2. Overall Height: 16 inches.
 - 3. Sound Curb: Curb with sound-absorbing insulation.
- G. Capacities and Characteristics:
 - 1. Refer to exhaust fans schedule on contract drawings.

2.2 IN-LINE CENTRIFUGAL FANS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Carnes Company.
 - 2. Greenheck Fan Corporation.
 - 3. Loren Cook Company.
 - 4. PennBarry.
- B. Housing: Split, spun aluminum with aluminum straightening vanes, inlet and outlet flanges, and support bracket adaptable to floor, side wall, or ceiling mounting.
- C. Direct-Drive Units: Motor mounted in airstream, factory wired to disconnect switch located on outside of fan housing.
- D. Belt-Driven Units: Motor mounted on adjustable base, with adjustable sheaves, enclosure around belts within fan housing, and lubricating tubes from fan bearings extended to outside of fan housing.

- E. Fan Wheels: Aluminum, airfoil blades welded to aluminum hub.
- F. Accessories:
 - 1. Variable-Speed Controller: Solid-state control to reduce speed from 100 to less than 50 percent.
 - 2. Volume-Control Damper: Manually operated with quadrant lock, located in fan outlet.
 - 3. Companion Flanges: For inlet and outlet duct connections.
 - 4. Fan Guards: 1/2- by 1-inch mesh of galvanized steel in removable frame. Provide guard for inlet or outlet for units not connected to ductwork.
 - 5. Motor and Drive Cover (Belt Guard): Epoxy-coated steel.
- G. Capacities and Characteristics:
 - 1. Refer to exhaust fans schedule on contract drawings.

2.3 SOURCE QUALITY CONTROL

- A. Certify sound-power level ratings according to AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Factory test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA-Certified Ratings Seal.
- B. Certify fan performance ratings, including flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating." Label fans with the AMCA-Certified Ratings Seal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install power ventilators level and plumb.
- B. Equipment Mounting:
 - 1. Comply with requirements for vibration isolation and seismic control devices specified in Section 230548 "Vibration and Seismic Controls for HVAC."
- C. Secure roof-mounted fans to roof curbs with cadmium-plated hardware.
- D. Install units with clearances for service and maintenance.
- E. Label units according to requirements specified in Section 230553 "Identification for HVAC Piping and Equipment."

3.2 CONNECTIONS

- A. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Section 233300 "Air Duct Accessories."
- B. Install ducts adjacent to power ventilators to allow service and maintenance.

- C. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
- D. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Tests and Inspections:
 - 1. Verify that shipping, blocking, and bracing are removed.
 - 2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
 - 3. Verify that cleaning and adjusting are complete.
 - 4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
 - 5. Adjust belt tension.
 - 6. Adjust damper linkages for proper damper operation.
 - 7. Verify lubrication for bearings and other moving parts.
 - 8. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.
 - 9. Disable automatic temperature-control operators, energize motor and adjust fan to indicated rpm, and measure and record motor voltage and amperage.
 - 10. Shut unit down and reconnect automatic temperature-control operators.
 - 11. Remove and replace malfunctioning units and retest as specified above.
- C. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Prepare test and inspection reports.

3.4 ADJUSTING

- A. Adjust damper linkages for proper damper operation.
- B. Adjust belt tension.
- C. Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing procedures.
- D. Replace fan and motor pulleys as required to achieve design airflow.
- E. Lubricate bearings.

END OF SECTION 233423

SECTION 233600 - AIR TERMINAL UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Bypass, single-duct air terminal units.
 - 2. Shutoff, single-duct air terminal units.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of air terminal unit.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for air terminal units.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Ceiling suspension assembly members.
 - 2. Size and location of initial access modules for acoustic tile.
 - 3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
- B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For air terminal units to include in emergency, operation, and maintenance manuals.
 - 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. Instructions for resetting minimum and maximum air volumes.
 - b. Instructions for adjusting software set points.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fan-Powered-Unit Filters: Furnish one spare filter(s) for each filter installed.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-up."
- C. ASHRAE Compliance: Applicable requirements in ASHRAE/IES 90.1, "Section 6 - Heating, Ventilating, and Air Conditioning."

2.2 BYPASS, SINGLE-DUCT AIR TERMINAL UNITS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Carnes Company.
 - 2. Carrier Corporation; a unit of United Technologies Corp.
 - 3. Krueger.
 - 4. Titus.
 - 5. Tuttle & Bailey.
- B. Configuration: Diverting-damper assembly inside unit casing with control components inside a protective metal shroud.
- C. Casing: 0.040-inch- thick galvanized steel, single wall.
 - 1. Casing Liner: Comply with requirements in "Casing Liner" Article for fibrous-glass duct liner.
- D. Diverter Assembly: Galvanized-steel gate, with polyethylene linear bearings.
- E. Multioutlet Attenuator Section: With two 8-inch- diameter collars, each with locking butterfly balancing damper.
 - 1. Attenuator Section Liner: Comply with requirements in "Casing Liner" Article for fibrous-glass duct liner.
 - 2. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
- F. Hydronic Heating Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch, and rated for a minimum working pressure of 200 psig and a maximum entering-water temperature of 220 deg F. Include manual air vent and drain valve.

- G. Electric Controls: Damper actuator and thermostat.
1. Damper Actuator: 24 V, powered closed, powered open with microswitch to energize heating control circuit.
 2. Thermostat: Wall-mounted electric type with temperature display in Fahrenheit and Celsius, and space temperature set point.
 3. Changeover Thermostat: Duct-mounted, field-adjustable, electric type reverses action of zone thermostat when air temperature reaches 70 deg F.
- H. Electronic Controls: Bidirectional damper operator and microprocessor-based thermostat. Control devices shall be compatible with temperature controls specified in Section 230923 "Direct Digital Control (DDC) System for HVAC" and shall have the following features:
1. Damper Actuator: 24 V, powered open, spring return.
 2. Thermostat: Wall-mounted electronic type with the following features:
 - a. Temperature set-point display in Fahrenheit and Celsius.
 - b. Auxiliary switch to energize heating control circuit.
 - c. Changeover thermistor to reverse action.
- I. Direct Digital Controls: Single-package unitary controller and actuator specified in Section 230923 "Direct Digital Control (DDC) System for HVAC."

2.3 SHUTOFF, SINGLE-DUCT AIR TERMINAL UNITS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Anemostat Products; a Mestek company.
 2. Carnes Company.
 3. Carrier Corporation; a unit of United Technologies Corp.
 4. ENVIRO-TEC; by Johnson Controls, Inc.
 5. Johnson Controls.
 6. Krueger.
 7. METALAIRE, Inc.
 8. Nailor Industries Inc.
 9. Price Industries.
 10. Raymon-Donco.
 11. Titus.
 12. Trane.
 13. Trox USA Inc.
 14. Tuttle & Bailey.
- B. Configuration: Volume-damper assembly inside unit casing with control components inside a protective metal shroud.
- C. Casing: 0.040-inch- thick galvanized steel, single wall.
1. Casing Liner: Comply with requirements in "Casing Liner" Article for fibrous-glass duct liner.
 2. Air Inlet: Round stub connection or S-slip and drive connections for duct attachment.
 3. Air Outlet: S-slip and drive connections, size matching inlet size.
 4. Access: Removable panels for access to parts requiring service, adjustment, or maintenance; with airtight gasket.

5. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
- D. Regulator Assembly: System-air-powered bellows section incorporating polypropylene bellows for volume regulation and thermostatic control. Bellows shall operate at temperatures from zero to 140 deg F, shall be impervious to moisture and fungus, shall be suitable for 10-inch wg static pressure, and shall be factory tested for leaks.
- E. Volume Damper: Galvanized steel with peripheral gasket and self-lubricating bearings.
 1. Maximum Damper Leakage: AHRI 880 rated, 2 percent of nominal airflow at 3-inch wg inlet static pressure.
 2. Damper Position: Normally open.
- F. Attenuator Section: 0.034-inch steel sheet.
 1. Attenuator Section Liner: Comply with requirements in "Casing Liner" Article for fibrous-glass duct liner.
 2. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
- G. Multioutlet Attenuator Section: With two 8-inch- diameter collars, each with locking butterfly balancing damper.
- H. Hydronic Heating Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch, and rated for a minimum working pressure of 200 psig and a maximum entering-water temperature of 220 deg F. Include manual air vent and drain valve.
- I. Control devices shall be compatible with temperature controls system specified in Section 230923 "Direct Digital Control (DDC) System for HVAC."
 1. Electric Damper Actuator: 24 V, powered open, spring return.
 2. Electronic Damper Actuator: 24 V, powered open, spring return.
 3. Electronic Thermostat: Wall-mounted electronic type with temperature set-point display in Fahrenheit and Celsius.
 4. Electronic Velocity Controller: Factory calibrated and field adjustable to minimum and maximum air volumes; shall maintain constant airflow dictated by thermostat within 5 percent of set point while compensating for inlet static-pressure variations up to 4-inch wg; and shall have a multipoint velocity sensor at air inlet.
 5. Terminal Unit Controller: Pressure-independent, variable-air-volume (VAV) controller with electronic airflow transducer with multipoint velocity sensor at air inlet, factory calibrated to minimum and maximum air volumes, and having the following features:
 - a. Occupied and unoccupied operating mode.
 - b. Remote reset of airflow or temperature set points.
 - c. Adjusting and monitoring with portable terminal.
 - d. Communication with temperature-control system specified in Section 230923 "Direct Digital Control (DDC) System for HVAC."
 6. Room Sensor: Wall mounted with temperature set-point adjustment and access for connection of portable operator terminal.
- J. Controls:

1. Suitable for operation with duct pressures between 0.25- and 3.0-inch wg inlet static pressure.
2. System-powered, wall-mounted thermostat.

K. Control Sequences:

1. Occupied:
 - a. In a call for cooling, airflow will increase as the damper opens towards maximum setting to satisfy set point.
 - b. In a call for less cooling, airflow will decrease as the damper closes towards minimum setting to satisfy set point.
2. Unoccupied:
 - a. Damper closes to minimum maximum setting.

2.4 SOURCE QUALITY CONTROL

A. Factory Tests: Test assembled air terminal units according to AHRI 880.

1. Label each air terminal unit with plan number, nominal airflow, maximum and minimum factory-set airflows, coil type, and AHRI certification seal.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Ch. 5, "Hangers and Supports" and with Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
 1. Where practical, install concrete inserts before placing concrete.
 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes and for slabs more than 4 inches thick.
 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes and for slabs less than 4 inches thick.
 5. Do not use powder-actuated concrete fasteners for seismic restraints.
- C. Hangers Exposed to View: Threaded rod and angle or channel supports.
- D. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.2 SEISMIC-RESTRAINT-DEVICE INSTALLATION

- A. Install hangers and braces designed to support the air terminal units and to restrain against seismic forces required by applicable building codes. Comply with ASCE/SEI 7. Comply with requirements for seismic-restraint devices in Section 230548 "Vibration and Seismic Controls for HVAC."
- B. Select seismic-restraint devices with capacities adequate to carry present and future static and seismic loads.
- C. Install cables so they do not bend across edges of adjacent equipment or building structure.
- D. Install cable restraints on air terminal units that are suspended with vibration isolators.
- E. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction.
- F. Attachment to Structure: If specific attachment is not indicated, anchor bracing and restraints to structure, to flanges of beams, to upper truss chords of bar joists, or to concrete members.
- G. Drilling for and Setting Anchors:
 - 1. Identify position of reinforcing steel and other embedded items before drilling holes for anchors. Do not damage existing reinforcement or embedded items during drilling. Notify Architect if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 - 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 - 3. Wedge Anchors: Protect threads from damage during anchor installation. Install heavy-duty sleeve anchors with sleeve fully engaged in the structural element to which anchor is to be fastened.
 - 4. Set anchors to manufacturer's recommended torque, using a torque wrench.
 - 5. Install zinc-coated steel anchors for interior applications and stainless-steel anchors for applications exposed to weather.

3.3 TERMINAL UNIT INSTALLATION

- A. Install air terminal units according to NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems."
- B. Install air terminal units level and plumb. Maintain sufficient clearance for normal service and maintenance.
- C. Install wall-mounted thermostats.

3.4 CONNECTIONS

- A. Where installing piping adjacent to air terminal unit, allow space for service and maintenance.
- B. Hot-Water Piping: Comply with requirements in Section 232113 "Hydronic Piping" and Section 232116 "Hydronic Piping Specialties," and connect heating coils to supply with shutoff valve, strainer, control valve, and union or flange; and to return with balancing valve and union or flange.
- C. Comply with requirements in Section 233113 "Metal Ducts" for connecting ducts to air terminal units.

- D. Make connections to air terminal units with flexible connectors complying with requirements in Section 233300 "Air Duct Accessories."

3.5 IDENTIFICATION

- A. Label each air terminal unit with plan number, nominal airflow, and maximum and minimum factory-set airflows. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for equipment labels and warning signs and labels.

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. After installing air terminal units and after electrical circuitry has been energized, test for compliance with requirements.
 - 2. Leak Test: After installation, fill water coils and test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Air terminal unit will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.7 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Verify that inlet duct connections are as recommended by air terminal unit manufacturer to achieve proper performance.
 - 3. Verify that controls and control enclosure are accessible.
 - 4. Verify that control connections are complete.
 - 5. Verify that nameplate and identification tag are visible.
 - 6. Verify that controls respond to inputs as specified.

3.8 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain air terminal units.

END OF SECTION 233600

SECTION 237313 - MODULAR INDOOR CENTRAL-STATION AIR-HANDLING UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Constant-air-volume, single-zone air-handling units.
 - 2. Variable-air-volume, single-zone air-handling units.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Casing panels shall be self-supporting and capable of withstanding 133 percent of internal static pressures indicated, without panel joints exceeding a deflection of L/100 where "L" is the unsupported span length within completed casings.
- B. Seismic Performance: Air-handling units shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.4 ACTION SUBMITTALS

- A. Product Data: For each air-handling unit indicated.
 - 1. Unit dimensions and weight.
 - 2. Cabinet material, metal thickness, finishes, insulation, and accessories.
 - 3. Fans:
 - a. Certified fan-performance curves with system operating conditions indicated.
 - b. Certified fan-sound power ratings.
 - c. Fan construction and accessories.
 - d. Motor ratings, electrical characteristics, and motor accessories.
 - 4. Certified coil-performance ratings with system operating conditions indicated.
 - 5. Dampers, including housings, linkages, and operators.
 - 6. Filters with performance characteristics.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Floor plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Mechanical-room layout and relationships between components and adjacent structural and mechanical elements.
 - 2. Support location, type, and weight.
 - 3. Field measurements.
- B. Seismic Qualification Certificates: For air-handling units, accessories, and components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Source quality-control reports.
- D. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For air-handling units to include in emergency, operation, and maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Filters: One set(s) for each air-handling unit.
 - 2. Gaskets: One set(s) for each access door.
 - 3. Fan Belts: One set(s) for each air-handling unit fan.

1.8 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NFPA Compliance: Comply with NFPA 90A for design, fabrication, and installation of air-handling units and components.
- C. ARI Certification: Air-handling units and their components shall be factory tested according to ARI 430, "Central-Station Air-Handling Units," and shall be listed and labeled by ARI.
- D. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

- E. ASHRAE/IESNA 90.1 Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."
- F. Comply with NFPA 70.

1.9 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided.
- B. Coordinate sizes and locations of structural-steel support members, if any, with actual equipment provided.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Air Enterprises, Inc.
 - 2. Airtherm; a Mestek company.
 - 3. Buffalo Air Handling.
 - 4. Carrier Corporation; a unit of United Technologies Corp.
 - 5. Coil Company, LLC.
 - 6. Dunham-Bush, Inc.
 - 7. Engineered Air.
 - 8. Mammoth Inc.
 - 9. Scott Springfield Mfg. Inc.
 - 10. Trane.
 - 11. USA Coil & Air.
 - 12. YORK; a Johnson Controls company.

2.2 UNIT CASINGS

- A. General Fabrication Requirements for Casings:
 - 1. Forming: Form walls, roofs, and floors with at least two breaks at each joint.
 - 2. Casing Joints: Sheet metal screws or pop rivets.
 - 3. Sealing: Seal all joints with water-resistant sealant.
 - 4. Factory Finish for Steel Casings: Apply manufacturer's standard primer immediately after cleaning and pretreating.
 - 5. Factory Finish for Steel Casings: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on enamel finish, consisting of prime coat and thermosetting topcoat.
 - 6. Casing Coating: Phenolic.
 - 7. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
- B. Casing Insulation and Adhesive:
 - 1. Materials: ASTM C 1071, Type I.

2. Location and Application: Factory applied with adhesive and mechanical fasteners to the internal surface of section panels downstream from, and including, the cooling-coil section.
 - a. Liner Adhesive: Comply with ASTM C 916, Type I.
 - b. Mechanical Fasteners: Galvanized steel, suitable for adhesive attachment, mechanical attachment, or welding attachment to duct without damaging liner when applied as recommended by manufacturer and without causing leakage in cabinet.
 - c. Liner materials applied in this location shall have air-stream surface coated with a temperature-resistant coating or faced with a plain or coated fibrous mat or fabric depending on service-air velocity.
 3. Location and Application: Encased between outside and inside casing.
- C. Inspection and Access Panels and Access Doors:
1. Panel and Door Fabrication: Formed and reinforced, single- or double-wall and insulated panels of same materials and thicknesses as casing.
 2. Inspection and Access Panels:
 - a. Fasteners: Two or more camlock type for panel lift-out operation. Arrangement shall allow panels to be opened against air-pressure differential.
 - b. Gasket: Neoprene, applied around entire perimeters of panel frames.
 - c. Size: Large enough to allow inspection and maintenance of air-handling unit's internal components.
 3. Access Doors:
 - a. Hinges: A minimum of two ball-bearing hinges or stainless-steel piano hinge and two wedge-lever-type latches, operable from inside and outside. Arrange doors to be opened against air-pressure differential.
 - b. Gasket: Neoprene, applied around entire perimeters of panel frames.
 - c. Fabricate windows in fan section doors of double-glazed, wire-reinforced safety glass with an air space between panes and sealed with interior and exterior rubber seals.
 - d. Size: At least 24 inches wide by full height of unit casing up to a maximum height of 60 inches.
 4. Locations and Applications:
 - a. Fan Section: Doors and inspection and access panels.
 - b. Access Section: Doors.
 - c. Coil Section: Inspection and access panel.
 - d. Damper Section: Inspection and access panels.
 - e. Filter Section: Inspection and access panels large enough to allow periodic removal and installation of filters.
 - f. Mixing Section: Doors.
 - g. Humidifier Section: Doors.
 5. Service Light: 100-W vaporproof fixture with switched junction box located outside adjacent to door.
 - a. Locations: Fan section.
- D. Condensate Drain Pans:

1. Fabricated with one percent slope in at least two planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) and from humidifiers and to direct water toward drain connection.
 - a. Length: Extend drain pan downstream from leaving face to comply with ASHRAE 62.1.
 - b. Depth: A minimum of 2 inches deep.
 2. Formed sections.
 3. Single-wall, galvanized-steel sheet.
 4. Double-wall, galvanized-steel sheet with space between walls filled with foam insulation and moisture-tight seal.
 5. Drain Connection: Located at lowest point of pan and sized to prevent overflow. Terminate with threaded nipple on one end of pan.
 - a. Minimum Connection Size: NPS 1.
 6. Pan-Top Surface Coating: Asphaltic waterproofing compound.
 7. Units with stacked coils shall have an intermediate drain pan to collect condensate from top coil.
- E. Service Platform: Galvanized steel, 42 inches wide running entire length of unit and located on service access side, with angle side rails, 4-inch kick plates, and expanded metal floor. Provide platform with a fixed ladder that extends from the top of the side rail to the floor.
- F. Air-Handling-Unit Mounting Frame: Formed galvanized-steel channel or structural channel supports, designed for low deflection, welded with integral lifting lugs.
1. Seismic Fabrication Requirements: Fabricate mounting base and attachment to air-handling unit sections, accessories, and components with reinforcement strong enough to withstand seismic forces defined in Section 230548 "Vibration and Seismic Controls for HVAC" when air-handling unit frame is anchored to building structure.

2.3 FAN, DRIVE, AND MOTOR SECTION

- A. Fan and Drive Assemblies: Statically and dynamically balanced and designed for continuous operation at maximum-rated fan speed and motor horsepower.
1. Shafts: Designed for continuous operation at maximum-rated fan speed and motor horsepower, and with field-adjustable alignment.
 - a. Turned, ground, and polished hot-rolled steel with keyway. Ship with a protective coating of lubricating oil.
 - b. Designed to operate at no more than 70 percent of first critical speed at top of fan's speed range.
- B. Centrifugal Fan Housings: Formed- and reinforced-steel panels to form curved scroll housings with shaped cutoff and spun-metal inlet bell.
1. Bracing: Steel angle or channel supports for mounting and supporting fan scroll, wheel, motor, and accessories.
 2. Horizontal-Flanged, Split Housing: Bolted construction.
 3. Housing for Supply Fan: Attach housing to fan-section casing with metal-edged flexible duct connector.
 4. Flexible Connector: Factory fabricated with a fabric strip 3-1/2 inches wide attached to 2 strips of 2-3/4-inch-wide, 0.028-inch-thick, galvanized-steel sheet or 0.032-inch-thick aluminum sheets; select metal compatible with casing.

- a. Flexible Connector Fabric: Glass fabric, double coated with neoprene. Fabrics, coatings, and adhesives shall comply with UL 181, Class 1.
 - 1) Fabric Minimum Weight: 26 oz./sq. yd..
 - 2) Fabric Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
 - 3) Fabric Service Temperature: Minus 40 to plus 200 deg F.
- C. Plenum Fan Housings: Steel frame and panel; fabricated without fan scroll and volute housing.
- D. Backward-Inclined, Centrifugal Fan Wheels: Single-width-single-inlet and double-width-double-inlet construction with curved inlet flange, backplate, backward-inclined blades welded or riveted to flange and backplate; cast-iron or cast-steel hub riveted to backplate and fastened to shaft with set screws.
- E. Forward-Curved, Centrifugal Fan Wheels: Inlet flange, backplate, and shallow blades with inlet and tip curved forward in direction of airflow and mechanically fastened to flange and backplate; cast-steel hub swaged to backplate and fastened to shaft with set screws.
- F. Airfoil, Centrifugal Fan Wheels: Smooth-curved inlet flange, backplate, and hollow die-formed airfoil-shaped blades continuously welded at tip flange and backplate; cast-iron or cast-steel hub riveted to backplate and fastened to shaft with set screws.
- G. Axial Fans: Fan wheel and housing, straightening-vane section, factory-mounted motor with belt drive or direct drive, an inlet cone section, and accessories.
 1. Variable-Pitch Fans: Internally mounted electronic actuator, externally mounted positive positioner, and mechanical-blade-pitch indicator.
 2. Housings: Galvanized steel.
 - a. Inlet and Outlet Connections: Flanges.
 - b. Guide Vane Section: Integral guide vanes downstream from fan wheel designed to straighten airflow.
- H. Fan Shaft Bearings:
 1. Prelubricated and Sealed, Ball Bearings: Self-aligning, pillow-block type with a rated life of 120,000 hours according to ABMA 9.
 2. Grease-Lubricated, Tapered-Roller Bearings: Self-aligning, pillow-block type with double-locking collars and 2-piece, cast-iron housing with grease lines extended to outside unit and a rated life of 120,000 hours according to ABMA 11.
 3. Grease-Lubricated Bearings: Self-aligning, pillow-block-type, ball or roller bearings with adapter mount and two-piece, cast-iron housing with grease lines extended to outside unit.
- I. Belt Drives: Factory mounted, with adjustable alignment and belt tensioning, and with 1.5 service factor based on fan motor.
 1. Pulleys: Cast iron or cast steel with split, tapered bushing; dynamically balanced at factory.
 2. Motor Pulleys: Adjustable pitch for use with 5-hp motors and smaller; fixed pitch for use with motors larger than 5 hp. Select pulley size so pitch adjustment is at the middle of adjustment range at fan design conditions.
 3. Belts: Oil resistant, nonsparking, and nonstatic; in matched sets for multiple-belt drives.
 4. Belt Guards: Comply with requirements specified by OSHA and fabricate according to SMACNA's "HVAC Duct Construction Standards"; 0.1046-inch-thick, 3/4-inch diamond-mesh wire screen, welded to steel angle frame; prime coated.

- J. Variable-Inlet Vanes: Steel, with blades supported at both ends with permanently lubricated bearings. Variable mechanism terminating in single lever for connection to control actuator with connecting shaft for second set of variable inlet vanes on double-width fans.
- K. Discharge Dampers: Heavy-duty steel assembly with channel frame and sealed ball bearings, and opposed blades constructed of two plates formed around and welded to shaft, with blades linked out of air stream to single control lever.
- L. Internal Vibration Isolation and Seismic Control: Fans shall be factory mounted with manufacturer's standard restrained vibration isolation mounting devices having a minimum static deflection of 1 inch.
 - 1. Seismic Fabrication Requirements: Fabricate fan section, internal mounting frame and attachment to fans, fan housings, motors, casings, accessories, and other fan section components with reinforcement strong enough to withstand seismic forces defined in Section 230548 "Vibration and Seismic Controls for HVAC" when fan-mounting frame and air-handling-unit mounting frame are anchored to building structure.
- M. Motor: Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
 - 1. Enclosure Type: Totally enclosed, fan cooled.
 - 2. NEMA Premium (TM) efficient motors as defined in NEMA MG 1.
 - 3. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
 - 4. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in electrical Sections.
 - 5. Mount unit-mounted disconnect switches on exterior of unit.
- N. Variable Frequency Controllers:
 - 1. Description: NEMA ICS 2, IGBT, PWM, VFC; listed and labeled as a complete unit and arranged to provide variable speed of an NEMA MG 1, Design B, 3-phase induction motor by adjusting output voltage and frequency.
 - 2. Output Rating: 3-phase; 6 to 60 Hz, with voltage proportional to frequency throughout voltage range.
 - 3. Unit Operating Requirements:
 - a. Input ac voltage tolerance of 208 V, plus or minus 5 percent.
 - b. Input frequency tolerance of 60 Hz, plus or minus 6 percent.
 - c. Minimum Efficiency: 96 percent at 60 Hz, full load.
 - d. Minimum Displacement Primary-Side Power Factor: 96 percent.
 - e. Overload Capability: 1.1 times the base load current for 60 seconds; 2.0 times the base load current for 3 seconds.
 - f. Starting Torque: 100 percent of rated torque or as indicated.
 - g. Speed Regulation: Plus or minus 1 percent.
 - 4. Isolated control interface to allow controller to follow control signal over an 11:1 speed range.
 - 5. Internal Adjustability Capabilities:
 - a. Minimum Speed: 5 to 25 percent of maximum rpm.
 - b. Maximum Speed: 80 to 100 percent of maximum rpm.
 - c. Acceleration: 2 to a minimum of 22 seconds.
 - d. Deceleration: 2 to a minimum of 22 seconds.
 - e. Current Limit: 50 to a minimum of 110 percent of maximum rating.

6. Self-Protection and Reliability Features:
 - a. Input transient protection by means of surge suppressors.
 - b. Undervoltage and overvoltage trips; inverter overtemperature, overload, and overcurrent trips.
 - c. Adjustable motor overload relays capable of NEMA ICS 2, Class 10 performance.
 - d. Notch filter to prevent operation of the controller-motor-load combination at a natural frequency of the combination.
 - e. Instantaneous line-to-line and line-to-ground overcurrent trips.
 - f. Loss-of-phase protection.
 - g. Reverse-phase protection.
 - h. Short-circuit protection.
 - i. Motor overtemperature fault.
7. Automatic Reset/Restart: Attempts three restarts after controller fault or on return of power after an interruption and before shutting down for manual reset or fault correction. Bidirectional autospeed search shall be capable of starting into rotating loads spinning in either direction and returning motor to set speed in proper direction, without damage to controller, motor, or load.
8. Power-Interruption Protection: To prevent motor from re-energizing after a power interruption until motor has stopped.
9. Torque Boost: Automatically varies starting and continuous torque to at least 1.5 times the minimum torque to ensure high-starting torque and increased torque at slow speeds.
10. Motor Temperature Compensation at Slow Speeds: Adjustable current fall-back based on output frequency for temperature protection of self-cooled, fan-ventilated motors at slow speeds.
11. Door-mounted LED status lights shall indicate the following conditions:
 - a. Power on.
 - b. Run.
 - c. Overvoltage.
 - d. Line fault.
 - e. Overcurrent.
 - f. External fault.
12. Panel-Mounted Operator Station: Start-stop and auto-manual selector switches with manual-speed-control potentiometer and elapsed time meter.
13. Meters or digital readout devices and selector switch, mounted flush in controller door and connected to indicate the following controller parameters:
 - a. Output frequency (Hertz).
 - b. Motor speed (rpm).
 - c. Motor status (running, stop, fault).
 - d. Motor current (amperes).
 - e. Motor torque (percent).
 - f. Fault or alarming status (code).
 - g. Proportional-integral-derivative (PID) feedback signal (percent).
 - h. DC-link voltage (volts direct current).
 - i. Set-point frequency (Hertz).
 - j. Motor output voltage (volts).
14. Control Signal Interface:
 - a. Electric Input Signal Interface: A minimum of 2 analog inputs (0 to 10 V or 0/4-20 mA) and 6 programmable digital inputs.
 - b. Remote signal inputs capable of accepting any of the following speed-setting input signals from the control system:

- 1) 0 to 10-V dc.
 - 2) 0-20 or 4-20 mA.
 - 3) Potentiometer using up/down digital inputs.
 - 4) Fixed frequencies using digital inputs.
 - 5) RS485.
 - 6) Keypad display for local hand operation.
- c. Output signal interface with a minimum of 1 analog output signal (0/4-20 mA), which can be programmed to any of the following:
- 1) Output frequency (Hertz).
 - 2) Output current (load).
 - 3) DC-link voltage (volts direct current).
 - 4) Motor torque (percent).
 - 5) Motor speed (rpm).
 - 6) Set-point frequency (Hertz).
- d. Remote indication interface with a minimum of 2 dry circuit relay outputs (120-V ac, 1 A) for remote indication of the following:
- 1) Motor running.
 - 2) Set-point speed reached.
 - 3) Fault and warning indication (overtemperature or overcurrent).
 - 4) High- or low-speed limits reached.
15. Communications: RS485 interface allows VFC to be used with an external system within a multidrop LAN configuration. Interface shall allow all parameter settings of VFC to be programmed via BMS control. Provide capability for VFC to retain these settings within the nonvolatile memory.
16. Integral Disconnecting Means: NEMA AB 1, instantaneous-trip circuit breaker with lockable handle.
17. Accessories:
- a. Devices shall be factory installed in controller enclosure unless otherwise indicated.
 - b. Push-Button Stations, Pilot Lights, and Selector Switches: NEMA ICS 2, heavy-duty type.
 - c. Standard Displays:
 - 1) Output frequency (Hertz).
 - 2) Set-point frequency (Hertz).
 - 3) Motor current (amperes).
 - 4) DC-link voltage (volts direct current).
 - 5) Motor torque (percent).
 - 6) Motor speed (rpm).
 - 7) Motor output voltage (volts).

2.4 COIL SECTION

A. General Requirements for Coil Section:

1. Comply with ARI 410.
2. Fabricate coil section to allow removal and replacement of coil for maintenance and to allow in-place access for service and maintenance of coil(s).
3. For multizone units, provide air deflectors and air baffles to balance airflow across coils.
4. Coils shall not act as structural component of unit.

5. Seismic Fabrication Requirements: Fabricate coil section, internal mounting frame and attachment to coils, and other coil section components with reinforcement strong enough to withstand seismic forces defined in Section 230548 "Vibration and Seismic Controls for HVAC" when coil-mounting frame and air-handling-unit mounting frame are anchored to building structure.

2.5 AIR FILTRATION SECTION

A. General Requirements for Air Filtration Section:

1. Comply with NFPA 90A.
2. Provide minimum arrestance according to ASHRAE 52.1, and a minimum efficiency reporting value (MERV) according to ASHRAE 52.2.
3. Provide filter holding frames arranged for flat or angular orientation, with access doors on both sides of unit. Filters shall be removable from one side or lifted out from access plenum.

B. Disposable Panel Filters:

1. Factory-fabricated, viscous-coated, flat-panel type.
2. Thickness: 2 inches.
3. Arrestance (ASHRAE 52.1): 80.
4. MERV (ASHRAE 52.2): 5.
5. Media: Interlaced glass fibers sprayed with nonflammable adhesive and antimicrobial agent.
6. Frame: Galvanized steel, with metal grid on outlet side, steel rod grid on inlet side, hinged, and with pull and retaining handles.

C. Filter Gage:

1. 2-inch- diameter, diaphragm-actuated dial in metal case.
2. Vent valves.
3. Black figures on white background.
4. Front recalibration adjustment.
5. 2 percent of full-scale accuracy.
6. Range: 0- to 1.0-inch wg.
7. Accessories: Static-pressure tips with integral compression fittings, 1/4-inch aluminum tubing, and 2- or 3-way vent valves.

2.6 DAMPERS

A. General Requirements for Dampers: Leakage rate, according to AMCA 500, "Laboratory Methods for Testing Dampers for Rating," shall not exceed 2 percent of air quantity at 2000-fpm face velocity through damper and 4-inch wg pressure differential.

B. Damper Operators: Comply with requirements in Section 230923.12 "Control Dampers."

C. Electronic Damper Operators:

1. Direct-coupled type designed for minimum 60,000 full-stroke cycles at rated torque.
2. Electronic damper position indicator shall have visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.
3. Operator Motors:

- a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
 - b. Size to operate with sufficient reserve power to provide smooth modulating action or two-position action.
 - c. Permanent Split-Capacitor or Shaded-Pole Type: Gear trains completely oil immersed and sealed. Equip spring-return motors with integral spiral-spring mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.
4. Nonspring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
 5. Spring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running and breakaway torque of 150 in. x lbf.
 6. Size dampers for running torque calculated as follows:
 - a. Parallel-Blade Damper with Edge Seals: 7 inch-lb/sq. ft. of damper.
 - b. Opposed-Blade Damper with Edge Seals: 5 inch-lb/sq. ft. of damper.
 - c. Parallel-Blade Damper without Edge Seals: 4 inch-lb/sq. ft. of damper.
 - d. Opposed-Blade Damper without Edge Seals: 3 inch-lb/sq. ft. of damper.
 - e. Dampers with 2- to 3-Inch wg of Pressure Drop or Face Velocities of 1000 to 2500 fpm: Increase running torque by 1.5.
 - f. Dampers with 3- to 4-Inch wg of Pressure Drop or Face Velocities of 2500 to 3000 fpm: Increase running torque by 2.0.
 7. Coupling: V-bolt and V-shaped, toothed cradle.
 8. Overload Protection: Electronic overload or digital rotation-sensing circuitry.
 9. Fail-Safe Operation: Mechanical, spring-return mechanism with external, manual gear release on nonspring-return actuators.
 10. Power Requirements (Two-Position Spring Return): 24-V ac.
 11. Power Requirements (Modulating): Maximum 10 VA at 24-V ac or 8 W at 24-V dc.
 12. Proportional Signal: 2- to 10-V dc or 4 to 20 mA, and 2- to 10-V dc position feedback signal.
 13. Temperature Rating: Minus 22 to plus 122 deg F.
 14. Run Time: 12 seconds open, 5 seconds closed.
- D. Zone Dampers: Two single-blade, galvanized-steel dampers offset 90 degrees from each other on cadmium-plated steel operating rod rotating in sintered bronze or nylon bearings mounted in a single galvanized-steel frame. Provide blade gaskets and edge seals, and mechanically fasten blades to operating rod.
- E. Face-and-Bypass Dampers: Opposed-blade, galvanized-steel dampers with cadmium-plated steel operating rods rotating in sintered bronze or nylon bearings mounted in a single galvanized-steel frame and with operating rods connected with a common linkage. Provide blade gaskets and edge seals, and mechanically fasten blades to operating rod.
- F. Outdoor- and Return-Air Mixing Dampers: Parallel-blade, galvanized-steel dampers mechanically fastened to cadmium-plated steel operating rod in reinforced cabinet. Connect operating rods with common linkage and interconnect linkages so dampers operate simultaneously.
- G. Outdoor- and Return-Air Dampers: Low-leakage, double-skin, airfoil-blade, galvanized-steel dampers with compressible jamb seals and extruded-vinyl blade edge seals in opposed-blade arrangement with cadmium-plated steel operating rods rotating in sintered bronze or nylon bearings mounted in a single galvanized-steel frame, and with operating rods connected with a common linkage. Leakage rate shall not exceed 5 cfm/sq. ft. at 1-inch wg and 9 cfm/sq. ft. at 4-inch wg.
- H. Mixing Section: Multiple-blade, air-mixer assembly located immediately downstream of mixing section.

I. Combination Filter and Mixing Section:

1. Cabinet support members shall hold 2-inch-thick, pleated, flat, permanent or throwaway filters.
2. Multiple-blade, air-mixer assembly shall mix air to prevent stratification, located immediately downstream of mixing box.

2.7 SOURCE QUALITY CONTROL

- A. Fan Sound-Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Fans shall bear AMCA-certified sound ratings seal.
- B. Fan Performance Rating: Factory test fan performance for airflow, pressure, power, air density, rotation speed, and efficiency. Rate performance according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating."
- C. Water Coils: Factory tested to 300 psig according to ARI 410 and ASHRAE 33.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine casing insulation materials and filter media before air-handling unit installation. Reject insulation materials and filter media that are wet, moisture damaged, or mold damaged.
- C. Examine roughing-in for hydronic, and condensate drainage piping systems and electrical services to verify actual locations of connections before installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Equipment Mounting:
 1. Install air-handling units on cast-in-place concrete equipment bases. Comply with requirements for equipment bases and foundations specified in Section 033053 "Miscellaneous Cast-in-Place Concrete."
 2. Comply with requirements for vibration isolation and seismic control devices specified in Section 230548 "Vibration and Seismic Controls for HVAC."
 3. Comply with requirements for vibration isolation devices specified in Section 230548.13 "Vibration Controls for HVAC."
- B. Suspended Units: Suspend and brace units from structural-steel support frame using threaded steel rods and spring hangers. Comply with requirements for vibration isolation devices specified in Section 230548 "Vibration and Seismic Controls for HVAC."
- C. Arrange installation of units to provide access space around air-handling units for service and maintenance.

- D. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction and testing, with new, clean filters.
- E. Install filter-gage, static-pressure taps upstream and downstream of filters. Mount filter gages on outside of filter housing or filter plenum in accessible position. Provide filter gages on filter banks, installed with separate static-pressure taps upstream and downstream of filters.

3.3 CONNECTIONS

- A. Comply with requirements for piping specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to air-handling unit to allow service and maintenance.
- C. Connect piping to air-handling units mounted on vibration isolators with flexible connectors.
- D. Connect condensate drain pans using NPS 1-1/4, ASTM B 88, Type M copper tubing. Extend to nearest equipment or floor drain. Construct deep trap at connection to drain pan and install cleanouts at changes in direction.
- E. Hot- and Chilled-Water Piping: Comply with applicable requirements in Section 232113 "Hydronic Piping" and Section 232116 Hydronic Piping Specialties." Install shutoff valve and union or flange at each coil supply connection. Install balancing valve and union or flange at each coil return connection.
- F. Connect duct to air-handling units with flexible connections. Comply with requirements in Section 233300 "Air Duct Accessories."

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 - 1. Leak Test: After installation, fill water and steam coils with water, and test coils and connections for leaks.
 - 2. Fan Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Air-handling unit or components will be considered defective if unit or components do not pass tests and inspections.
- E. Prepare test and inspection reports.

3.5 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Verify that shipping, blocking, and bracing are removed.
 - 3. Verify that unit is secure on mountings and supporting devices and that connections to piping, ducts, and electrical systems are complete. Verify that proper thermal-overload protection is installed in motors, controllers, and switches.
 - 4. Verify proper motor rotation direction, free fan wheel rotation, and smooth bearing operations. Reconnect fan drive system, align belts, and install belt guards.
 - 5. Verify that bearings, pulleys, belts, and other moving parts are lubricated with factory-recommended lubricants.
 - 6. Verify that zone dampers fully open and close for each zone.
 - 7. Verify that face-and-bypass dampers provide full face flow.
 - 8. Verify that outdoor- and return-air mixing dampers open and close, and maintain minimum outdoor-air setting.
 - 9. Comb coil fins for parallel orientation.
 - 10. Install new, clean filters.
 - 11. Verify that manual and automatic volume control and fire and smoke dampers in connected duct systems are in fully open position.

- B. Starting procedures for air-handling units include the following:
 - 1. Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated rpm. Replace fan and motor pulleys as required to achieve design conditions.
 - 2. Measure and record motor electrical values for voltage and amperage.
 - 3. Manually operate dampers from fully closed to fully open position and record fan performance.

3.6 ADJUSTING

- A. Adjust damper linkages for proper damper operation.

- B. Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC" for air-handling system testing, adjusting, and balancing.

3.7 CLEANING

- A. After completing system installation and testing, adjusting, and balancing air-handling unit and air-distribution systems and after completing startup service, clean air-handling units internally to remove foreign material and construction dirt and dust. Clean fan wheels, cabinets, dampers, coils, and filter housings, and install new, clean filters.

3.8 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain air-handling units.

END OF SECTION 237313

SECTION 260519 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

B. Related Requirements:

1. Section 260523 "Control-Voltage Electrical Power Cables" for control systems communications cables and Classes 1, 2 and 3 control cables.

1.3 DEFINITIONS

- A. VFC: Variable frequency controller.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product (s) indicated on Drawings or comparable product by one of the following:
1. Alcan Products Corporation; Alcan Cable Division.
 2. Belden Inc.
 3. Southwire Incorporated.
- B. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.
- C. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN-2-THWN-2 and Type XHHW-2.
- D. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for armored cable, Type AC metal-clad cable, Type MC with ground wire.
- E. VFC Cable:
1. Comply with UL 1277, UL 1685, and NFPA 70 for Type TC-ER cable.
 2. Type TC-ER with oversized crosslinked polyethylene insulation, shielded per VFC manufacturers recommendations, and sunlight- and oil-resistant outer PVC jacket.
 3. Comply with UL requirements for cables in the environment for which applied.

2.2 CONNECTORS AND SPLICES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Hubbell Power Systems, Inc.
 2. Ideal Industries, Inc.
 3. O-Z/Gedney; a brand of the EGS Electrical Group.
 4. 3M; Electrical Markets Division.
 5. Tyco Electronics.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Exposed Feeders: Type THHN-2-THWN-2, single conductors in raceway or Type XHHW-2, single conductors in raceway.
- B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-2-THWN-2, single conductors in raceway.
- C. Exposed Branch Circuits, Including in Crawlspace: Type THHN-2-THWN-2, single conductors in raceway.
- D. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-2-THWN-2, single conductors in raceway, or Metal-clad cable, Type MC.
- E. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
- F. VFC Output Circuits: Type XHHW-2 in metal conduit, Type TC-ER cable, shielded per VFC manufacturers recommendations.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

- A.
- B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- C. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- D. Wiring at Outlets: Install conductor at each outlet, with an appropriate amount of slack.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform the following tests and inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 3. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.
 - a. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.

- b. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
 - c. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
- D. Test and Inspection Reports: Prepare a written report to record the following:
- 1. Procedures used.
 - 2. Results that comply with requirements.
 - 3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- E. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 260519

SECTION 260526 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes grounding and bonding systems and equipment.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency and testing agency's field supervisor.
- B. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Burndy; Part of Hubbell Electrical Systems.
 - 2. ERICO International Corporation.
 - 3. O-Z/Gedney; A Brand of the EGS Electrical Group.

2.2 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.3 CONDUCTORS

- A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
 - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 - 6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
 - 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.
 2. Lighting circuits.
 3. Receptacle circuits.
 4. Single-phase motor and appliance branch circuits.
 5. Three-phase motor and appliance branch circuits.
 6. Flexible raceway runs.
 7. Armored and metal-clad cable runs.
 8. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
- C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- D. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- E. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.
- F. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
1. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
- C. Grounding and Bonding for Piping:
1. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- D. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.

B. Tests and Inspections:

1. After installing grounding facilities but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

END OF SECTION 260526

SECTION 260529 – HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Hangers and supports for electrical equipment and systems.
 - 2. Construction requirements for concrete bases.

1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.5 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Steel slotted support systems.
 - 2. Nonmetallic slotted support systems.

1.6 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.7 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with NFPA 70.

1.8 COORDINATION

- A. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.; a division of Cooper Industries.
 - c. ERICO International Corporation.
 - d. Thomas & Betts Corporation.
 - e. Unistrut; Tyco International, Ltd.
 - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
 - 4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 - 5. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

- a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Hilti Inc.
 - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Hilti Inc.
 - 3) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
 6. Toggle Bolts: All-steel springhead type.
 7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 1. Secure raceways and cables to these supports.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1 EMT, and RMC may be supported by openings through structure members, as permitted in NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.
 - 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
 - 6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
 - 7. To Light Steel: Sheet metal screws.
 - 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Clean and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

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Bid Issue

Union County Courthouse Fire Code Upgrades
Phase C1 Rotunda & Phase C2 Tower-Internal Stair
Elizabeth, New Jersey

END OF SECTION 260529

SECTION 260533 – RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Metal conduits, tubing, and fittings.
 - 2. Nonmetal conduits, tubing, and fittings.
 - 3. Metal wireways and auxiliary gutters.
 - 4. Boxes, enclosures, and cabinets.

1.3 DEFINITIONS

- A. ARC: Aluminum rigid conduit.
- B. GRC: Galvanized rigid steel conduit.

1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.
- C. Samples: For surface raceways and for each color and texture specified.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
 - 1. Structural members in paths of conduit groups with common supports.
 - 2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.
- B. Qualification Data: For professional engineer.
- C. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
4. Detailed description of conduit support devices and interconnections on which the certification is based and their installation requirements.

D. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Allied Tube & Conduit; a Tyco International Ltd. Co.
2. O-Z/Gedney; a brand of EGS Electrical Group.
3. Robroy Industries.
4. Thomas & Betts Corporation.
5. Wheatland Tube Company; a division of John Maneely Company.

B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. ARC: Comply with ANSI C80.5 and UL 6A.

E. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.

1. Comply with NEMA RN 1.
2. Coating Thickness: 0.040 inch, minimum.

F. EMT: Comply with ANSI C80.3 and UL 797.

G. FMC: Comply with UL 1; aluminum.

H. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

I. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.

1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
2. Fittings for EMT:
 - a. Material: Die cast.
 - b. Type: Setscrew or compression.
3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

- J. Joint Compound for GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Lamson & Sessions; Carlon Electrical Products.
 - 2. RACO; a Hubbell company.
 - 3. Thomas & Betts Corporation.
- B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- D. LFNC: Comply with UL 1660.
- E. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
- F. Fittings for LFNC: Comply with UL 514B.
- G. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- H. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cooper B-Line, Inc.
 - 2. Hoffman; a Pentair company.
 - 3. Square D; a brand of Schneider Electric.
- B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1, Type 3R, Type 4 and Type 12, and sized according to NFPA 70.
 - 1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Screw-cover type unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

2.4 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Cooper Technologies Company; Cooper Crouse-Hinds.
 2. EGS/Appleton Electric.
 3. Hoffman; a Pentair company.
 4. Hubbell Incorporated; Killark Division.
 5. Milbank Manufacturing Co.
 6. O-Z/Gedney; a brand of EGS Electrical Group.
 7. RACO; a Hubbell Company.
 8. Robroy Industries.
 9. Spring City Electrical Manufacturing Company.
 10. Thomas & Betts Corporation.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, Type FD, with gasketed cover.
- E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- F. Metal Floor Boxes:
1. Material: Cast metal or sheet metal.
 2. Type: Fully adjustable.
 3. Shape: Rectangular.
 4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- G. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- H. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb.
1. Listing and Labeling: Paddle fan outlet boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- I. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- J. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, with gasketed cover.
- K. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- L. Device Box Dimensions: 4 inches square by 2-1/8 inches deep or 4 inches by 2-1/8 inches by 2-1/8 inches deep.
- M. Gangable boxes are allowed.
- N. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

O. Cabinets:

1. NEMA 250, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: GRC.
2. Concealed Conduit, Aboveground: GRC.
3. Underground Conduit: RNC, Type EPC-40-PVC, or Type EPC-80-PVC, direct buried.
4. Connection to Vibrating Equipment (Including Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
 - a. Loading dock.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 - d. Areas subject to vehicle traffic.
4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: GRC.
7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 1/2-inch (control), 3/4-inch (power) trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.

2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 3. EMT: Use setscrew or compression, cast-metal fittings. Comply with NEMA FB 2.10.
 4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
- F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
- G. Install surface raceways only where indicated on Drawings.

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. Support conduit within 12 inches of enclosures to which attached.
- I. Stub-ups to Above Recessed Ceilings:
1. Use EMT, or RMC for raceways.
 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- K. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- L. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

- M. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- N. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- O. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- P. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- Q. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- R. Surface Raceways:
 - 1. Install surface raceway with a minimum 2-inch radius control at bend points.
 - 2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
- S. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- T. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service raceway enters a building or structure.
 - 3. Where otherwise required by NFPA 70.
- U. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- V. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - 1. Use LFMC in damp or wet locations subject to severe physical damage.
 - 2. Use LFMC in damp or wet locations not subject to severe physical damage.
- W. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- X. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- Y. Locate boxes so that cover or plate will not span different building finishes.
- Z. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

- AA. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- BB. Set metal floor boxes level and flush with finished floor surface.
- CC. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit.
2. Install backfill.
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
4. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
 - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
5. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.4 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.5 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

3.6 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

SECTION 260536 - CABLE TRAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Ladder cable trays.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- 1. Include data indicating dimensions and finishes for each type of cable tray indicated.

- B. Shop Drawings: For each type of cable tray.

- 1. Show fabrication and installation details of cable trays, including plans, elevations, and sections of components and attachments to other construction elements. Designate components and accessories, including clamps, brackets, hanger rods, splice-plate connectors, expansion-joint assemblies, straight lengths, and fittings.

- C. Delegated-Design Submittal: For seismic restraints.

- 1. Seismic-Restraint Details: Signed and sealed by a qualified professional engineer, licensed in the state where Project is located, who is responsible for their preparation.
- 2. Design Calculations: Calculate requirements for selecting seismic restraints.
- 3. Detail fabrication, including anchorages and attachments to structure and to supported cable trays.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Floor plans and sections, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

- 1. Include scaled cable tray layout and relationships between components and adjacent structural, electrical, and mechanical elements.
- 2. Vertical and horizontal offsets and transitions.
- 3. Clearances for access above and to side of cable trays.
- 4. Vertical elevation of cable trays above the floor or below bottom of ceiling structure.

- B. Seismic Qualification Certificates: For cable trays, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Field quality-control reports.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design cable tray supports and seismic bracing.
- B. Seismic Performance: Cable trays and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 1. The term "withstand" means "cable trays will remain in place without separation of any parts when subjected to the seismic forces specified."
 2. Component Importance Factor: 1.5.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes in cable tray installed outdoors.
 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 GENERAL REQUIREMENTS FOR CABLE TRAYS

- A. Cable Trays and Accessories: Identified as defined in NFPA 70 and marked for intended location, application, and grounding.
 1. Source Limitations: Obtain cable trays and components from single manufacturer.
- B. Sizes and Configurations: See the Cable Tray Schedule on Drawings for specific requirements for types, materials, sizes, and configurations.
- C. Structural Performance: See articles on individual cable tray types for specific values for the following parameters:
 1. Uniform Load Distribution: Capable of supporting a uniformly distributed load on the indicated support span when supported as a simple span and tested according to NEMA VE 1.
 2. Concentrated Load: A load applied at midpoint of span and centerline of tray.
 3. Load and Safety Factors: Applicable to both side rails and rung capacities.

2.3 LADDER CABLE TRAYS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Allied Tube & Conduit; a part of Atkore International.
2. B-line, an Eaton business.
3. Chalfant Manufacturing Company.
4. MonoSystems, Inc.
5. MP Husky USA Cable Tray & Cable Bus.
6. Niedax Inc.
7. Thomas & Betts Corporation; A Member of the ABB Group.

B. Description:

1. Configuration: Two I-beam side rails with transverse rungs welded to side rails.
2. Rung Spacing: 6 inches o.c.
3. Radius-Fitting Rung Spacing: 9 inches at center of tray's width.
4. Minimum Cable-Bearing Surface for Rungs: 7/8-inch width with radius edges.
5. No portion of the rungs shall protrude below the bottom plane of side rails.
6. Structural Performance of Each Rung: Capable of supporting a maximum cable load, with a safety factor of 1.5, plus a 200-lb concentrated load, when tested according to NEMA VE 1.
7. Minimum Usable Load Depth: 3 inches.
8. Straight Section Lengths: 10 feet except where shorter lengths are required to facilitate tray assembly.
9. Class Designation: Comply with NEMA VE 1, Class 12B.
10. Splicing Assemblies: Bolted type using serrated flange locknuts.
11. Hardware and Fasteners: Steel, zinc plated according to ASTM B 633.
12. Splice Plate Capacity: Splices located within support span shall not diminish rated loading capacity of cable tray.

2.4 MATERIALS AND FINISHES

A. Steel:

1. Straight Section and Fitting Side Rails and Rungs: Steel complies with the minimum mechanical properties of ASTM A 1008/A 1008M, Grade 33, Type 2.
2. Steel Tray Splice Plates: ASTM A 1011/A 1011M, HSLAS, Grade 50, Class 1.
3. Fasteners: Steel complies with the minimum mechanical properties of ASTM A 510/A 510M, Grade 1008.
4. Finish: Mill galvanized before fabrication.
 - a. Standard: Comply with ASTM A 653/A 653M, G90.
 - b. Hardware: Chromium-zinc plated, ASTM F 1136.
5. Finish: Electrogalvanized before fabrication.
 - a. Standard: Comply with ASTM B 633.
 - b. Hardware: Galvanized, ASTM B 633.
6. Finish: Hot-dip galvanized after fabrication.
 - a. Standard: Comply with ASTM A123/A123 M, Class B2.
 - b. Hardware: Chromium-zinc plated, ASTM F 1136.
7. Finish: Epoxy-resin paint.
 - a. Powder-Coat Enamel: Cable tray manufacturer's recommended primer and corrosion-inhibiting treatment, with factory-applied powder-coat paint.
 - b. Epoxy-Resin Prime Coat: Cold-curing epoxy primer, MPI# 101.

- c. Epoxy-Resin Topcoat: Epoxy, cold-cured, gloss, MPI# 77.
 - d. Hardware: Chromium-zinc plated. ASTM F 1136.
8. Finish: Factory-standard primer, ready for field painting, with chromium-zinc-plated hardware according to ASTM F 1136.
9. Finish: Black oxide finish for support accessories and miscellaneous hardware according to ASTM D 769.
- B. Aluminum:
- 1. Materials: Alloy 6063-T6 according to ANSI H35.1/H 35.1M for extruded components, and Alloy 6061-T6 according to ANSI H35.1/H 35.1M for fabricated parts.
 - 2. Hardware: Chromium-zinc-plated steel, ASTM F 1136.
 - 3. Hardware for Aluminum Cable Tray Used Outdoors: Stainless steel, Type 316, ASTM F 593 and ASTM F 594.

2.5 CABLE TRAY ACCESSORIES

- A. Fittings: Tees, crosses, risers, elbows, and other fittings as indicated, of same materials and finishes as cable tray.
- B. Covers: Louvered type made of same materials and with same finishes as cable tray.
- C. Barrier Strips: Same materials and finishes as for cable tray.
- D. Cable tray supports and connectors, including bonding jumpers, as recommended by cable tray manufacturer.

2.6 WARNING SIGNS

- A. Lettering: 1-1/2-inch- high, black letters on yellow background with legend "Warning! Not To Be Used as Walkway, Ladder, or Support for Ladders or Personnel."
- B. Comply with requirements for fasteners in Section 260553 "Identification for Electrical Systems."

2.7 SOURCE QUALITY CONTROL

- A. Testing: Test and inspect cable trays according to NEMA FG 1.

PART 3 - EXECUTION

3.1 CABLE TRAY INSTALLATION

- A. Install cable trays according to NEMA FG 1.
- B. Install cable trays as a complete system, including fasteners, hold-down clips, support systems, barrier strips, adjustable horizontal and vertical splice plates, elbows, reducers, tees, crosses, cable dropouts, adapters, covers, and bonding.
- C. Install cable trays so that the tray is accessible for cable installation and all splices are accessible for inspection and adjustment.

- D. Remove burrs and sharp edges from cable trays.
- E. Join aluminum cable tray with splice plates; use four square-neck carriage bolts and locknuts.
- F. Fasten cable tray supports to building structure and install seismic restraints.
- G. Design fasteners and supports to carry cable tray, the cables, and a concentrated load of 200 lb. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems."
- H. Place supports so that spans do not exceed maximum spans on schedules and provide clearances shown on Drawings. Install intermediate supports when cable weight exceeds the load-carrying capacity of the tray rungs.
- I. Construct supports from channel members, threaded rods, and other appurtenances furnished by cable tray manufacturer. Arrange supports in trapeze or wall-bracket form as required by application.
- J. Support bus assembly to prevent twisting from eccentric loading.
- K. Install center-hung supports for single-rail trays designed for 60 versus 40 percent eccentric loading condition, with a safety factor of 3.
- L. Locate and install supports according to NEMA FG 1. Do not install more than one cable tray splice between supports.
- M. Make connections to equipment with flanged fittings fastened to cable trays and to equipment. Support cable trays independent of fittings. Do not carry weight of cable trays on equipment enclosure.
- N. Install expansion connectors where cable trays cross building expansion joints and in cable tray runs that exceed dimensions recommended in NEMA FG 1. Space connectors and set gaps according to applicable standard.
- O. Make changes in direction and elevation using manufacturer's recommended fittings.
- P. Make cable tray connections using manufacturer's recommended fittings.
- Q. Seal penetrations through fire and smoke barriers. Comply with requirements in Section 078413 "Penetration Firestopping."
- R. Install capped metal sleeves for future cables through firestop-sealed cable tray penetrations of fire and smoke barriers.
- S. Install cable trays with enough workspace to permit access for installing cables.
- T. Install barriers to separate cables of different systems, such as power, communications, and data processing; or of different insulation levels, such as 600, 5000, and 15 000 V.
- U. Install permanent covers, if used, after installing cable. Install cover clamps according to NEMA VE 2.
- V. Clamp covers on cable trays installed outdoors with heavy-duty clamps.
- W. Install warning signs in visible locations on or near cable trays after cable tray installation.

3.2 CABLE TRAY GROUNDING

- A. Ground cable trays according to NFPA 70 unless additional grounding is specified. Comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Cable trays with electrical power conductors shall be bonded together with splice plates listed for grounding purposes or with listed bonding jumpers.
- C. Cable trays with single-conductor power conductors shall be bonded together with a grounding conductor run in the tray along with the power conductors and bonded to the tray at 72-inch intervals. The grounding conductor shall be sized according to NFPA 70, Article 250.122, "Size of Equipment Grounding Conductors," and Article 392, "Cable Trays."
- D. When using epoxy- or powder-coat painted cable trays as a grounding conductor, completely remove coating at all splice contact points or ground connector attachment. After completing splice-to-grounding-bolt attachment, repair the coated surfaces with coating materials recommended by cable tray manufacturer.
- E. Bond cable trays to power source for cables contained within with bonding conductors sized according to NFPA 70, Article 250.122, "Size of Equipment Grounding Conductors."

3.3 CABLE INSTALLATION

- A. Install cables only when each cable tray run has been completed and inspected.
- B. Fasten cables on horizontal runs with cable clamps or cable ties according to NEMA VE 2. Tighten clamps only enough to secure the cable, without indenting the cable jacket. Install cable ties with a tool that includes an automatic pressure-limiting device.
- C. Fasten cables on vertical runs to cable trays every 18 inches.
- D. Fasten and support cables that pass from one cable tray to another or drop from cable trays to equipment enclosures. Fasten cables to the cable tray at the point of exit and support cables independent of the enclosure. The cable length between cable trays or between cable tray and enclosure shall be no more than 72 inches.
- E. Tie MI cables down every 36 inches where required to provide a 2-hour fire rating and every 72 inches elsewhere.
- F. In existing construction, remove inactive or dead cables from cable trays.

3.4 CONNECTIONS

- A. Remove paint from all connection points before making connections. Repair paint after the connections are completed.
- B. Connect raceways to cable trays according to requirements in NEMA VE 2 and NEMA FG 1.

3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. After installing cable trays and after electrical circuitry has been energized, survey for compliance with requirements.

2. Visually inspect cable insulation for damage. Correct sharp corners, protuberances in cable trays, vibrations, and thermal expansion and contraction conditions, which may cause or have caused damage.
3. Verify that the number, size, and voltage of cables in cable trays do not exceed that permitted by NFPA 70. Verify that communications or data-processing circuits are separated from power circuits by barriers or are installed in separate cable trays.
4. Verify that there are no intruding items such as pipes, hangers, or other equipment in the cable tray.
5. Remove dust deposits, industrial process materials, trash of any description, and any blockage of tray ventilation.
6. Visually inspect each cable tray joint and each ground connection for mechanical continuity. Check bolted connections between sections for corrosion. Clean and retorque in suspect areas.
7. Check for improperly sized or installed bonding jumpers.
8. Check for missing, incorrect, or damaged bolts, bolt heads, or nuts. When found, replace with specified hardware.
9. Perform visual and mechanical checks for adequacy of cable tray grounding; verify that all takeoff raceways are bonded to cable trays. Test entire cable tray system for continuity. Maximum allowable resistance is 1 ohm.

B. Prepare test and inspection reports.

3.6 PROTECTION

A. Protect installed cable trays and cables.

1. Install temporary protection for cables in open trays to safeguard exposed cables against falling objects or debris during construction. Temporary protection for cables and cable tray can be constructed of wood or metal materials and shall remain in place until the risk of damage is over.
2. Repair damage to galvanized finishes with zinc-rich paint recommended by cable tray manufacturer.
3. Repair damage to paint finishes with matching touchup coating recommended by cable tray manufacturer.

END OF SECTION 260536

SECTION 260544 – SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
 - 2. Sleeve-seal systems.
 - 3. Sleeve-seal fittings.
 - 4. Grout.
 - 5. Silicone sealants.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Wall Sleeves:
 - 1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
 - 2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.
- C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.
- E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.
- F. Sleeves for Rectangular Openings:
 - 1. Material: Galvanized sheet steel.
 - 2. Minimum Metal Thickness:

- a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
- b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE-SEAL SYSTEMS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Advance Products & Systems, Inc.
 - b. CALPICO, Inc.
 - c. Metraflex Company (The).
 - d. Pipeline Seal and Insulator, Inc.
 - e. Proco Products, Inc.
 2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 3. Pressure Plates: Stainless steel.
 4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.
1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Presealed Systems.

2.4 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint.
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.
 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
 1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.

- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 260544

SECTION 260553 – IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Identification for raceways.
 - 2. Identification of power and control cables.
 - 3. Identification for conductors.
 - 4. Underground-line warning tape.
 - 5. Warning labels and signs.
 - 6. Instruction signs.
 - 7. Equipment identification labels.
 - 8. Miscellaneous identification products.

1.3 ACTION SUBMITTALS

- A. Product Data: For each electrical identification product indicated.
- B. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.
- C. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.4 QUALITY ASSURANCE

- A. Comply with ANSI A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER AND CONTROL RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Raceways Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- C. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.
- D. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.2 ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.
- B. Colors for Cables Carrying Circuits at 600 V and Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- C. Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.
- D. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.

2.3 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.
- B. Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.
- C. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.4 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- C. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Labels for Tags: Self-adhesive label, machine-printed with permanent, waterproof, black ink recommended by printer manufacturer, sized for attachment to tag.

2.5 UNDERGROUND-LINE WARNING TAPE

- A. Tape:
 - 1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - 2. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - 3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.
- B. Color and Printing:
 - 1. Comply with ANSI Z535.1 through ANSI Z535.5.
 - 2. Inscriptions for Red-Colored Tapes: **ELECTRIC LINE, HIGH VOLTAGE.**
 - 3. Inscriptions for Orange-Colored Tapes: **TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE.**

2.6 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
- C. Warning label and sign shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."

2.7 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.
 1. Engraved legend with black letters on white face.
 2. Punched or drilled for mechanical fasteners.
 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.8 EQUIPMENT IDENTIFICATION LABELS

- A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

2.9 CABLE TIES

- A. General-Purpose Cable Ties: Fungus inert, self extinguishing, one piece, self locking, Type 6/6 nylon.
 1. Minimum Width: 3/16 inch.
 2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
 3. Temperature Range: Minus 40 to plus 185 deg F.
 4. Color: Black except where used for color-coding.
- B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self extinguishing, one piece, self locking, Type 6/6 nylon.
 1. Minimum Width: 3/16 inch.
 2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
 3. Temperature Range: Minus 40 to plus 185 deg F.
 4. Color: Black.
- C. Plenum-Rated Cable Ties: Self extinguishing, UV stabilized, one piece, self locking.
 1. Minimum Width: 3/16 inch.
 2. Tensile Strength at 73 deg F, According to ASTM D 638: 7000 psi.
 3. UL 94 Flame Rating: 94V-0.
 4. Temperature Range: Minus 50 to plus 284 deg F.
 5. Color: Black.

2.10 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- G. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.
- H. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches overall.
- I. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Metal-Clad Cables, for new work 600 V or Less, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl label. Install labels at 30-foot maximum intervals.
- B. Accessible Raceways and Cables within Buildings: For new work, identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
 - 1. Emergency Power.
 - 2. Power.
- C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and hand-holes, use color-coding conductor tape to identify the phase.
 - 1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded feeder and branch-circuit conductors.

- a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - c. Colors for 480/277-V Circuits:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- D. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- E. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and hand-holes, use self-adhesive vinyl labels with the conductor or cable designation, origin, and destination.
- F. Control-Circuit Conductor Termination Identification: For identification at terminations provide self-adhesive vinyl labels with the conductor designation.
- G. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source.
- H. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
- 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 - 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- I. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
- 1. Limit use of underground-line warning tape to direct-buried cables.
 - 2. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- J. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panel-boards and similar equipment in finished spaces.
- K. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
- 1. Comply with 29 CFR 1910.145.

2. Identify system voltage with black letters on an orange background.
 3. Apply to exterior of door, cover, or other access.
 4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
 - a. Controls with external control power connections.
- L. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- M. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
1. Labeling Instructions:
 - a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
 - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
 - d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
 2. Equipment to Be Labeled:
 - a. Panel-boards: Typewritten directory of circuits in the location provided by panel-board manufacturer. Panel-board identification shall be self-adhesive, engraved, laminated acrylic or melamine label.
 - b. Enclosures and electrical cabinets.
 - c. Access doors and panels for concealed electrical items.
 - d. Enclosed switches.
 - e. Enclosed circuit breakers.
 - f. Enclosed controllers.
 - g. Variable-speed controllers.
 - h. Push-button stations.
 - i. Contactors.
 - j. Remote-controlled switches, dimmer modules, and control devices.

END OF SECTION 260553

SECTION 262200 - LOW-VOLTAGE TRANSFORMERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Distribution, dry-type transformers rated 600 V and less, with capacities up to 1500 kVA.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type and size of transformer.
 - 2. Include rated nameplate data, capacities, weights, dimensions, minimum clearances, installed devices and features, and performance for each type and size of transformer.
- B. Shop Drawings:
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment.
 - 3. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Certificates: For transformers, accessories, and components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- B. Qualification Data: For testing agency.
- C. Source quality-control reports.
- D. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For transformers to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Accredited by NETA.
1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Temporary Heating: Apply temporary heat according to manufacturer's written instructions within the enclosure of each ventilated-type unit, throughout periods during which equipment is not energized and when transformer is not in a space that is continuously under normal control of temperature and humidity.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Acme Electric Corporation.
2. Dongan Electric Manufacturing Company.
3. Eaton.
4. Federal Pacific.
5. General Electric Company.
6. Hammond Power Solutions Inc.
7. Jefferson Electric, Inc.
8. Lincoln Electric Products Co., Inc.
9. Mag-Tran; a division of Quality Transformer & Electronics.
10. Marcus Transformer LTD.
11. MGM Transformer Company.
12. Micron Industries Corporation.
13. Mirus International Inc.
14. Powersmiths International Corp.
15. Rex Power Magnetics.
16. Siemens Power Transmission & Distribution, Inc.
17. Sola/Hevi-Duty; a brand of Emerson Electric Co.
18. Square D; by Schneider Electric.
19. TEMCo Transformers.

- B. Source Limitations: Obtain each transformer type from single source from single manufacturer.

2.2 GENERAL TRANSFORMER REQUIREMENTS

- A. Description: Factory-assembled and -tested, air-cooled units for 60-Hz service.

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Transformers Rated 15 kVA and Larger: Comply with NEMA TP 1 energy-efficiency levels as verified by testing according to NEMA TP 2.
- D. Cores: Electrical grade, non-aging silicon steel with high permeability and low hysteresis losses.
- E. Coils: Continuous windings without splices except for taps.
 - 1. Internal Coil Connections: Brazed or pressure type.
 - 2. Coil Material: Copper.
- F. Encapsulation: Transformers smaller than 30 kVA shall have core and coils completely resin encapsulated.
- G. Shipping Restraints: Paint or otherwise color code bolts, wedges, blocks, and other restraints that are to be removed after installation and before energizing. Use fluorescent colors that are easily identifiable inside the transformer enclosure.

2.3 DISTRIBUTION TRANSFORMERS

- A. Comply with NFPA 70, and list and label as complying with UL 1561.
- B. Provide transformers that are constructed to withstand seismic forces specified in Section 260548.16 "Seismic Controls for Electrical Systems."
- C. Cores: One leg per phase.
- D. Enclosure: Ventilated.
 - 1. NEMA 250: Core and coil shall be encapsulated within resin compound utilizing a vacuum pressure impregnation process to seal out moisture and air.
 - 2. KVA Ratings: Based on convection cooling only and not relying on auxiliary fans.
- E. Transformer Enclosure Finish: Comply with NEMA 250.
 - 1. Finish Color: NSF/ANSI 61 gray.
- F. Taps for Transformers 3 kVA and Smaller: One 5 percent tap above normal full capacity.
- G. Taps for Transformers 7.5 to 24 kVA: One 5 percent tap above and one 5 percent tap below normal full capacity.
- H. Taps for Transformers 25 kVA and Larger: Two 2.5 percent taps above and two 2.5 percent taps below normal full capacity.
- I. Insulation Class, Smaller than 30 kVA: 185 deg C, UL-component-recognized insulation system with a maximum of 115-deg C rise above 40-deg C ambient temperature.
- J. Insulation Class, 30 kVA and Larger: 220 deg C, UL-component-recognized insulation system with a maximum of 115-deg C rise above 40-deg C ambient temperature.
- K. K-Factor Rating: Transformers indicated to be K-factor rated shall comply with UL 1561 requirements for nonsinusoidal load current-handling capability to the degree defined by designated K-factor.

1. Unit shall not overheat when carrying full-load current with harmonic distortion corresponding to designated K-factor.
 2. Indicate value of K-factor on transformer nameplate.
 3. Unit shall meet requirements of NEMA TP 1 when tested according to NEMA TP 2 with a K-factor equal to one.
- L. Electrostatic Shielding: Each winding shall have an independent, single, full-width copper electrostatic shield arranged to minimize interwinding capacitance.
1. Arrange coil leads and terminal strips to minimize capacitive coupling between input and output terminals.
 2. Include special terminal for grounding the shield.
- M. Neutral: Rated 200 percent of full load current for K-factor rated transformers.
- N. Wall Brackets: Manufacturer's standard brackets.
- O. Fungus Proofing: Permanent fungicidal treatment for coil and core.

2.4 IDENTIFICATION DEVICES

- A. Nameplates: Engraved, laminated-plastic or metal nameplate for each distribution transformer, mounted with corrosion-resistant screws. Nameplates and label products are specified in Section 260553 "Identification for Electrical Systems."

2.5 SOURCE QUALITY CONTROL

- A. Test and inspect transformers according to IEEE C57.12.01 and IEEE C57.12.91.
1. Resistance measurements of all windings at the rated voltage connections and at all tap connections.
 2. Ratio tests at the rated voltage connections and at all tap connections.
 3. Phase relation and polarity tests at the rated voltage connections.
 4. No load losses, and excitation current and rated voltage at the rated voltage connections.
 5. Impedance and load losses at rated current and rated frequency at the rated voltage connections.
 6. Applied and induced tensile tests.
 7. Regulation and efficiency at rated load and voltage.
 8. Insulation Resistance Tests:
 - a. High-voltage to ground.
 - b. Low-voltage to ground.
 - c. High-voltage to low-voltage.
 9. Temperature tests.
- B. Factory Sound-Level Tests: Conduct prototype sound-level tests on production-line products.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions for compliance with enclosure- and ambient-temperature requirements for each transformer.

- B. Verify that field measurements are as needed to maintain working clearances required by NFPA 70 and manufacturer's written instructions.
- C. Examine walls, floors, roofs, and concrete bases for suitable mounting conditions where transformers will be installed.
- D. Verify that ground connections are in place and requirements in Section 260526 "Grounding and Bonding for Electrical Systems" have been met. Maximum ground resistance shall be 5 ohms at location of transformer.
- E. Environment: Enclosures shall be rated for the environment in which they are located. Covers for NEMA 250, Type 4X enclosures shall not cause accessibility problems.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install wall-mounted transformers level and plumb with wall brackets fabricated by transformer manufacturer.
 - 1. Coordinate installation of wall-mounted and structure-hanging supports with actual transformer provided.
 - 2. Brace wall-mounted transformers as specified in Section 260548.16 "Seismic Controls for Electrical Systems."
- B. Install transformers level and plumb on a concrete base with vibration-dampening supports. Locate transformers away from corners and not parallel to adjacent wall surface.
- C. Construct concrete bases according to Section 033053 "Miscellaneous Cast-in-Place Concrete" and anchor floor-mounted transformers according to manufacturer's written instructions, seismic codes applicable to Project, and requirements in Section 260529 "Hangers and Supports for Electrical Systems."
 - 1. Coordinate size and location of concrete bases with actual transformer provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.
- D. Secure transformer to concrete base according to manufacturer's written instructions.
- E. Secure covers to enclosure and tighten all bolts to manufacturer-recommended torques to reduce noise generation.
- F. Remove shipping bolts, blocking, and wedges.

3.3 CONNECTIONS

- A. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- D. Provide flexible connections at all conduit and conductor terminations and supports to eliminate sound and vibration transmission to the building structure.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- D. Perform tests and inspections.
- E. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA ATS for dry-type, air-cooled, low-voltage transformers. Certify compliance with test parameters.
- F. Remove and replace units that do not pass tests or inspections and retest as specified above.
- G. Infrared Scanning: Two months after Substantial Completion, perform an infrared scan of transformer connections.
 - 1. Use an infrared-scanning device designed to measure temperature or detect significant deviations from normal values. Provide documentation of device calibration.
 - 2. Perform two follow-up infrared scans of transformers, one at four months and the other at 11 months after Substantial Completion.
 - 3. Prepare a certified report identifying transformer checked and describing results of scanning. Include notation of deficiencies detected, remedial action taken, and scanning observations after remedial action.
- H. Test Labeling: On completion of satisfactory testing of each unit, attach a dated and signed "Satisfactory Test" label to tested component.

3.5 ADJUSTING

- A. Record transformer secondary voltage at each unit for at least 48 hours of typical occupancy period. Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding nameplate voltage plus 5 percent and not being lower than nameplate voltage minus 3 percent at maximum load conditions. Submit recording and tap settings as test results.
- B. Connect buck-boost transformers to provide nameplate voltage of equipment being served, plus or minus 5 percent, at secondary terminals.
- C. Output Settings Report: Prepare a written report recording output voltages and tap settings.

3.6 CLEANING

- A. Vacuum dirt and debris; do not use compressed air to assist in cleaning.

END OF SECTION 262200

SECTION 262416 – PANEL-BOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Lighting and appliance branch-circuit panel-boards.

1.3 DEFINITIONS

- A. SVR: Suppressed voltage rating.
- B. TVSS: Transient voltage surge suppressor.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of panel-board, switching and over-current protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panel-board and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
 - 2. Detail enclosure types and details for types other than NEMA 250, Type 1.
 - 3. Detail bus configuration, current, and voltage ratings.
 - 4. Short-circuit current rating of panel-boards and over-current protective devices.
 - 5. Include evidence of NRTL listing for series rating of installed devices.
 - 6. Detail features, characteristics, ratings, and factory settings of individual over-current protective devices and auxiliary components.
 - 7. Include wiring diagrams for power, signal, and control wiring.
 - 8. Include time-current coordination curves for each type and rating of over-current protective device included in panel-boards. Submit on translucent log-log graft paper; include selectable ranges for each type of over-current protective device.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.

- B. Seismic Qualification Certificates: Submit certification that panel-boards, over-current protective devices, accessories, and components will withstand seismic forces defined in Section 260548 "Vibration and Seismic Controls for Electrical Systems." Include the following:
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Field Quality-Control Reports:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- D. Panel-board Schedules: For installation in panel-boards. Submit final versions after load balancing.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For panel-boards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - 1. Manufacturer's written instructions for testing and adjusting over-current protective devices.
 - 2. Time-current curves, including selectable ranges for each type of over-current protective device that allows adjustments.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Keys: Two spares for each type of panel-board cabinet lock.
 - 2. Circuit Breakers Including GFCI and Ground Fault Equipment Protection (GFEP) Types: Two spares for each panel-board.

1.8 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- B. Source Limitations: Obtain panel-boards, over-current protective devices, components, and accessories from single source from single manufacturer.
- C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panel-boards including clearances between panel-boards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. Comply with NEMA PB 1.
- F. Comply with NFPA 70.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Remove loose packing and flammable materials from inside panel-boards; install temporary electric heating (250 W per panel-board) to prevent condensation.
- B. Handle and prepare panel-boards for installation according to NECA 407 NEMA PB 1.

1.10 PROJECT CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install panel-boards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panel-boards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 - 2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - a. Ambient Temperature: Not exceeding 23 deg F to plus 104 deg F.
 - b. Altitude: Not exceeding 6600 feet.
- B. Service Conditions: NEMA PB 1, usual service conditions, as follows:
 - 1. Ambient temperatures within limits specified.
 - 2. Altitude not exceeding 6600 feet.
- C. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 - 1. Notify Architect and Owner no fewer than seven days in advance of proposed interruption of electric service.
 - 2. Do not proceed with interruption of electric service without Architect's and Owner's written permission.
 - 3. Comply with NFPA 70E.

1.11 COORDINATION

- A. Coordinate layout and installation of panel-boards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

1.12 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace transient voltage suppression devices that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PANEL-BOARDS

- A. Fabricate and test panel-boards according to IEEE 344 to withstand seismic forces defined in Section 260548 "Vibration and Seismic Controls for Electrical Systems."
- B. Enclosures: Flush- and surface-mounted cabinets.
 - 1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 - b. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.
 - 2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
 - 3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
 - 4. Skirt for Surface-Mounted Panel-boards: Same gage and finish as panel-board front with flanges for attachment to panel-board, wall, and ceiling or floor.
 - 5. Gutter Extension and Barrier: Same gage and finish as panel-board enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
 - 6. Finishes:
 - a. Panels and Trim: Steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
 - b. Back Boxes: Galvanized steel.
 - 7. Directory Card: Inside panel-board door, mounted in transparent card holder.
- C. Incoming Mains Location: Top and bottom.
- D. Phase, Neutral, and Ground Buses:
 - 1. Material: Hard-drawn copper, 98 percent conductivity.
 - 2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
 - 3. Isolated Ground Bus: Adequate for branch-circuit isolated ground conductors; insulated from box.
 - 4. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and UL listed as suitable for nonlinear loads.
 - 5. Split Bus: Vertical buses divided into individual vertical sections.
- E. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Hard-drawn copper, 98 percent conductivity.
2. Main and Neutral Lugs: Compression type.
3. Ground Lugs and Bus-Configured Terminators: Mechanical type.
4. Feed-Through Lugs: Compression type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
5. Subfeed (Double) Lugs: Compression type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
6. Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs mounted on extra-capacity neutral bus.

- F. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
- G. Panel-board Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Panel-boards shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANEL-BOARDS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 2. Siemens Energy & Automation, Inc.
 3. Square D; a brand of Schneider Electric.
- B. Panel-boards: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Mains: Circuit breaker or lugs only. As indicated on the drawings.
- D. Branch Over-current Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.4 DISCONNECTING AND OVER-CURRENT PROTECTIVE DEVICES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 2. Siemens Energy & Automation, Inc.
 3. Square D; a brand of Schneider Electric.
- B. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
4. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
5. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
 - c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
 - d. Multipole units enclosed in a single housing or factory assembled to operate as a single unit.
 - e. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Receive, inspect, handle, and store panel-boards according to NECA 407 NEMA PB 1.1.
- B. Examine panel-boards before installation. Reject panel-boards that are damaged or rusted or have been subjected to water saturation.
- C. Examine elements and surfaces to receive panel-boards for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install panel-boards and accessories according to NECA 407 NEMA PB 1.1.
- B. Comply with mounting and anchoring requirements specified in Section 260548 "Vibration and Seismic Controls for Electrical Systems."
- C. Mount panel-board cabinet plumb and rigid without distortion of box. Mount recessed panel-boards with fronts uniformly flush with wall finish and mating with back box.
- D. Install over-current protective devices and controllers not already factory installed.
 1. Set field-adjustable, circuit-breaker trip ranges.
- E. Install filler plates in unused spaces.

- F. Stub four 1-inch empty conduits from panel-board into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.
- G. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.
- H. Comply with NECA 1.

3.3 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Section 260553 "Identification for Electrical Systems."
- B. Create a directory to indicate installed circuit loads after balancing panel-board loads; incorporate Owner's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
- C. Panel-board Nameplates: Label each panel-board with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- D. Device Nameplates: Label each branch circuit device in distribution panel-boards with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- D. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each panel-board bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- E. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - 3. Perform the following infrared scan tests and inspections and prepare reports:
 - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each panel-board. Remove front panels so joints and connections are accessible to portable scanner.

- b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each panel-board 11 months after date of Substantial Completion.
- c. Instruments and Equipment:
 - 1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

F. Panel-boards will be considered defective if they do not pass tests and inspections.

G. Prepare test and inspection reports, including a certified report that identifies panel-boards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

A. Adjust moving parts and operable component to function smoothly, and lubricate as recommended by manufacturer.

B. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.

- 1. Measure as directed during period of normal system loading.
- 2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
- 3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
- 4. Tolerance: Difference exceeding 20 percent between phase loads, within a panel-board, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

END OF SECTION 262416

SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. Twist-locking receptacles.
 - 3. Isolated-ground receptacles.
 - 4. Weather-resistant receptacles.
 - 5. Snap switches and wall-box dimmers.
 - 6. Cord and plug sets.
 - 7. Floor service outlets, poke-through assemblies, service poles, and multioutlet assemblies.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.
- E. TVSS: Transient voltage surge suppressor.
- F. UTP: Unshielded twisted pair.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Receptacles for Owner-Furnished Equipment: Match plug configurations.
 - 2. Cord and Plug Sets: Match equipment requirements.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. Samples: One for each type of device and wall plate specified, in each color specified.

1.6 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 - 1. Cooper Wiring Devices; Division of Cooper Industries, Inc. (Cooper).
 - 2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
 - 3. Leviton Mfg. Company Inc. (Leviton).
 - 4. Pass & Seymour/Legrand (Pass & Seymour).
- B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.
- C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
 - 1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
 - 2. Devices shall comply with the requirements in this Section.

2.3 STRAIGHT-BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cooper; 5351 (single), CR5362 (duplex).
 - b. Hubbell; HBL5351 (single), HBL5352 (duplex).
 - c. Leviton; 5891 (single), 5352 (duplex).
 - d. Pass & Seymour; 5361 (single), 5362 (duplex).

B. Isolated-Ground, Duplex Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cooper; IG5362RN.
 - b. Hubbell; IG5362.
 - c. Leviton; 5362-IG.
 - d. Pass & Seymour; IG5362.
2. Description: Straight blade; equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.

2.4 GFCI RECEPTACLES

A. General Description:

1. Straight blade, non-feed-through type.
2. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596.
3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.

B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cooper; VGF20.
 - b. Hubbell; GFR5352L.
 - c. Pass & Seymour; 2095.
 - d. Leviton; 7590.

2.5 TWIST-LOCKING RECEPTACLES

A. Special-Purpose Receptacles: Comply with NEMA WD 1, NEMA WD 6 configuration as indicated on the plans.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cooper; L520R.
 - b. Hubbell; HBL2310.

- c. Leviton; 2310.
- d. Pass & Seymour; L520-R.

2.6 CORD AND PLUG SETS

A. Description:

- 1. Match voltage and current ratings and number of conductors to requirements of equipment being connected.
- 2. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and ampacity of at least 130 percent of the equipment rating.
- 3. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.7 TOGGLE SWITCHES

A. Comply with NEMA WD 1, UL 20, and FS W-S-896.

B. Switches, 120/277 V, 20 A:

- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Single Pole:
 - 2) Cooper; AH1221.
 - 3) Hubbell; HBL1221.
 - 4) Leviton; 1221-2.
 - 5) Pass & Seymour; CSB20AC1.
 - 6) Two Pole:
 - 7) Cooper; AH1222.
 - 8) Hubbell; HBL1222.
 - 9) Leviton; 1222-2.
 - 10) Pass & Seymour; CSB20AC2.
 - 11) Three Way:
 - 12) Cooper; AH1223.
 - 13) Hubbell; HBL1223.
 - 14) Leviton; 1223-2.
 - 15) Pass & Seymour; CSB20AC3.
 - 16) Four Way:
 - 17) Cooper; AH1224.
 - 18) Hubbell; HBL1224.
 - 19) Leviton; 1224-2.
 - 20) Pass & Seymour; CSB20AC4.

2.8 WALL-BOX DIMMERS

- A. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
- B. Control: Continuously adjustable slider; with single-pole or three-way switching. Comply with UL 1472.
- C. Incandescent Lamp Dimmers: 120 V; control shall follow square-law dimming curve. On-off switch positions shall bypass dimmer module.
 - 1. 600 W; dimmers shall require no derating when ganged with other devices.
- D. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness.

2.9 WALL PLATES

- A. Single and combination types shall match corresponding wiring devices. Submit finishes to the Architect for approval and selection. Architect's selection shall govern.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: 0.035-inch- thick, satin-finished, Type 302 stainless steel
 - 3. Material for Unfinished Spaces: Galvanized steel.
 - 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

2.10 FLOOR SERVICE FITTINGS

- A. Type: Modular, [lush-type, dual-service units suitable for wiring method used.
- B. Compartments: Barrier separates power from voice and data communication cabling.
- C. Service Plate: Round, die-cast aluminum with satin finish.
- D. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.

2.11 POKE-THROUGH ASSEMBLIES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Hubbell Incorporated; Wiring Device-Kellems.
 - 2. Pass & Seymour/Legrand.
 - 3. Wiremold/Legrand.

B. Description:

1. Factory-fabricated and -wired assembly of below-floor junction box with multichanneled, through-floor raceway/firestop unit and detachable matching floor service-outlet assembly.
2. Comply with UL 514 scrub water exclusion requirements.
3. Service-Outlet Assembly: Pedestal type with services as required.
4. Size: Selected to fit nominal 4-inch cored holes in floor and matched to floor thickness.
5. Fire Rating: Unit is listed and labeled for fire rating of floor-ceiling assembly.
6. Closure Plug: Arranged to close unused 4-inch cored openings and reestablish fire rating of floor.
7. Wiring Raceways and Compartments: For a minimum of four No. 12 AWG conductors and a minimum of four, four-pair cables.

2.12 PREFABRICATED MULTIOUTLET ASSEMBLIES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Hubbell Incorporated; Wiring Device-Kellems.
2. Wiremold/Legrand.

2.13 FINISHES

A. Device Color:

1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
2. Isolated-Ground Receptacles: As specified above, with orange triangle on face.

B. Wall Plate Color: As selected by the Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
 - a. Cut back and pigtail, or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.
2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

- A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

- A. Comply with Section 260553 "Identification for Electrical Systems."
- B. Identify each receptacle with panelboard identification and circuit number. Unless otherwise indicated on the drawings. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. In healthcare facilities, prepare reports that comply with recommendations in NFPA 99.
 - 2. Test Instruments: Use instruments that comply with UL 1436.
 - 3. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- B. Tests for Convenience Receptacles:
 - 1. Line Voltage: Acceptable range is 105 to 132 V.
 - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 - 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 - 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
- C. Test straight-blade convenience outlets in patient-care areas for the retention force of the grounding blade according to NFPA 99. Retention force shall be not less than 4 oz..
- D. Wiring device will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

END OF SECTION 262726

SECTION 262813 - FUSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Cartridge fuses rated 600-V ac and less for use in control circuits enclosed switches panelboards switchboards enclosed controllers and motor-control centers.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material, dimensions, descriptions of individual components, and finishes for spare-fuse cabinets. Include the following for each fuse type indicated:

- 1. Ambient Temperature Adjustment Information: If ratings of fuses have been adjusted to accommodate ambient temperatures, provide list of fuses with adjusted ratings.
 - a. For each fuse having adjusted ratings, include location of fuse, original fuse rating, local ambient temperature, and adjusted fuse rating.
 - b. Provide manufacturer's technical data on which ambient temperature adjustment calculations are based.
- 2. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
- 3. Current-limitation curves for fuses with current-limiting characteristics.
- 4. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse.
- 5. Coordination charts and tables and related data.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fuses to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

- 1. Ambient temperature adjustment information.
- 2. Current-limitation curves for fuses with current-limiting characteristics.
- 3. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse.
- 4. Coordination charts and tables and related data.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NEMA FU 1 for cartridge fuses.
- D. Comply with NFPA 70.
- E. Comply with UL 248-11 for plug fuses.

1.7 PROJECT CONDITIONS

- A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F or more than 100 deg F, apply manufacturer's ambient temperature adjustment factors to fuse ratings.

1.8 COORDINATION

- A. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cooper Bussmann, Inc.
 - 2. Ferraz Shawmut, Inc.
 - 3. Littelfuse, Inc.

2.2 CARTRIDGE FUSES

- A. Characteristics: NEMA FU 1, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.
- B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.
- C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.
- D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

- A. Cartridge Fuses:
 - 1. All fuse application shall meet the protection requirement of the manufactures of the equipment being powered.
 - 2. Feeders: Class L, time delay Class J, time delay.
 - 3. Motor Branch Circuits: Class RK5, time delay.
 - 4. Other Branch Circuits: Class RK5, time delay Class J, time delay].
 - 5. Control Circuits: Class CC, fast acting.

3.3 INSTALLATION

- A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.
- B. Install spare-fuse cabinet(s).

3.4 IDENTIFICATION

- A. Install labels complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems" and indicating fuse replacement information on inside door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 262813

SECTION 262913 – ENCLOSED CONTROLLERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all other involved trade Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes the following enclosed controllers rated 600 V and less:
 - 1. Full-voltage manual.
 - 2. Full-voltage magnetic.

1.3 DEFINITIONS

- A. CPT: Control power transformer.
- B. MCCB: Molded-case circuit breaker.
- C. MCP: Motor circuit protector.
- D. N.C.: Normally closed.
- E. N.O.: Normally open.
- F. OCPD: Overcurrent protective device.
- G. SCR: Silicon-controlled rectifier.

1.4 SUBMITTALS

- A. Product Data: For each type of enclosed controller. Include manufacturer's technical data on features, performance, electrical characteristics, ratings, and enclosure types and finishes.
- B. Shop Drawings: For each enclosed controller. Include dimensioned plans, elevations, sections, details, and required clearances and service spaces around controller enclosures.
 - 1. Show tabulations of the following:
 - a. Each installed unit's type and details.
 - b. Factory-installed devices.
 - c. Nameplate legends.
 - d. Short-circuit current rating of integrated unit.
 - e. Listed and labeled for integrated short-circuit current (withstand) rating of OCPDs in combination controllers by an NRTL acceptable to authorities having jurisdiction.
 - f. Features, characteristics, ratings, and factory settings of individual OCPDs in combination controllers.
 - 2. Wiring Diagrams: For power, signal, and control wiring.

- C. Qualification Data: For qualified testing agency.
- D. Field quality-control reports.
- E. Operation and Maintenance Data: For enclosed controllers to include in emergency, operation, and maintenance manuals. Include the following:
 - 1. Routine maintenance requirements for enclosed controllers and installed components.
 - 2. Manufacturer's written instructions for testing and adjusting circuit breaker and MCP trip settings.
 - 3. Manufacturer's written instructions for setting field-adjustable overload relays.
 - 4. Manufacturer's written instructions for testing, adjusting, and reprogramming reduced-voltage solid-state controllers.
- F. Load-Current and Overload-Relay Heater List: Compile after motors have been installed, and arrange to demonstrate that selection of heaters suits actual motor nameplate full-load currents.
- G. Load-Current and List of Settings of Adjustable Overload Relays: Compile after motors have been installed, and arrange to demonstrate that switch settings for motor running overload protection suit actual motors to be protected.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NFPA 70.
- D. IEEE Compliance: Fabricate and test enclosed controllers according to IEEE 344 to withstand seismic forces.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store enclosed controllers indoors in clean, dry space with uniform temperature to prevent condensation. Protect enclosed controllers from exposure to dirt, fumes, water, corrosive substances, and physical damage.
- B. If stored in areas subject to weather, cover enclosed controllers to protect them from weather, dirt, dust, corrosive substances, and physical damage. Remove loose packing and flammable materials from inside controllers; install temporary electric heating, with at least 250 W per controller.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - 1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.
 - 2. Altitude: Not exceeding 6600 feet.
- B. Interruption of Existing Electrical Systems: Do not interrupt electrical systems in facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:
 - 1. Notify ESCO no fewer than two days in advance of proposed interruption of electrical systems.

2. Indicate method of providing temporary utilities.
3. Do not proceed with interruption of electrical systems without ESCO's written permission.
4. Comply with NFPA 70E.

1.8 COORDINATION

- A. Coordinate layout and installation of enclosed controllers with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases.
- C. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

1.9 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Fuses for Fused Switches: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
 2. Control Power Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.
 3. Indicating Lights: Two of each type and color installed.
 4. Auxiliary Contacts: Furnish one spare(s) for each size and type of magnetic controller installed.
 5. Power Contacts: Furnish three spares for each size and type of magnetic contactor installed.

PART 2 - PRODUCTS

2.1 FULL-VOLTAGE CONTROLLERS

- A. General Requirements for Full-Voltage Controllers: Comply with NEMA ICS 2, general purpose, Class A.
- B. Motor-Starting Switches: "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off or on.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - b. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - c. Rockwell Automation, Inc.; Allen-Bradley brand.
 - d. Siemens Energy & Automation, Inc.
 - e. Square D; a brand of Schneider Electric.
 2. Configuration: As required to suit application.
 3. Surface mounting.
- C. Fractional Horsepower Manual Controllers: "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off, on, or tripped.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - b. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - c. Rockwell Automation, Inc.; Allen-Bradley brand.
 - d. Siemens Energy & Automation, Inc.
 - e. Square D; a brand of Schneider Electric.
 2. Configuration: As required to suit application.
 3. Overload Relays: Inverse-time-current characteristics; NEMA ICS 2, Class 10 tripping characteristics; heaters matched to nameplate full-load current of actual protected motor; external reset push button; bimetallic type.
 4. Flush mounting.
- D. Magnetic Controllers: Full voltage, across the line, electrically held.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - b. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - c. Rockwell Automation, Inc.; Allen-Bradley brand.
 - d. Siemens Energy & Automation, Inc.
 - e. Square D; a brand of Schneider Electric.
 2. Configuration: Non-Reversing, unless otherwise indicated on the drawings.
 3. Contactor Coils: Pressure-encapsulated type with coil transient suppressors.
 - a. Operating Voltage: Depending on contactor NEMA size and line-voltage rating, manufacturer's standard matching control power or line voltage.
 4. Power Contacts: Totally enclosed, double-break, silver-cadmium oxide; assembled to allow inspection and replacement without disturbing line or load wiring.
 5. Control Circuits: 120V ac or as otherwise required by other trade requirements; obtained from integral CPT, with primary and secondary fuses, with CPT of sufficient capacity to operate integral devices and remotely located pilot, indicating, and control devices.
 - a. CPT Spare Capacity: 50 VA.
 6. Melting Alloy Overload Relays:
 - a. Inverse-time-current characteristic.
 - b. Class 20 tripping characteristic.
 - c. Heaters in each phase matched to nameplate full-load current of actual protected motor and with appropriate adjustment for duty cycle.
 7. Bimetallic Overload Relays:
 - a. Inverse-time-current characteristic.
 - b. Class 20 tripping characteristic.
 - c. Heaters in each phase matched to nameplate full-load current of actual protected motor and with appropriate adjustment for duty cycle.
 - d. Ambient compensated.
 - e. Automatic resetting.
 8. Solid-State Overload Relay:
 - a. Switch or dial selectable for motor running overload protection.
 - b. Sensors in each phase.
 - c. Class 10/20 selectable tripping characteristic selected to protect motor against voltage and current unbalance and single phasing.
 - d. Class II ground-fault protection, with start and run delays to prevent nuisance trip on starting.
 - e. Analog communication module.
 9. N.C., isolated overload alarm contact.
- E. Combination Magnetic Controller: Factory-assembled combination of magnetic controller, OCPD, and disconnecting means.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
 - a. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - b. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - c. Rockwell Automation, Inc.; Allen-Bradley brand.
 - d. Siemens Energy & Automation, Inc.
 - e. Square D; a brand of Schneider Electric.
2. Fusible Disconnecting Means:
 - a. NEMA KS 1, heavy-duty, horsepower-rated, fusible switch with clips or bolt pads to accommodate Class J fuses.
 - b. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
 - c. Auxiliary Contacts: N.O./N.C., arranged to activate before switch blades open.
3. Nonfusible Disconnecting Means:
 - a. NEMA KS 1, heavy-duty, horsepower-rated, nonfusible switch.
 - b. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
4. MCP Disconnecting Means:
 - a. UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents, instantaneous-only circuit breaker with front-mounted, field-adjustable, short-circuit trip coordinated with motor locked-rotor amperes.
 - b. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
 - c. Auxiliary contacts "a" and "b" arranged to activate with MCP handle.
 - d. N.C. alarm contact that operates only when MCP has tripped.
 - e. Current-limiting module to increase controller short-circuit current (withstand) rating to 100 kA.
5. MCCB Disconnecting Means:
 - a. UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents; thermal-magnetic MCCB, with inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits.
 - b. Front-mounted, adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - c. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
 - d. Auxiliary contacts "a" and "b" arranged to activate with MCCB handle.
 - e. N.C. alarm contact that operates only when MCCB has tripped.

2.2 ENCLOSURES

- A. Enclosed Controllers: NEMA ICS 6, to comply with environmental conditions at installed location.
 1. Dry and Clean Indoor Locations: Type 1.
 2. Outdoor Locations: Type 3R.
 3. Kitchen Areas: Type 4X, stainless steel.
 4. Other Wet or Damp Indoor Locations: Type 4.
 5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: Type 12.
 6. Hazardous Areas Indicated on Drawings: Type 9.

2.3 ACCESSORIES

- A. General Requirements for Control Circuit and Pilot Devices: NEMA ICS 5; factory installed in controller enclosure cover. The following minimum accessories shall be provided unless otherwise indicated on the drawings, or required by other trade requirements.
 1. Push Buttons, Pilot Lights, and Selector Switches: Standard-duty, oiltight type.
 - a. Selector Switch: 3-position, Rotary-type, Hand/Off/Auto. (magnetic starters only)
 - b. Pilot Lights: LED types; Red "RUN" light; push to test.

- B. External overload reset push button. (magnetic starters only)
- C. Reversible N.C./N.O. auxiliary contact(s). (magnetic starters only)
- D. Control Relays: 4-Pole auxiliary run relay. 4-pole auxiliary electronic time delay relay. (magnetic starters only)
- E. Breather and drain assemblies, to maintain interior pressure and release condensation in Type 4 enclosures installed outdoors or in unconditioned interior spaces subject to humidity and temperature swings.
- F. Space heaters, with N.C. auxiliary contacts, to mitigate condensation in Type 3R enclosures installed outdoors or in unconditioned interior spaces subject to humidity and temperature swings.
- G. Sun shields installed on fronts, sides, and tops of enclosures installed outdoors and subject to direct and extended sun exposure.
- H. Cover gaskets for Type 1 enclosures.
- I. 20% spare control wiring terminal blocks; unwired. (magnetic starters only)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and surfaces to receive enclosed controllers, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine enclosed controllers before installation. Reject enclosed controllers that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Wall-Mounted Controllers: Install enclosed controllers on walls with tops at uniform height unless otherwise indicated, and by bolting units to wall or mounting on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks complying with Division 26 Section "Hangers and Supports for Electrical Systems."
- B. Floor-Mounted Controllers: Install enclosed controllers on 4-inch nominal-thickness concrete base.
 - 1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 - 2. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 - 3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 4. Install anchor bolts to elevations required for proper attachment to supported equipment.
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

- D. Install fuses in each fusible-switch enclosed controller.
- E. Install fuses in control circuits if not factory installed. Comply with requirements in Division 262813 Section "Fuses."
- F. Install heaters in thermal overload relays. Select heaters based on actual nameplate full-load amperes after motors have been installed.
- G. Install, connect, and fuse thermal-protector monitoring relays furnished with motor-driven equipment.
- H. Comply with NECA 1.

3.3 IDENTIFICATION

- A. Identify enclosed controllers, components, and control wiring. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved nameplate.
 - 3. Label each enclosure-mounted control and pilot device.

3.4 CONTROL WIRING INSTALLATION

- A. Install wiring between enclosed controllers and remote devices.
- B. Bundle, train, and support wiring in enclosures.
- C. Connect selector switches and other automatic-control selection devices where applicable.
 - 1. Connect selector switches to bypass only those manual- and automatic-control devices that have no safety functions when switch is in manual-control position.
 - 2. Connect selector switches with enclosed-controller circuit in both manual and automatic positions for safety-type control devices such as low- and high-pressure cutouts, high-temperature cutouts, and motor overload protectors.

3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 - 1. Inspect controllers, wiring, components, connections, and equipment installation. Test and adjust controllers, components, and equipment.
 - 2. Test insulation resistance for each enclosed-controller element, component, connecting motor supply, feeder, and control circuits.

3. Test continuity of each circuit.
4. Verify that voltages at controller locations are within plus or minus 10 percent of motor nameplate rated voltages. If outside this range for any motor, notify ESCO before starting the motor(s).
5. Test each motor for proper phase rotation.
6. Perform each electrical test and visual and mechanical inspection stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
7. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
8. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

D. Enclosed controllers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports including a certified report that identifies enclosed controllers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.6 ADJUSTING

- A. Set field-adjustable switches, auxiliary relays, time-delay relays, timers, and overload-relay pickup and trip ranges.
- B. Adjust overload-relay heaters or settings if power factor correction capacitors are connected to the load side of the overload relays.
- C. Adjust the trip settings of MCPs and thermal-magnetic circuit breakers with adjustable instantaneous trip elements. Initially adjust to six times the motor nameplate full-load ampere ratings and attempt to start motors several times, allowing for motor cooldown between starts. If tripping occurs on motor inrush, adjust settings in increments until motors start without tripping. Do not exceed eight times the motor full-load amperes (or 11 times for NEMA Premium Efficient motors if required). Where these maximum settings do not allow starting of a motor, notify ESCO before increasing settings.
- D. Set field-adjustable switches and program microprocessors for required start and stop sequences in reduced-voltage solid-state controllers.

3.7 PROTECTION

- A. Temporary Heating: Apply temporary heat to maintain temperature according to manufacturer's written instructions until enclosed controllers are ready to be energized and placed into service.
- B. Replace controllers whose interiors have been exposed to water or other liquids prior to Substantial Completion.

END OF SECTION 262913

SECTION 262923 - VARIABLE-FREQUENCY MOTOR CONTROLLERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes separately enclosed, preassembled, combination VFCs, rated 600 V and less, for speed control of three-phase, squirrel-cage induction motors.

1.3 DEFINITIONS

- A. CE: Conformance Europeene (European Compliance).
- B. CPT: Control power transformer.
- C. DDC: Direct digital control.
- D. EMI: Electromagnetic interference.
- E. LED: Light-emitting diode.
- F. NC: Normally closed.
- G. NO: Normally open.
- H. OCPD: Overcurrent protective device.
- I. PID: Control action, proportional plus integral plus derivative.
- J. RFI: Radio-frequency interference.
- K. VFC: Variable-frequency motor controller.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type and rating of VFC indicated.
 - 1. Include dimensions and finishes for VFCs.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For each VFC indicated.

1. Include mounting and attachment details.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Floor plans, drawn to scale, showing dimensioned layout on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 1. Required working clearances and required area above and around VFCs.
 2. Show VFC layout and relationships between electrical components and adjacent structural and mechanical elements.
 3. Show support locations, type of support, and weight on each support.
 4. Indicate field measurements.
- B. Qualification Data: For testing agency.
- C. Seismic Qualification Certificates: For each VFC, accessories, and components, from manufacturer.
 1. Certificate of compliance.
 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 3. Detailed description of equipment anchorage devices on which the certification is based, and their installation requirements.
- D. Product Certificates: For each VFC from manufacturer.
- E. Harmonic Analysis Report: Provide Project-specific calculations and manufacturer's statement of compliance with IEEE 519.
- F. Source quality-control reports.
- G. Field quality-control reports.
- H. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For VFCs to include in emergency, operation, and maintenance manuals.
 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. Manufacturer's written instructions for testing and adjusting thermal-magnetic circuit breaker and motor-circuit protector trip settings.
 - b. Manufacturer's written instructions for setting field-adjustable overload relays.
 - c. Manufacturer's written instructions for testing, adjusting, and reprogramming microprocessor control modules.
 - d. Manufacturer's written instructions for setting field-adjustable timers, controls, and status and alarm points.
 - e. Load-Current and Overload-Relay Heater List: Compile after motors have been installed, and arrange to demonstrate that selection of heaters suits actual motor nameplate, full-load currents.

- f. Load-Current and List of Settings of Adjustable Overload Relays: Compile after motors have been installed, and arrange to demonstrate that switch settings for motor-running overload protection suit actual motors to be protected.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Power Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
 2. Control Power Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.
 3. Indicating Lights: Two of each type and color installed.
 4. Auxiliary Contacts: Furnish one spare(s) for each size and type of magnetic controller installed.
 5. Power Contacts: Furnish three spares for each size and type of magnetic contactor installed.

1.8 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. If stored in space that is not permanently enclosed and air conditioned, remove loose packing and flammable materials from inside controllers and install temporary electric heating, with at least 250 W per controller.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for VFCs, including clearances between VFCs, and adjacent surfaces and other items.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace VFCs that fail in materials or workmanship within specified warranty period.
 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 1. Cerus Industrial, Inc.
 2. Danfoss Inc.
 3. Eaton.

4. Rockwell Automation, Inc.
5. Schneider Electric USA, Inc.
6. Siemens Industry, Inc.
7. Yaskawa Electric America, Inc.

2.2 SYSTEM DESCRIPTION

A. General Requirements for VFCs:

1. VFCs and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Comply with NEMA ICS 7, NEMA ICS 61800-2, and UL 508A.

B. Application: variable torque.

C. VFC Description: Variable-frequency motor controller, consisting of power converter that employs pulse-width-modulated inverter, factory built and tested in an enclosure, with integral disconnecting means and overcurrent and overload protection; listed and labeled by an NRTL as a complete unit; arranged to provide self-protection, protection, and variable-speed control of one or more three-phase induction motors by adjusting output voltage and frequency.

1. Units suitable for operation of NEMA MG 1, Design A and Design B motors, as defined by NEMA MG 1, Section IV, Part 30, "Application Considerations for Constant Speed Motors Used on a Sinusoidal Bus with Harmonic Content and General Purpose Motors Used with Adjustable-Voltage or Adjustable-Frequency Controls or Both."
2. Units suitable for operation of inverter-duty motors as defined by NEMA MG 1, Section IV, Part 31, "Definite-Purpose Inverter-Fed Polyphase Motors."
3. Listed and labeled for integrated short-circuit current (withstand) rating by an NRTL acceptable to authorities having jurisdiction.

D. Design and Rating: Match load type, such as fans, blowers, and pumps; and type of connection used between motor and load such as direct or through a power-transmission connection.

E. Output Rating: Three phase; 10 to 60 Hz, with voltage proportional to frequency throughout voltage range; maximum voltage equals input voltage.

F. Unit Operating Requirements:

1. Input AC Voltage Tolerance: Plus 10 and minus 10 percent of VFC input voltage rating.
2. Input AC Voltage Unbalance: Not exceeding 3 percent.
3. Input Frequency Tolerance: Plus or minus 3 percent of VFC frequency rating.
4. Minimum Efficiency: 97 percent at 60 Hz, full load.
5. Minimum Displacement Primary-Side Power Factor: 98 percent under any load or speed condition.
6. Minimum Short-Circuit Current (Withstand) Rating: Refer drawings for applicable kA.
7. Ambient Temperature Rating: Not less than 32 deg F and not exceeding 104 deg F.
8. Humidity Rating: Less than 95 percent (noncondensing).
9. Altitude Rating: Not exceeding 3300 feet.
10. Vibration Withstand: Comply with NEMA ICS 61800-2.
11. Overload Capability: 1.5 times the base load current for 60 seconds; minimum of 1.8 times the base load current for three seconds.
12. Starting Torque: Minimum 100 percent of rated torque from 3 to 60 Hz.
13. Speed Regulation: Plus or minus 5 percent.
14. Output Carrier Frequency: Selectable; 0.5 to 15 kHz.

15. Stop Modes: Programmable; includes fast, free-wheel, and dc injection braking.
- G. Inverter Logic: Microprocessor based, 32 bit, isolated from all power circuits.
- H. Isolated Control Interface: Allows VFCs to follow remote-control signal over a minimum 40:1 speed range.
1. Signal: Electrical.
- I. Internal Adjustability Capabilities:
1. Minimum Speed: 5 to 25 percent of maximum rpm.
 2. Maximum Speed: 80 to 100 percent of maximum rpm.
 3. Acceleration: 0.1 to 999.9 seconds.
 4. Deceleration: 0.1 to 999.9 seconds.
 5. Current Limit: 30 to minimum of 150 percent of maximum rating.
- J. Self-Protection and Reliability Features:
1. Surge Suppression: Factory installed as an integral part of the VFC, complying with UL 1449 SPD, Type 1 or Type 2.
 2. Surge Suppression: Field-mounted surge suppressors complying with Section 264313 "Surge Protection for Low-Voltage Electrical Power Circuits," UL 1449 SPD, Type 2.
 3. Loss of Input Signal Protection: Selectable response strategy, including speed default to a percent of the most recent speed, a preset speed, or stop; with alarm.
 4. Under- and overvoltage trips.
 5. Inverter overcurrent trips.
 6. VFC and Motor-Overload/Overtemperature Protection: Microprocessor-based thermal protection system for monitoring VFCs and motor thermal characteristics, and for providing VFC overtemperature and motor-overload alarm and trip; settings selectable via the keypad.
 7. Critical frequency rejection, with three selectable, adjustable deadbands.
 8. Instantaneous line-to-line and line-to-ground overcurrent trips.
 9. Loss-of-phase protection.
 10. Reverse-phase protection.
 11. Short-circuit protection.
 12. Motor-overtemperature fault.
- K. Automatic Reset/Restart: Attempt three restarts after drive fault or on return of power after an interruption and before shutting down for manual reset or fault correction; adjustable delay time between restart attempts.
- L. Power-Interruption Protection: To prevent motor from re-energizing after a power interruption until motor has stopped, unless "Bidirectional Autospeed Search" feature is available and engaged.
- M. Bidirectional Autospeed Search: Capable of starting VFC into rotating loads spinning in either direction and returning motor to set speed in proper direction, without causing damage to drive, motor, or load.
- N. Torque Boost: Automatically varies starting and continuous torque to at least 1.5 times the minimum torque to ensure high-starting torque and increased torque at slow speeds.
- O. Motor Temperature Compensation at Slow Speeds: Adjustable current fall-back based on output frequency for temperature protection of self-cooled, fan-ventilated motors at slow speeds.
- P. Integral Input Disconnecting Means and OCPD: UL 489, instantaneous-trip circuit breaker with pad-lockable, door-mounted handle mechanism.

1. Disconnect Rating: Not less than 115 percent of VFC input current rating.
2. Disconnect Rating: Not less than 115 percent of NFPA 70 motor full-load current rating or VFC input current rating, whichever is larger.
3. Auxiliary Contacts: NO or NC, arranged to activate before switch blades open.
4. Auxiliary contacts "a" and "b" arranged to activate with circuit-breaker handle.
5. NC alarm contact that operates only when circuit breaker has tripped.

2.3 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: VFCs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7. The designated VFCs shall be tested and certified by an NRTL as meeting the ICC-ES AC 156 test procedure requirements.
1. The term "withstand" means "the unit will remain in place without separation of any parts when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

2.4 CONTROLS AND INDICATION

- A. Status Lights: Door-mounted LED indicators displaying the following conditions:
1. Power on.
 2. Run.
 3. Overvoltage.
 4. Line fault.
 5. Overcurrent.
 6. External fault.
- B. Panel-Mounted Operator Station: Manufacturer's standard front-accessible, sealed keypad and plain-English-language digital display; allows complete programming, program copying, operating, monitoring, and diagnostic capability.
1. Keypad: In addition to required programming and control keys, include keys for HAND, OFF, and AUTO modes.
 2. Security Access: Provide electronic security access to controls through identification and password with at least three levels of access: View only; view and operate; and view, operate, and service.
 - a. Control Authority: Supports at least four conditions: Off, local manual control at VFC, local automatic control at VFC, and automatic control through a remote source.
- C. Historical Logging Information and Displays:
1. Real-time clock with current time and date.
 2. Running log of total power versus time.
 3. Total run time.
 4. Fault log, maintaining last four faults with time and date stamp for each.
- D. Indicating Devices: Digital display and additional readout devices as required, mounted flush in VFC door and connected to display VFC parameters including, but not limited to:
1. Output frequency (Hz).
 2. Motor speed (rpm).
 3. Motor status (running, stop, fault).

4. Motor current (amperes).
 5. Motor torque (percent).
 6. Fault or alarming status (code).
 7. PID feedback signal (percent).
 8. DC-link voltage (V dc).
 9. Set point frequency (Hz).
 10. Motor output voltage (V ac).
- E. Control Signal Interfaces:
1. Electric Input Signal Interface:
 - a. A minimum of two programmable analog inputs: 4- to 20-mA dc.
 - b. A minimum of six multifunction programmable digital inputs.
 2. Pneumatic Input Signal Interface: 3 to 15 psig.
 3. Remote Signal Inputs: Capability to accept any of the following speed-setting input signals from the DDC system for HVAC or other control systems:
 - a. 0- to 10-V dc.
 - b. 4- to 20-mA dc.
 - c. Potentiometer using up/down digital inputs.
 - d. Fixed frequencies using digital inputs.
 4. Output Signal Interface: A minimum of one programmable analog output signal(s) (4- to 20-mA dc), which can be configured for any of the following:
 - a. Output frequency (Hz).
 - b. Output current (load).
 - c. DC-link voltage (V dc).
 - d. Motor torque (percent).
 - e. Motor speed (rpm).
 - f. Set point frequency (Hz).
 5. Remote Indication Interface: A minimum of two programmable dry-circuit relay outputs (120-V ac, 1 A) for remote indication of the following:
 - a. Motor running.
 - b. Set point speed reached.
 - c. Fault and warning indication (overtemperature or overcurrent).
 - d. PID high- or low-speed limits reached.
- F. PID Control Interface: Provides closed-loop set point, differential feedback control in response to dual feedback signals. Allows for closed-loop control of fans and pumps for pressure, flow, or temperature regulation.
1. Number of Loops: Two.
- G. Interface with DDC System for HVAC: Factory-installed hardware and software shall interface with DDC system for HVAC to monitor, control, display, and record data for use in processing reports. VFC settings shall be retained within VFC's nonvolatile memory.
1. Hardwired Points:
 - a. Monitoring: On-off status,.

- b. Control: On-off operation,.
- 2. Communication Interface: Comply with ASHRAE 135. Communication shall interface with DDC system for HVAC to remotely control and monitor lighting from a DDC system for HVAC operator workstation. Control features and monitoring points displayed locally at lighting panel shall be available through the DDC system for HVAC.

2.5 LINE CONDITIONING AND FILTERING

- A. Input Line Conditioning: Based on the manufacturer's harmonic analysis study and report, provide input filtering, as required, to limit total demand (harmonic current) distortion and total harmonic voltage demand at the defined point of common coupling to meet IEEE 519 recommendations.
- B. EMI/RFI Filtering: CE marked; certify compliance with IEC 61800-3 for Category C2.

2.6 OPTIONAL FEATURES

- A. Multiple-Motor Capability: VFC suitable for variable-speed service to multiple motors. Overload protection shuts down VFC and motors served by it, and generates fault indications when overload protection activates.
 - 1. Configure to allow two or more motors to operate simultaneously at the same speed; separate overload relay for each controlled motor.
 - 2. Configure to allow two motors to operate separately; operator selectable via local or remote switch or contact closures; single overload relay for both motors; separate output magnetic contactors for each motor.
 - 3. Configure to allow two motors to operate simultaneously and in a lead/lag mode, with one motor operated at variable speed via the power converter and the other at constant speed via the bypass controller; separate overload relay for each controlled motor.
- B. Damper control circuit with end-of-travel feedback capability.
- C. Sleep Function: Senses a minimal deviation of a feedback signal and stops the motor. On an increase in speed-command signal deviation, VFC resumes normal operation.
- D. Motor Preheat Function: Preheats motor when idle to prevent moisture accumulation in the motor.
- E. Firefighter's Override (Smoke Purge) Input: On a remote contact closure from the firefighter's control station, this password-protected input:
 - 1. Overrides all other local and external inputs (analog/digital, serial communication, and all keypad commands).
 - 2. Forces VFC to operate motor, without any other run or speed command, at a field-adjustable, preset speed.
 - 3. Forces VFC to transfer to bypass mode and operate motor at full speed.
 - 4. Causes display of override mode on the VFC display.
 - 5. Reset VFC to normal operation on removal of override signal automatically.
- F. Remote Indicating Circuit Terminals: Mode selection, controller status, and controller fault.
- G. Remote digital operator kit.
- H. Communication Port: RS-232 port, USB 2.0 port, or equivalent connection capable of connecting a printer and a notebook computer.

2.7 ENCLOSURES

- A. VFC Enclosures: NEMA 250, to comply with environmental conditions at installed location.
 - 1. Dry and Clean Indoor Locations: Type 1.
 - 2. Outdoor Locations: Type 3R.
 - 3. Kitchen Wash-Down Areas: Type 4X.
 - 4. Other Wet or Damp Indoor Locations: Type 4.
 - 5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: Type 12.
- B. Plenum Rating: UL 1995; NRTL certification label on enclosure, clearly identifying VFC as "Plenum Rated."

2.8 ACCESSORIES

- A. General Requirements for Control-Circuit and Pilot Devices: NEMA ICS 5; factory installed in VFC enclosure cover unless otherwise indicated.
 - 1. Push Buttons: Covered.
 - 2. Pilot Lights: Push to test.
 - 3. Selector Switches: Rotary type.
 - 4. Stop and Lockout Push-Button Station: Momentary-break, push-button station with a factory-applied hasp arranged so padlock can be used to lock push button in depressed position with control circuit open.
- B. Reversible NC/NO bypass contactor auxiliary contact(s).
- C. Control Relays: Auxiliary and adjustable solid-state time-delay relays.
- D. Phase-Failure, Phase-Reversal, and Undervoltage and Overvoltage Relays: Solid-state sensing circuit with isolated output contacts for hard-wired connections. Provide adjustable undervoltage, overvoltage, and time-delay settings.
 - 1. Current Transformers: Continuous current rating, basic impulse insulating level (BIL) rating, burden, and accuracy class suitable for connected circuitry. Comply with IEEE C57.13.
- E. Supplemental Digital Meters:
 - 1. Elapsed-time meter.
 - 2. Kilowatt meter.
 - 3. Kilowatt-hour meter.
- F. Breather and drain assemblies, to maintain interior pressure and release condensation in NEMA 250, Type 4 enclosures installed outdoors or in unconditioned interior spaces subject to humidity and temperature swings.
- G. Space heaters, with NC auxiliary contacts, to mitigate condensation in NEMA 250, Type 3R enclosures installed outdoors or in unconditioned interior spaces subject to humidity and temperature swings.
- H. Cooling Fan and Exhaust System: For NEMA 250, Type 12; UL 508 component recognized: Supply fan, with composite intake and exhaust grills and filters; 120-V ac; obtained from integral CPT.
- I. Sun shields installed on fronts, sides, and tops of enclosures installed outdoors and subject to direct and extended sun exposure.
- J. Spare control-wiring terminal blocks; wired.

2.9 SOURCE QUALITY CONTROL

- A. Testing: Test and inspect VFCs according to requirements in NEMA ICS 61800-2.
 - 1. Test each VFC while connected to its specified motor.
 - 2. Verification of Performance: Rate VFCs according to operation of functions and features specified.
- B. VFCs will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, surfaces, and substrates to receive VFCs, with Installer present, for compliance with requirements for installation tolerances, and other conditions affecting performance of the Work.
- B. Examine VFC before installation. Reject VFCs that are wet, moisture damaged, or mold damaged.
- C. Examine roughing-in for conduit systems to verify actual locations of conduit connections before VFC installation.
- D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Wall-Mounting Controllers: Install with tops at uniform height and with disconnect operating handles not higher than 79 inches above finished floor, unless otherwise indicated, and by bolting units to wall or mounting on lightweight structural-steel channels bolted to wall. For controllers not on walls, provide freestanding racks complying with Section 260529 "Hangers and Supports for Electrical Systems."
- B. Floor-Mounting Controllers: Install VFCs on 4-inch nominal thickness concrete base. Comply with requirements for concrete base specified in Section 033053 "Miscellaneous Cast-in-Place Concrete."
 - 1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 - 2. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 - 3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 4. Install anchor bolts to elevations required for proper attachment to supported equipment.
- C. Roof-Mounting Controllers: Install VFC on roofs with tops at uniform height and with disconnect operating handles not higher than 79 inches above finished roof surface unless otherwise indicated, and by bolting units to curbs or mounting on freestanding, lightweight, structural-steel channels bolted to curbs. Seal roof penetrations after raceways are installed.
 - 1. Curbs and roof penetrations are specified in Section 077200 "Roof Accessories."

2. Structural-steel channels are specified in Section 260529 "Hangers and Supports for Electrical Systems."
- D. Seismic Bracing: Comply with requirements specified in Section 260548.16 "Seismic Controls for Electrical Systems."
- E. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- F. Install fuses in each fusible-switch VFC.
- G. Install fuses in control circuits if not factory installed. Comply with requirements in Section 262813 "Fuses."
- H. Install heaters in thermal-overload relays. Select heaters based on actual nameplate full-load amperes after motors are installed.
- I. Install, connect, and fuse thermal-protector monitoring relays furnished with motor-driven equipment.
- J. Comply with NECA 1.

3.3 CONTROL WIRING INSTALLATION

- A. Install wiring between VFCs and remote devices and facility's central-control system.
- B. Bundle, train, and support wiring in enclosures.
- C. Connect selector switches and other automatic-control devices where applicable.
 1. Connect selector switches to bypass only those manual- and automatic-control devices that have no safety functions when switches are in manual-control position.
 2. Connect selector switches with control circuit in both manual and automatic positions for safety-type control devices such as low- and high-pressure cutouts, high-temperature cutouts, and motor-overload protectors.

3.4 IDENTIFICATION

- A. Identify VFCs, components, and control wiring. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 2. Label each VFC with engraved nameplate.
 3. Label each enclosure-mounted control and pilot device.
- B. Operating Instructions: Frame printed operating instructions for VFCs, including control sequences and emergency procedures. Fabricate frame of finished metal, and cover instructions with clear acrylic plastic. Mount on front of VFC units.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
- D. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each VFC element, bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- E. Tests and Inspections:
 - 1. Inspect VFC, wiring, components, connections, and equipment installation. Test and adjust controllers, components, and equipment.
 - 2. Test insulation resistance for each VFC element, component, connecting motor supply, feeder, and control circuits.
 - 3. Test continuity of each circuit.
 - 4. Verify that voltages at VFC locations are within 10 percent of motor nameplate rated voltages. If outside this range for any motor, notify Construction Manager before starting the motor(s).
 - 5. Test each motor for proper phase rotation.
 - 6. Perform tests according to the Inspection and Test Procedures for Adjustable Speed Drives stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 7. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - 8. Perform the following infrared (thermographic) scan tests and inspections, and prepare reports:
 - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each VFC. Remove front panels so joints and connections are accessible to portable scanner.
 - b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each VFC 11 months after date of Substantial Completion.
 - c. Instruments and Equipment: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
 - 9. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- F. VFCs will be considered defective if they do not pass tests and inspections.
- G. Prepare test and inspection reports, including a certified report that identifies the VFC and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations made after remedial action.

3.6 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.

3.7 ADJUSTING

- A. Program microprocessors for required operational sequences, status indications, alarms, event recording, and display features. Clear events memory after final acceptance testing and prior to Substantial Completion.
- B. Set field-adjustable switches, auxiliary relays, time-delay relays, timers, and overload-relay pickup and trip ranges.
- C. Adjust the trip settings of instantaneous-only circuit breakers and thermal-magnetic circuit breakers with adjustable, instantaneous trip elements. Initially adjust to 6 times the motor nameplate full-load amperes and attempt to start motors several times, allowing for motor cool-down between starts. If tripping occurs on motor inrush, adjust settings in increments until motors start without tripping. Do not exceed 8 times the motor full-load amperes (or 11 times for NEMA Premium Efficient motors if required). Where these maximum settings do not allow starting of a motor, notify Construction Manager before increasing settings.
- D. Set the taps on reduced-voltage autotransformer controllers.
- E. Set field-adjustable circuit-breaker trip ranges
- F. Set field-adjustable pressure switches.

3.8 PROTECTION

- A. Temporary Heating: Apply temporary heat to maintain temperature according to manufacturer's written instructions until controllers are ready to be energized and placed into service.
- B. Replace VFCs whose interiors have been exposed to water or other liquids prior to Substantial Completion.

3.9 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, reprogram, and maintain VFCs.

END OF SECTION 262923

SECTION 280513 - CONDUCTORS AND CABLES FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Fire alarm wire and cable.
 - 2. Identification products.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. IDC: Insulation displacement connector.
- C. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control and signaling power-limited circuits.
- D. Open Cabling: Passing telecommunications cabling through open space (e.g., between the studs of a wall cavity).
- E. RCDD: Registered Communications Distribution Designer.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate layout and installation of electronic safety and security cabling with Owner's telecommunications and LAN equipment and service suppliers.
- B. Coordinate telecommunications outlet/connector locations with location of power receptacles at each work area.

1.5 ACTION SUBMITTALS

- A. Shop Drawings:
 - 1. System Labeling Schedules: Electronic copy of labeling schedules that are part of the cabling and asset identification system of the software.
 - 2. Cabling administration drawings and printouts.

3. Wiring diagrams to show typical wiring schematics, including the following:
 - a. Cross-connects.
 - b. Patch panels.
 - c. Patch cords.
4. Cross-connects and patch panels. Detail mounting assemblies, and show elevations and physical relationship between the installed components.

B. Sustainable Design Submittals:

1. Product Data: For each conductor and cable indicating lead content.
2. Product Data: For solvents and adhesives, indicating VOC content.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.
- B. Source quality-control reports.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Test cables upon receipt at Project site.
 1. Test each pair of UTP cable for open and short circuits.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 50 or less.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 BACKBOARDS

- A. Backboards: Plywood, fire-retardant treated, 3/4 by 48 by 96 inches. Comply with requirements for plywood backing panels in Section 061000 "Rough Carpentry."

2.3 FIRE ALARM WIRE AND CABLE

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Allied Wire & Cable Inc.
 2. CommScope, Inc.
 3. Comtran Corporation.
 4. Draka Cableteq USA; a Prysmian Group company.
 5. Genesis Cable Products; Honeywell International, Inc.
 6. Radix Wire.
 7. Rockbestos-Suprenant Cable Corp.
 8. Superior Essex Inc.
 9. West Penn Wire.
- B. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.
1. Lead Content: Less than 300 parts per million.
- C. Signaling Line Circuits: Twisted, shielded pair, size as recommended by system manufacturer.
1. Circuit Integrity Cable: Twisted shielded pair, NFPA 70, Article 760, Classification CI, for power-limited fire alarm signal service Type FPL. NRTL listed and labeled as complying with UL 1424 and UL 2196 for a two-hour rating.
- D. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation, and complying with requirements in UL 2196 for a two-hour rating.
1. Low-Voltage Circuits: No. 16 AWG, minimum, in pathway.
 2. Line-Voltage Circuits: No. 12 AWG, minimum, in pathway.
 3. Multiconductor Armored Cable: NFPA 70, Type MC, copper conductors, Type TFN/THHN conductor insulation, copper drain wire, copper armor with outer jacket with red identifier stripe, NRTL listed for fire alarm and cable tray installation, plenum rated.

2.4 IDENTIFICATION PRODUCTS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Brady Corporation.
 2. HellermannTyton.
 3. Kroy LLC.
 4. Panduit Corp.
- B. Comply with TIA-606-B and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- C. Comply with requirements in Section 260553 "Identification for Electrical Systems."

2.5 CABLE MANAGEMENT SYSTEM

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Brady Worldwide Inc.
 2. Chatsworth Products, Inc.
 3. iTRACS Corporation.
 4. Telsoft Solutions.
 5. Total Wire Software Company, Inc.
- B. Description: Computer-based cable management system, with integrated database and graphic capabilities.
- C. Information shall be presented in database view, schematic plans, or technical drawings.

PART 3 - EXECUTION

3.1 INSTALLATION OF HANGERS AND SUPPORTS

- A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for installation of supports for cables.

3.2 WIRING METHOD

- A. Install wiring in metal pathways and wireways.
1. Minimum conduit size shall be 3/4 inch. Control and data-transmission wiring shall not share conduits with other building wiring systems.
 2. Comply with requirements in Section 260536 "Cable Trays for Electrical Systems."
- B. Install cable, concealed in accessible ceilings, walls, and floors when possible.
- C. Wiring on Racks and within Enclosures:
1. Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM's "Cabling Termination Practices" chapter. Cable ties shall not be excessively tightened such that the transmission characteristics of the cable are altered.
 2. Install lacing bars and distribution spools.
 3. Separate power-limited and non-power-limited conductors as recommended in writing by manufacturer.
 4. Install conductors parallel with or at right angles to sides and back of enclosure.
 5. Connect conductors associated with intrusion system that are terminated, spliced, or interrupted in any enclosure onto terminal blocks.
 6. Mark each terminal according to system's wiring diagrams.
 7. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Comply with NECA 1 and NFPA 70.
- B. Conductors: Size according to system manufacturer's written instructions unless otherwise indicated.
- C. Do not install conductors and cables that are wet, moisture damaged, or mold damaged.
- D. General Requirements for Cabling:
 - 1. Comply with TIA-568-C.1.
 - 2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
 - 3. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels. Leave a minimum of 6 inches of slack at outlet terminations and coil loosely into box after termination on outlet fitting.
 - 4. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 - 5. Maintain minimum cable bending radius during installation and termination of cables.
 - 6. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
 - 7. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
 - 8. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions. Do not exceed manufacturer's rated cable-pulling tension.
 - 9. Riser Cable: Riser cable support intervals shall be in accordance with manufacturer's recommendations.
 - 10. Comply with Section 260544 "Sleeves and Sleeve Seals for Electronic Safety and Security Pathways and Cabling."

3.4 FIRE ALARM WIRING INSTALLATION

- A. Comply with NECA 1 and NFPA 72.
- B. Wiring Method:
 - 1. Cables and pathways used for fire alarm circuits, and equipment control wiring associated with the fire alarm system, may not contain any other wire or cable.
 - 2. Fire-Rated Cables: Use of two-hour, fire-rated fire alarm cables, NFPA 70, Types MI and CI, is permitted.
 - 3. Signaling Line Circuits: Power-limited fire alarm cables may be installed in the same cable or pathway as signaling line circuits.
- C. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with the fire alarm system to terminal blocks. Mark each terminal according to the system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.

- D. Cable Taps: Use numbered terminal strips in junction, pull, and outlet boxes, cabinets, or equipment enclosures where circuit connections are made.
- E. Color Coding: Color code fire alarm conductors differently from the normal building power wiring. Use one color code for alarm circuit wiring and another for supervisory circuits. Color code audible alarm-indicating circuits differently from alarm-initiating circuits. Use different colors for visible alarm-indicating devices. Paint fire alarm system junction boxes and covers red.
- F. Wiring to Remote Alarm Transmitting Device: 1-inch conduit between the fire alarm control panel and the transmitter. Install number of conductors and electrical supervision for connecting wiring as needed to suit monitoring function.

3.5 POWER AND CONTROL-CIRCUIT CONDUCTORS

- A. 120-V Power Wiring: Install according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables" unless otherwise indicated.
- B. Minimum Conductor Sizes:
 - 1. Class 1 remote-control and signal circuits, No. 14 AWG.
 - 2. Class 2 low-energy, remote-control and signal circuits, No. 16 AWG.
 - 3. Class 3 low-energy, remote-control, alarm and signal circuits, No. 12 AWG.

3.6 CONNECTIONS

- A. Comply with requirements in Section 283111 "Digital, Addressable Fire-Alarm System" for connecting, terminating, and identifying wires and cables.
- B. Comply with requirements in Section 283500 "Refrigerant Detection and Alarm" for connecting, terminating, and identifying wires and cables.

3.7 FIRESTOPPING

- A. Comply with requirements in Section 078413 "Penetration Firestopping."

3.8 GROUNDING

- A. For communication wiring, comply with J-STD-607-A and with BICSI TDMM's "Grounding, Bonding, and Electrical Protection" chapter.

3.9 IDENTIFICATION

- A. Identify system components, wiring, and cabling complying with TIA-606-B. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

END OF SECTION 280513

SECTION 283111 - DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Fire-alarm control unit.
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. Air-sampling smoke detectors.
5. Nonsystem smoke detectors.
6. Heat detectors.
7. Notification appliances.
8. Device guards.
9. Firefighters' two-way telephone communication service.
10. Firefighters' smoke-control station.
11. Magnetic door holders.
12. Remote annunciator.
13. Graphic annunciator.
14. Addressable interface device.
15. Digital alarm communicator transmitter.
16. Radio alarm transmitter.
17. Network communications.
18. System printer.

- B. Related Requirements:

1. Section 280513 "Conductors and Cables for Electronic Safety and Security" for cables and conductors for fire-alarm systems.

1.3 DEFINITIONS

- A. EMT: Electrical Metallic Tubing.
- B. FACP: Fire Alarm Control Panel.
- C. HLI: High Level Interface.
- D. NICET: National Institute for Certification in Engineering Technologies.
- E. PC: Personal computer.
- F. VESDA: Very Early Smoke-Detection Apparatus.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product, including furnished options and accessories.
1. Include construction details, material descriptions, dimensions, profiles, and finishes.
 2. Include rated capacities, operating characteristics, and electrical characteristics.
- B. Shop Drawings: For fire-alarm system.
1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 2. Include plans, elevations, sections, details, and attachments to other work.
 3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
 4. Detail assembly and support requirements.
 5. Include voltage drop calculations for notification-appliance circuits.
 6. Include battery-size calculations.
 7. Include input/output matrix.
 8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
 9. Include performance parameters and installation details for each detector.
 10. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
 11. Provide program report showing that air-sampling detector pipe layout balances pneumatically within the airflow range of the air-sampling detector.
 12. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale; coordinate location of duct smoke detectors and access to them.
 - a. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.
 - b. Show field wiring required for HVAC unit shutdown on alarm.
 - c. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' control system.
 - d. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' smoke-evacuation system.
 - e. Locate detectors according to manufacturer's written recommendations.
 - f. Show air-sampling detector pipe routing.
 13. Include voice/alarm signaling-service equipment rack or console layout, grounding schematic, amplifier power calculation, and single-line connection diagram.
 14. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.
- C. General Submittal Requirements:
1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
 2. Shop Drawings shall be prepared by persons with the following qualifications:
 - a. Trained and certified by manufacturer in fire-alarm system design.
 - b. NICET-certified, fire-alarm technician; Level III minimum.
 - c. Licensed or certified by authorities having jurisdiction.

- D. Delegated-Design Submittal: For notification appliances and smoke and heat detectors, in addition to submittals listed above, indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
1. Drawings showing the location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the device.
 2. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72. Calculate spacing and intensities for strobe signals and sound-pressure levels for audible appliances.
 3. Indicate audible appliances required to produce square wave signal per NFPA 72.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Lamps for Remote Indicating Lamp Units: Quantity equal to 10 percent of amount installed, but no fewer than one unit.
 2. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no fewer than one unit.
 3. Smoke Detectors, Fire Detectors, and Flame Detectors: Quantity equal to 10 percent of amount of each type installed, but no fewer than one unit of each type.
 4. Detector Bases: Quantity equal to two percent of amount of each type installed, but no fewer than one unit of each type.
 5. Keys and Tools: One extra set for access to locked or tamperproofed components.
 6. Audible and Visual Notification Appliances: One of each type installed.
 7. Fuses: Two of each type installed in the system. Provide in a box or cabinet with compartments marked with fuse types and sizes.
 8. Filters for Air-Sampling Detectors: Quantity equal to two percent of amount of each type installed, but no fewer than one unit of each type.
 9. Air-Sampling Fan: Quantity equal to one for every five detectors, but no fewer than one unit of each type.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.
- B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level III technician.
- C. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL (nationally recognized testing laboratory).
- D. NFPA Certification: Obtain certification according to NFPA 72 by a UL-listed alarm company.
- E. NFPA Certification: Obtain certification according to NFPA 72 in the form of a placard by an FM Global-approved alarm company.

1.7 PROJECT CONDITIONS

- A. Use of Devices during Construction: Protect devices during construction unless devices are placed in service to protect the facility during construction.

1.8 SEQUENCING AND SCHEDULING

- A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service, and label existing fire-alarm equipment "NOT IN SERVICE" until removed from the building.
- B. Equipment Removal: After acceptance of new fire-alarm system, remove existing disconnected fire-alarm equipment and wiring.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Source Limitations for Fire-Alarm System and Components: Components shall be compatible with, and operate as an extension of, existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.
- B. Noncoded, UL-certified addressable system, with multiplexed signal transmission and horn/strobe evacuation.
- C. Automatic sensitivity control of certain smoke detectors.
- D. All components provided shall be listed for use with the selected system.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices:
 - 1. Manual stations.
 - 2. Heat detectors.
 - 3. Flame detectors.
 - 4. Smoke detectors.
 - 5. Duct smoke detectors.
 - 6. Air-sampling smoke-detection system (VESDA).
 - 7. Carbon monoxide detectors.
 - 8. Combustible gas detectors.
 - 9. Automatic sprinkler system water flow.
 - 10. Preaction system.
 - 11. Fire-extinguishing system operation.
 - 12. Fire standpipe system.

13. Dry system pressure flow switch.
14. Fire pump running.

B. Fire-alarm signal shall initiate the following actions:

1. Continuously operate alarm notification appliances, including voice evacuation notices.
2. Identify alarm and specific initiating device at fire-alarm control unit, connected network control panels and remote annunciators.
3. Transmit an alarm signal to the remote alarm receiving station.
4. Unlock electric door locks in designated egress paths.
5. Release fire and smoke doors held open by magnetic door holders.
6. Activate voice/alarm communication system.
7. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.
8. Activate smoke-control system (smoke management) at firefighters' smoke-control system panel.
9. Activate stairwell and elevator-shaft pressurization systems.
10. Close smoke dampers in air ducts of designated air-conditioning duct systems.
11. Activate preaction system.
12. Recall elevators to primary or alternate recall floors.
13. Activate elevator power shunt trip.
14. Activate emergency lighting control.
15. Activate emergency shutoffs for gas and fuel supplies.
16. Record events in the system memory.
17. Record events by the system printer.
18. Indicate device in alarm on the graphic annunciator.

C. Supervisory signal initiation shall be by one or more of the following devices and actions:

1. Valve supervisory switch.
2. High- or low-air-pressure switch of a dry-pipe or preaction sprinkler system.
3. Alert and Action signals of air-sampling detector system.
4. Elevator shunt-trip supervision.
5. Fire pump running.
6. Fire-pump loss of power.
7. Fire-pump power phase reversal.
8. Independent fire-detection and -suppression systems.
9. User disabling of zones or individual devices.
10. Loss of communication with any panel on the network.

D. System trouble signal initiation shall be by one or more of the following devices and actions:

1. Open circuits, shorts, and grounds in designated circuits.
2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
3. Loss of communication with any addressable sensor, input module, relay, control module, remote annunciator, printer interface, or Ethernet module.
4. Loss of primary power at fire-alarm control unit.
5. Ground or a single break in internal circuits of fire-alarm control unit.
6. Abnormal ac voltage at fire-alarm control unit.
7. Break in standby battery circuitry.
8. Failure of battery charging.
9. Abnormal position of any switch at fire-alarm control unit or annunciator.
10. Voice signal amplifier failure.
11. Hose cabinet door open.

E. System Supervisory Signal Actions:

1. Initiate notification appliances.

2. Identify specific device initiating the event at fire-alarm control unit, connected network control panels and remote annunciators.
3. Record the event on system printer.
4. After a time delay of 200 seconds, transmit a trouble or supervisory signal to the remote alarm receiving station.
5. Transmit system status to building management system.
6. Display system status on graphic annunciator.

2.3 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Fire-alarm control unit and raceways shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

2.4 FIRE-ALARM CONTROL UNIT

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. SimplexGrinnell LP.
- B. General Requirements for Fire-Alarm Control Unit:
1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.
 - a. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.
 - b. Include a real-time clock for time annotation of events on the event recorder and printer.
 - c. Provide communication between the FACP and remote circuit interface panels, annunciators, and displays.
 - d. The FACP shall be listed for connection to a central-station signaling system service.
 - e. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The FACP shall provide a minimum 500-event history log.
 2. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
 3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.
- C. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.
1. Annunciator and Display: Liquid-crystal type, 80 characters, minimum.
 2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.

- D. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.
1. Annunciator and Display: Liquid-crystal type, three line(s) of 80 characters, minimum.
 2. Keypad: Arranged to permit entry and execution of programming, display, and control commands and to indicate control commands to be entered into the system for control of smoke-detector sensitivity and other parameters.
- E. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:
1. Pathway Class Designations: NFPA 72, Class A.
 2. Pathway Survivability: Level 1.
 3. Install no more than 100 addressable devices on each signaling-line circuit.
 4. Serial Interfaces:
 - a. One dedicated RS 485 port for remote station operation using point ID DACT.
 - b. One RS 485 port for remote annunciators, Ethernet module, or multi-interface module (printer port).
 - c. One RS 232 port for PC configuration.
 - d. One RS 232 port for VESDA HLI connection.
 - e. One RS 232 port for voice evacuation interface.
- F. Smoke-Alarm Verification:
1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.
 2. Activate an approved "alarm-verification" sequence at fire-alarm control unit and detector.
 3. Record events by the system printer.
 4. Sound general alarm if the alarm is verified.
 5. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.
- G. Notification-Appliance Circuit:
1. Audible appliances shall sound in a three-pulse temporal pattern, as defined in NFPA 72.
 2. Where notification appliances provide signals to sleeping areas, the alarm signal shall be a 520-Hz square wave with an intensity 15 dB above the average ambient sound level or 5 dB above the maximum sound level, or at least 75 dBA, whichever is greater, measured at the pillow.
 3. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.
- H. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke-barrier walls shall be connected to fire-alarm system.
- I. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory, and print out the final adjusted values on system printer.
- J. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.
- K. Printout of Events: On receipt of signal, print alarm, supervisory, and trouble events. Identify zone, device, and function. Include type of signal (alarm, supervisory, or trouble) and date and time of occurrence. Differentiate alarm signals from all other printed indications. Also print system reset event, including same information for

device, location, date, and time. Commands initiate the printing of a list of existing alarm, supervisory, and trouble conditions in the system and a historical log of events.

- L. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory and digital alarm communicator transmitters shall be powered by 24-V dc source.
 - 1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.
- M. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.
 - 1. Batteries: Sealed lead calcium.
- N. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

2.5 MANUAL FIRE-ALARM BOXES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. SimplexGrinnell LP.
- B. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.
 - 1. Single-action mechanism, pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
 - 2. Double-action mechanism requiring two actions to initiate an alarm, pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
 - 3. Station Reset: Key- or wrench-operated switch.
 - 4. Indoor Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm. Lifting the cover actuates an integral battery-powered audible horn intended to discourage false-alarm operation.
 - 5. Weatherproof Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm.

2.6 SYSTEM SMOKE DETECTORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. SimplexGrinnell LP.
- B. General Requirements for System Smoke Detectors:
 - 1. Comply with UL 268; operating at 24-V dc, nominal.
 - 2. Detectors shall be four-wire type.

3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
 4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
 5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
 6. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
 7. Remote Control: Unless otherwise indicated, detectors shall be digital-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire-alarm control unit.
 - a. Rate-of-rise temperature characteristic of combination smoke- and heat-detection units shall be selectable at fire-alarm control unit for 15 or 20 deg F per minute.
 - b. Fixed-temperature sensing characteristic of combination smoke- and heat-detection units shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 or 155 deg F.
 - c. Multiple levels of detection sensitivity for each sensor.
 - d. Sensitivity levels based on time of day.
- C. Photoelectric Smoke Detectors:
1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
- D. Ionization Smoke Detector:
1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
- E. Duct Smoke Detectors: Photoelectric type complying with UL 268A.
1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.

- d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
3. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector for smoke detection in HVAC system ducts.
 4. Each sensor shall have multiple levels of detection sensitivity.
 5. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
 6. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

2.7 PROJECTED BEAM SMOKE DETECTORS

- A. Projected Beam Light Source and Receiver: Designed to accommodate small angular movements and continue to operate and not cause nuisance alarms.
- B. Detector Address: Accessible from fire-alarm control unit and able to identify the detector's location within the system and its sensitivity setting.
- C. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 1. Primary status.
 2. Device type.
 3. Present average value.
 4. Present sensitivity selected.
 5. Sensor range (normal, dirty, etc.).

2.8 CARBON MONOXIDE DETECTORS

- A. General: Carbon monoxide detector listed for connection to fire-alarm system.
 1. Mounting: Adapter plate for outlet box mounting.
 2. Testable by introducing test carbon monoxide into the sensing cell.
 3. Detector shall provide alarm contacts and trouble contacts.
 4. Detector shall send trouble alarm when nearing end-of-life, power supply problems, or internal faults.
 5. Comply with UL 2075.
 6. Locate, mount, and wire according to manufacturer's written instructions.
 7. Provide means for addressable connection to fire-alarm system.
 8. Test button simulates an alarm condition.

2.9 HEAT DETECTORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. SimplexGrinnell LP.
- B. General Requirements for Heat Detectors: Comply with UL 521.
 1. Temperature sensors shall test for and communicate the sensitivity range of the device.

- C. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F or a rate of rise that exceeds 15 deg F per minute unless otherwise indicated.
 - 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
 - 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

- D. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of 190 deg F.
 - 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
 - 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

- E. Continuous Linear Heat-Detector System:
 - 1. Detector Cable: Rated detection temperature 155 deg F. Listed for "regular" service and a standard environment. Cable includes two steel actuator wires twisted together with spring pressure, wrapped with protective tape, and finished with PVC outer sheath. Each actuator wire is insulated with heat-sensitive material that reacts with heat to allow the cable twist pressure to short circuit wires at the location of elevated temperature.
 - 2. Control Unit: Two-zone or multizone unit as indicated. Provide same system power supply, supervision, and alarm features as specified for fire-alarm control unit.
 - 3. Signals to Fire-Alarm Control Unit: Any type of local system trouble shall be reported to fire-alarm control unit as a composite "trouble" signal. Alarms on each detection zone shall be individually reported to central fire-alarm control unit as separately identified zones.
 - 4. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.10 AIR-SAMPLING SMOKE DETECTOR

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Ansul Incorporated; Tyco International Ltd.
 - 2. Fenwal Protection Systems; A UTC Fire & Security Company.
 - 3. Fike Corporation.
 - 4. Notifier.
 - 5. Xtralis Pty Ltd.

- B. General Description:
 - 1. Air-sampling smoke detector shall be laser based using a piping system and a fan to transport the particles of combustion to the detector.
 - 2. Provide two levels of alarm from each zone covered by the detector and two supervisory levels of alarm from each detector.
 - 3. The air being sampled shall pass through filters to remove dust particulates greater than 20 microns before entering the detection chamber.
 - 4. Detectors shall have the capability via RS 485 to connect up to 100 detectors in a network.
 - 5. Detectors shall communicate with the fire-alarm control unit via addressable, monitored dry contact closures, RS 485, and interface modules. Provide a minimum of six relays, individually programmable remotely for any function.
 - 6. Pipe airflow balancing calculations shall be performed using approved calculation software.

C. Detector:

1. Detector, Filter, Aspirator, and Relays: Housed in a mounting box and arranged in such a way that air is drawn from the detection area and a sample passed through the dual-stage filter and detector by the aspirator.
2. Obscuration Sensitivity Range: 0.005 - 6 percent obs/ft..
3. Four independent, field-programmable, smoke-alarm thresholds per sensor pipe and a programmable scan time delay. The threshold set points shall be programmable.
 - a. The four alarm thresholds may be used as follows:
 - 1) Alarm Level 1 (Alert): Activate a visual and an audible supervisory alarm.
 - 2) Alarm Level 2 (Action): Activate shutdown of electrical/HVAC equipment and activate a visual and an audible supervisory alarm.
 - 3) Alarm Level 3 (Fire 1): Activate building alarm systems and initiate call to fire response unit.
 - 4) Alarm Level 4 (Fire 2): Activate suppression system or other countermeasures.
 - b. Final Detection System Settings: Approved by Owner.
 - c. Initial Detection Alarm Settings:
 - 1) Alarm Level 1 (Alert): 0.08 percent obs/ft..
 - 2) Alarm Level 2 (Action): 1.0 percent obs/ft..
 - 3) Alarm Level 3 (Fire 1): 2.0 percent obs/ft..
 - 4) Alarm Level 4 (Fire 2): 4.0 percent obs/ft..
4. Power Supply:
 - a. Regulated 24-V dc, monitored by the fire-alarm control unit, with battery backup.
 - b. Battery backup shall provide 24 hours' standby, followed by 30 minutes at maximum connected load.
5. Detector shall also transmit the following faults:
 - a. Detector.
 - b. Airflow.
 - c. Filter.
 - d. System.
 - e. Zone.
 - f. Network.
 - g. Power.
6. Provide four in-line sample pipe inlets that shall contain a flow sensor for each pipe inlet. The detector shall be capable of identifying the pipe from which smoke was detected.
7. Aspirator: Air pump capable of allowing for multiple sampling pipe runs up to 650 feet in total, (four pipe runs per detector) with a transport time of less than 120 seconds from the farthest sample port.
8. Air-Sampling Flow Rates Outside Manufacturer's Specified Range: Result in a trouble alarm.
9. Provide software-programmable relays rated at 2 A at 30-V dc for alarm and fault conditions.
10. Provide built-in event and smoke logging; store smoke levels, alarm conditions, operator actions, and faults with date and time of each event. Each detector (zone) shall be capable of storing up to 18,000 events.
11. Urgent and Minor Faults. Minor faults shall be designated as trouble alarms. Urgent faults, which indicate the unit may not be able to detect smoke, shall be designated as supervisory alarms.

D. Displays:

1. Include display module within each detector.
2. Each display shall provide the following features at a minimum:
 - a. A bar-graph display.
 - b. Four independent, high-intensity alarm indicators (Alert, Action, Fire 1, and Fire 2), corresponding to the four alarm thresholds of the indicated sector.
 - c. Alarm threshold indicators for Alert, Action, and Fire 1.
 - d. LED indication that the first alarm sector is established.
 - e. Detector fault and airflow fault indicators.
 - f. LED indicators shall be provided for faults originating in the particular zone (Zone Fault), faults produced by the overall smoke-detection system, and faults resulting from network wiring errors (Network Fault).
 - g. Minor and urgent LED fault indicators.

E. Sampling Tubes:

1. Smooth bore with a nominal 1-inch OD and a 7/8-inch ID. Sampling pipe with between 5/8- and 1-inch ID can be used in specifically approved locations when recommended by manufacturer.
2. Pipe Material: CPVC and complying with UL 1887, "Safety Fire Test of Plastic Sprinkler Pipe for Visible Flame and Smoke Characteristics."
3. Joints in the sampling pipe shall be airtight. Use solvent cement approved by the pipe manufacturer on all joints except at entry to the detector.
4. Identify piping with labels reading: "Aspirating Smoke Detector Pipe - Do Not Paint or Disturb" along its entire length at regular intervals according to NFPA 72.
5. Support pipes at not more than 60-inch centers.
6. Fit end of each trunk or branch pipe with an end cap and drilled with a hole appropriately sized to achieve the performance as specified and as calculated by the system design.

F. Sampling Holes:

1. Sampling holes of 5/64 inch, or other sized holes per manufacturer's written instructions, shall be separated by not more than the maximum distance allowable for conventional smoke detectors. Intervals may vary according to calculations.
2. Follow manufacturer's written recommendations to determine the number and spacing of sampling points and the distance from sampling points to ceiling or roof structure and to forced ventilation systems.
3. Each sampling point shall be identified by an applied decal.

2.11 NOTIFICATION APPLIANCES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. SimplexGrinnell LP.
- B. General Requirements for Notification Appliances: Individually addressed, connected to a signaling-line circuit, equipped for mounting as indicated, and with screw terminals for system connections.
- C. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.
 1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.
- D. Chimes, Low-Level Output: Vibrating type, 75-dBA minimum rated output.

- E. Chimes, High-Level Output: Vibrating type, 81-dBA minimum rated output.
- F. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet from the horn, using the coded signal prescribed in UL 464 test protocol.
- G. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- high letters on the lens.
 - 1. Rated Light Output:
 - a. 15/30/75/110 cd, selectable in the field.
 - 2. Mounting: Wall mounted unless otherwise indicated.
 - 3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
 - 4. Flashing shall be in a temporal pattern, synchronized with other units.
 - 5. Strobe Leads: Factory connected to screw terminals.
 - 6. Mounting Faceplate: Factory finished, red.
- H. Voice/Tone Notification Appliances:
 - 1. Comply with UL 1480.
 - 2. Speakers for Voice Notification: Locate speakers for voice notification to provide the intelligibility requirements of the "Notification Appliances" and "Emergency Communications Systems" chapters in NFPA 72.
 - 3. High-Range Units: Rated 2 to 15 W.
 - 4. Low-Range Units: Rated 1 to 2 W.
 - 5. Mounting: Flush.
 - 6. Matching Transformers: Tap range matched to acoustical environment of speaker location.
- I. Exit Marking Audible Notification Appliance:
 - 1. Exit marking audible notification appliances shall meet the audibility requirements in NFPA 72.
 - 2. Provide exit marking audible notification appliances at the entrance to all building exits.
 - 3. Provide exit marking audible notification appliances at the entrance to areas of refuge with audible signals distinct from those used for building exit marking.

2.12 MAGNETIC DOOR HOLDERS

- A. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching doorplate.
 - 1. Electromagnets: Require no more than 3 W to develop 25-lbf holding force.
 - 2. Wall-Mounted Units: Flush mounted unless otherwise indicated.
 - 3. Rating: 24-V ac or dc.
 - 4. Rating: 120-V ac.
- B. Material and Finish: Match door hardware.

2.13 REMOTE ANNUNCIATOR

- A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.
 - 1. Mounting: Flush cabinet, NEMA 250, Type 1.
- B. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

2.14 ADDRESSABLE INTERFACE DEVICE

- A. General:
 - 1. Include address-setting means on the module.
 - 2. Store an internal identifying code for control panel use to identify the module type.
 - 3. Listed for controlling HVAC fan motor controllers.
- B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.
- C. Control Module:
 - 1. Operate notification devices.
 - 2. Operate solenoids for use in sprinkler service.

2.15 DIGITAL ALARM COMMUNICATOR TRANSMITTER

- A. Digital alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL 632.
- B. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture two telephone line(s) and dial a preset number for a remote central station. When contact is made with central station(s), signals shall be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both telephone lines, transmitter shall initiate the local trouble signal.
- C. Local functions and display at the digital alarm communicator transmitter shall include the following:
 - 1. Verification that both telephone lines are available.
 - 2. Programming device.
 - 3. LED display.
 - 4. Manual test report function and manual transmission clear indication.
 - 5. Communications failure with the central station or fire-alarm control unit.
- D. Digital data transmission shall include the following:
 - 1. Address of the alarm-initiating device.
 - 2. Address of the supervisory signal.

3. Address of the trouble-initiating device.
4. Loss of ac supply.
5. Loss of power.
6. Low battery.
7. Abnormal test signal.
8. Communication bus failure.

E. Secondary Power: Integral rechargeable battery and automatic charger.

F. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

2.16 NETWORK COMMUNICATIONS

- A. Provide network communications for fire-alarm system according to fire-alarm manufacturer's written requirements.
- B. Provide network communications pathway per manufacturer's written requirements and requirements in NFPA 72 and NFPA 70.
- C. Provide integration gateway using BACnet for connection to building automation system.

2.17 SYSTEM PRINTER

- A. Printer shall be listed and labeled as an integral part of fire-alarm system.

2.18 DEVICE GUARDS

- A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.
 1. Factory fabricated and furnished by device manufacturer.
 2. Finish: Paint of color to match the protected device.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.
 1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.
- B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
1. Devices placed in service before all other trades have completed cleanup shall be replaced.
 2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.
- B. Equipment Mounting: Install fire-alarm control unit on concrete base.
1. Install seismic bracing. Comply with requirements in Section 260548.16 "Seismic Controls for Electrical Systems."
 2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 3. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 4. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 5. Install anchor bolts to elevations required for proper attachment to supported equipment.
- C. Equipment Mounting: Install fire-alarm control unit on finished floor.
- D. Install wall-mounted equipment, with tops of cabinets not more than 78 inches above the finished floor.
- E. Manual Fire-Alarm Boxes:
1. Install manual fire-alarm box in the normal path of egress within 60 inches of the exit doorway.
 2. Mount manual fire-alarm box on a background of a contrasting color.
 3. The operable part of manual fire-alarm box shall be between 42 inches and 48 inches above floor level. All devices shall be mounted at the same height unless otherwise indicated.
- F. Smoke- or Heat-Detector Spacing:
1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
 2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
 3. Smooth ceiling spacing shall not exceed 30 feet.
 4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex A or Annex B in NFPA 72.
 5. HVAC: Locate detectors not closer than 36 inches from air-supply diffuser or return-air opening.
 6. Lighting Fixtures: Locate detectors not closer than 12 inches from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.
- G. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.
- H. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches long shall be supported at both ends.
1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.

- I. Air-Sampling Smoke Detectors: If using multiple pipe runs, the runs shall be pneumatically balanced.
- J. Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location. Do not install smoke detectors in sprinklered elevator shafts.
- K. Single-Station Smoke Detectors: Where more than one smoke alarm is installed within a dwelling or suite, they shall be connected so that the operation of any smoke alarm causes the alarm in all smoke alarms to sound.
- L. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.
- M. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.
- N. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches below the ceiling. Install all devices at the same height unless otherwise indicated.
- O. Device Location-Indicating Lights: Locate in public space near the device they monitor.
- P. Antenna for Radio Alarm Transmitter: Mount to building structure where indicated. Use mounting arrangement and substrate connection that resists 100-mph wind load with a gust factor of 1.3 without damage.

3.3 PATHWAYS

- A. Pathways above recessed ceilings and in nonaccessible locations may be routed exposed.
 - 1. Exposed pathways located less than 96 inches above the floor shall be installed in EMT.
- B. Pathways shall be installed in EMT.
- C. Exposed EMT shall be painted red enamel.

3.4 CONNECTIONS

- A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Section 087100 "Door Hardware." Connect hardware and devices to fire-alarm system.
 - 1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.
- B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
 - 1. Smoke dampers in air ducts of designated HVAC duct systems.
 - 2. Magnetically held-open doors.
 - 3. Electronically locked doors and access gates.
 - 4. Alarm-initiating connection to activate emergency lighting control.
 - 5. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
 - 6. Supervisory connections at valve supervisory switches.
 - 7. Data communication circuits for connection to building management system.

8. Data communication circuits for connection to mass notification system.
9. Supervisory connections at fire-extinguisher locations.

3.5 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Install framed instructions in a location visible from fire-alarm control unit.

3.6 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

3.7 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by Construction Manager and Owner.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
- D. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 1. Visual Inspection: Conduct visual inspection prior to testing.
 - a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- F. Fire-alarm system will be considered defective if it does not pass tests and inspections.

- G. Prepare test and inspection reports.
- H. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.
- I. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.8 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of manufacturer's designated service organization. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
 - 1. Include visual inspections according to the "Visual Inspection Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - 2. Perform tests in the "Test Methods" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - 3. Perform tests per the "Testing Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

3.9 SOFTWARE SERVICE AGREEMENT

- A. Comply with UL 864.
- B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.
- C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.
 - 1. Upgrade Notice: At least 30 days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

3.10 DEMONSTRATION

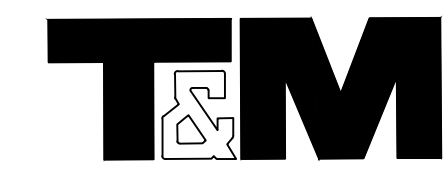
- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION 283111



UNION COUNTY COURTHOUSE INTERNAL STAIR (TOWER)

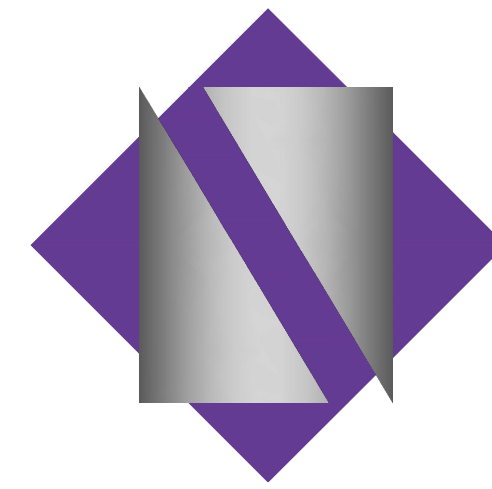
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ELIZABETH, NJ 07202



ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365
NEW JERSEY BOARD OF
PROFESSIONAL ENGINEERS AND
LAND SURVEYORS
CERTIFICATE OF AUTHORIZATION
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ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
1084 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2860 FAX: 973-286-2864
WWW.ATIENGINEERS.COM
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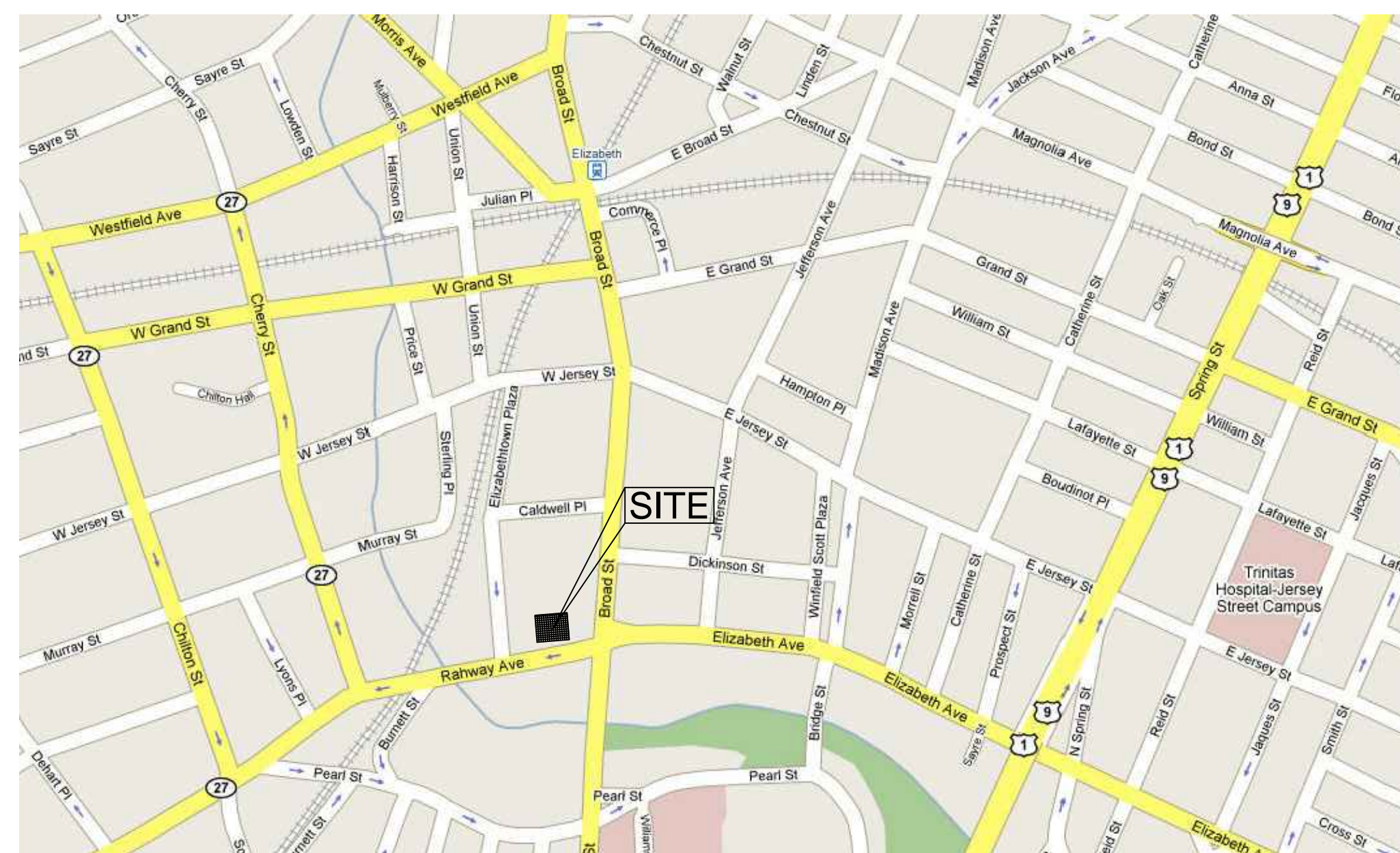


NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

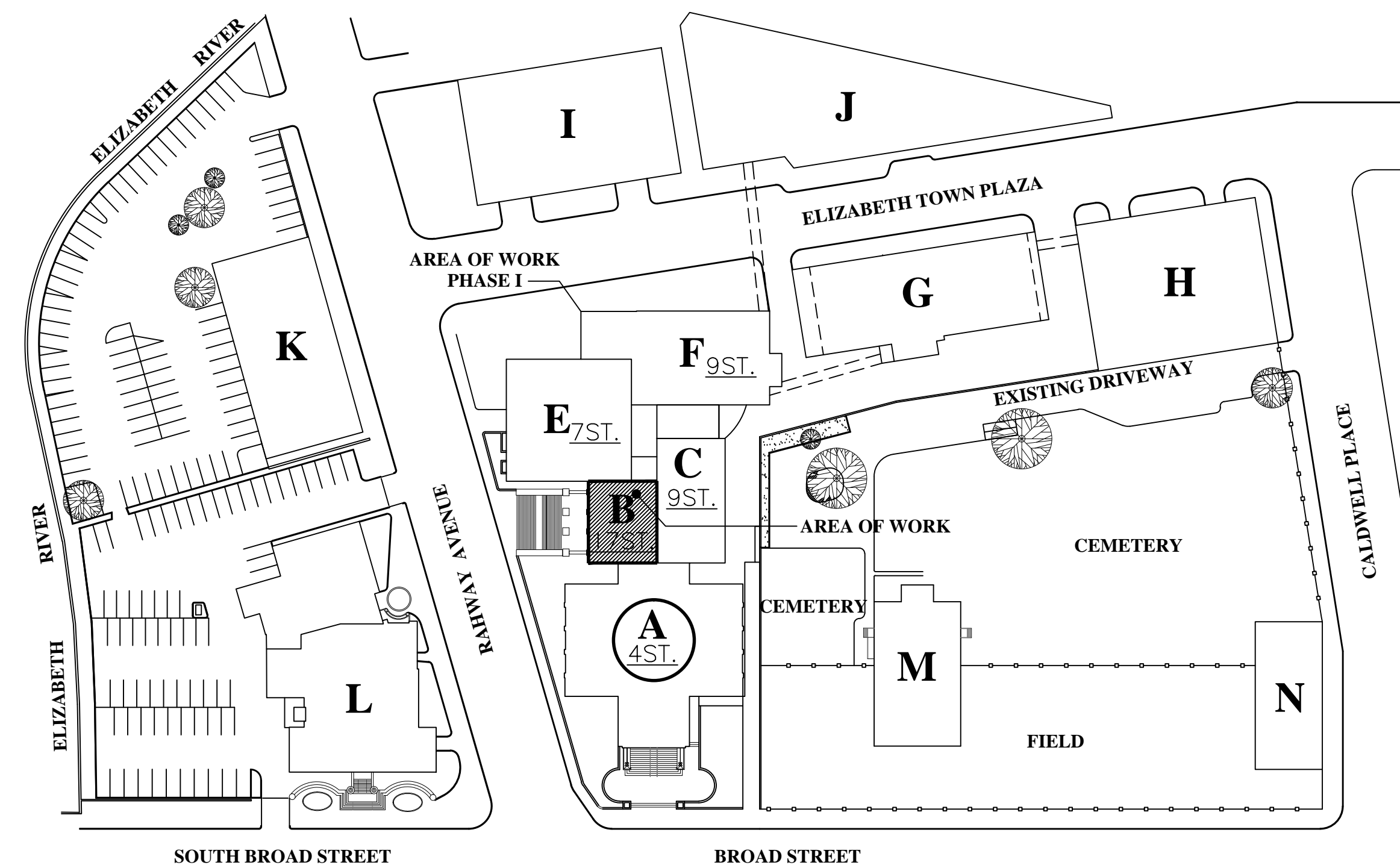


1160 Route 22 West, 2nd Floor, Mountainside, New Jersey 07092
o 908.379.2911 d 908.379.2911 x210 m 908.377.0938
e ppanzarino@o-n.com w o-n.com

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SEPTEMBER 7, 2017



LOCATION PLAN
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LEGEND

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| A. COURT HOUSE ROTUNDA | H. PARKING GARAGE / DETENTION CENTER |
| B. TOWER COURT HOUSE | I. ADMINISTRATION |
| C. OLD COURT HOUSE | J. RALPH ORISCELLO CORRECTIONAL FACILITY |
| D. OMITTED | K. JUSTICE FACILITY |
| E. OLD COURT HOUSE ANNEX | L. PUBLIC LIBRARY |
| F. OLD COURT HOUSE JAIL | M. FIRST PRESBYN. CHURCH |
| G. NEW COURT HOUSE ANNEX | N. PARISH HO. |

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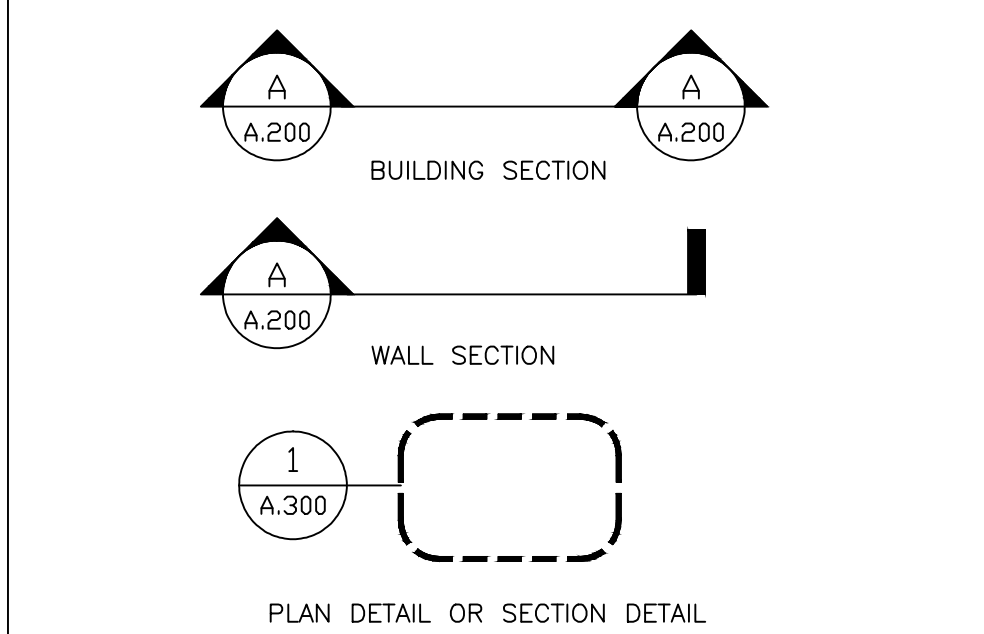
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E.407	ELECTRICAL LIGHTING PLAN SEVENTH FLOOR
E.408	ELECTRICAL LIGHTING PLAN EIGHTH FLOOR
E.409	ELECTRICAL LIGHTING PLAN NINTH FLOOR
E.410	ELECTRICAL LIGHTING PLAN TENTH FLOOR
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E.805	ELECTRICAL DETAILS (SHEET 5)
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P.102	PLUMBING SYMBOLS & ABBREVIATIONS
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FP.300G	SPRINKLER PIPING PLAN GROUND FLOOR
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FP.302	SPRINKLER PIPING PLAN SECOND FLOOR
FP.303	SPRINKLER PIPING PLAN THIRD FLOOR
FP.304	SPRINKLER PIPING PLAN FOURTH FLOOR
FP.305	SPRINKLER PIPING PLAN FIFTH FLOOR
FP.306	SPRINKLER PIPING PLAN SIXTH FLOOR
FP.307	SPRINKLER PIPING PLAN SEVENTH FLOOR
FP.308	SPRINKLER PIPING PLAN EIGHTH FLOOR
FP.309	SPRINKLER PIPING PLAN NINTH FLOOR
FP.310	SPRINKLER PIPING PLAN TENTH & 11TH FLR.
FP.311	SPRINKLER PIPING PLAN 12TH & 13TH FLR.
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FP.313	SPRINKLER PIPING PLAN 16TH & 17TH FLR.
FP.601	FIRE PROTECTION RISER DIAGRAM
FP.801	FIRE PROTECTION DETAILS

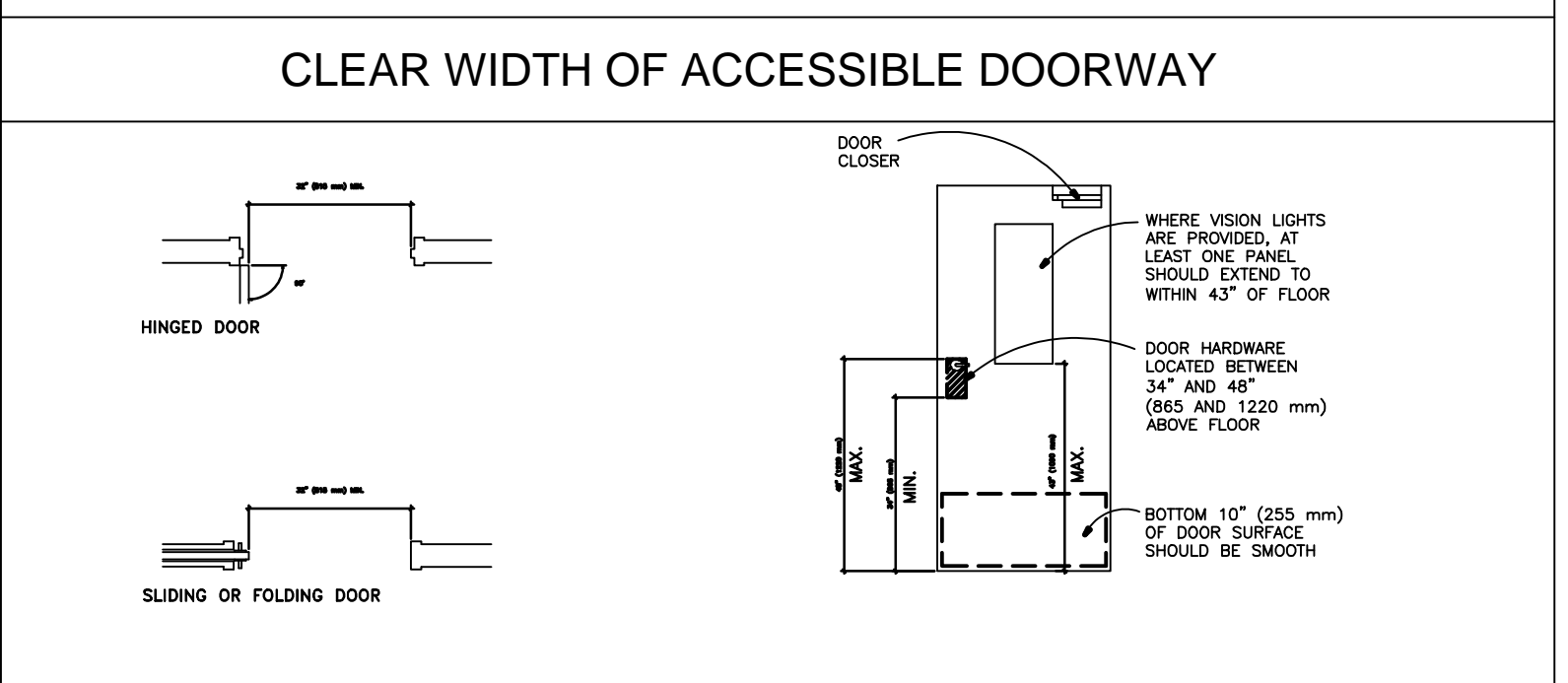
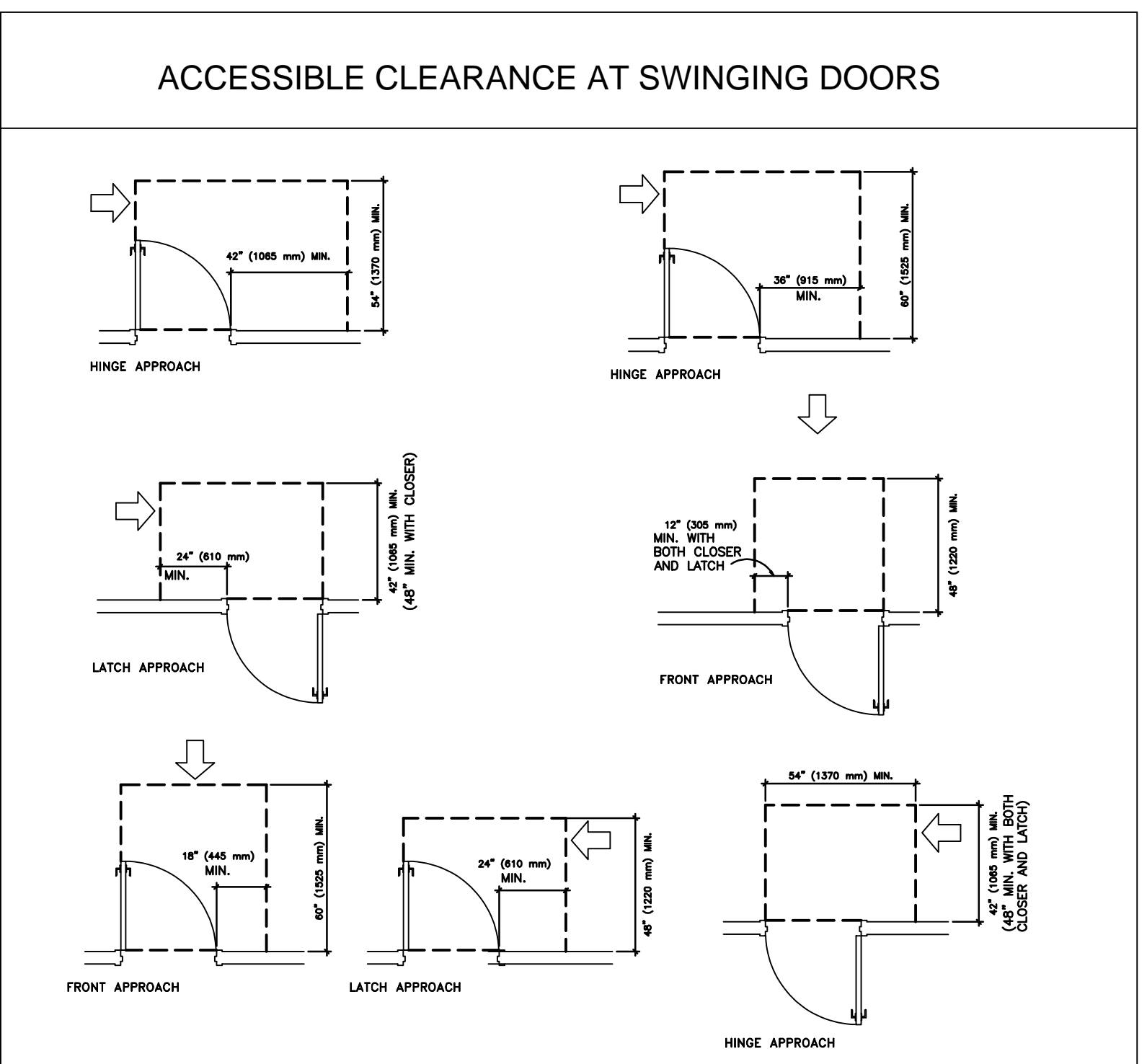
SYMBOLS	
	PARTITION TYPE
	WINDOW TYPE
	KEYNOTES
	DEMOLITION KEYNOTES
	REVISION TAG
	DOOR NUMBER
	ELEVATION POINTER / WORK POINT
	SIGNAGE
	WALL FINISH
	ROOM FINISHES

Drawing Title	→ 1 PLAN	SCALE
Drawing No.	→ 1	SCALE
Sheet No.	→ 1	SCALE
Drawing Title	→ 1 ELEVATION	SCALE
Drawing No.	→ 1	SCALE
Sheet No.	→ 1	SCALE
Drawing Title	→ 1 SECTION	SCALE
Drawing No.	→ 1	SCALE
Sheet No.	→ 1	SCALE
Drawing Title	→ 1 DETAIL	SCALE
Drawing No.	→ 1	SCALE
Sheet No.	→ 1	SCALE



MATERIALS LEGEND	
	CONCRETE
	BRICK OR FACEBLOCK
	LIMESTONE/GRANITE
	CMU
	STEEL
	PLYWOOD
	WOOD STUD / WOOD BLOCKING
	RIGID INSULATION
	SHIM
	CARPET
	GYPSON BOARD
	EARTH
	GRAVEL / POROUS FILL
	BATT INSULATION

ABBREVIATIONS	
ALUM.	ALUMINUM
A.F.F.	ABOVE FINISH FLOOR
ALT.	ALTERNATE
APPROX.	APPROXIMATE
ARCH.	ARCHITECT
ARCH'L.	ARCHITECTURAL
BD.	BOARD
BLDG.	BUILDING
BOT.	BOTTOM
C.J.	CONTROL JOINT
CLG.	CEILING
CU.	CONDENSING UNIT
CLO.	CLOSET
C.T.	CERAMIC TILE
COL.	COLLUMN
C.M.U.	CONCRETE MASONRY UNIT
CONC.	CONCRETE
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
DET.	DETAIL
DIA.	DIAMETER
DIM.	DIMENSION
DN.	DOWN
DR.	DOOR
DWG.	DRAWING
EA.	EACH
ELEC.	ELECTRIC
ELECT'L.	ELECTRICAL
ENCL.	ENCLOSURE
EL.	ELEVATION
ELEV.	ELEVATOR
EQUIP.	EQUIPMENT
EQ.	EQUAL
E.W.C.	ELECTRIC WATER COOLER
EXIST.	EXISTING
E.T.R.	EXISTING TO REMAIN
EXP.	EXPANSION
EXT.	EXTERIOR
E.J.	EXPANSION JOINT
F.D.	FLOOR DRAIN
FDN.	FOUNDATION
F.E.	FREIGHT ELEVATOR
F.H.C.	FIRE HOSE CABINET
FIN.	FINISH
FL.	FLOOR
FLUR.	FLUORESCENT FOOT / FEET FOOTING
FT.	FOOTING
FTG.	FOOTING
GA.	GAUGE
GALV.	GALVANIZED
GL.	GLASS
GWB	GYPSON WALL BOARD
GYP. BD.	GYPSON BOARD
H.C.	HANDICAPPED
HDWR.	HARDWARE
HDWD.	HARDWOOD
H.M.	HOLLOW METAL
H.P.	HIGH POINT
HT.	HEIGHT
H.V.A.C.	HEATING, VENTILATION, & AIR CONDITIONING
HORIZ.	HORIZONTAL
HR.	HOUR
I.D.	INSIDE DIAMETER
IN.	INCH / INCHES
INCL.	INCLUDING
INFO.	INFORMATION
INSUL.	INSULATION
INV.	INVERT
JT.	JOINT
LAM.	LAMINATE
LAV.	LAVATORY
LG.	LONG
L.P.	LOW POINT
LT.	LIGHT
LT. WT.	LIGHT WEIGHT
MACH.	MACHINE
M.H.	MANHOLE
MAT'L.	MATERIAL
MAX.	MAXIMUM
MECH.	MECHANICAL
MEMB.	MEMBRANE
MIN.	MINIMUM
MIR.	MIRROR
MISC.	MISCELLANEOUS
M.O.	MASONRY OPENING
M.L.D.G.	MOLDING
M.O.H.	MIRROR OPPOSITE HAND
M.T.D.	MAINTAINED
M.T.	METAL
MFD.	METAL FLOOR DECK
MDF.	MEDIUM DENSITY FIBERBOARD
MRD.	METAL ROOF DECK
MULL.	MULLION
N.	NORTH
NAT.	NATURAL
N.I.C.	NOT IN CONTRACT
NO.	NUMBER
N.T.S.	NOT TO SCALE
O.A.	OVERALL
O.A.I.	OUTSIDE AIR INTAKE ON CENTER
O.C.	OPENING
OPP.	OPPOSITE
ORIG.	ORIGINAL
O.H.	OVERHEAD
O.D.	OVERFLOW DRAIN
PART.	PARTITION
PTN.	PARTITION
PASS.	PASSENGER
PLAS.	PLASTIC
PL. LAM.	PLASTIC LAMINATE
PL.	PLATE
PLYWD.	PLYWOOD
PANL.	PANEL
PR.	PAIR
PTD.	PAINTED
P.V.C.	POLYVINYL CHLORIDE
P.S.I.	POUNDS PER SQUARE INCH
P.S.F.	POUNDS PER SQUARE FOOT
R.	RISER
RAD.	RADIUS
RB	RUBBER BASE
RCP	REFLECTED CEILING PLAN
R.D.	ROOF DRAIN
REF.	REFERENCE
REFL.	REFLECTED
REQ'D.	REQUIRED
REIN.F.	REINFORCING
REV.	REVISION
R.H.	RIGHT HAND
RM.	ROOM
R.O.	ROUGH OPENING
R.O.D.	ROOF OVERFLOW DRAIN
RISER	RISER
RADIUS	RADIUS
RUBBER BASE	RUBBER BASE
REFLECTED CEILING PLAN	REFLECTED CEILING PLAN
ROOF DRAIN	ROOF DRAIN
REFERENCE	REFERENCE
REFLECTED	REFLECTED
REQUIRED	REQUIRED
REINFORCING	REINFORCING
REVISION	REVISION
RIGHT HAND	RIGHT HAND
ROOM	ROOM
ROUGH OPENING	ROUGH OPENING
ROOF OVERFLOW DRAIN	ROOF OVERFLOW DRAIN
SECTION	SECTION
SHOW	SHOW
SIMILAR	SIMILAR
SKETCH	SKETCH
SPECIFICATIONS	SPECIFICATIONS
SQUARE	SQUARE
STAINLESS STEEL	STAINLESS STEEL
STEEL	STEEL
STANDARD	STANDARD
STRUCT.	STRUCTURE
STRUCT'L	STRUCTURAL
SUSP.	SUSPENDED
TOP OF	TOP OF
TELEPHONE	TELEPHONE
TERRAZZO	TERRAZZO
TRANSFORMER	TRANSFORMER
TYPICAL	TYPICAL
TO BE DETERMINED	TO BE DETERMINED
UNDERWRITER'S LABORATORY UNFINISHED UNLESS OTHERWISE NOTED	UNDERWRITER'S LABORATORY UNFINISHED UNLESS OTHERWISE NOTED
UTILITY	UTILITY
VINYL BASE	VINYL BASE
VINYL COMPOSITION TILE	VINYL COMPOSITION TILE
VESTIBULE	VESTIBULE
VERIFY IN FIELD	VERIFY IN FIELD
VOLUME	VOLUME
VENT THRU ROOF	VENT THRU ROOF
WATER CLOSET	WATER CLOSET
WIDE FLANGE	WIDE FLANGE
WINDOW OPENING	WINDOW OPENING
WORKING POINT	WORKING POINT
WELDED WIRE FABRIC	WELDED WIRE FABRIC



BUILDING CODE INFORMATION	
PROJECT NAME:	UNION COUNTY COURTHOUSE INTERNAL STAIR (TOWER)
LOCATION:	2 BROAD STREET, ELIZABETH, NEW JERSEY 07202
THE PRIMARY CODE REFERENCE WILL BE THE NEW JERSEY UNIFORM CONSTRUCTION CODE (N.J.A.C. 5:23 ET SEQ). THE UNIFORM CONSTRUCTION CODE ADOPTS SEVERAL MODEL CODES THAT ARE REFERENCED AS SUBCODES. THESE SUBCODES ARE AN INTEGRAL PART OF THE UNIFORM CONSTRUCTION CODE AND ARE AS FOLLOWS:	

SUBCODE	NATIONAL MODEL CODE	UCC REFERENCE
BUILDING	IBC/2009 NEW JERSEY EDITION	N.J.A.C. 5:23-3.14
ACCESSIBILITY	ANSI-A117.1 2003	NJAC 5:23-7
PLUMBING	NATIONAL STANDARD PLUMBING CODE 2009	N.J.A.C. 5:23-3.15
ELECTRICAL	NATIONAL ELECTRICAL CODE 2011	N.J.A.C. 5:23-3.16
ENERGY	ASHRAE 90.1-2007	N.J.A.C. 5:23-3.18
MECHANICAL	INTERNATIONAL MECHANICAL CODE 2009	N.J.A.C. 5:23-3.20

GENERAL BUILDING INFORMATION			
USE AND OCCUPANCY CLASSIFICATION	CRITERION / DESIGNATION		IBC REFERENCE
	EXISTING ASSEMBLY A-3	ADDITION ASSEMBLY A-3	
OCCUPANCY	NON SEPARATED	NON SEPARATED	SECTION 508.3
CONSTRUCTION CLASSIFICATION	TYPE IA	TYPE IA	TABLE 601
FIRE SUPPRESSION	YES	YES	

FIRE RESISTANT RATING REQUIREMENTS FOR BUILDING ELEMENTS (TABLE 601)			
BUILDING ELEMENT	CRITERION / DESIGNATION		IBC REFERENCE
	ALLOWABLE	ACTUAL	
STRUCTURAL FRAME INCLUDING GIRDERS, BEAMS, TRUSSES	3-HR	EXISTING 3-HR	TABLE 601
BEARING WALLS EXTERIOR INTERIOR	3-HR	EXISTING 3-HR	TABLE 601
NONBEARING WALLS & PARTITIONS	0-HR	1-HR	TABLE 601
FLOOR CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS	2-HR	EXISTING 2-HR	TABLE 601
ROOF CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS	1 1/2-HR	EXISTING 1 1/2-HR	TABLE 601

GENERAL MEANS OF EGRESS (SECTION 1003)			
	ALLOWABLE	ACTUAL	SECTION
CEILING HEIGHT	NOT LESS THAN 7'-6"	8'-0"	1003.2
FREE-STANDING OBJECTS	OBJECT NOT OVERHANG <4" & LEADING EDGE >27"	LESS THAN 4"	1003.3.2
HORIZONTAL PROJECTIONS	NOT PROJECT > 4" BETWEEN THE HEIGHT OF 27" TO 80"	LESS THAN 4"	1003.2.4
ELEVATION CHANGE	EL. CHANGE <12" - SLOPED SURFACE SHALL BE USED OR EXCEPTION	GREATER THAN 12"	1003.5

LOCATION	FLOOR AREA IN SQ. FT. PER OCCUPANT	FUNCTION OF SPACE	TOTAL OCCUPANTS	EXIT WIDTH PER OCCUPANT SERVED (TABLE 1005.1) (WITH SPRINKLER SYSTEM)				
				STAIRWAY (2 INCHES PER OCCUPANT)	OTHER EGRESS COMPONENTS (.15 INCHES PER OCCUPANT)	STAIRWAY (ACTUAL)	OTHER EGRESS (ACTUAL)	
BASEMENT	300	M	28	EXIT 28 OCC	5.6"	4.2"	30"	36"
GROUND FLOOR	100	B	102	EXIT 531 OCC	20.4"	15.3"	30"	72"
1ST FLOOR	300	B	141	STAIR TF 395 OCC EXT. STAIR 979 OCC	28.2"	21.15"	52"	36"
2ND FLOOR	100	B	7	STAIR T2 108 OCC	21.6"	16.2"	60"	36"
3RD FLOOR	100	B	164	STAIR T1 108 OCC STAIR T2 56 OCC	52.8"	35.2"	54"	36"
4TH FLOOR	100	B	18	STAIR T1 9 OCC	3.6"	2.7"	54"	36"
5TH FLOOR	100	B	154	STAIR T1 129 OCC STAIR T2 34 OCC	30.8"	23.1"	54"	36"
6TH FLOOR	100	B	14	STAIR T1 7 OCC	2.8"	2.1"	54"	36"
7TH FLOOR	100	B	155	STAIR T2 7 OCC STAIR T1 123 OCC	3.1"	23.25"	54"	36"
8TH FLOOR	100	B	13	STAIR T1 5 OCC STAIR T2 8 OCC	2.6"	1.95"	54"	36"
9TH FLOOR	100	B	56	STAIR T1 28 OCC STAIR T2 28 OCC	11.2"	8.4"	54"	36"
10TH FLOOR	100	B	56	STAIR T1 28 OCC STAIR T2 28 OCC	11.2"	8.4"	54"	36"
11TH FLOOR	100	B	76	STAIR T1 38 OCC STAIR T2 38 OCC	15.2"	11.4"	54"	36"
12TH FLOOR	100	B	76	STAIR T1 38 OCC STAIR T2 38 OCC	15.2"	11.4"	54"	36"
13TH FLOOR	100	B	56	STAIR T1 26 OCC STAIR T2 27 OCC	11.6"	8.4"	54"	36"
14TH FLOOR	100	B	56	STAIR T1 28 OCC STAIR T2 28 OCC	11.6"	8.4"	54"	36"
15TH FLOOR	100	B	16	STAIR T1 8 OCC STAIR T2 8 OCC	3.2"	2.25"	54"	36"
16TH FLOOR	100	B	15	STAIR T1 6 OCC STAIR T2 3 OCC	3"	2.25"	54"	36"
PENTHOUSE	100	B	6	PENTHOUSE STAIR	1.2"	0.9"	30"	36"

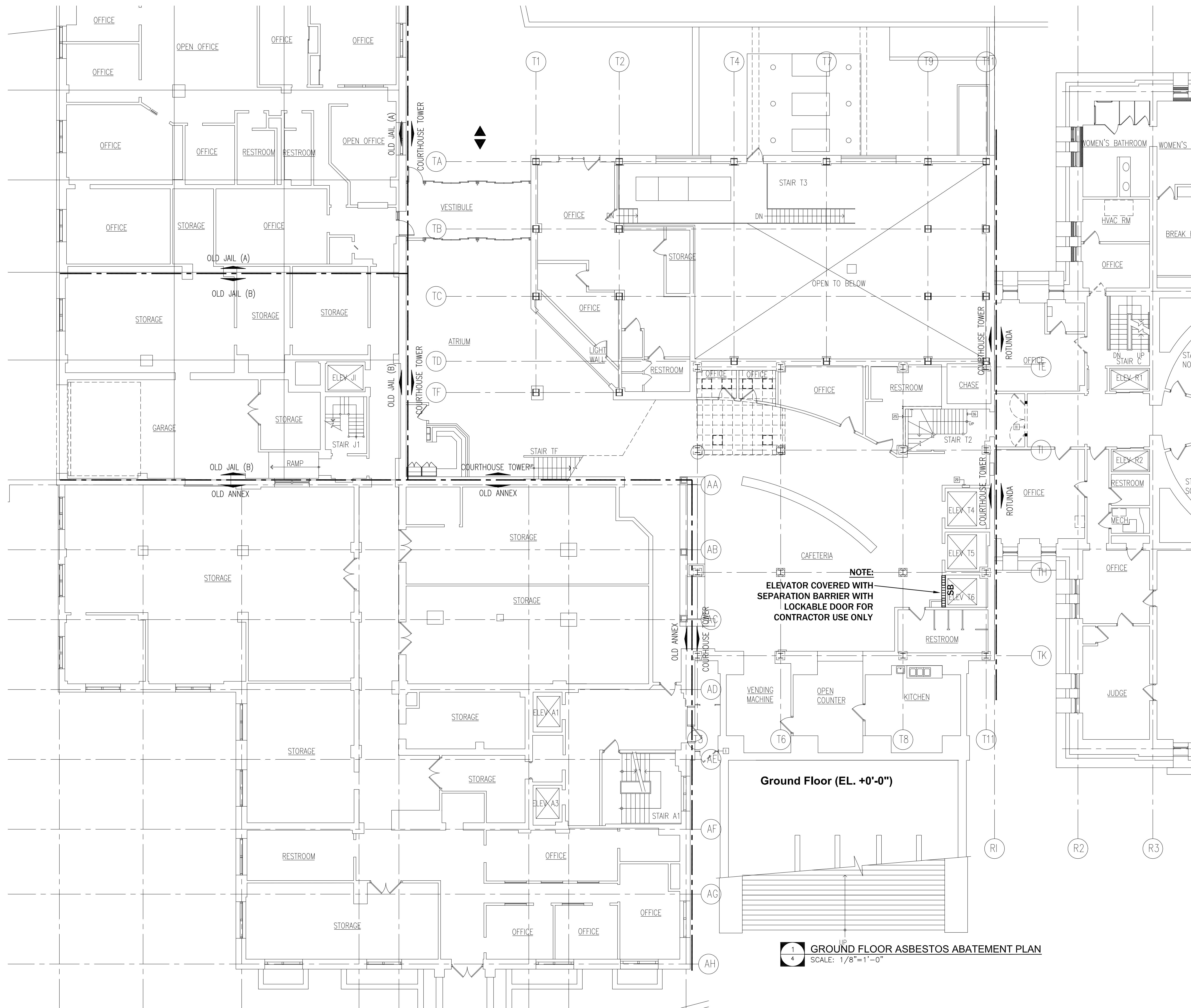
FIRE RESISTANT RATING REQUIREMENTS FOR BUILDING ELEMENTS (TABLE 602)				
FIRE SEPARATION	TYPE OF CONSTRUCTION	OCCUPANCY	ACTUAL	IBC PREFERENCE
< 5'	ALL	1	-	TABLE 602
5' < OR = X < 10'	1A, IIB OTHERS	1	-	
10' < OR = X < 30'	1A, IIB IIB, VB OTHERS	1-D 0 1-D	-	
X > OR = 30'	ALL	0-HR	-	

FIRE DOORS & FIRE SHUTTER			
	REQUIRED ASSEMBLY RATING (HOURS)	MINIMUM FIRE DOOR & FIRE SHUTTER ASSEMBLY RATING (HOURS)	REMARK
FIRE WALLS AND FIRE BARRIERS HAVING A REQUIRED FIRE-RESISTANCE RATING GREATER THAN 1 HOUR	4 3 2 1 1/2	3 2 1 1/2	
FIRE BARRIERS HAVING 1 HOUR SHFT, EXIT ENCL, EXIT PASSAGEWAY WALLS OTHER FIRE BARRIERS	1	1	
OTHER FIRE BARRIERS	1	3/4	
FIREWALL	2	NOT PERMITTED	TABLE 706.4

GENERAL BUILDING HEIGHTS & AREAS CONSTRUCTION CLASSIFICATION TYPE 1A					
BUILDING AREA	ALLOWABLE	EXISTING	ADDITION	ACTUAL	IBC PREFERENCE
BASEMENT	UNLIMITED	10,000 S.F.		10,000 S.F.	503, 504.2 & 504.2
GROUND FLOOR	UNLIMITED	5,083 S.F.		5,083 S.F.	503, 504.2 & 504.2
FIRST FLOOR	UNLIMITED	7,223 S.F.		7,223 S.F.	503, 504.2 & 504.2
SECOND FLOOR	UNLIMITED	2,851 S.F.	260 S.F.	3,111 S.F.	503, 504.2 & 504.2
THIRD FLOOR	UNLIMITED	7,140 S.F.		7,140 S.F.	503, 504.2 & 504.2
FOURTH FLOOR	UNLIMITED	4,667 S.F.		4,667 S.F.	503, 504.2 & 504.2
FIFTH FLOOR	UNLIMITED	6,944 S.F.		6,944 S.F.	503, 504.2 & 504.2
SIXTH FLOOR	UNLIMITED	3,785 S.F.	260 S.F.	4,045 S.F.	503 & 504.2
SEVENTH FLOOR	UNLIMITED	7,140 S.F.		7,140 S.F.	503 & 504.2
EIGHTH FLOOR	UNLIMITED	3,489 S.F.	324 S.F.	3,813 S.F.	503 & 504.2
NINTH FLOOR	UNLIMITED	3,345 S.F.		3,345 S.F.	503 & 504.2
TENTH FLOOR	UNLIMITED	3,404 S.F.		3,404 S.F.	503 & 504.2
ELEVENTH FLOOR	UNLIMITED	3,404 S.F.		3,404 S.F.	503 & 504.2
TWELFTH FLOOR	UNLIMITED	3,404 S.F.		3,404 S.F.	503 & 504.2
THIRTEENTH FLOOR	UNLIMITED	3,404 S.F.		3,404 S.F.	503 & 504.2
FOURTEENTH FLOOR	UNLIMITED	3,137 S.F.		3,137 S.F.	503 & 504.2
FIFTEENTH FLOOR	UNLIMITED	1,900 S.F.		1,900 S.F.	503 & 504.2
SIXTEENTH FLOOR	UNLIMITED	2,278 S.F.		2,278 S.F.	503 & 504.2
PENTHOUSE 17TH FLOOR	UNLIMITED	1,575 S.F.		1,575 S.F.	503 & 504.2
TOTAL	EXISTING	84,173 S.F.	844 S.F.	85,017 S.F.	
NO. OF STORIES	17	EXISTING TO REMAIN 17 STORIES	17		504, 504.1 & 504.2
BUILDING HEIGHT	270'-0"	EXISTING		270'-0"	EXISTING

STAIRWAYS (1009)			
STAIRWAY WIDTHS	ALLOWABLE	ACTUAL	SECTION
GREATER THAN 44" OR EXCEPTION		80"54" WIDTH	1009.1
HEADROOM	80" MIN	80" MIN	1009.2
TREADS & WIDTHS	RISE - 7" MAX. 4" MIN. TREADS 11"	RISE - 7" MAX. 4" MIN. TREADS 11"	1009.4.2
DIMENSIONAL UNIFORM	RISE HT. BETWEEN LARGEST AND SMALLEST TREAD - 3/8" IN ANY FLIGHT		1009.4.4
PROFILE	NOBING NOT PROJECT > 1/25" EDGE NOT > .5"		1009.4.5
LANDINGS	WIDTH OF LANDING NOT LESS THAN WIDTH OF STAIR		1009.5
ENCLOSURE UNDER	1 HOUR RATED OR STAIRWAY ENCLOSURE		1009.6.3
VERTICAL RISE	NOT GREATER THAN 12'-0"		1009.7
CURVED STAIRWAY	SEE IBCNJ FOR FURTHER INFO.	N/A	1009.8
SPIRAL STAIRWAYS	NOT PERMITTED AS MEANS OF EGRESS OR EXCEPTION	N/A	1009.9
ALTERNATING TREADS	SEE IBCNJ FOR FURTHER INFO.	N/A	1009.10
HANDRAILS	HANDRAILS ON EACH SIDE OR EXCEPTION		1009.12
STAIRS TO ROOF	BUILDINGS W/ > THAN 4 STORIES, ONE STAIR UP TO ROOF	N/A	1009.13
PROTECTION AT ROOF HATCHES	HATCHES LESS THAN 10'-0" FROM EDGE: MUST BE PROTECTED WITH GUARD RAIL	N/A	1009.13.2

HANDRAILS (SECTION 1012)			
WHERE REQUIRED	ALLOWABLE	ACTUAL	SECTION
RAMP & STAIRS	SECTION 1607.7, 1009		



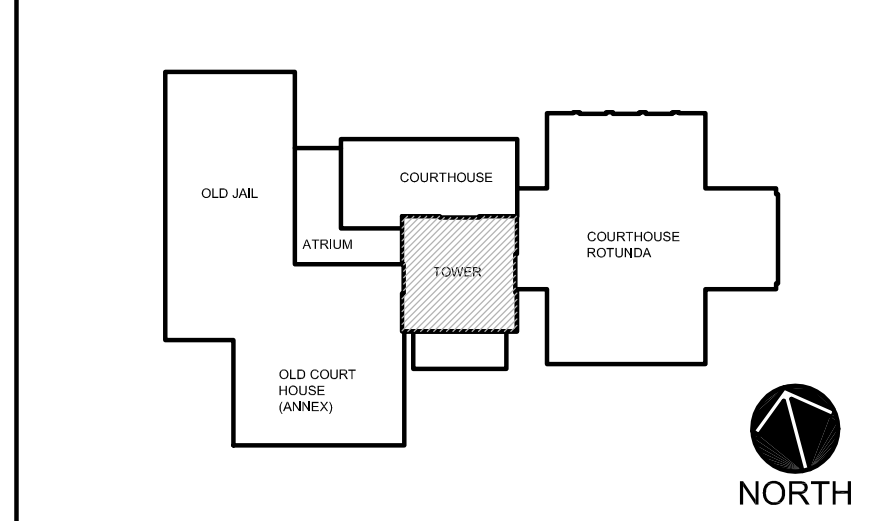
NOTES

1. COMPLETE ALL OF THE ASBESTOS ABATEMENT WORK SPECIFIED IN ACCORDANCE WITH N.J.A.C. 5:23-8.15 "ASBESTOS HAZARDOUS ABATEMENT PROJECTS", N.J.A.C. 5:23-8.19 "ABATEMENT IN OCCUPIED BUILDINGS" AND THE SPECIFICATIONS.
2. COMPLETE THE ASBESTOS ABATEMENT WORK SPECIFIED ON THESE DRAWINGS UTILIZING NO MORE THAN FIVE (5) FULL WORK AREA ENCLOSURES IN ACCORDANCE WITH THE SUB CODE AND THE SPECIFICATIONS.
3. AREAS WHERE NO ACM IS PRESENT MAY BE EXCLUDED FROM THE WORK AREAS.
4. INSTALL AND MAINTAIN THE SEPARATION BARRIERS ON THESE DRAWINGS AS REQUIRED FOR THE DURATION OF THE ASBESTOS ABATEMENT WORK.
5. THE HEPA UNIT AND AIR SAMPLE LOCATIONS INDICATED ARE FOR ILLUSTRATION PURPOSES ONLY. THE ACTUAL NUMBER AND LOCATIONS OF THE HEPA UNITS AND AIR SAMPLES SHALL VARY DEPENDING UPON SITE CONDITIONS AND NEGATIVE AIRFLOW MEASUREMENTS.
6. EXHAUST ALL HEPA UNITS TO THE EXTERIOR OF THE FACILITY.
7. BUILDING TO REMAIN OCCUPIED FOR THE DURATION OF THE WORK.

LEGEND

- DECONTAMINATION UNIT.
- HEPA - NEGATIVE AIR FILTRATION UNIT
- EXHAUST DUCT FROM NEGATIVE AIR FILTRATION UNIT
- FULL WORK AREA ENCLOSURE
- SEPARATION BARRIER (DOORWAY)
- AIR SAMPLE LOCATION
- MANOMETER LOCATION
- CONTRACTOR ENTRANCE/ EXIT AND WASTE TRANSPORTATION ROUTE.
- BUILDING OCCUPANT ENTRANCE/EXIT
- FREE STANDING LUMBER AND POLYETHYLENE WALL.

KEYPLAN



1 GROUND FLOOR ASBESTOS ABATEMENT PLAN
SCALE: 1/8"=1'-0"

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These drawings shall be used for the specific project location indicated within the Title Block, and shall not be used at any other location without prior consent from the ARCHITECT.

NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

AND ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NEW JERSEY 07748
TEL: 732-676-1725 FAX: 732-671-7365

APPROVED AND RELEASED
ACREDITED AREA PROJECT DESIGNER
KEVIN BURNS DATE: 05/24/17

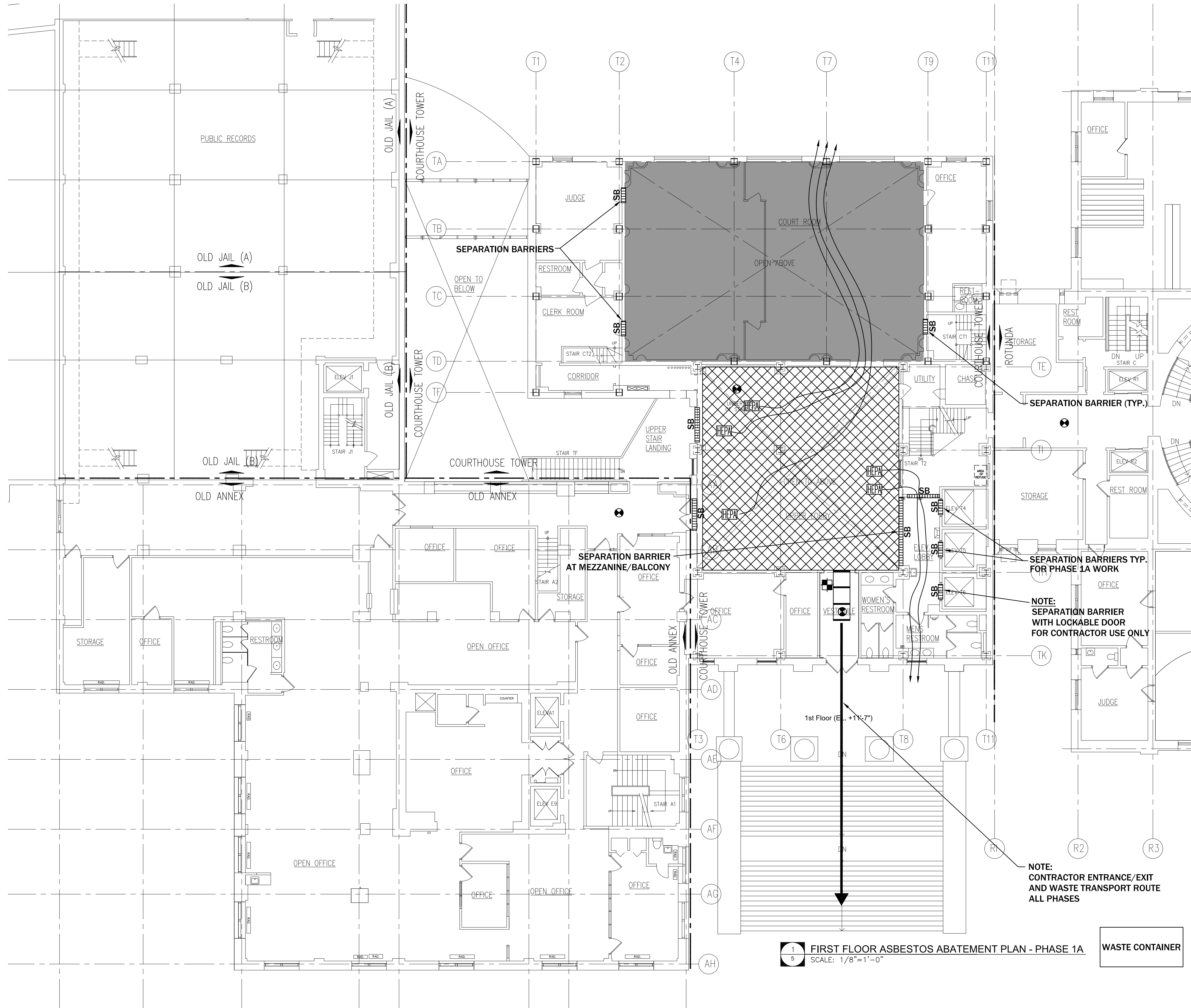
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-379-0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
GROUND FLOOR ASBESTOS ABATEMENT

SUBMISSIONS				REVISIONS				DATE	08-30-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	GH
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00080
								SHEET:	4 OF 160
								DWG NO	

AA-1



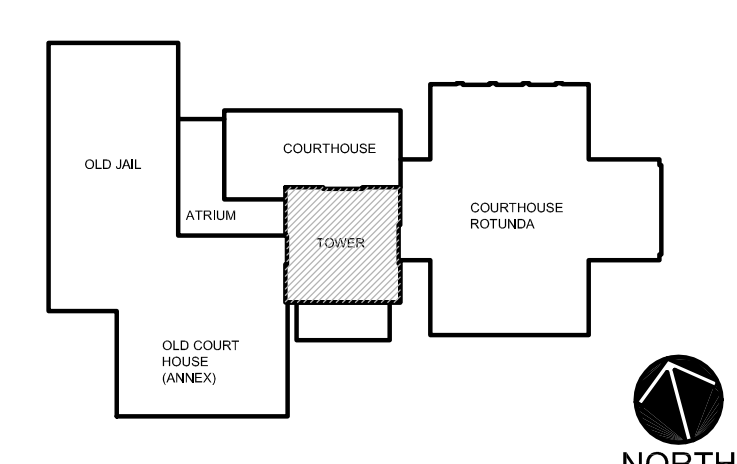
NOTES

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6. EXHAUST ALL HEPA UNITS TO THE EXTERIOR OF THE FACILITY.
7. BUILDING TO REMAIN OCCUPIED FOR THE DURATION OF THE WORK.

LEGEND

- DECONTAMINATION UNIT.
- NEGATIVE AIR FILTRATION UNIT
- EXHAUST DUCT FROM NEGATIVE AIR FILTRATION UNIT
- FULL WORK AREA ENCLOSURE
- SEPARATION BARRIER (DOORWAY)
- AIR SAMPLE LOCATION
- MANOMETER LOCATION
- CONTRACTOR ENTRANCE/ EXIT AND WASTE TRANSPORTATION ROUTE.
- BUILDING OCCUPANT ENTRANCE/EXIT
- FREE STANDING LUMBER AND POLYETHYLENE WALL.
- OPERATIONS AND MAINTENANCE (O&M) ACTIVITIES RELATED TO SPRINKLER INSTALLATION (TYP.)

KEYPLAN



1 5 FIRST FLOOR ASBESTOS ABATEMENT PLAN - PHASE 1A SCALE: 1/8"=1'-0"

WASTE CONTAINER

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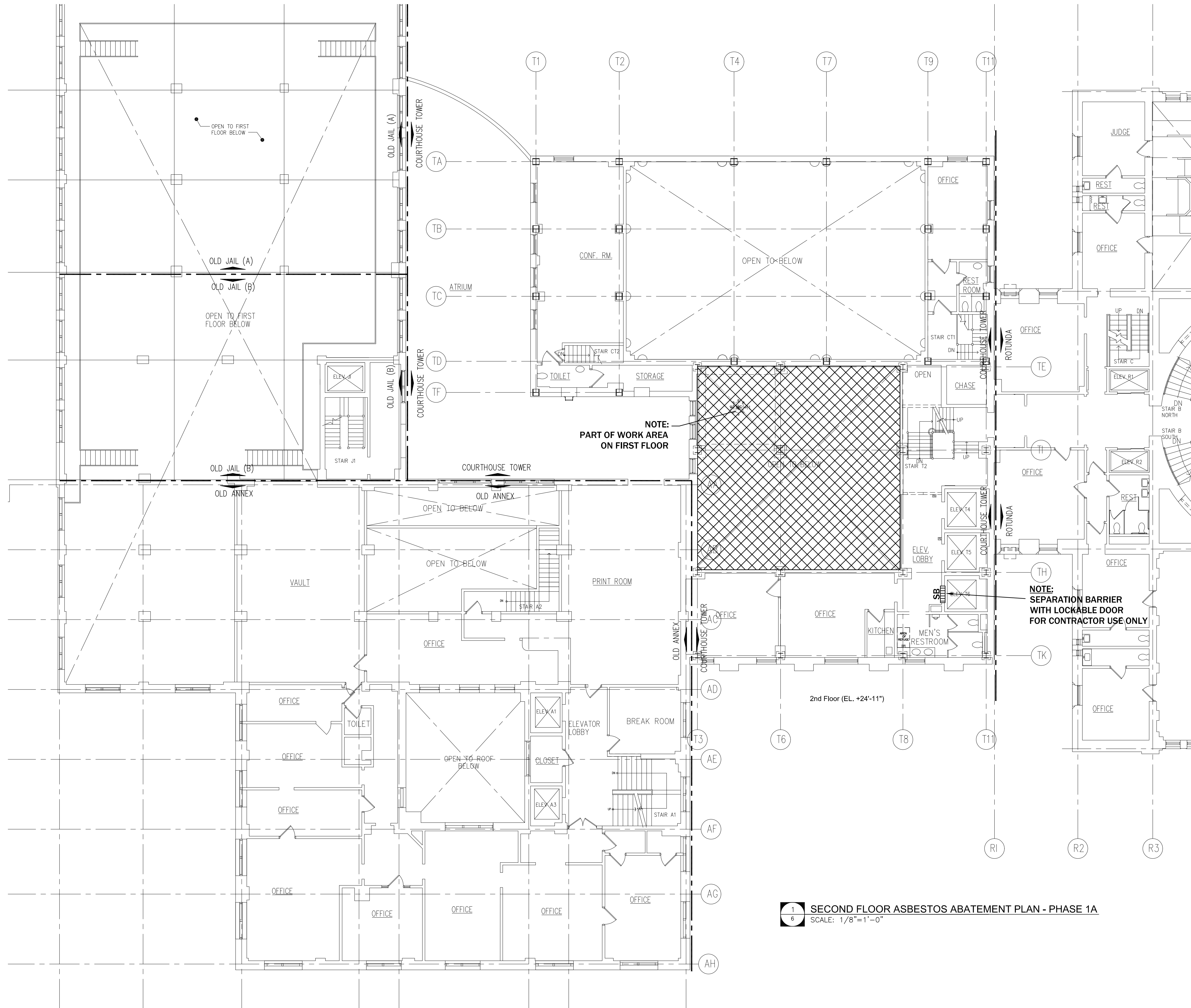
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: UC COURTHOUSE INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS: FIRST FLOOR ASBESTOS ABATEMENT

SUBMISSIONS				REVISIONS				DATE	08-30-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	GH
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00080
								SHEET:	5 OF: 160
								DWG NO	



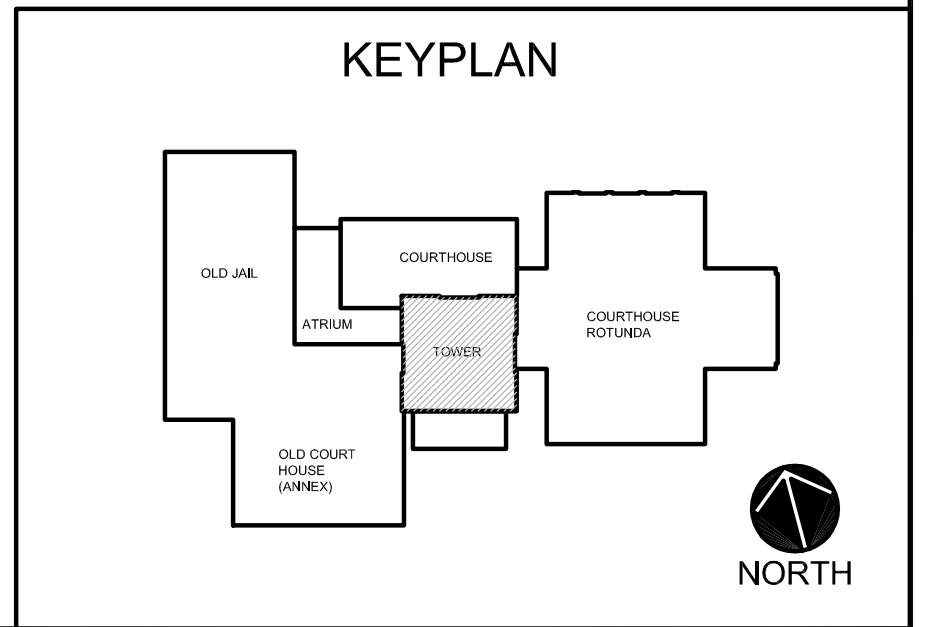
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- EXHAUST DUCT FROM NEGATIVE AIR FILTRATION UNIT
- FULL WORK AREA ENCLOSURE
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- AIR SAMPLE LOCATION
- MANOMETER LOCATION
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- BUILDING OCCUPANT ENTRANCE/EXIT
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1 SECOND FLOOR ASBESTOS ABATEMENT PLAN - PHASE 1A
 SCALE: 1/8"=1'-0"



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LAURENCE K. UHER, AIA, LEED, AP
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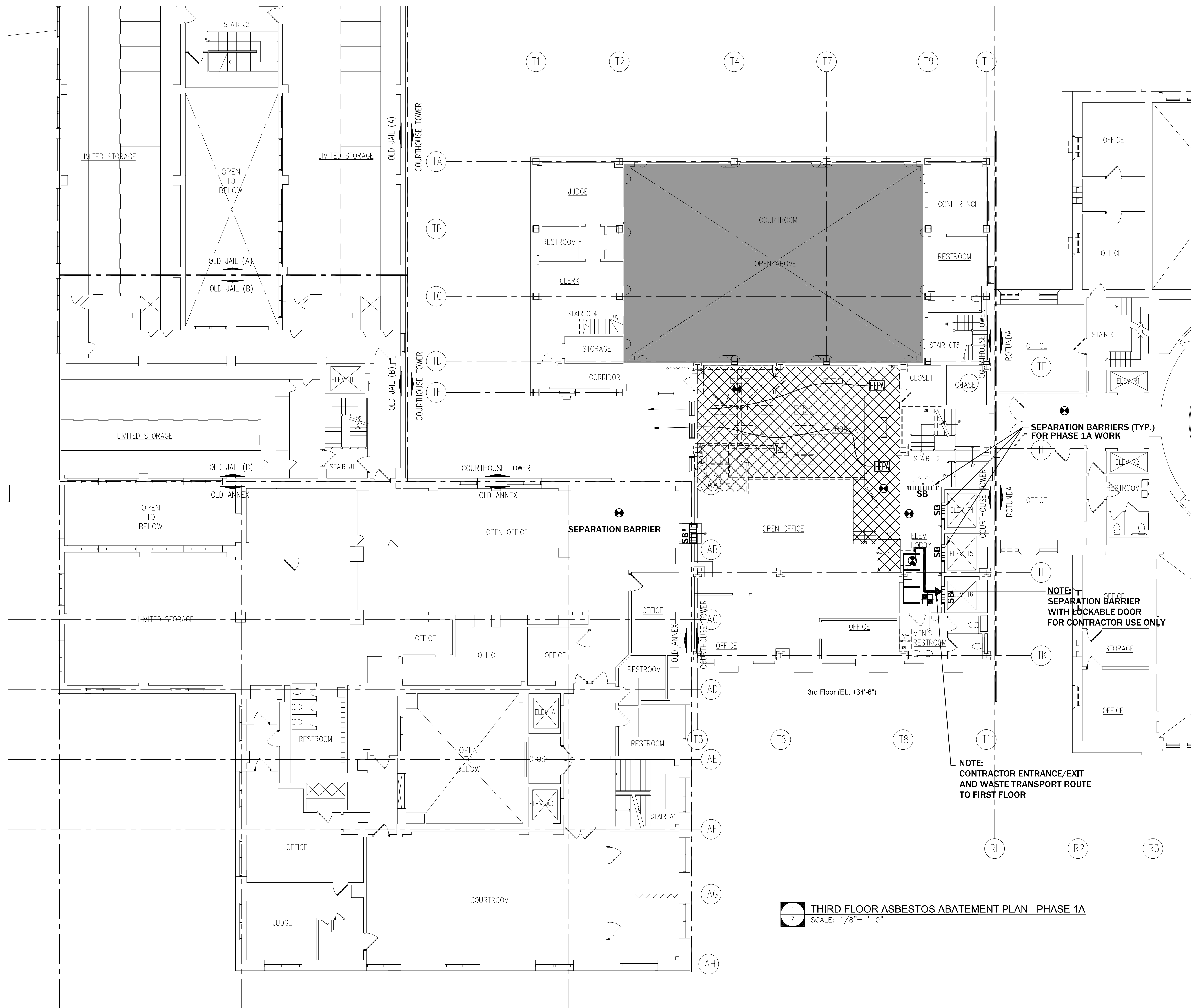


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SECOND FLOOR ASBESTOS ABATEMENT

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10.30.15	95% SUBMISSION	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00080
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								DWG NO	

AA-3



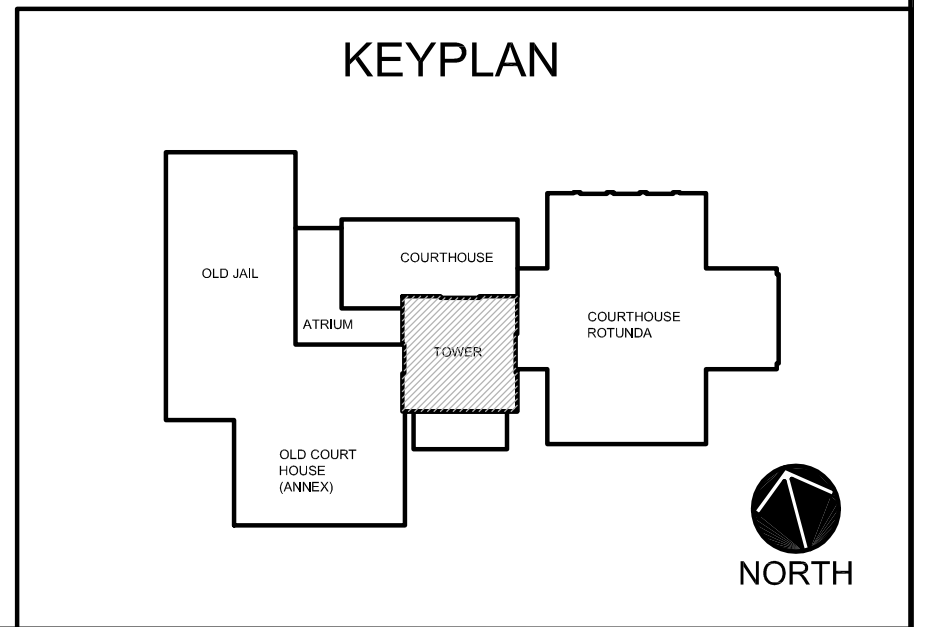
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LEGEND

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- HEPA - NEGATIVE AIR FILTRATION UNIT
- EXHAUST DUCT FROM NEGATIVE AIR FILTRATION UNIT
- FULL WORK AREA ENCLOSURE
- SEPARATION BARRIER (DOORWAY)
- AIR SAMPLE LOCATION
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- OPERATIONS AND MAINTENANCE (O&M) ACTIVITIES RELATED TO SPRINKLER INSTALLATION (TYP.)

1 THIRD FLOOR ASBESTOS ABATEMENT PLAN - PHASE 1A
7 SCALE: 1/8"=1'-0"



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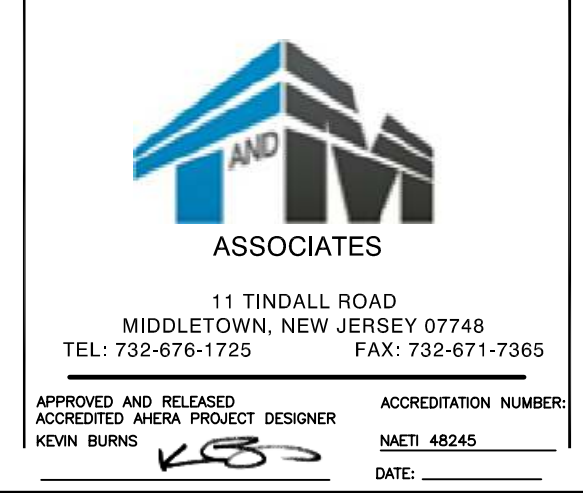
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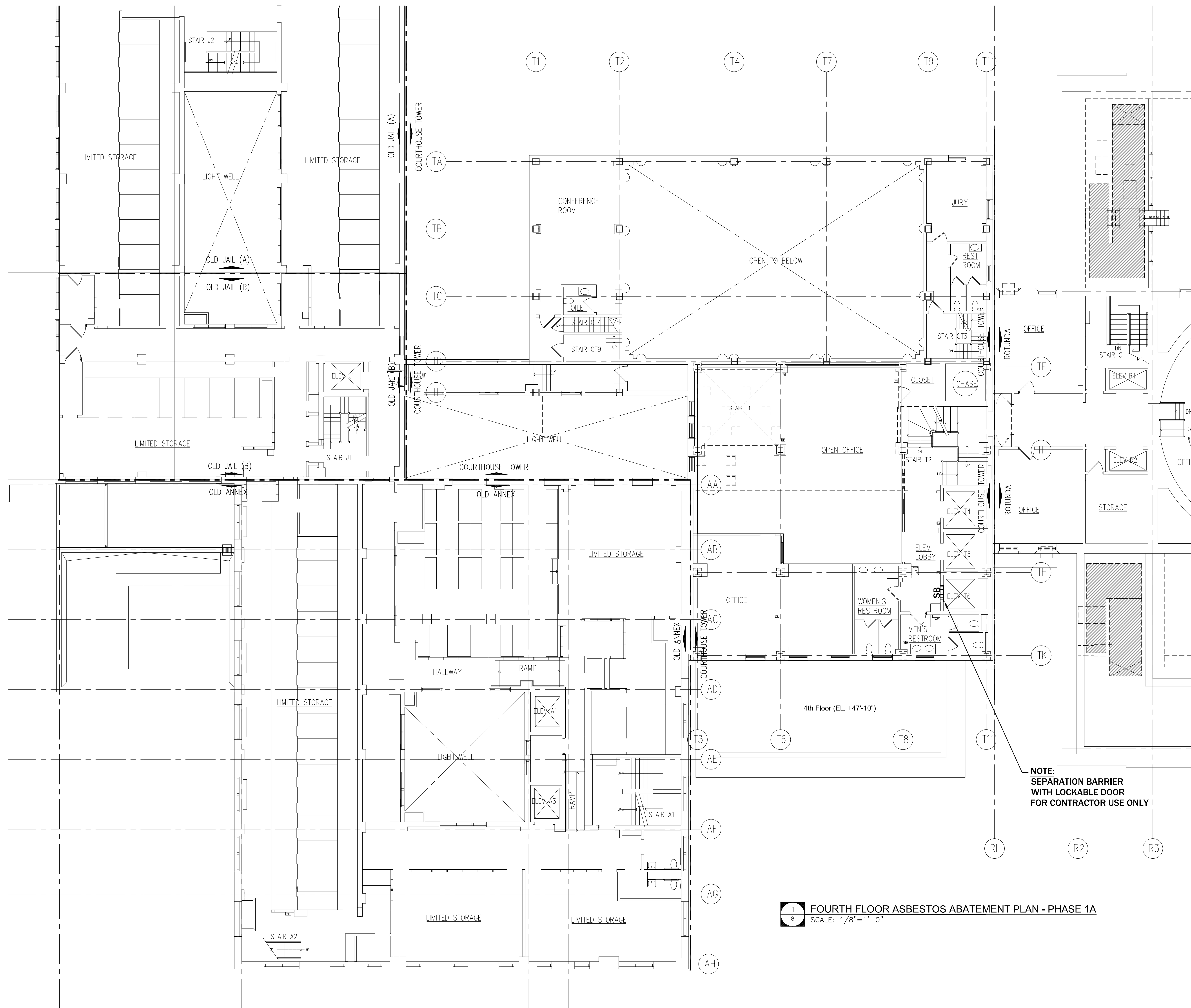
LAURENCE K. UHER, AIA, LEED, AP
 NJ License No. AI 14394



PROJECT: UC COURTHOUSE INTERNAL STAIR (TOWER)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
 THIRD FLOOR ASBESTOS ABATEMENT

SUBMISSIONS				REVISIONS				DATE	08-30-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	GH
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00080
								SHEET:	7 OF: 160
								DWG NO	



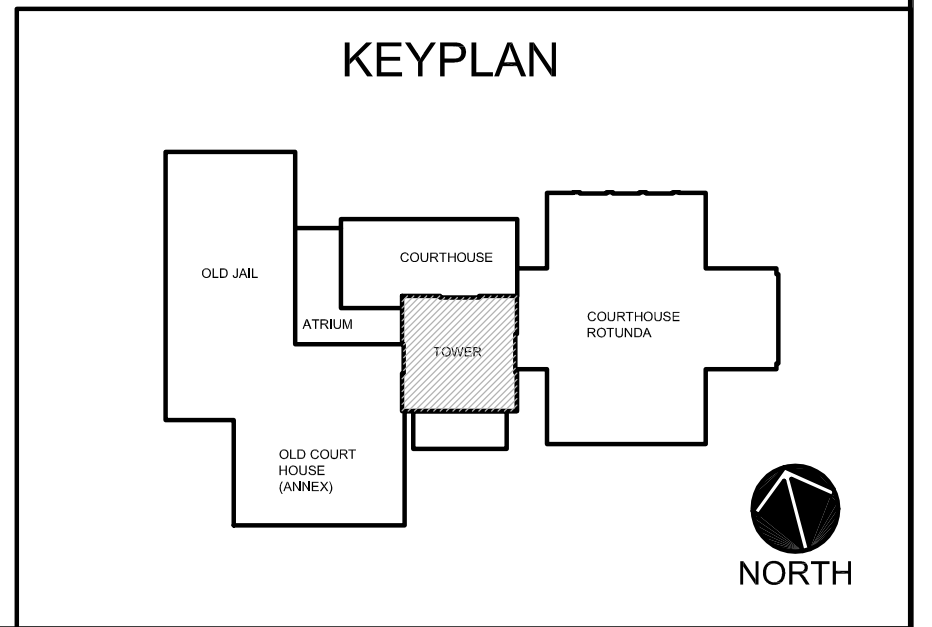
1 FOURTH FLOOR ASBESTOS ABATEMENT PLAN - PHASE 1A
8 SCALE: 1/8"=1'-0"

NOTES

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 NJ License No. AI 14394

AND ASSOCIATES
 11 TINDALL ROAD
 MIDDLETOWN, NEW JERSEY 07748
 TEL: 732-676-1725 FAX: 732-671-7365

APPROVED AND RELEASED
 ACCREDITED ARCHITECT PROJECT DESIGNER
 KEVIN BURNS
 DATE: 08/24/17

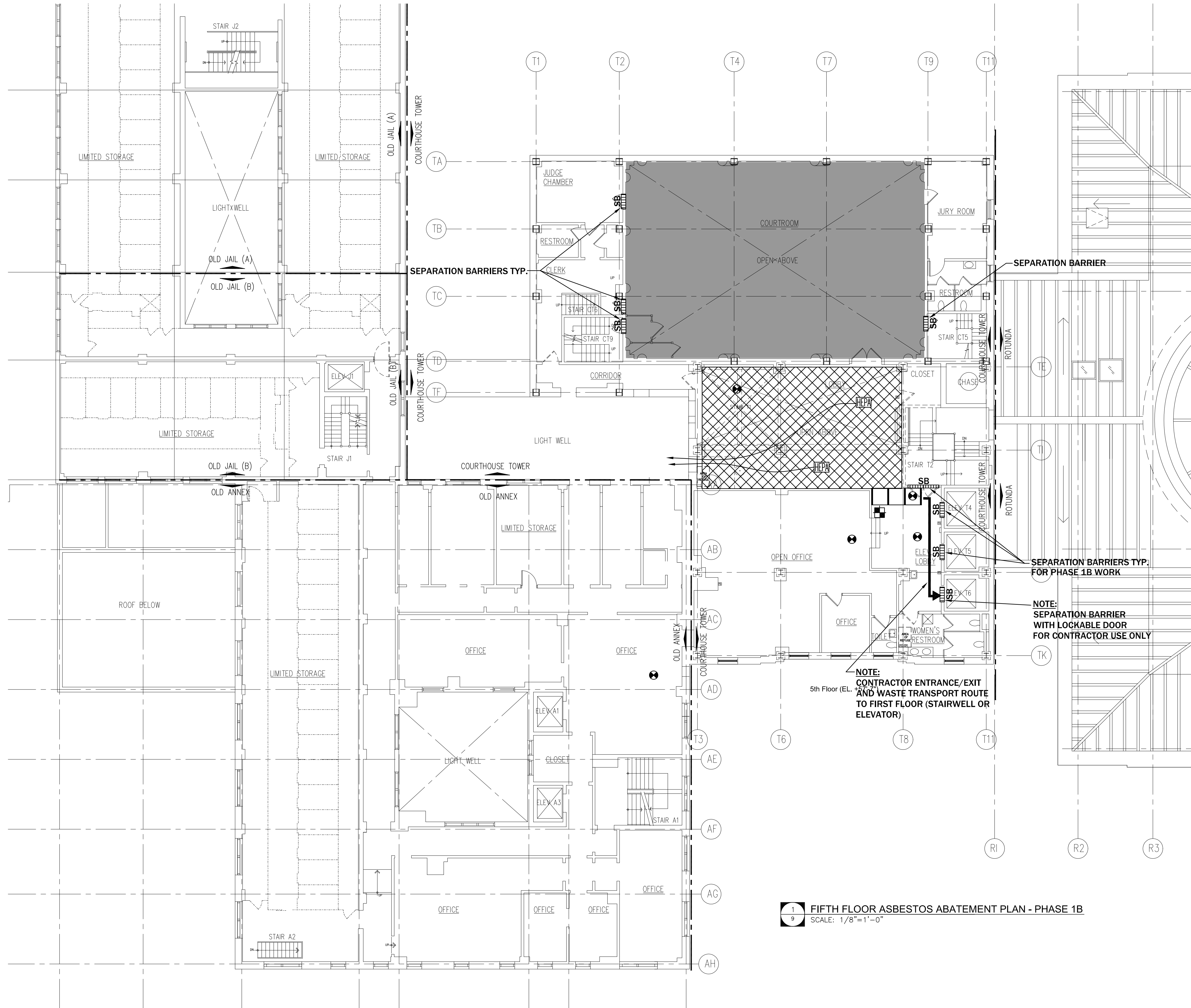
NETTA ARCHITECTS
 ARCHITECTURE - PLANNING - INTERIOR DESIGN
 1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
 TEL: 973-379-0006 FAX: 973-379-1061
 CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: UC COURTHOUSE
 INTERNAL STAIR (TOWER)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
 FOURTH FLOOR ASBESTOS ABATEMENT

SUBMISSIONS				REVISIONS				DATE	08-30-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	GH
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00080
								SHEET:	8 OF: 160
								DWG NO	

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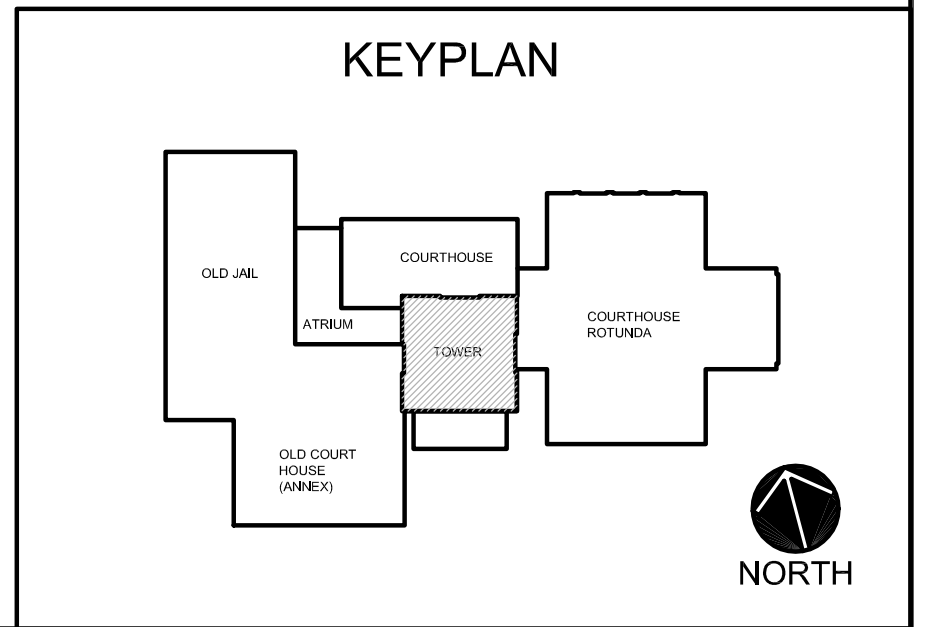
1 FIFTH FLOOR ASBESTOS ABATEMENT PLAN - PHASE 1B
9 SCALE: 1/8"=1'-0"

NOTES

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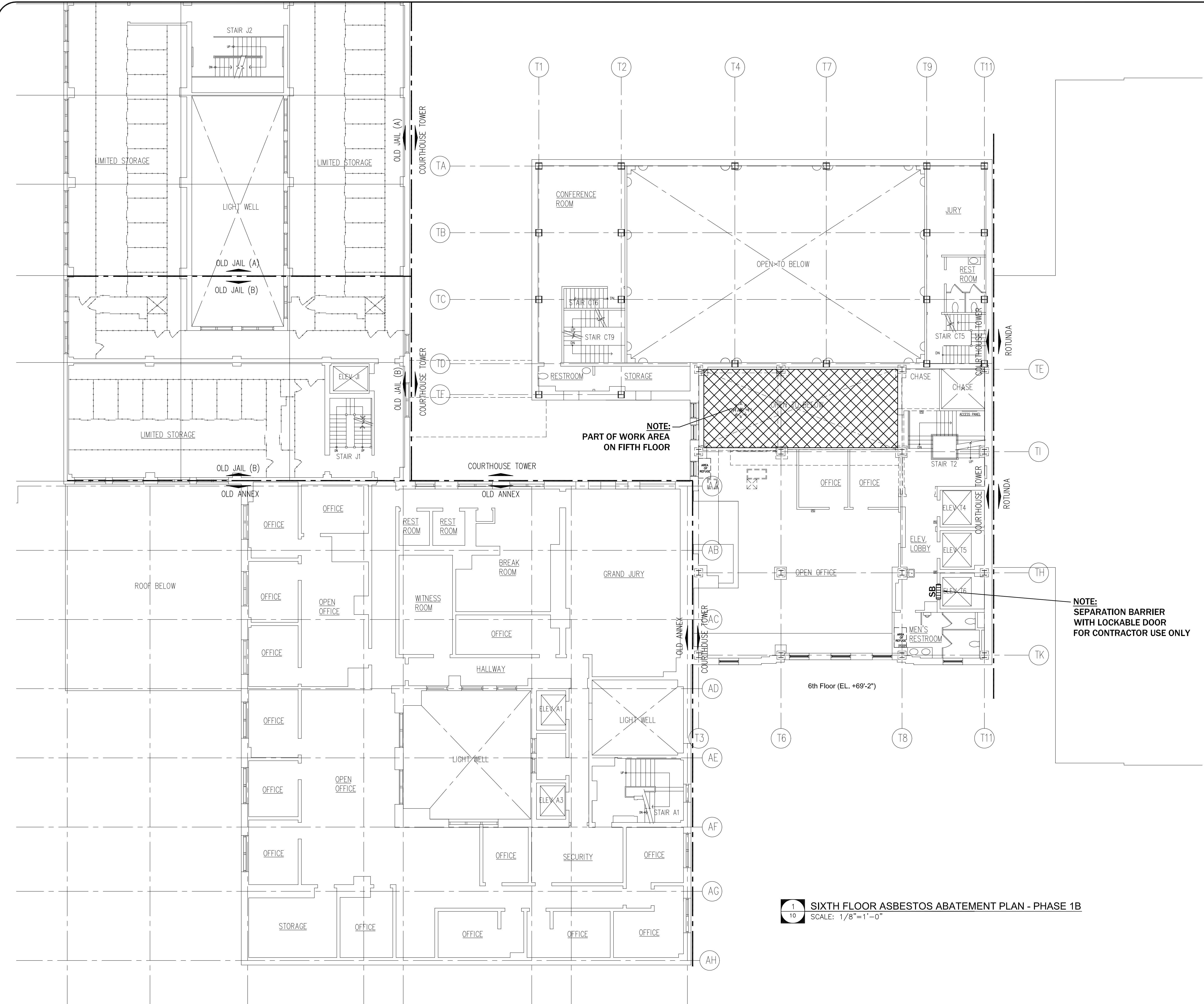
APPROVED AND RELEASED
 ACCREDITED ARCHITECT PROJECT DESIGNER
 KEVIN BURNS DATE: 08/30/17

ARCHITECTURE - PLANNING - INTERIOR DESIGN
 1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
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PROJECT: UC COURTHOUSE
 INTERNAL STAIR (TOWER)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
 FIFTH FLOOR ASBESTOS ABATEMENT

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DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	100% SUBMISSION	KD	FM					DRAWN BY	GH
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05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00080
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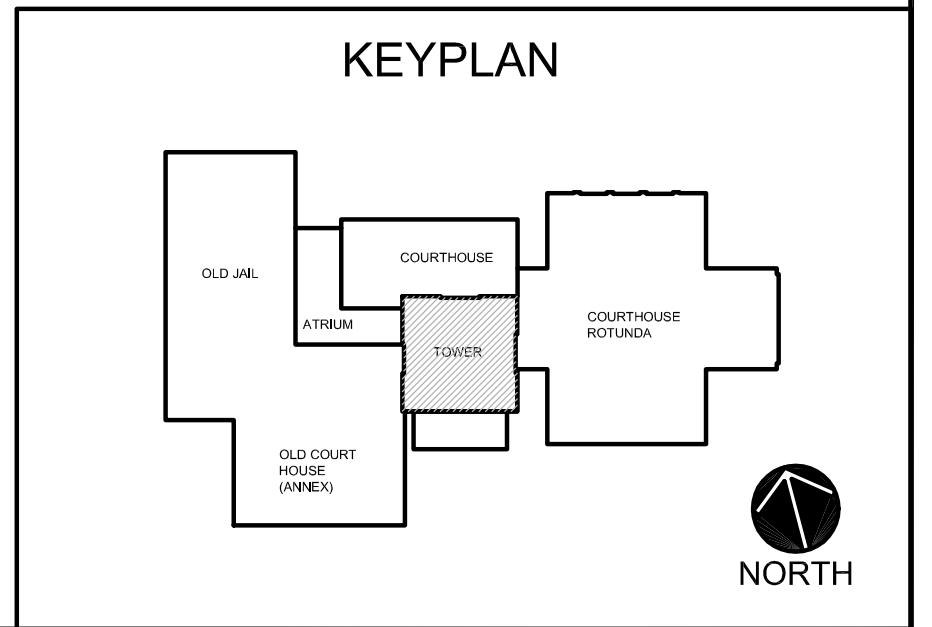
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1
10 SIXTH FLOOR ASBESTOS ABATEMENT PLAN - PHASE 1B
SCALE: 1/8"=1'-0"



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SHEET CONTENTS:
SIXTH FLOOR ASBESTOS ABATEMENT

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05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00080
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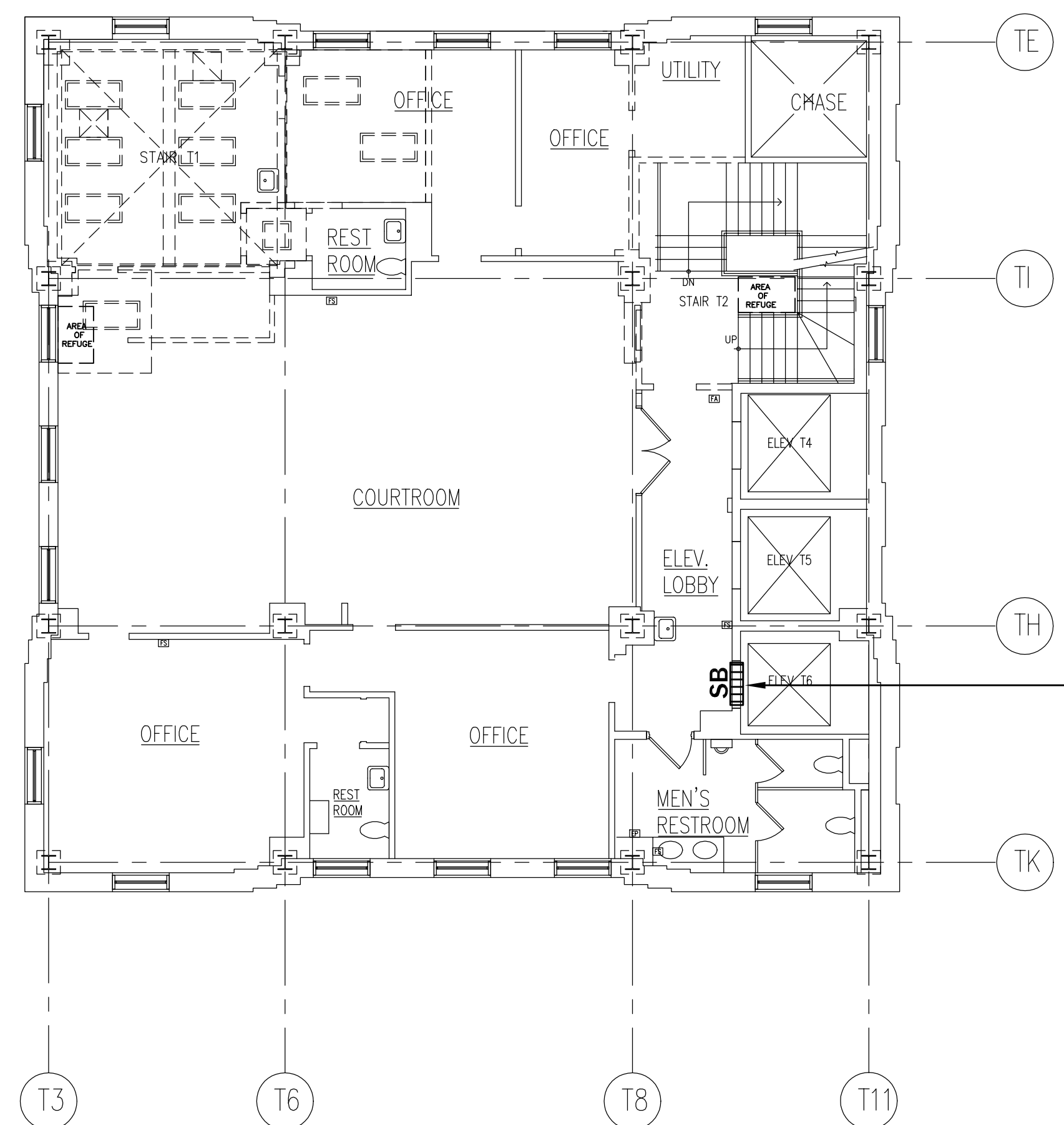
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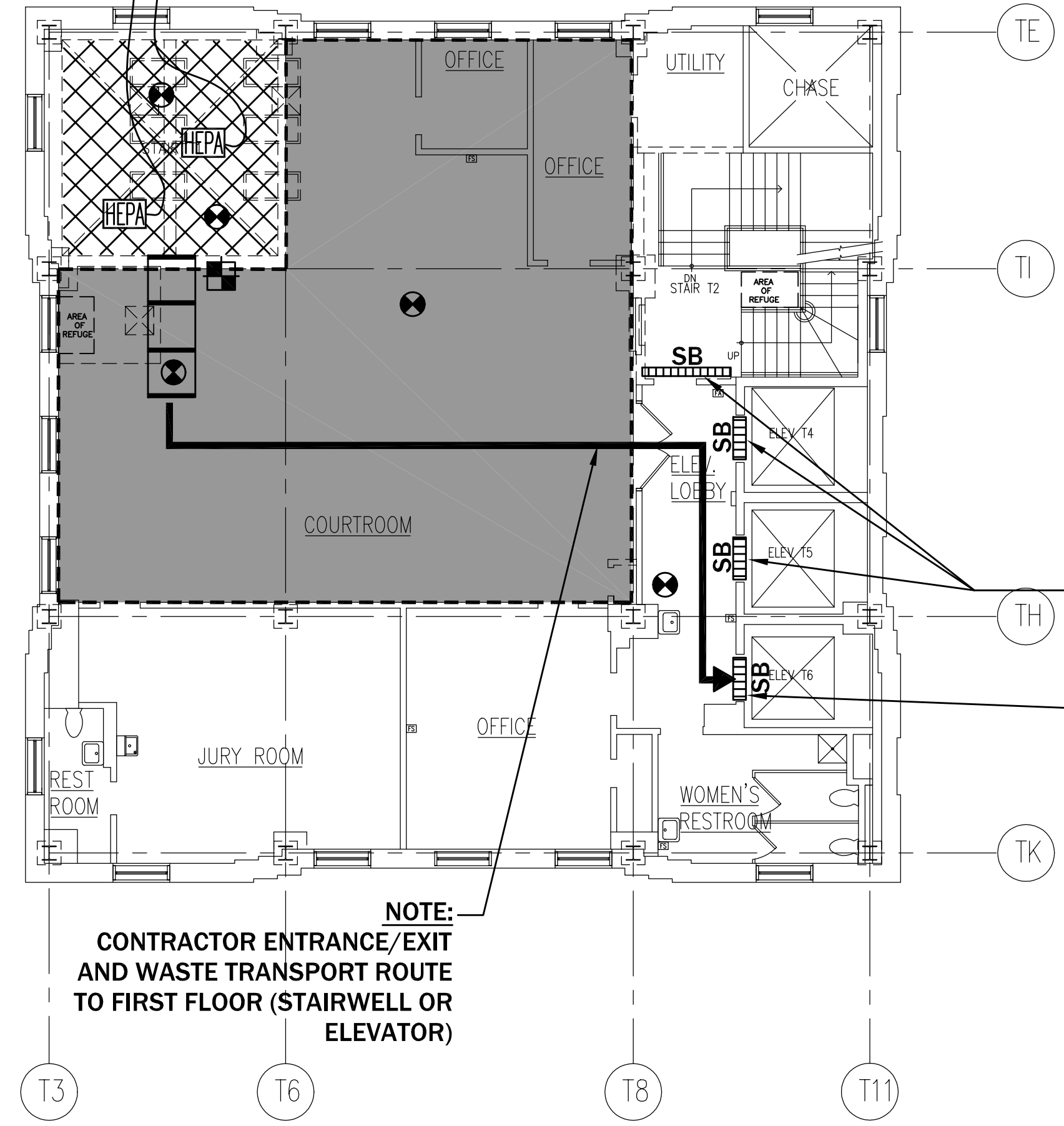
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LEGEND

- [Symbol] - DECONTAMINATION UNIT.
- [Symbol] - NEGATIVE AIR FILTRATION UNIT
- [Symbol] - EXHAUST DUCT FROM NEGATIVE AIR FILTRATION UNIT
- [Symbol] - FULL WORK AREA ENCLOSURE
- [Symbol] - SEPARATION BARRIER (DOORWAY)
- [Symbol] - AIR SAMPLE LOCATION
- [Symbol] - MANOMETER LOCATION
- [Symbol] - CONTRACTOR ENTRANCE/ EXIT AND WASTE TRANSPORTATION ROUTE.
- [Symbol] - BUILDING OCCUPANT ENTRANCE/EXIT
- [Symbol] - FREE STANDING LUMBER AND POLYETHYLENE WALL
- [Symbol] - OPERATIONS AND MAINTENANCE (O&M) ACTIVITIES RELATED TO SPRINKLER INSTALLATION (TYP.)



NOTE:
SEPARATION BARRIER ON THIS FLOOR AND REMAINING UPPER FLOORS, AS ELEVATOR IS FOR CONTRACTOR USE ONLY



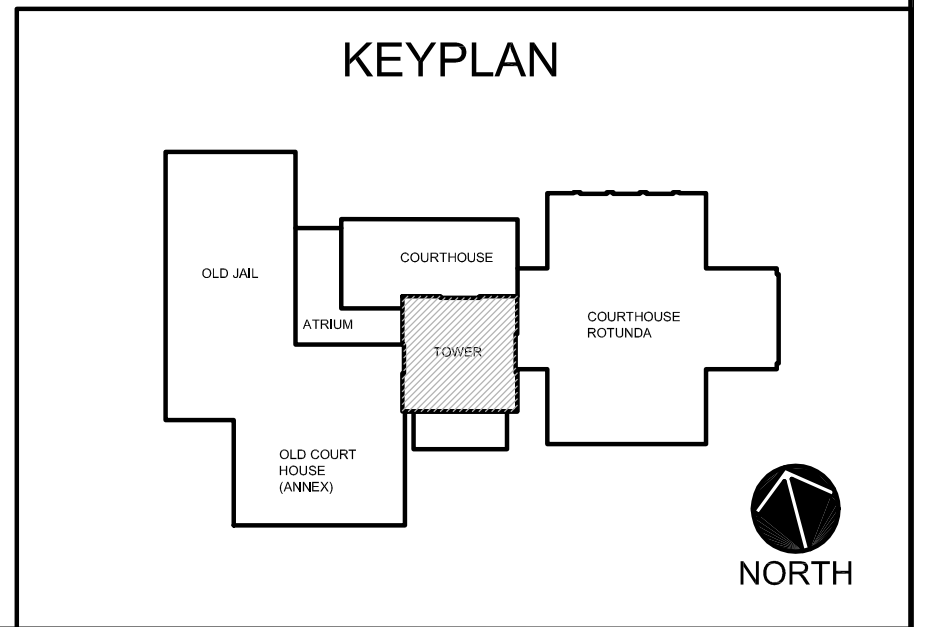
SEPARATION BARRIERS TYP.

NOTE:
SEPARATION BARRIER WITH LOCKABLE DOOR FOR CONTRACTOR USE ONLY

NOTE:
CONTRACTOR ENTRANCE/EXIT AND WASTE TRANSPORT ROUTE TO FIRST FLOOR (STAIRWELL OR ELEVATOR)

1 TENTH FLOOR ASBESTOS ABATEMENT PLAN
SCALE: 1/8"=1'-0"

2 ELEVENTH FLOOR ASBESTOS ABATEMENT PLAN - PHASE 1C
SCALE: 1/8"=1'-0"



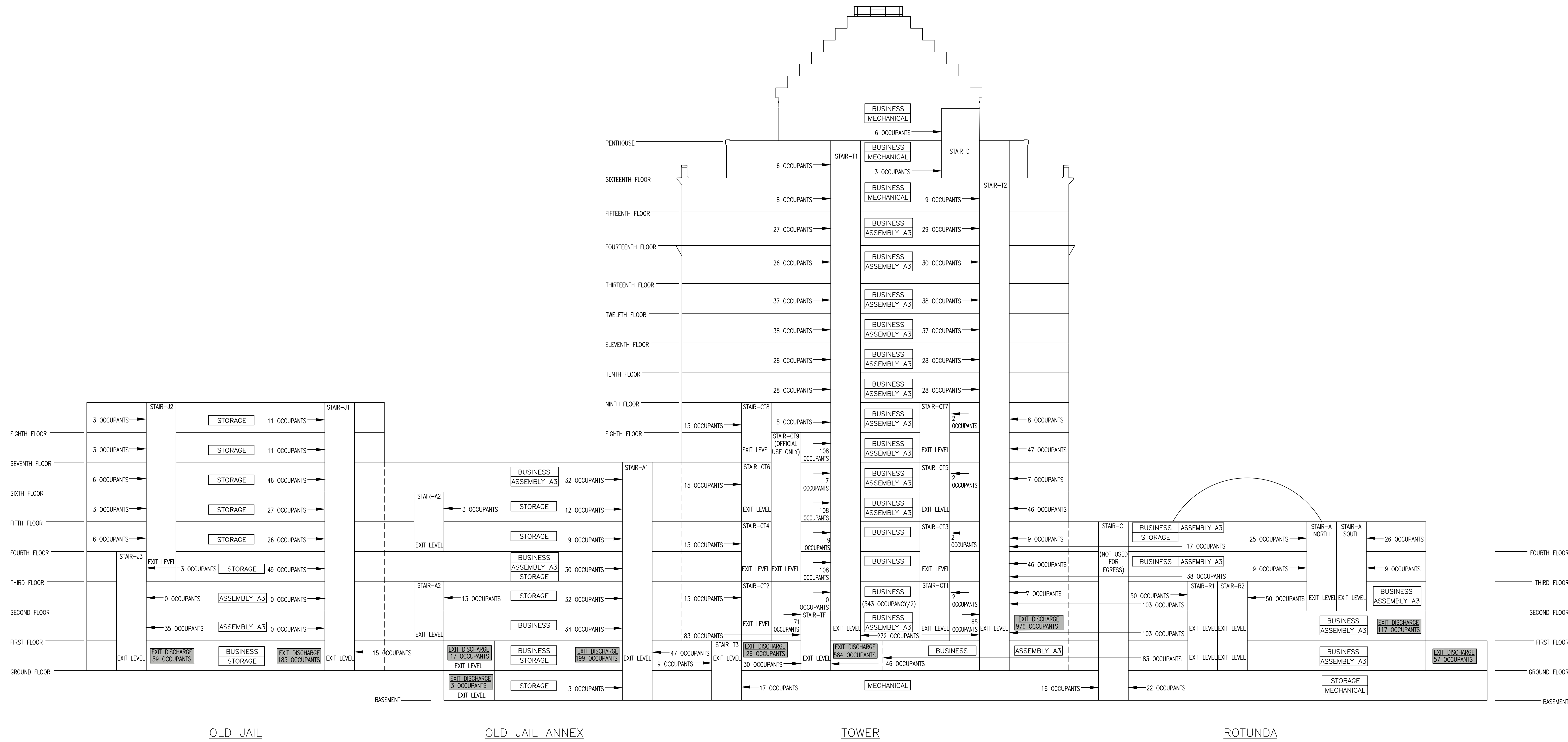
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PROJECT: UC COURTHOUSE INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey
SHEET CONTENTS:
TENTH & ELEVENTH FLOOR ASBESTOS ABATEMENT

SUBMISSIONS				REVISIONS				DATE	08-30-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	GH
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00080
								SHEET:	13 OF: 160
								DWG NO	

AA-10



1
EP.100
SCHEMATIC VERTICAL EGRESS PLAN
SCALE: NTS

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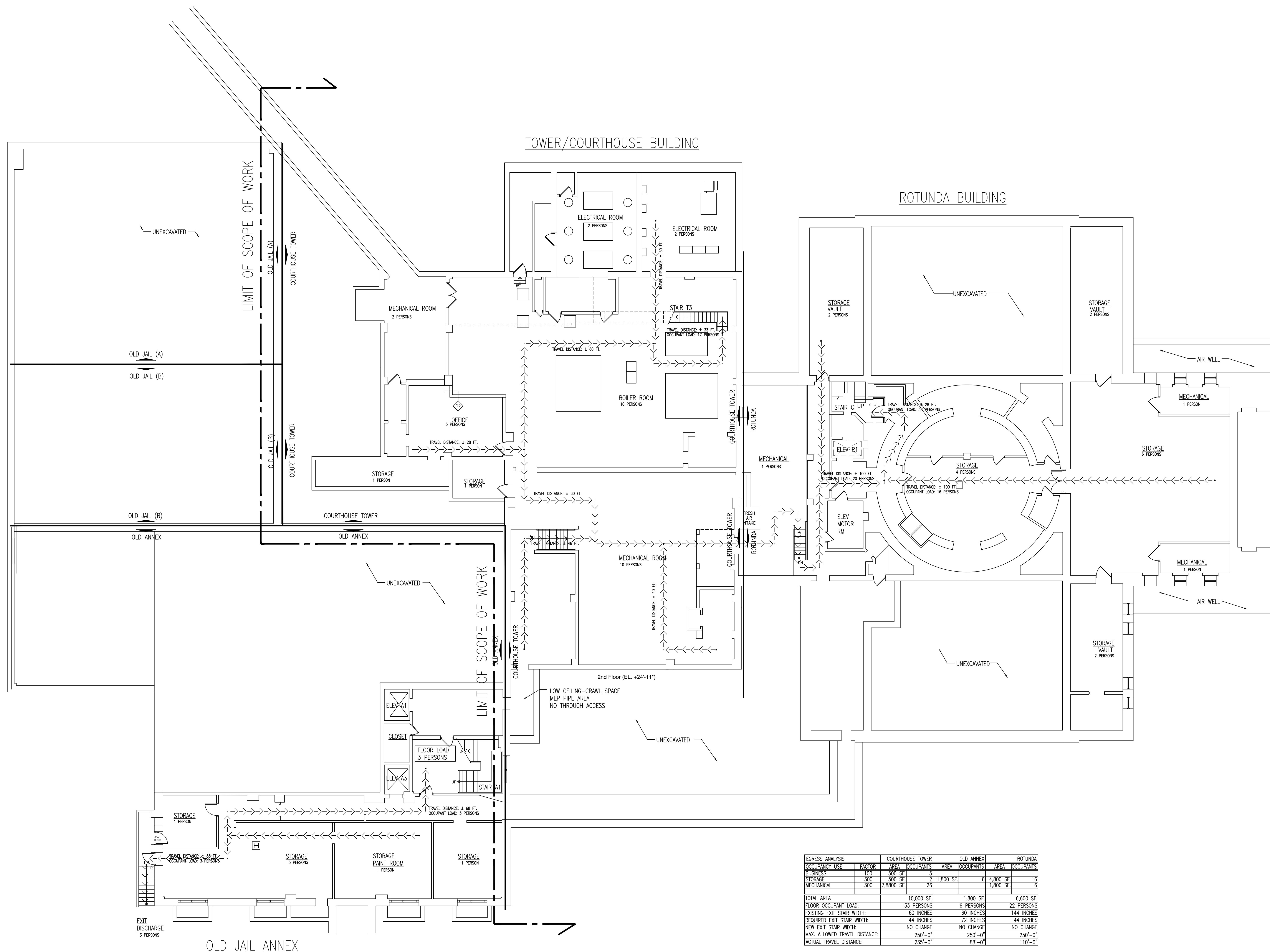


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SCHEMATIC VERTICAL EGRESS PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY KDF
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 14 OF 160
									DWG NO

EP.100



EGRESS ANALYSIS		COURTHOUSE TOWER		OLD ANNEX		ROTUNDA	
OCCUPANCY USE	FACTOR	AREA	OCCUPANTS	AREA	OCCUPANTS	AREA	OCCUPANTS
BUSINESS	100	500 SF	5				
STORAGE	200	500 SF	2	1,800 SF	6	4,800 SF	16
MECHANICAL	300	7,880 SF	26			1,800 SF	6
TOTAL AREA		10,000 SF		1,800 SF		6,600 SF	
FLOOR OCCUPANT LOAD:		33 PERSONS		6 PERSONS		22 PERSONS	
EXISTING EXIT STAIR WIDTH:		60 INCHES		60 INCHES		144 INCHES	
REQUIRED EXIT STAIR WIDTH:		44 INCHES		72 INCHES		44 INCHES	
NEW EXIT STAIR WIDTH:		NO CHANGE		NO CHANGE		NO CHANGE	
MAX. ALLOWED TRAVEL DISTANCE:		250'-0"		250'-0"		250'-0"	
ACTUAL TRAVEL DISTANCE:		235'-0"		88'-0"		110'-0"	

1 BASEMENT FLOOR EGRESS PLAN
 EP.100B SCALE: 1/4"=1'-0"

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PROJECT:

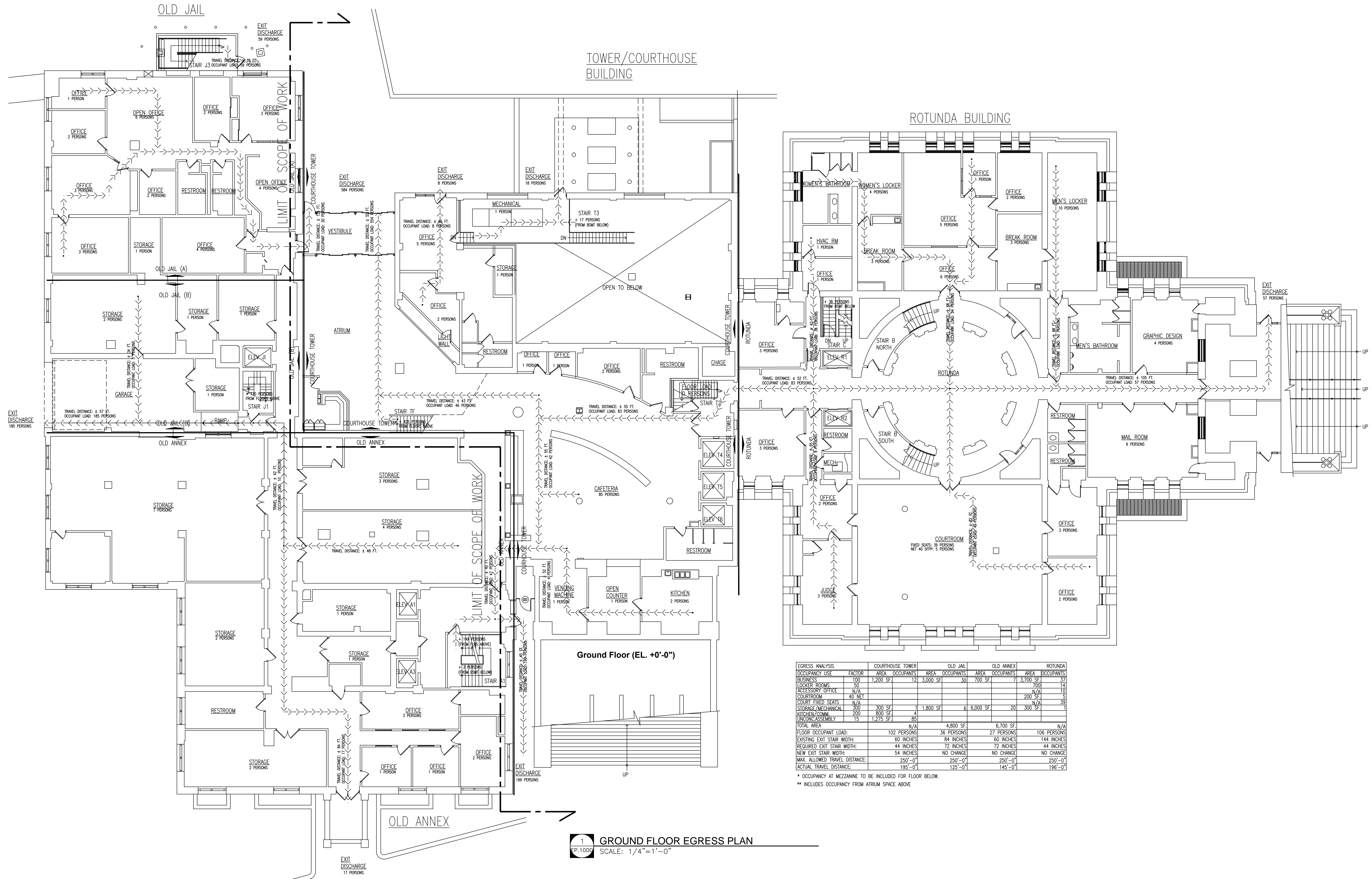
**UC COURTHOUSE
 INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

BASEMENT FLOOR EGRESS PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY KDF
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 15 OF 160
									DWG NO

EP.100B



EGRESS ANALYSIS	COURTHOUSE TOWER		OLD JAIL		OLD ANNEX		ROTUNDA	
	AREA	OCCUPANTS	AREA	OCCUPANTS	AREA	OCCUPANTS	AREA	OCCUPANTS
BUSINESS	100	1,200 SF	72	3,000 SF	30	700 SF	7	3,700 SF
LOCKER ROOMS	50							39
ACCESSORY OFFICE	N/A							10
COURTROOM	40	NET					200	SF
COURT FIXED SEATS	N/A							N/A
STORAGE/MECHANICAL	300	300 SF	1,800	SF	6	6,000 SF	20	300 SF
KITCHEN/COMM.	200	800 SF	4					
UNION ASSEMBLY	15	1,275 SF	85					
TOTAL AREA		N/A		4,800 SF		6,700 SF		N/A
FLOOR OCCUPANT LOAD:		102 PERSONS		36 PERSONS		27 PERSONS		106 PERSONS
EXISTING EXIT STAIR WIDTH:		60 INCHES		64 INCHES		60 INCHES		144 INCHES
REQUIRED EXIT STAIR WIDTH:		44 INCHES		72 INCHES		72 INCHES		44 INCHES
NEW EXIT STAIR WIDTH:		54 INCHES		NO CHANGE		NO CHANGE		NO CHANGE
MAX. ALLOWED TRAVEL DISTANCE:		250'-0"		250'-0"		250'-0"		250'-0"
ACTUAL TRAVEL DISTANCE:		195'-0"		125'-0"		145'-0"		196'-0"

* OCCUPANCY AT MEZZANINE TO BE INCLUDED FOR FLOOR BELOW.
** INCLUDES OCCUPANCY FROM ATRIUM SPACE ABOVE

1 GROUND FLOOR EGRESS PLAN
SCALE: 1/4"=1'-0"

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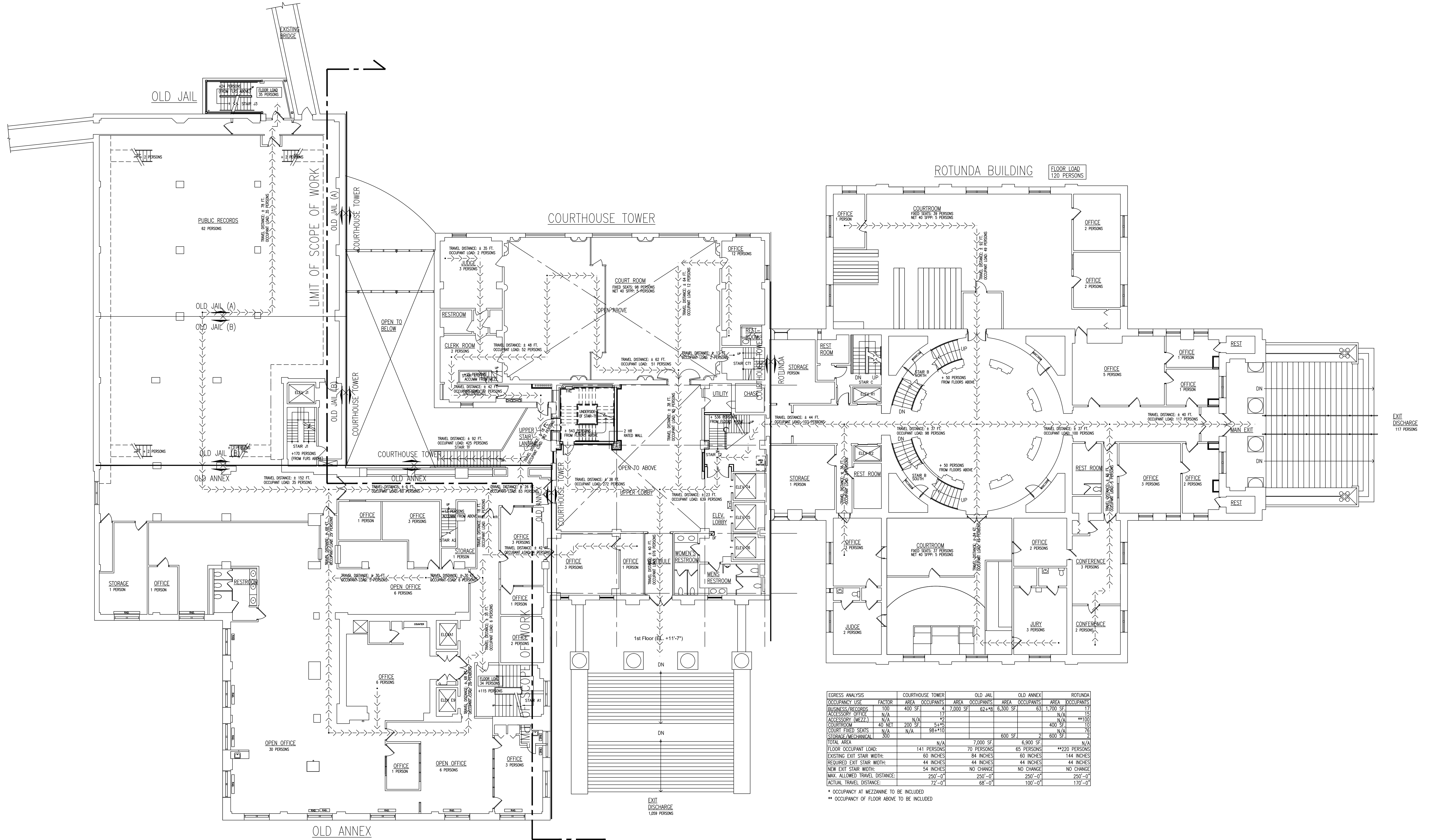


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
GROUND FLOOR EGRESS PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY KDF
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 16 OF 160
									DWG NO

EP.100G



EGRESS ANALYSIS	COURTHOUSE TOWER	OLD JAIL	OLD ANNEX	ROTUNDA
OCCUPANCY USE FACTOR	100	400 SF	4	7,000 SF
BUSINESS/RECORDS	N/A	N/A	624*	6,300 SF
ACCESSORY OFFICE	N/A	N/A	17	1,700 SF
ACCESSORY (MEZZ)	N/A	N/A	42	N/A
COURTROOM	40 NET	200 SF	114*	400 SF
COURT FIXED SEATS	N/A	N/A	98**10	N/A
STORAGE/MECHANICAL	300	N/A	7,000 SF	600 SF
TOTAL AREA	141 PERSONS	70 PERSONS	65 PERSONS	**220 PERSONS
FLOOR OCCUPANT LOAD:	141 PERSONS	70 PERSONS	65 PERSONS	**220 PERSONS
EXISTING EXIT STAIR WIDTH:	60 INCHES	84 INCHES	60 INCHES	144 INCHES
REQUIRED EXIT STAIR WIDTH:	44 INCHES	44 INCHES	44 INCHES	44 INCHES
NEW EXIT STAIR WIDTH:	54 INCHES	NO CHANGE	NO CHANGE	NO CHANGE
MAX. ALLOWED TRAVEL DISTANCE:	250'-0"	250'-0"	250'-0"	250'-0"
ACTUAL TRAVEL DISTANCE:	72'-0"	68'-0"	100'-0"	170'-0"

* OCCUPANCY AT MEZZANINE TO BE INCLUDED
 ** OCCUPANCY OF FLOOR ABOVE TO BE INCLUDED

1 FIRST FLOOR EGRESS PLAN
 EP.101 SCALE: 1/4"=1'-0"

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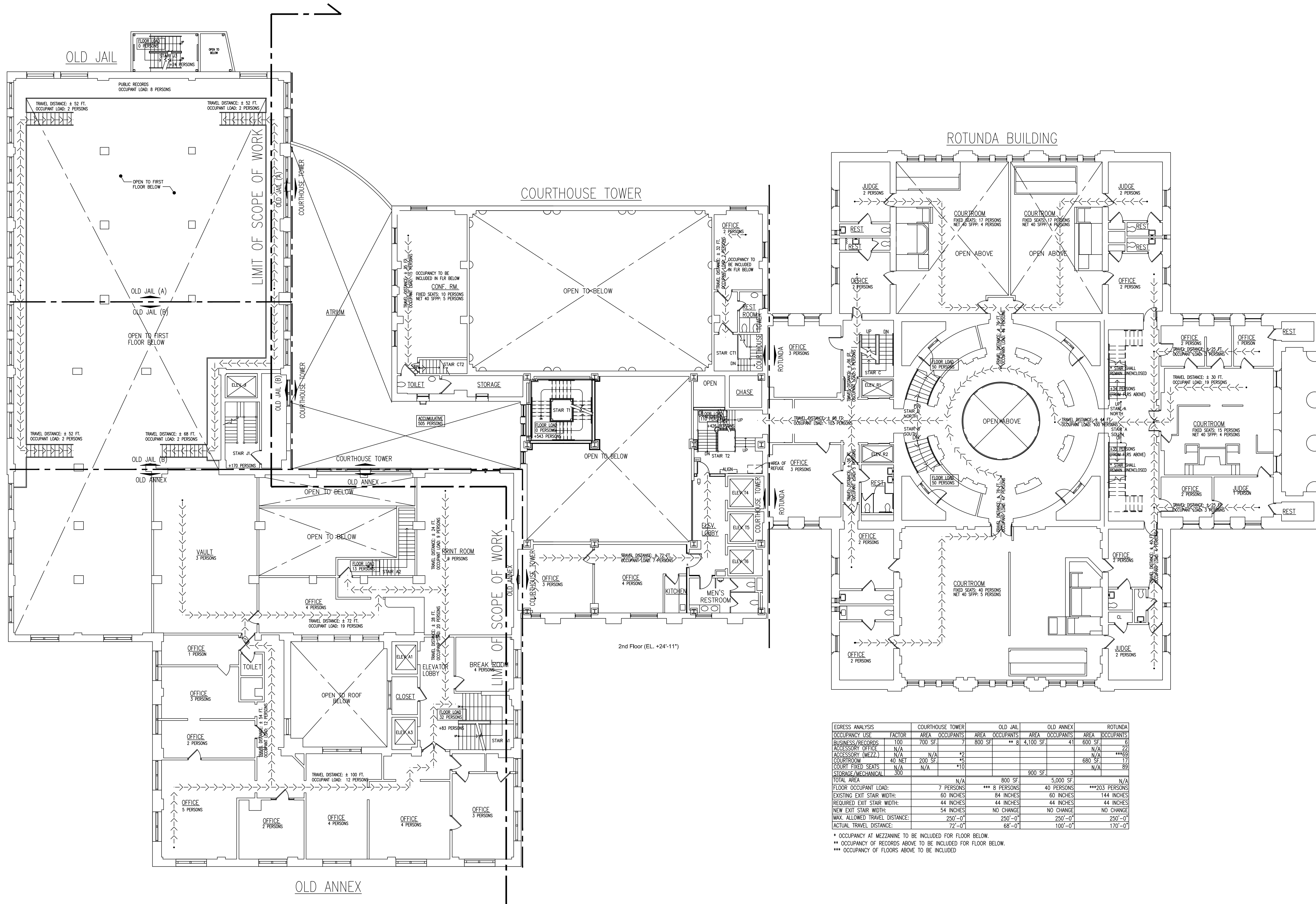


PROJECT: UC COURTHOUSE
 INTERNAL STAIR (TOWER)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
 FIRST FLOOR EGRESS PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY KDF
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 17 OF 160
									DWG NO

EP.101



EGRESS ANALYSIS	COURTHOUSE TOWER	OLD JAIL	OLD ANNEX	ROTUNDA
OCCUPANCY USE	700 SF	800 SF	4,100 SF	600 SF
BUSINESS RECORDS	100	** 8	41	20
ACCESSORY OFFICE	N/A	N/A	N/A	N/A
ACCESSORY (MEZ)	N/A	N/A	N/A	N/A
COURTROOM	40 NET	200 SF	45	680 SF
COURT FIXED SEATS	N/A	N/A	*10	N/A
STORAGE/MECHANICAL	300			
TOTAL AREA	N/A	800 SF	5,000 SF	N/A
FLOOR OCCUPANT LOAD:	7 PERSONS	** 8 PERSONS	40 PERSONS	**203 PERSONS
EXISTING EXIT STAIR WIDTH:	60 INCHES	84 INCHES	60 INCHES	144 INCHES
REQUIRED EXIT STAIR WIDTH:	44 INCHES	44 INCHES	44 INCHES	44 INCHES
NEW EXIT STAIR WIDTH:	54 INCHES	NO CHANGE	NO CHANGE	NO CHANGE
MAX. ALLOWED TRAVEL DISTANCE:	250'-0"	250'-0"	250'-0"	250'-0"
ACTUAL TRAVEL DISTANCE:	72'-0"	68'-0"	100'-0"	170'-0"

* OCCUPANCY AT MEZZANINE TO BE INCLUDED FOR FLOOR BELOW.
 ** OCCUPANCY OF RECORDS ABOVE TO BE INCLUDED FOR FLOOR BELOW.
 *** OCCUPANCY OF FLOORS ABOVE TO BE INCLUDED.

1 SECOND FLOOR EGRESS PLAN
 EP.102 SCALE: 1/4"=1'-0"

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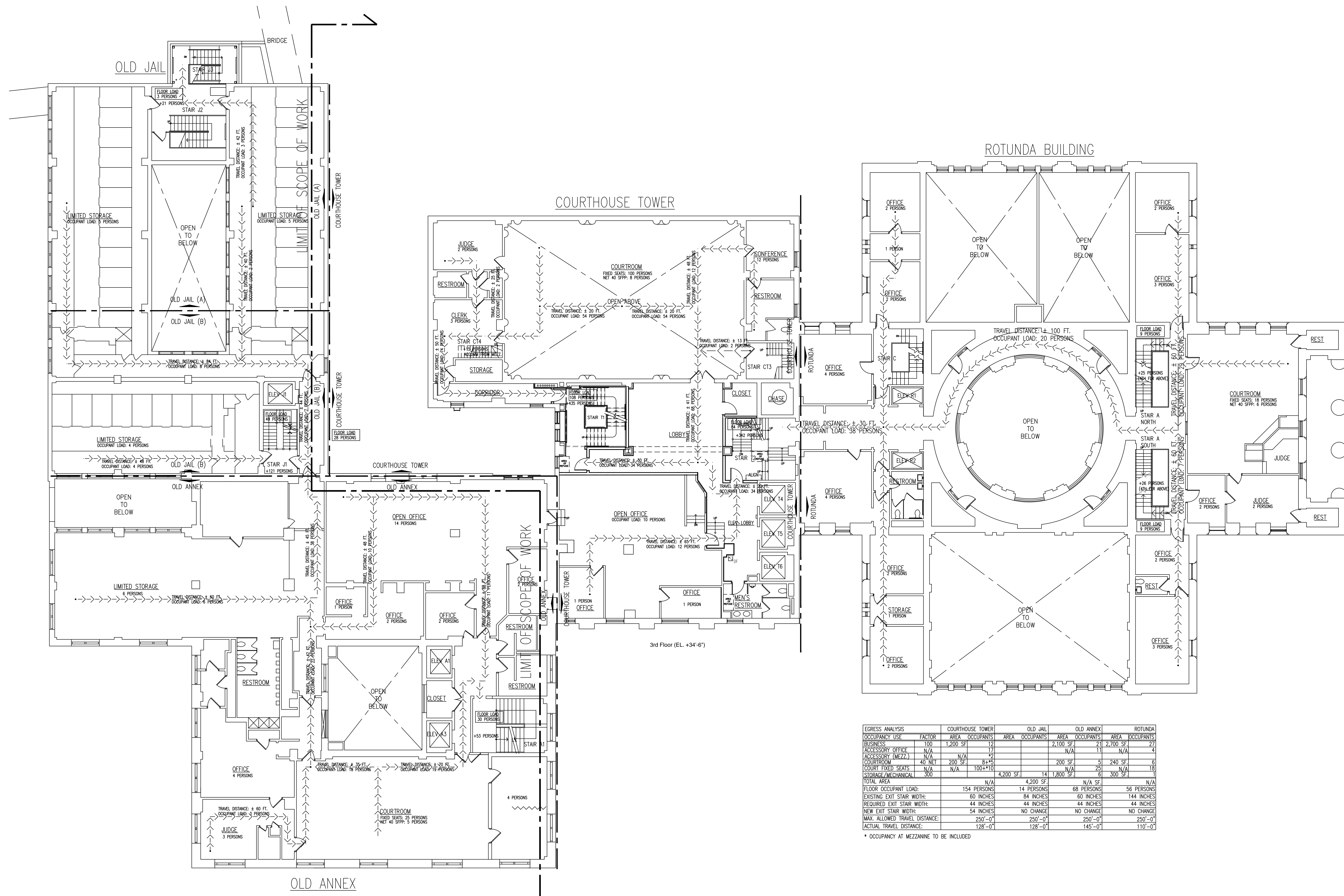


PROJECT:
**UC COURTHOUSE
 INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SECOND FLOOR EGRESS PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY KDF
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 18 OF 160
									DWG NO

EP.102



EGRESS ANALYSIS		COURTHOUSE TOWER		OLD JAIL		OLD ANNEX		ROTUNDA	
OCCUPANCY USE	FACTOR	AREA	OCCUPANTS	AREA	OCCUPANTS	AREA	OCCUPANTS	AREA	OCCUPANTS
BUSINESS	100	1,200 SF	12			2,100 SF	21	2,700 SF	27
ACCESSORY OFFICE	N/A					N/A		N/A	
ACCESSORY (MEZZ)	N/A								
COURTROOM	40	NET 200 SF	8			200 SF	8	240 SF	9
COURT FIXED SEATS	N/A					N/A		N/A	
STORAGE/MECHANICAL	300			100+10	11				
TOTAL AREA				4,200 SF	14	1,800 SF	6	300 SF	1
FLOOR OCCUPANT LOAD:				154 PERSONS	14 PERSONS	68 PERSONS	6 PERSONS	56 PERSONS	5 PERSONS
EXISTING EXIT STAIR WIDTH:				60 INCHES	84 INCHES	60 INCHES	144 INCHES	44 INCHES	44 INCHES
REQUIRED EXIT STAIR WIDTH:				44 INCHES	44 INCHES	44 INCHES	44 INCHES	44 INCHES	44 INCHES
NEW EXIT STAIR WIDTH:				54 INCHES	NO CHANGE	NO CHANGE	NO CHANGE	NO CHANGE	NO CHANGE
MAX. ALLOWED TRAVEL DISTANCE:				250'-0"	250'-0"	250'-0"	250'-0"	250'-0"	250'-0"
ACTUAL TRAVEL DISTANCE:				128'-0"	128'-0"	145'-0"	110'-0"	110'-0"	110'-0"

* OCCUPANCY AT MEZZANINE TO BE INCLUDED

1 THIRD FLOOR EGRESS PLAN
 EP.103 SCALE: 1/4"=1'-0"

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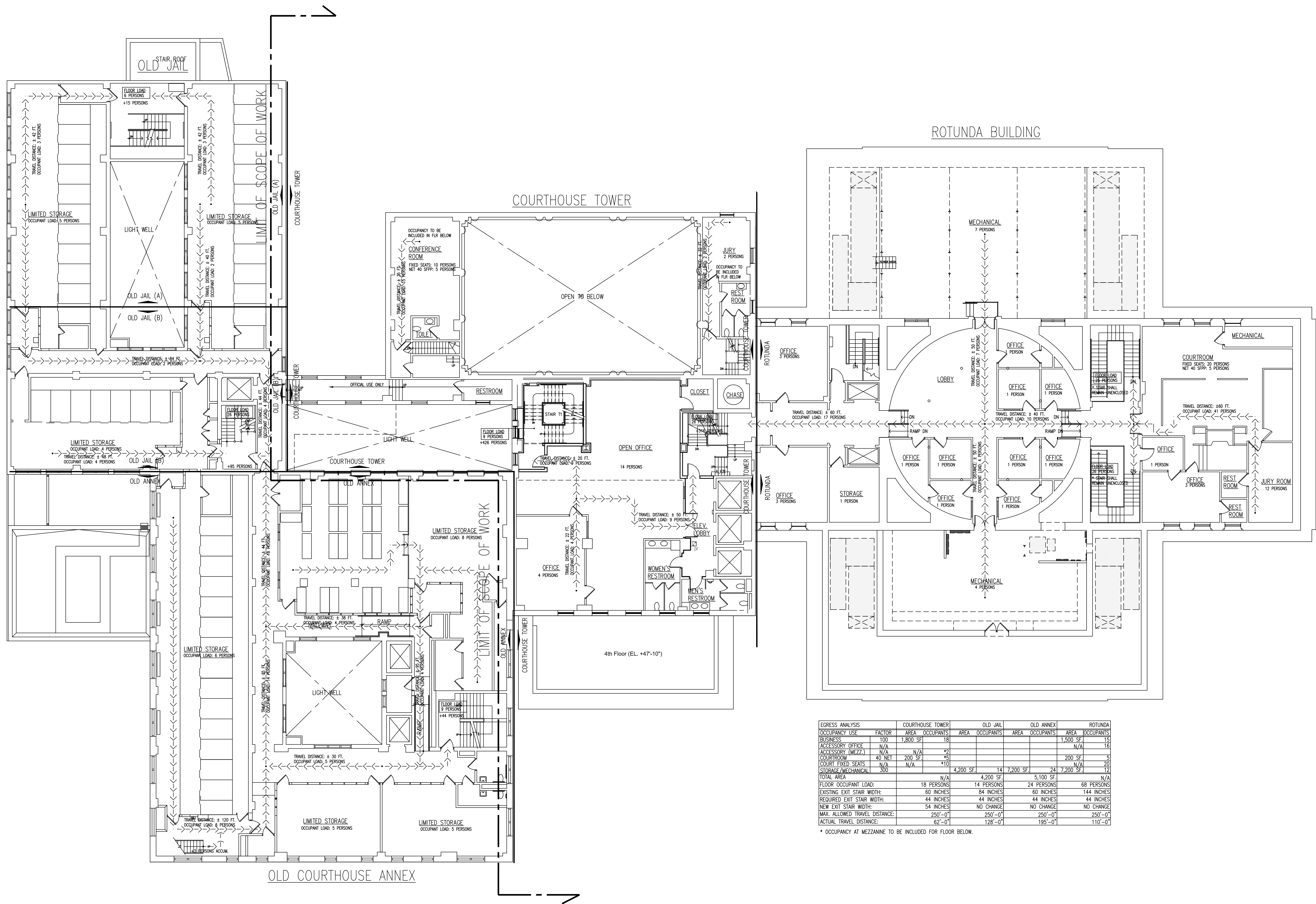


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
THIRD FLOOR EGRESS PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 19 OF 160
									DWG NO

EP.103



1 FOURTH FLOOR EGRESS PLAN
 EP.104 SCALE: 1/4"=1'-0"

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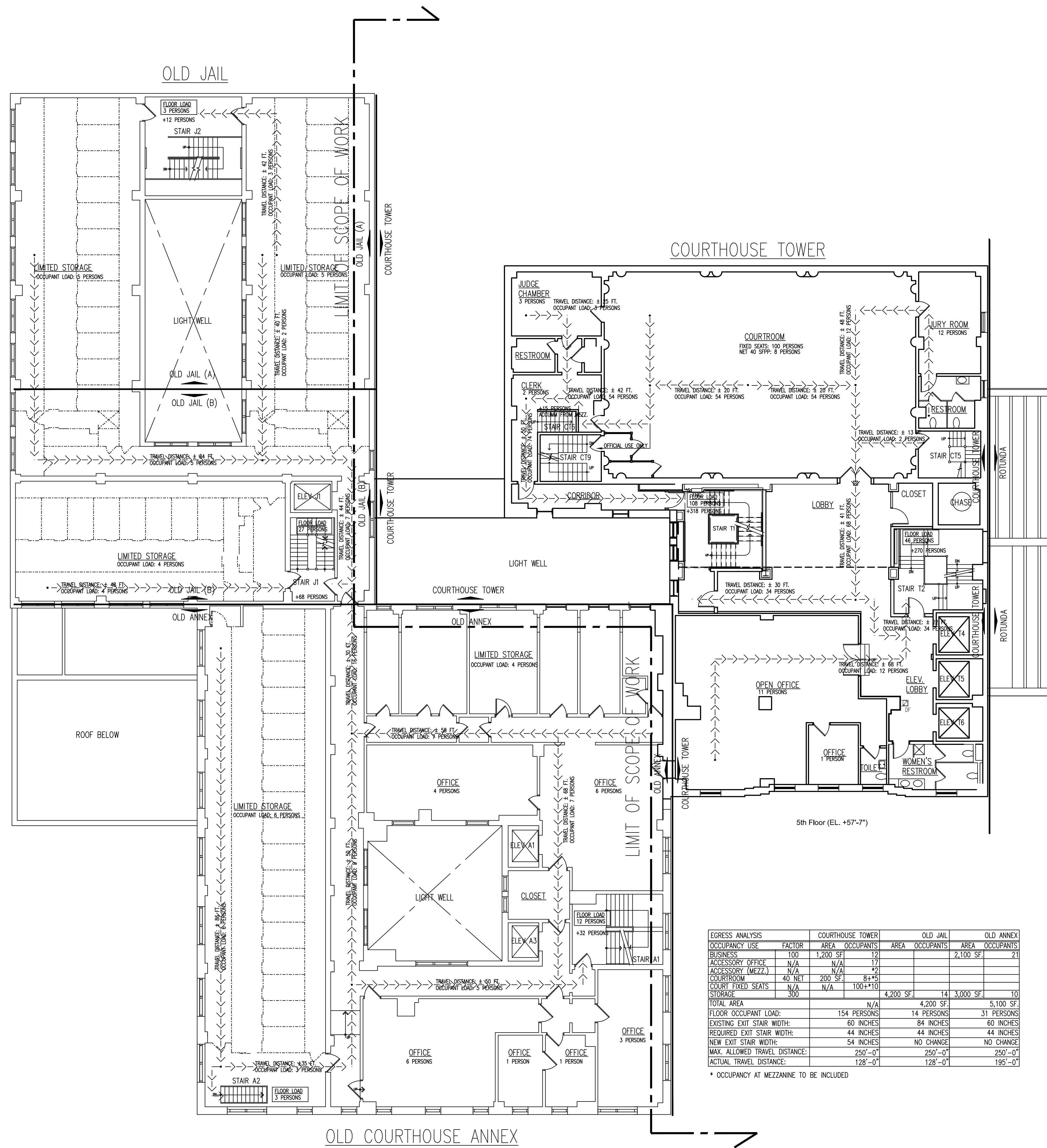


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FOURTH FLOOR EGRESS PLAN

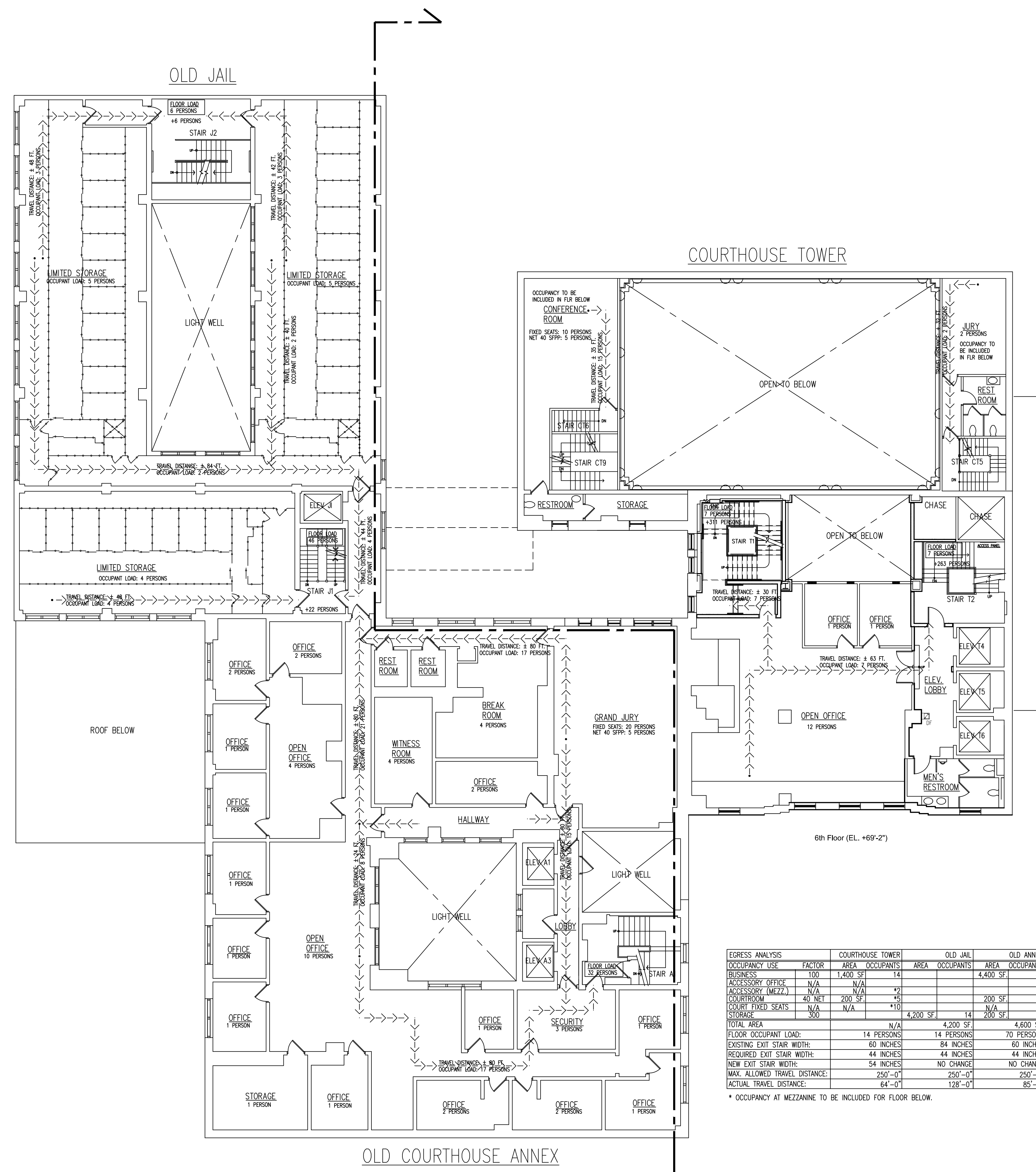
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10.30.15	95% SUBMISSION	KD	FM					AS SHOWN
05.31.17	100% SUBMISSION	MC	FM					DRAWN BY KDF
08.30.17	ISSUED FOR BID	MC	FM					CHKD BY NJN
								JOB NO 2141151
								SHEET: 20 OF: 160
								DWG NO

EP.104



EGRESS ANALYSIS	COURTHOUSE TOWER	OLD JAIL	OLD ANNEX		
OCCUPANCY USE	100	1,200 SF	12	2,100 SF	21
BUSINESS	100	1,200 SF	12	2,100 SF	21
ADJUTORY OFFICE	N/A	N/A	17		
ADJUTORY (MEZZ.)	N/A	N/A	12		
COURTROOM	40 NET	200 SF	8+5		5
COURT FIXED SEATS	N/A	N/A	100+10		20
STORAGE	200	N/A	100+10		1
TOTAL AREA		N/A	4,200 SF	14	5,100 SF
FLOOR OCCUPANT LOAD:		154 PERSONS	14 PERSONS		31 PERSONS
EXISTING EXIT STAIR WIDTH:		60 INCHES	54 INCHES		60 INCHES
REQUIRED EXIT STAIR WIDTH:		44 INCHES	44 INCHES		44 INCHES
NEW EXIT STAIR WIDTH:		54 INCHES	NO CHANGE		NO CHANGE
MAX. ALLOWED TRAVEL DISTANCE:		250'-0"	250'-0"		250'-0"
ACTUAL TRAVEL DISTANCE:		128'-0"	128'-0"		195'-0"

* OCCUPANCY AT MEZZANINE TO BE INCLUDED



EGRESS ANALYSIS	COURTHOUSE TOWER	OLD JAIL	OLD ANNEX		
OCCUPANCY USE	100	1,400 SF	14	4,400 SF	44
BUSINESS	100	1,400 SF	14	4,400 SF	44
ADJUTORY OFFICE	N/A	N/A	12		
ADJUTORY (MEZZ.)	N/A	N/A	12		
COURTROOM	40 NET	200 SF	8+5		5
COURT FIXED SEATS	N/A	N/A	100+10		20
STORAGE	200	N/A	100+10		1
TOTAL AREA		N/A	4,200 SF	14	4,600 SF
FLOOR OCCUPANT LOAD:		14 PERSONS	14 PERSONS		70 PERSONS
EXISTING EXIT STAIR WIDTH:		60 INCHES	54 INCHES		60 INCHES
REQUIRED EXIT STAIR WIDTH:		44 INCHES	44 INCHES		44 INCHES
NEW EXIT STAIR WIDTH:		54 INCHES	NO CHANGE		NO CHANGE
MAX. ALLOWED TRAVEL DISTANCE:		250'-0"	250'-0"		250'-0"
ACTUAL TRAVEL DISTANCE:		64'-0"	128'-0"		85'-0"

* OCCUPANCY AT MEZZANINE TO BE INCLUDED FOR FLOOR BELOW

1 FIFTH FLOOR EGRESS PLAN
 EP.105 SCALE: 1/4"=1'-0"

1 SIXTH FLOOR EGRESS PLAN
 EP.105 SCALE: 1/4"=1'-0"

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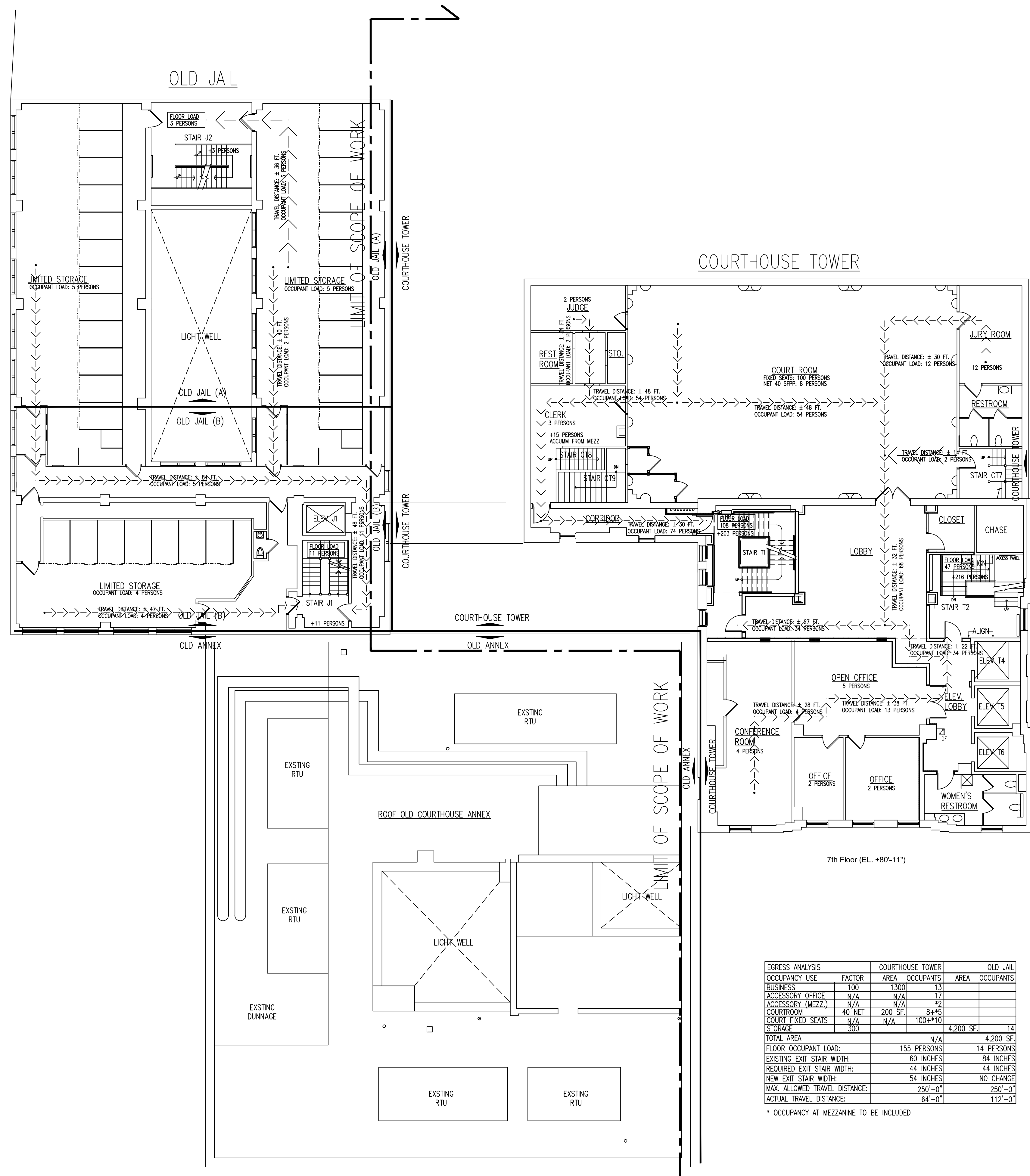


PROJECT: UC COURTHOUSE
 INTERNAL STAIR (TOWER)
 2 Broad Street, Elizabeth New Jersey

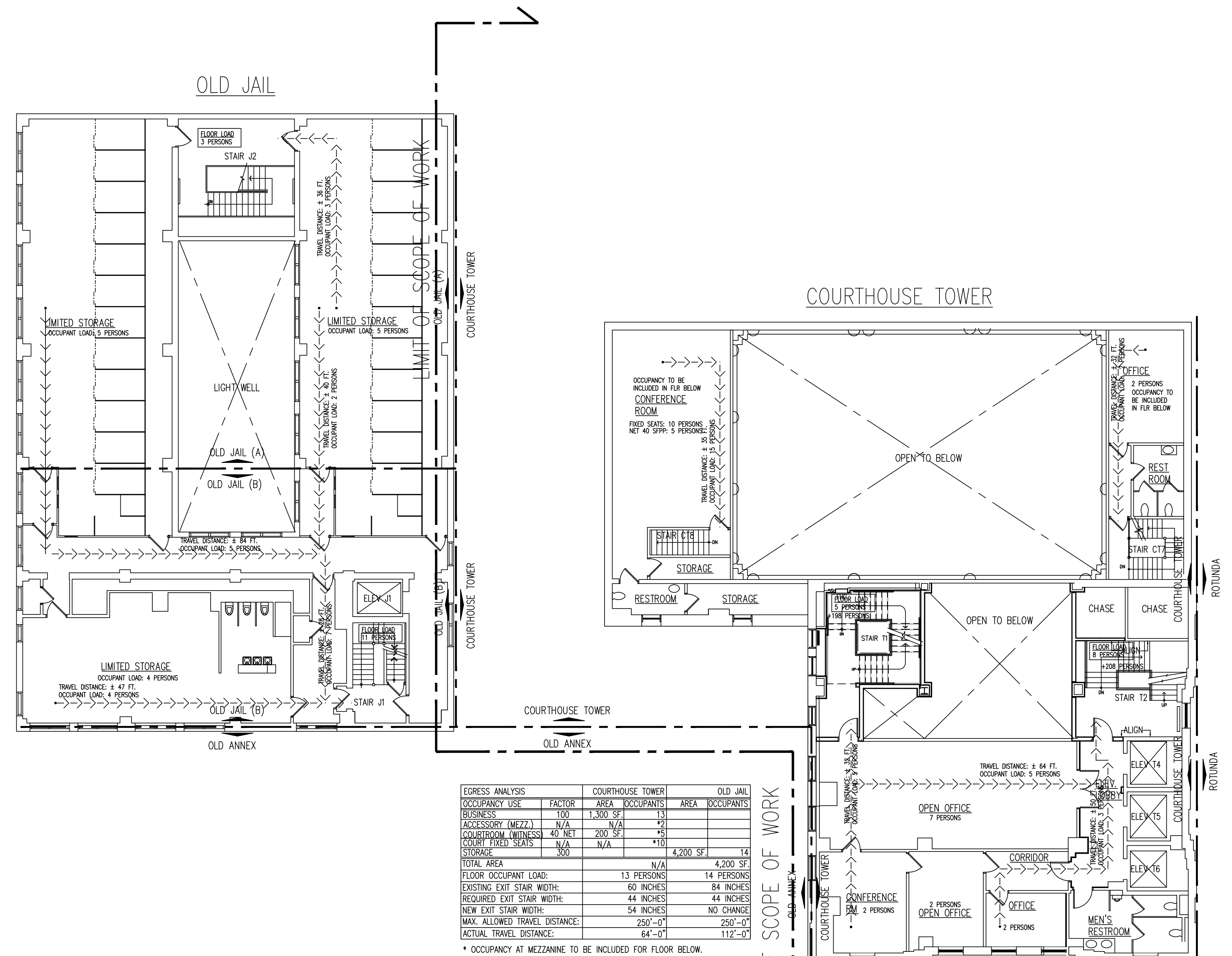
SHEET CONTENTS:
 FIFTH FLOOR & SIXTH FLOOR
 EGRESS PLAN

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						
10.30.15	95% SUBMISSION	KD	FM						
05.31.17	100% SUBMISSION	MC	FM						
08.30.17	ISSUED FOR BID	MC	FM						

DRAWN BY: KDF
 CHKD BY: NJN
 JOB NO: 2141151
 SHEET: 21 OF 160
 DWG NO



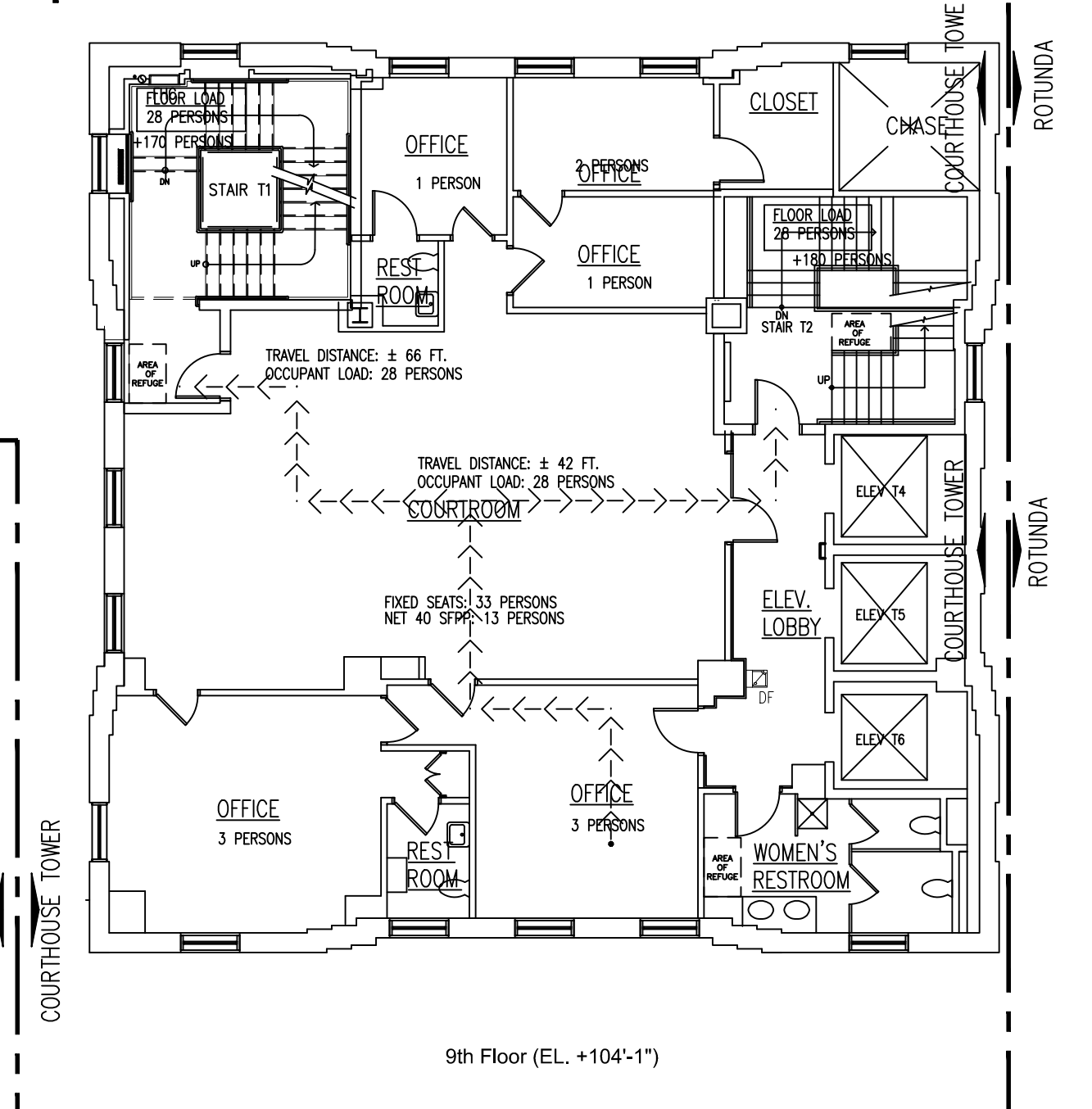
1 SEVENTH FLOOR EGRESS PLAN
SCALE: 1/8"=1'-0"



2 EIGHTH FLOOR EGRESS PLAN
SCALE: 1/4"=1'-0"

EGRESS ANALYSIS	COURTHOUSE TOWER	OLD JAIL			
OCCUPANCY USE	FACTOR	AREA	OCCUPANTS	AREA	OCCUPANTS
BUSINESS	100	1,300 SF	13		
ACCESSORY (MEZZ.)	N/A	N/A	2		
COURTROOM (BUSINESS)	40	200 SF	8		
COURT FIXED SEATS	N/A	N/A	10		
STORAGE	300			4,200 SF	14
TOTAL AREA		N/A	4,200 SF		
FLOOR OCCUPANT LOAD:	13 PERSONS		14 PERSONS		
EXISTING EXIT STAIR WIDTH:	60 INCHES		84 INCHES		
REQUIRED EXIT STAIR WIDTH:	44 INCHES		44 INCHES		
NEW EXIT STAIR WIDTH:	54 INCHES		NO CHANGE		
MAX. ALLOWED TRAVEL DISTANCE:	250'-0"		250'-0"		
ACTUAL TRAVEL DISTANCE:	64'-0"		112'-0"		

* OCCUPANCY AT MEZZANINE TO BE INCLUDED FOR FLOOR BELOW.



3 NINTH FLOOR EGRESS PLAN
SCALE: 1/8"=1'-0"

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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

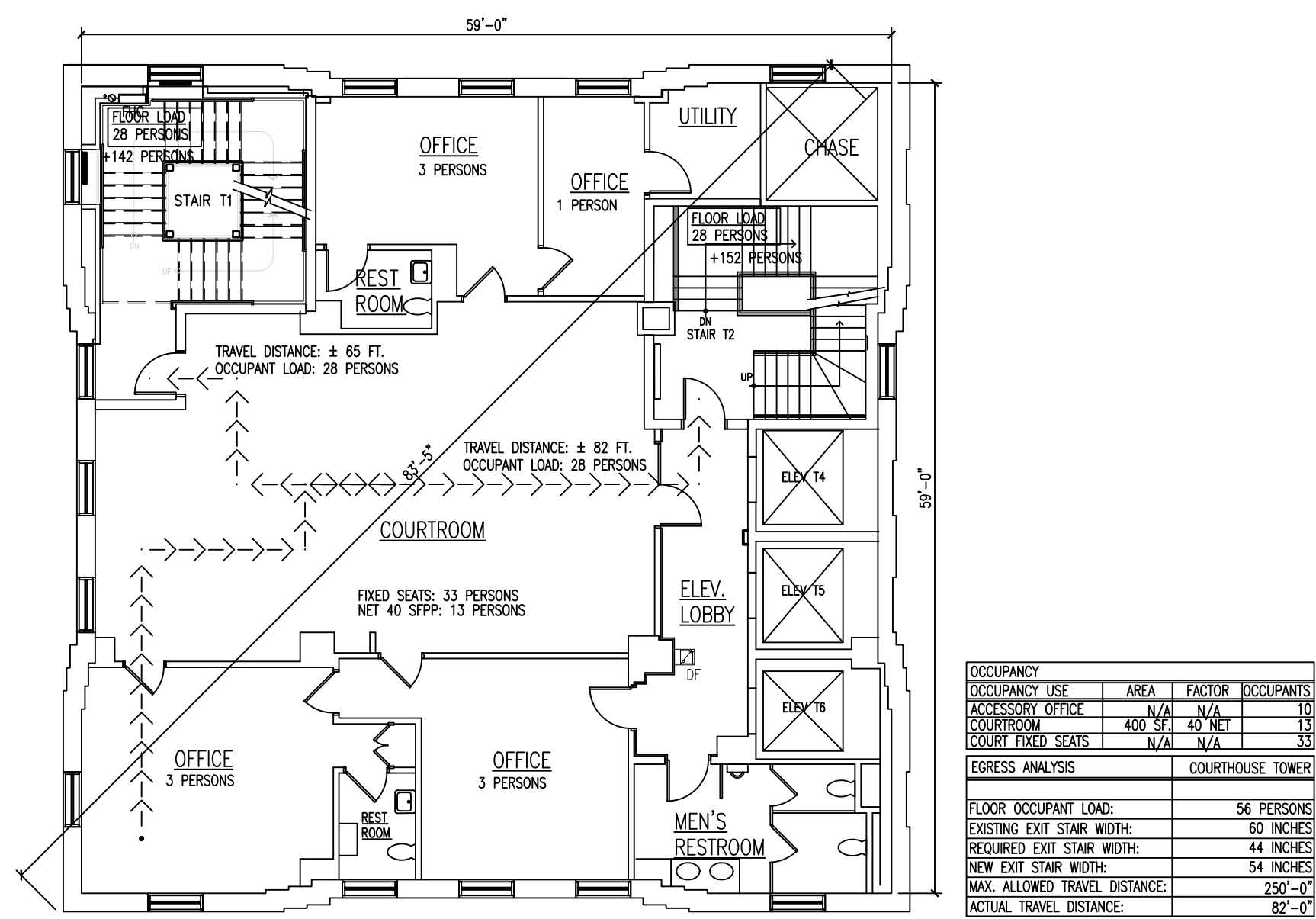


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

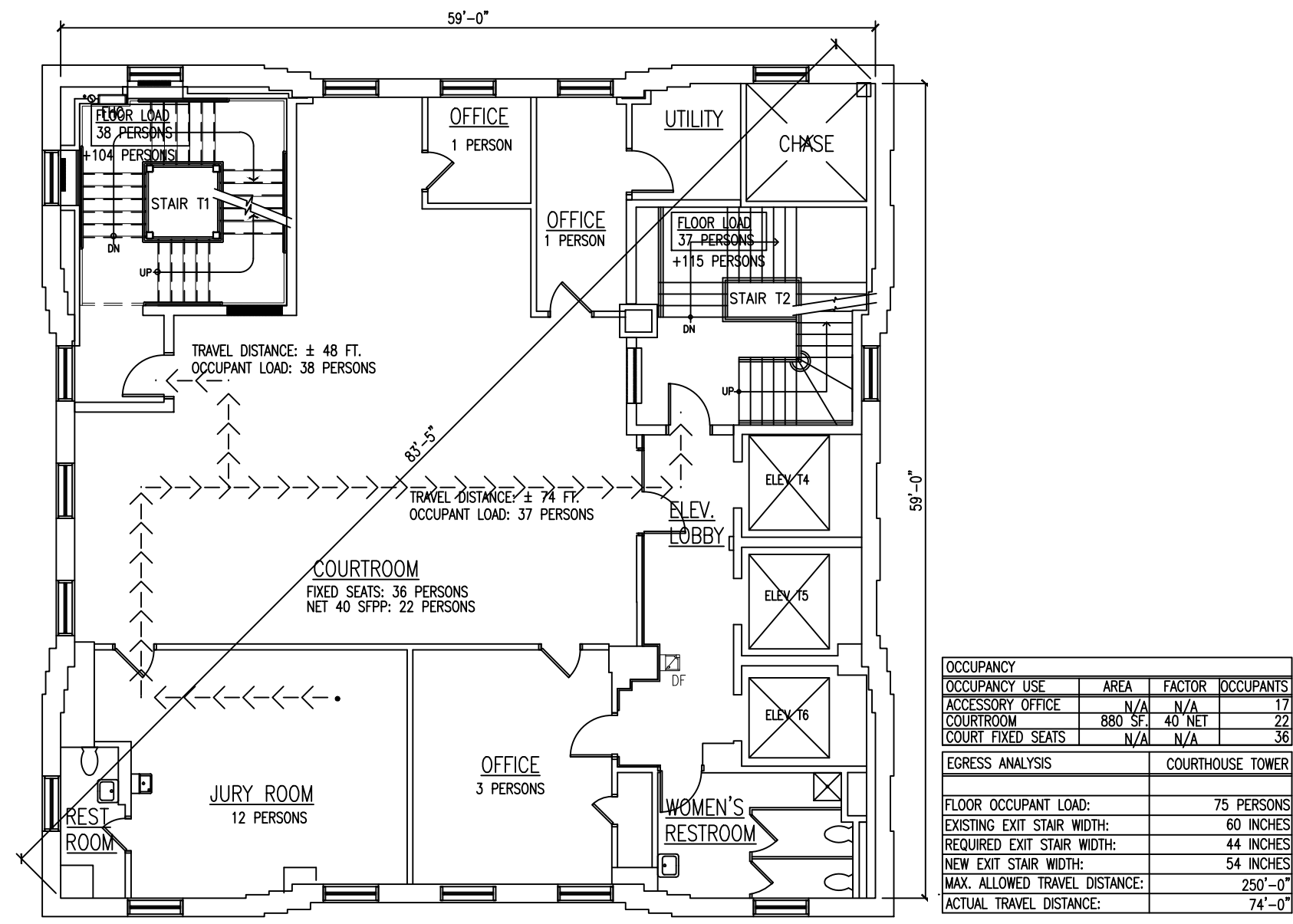
SHEET CONTENTS:
SEVENTH FLOOR, EIGHTH FLOOR & NINTH FLOOR
EGRESS PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						
10.30.15	95% SUBMISSION	KD	FM						
05.31.17	100% SUBMISSION	MC	FM						
08.30.17	ISSUED FOR BID	MC	FM						

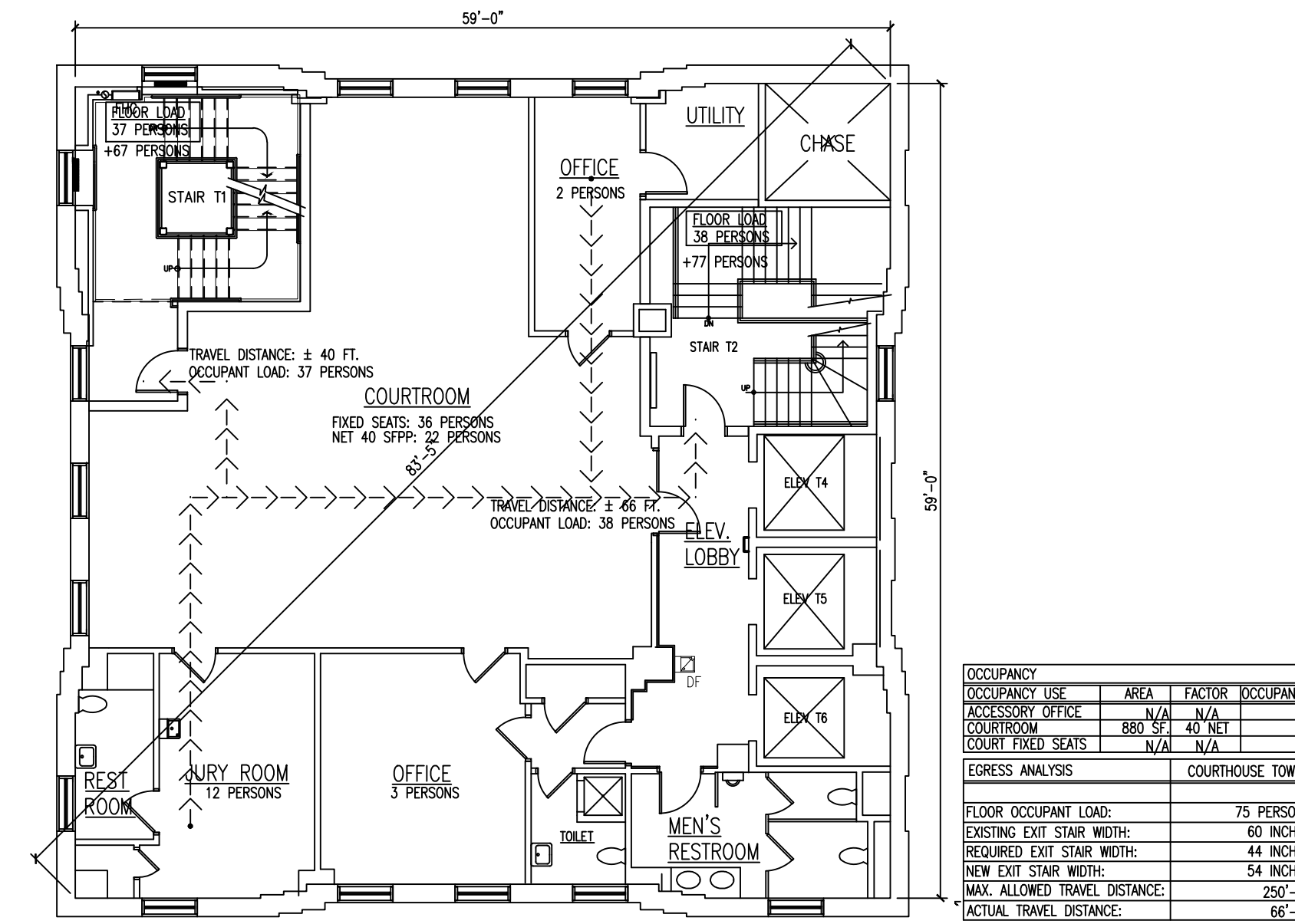
EP.106



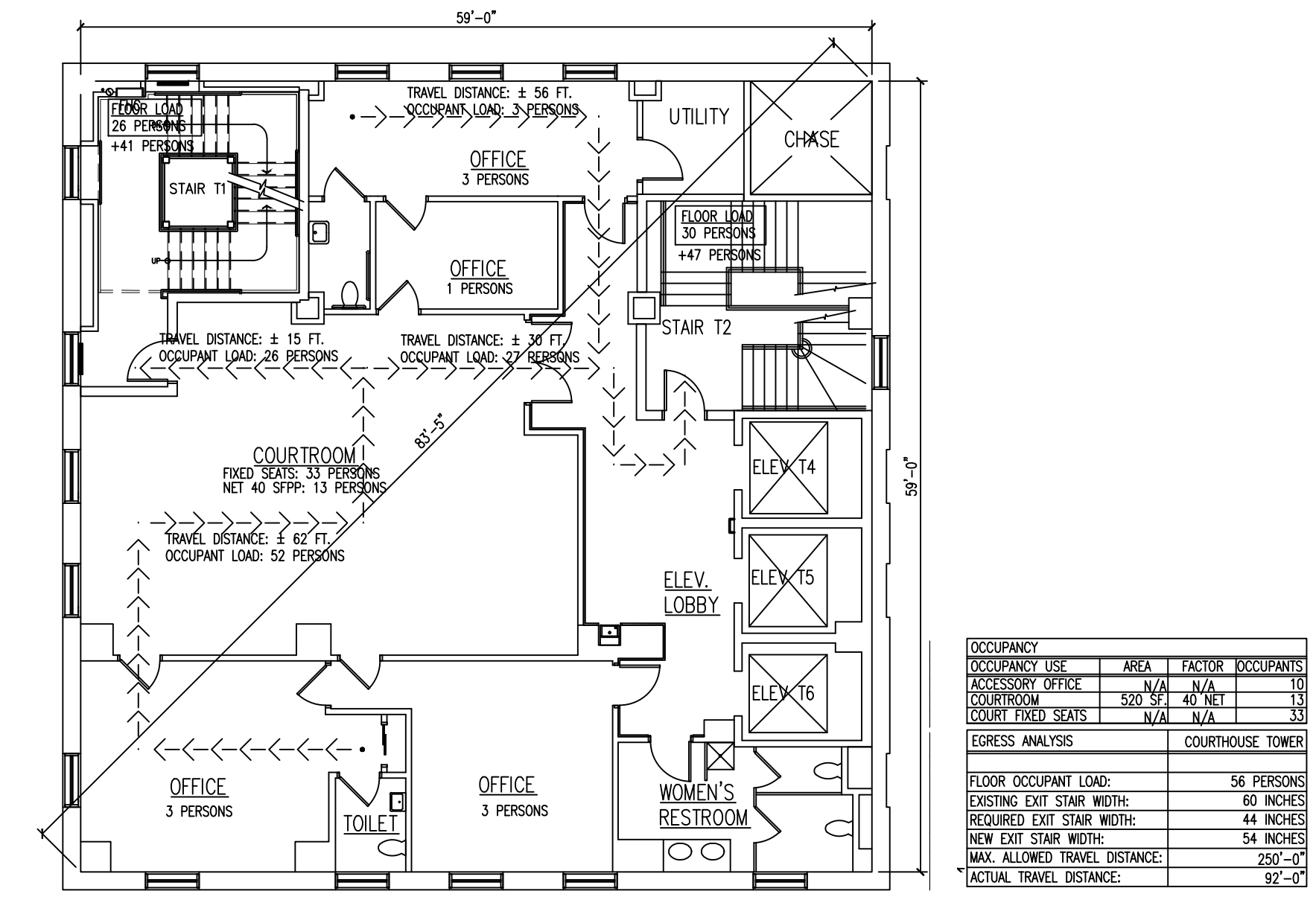
1 TENTH FLOOR EGRESS PLAN
SCALE: 1/4"=1'-0"



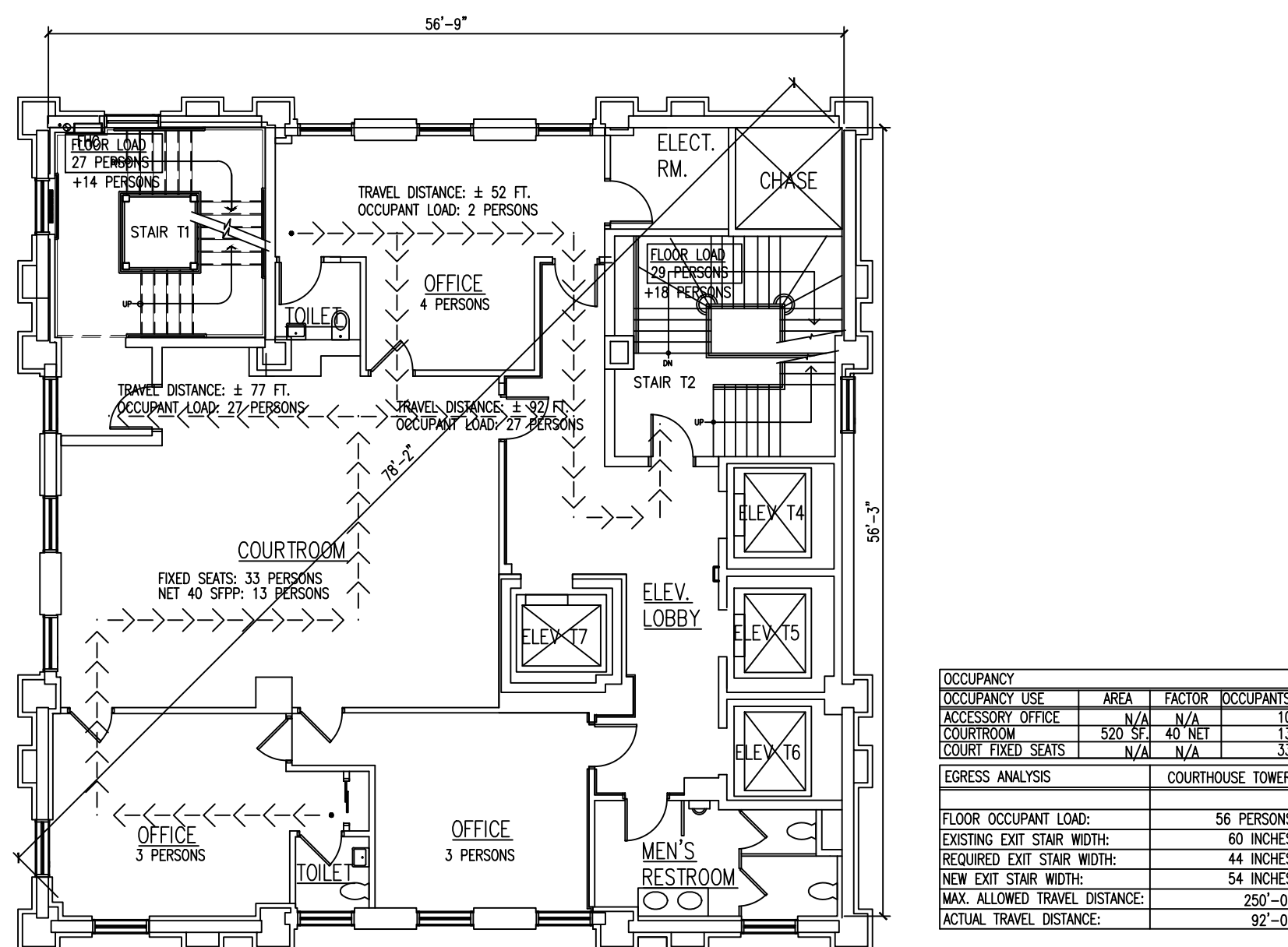
2 ELEVENTH FLOOR EGRESS PLAN
SCALE: 1/4"=1'-0"



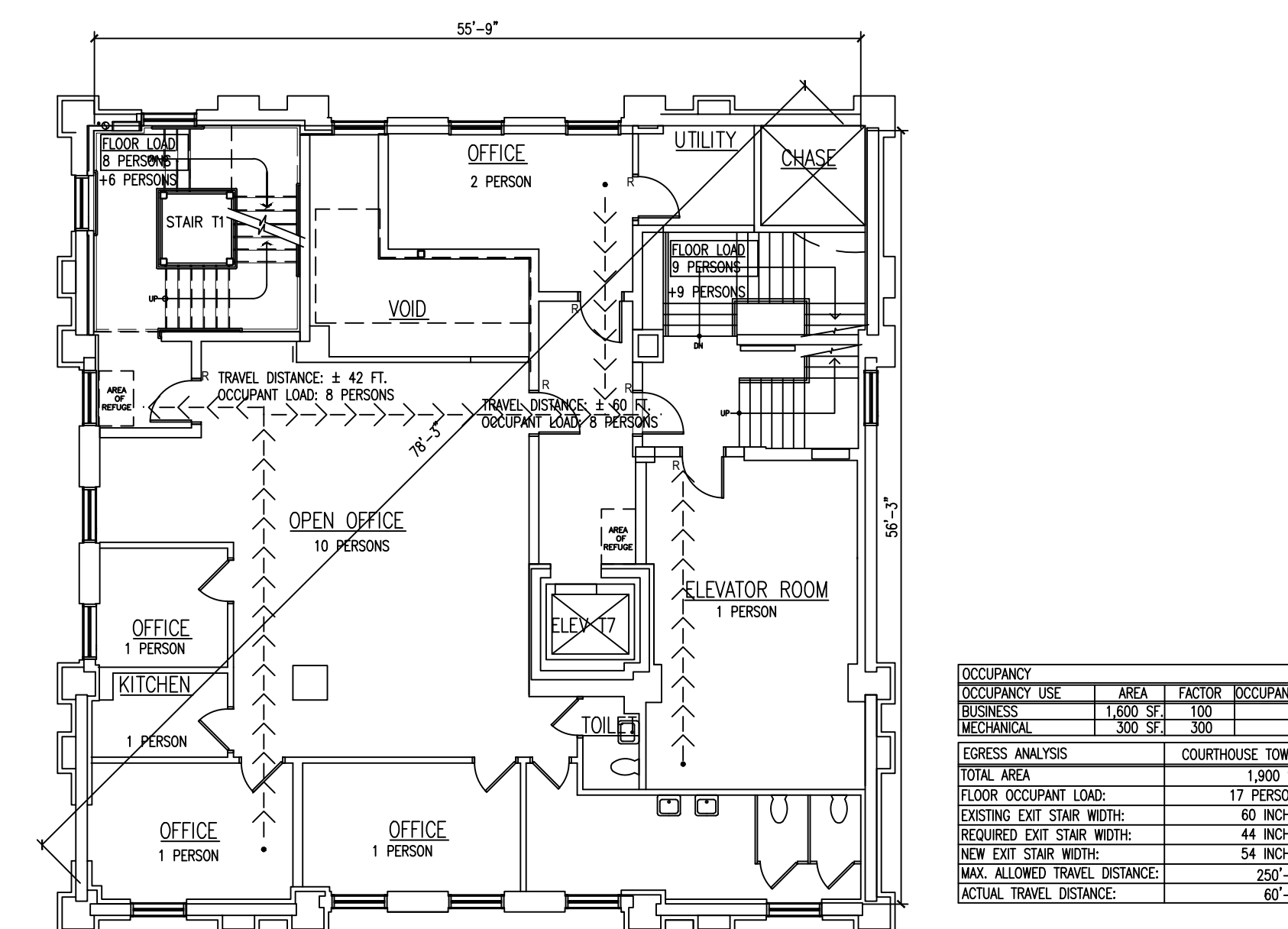
3 TWELFTH FLOOR EGRESS PLAN
SCALE: 1/4"=1'-0"



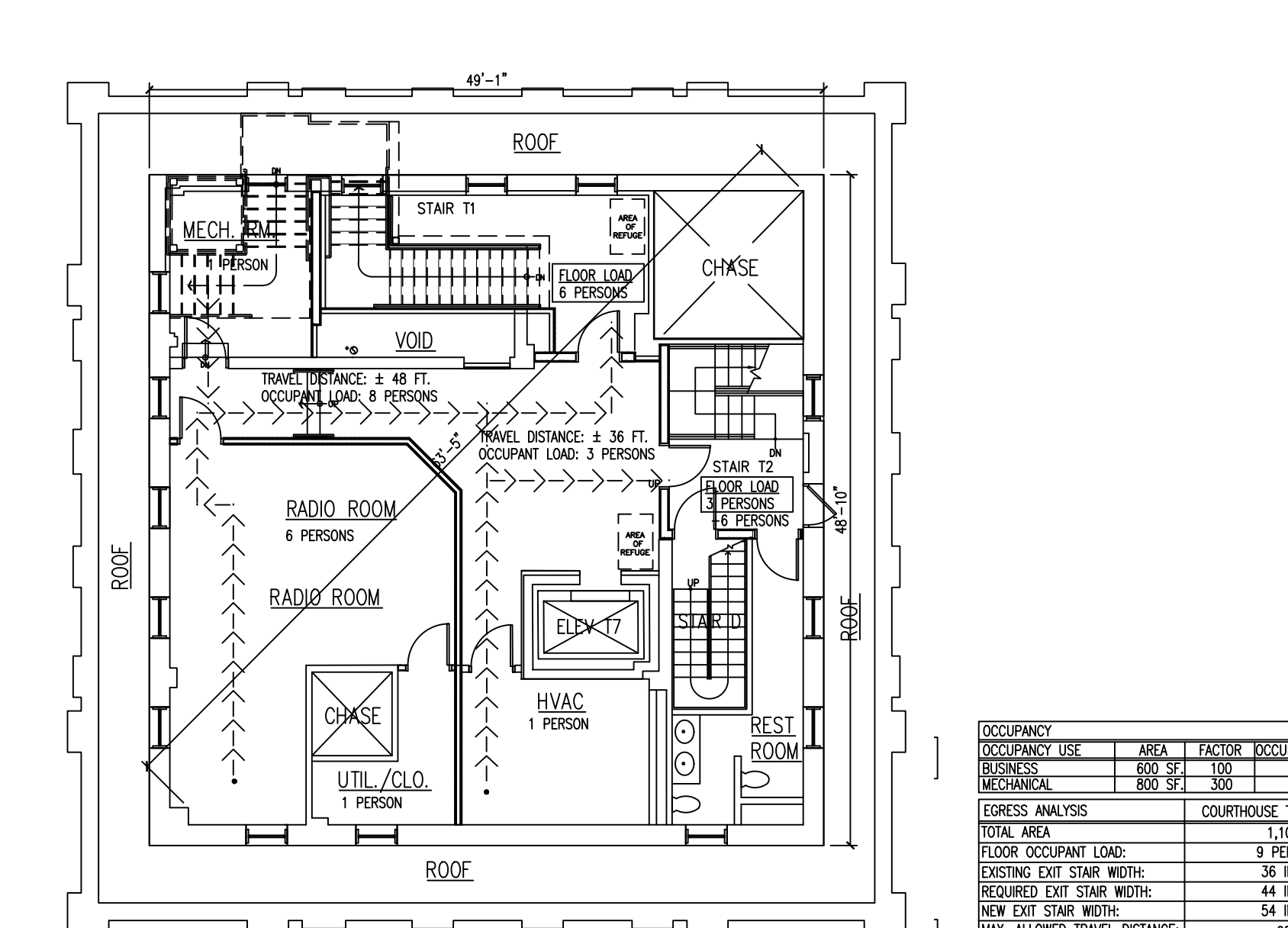
4 THIRTEENTH FLOOR EGRESS PLAN
SCALE: 1/4"=1'-0"



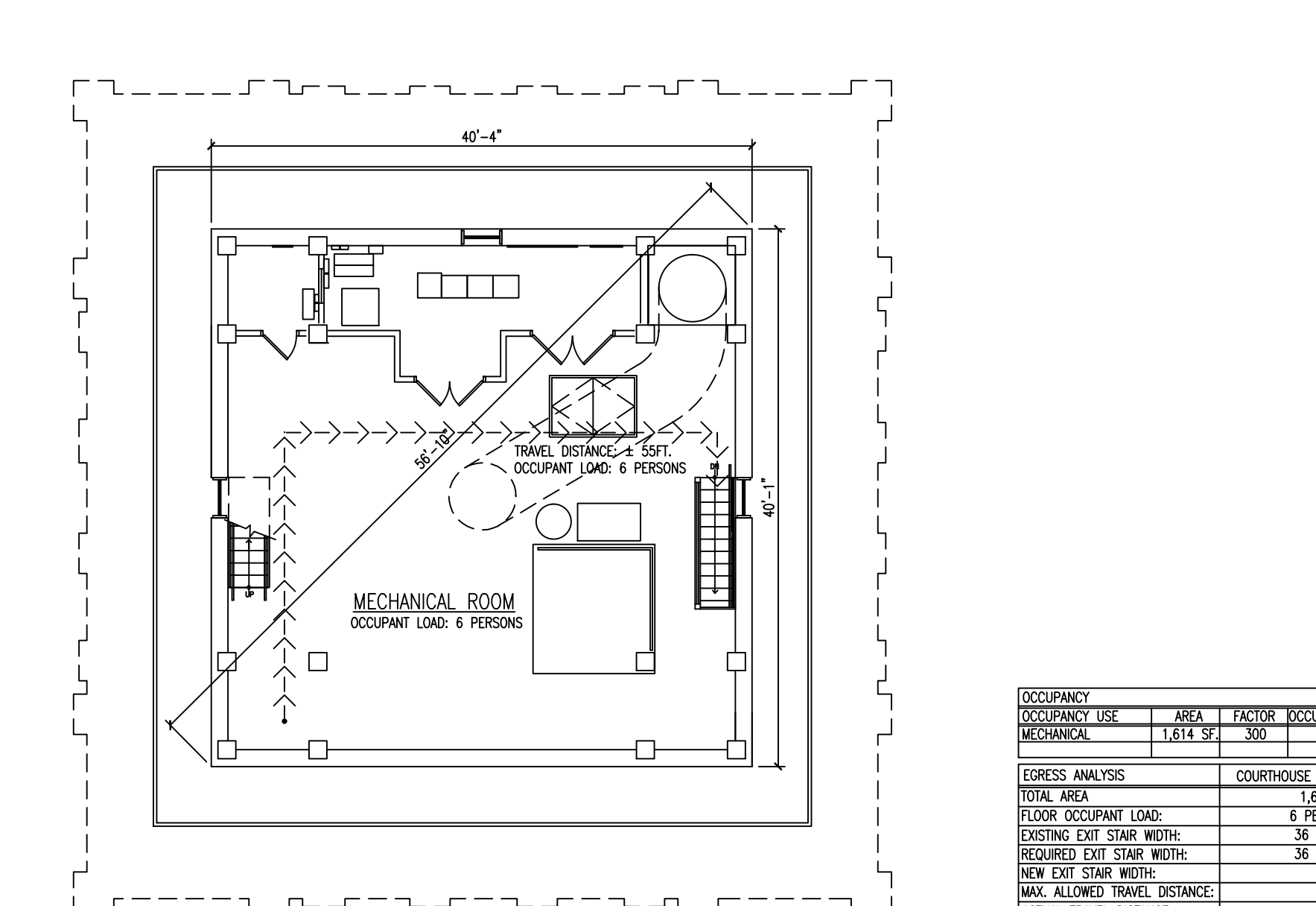
5 FOURTEENTH FLOOR EGRESS PLAN
SCALE: 1/4"=1'-0"



6 FIFTEENTH FLOOR EGRESS PLAN
SCALE: 1/4"=1'-0"



7 SIXTEENTH FLOOR EGRESS PLAN
SCALE: 1/4"=1'-0"



8 PENTHOUSE FLOOR EGRESS PLAN
SCALE: 1/4"=1'-0"

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PROJECT:

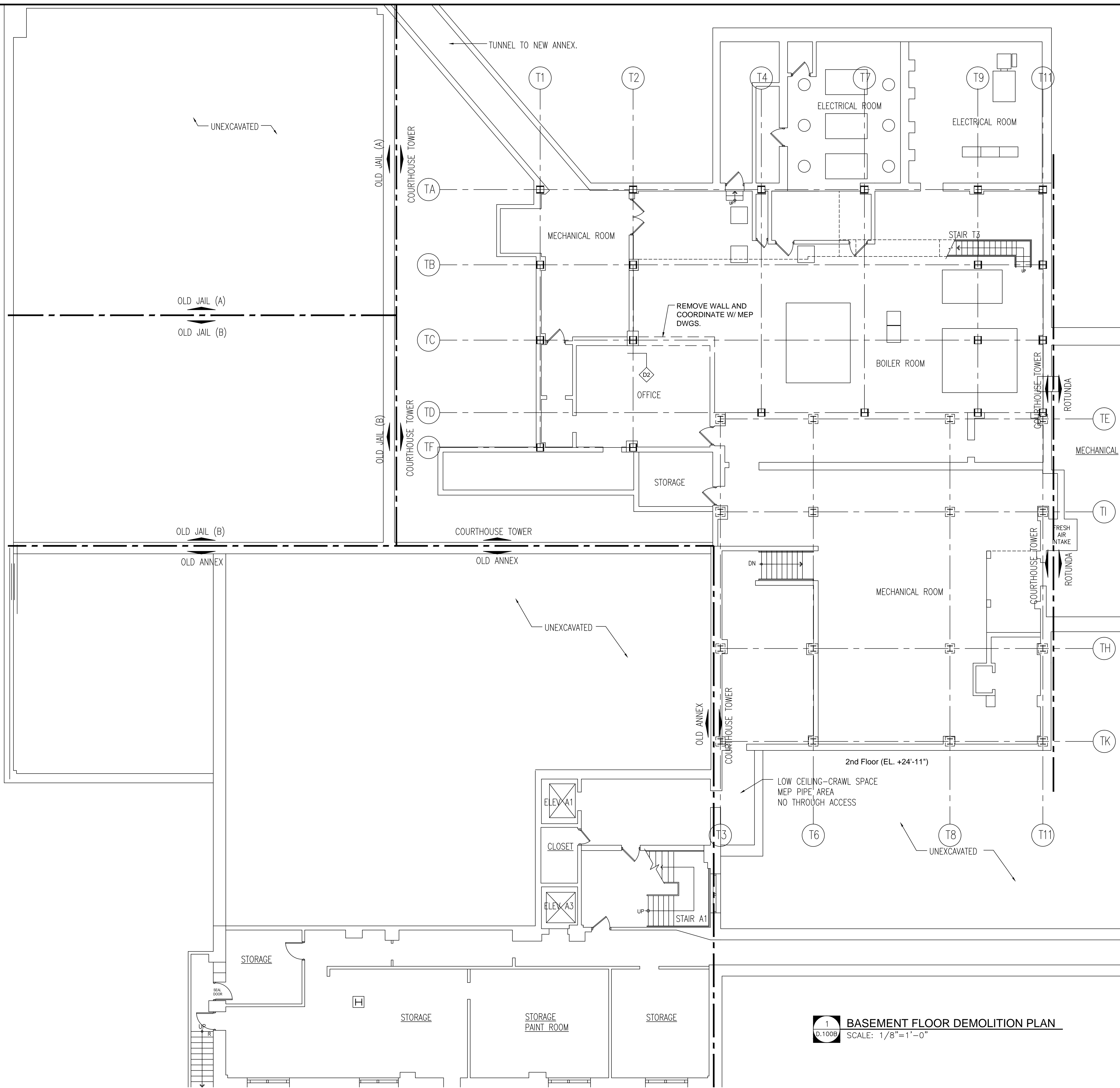
UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

TENTH, ELEVENTH, TWELFTH, THIRTEENTH,
FOURTEENTH, FIFTEENTH, SIXTEENTH, PENTHOUSE
FLOOR EGRESS PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY KDF
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 23 OF: 160
									DWG NO

EP.107

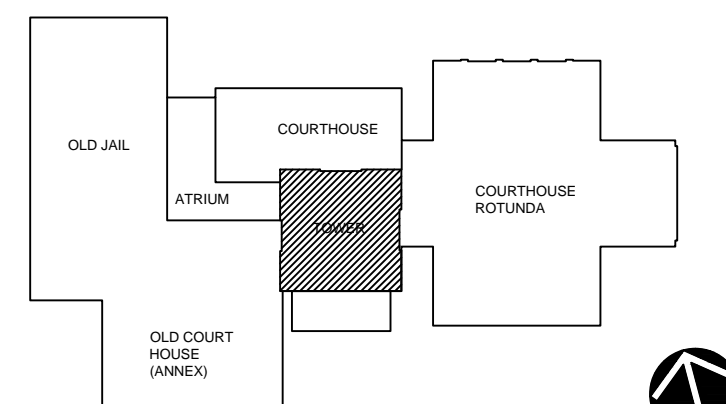


1 BASEMENT FLOOR DEMOLITION PLAN
 SCALE: 1/8" = 1'-0"

DEMOLITION KEYNOTES

1. REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.) SALVAGE & STORE FOR RE-INSTALLATION.
2. REMOVE EXISTING WINDOW SYSTEM.
3. PROVIDE FLOOR OPENING FOR NEW STAIR. CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXIST'G AFFECTED STAIR STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
4. REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
5. LINE OF EXISTING STAIR ENCLOSURES ABOVE.
6. REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
7. SCRABE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
8. RELOCATE EXISTING FIRE ALARM
9. DEACTIVATE, DISCONNECT AND REMOVED AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
10. REMOVED EXIST. LOW PARTITION DIVIDER.
11. REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR. SEE DOOR SCHEDULE.
12. RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
13. REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
14. EXIST'G WATER COOLER TO REMAIN.
15. EXIST'G COLUMN TO REMAIN.
16. EXIST'G STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
17. REMOVE, RECONFIGURE AND REINSTALL EXIST'G LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION. REFER TO DWGS. A600B-A613 REFLECTED CEILING PLANS.
18. DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES AT ANY AREA DESIGNATED TO RECEIVE NEW WORK.
19. EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
20. EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
21. EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
22. EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
23. EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE. REFER TO STRUCT DWG.
24. RELOCATE EXIST. MICROWAVE DISH PANEL.
25. PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED). PLACE TEMPORARY SUPPORT FOR EXIST'G STAIR. INDICATED AREA TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH & REPAIR OPENING. PAINT TO MATCH EXIST'G ADJACENT WALL.
26. EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS
27. NOT USED
28. CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
29. EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNLOGGED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
30. PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
31. REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
32. COURTROOM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
33. PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
34. REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
35. EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWGS. INFILL, PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
36. SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS. SEE MECHL DWGS.
37. REMOVE EXISTING WINDOW A/C UNITS. SEE MECHL DWGS.
38. CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
39. REROUTE EXIST'G WIRE MANAGEMENT REFER TO ELECTRICAL DWGS.
40. RELOCATE EXISTING SCONCE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
41. REMOVE & COORDINATE RELOCATION OF EXIST'G CAMERA W/ OWNER.
42. CM TO COORDINATE W/ OWNER THE REMOVAL STORAGE & RELOCATION EXIST'G WALL PORTRAITS
43. REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
44. EXISTING FIRE RATED GLAZING TO REMAIN.
45. RELOCATE EXISTING ELECTRIC CLOCK
46. REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
47. REMOVED, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACOUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION. REFER TO DWGS. A600B-A613. REFLECTED CEILING PLANS.
48. REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.

KEYPLAN



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 NJ License No. AI 12541

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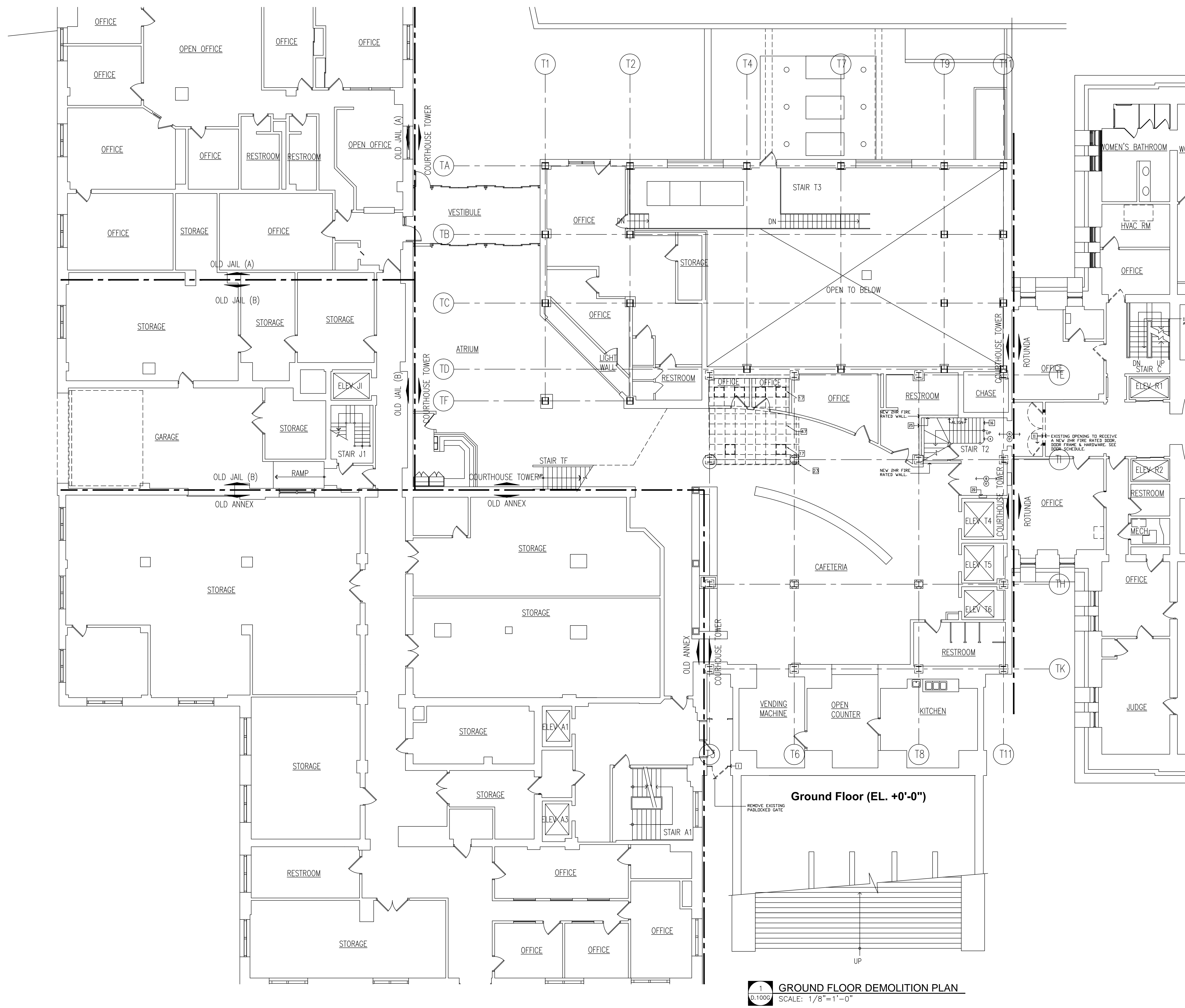


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
BASEMENT FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 24 OF 160
									DWG NO

D.100B

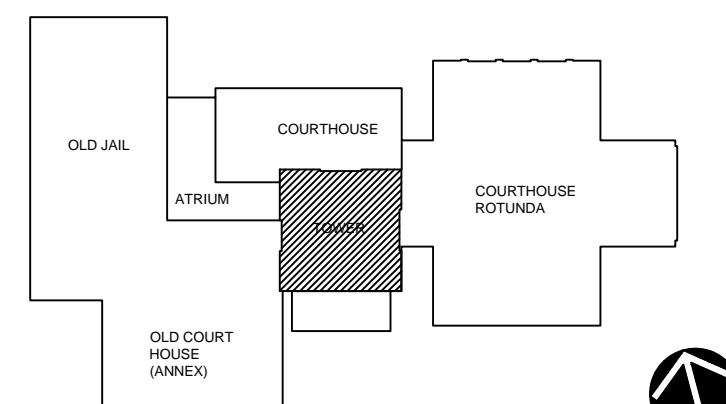


1 GROUND FLOOR DEMOLITION PLAN
 SCALE: 1/8"=1'-0"

DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXISTING WINDOW SYSTEM.
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10 REMOVED EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS. MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23 EXIST. COLUMN & BEAM TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24 RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS
- 27 NOT USED
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNCLOGGED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTROOM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH. PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWGS. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCENE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41 RELOCATE EXISTING CAMERA
- 42 RELOCATE EXISTING WALL PORTRAITS
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLOCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47 REMOVED, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACOUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 48 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.

KEYPLAN



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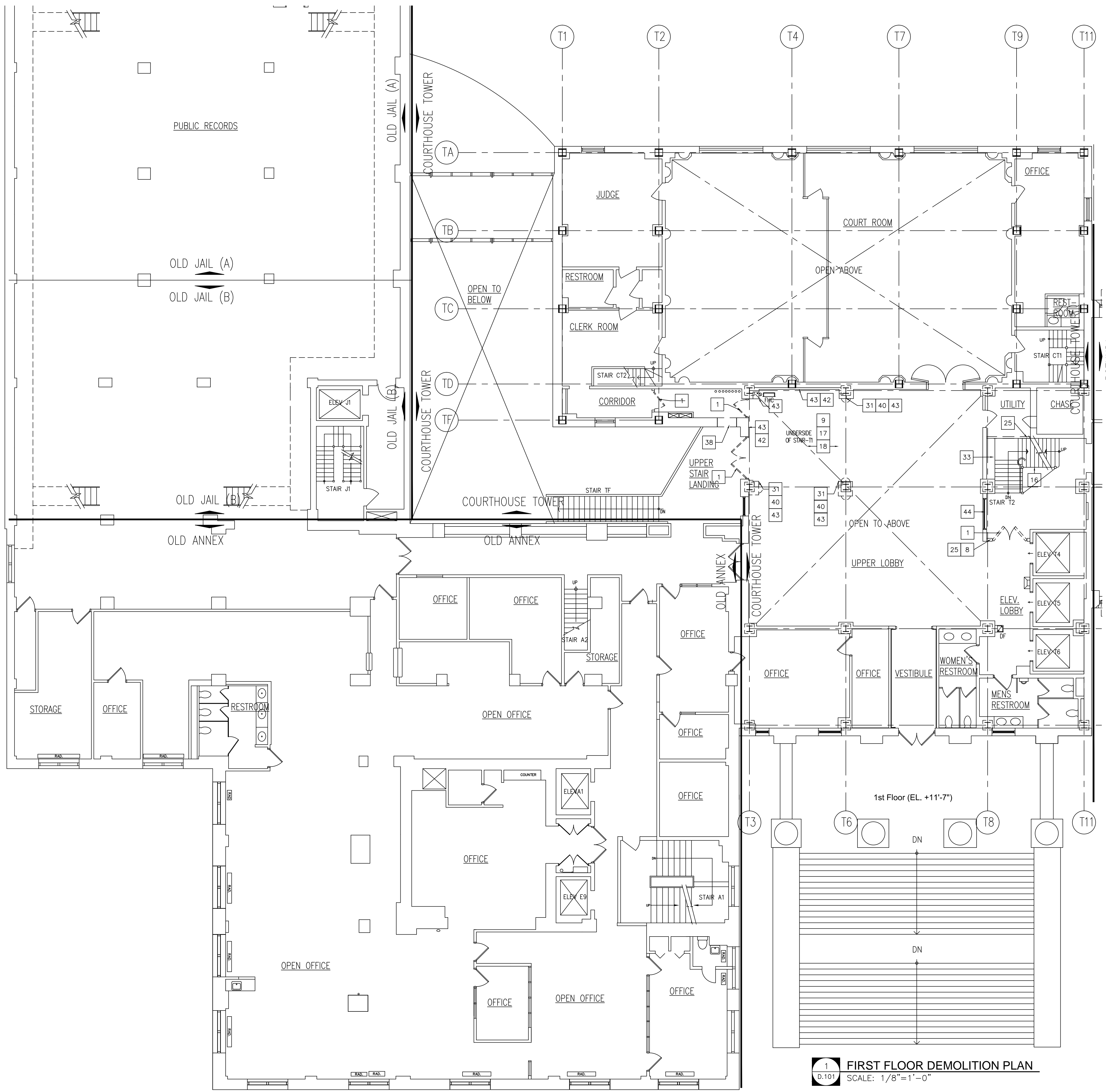


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
GROUND FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 25 OF 160
									DWG NO

D.100G

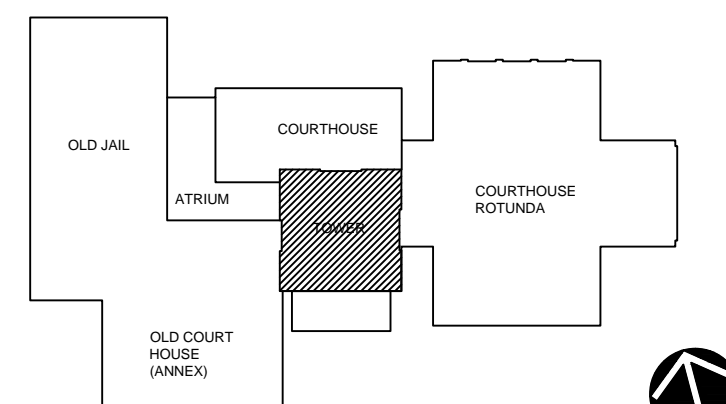


1 FIRST FLOOR DEMOLITION PLAN
SCALE: 1/8"=1'-0"

DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXISTING WINDOW SYSTEM.
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10 REMOVED EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23 EXIST. COLUMN & BEAM TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24 RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS
- 27 NOT USED
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNBLOCKED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTROOM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCENIC LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41 RELOCATE EXISTING CAMERA
- 42 RELOCATE EXISTING WALL PORTRAITS
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLOCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47 REMOVED, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 48 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.

KEYPLAN



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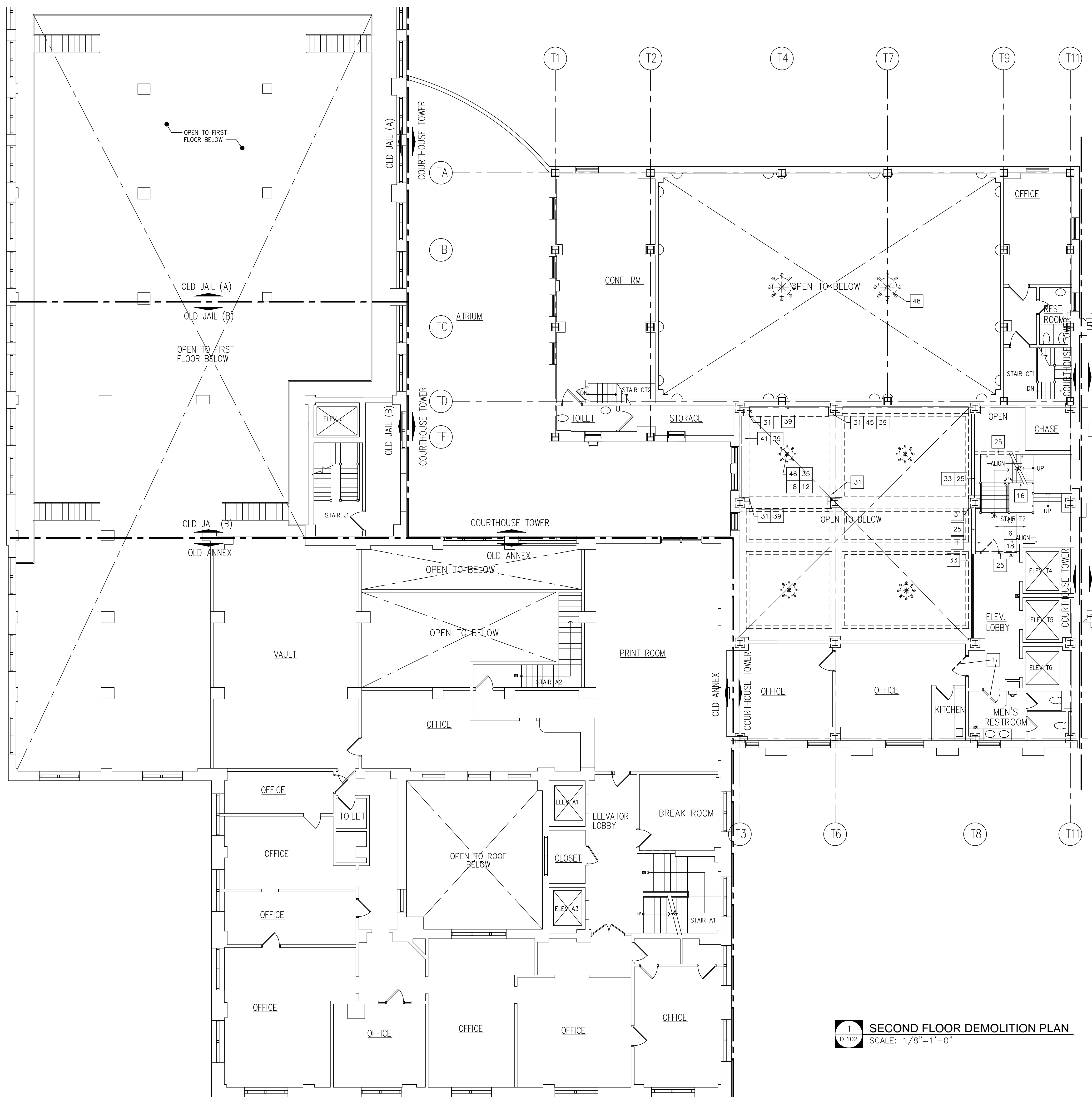
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ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.376.0098 FAX: 973.376.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FIRST FLOOR DEMOLITION PLAN

SUBMISSIONS		REVISIONS		DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION
04.02.15	DD SUBMISSION	KD	FM		AS SHOWN
10.30.15	95% SUBMISSION	KD	FM		DRAWN BY BT
05.31.17	100% SUBMISSION	MC	FM		CHKD BY NJN
08.30.17	ISSUED FOR BID	MC	FM		JOB NO 2141151
					SHEET: 26 OF 160
					DWG NO

D.101

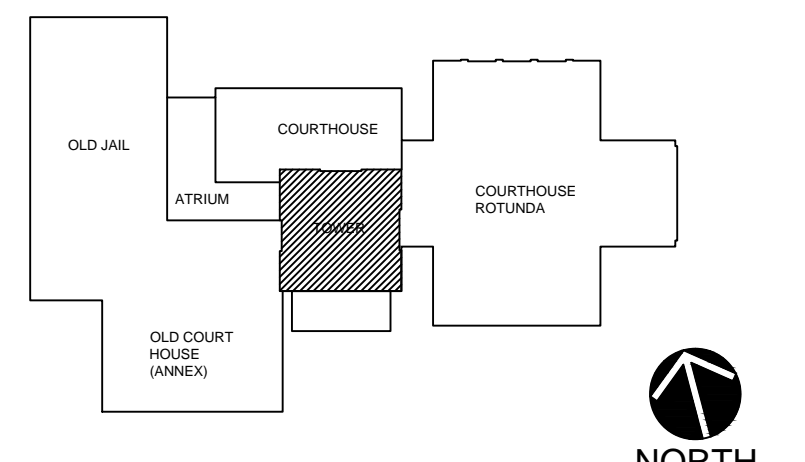


1
0.102
SECOND FLOOR DEMOLITION PLAN
SCALE: 1/8" = 1'-0"

DEMOLITION KEYNOTES

- 1] REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2] REMOVE EXISTING WINDOW SYSTEM.
- 3] PROVIDE FLOOR OPENING FOR NEW STAIR, CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4] REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5] LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6] REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7] SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8] RELOCATE EXISTING FIRE ALARM
- 9] DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10] REMOVED EXIST. LOW PARTITION DIVIDER.
- 11] REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12] RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13] REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14] REMOVED EXIST. WATER COOLER.
- 15] EXIST. COLUMN TO REMAIN.
- 16] EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17] REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18] DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19] EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20] EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21] EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22] EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23] EXIST. COLUMN & BEAM TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24] RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25] PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26] EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWG'S
- 27] NOT USED
- 28] CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29] EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNBLOCKED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30] PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31] REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENGAGEMENT. PATCH ENGAGEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32] COURTROOM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33] PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34] REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35] EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
- 36] SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
- 37] REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38] CREATE NEW OPENING IN EXISTING INTERIOR MASSWRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39] REROUTE EXISTING WIRE MANAGEMENT
- 40] RELOCATE EXISTING SCENIC LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41] RELOCATE EXISTING CAMERA
- 42] RELOCATE EXISTING WALL PORTRAITS
- 43] REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44] REMOVE EXISTING FIRE RATED GLAZING.
- 45] RELOCATE EXISTING ELECTRIC CLOCK
- 46] REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47] REMOVE, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ADJUTICAL CEILING TILES. REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION.
- 48] REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.

KEYPLAN



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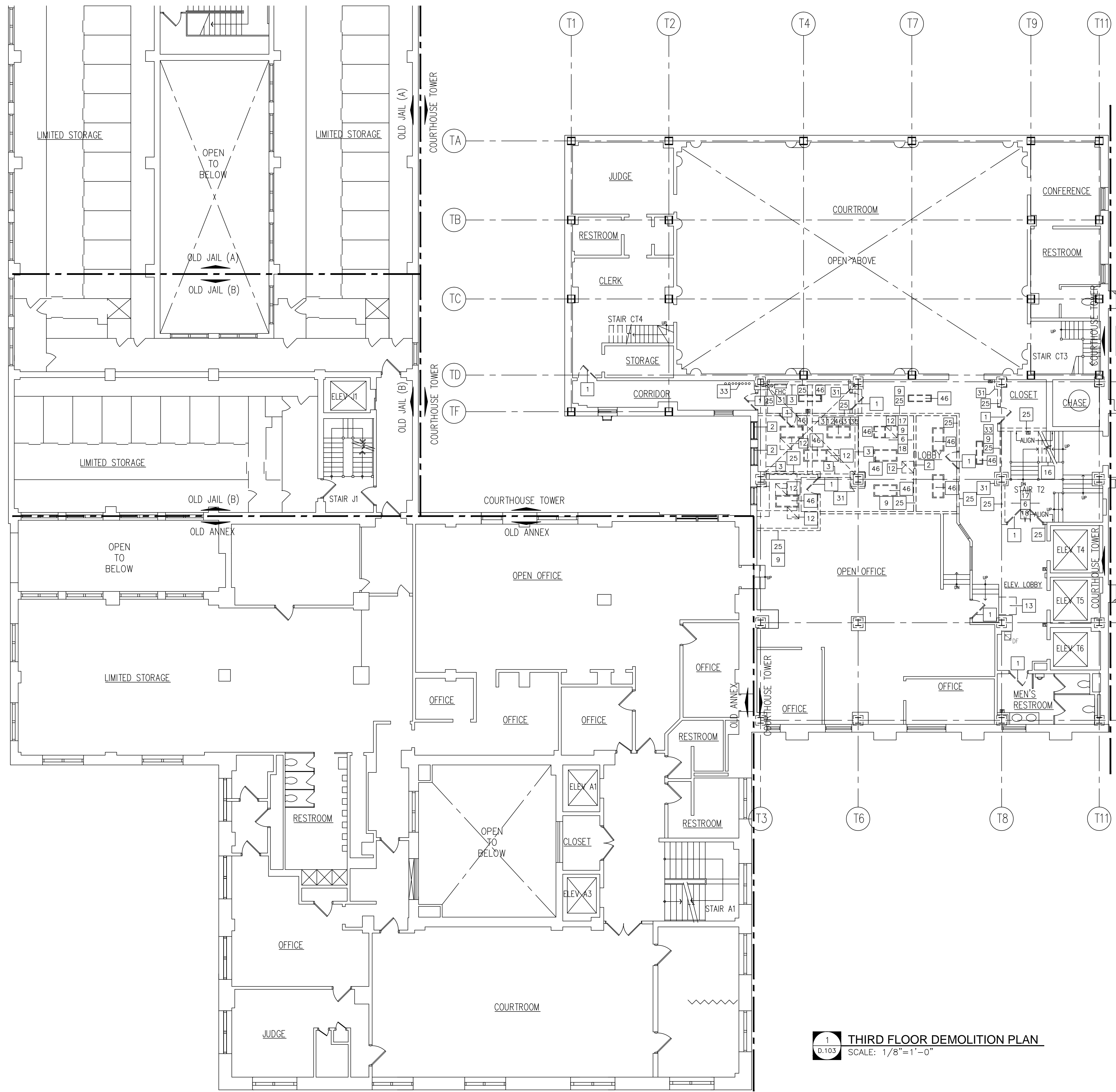
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PROJECT:
**UC COURTHOUSE
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2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SECOND FLOOR DEMOLITION PLAN

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05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 27 OF: 160
									DWG NO

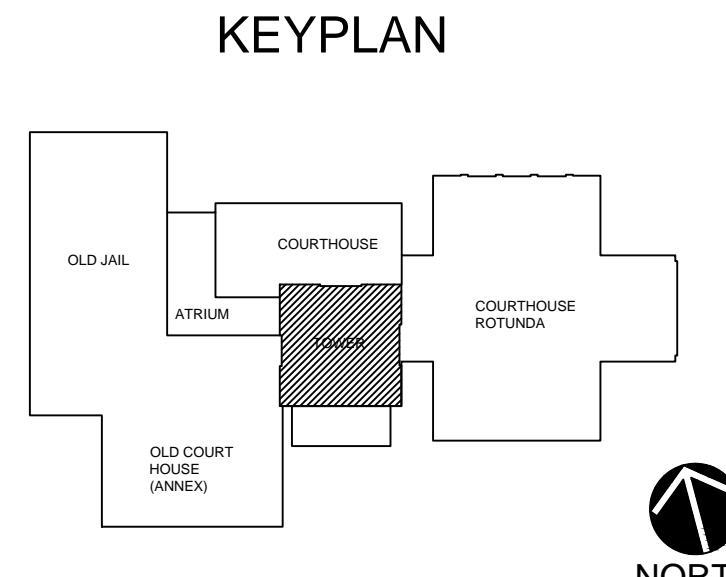
D.102



1 THIRD FLOOR DEMOLITION PLAN
 0.103 SCALE: 1/8" = 1'-0"

DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXISTING WINDOW SYSTEM
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET. REFER TO ELECT. DWGS.
- 10 REMOVED EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS; MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23 EXIST. COLUMN & BEAM TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24 RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS.
- 27 NOT USED
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNBLOCKED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
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- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTRM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
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- 40 RELOCATE EXISTING SCENIC LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41 RELOCATE EXISTING CAMERA
- 42 RELOCATE EXISTING WALL PORTRAITS
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLOCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47 REMOVE, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ADJUSTABLE CEILING TILES. REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION.
- 48 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.



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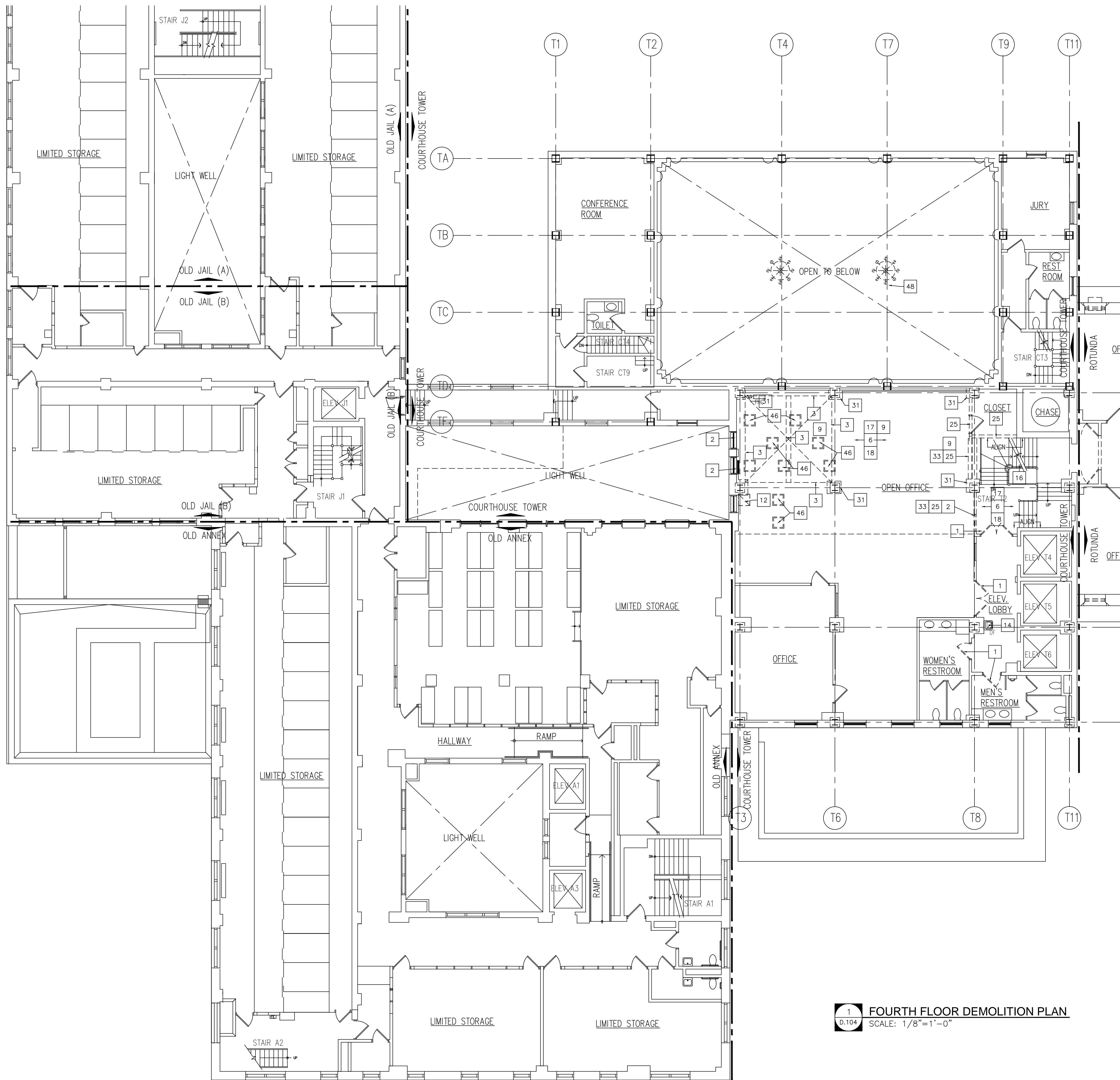
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 TEL: 973.376.0008 FAX: 973.376.1061
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PROJECT: **UC COURTHOUSE
 INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
THIRD FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 28 OF: 160
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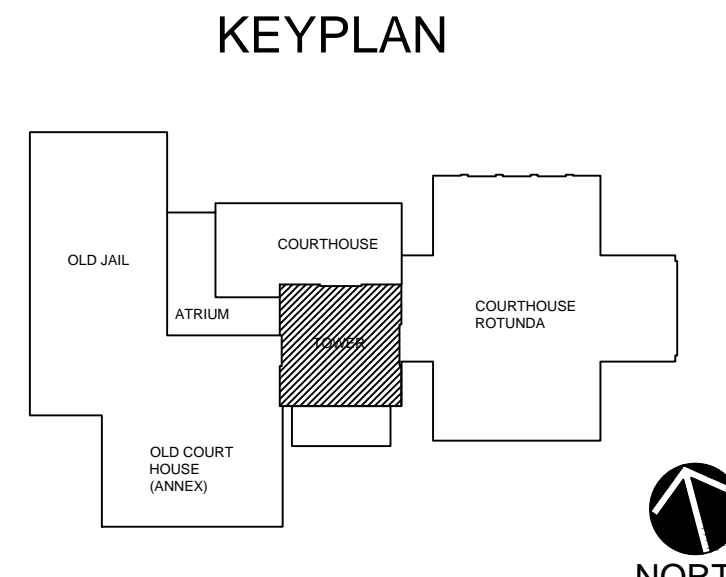
D.103



1 FOURTH FLOOR DEMOLITION PLAN
 0.104 SCALE: 1/8" = 1'-0"

DEMOLITION KEYNOTES

- 1) REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2) REMOVE EXISTING WINDOW SYSTEM.
- 3) PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4) REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5) LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6) REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7) SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8) RELOCATE EXISTING FIRE ALARM
- 9) DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10) REMOVE EXIST. LOW PARTITION DIVIDER.
- 11) REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12) RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13) REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14) REMOVE EXIST. WATER COOLER.
- 15) EXIST. COLUMN TO REMAIN.
- 16) EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17) REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18) DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19) EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20) EXISTING ELECTRICAL PANEL TO REMAIN CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21) EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22) EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23) EXIST. COLUMN & BEAM TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24) RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25) PORTION OF EXISTING WALL, TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26) EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS
- 27) NOT USED
- 28) CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29) EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNBLOCKED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30) PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
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- 39) REDROUTE EXISTING WIRE MANAGEMENT
- 40) RELOCATE EXISTING SCIENCE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41) RELOCATE EXISTING CAMERA
- 42) RELOCATE EXISTING WALL PORTRAITS
- 43) REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44) REMOVE EXISTING FIRE RATED GLAZING.
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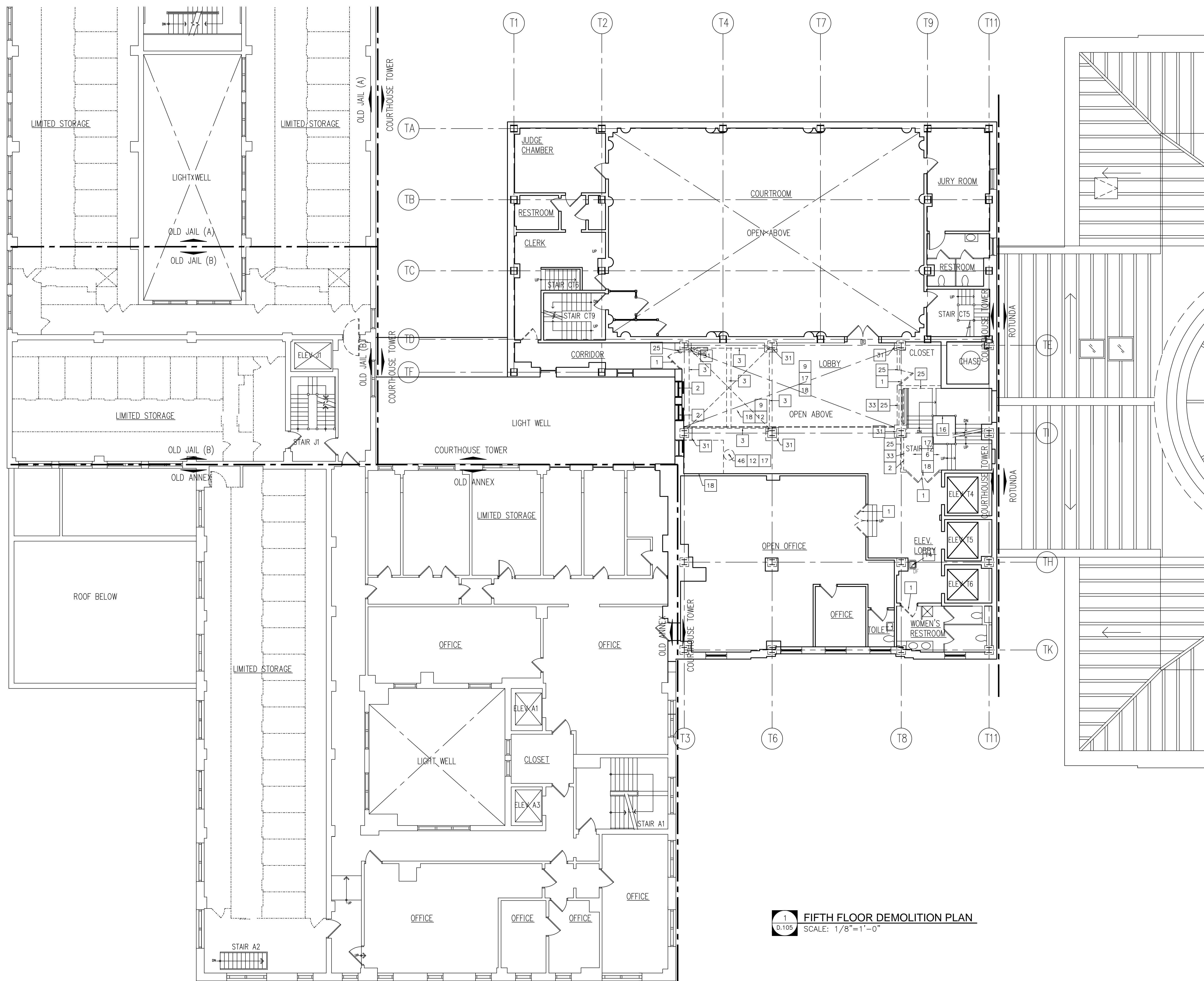
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04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 29 OF 160
									DWG NO

D.104

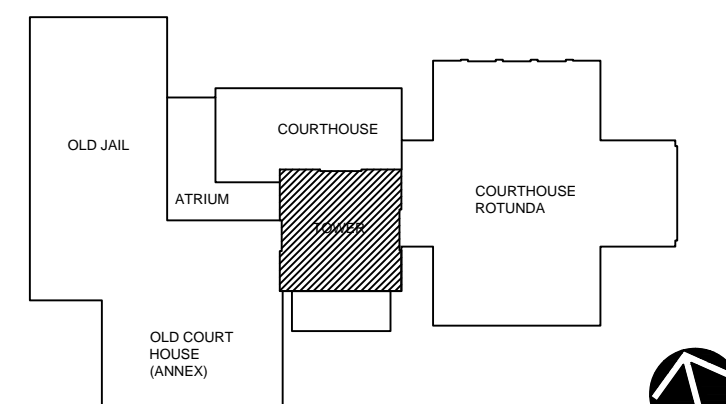


1 FIFTH FLOOR DEMOLITION PLAN
 0.105 SCALE: 1/8" = 1'-0"

DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC)
- 2 REMOVE EXISTING WINDOW SYSTEM.
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR, CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELEC. DWGS.
- 10 REMOVED EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR. SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23 EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24 RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWG'S
- 27 NOT USED
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNCLOGGED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTRM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH. PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCENIC LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41 RELOCATE EXISTING CAMERA
- 42 RELOCATE EXISTING WALL PORTRAITS
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLDCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELEC. DRAWINGS
- 47 REMOVED, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 48 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.

KEYPLAN



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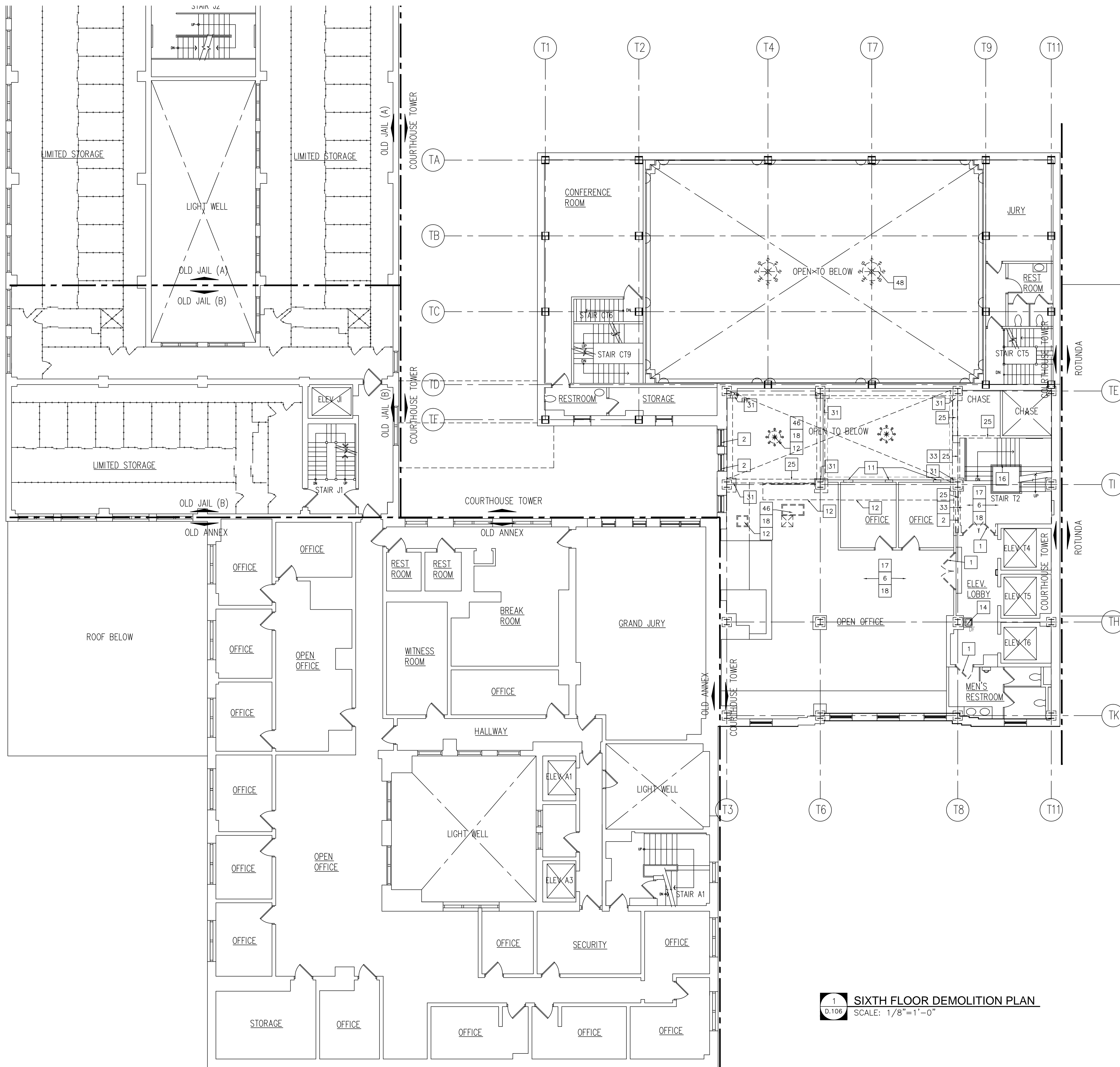


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FIFTH FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 30 OF: 160
									DWG NO

D.105

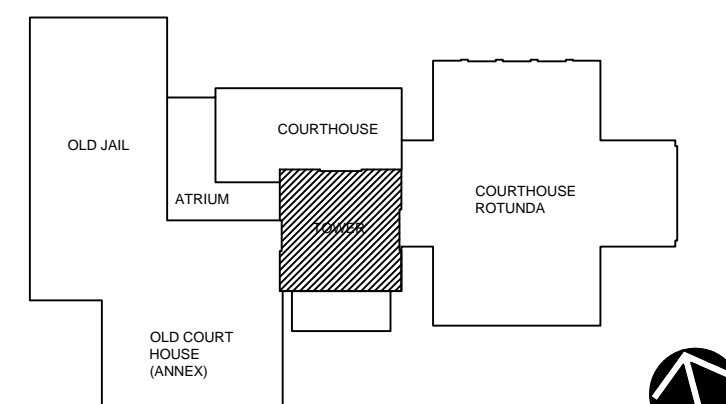


1 SIXTH FLOOR DEMOLITION PLAN
 SCALE: 1/8" = 1'-0"

DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXISTING WINDOW SYSTEM.
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10 REMOVED EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE OR MECH. GRILLES
- 12 RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23 EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24 RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY, CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWG'S
- 27 NOT USED
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNBLOCKED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTROOM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCENIC LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41 RELOCATE EXISTING CAMERA
- 42 RELOCATE EXISTING WALL PORTRAITS
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLOCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47 REMOVED, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACOUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 48 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.

KEYPLAN



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NICHOLAS J. NETTA, AIA, NCARB
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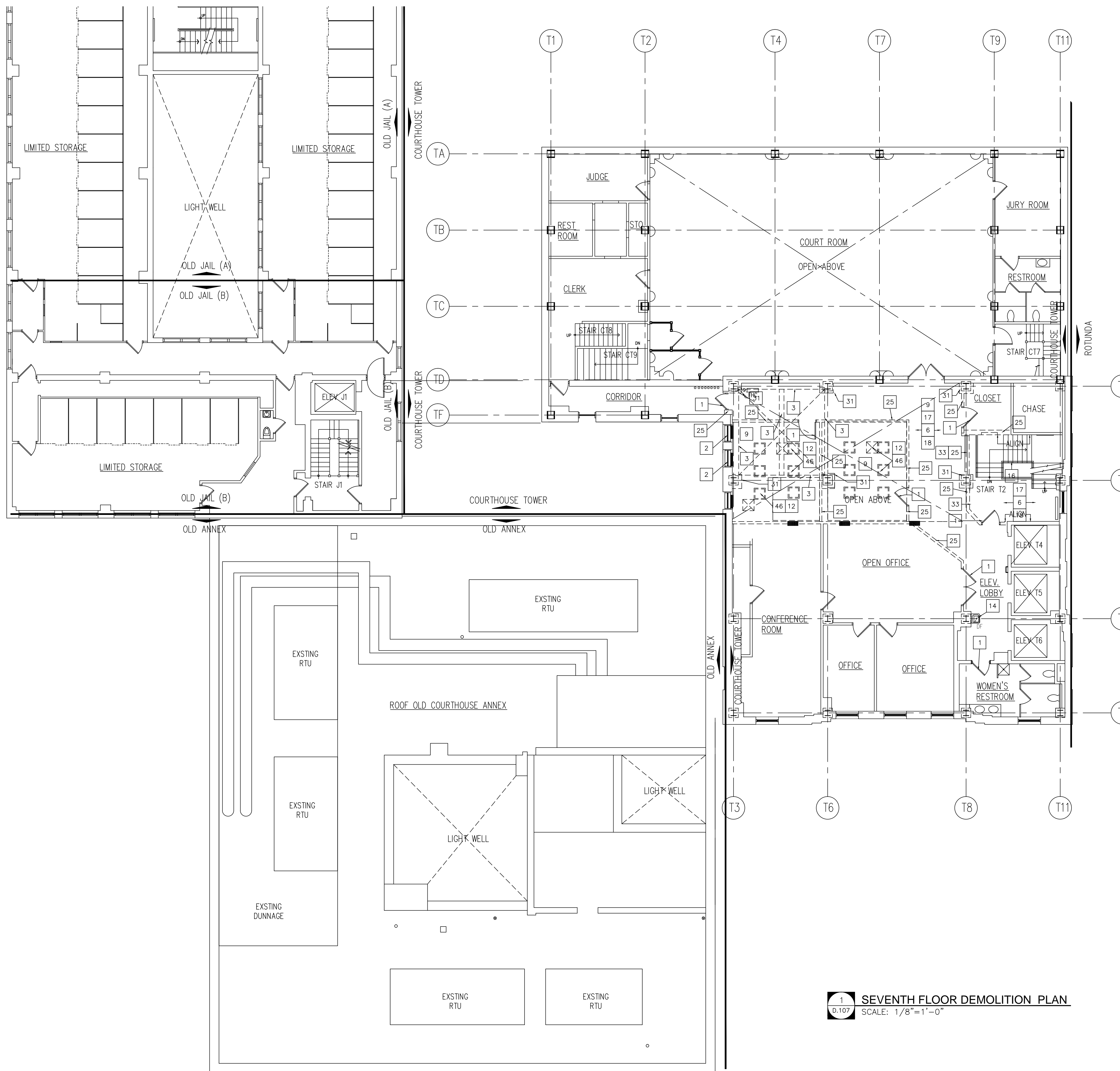
NETTA ARCHITECTS
 ARCHITECTURE - PLANNING - INTERIOR DESIGN
 1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
 TEL: 973-376-0088 FAX: 973-376-1061
 CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SIXTH FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 31 OF: 160
									DWG NO

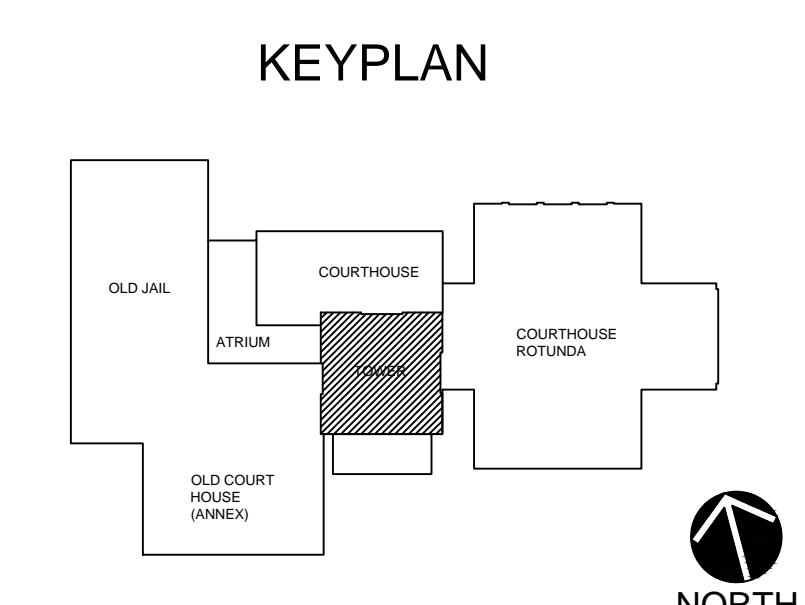
D.106



DEMOLITION KEYNOTES

- 1] REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2] REMOVE EXISTING WINDOW SYSTEM.
- 3] PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4] REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5] LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6] REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7] SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8] RELOCATE EXISTING FIRE ALARM
- 9] DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10] REMOVED EXIST. LOW PARTITION DIVIDER.
- 11] REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12] RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13] REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14] REMOVED EXIST. WATER COOLER.
- 15] EXIST. COLUMN TO REMAIN.
- 16] EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17] REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE. REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION.
- 18] DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19] EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20] EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21] EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22] EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23] EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24] RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25] PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26] EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS
- 27] NOT USED
- 28] CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29] EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNOCLOGGED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30] PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31] REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32] COURTRM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33] PROTECT EXIST. MECH. PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34] REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35] EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
- 36] SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
- 37] REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38] CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL. BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39] REROUTE EXISTING WIRE MANAGEMENT
- 40] RELOCATE EXISTING SCIENCE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41] RELOCATE EXISTING CAMERA
- 42] RELOCATE EXISTING WALL PORTRAITS
- 43] REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44] REMOVE EXISTING FIRE RATED GLAZING.
- 45] RELOCATE EXISTING ELECTRIC CLOCK
- 46] REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47] REMOVE, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 48] REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.

1 SEVENTH FLOOR DEMOLITION PLAN
SCALE: 1/8"=1'-0"



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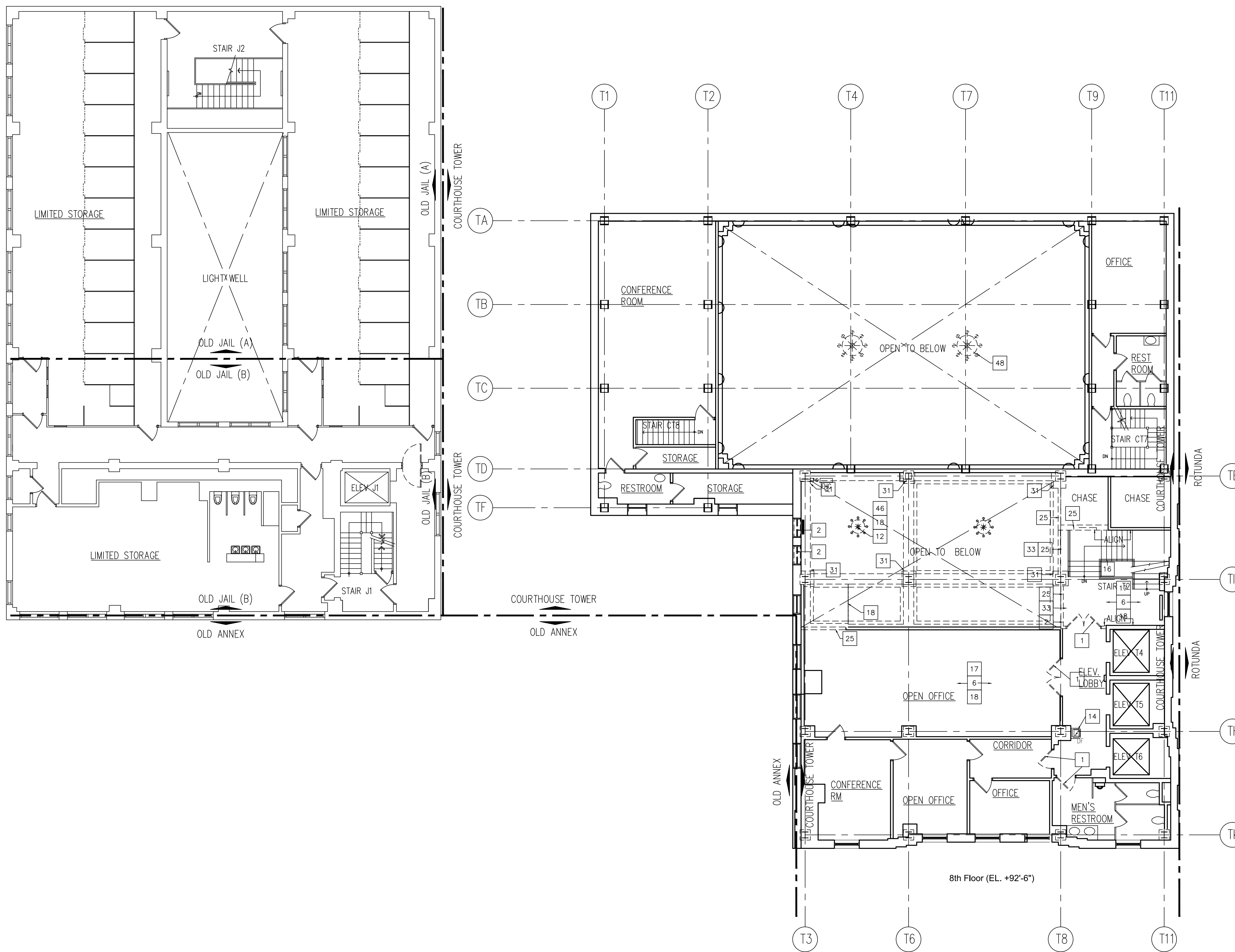


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SEVENTH FLOOR DEMOLITION PLAN

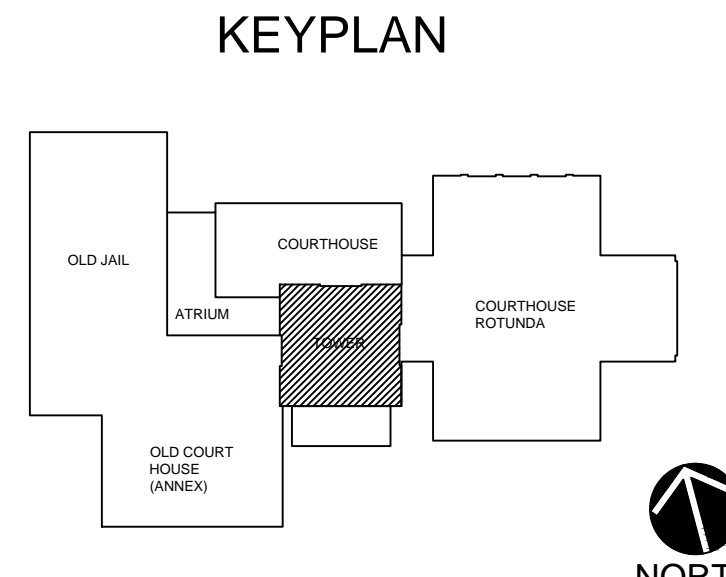
SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 32 OF: 160
									DWG NO

D.107



DEMOLITION KEYNOTES

- 1] REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2] REMOVE EXISTING WINDOW SYSTEM.
- 3] PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4] REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5] LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6] REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7] SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8] RELOCATE EXISTING FIRE ALARM
- 9] DEACTIVATE, DISCONNECT AND REMOVED AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10] REMOVED EXIST. LOW PARTITION DIVIDER.
- 11] REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR. SEE DOOR SCHEDULE.
- 12] RELOCATE EXIST. DIFFUSERS. MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13] REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14] REMOVED EXIST. WATER COOLER.
- 15] EXIST. COLUMN TO REMAIN.
- 16] EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17] REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18] DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19] EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20] EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21] EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22] EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23] EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24] RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25] PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26] EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS.
- 27] NOT USED
- 28] CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29] EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNLOGGED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30] PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31] REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32] COURTRM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33] PROTECT EXIST. MECH. PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34] REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35] EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
- 36] SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS. SEE MECH'L DWGS.
- 37] REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38] CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39] REROUTE EXISTING WIRE MANAGEMENT
- 40] RELOCATE EXISTING SCIENCE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41] RELOCATE EXISTING CAMERA
- 42] RELOCATE EXISTING WALL PORTRAITS
- 43] REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44] REMOVE EXISTING FIRE RATED GLAZING.
- 45] RELOCATE EXISTING ELECTRIC CLOCK
- 46] REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47] REMOVED, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACOUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 48] REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.



1 EIGHTH FLOOR DEMOLITION PLAN
 SCALE: 1/8" = 1'-0"

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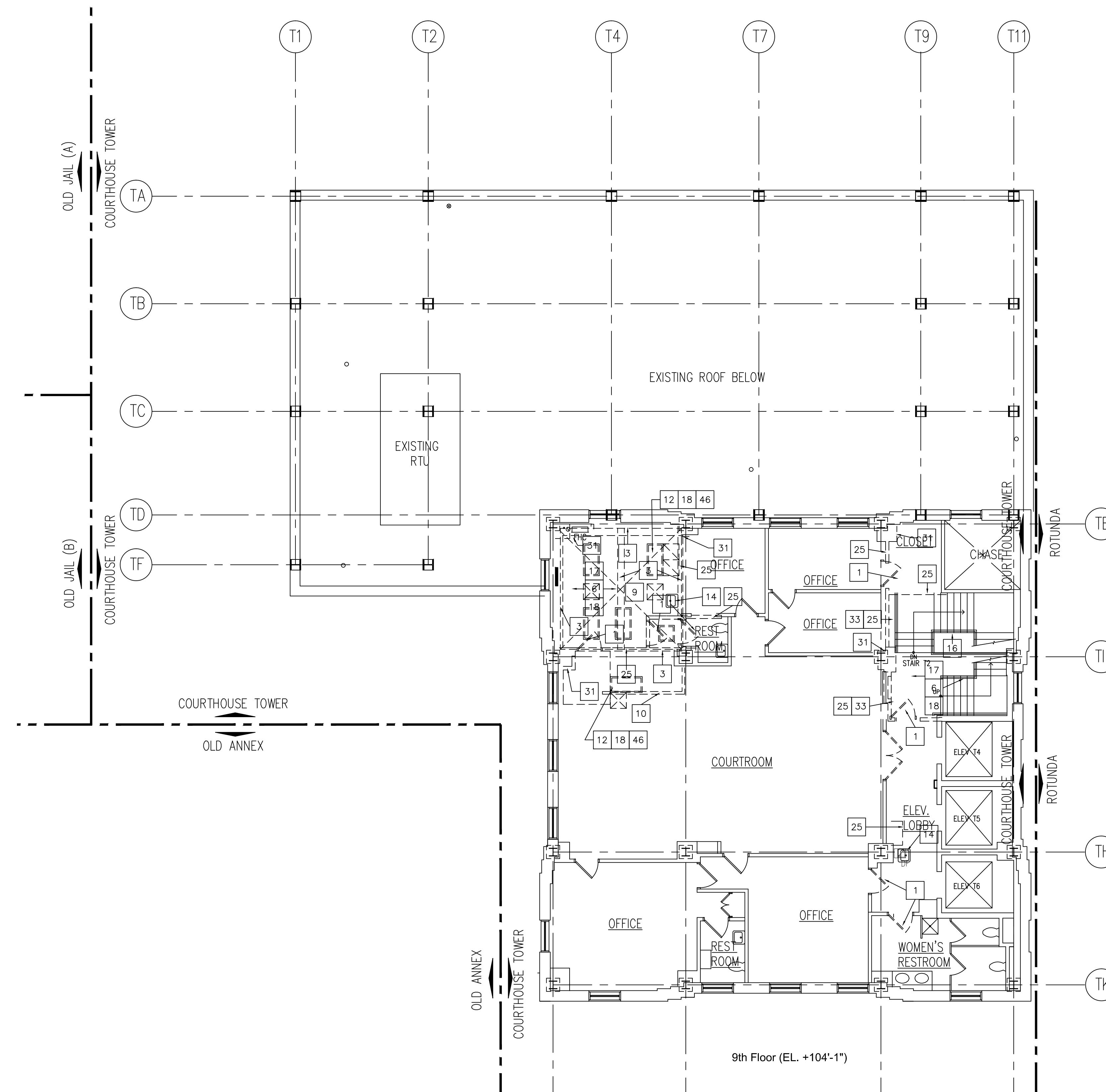


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
EIGHTH FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
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04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
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05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 33 OF: 160
									DWG NO

D.108

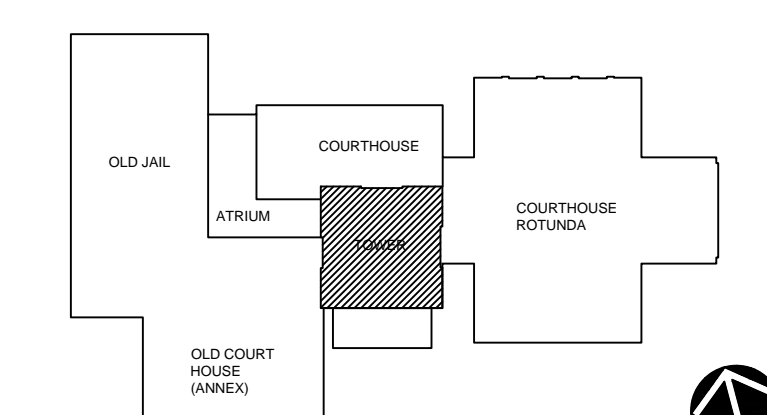


1 NINTH FLOOR DEMOLITION PLAN
SCALE: 1/8" = 1'-0"

DEMOLITION KEYNOTES

- 1] REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2] REMOVE EXISTING WINDOW SYSTEM.
- 3] PROVIDE FLOOR OPENING FOR NEW STAIR; CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4] REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5] LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6] REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7] SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8] RELOCATE EXISTING FIRE ALARM
- 9] DEACTIVATE, DISCONNECT AND REMOVED AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10] REMOVED EXIST. LOW PARTITION DIVIDER.
- 11] REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR. SEE DOOR SCHEDULE.
- 12] RELOCATE EXIST. DIFFUSERS. MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13] REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14] REMOVED EXIST. WATER COOLER.
- 15] EXIST. COLUMN TO REMAIN.
- 16] EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17] REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18] DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19] EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20] EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21] EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22] EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23] EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24] RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25] PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26] EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS.
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- 37] REMOVE EXISTING WINDOW A/C UNITS. SEE MECHL DWGS.
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- 48] REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.

KEYPLAN



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PROJECT:

UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

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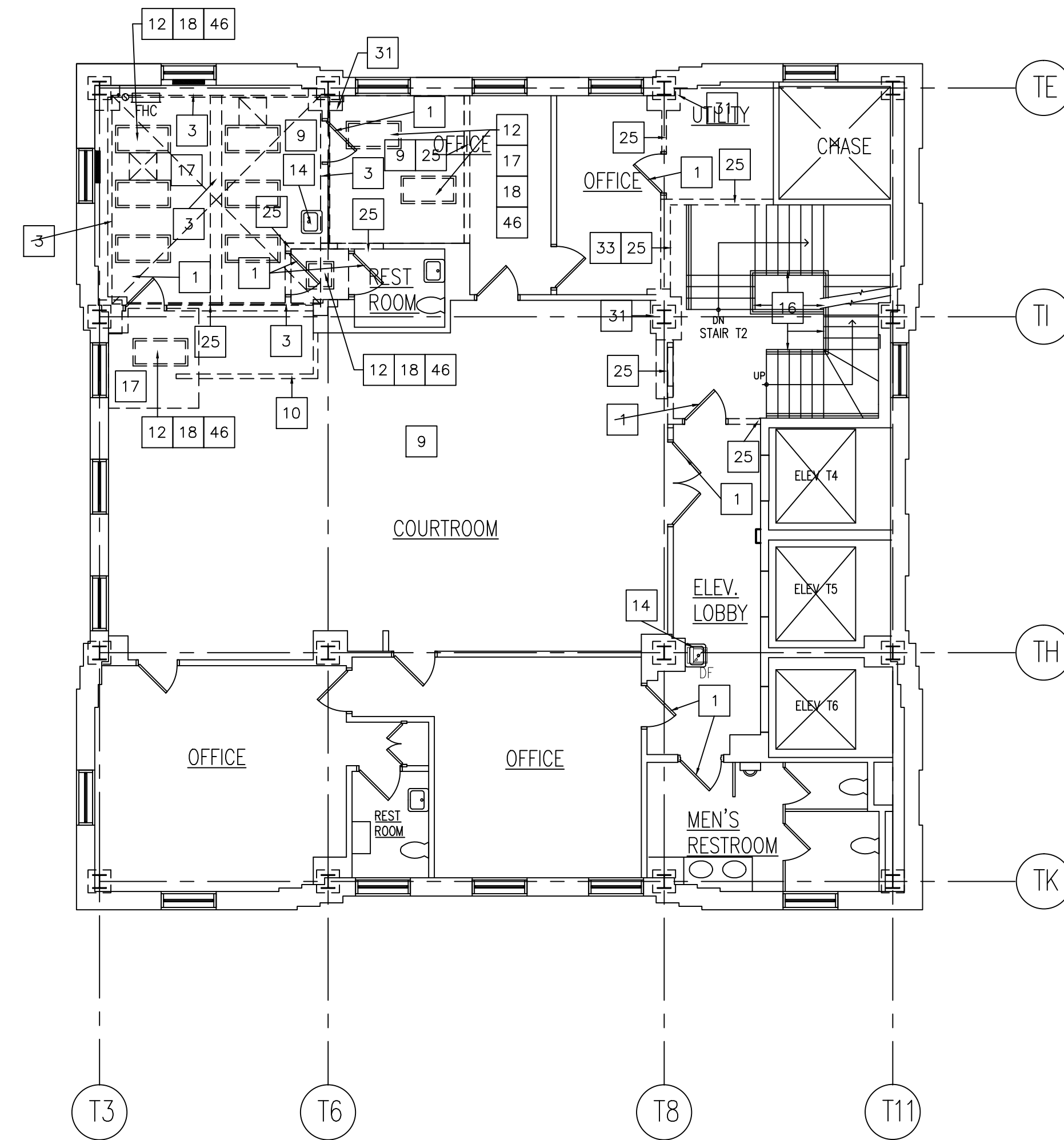
NINTH FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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								DWG NO	

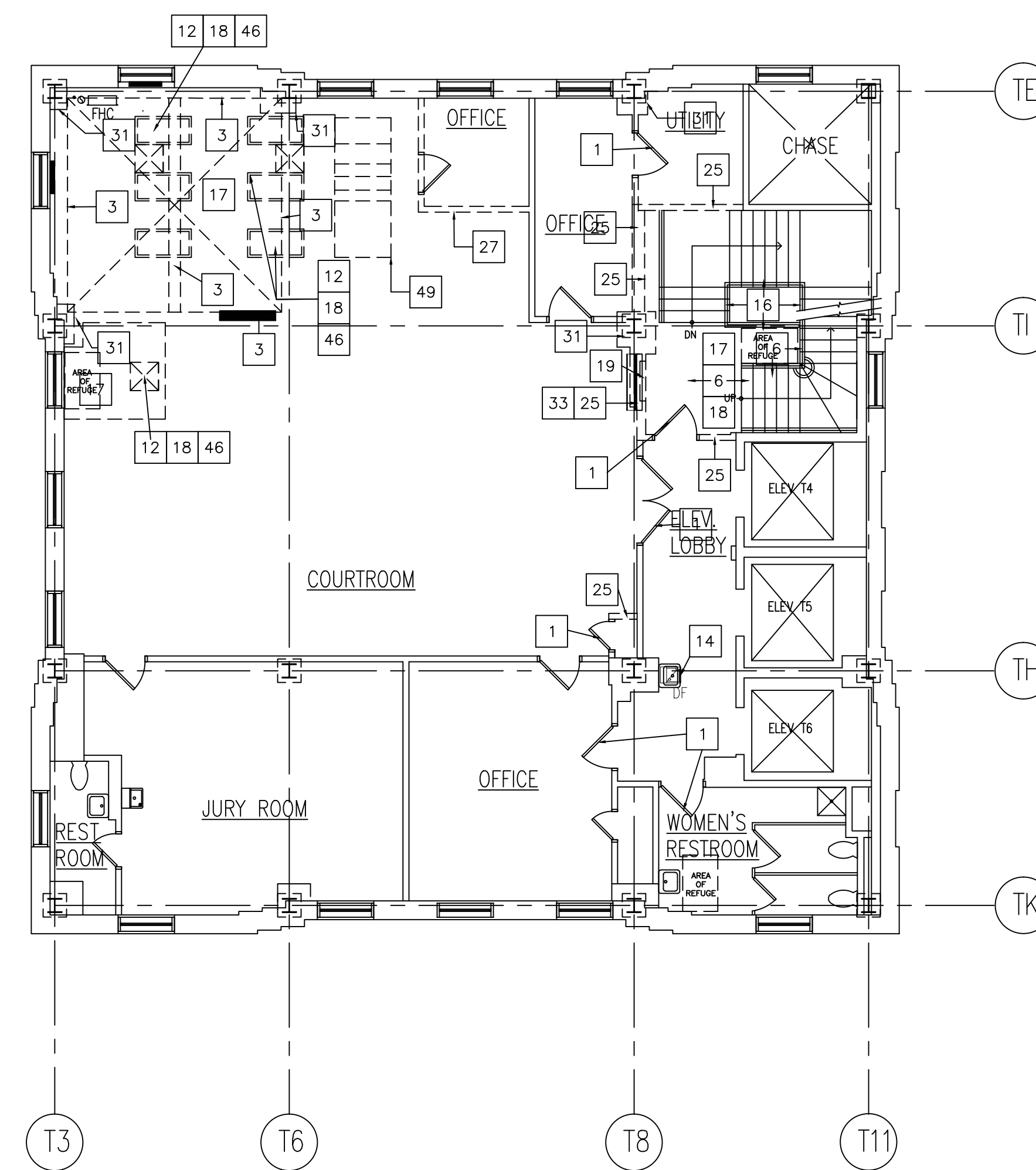
D.109

DEMOLITION KEYNOTES

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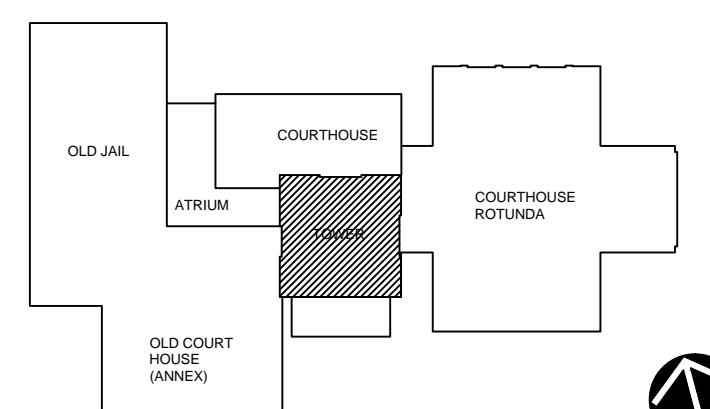


1 TENTH FLOOR DEMOLITION PLAN
 Q.110 SCALE: 1/8"=1'-0"



2 ELEVENTH FLOOR DEMOLITION PLAN
 Q.110 SCALE: 1/8"=1'-0"

KEYPLAN



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PROJECT:

**UC COURTHOUSE
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 2 Broad Street, Elizabeth New Jersey

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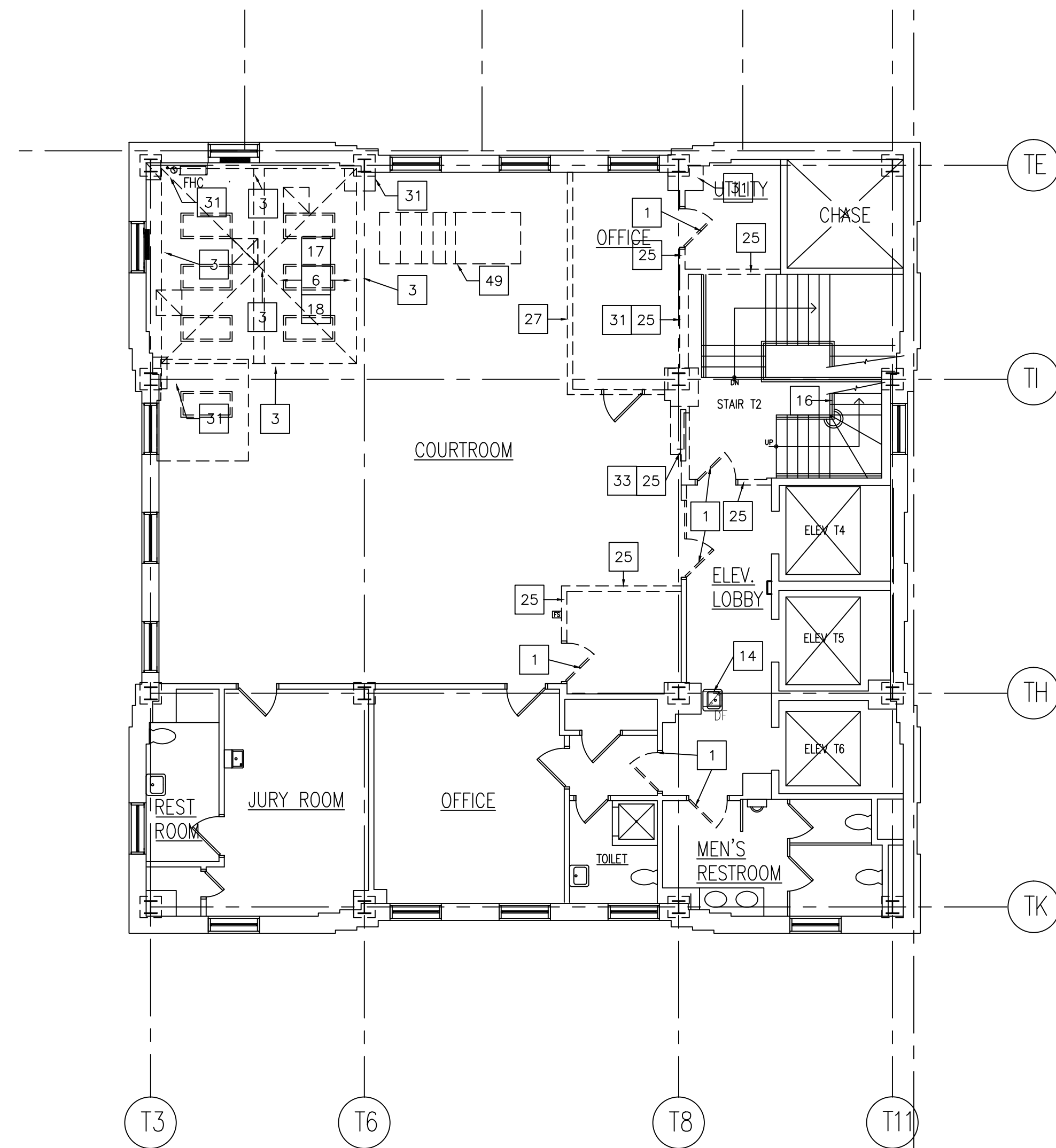
TENTH & ELEVENTH FLOOR DEMOLITION PLAN

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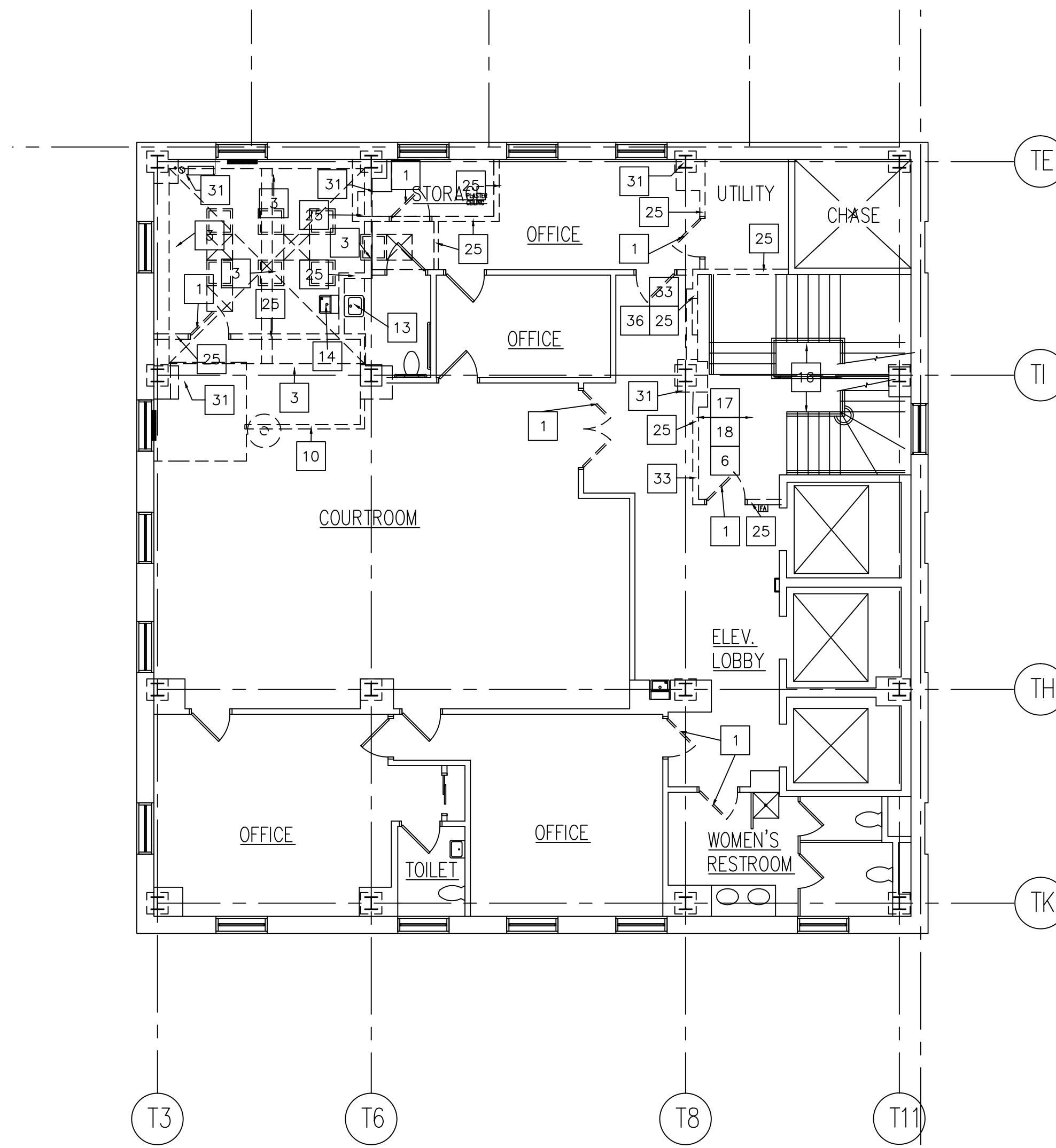
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- 45 RELOCATE EXISTING ELECTRIC CLOCK
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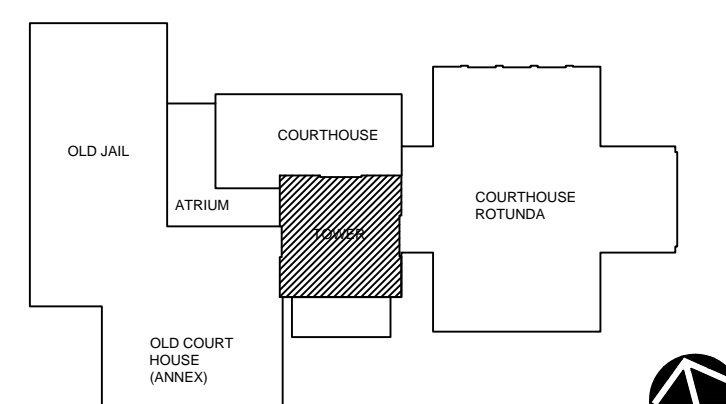


1 TWELFTH FLOOR DEMOLITION PLAN
SCALE: 1/4"=1'-0"



2 THIRTEENTH FLOOR DEMOLITION PLAN
SCALE: 1/4"=1'-0"

KEYPLAN



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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
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PROJECT:

UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

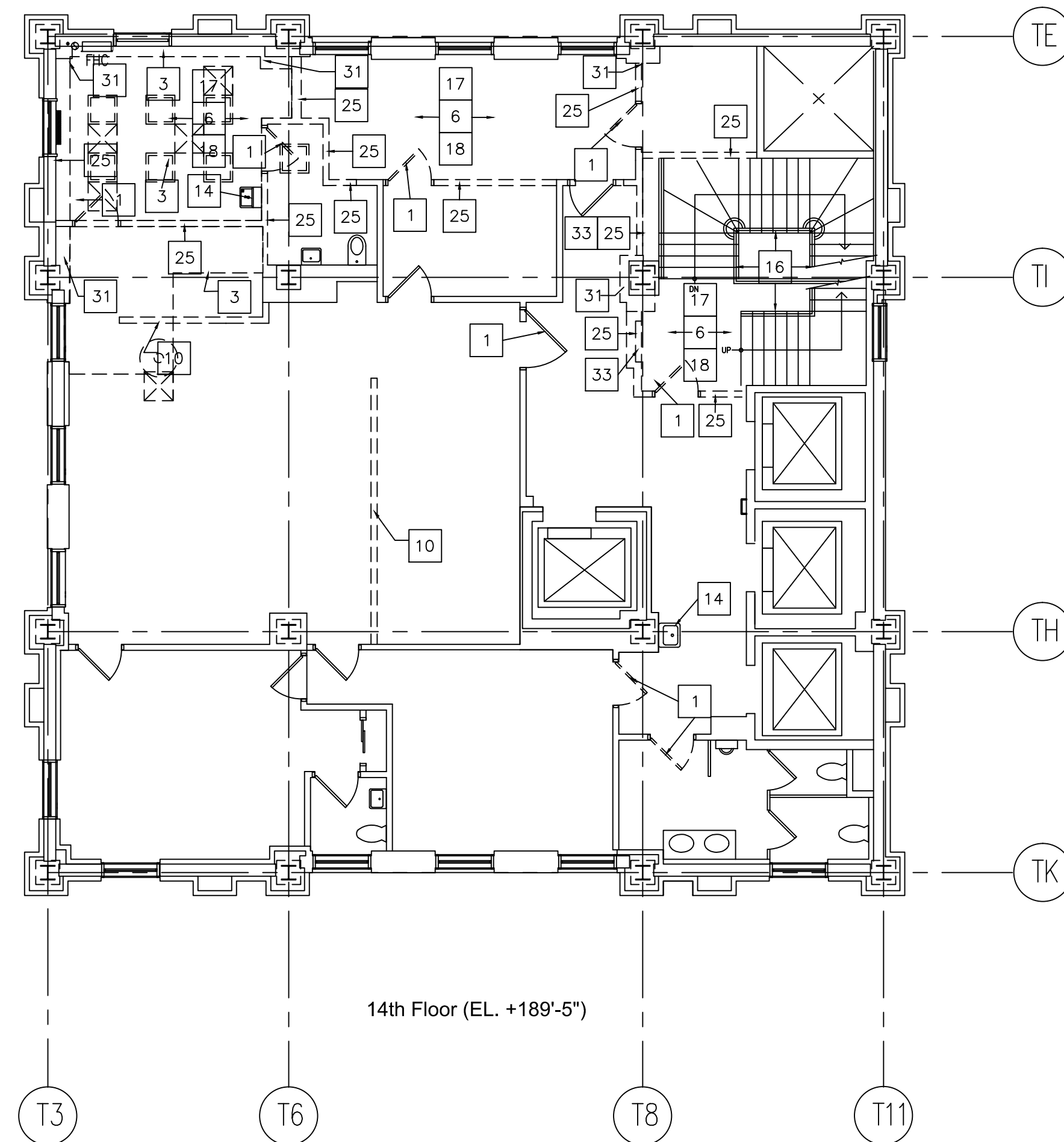
TWELFTH & THIRTEENTH FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	BT
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	NJN
05.31.17	100% SUBMISSION	MC	FM					JOB NO	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	36 OF: 160
								DWG NO	

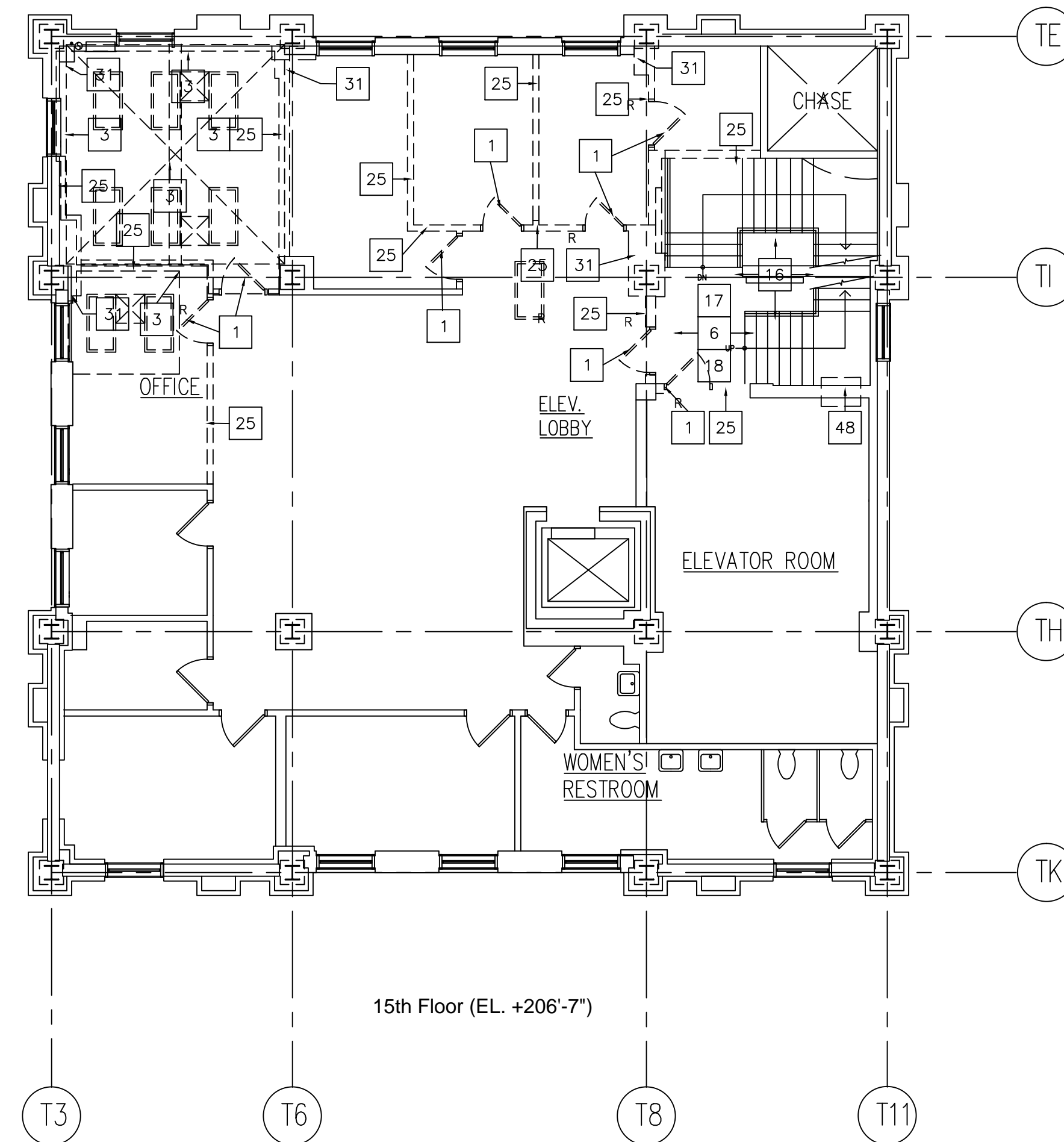
D.111

DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXISTING WINDOW SYSTEM.
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR, CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE UP EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECT. DWGS.
- 10 REMOVED EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS, MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVED EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
- 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCT.
- 23 EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR STRUCTURE ABOVE.
- 24 RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWG'S
- 27 NOT USED
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FLR. TO BE CLEAN, REPAIR AND UNBLOCKED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURED, AND REINSTALLED TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTROOM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MECH. PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL/PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 38 CREATE NEW OPENING IN EXISTING INTERIOR MASONRY WALL FOR NEW CASEWORK. CLEANLY SAWCUT WALL & PATCH, REPAIR AND MATCH EXISTING WALL BRACE, SHORE, SUPPORT & INSTALL NEW LINTELS.
- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCONCE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41 RELOCATE EXISTING CAMERA
- 42 RELOCATE EXISTING WALL PORTRAITS
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLOCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECT. DRAWINGS
- 47 REMOVED, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACOUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION).

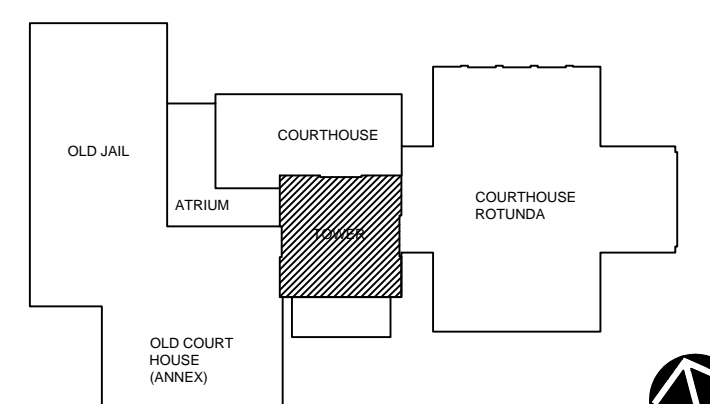


1 FOURTEENTH FLOOR DEMOLITION PLAN
SCALE: 1/8"=1'-0"



2 FIFTEENTH FLOOR DEMOLITION PLAN
SCALE: 1/8"=1'-0"

KEYPLAN



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PROJECT:

UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

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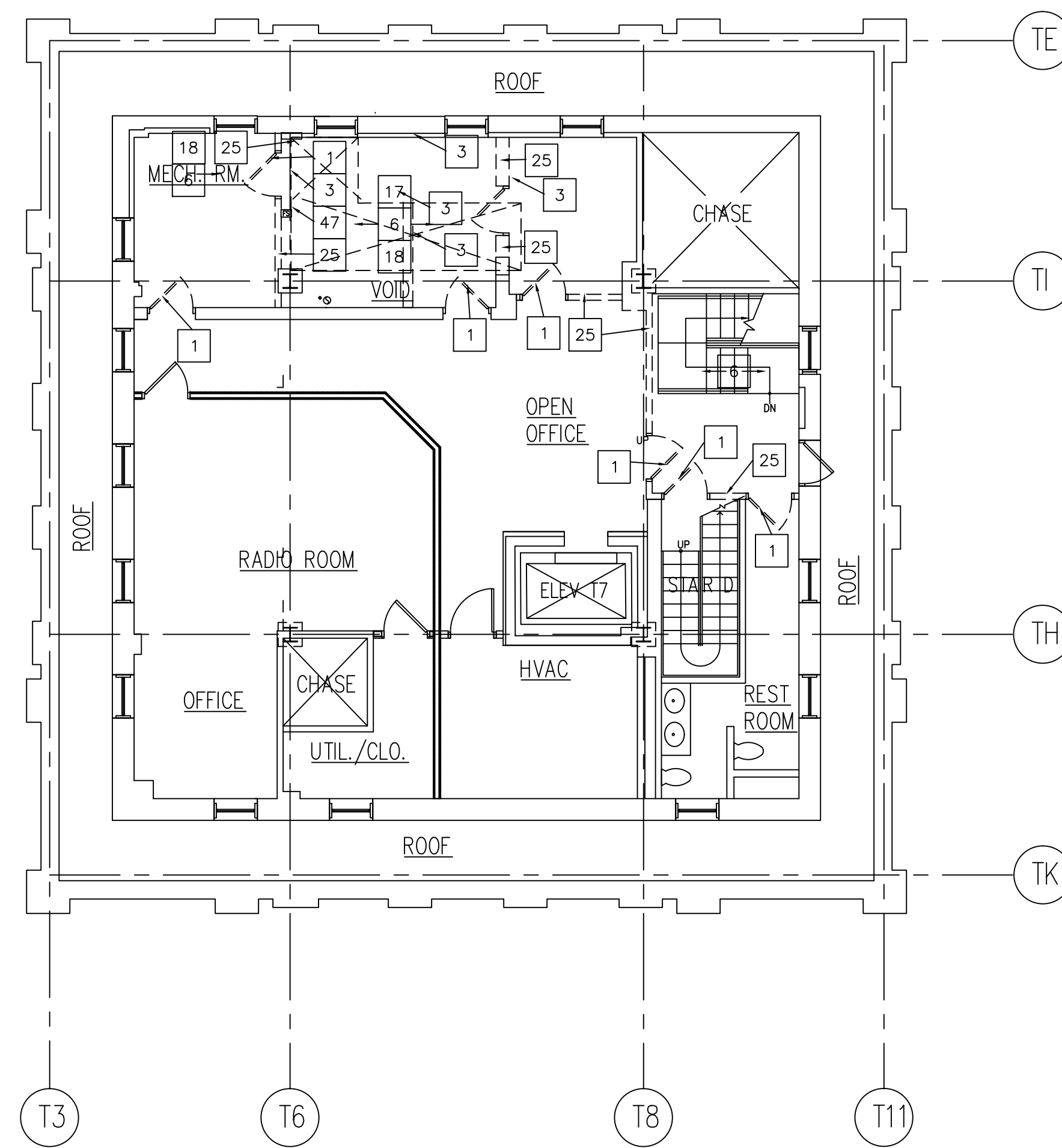
FOURTEENTH & FIFTEENTH FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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08.30.17	ISSUED FOR BID	MC	FM						SHEET: 37 OF 160
									DWG NO

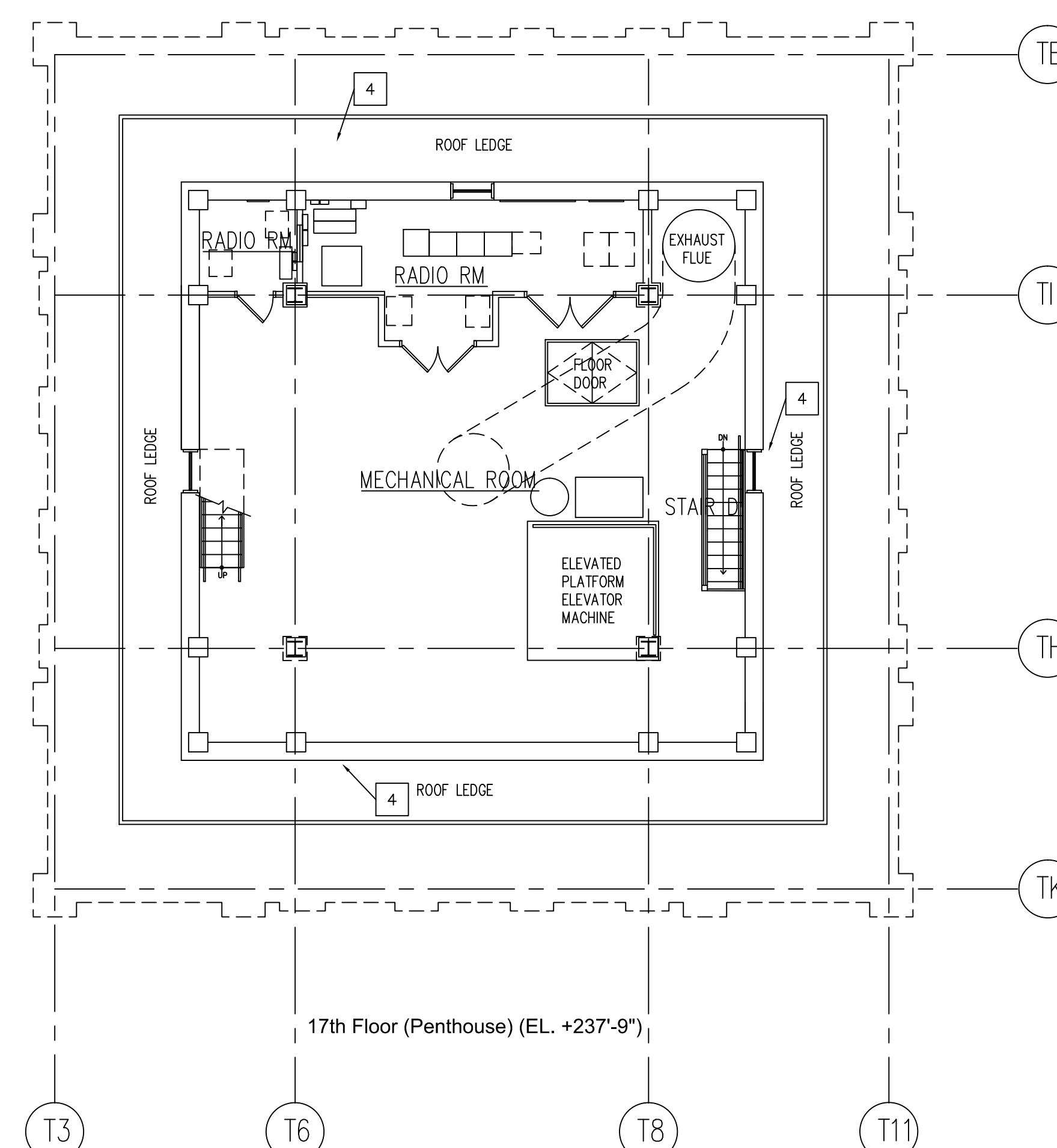
D.112

DEMOLITION KEYNOTES

- 1 REMOVE EXISTING DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXISTING WINDOW SYSTEM.
- 3 PROVIDE FLOOR OPENING FOR NEW STAIR. CLEANLY SAW-CUT EXISTING CONCRETE FLOOR SLAB AND CONCRETE ENCASED BEAM. PROVIDE ADDITIONAL SUPPORT TO EXISTING AFFECTED STRUCTURE AS REQUIRED BEFORE DEMOLITION. REFER TO STRUCTURAL DRAWINGS.
- 4 REPAIR, WATERPROOF AND RE-ROOF AFFECTED PORTION OF THE ROOF LEDGE AT 17TH FLOOR WORK AREA.
- 5 LINE OF EXISTING STAIR ENCLOSURES ABOVE.
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 7 SCRABE, PATCH, REPAIR AND SEAL LEAKS ON WATER DAMAGE WALL SURFACES.
- 8 RELOCATE EXISTING FIRE ALARM
- 9 DEACTIVATE, DISCONNECT AND REMOVE AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELEC. DWGS.
- 10 REMOVE EXIST. LOW PARTITION DIVIDER.
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
- 12 RELOCATE EXIST. DIFFUSERS. MODIFY AND RECONFIGURE DUCTS, PIPING AND ELECTRICAL WIRING TO NEW LOCATION.
- 13 REMOVE, DEACTIVATE AND DISCONNECT EXISTING TELEPHONE BOOTH.
- 14 REMOVE EXIST. WATER COOLER.
- 15 EXIST. COLUMN TO REMAIN.
- 16 EXIST STAIR TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
- 17 REMOVE, RECONFIGURE AND REINSTALL EXIST. LIGHTING FIXTURE. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
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- 20 EXISTING ELECTRICAL PANEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
- 21 EXISTING HANDRAIL / GUARDRAIL TO BE REMOVED.
- 22 EXIST. STEEL TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING EXISTING STEEL STRUCTURE.
- 23 EXIST. COLUMN TO BE DEMOLISHED. CONTRACTOR TO PROVIDE TEMPORARY BRACING FOR THE STRUCTURE ABOVE.
- 24 RELOCATE EXIST. MICROWAVE DISH PANEL.
- 25 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) TO RECEIVE NEW WALL ASSEMBLY. CLEAN, PATCH AND REPAIR OPENING. PAINT TO MATCH EXISTING ADJACENT WALL.
- 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MP DWGS
- 27 NOT USED
- 28 CONTRACTOR TO PROVIDE TEMPORARY STRUCTURE TO WALKWAY PRIOR TO CONSTRUCTION OF NEW STAIR.
- 29 EXISTING ROOF AT 16TH FL. TO BE CLEAN, REPAIR AND UNBLOCKED ROOF DRAIN, BEFORE INSTALLING NEW ROOFING SYSTEM
- 30 PORTION OF WALKWAY TO BE REMOVED, RECONFIGURE, AND REINSTALL TO ORIGINAL FORM PRIOR TO CONST. OF NEW STAIR. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT AT WALKWAY STRUCTURE.
- 31 REMOVE COLUMN/BEAM ENCLOSURE DOWN TO ENCASEMENT. PATCH ENCASEMENT IF REQUIRED PRIOR TO INSTALLING NEW ENCLOSURE.
- 32 COURTRM DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
- 33 PROTECT EXIST. MACH. PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
- 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
- 35 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWGS. INFILL, PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
- 36 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS. SEE MECH'L DWGS.
- 37 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
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- 39 REROUTE EXISTING WIRE MANAGEMENT
- 40 RELOCATE EXISTING SCENE LIGHTING FIXTURE AFFECTED BY CONSTRUCTION.
- 41 RELOCATE EXISTING CAMERA
- 42 RELOCATE EXISTING WALL PORTRAITS
- 43 REMOVE & RE-INSTALL MARBLE PANEL, TRIM & BASE AFFECTED BY CONSTRUCTION.
- 44 REMOVE EXISTING FIRE RATED GLAZING.
- 45 RELOCATE EXISTING ELECTRIC CLOCK
- 46 REMOVE EXISTING CEILING FIXTURE AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELEC. DRAWINGS
- 47 REMOVED, RECONFIGURE AND REINSTALL EXISTING CEILING GRID & ACUSTICAL CEILING TILES. (REINSTALLATION WILL COMMENCE AFTER THE STAIR TOWER COMPLETION)
- 48 REMOVE & RE-INSTALL EXISTING CEILING FIXTURE AFFECTED BY CONSTRUCTION.

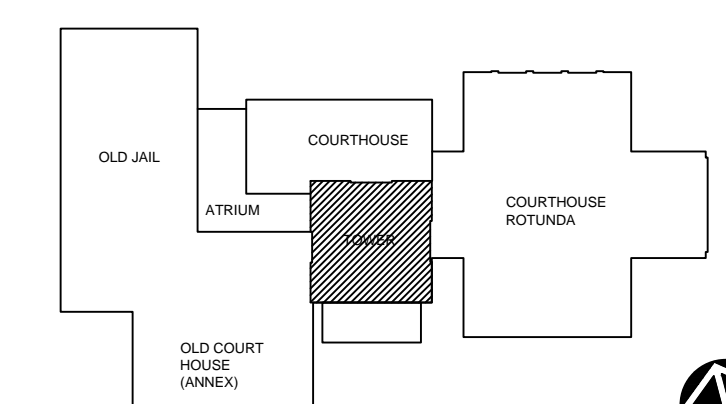


1 SIXTEENTH FLOOR DEMOLITION PLAN
SCALE: 1/8"=1'-0"



2 PENTHOUSE FLOOR DEMOLITION PLAN
SCALE: 1/8"=1'-0"

KEYPLAN



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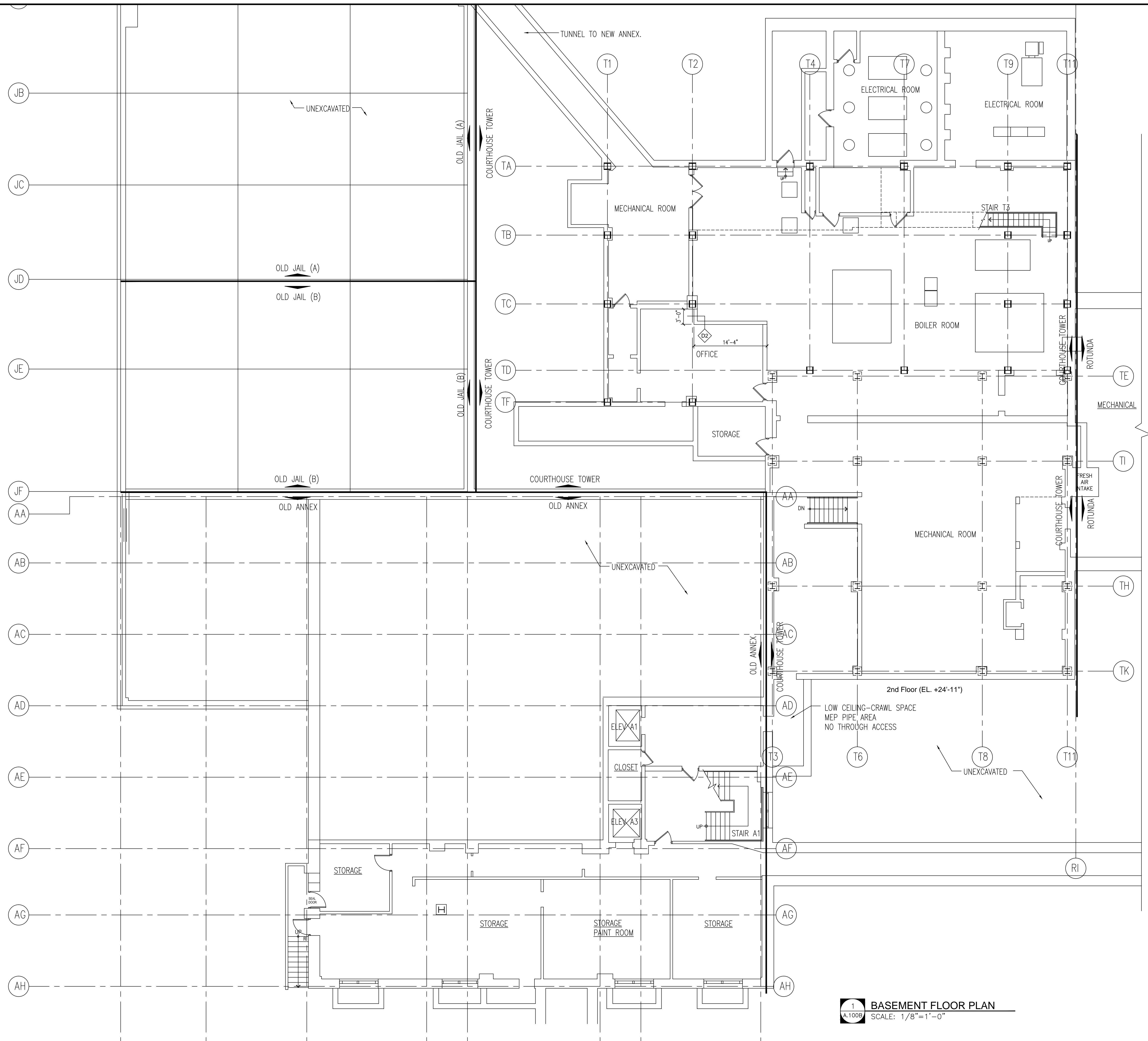


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SIXTEENTH & PENTHOUSE FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	BT
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	NJN
05.31.17	100% SUBMISSION	MC	FM					JOB NO	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	38 OF: 160
								DWG NO	

D.113



CONSTRUCTION KEYNOTES

1. NEW 2HR RATED WALL
2. REPLACE EXISTING DOOR & REVERSE SWING.
3. INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
7. EXIST. ROOFING SYSTEM TO REMAIN.
8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
9. NEW MECH'L. DUCTS OPENING
10. COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
11. REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
12. PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.'P
13. NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
14. DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC. TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND

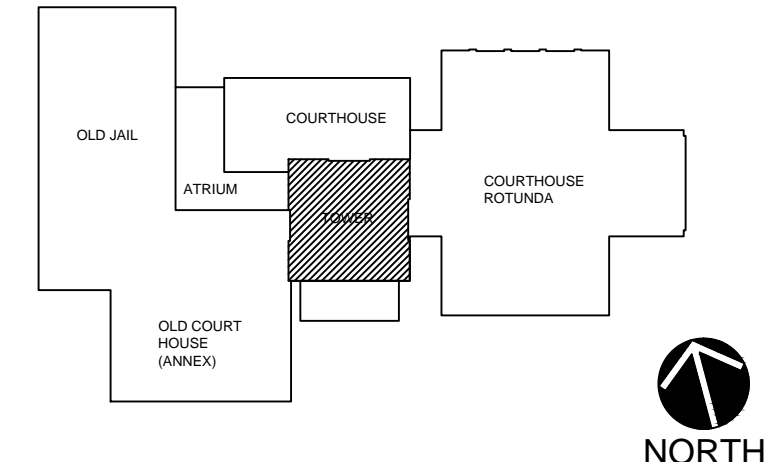
ROOM ID SIGN	
A	RM. #
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W-E	WINDOW TAG, REFER TO DWG. A301 FOR WINDOW SCHEDULE.
#	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
📹	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

1 BASEMENT FLOOR PLAN
SCALE: 1/8"=1'-0"

KEYPLAN



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NJ License No. AI 14394

NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1004 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

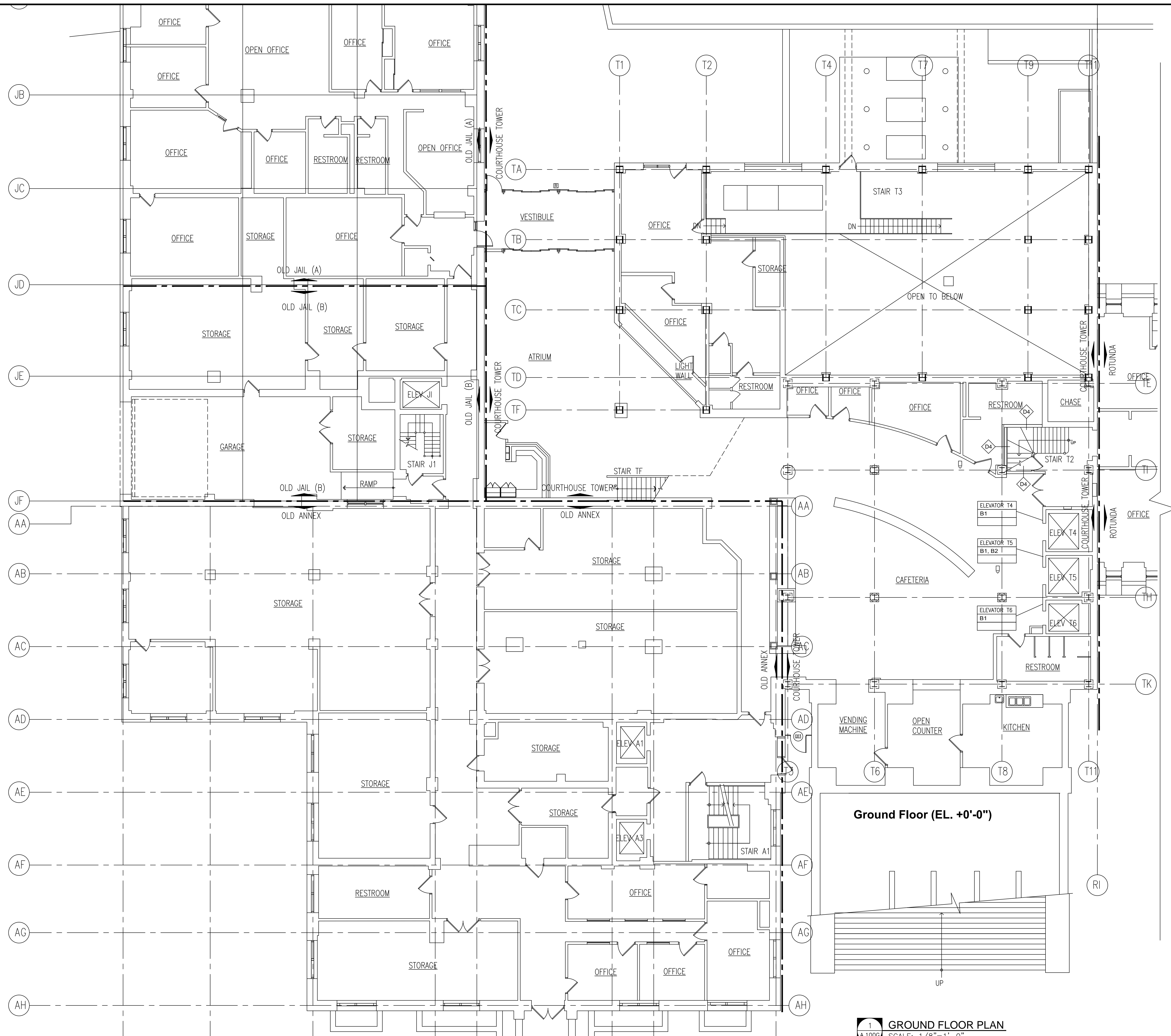
PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
BASEMENT FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% SUBMISSION	KD	FM						
05.31.17	100% SUBMISSION	MC	FM						
08.30.17	ISSUED FOR BID	MC	FM						

DRAWN BY BT
CHKD BY N/JN
JOB NO 2141151
SHEET: 39 OF: 160
DWG NO

A.100B



CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL. CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
- 9 NEW MECH'L. DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.'P
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
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LEGEND

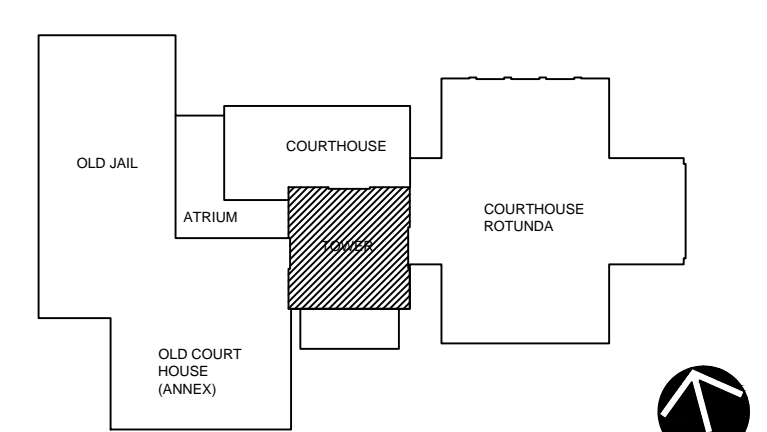
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A	ROOM ID SIGN
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C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
📹	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

NOTE:
SEE SHEET A-701 FOR FINISH SCHEDULES

KEYPLAN



1 GROUND FLOOR PLAN
SCALE: 1/8"=1'-0"

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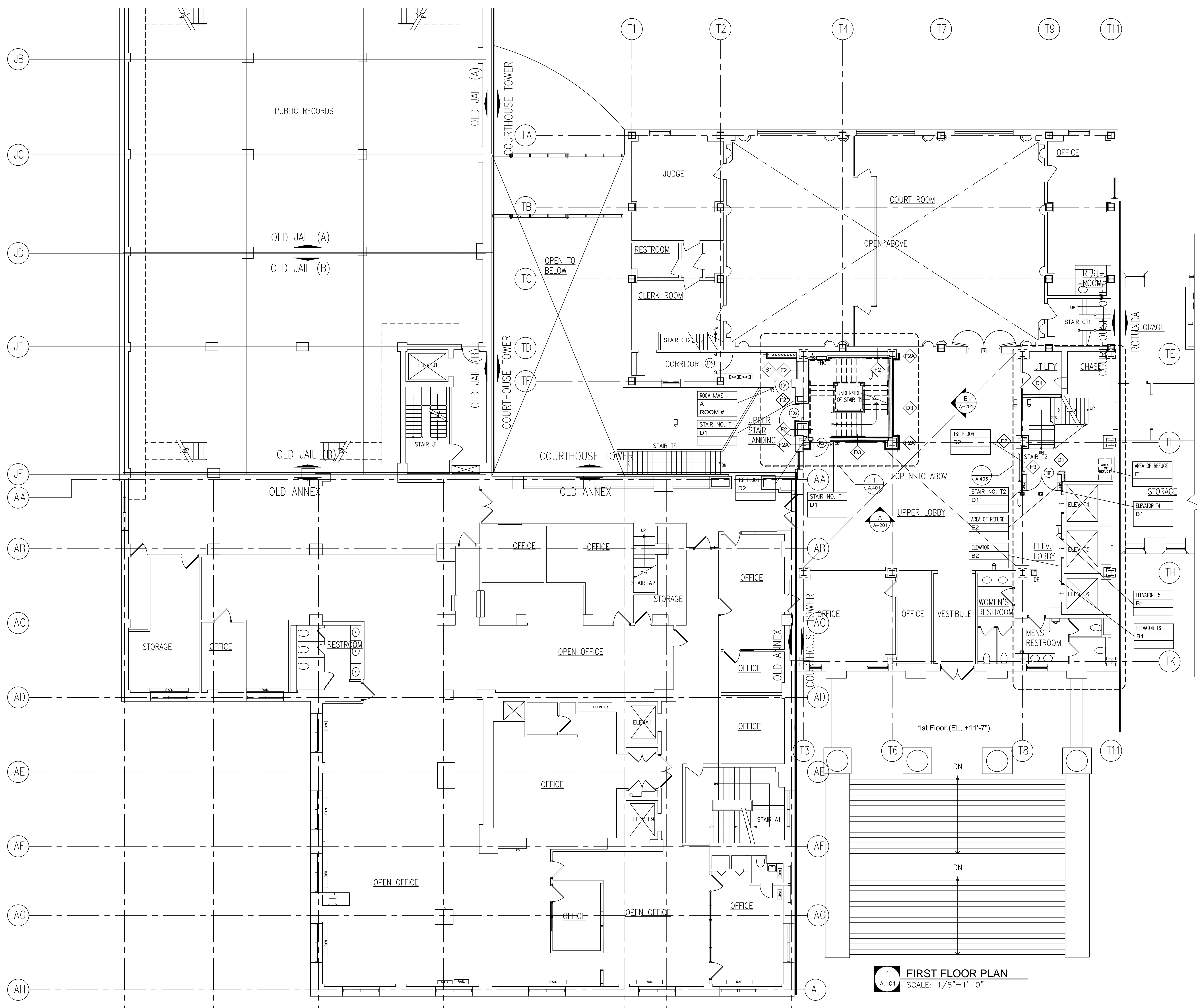


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
GROUND FLOOR PLAN

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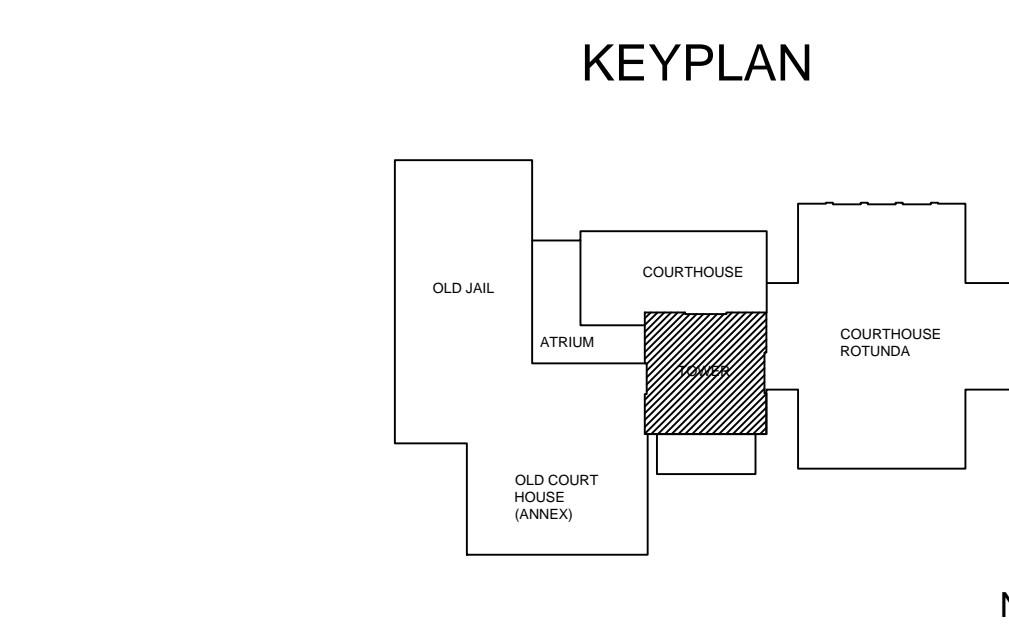
A.100G



CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING EQUIREMENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
- 9 NEW MECH'L. DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS."P
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMITC EGRESS STAIR REQUIRED BY CODE. GC. TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND	
	ROOM ID SIGN A RM. #
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN
SYMBOLS	
#	CONSTRUCTION KEYNOTES REFER TO DWG.
W-I	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
#	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
📹	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH



1 FIRST FLOOR PLAN
SCALE: 1/8"=1'-0"

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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

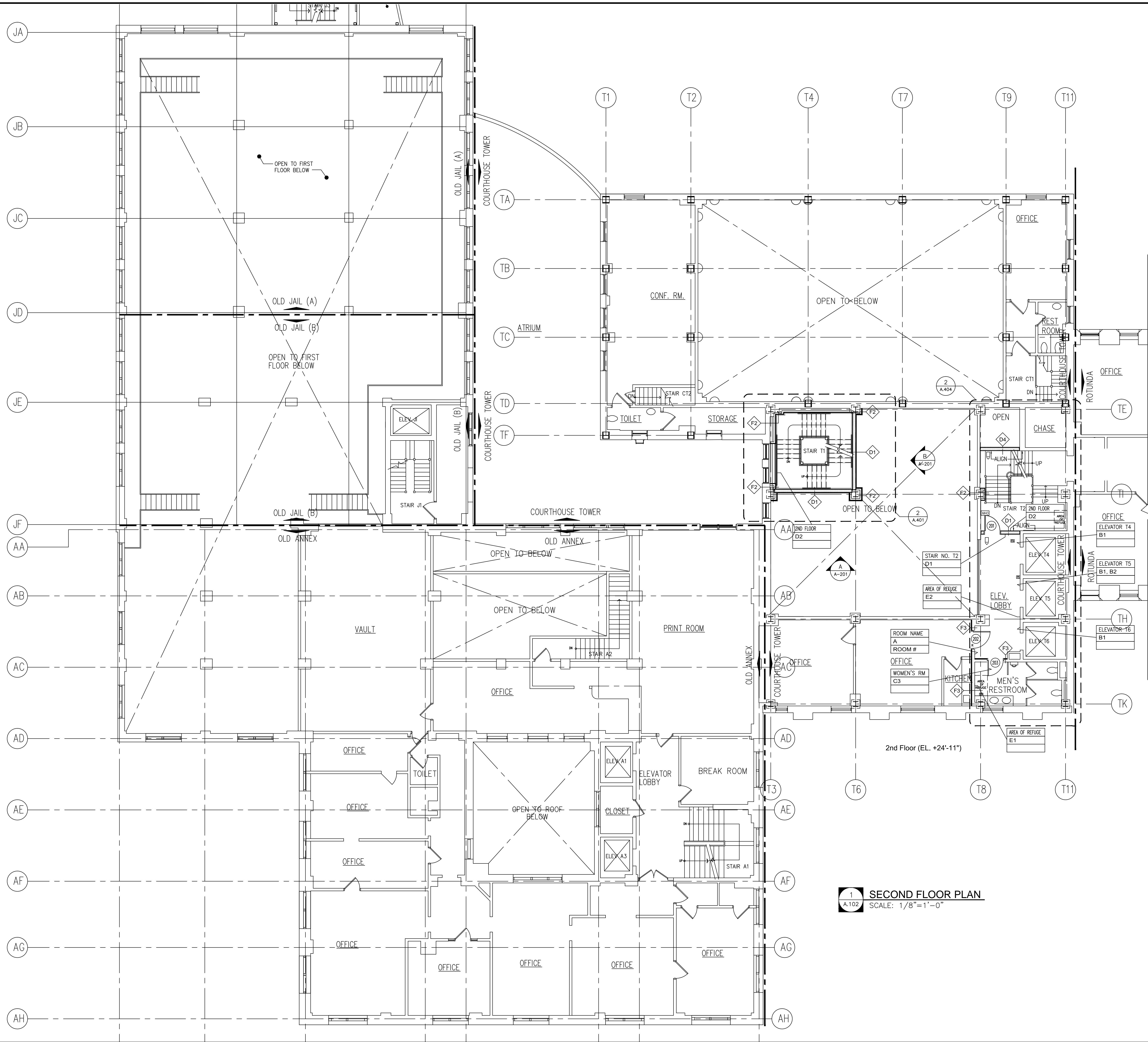
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.376.0008 FAX: 973.376.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FIRST FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 41 OF: 160
									DWG NO



CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
- 9 NEW MECH'L. DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.'P
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMATIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND

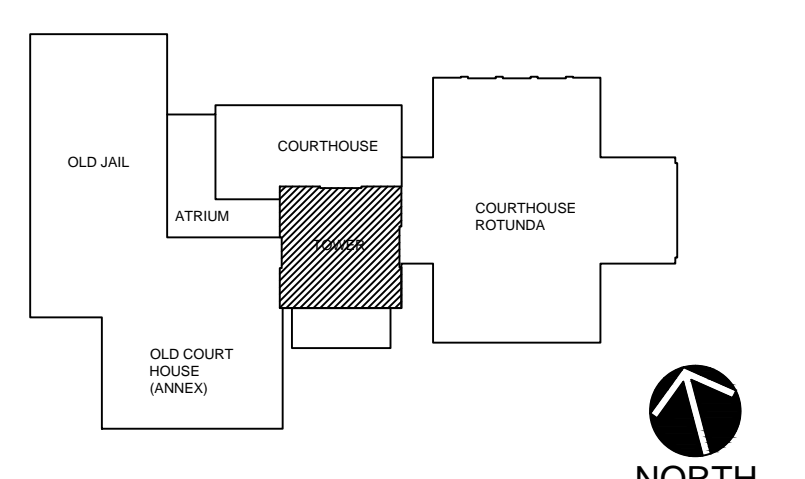
	ROOM ID SIGN
A	ROOM #
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
CV	SECURITY VIDEO CAMERA
R	CARD READER
RK	CARD READER AND KEY PAD
MH	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

1 SECOND FLOOR PLAN
SCALE: 1/8"=1'-0"

KEYPLAN



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NJ License No. AI 12541

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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

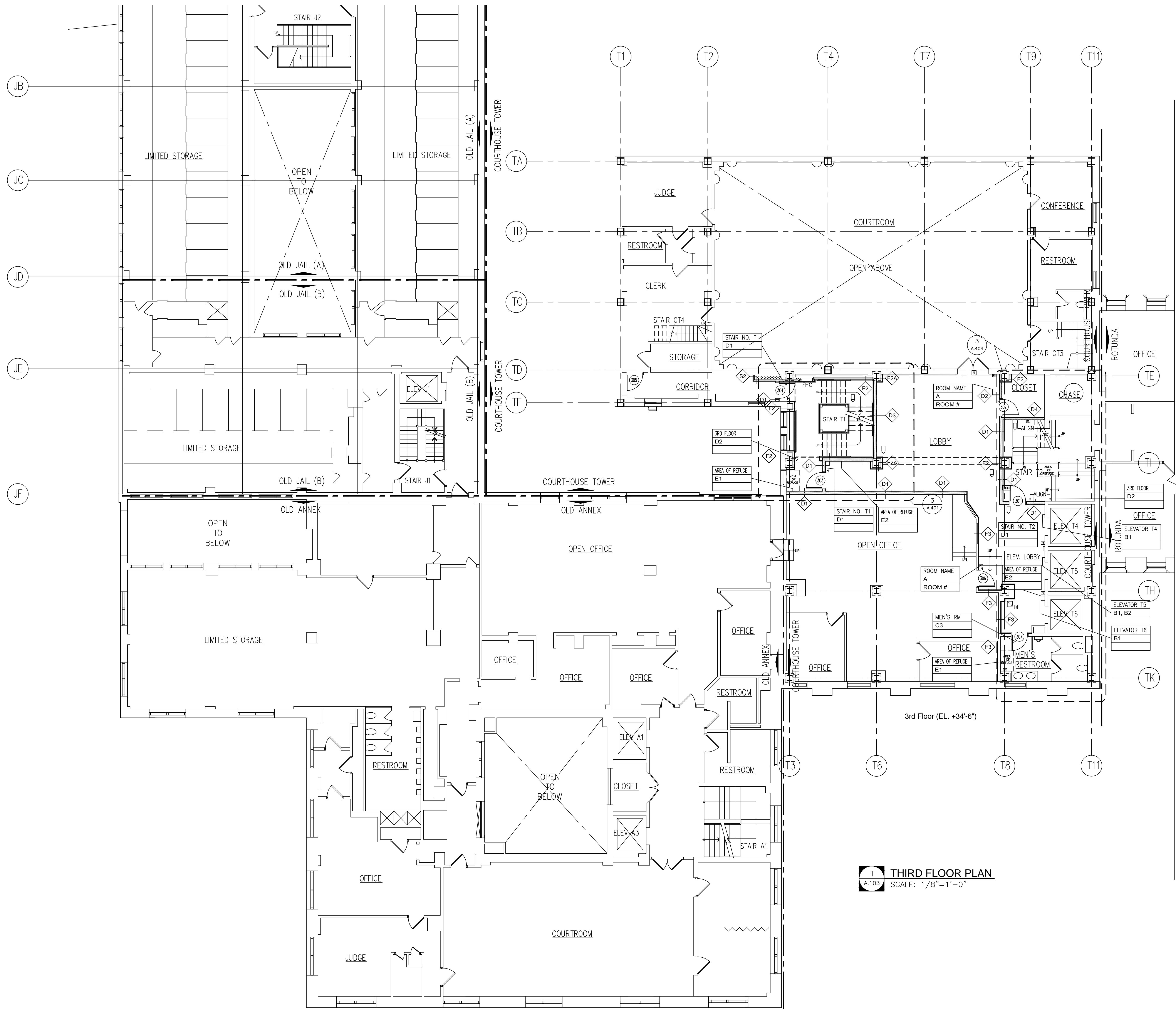
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ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 92 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.376.0098 FAX: 973.376.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SECOND FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 42 OF: 160
									DWG NO

A.102



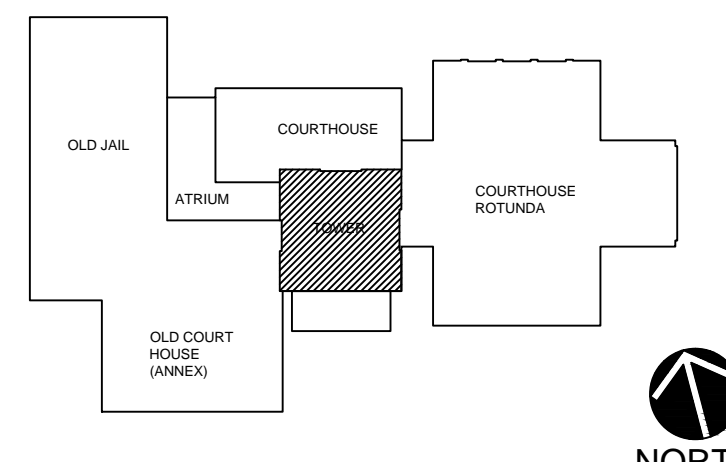
CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENINGS WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENINGS IN WALL UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENINGS SHALL BE PATCHED, REPAIRED & FINISHED TO MATCH ADJACENT SURFACES TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
- 9 NEW MECH'L. DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.'P
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMATIC EGRESS STAIR REQUIRED BY CODE. GC. TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND	
	ROOM ID SIGN
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS	
#	CONSTRUCTION KEYNOTES REFER TO DWG.
W-1	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
#	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
📹	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

KEYPLAN



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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

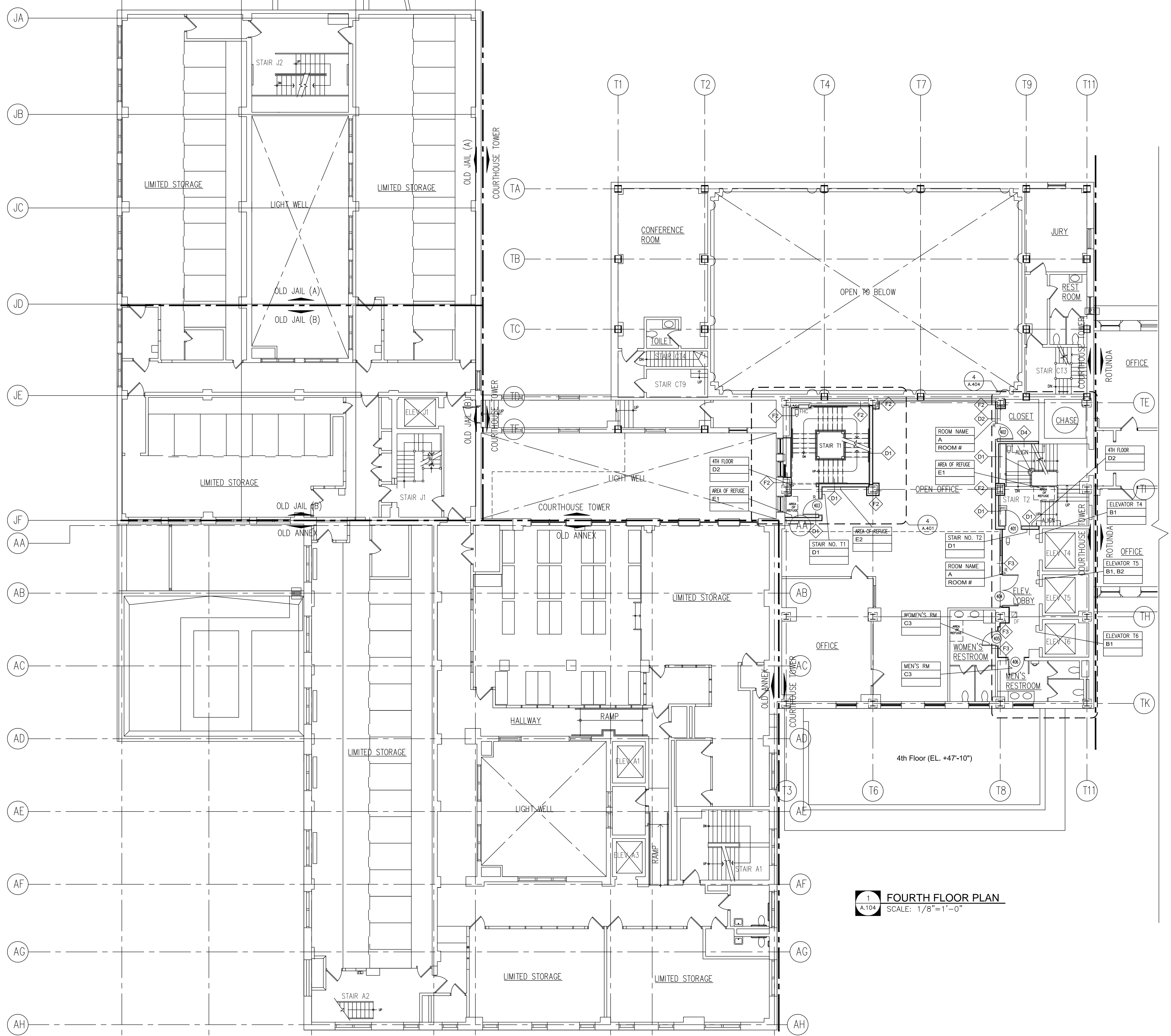
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ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.376.0098 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
THIRD FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 43 OF: 160
									DWG NO

A.103



CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE SCHEDULES.
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENINGS IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENINGS SHALL BE PATCHED, REPAIRED & FINISHED TO MATCH ADJACENT SURFACES TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
- 9 NEW MECH'L. DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.'P
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND

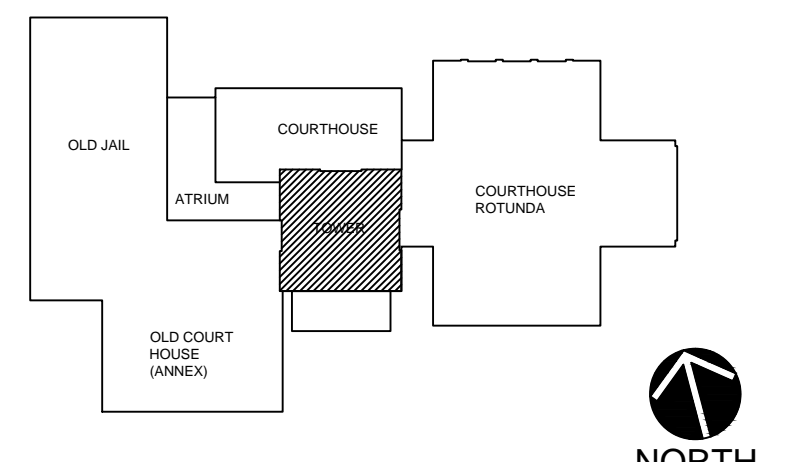
Symbol	Description
Room D Sign	ROOM D SIGN
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
CV	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

1 FOURTH FLOOR PLAN
A.104 SCALE: 1/8"=1'-0"

KEYPLAN



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MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

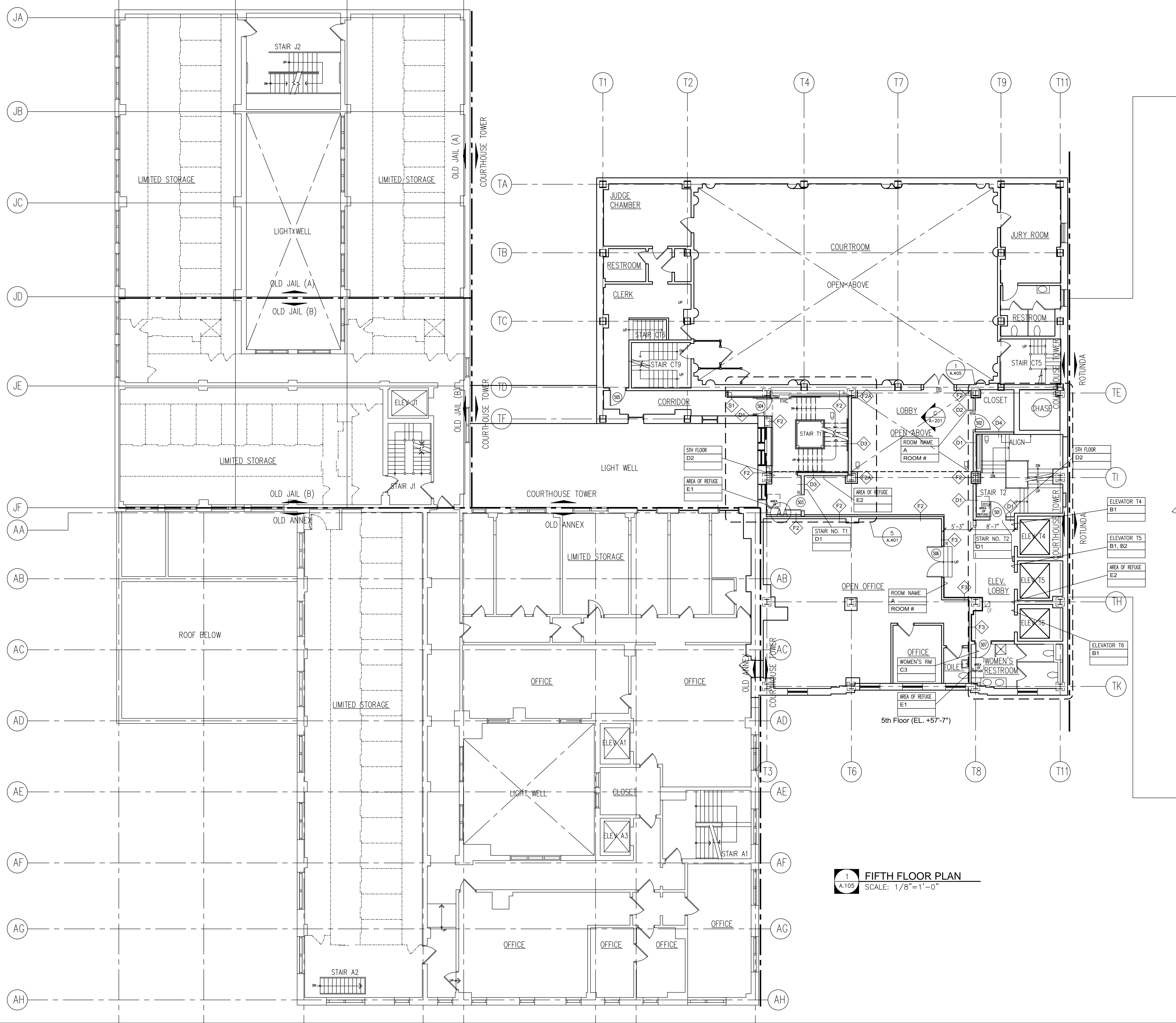


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FOURTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 44 OF: 160
									DWG NO

A.104



1
A.105
FIFTH FLOOR PLAN
SCALE: 1/8"=1'-0"

CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL, ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHED TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
- 9 NEW MECH'L. DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.'P
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMATIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

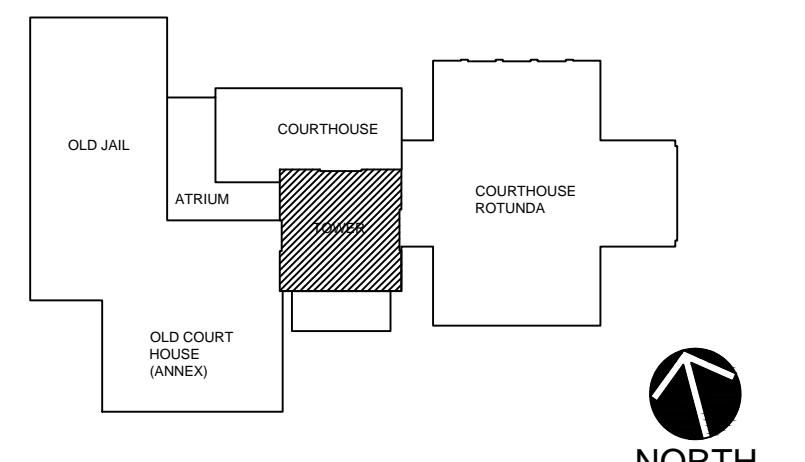
LEGEND

	ROOM ID SIGN
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
CV	SECURITY VIDEO CAMERA
R	CARD READER
RK	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

KEYPLAN



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MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

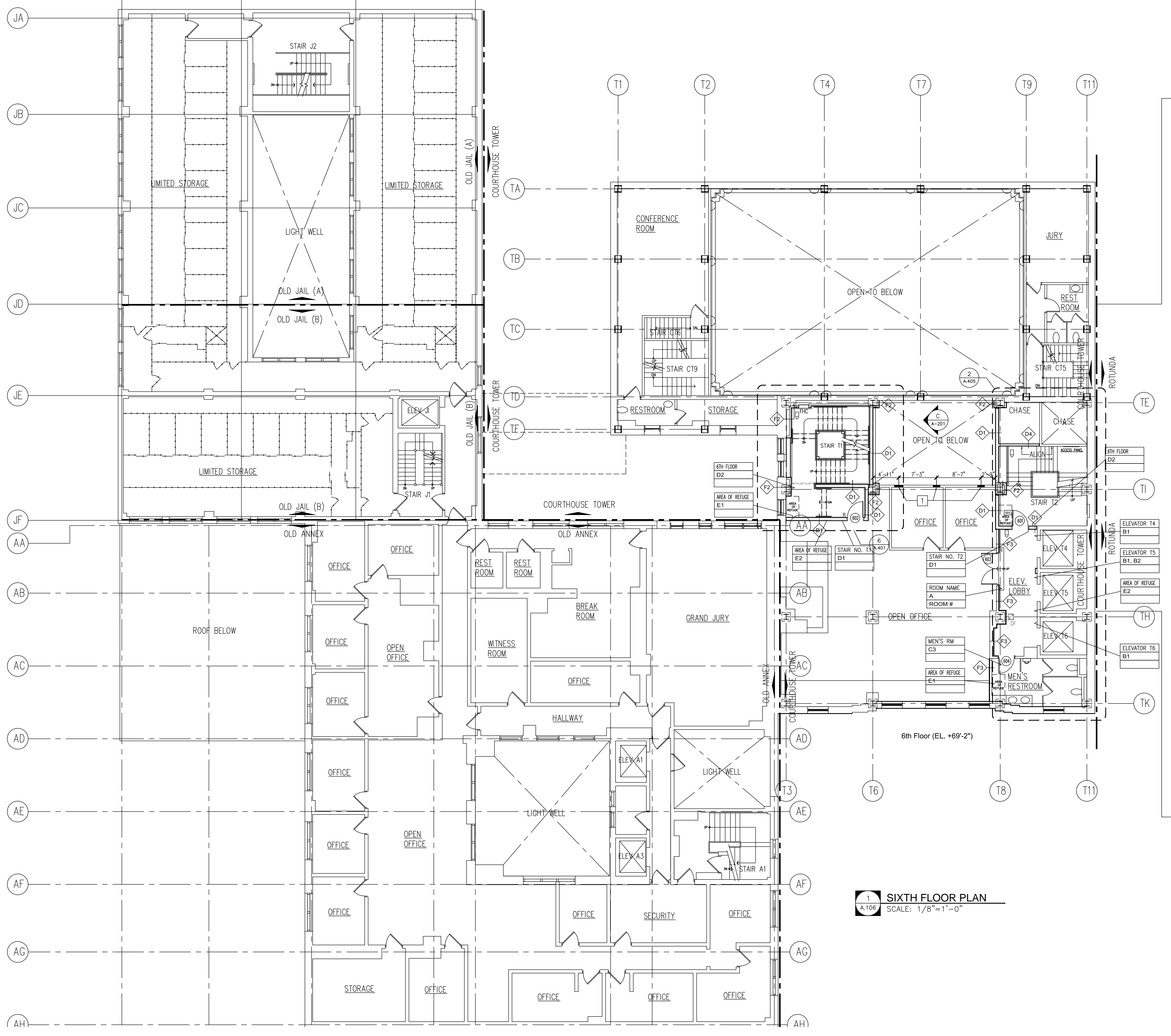
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 29 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.376.0098 FAX: 973.376.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FIFTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	BT
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	NJN
05.31.17	100% SUBMISSION	MC	FM					JOB NO	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	45 OF: 160
								DWG NO	

A.105



CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
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- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
- 9 NEW MECH'L. DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.'P
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC. TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND

ROOM ID SIGN
A
RM. #

A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

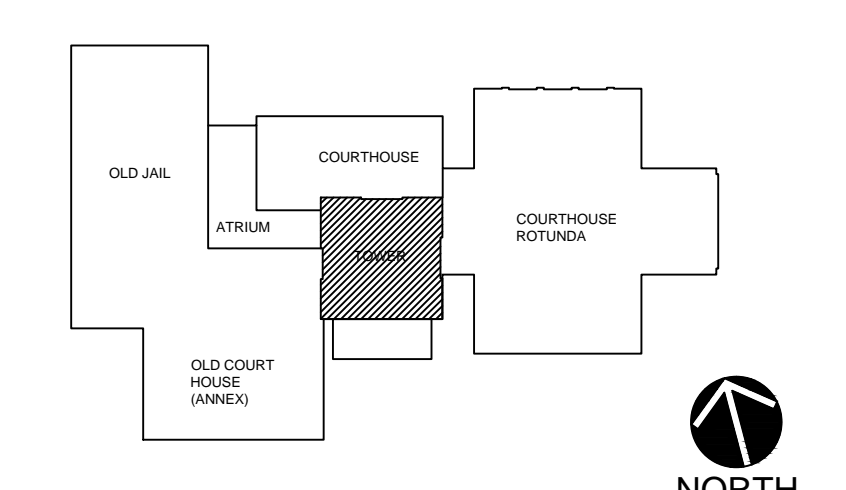
SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W+	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
📹	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHC	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

CONSTRUCTION KEY NOTES:

1 PROVIDE NEW WALL OPENING FOR NEW MECH. GRILLES, REFER TO M-406.

KEYPLAN



1 SIXTH FLOOR PLAN
A.106 SCALE: 1/8"=1'-0"

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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

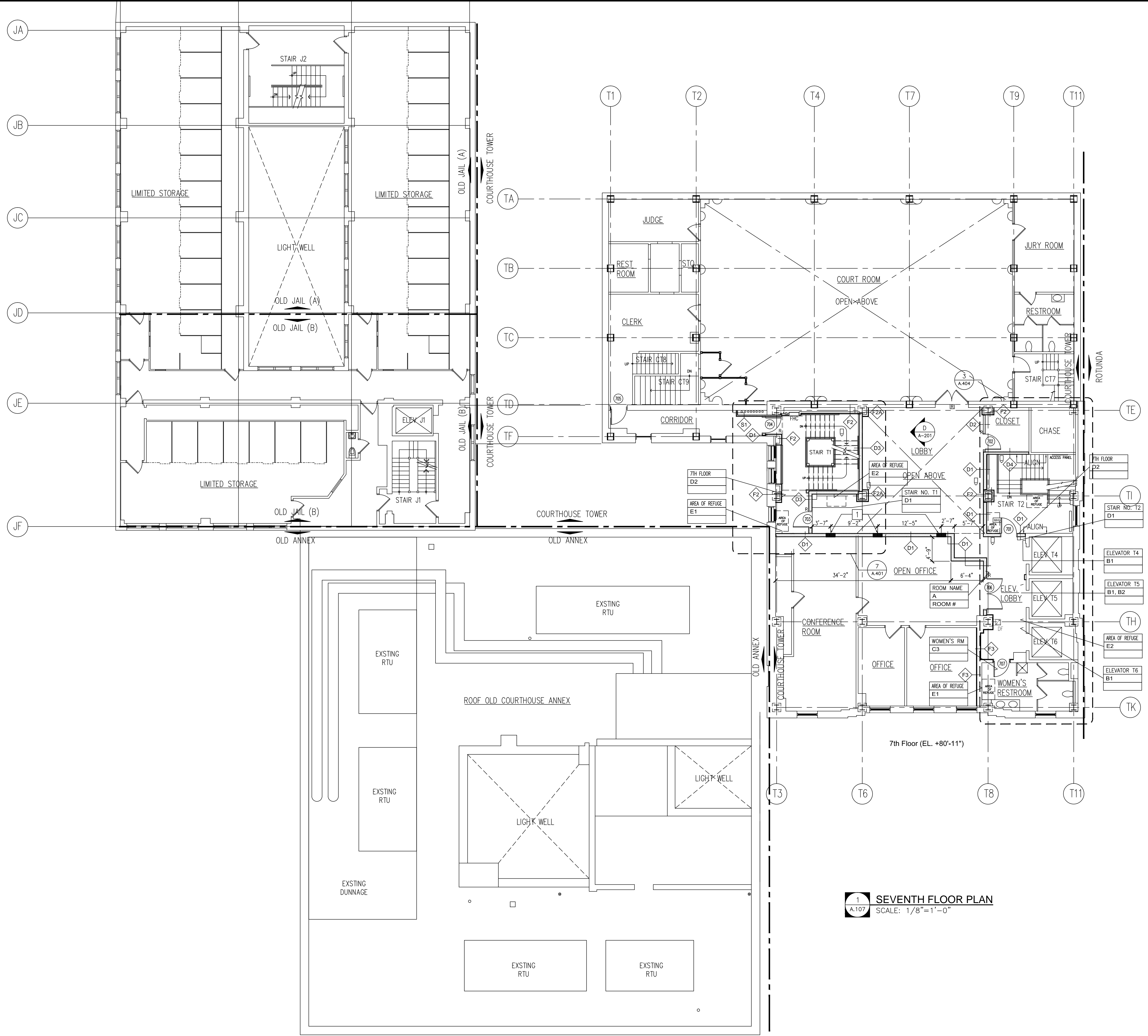


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SIXTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 46 OF: 160
									DWG NO

A.106



CONSTRUCTION KEYNOTES

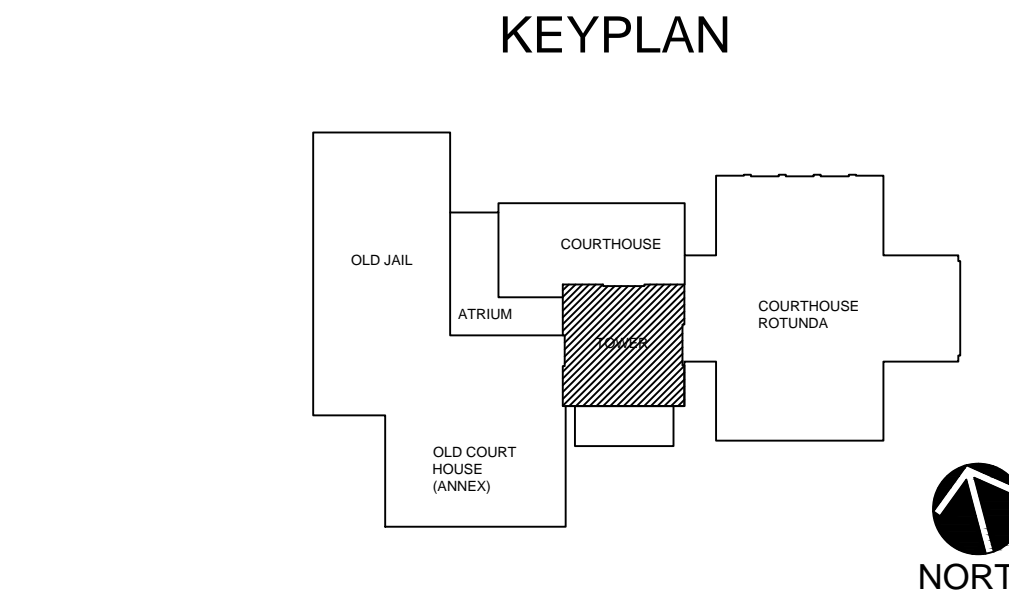
- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
- 9 NEW MECH'L. DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.'P
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

LEGEND	
ROOM ID SIGN	
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS	
#	CONSTRUCTION KEYNOTES REFER TO DWG.
W-#	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D-#	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
📹	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

CONSTRUCTION KEY NOTES:

- 1 PROVIDE NEW WALL OPENING FOR NEW MECH. GRILLES, REFER TO M-407.



1 SEVENTH FLOOR PLAN
SCALE: 1/8"=1'-0"

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NJ License No. AI 12541

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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

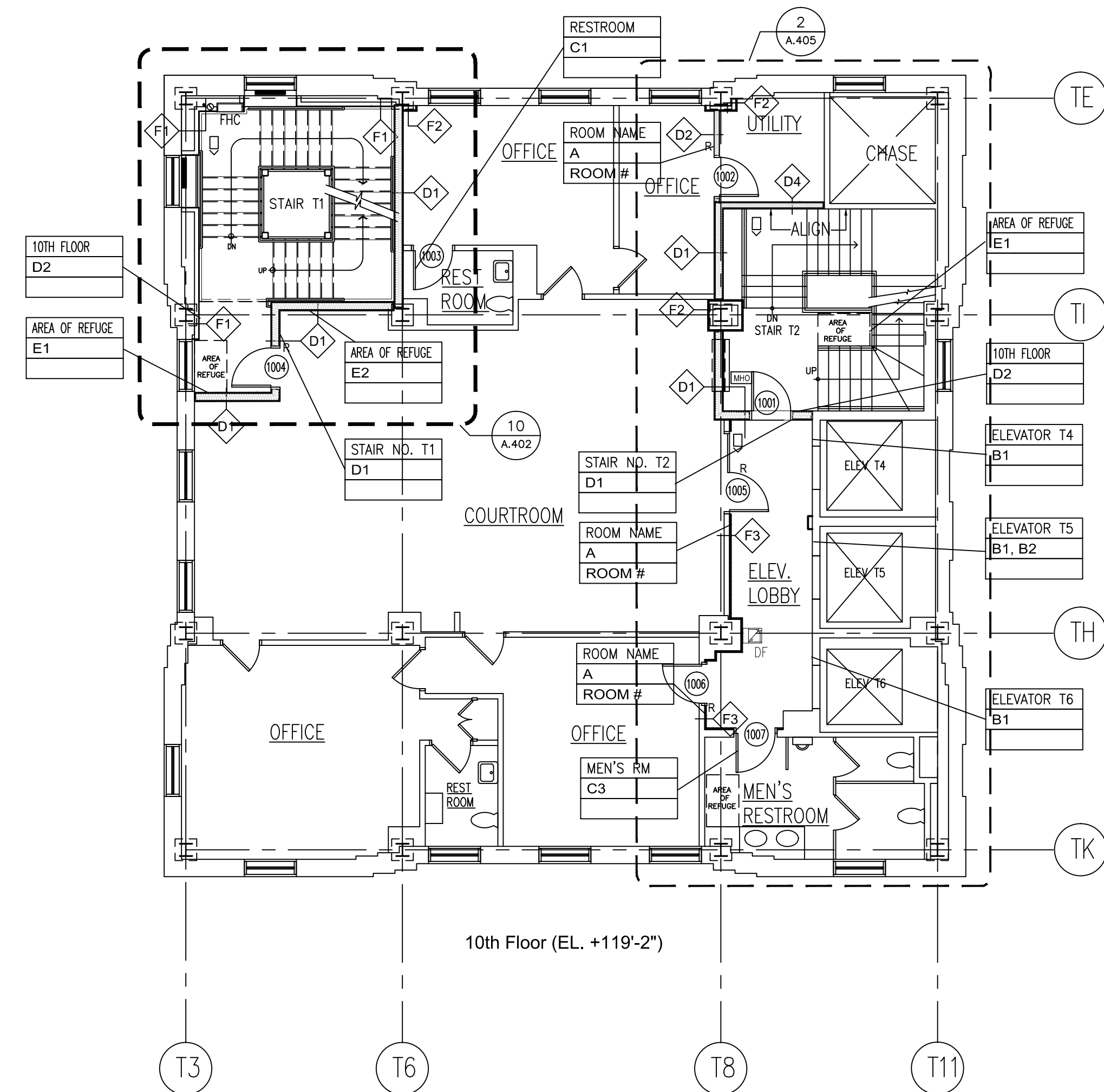


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

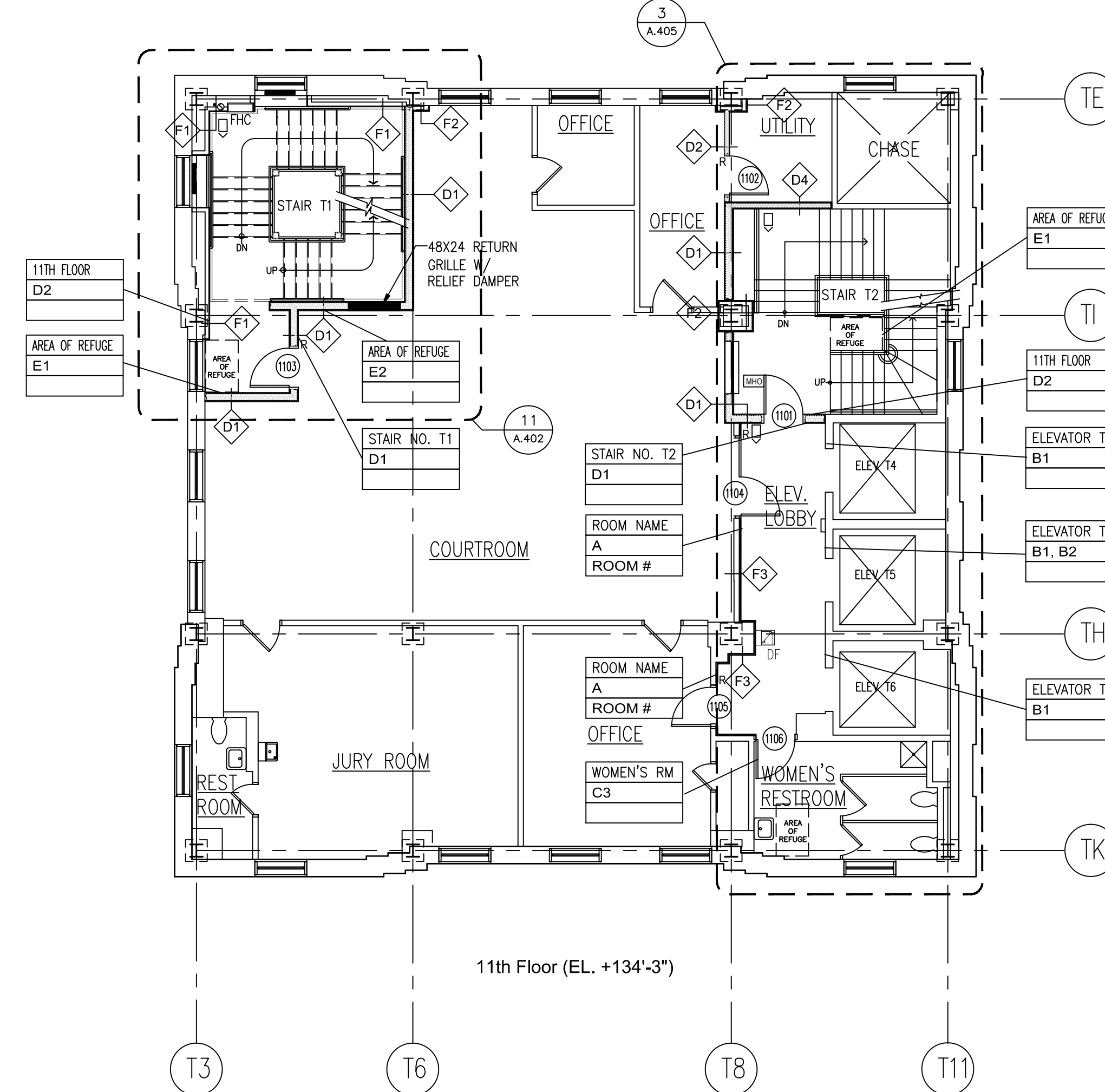
SHEET CONTENTS:
SEVENTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 47 OF: 160
									DWG NO

A.107



1 TENTH FLOOR PLAN
SCALE: 1/8"=1'-0"



2 ELEVENTH FLOOR PLAN
SCALE: 1/8"=1'-0"

CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING EQUIVALENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENINGS IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENINGS SHALL BE PATCHED, REPAIRED & FINISHED TO MATCH ADJACENT SURFACES TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
- 9 NEW MECH. L. DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.'P
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMATIC EGRESS STAIR REQUIRED BY CODE. GC. TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

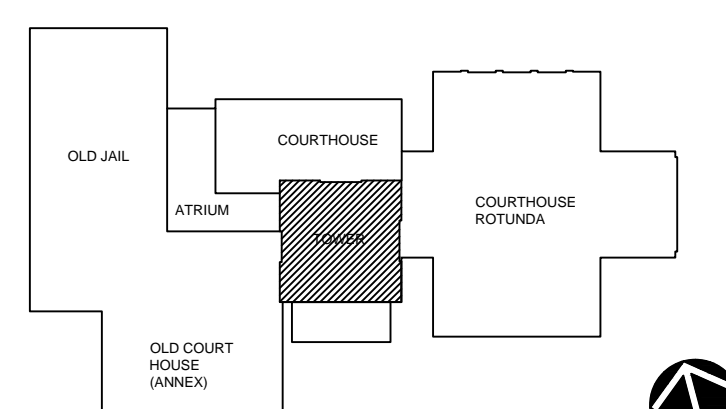
LEGEND

	ROOM ID SIGN
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG. REFER TO DWG. A301 FOR DOOR SCHEDULE.
CC	SECURITY VIDEO CAMERA
R	CARD READER
RK	CARD READER AND KEY PAD
MHC	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

KEYPLAN



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NJ License No. AI 16160

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PROJECT:

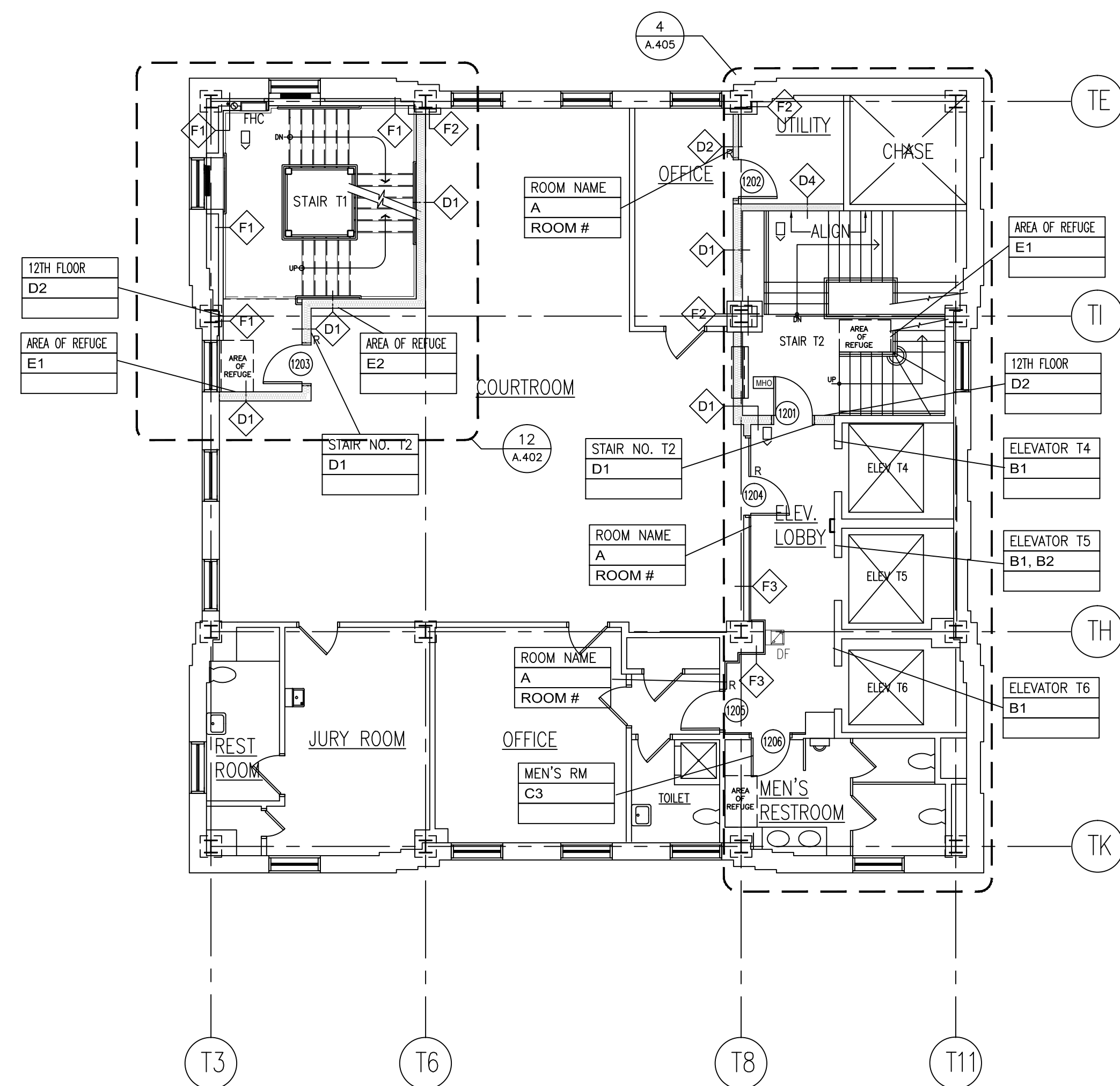
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

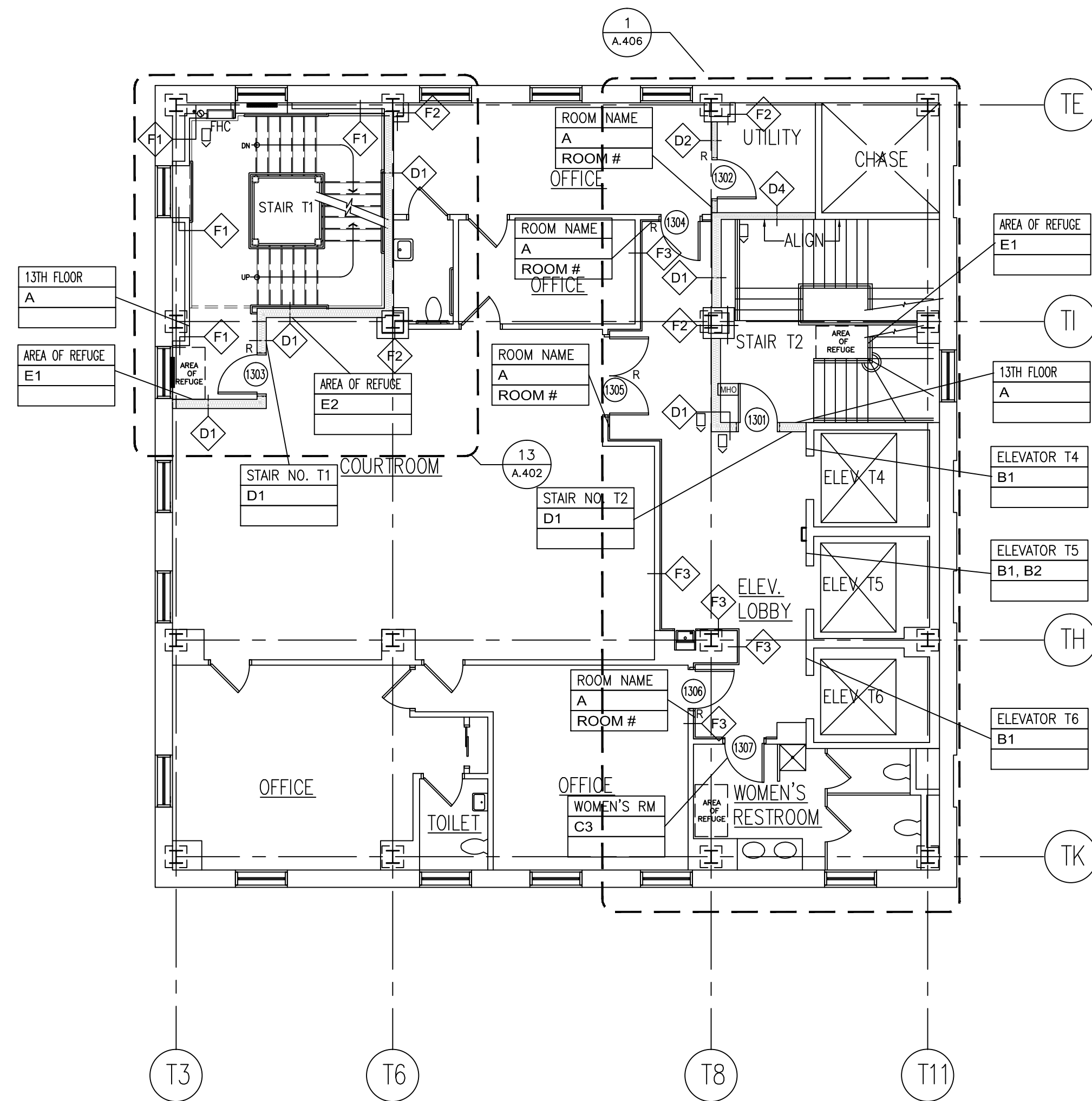
TENTH & ELEVENTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 50 OF: 160
									DWG NO

A.110



1 TWELFTH FLOOR PLAN
SCALE: 1/8"=1'-0"



2 THIRTEENTH FLOOR PLAN
SCALE: 1/8"=1'-0"

CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENINGS IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENINGS SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS.
- 9 NEW MECH'L DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
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- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.'P
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMATIC EGRESS STAIR REQUIRED BY CODE, GC, TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

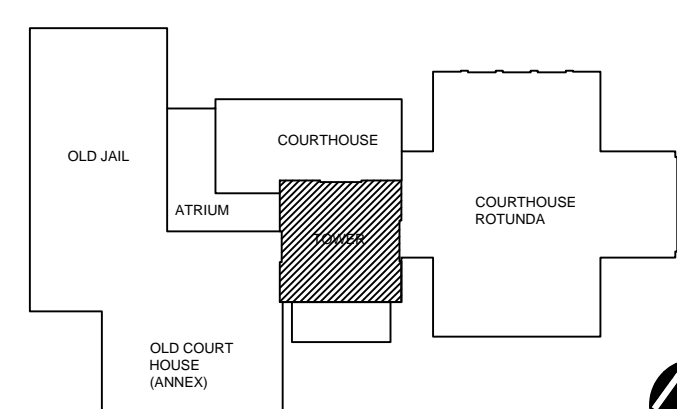
LEGEND

	ROOM ID SIGN
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
SEC	SECURITY VIDEO CAMERA
R	CARD READER
RK	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

KEYPLAN



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PROJECT:

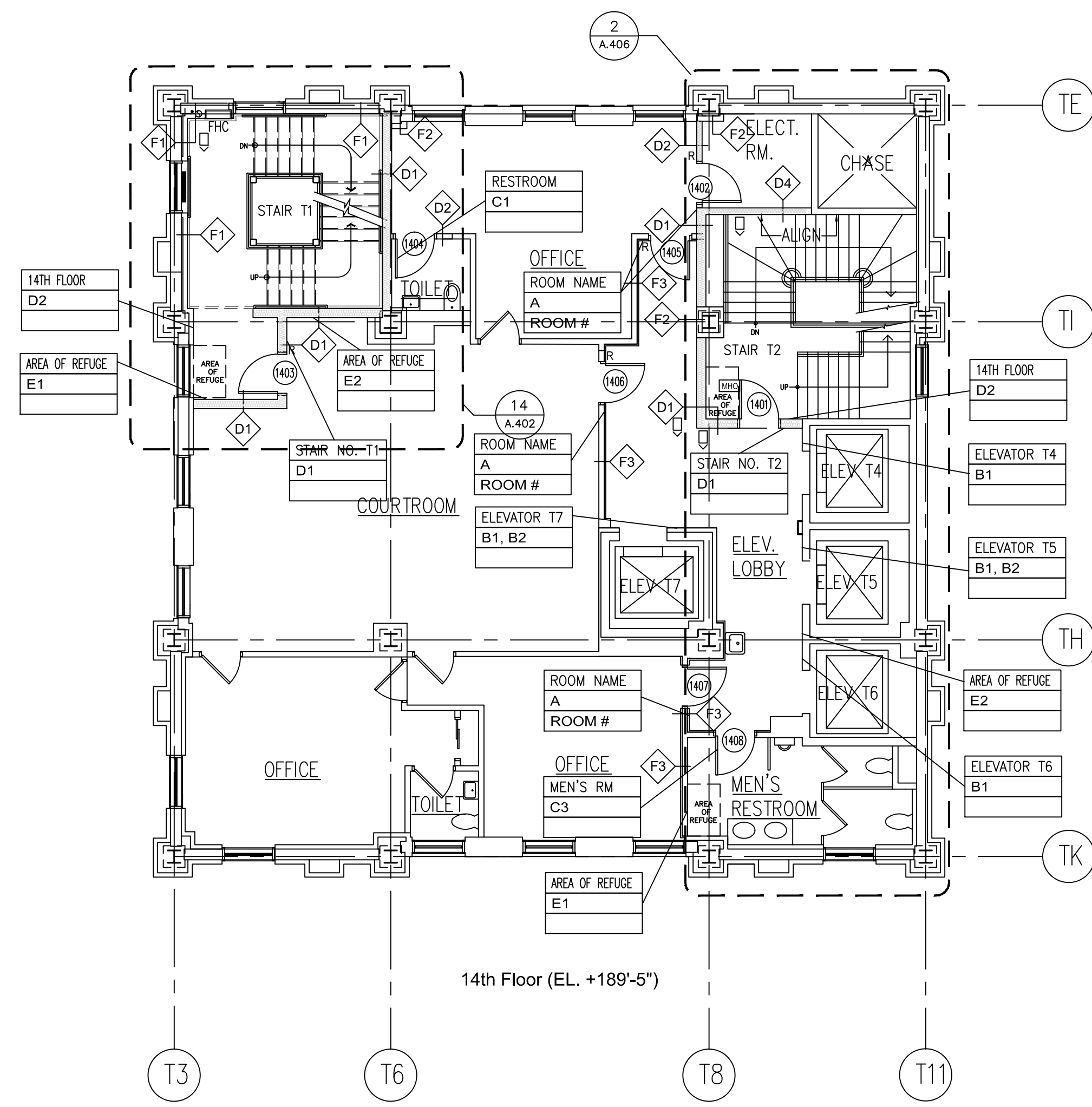
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

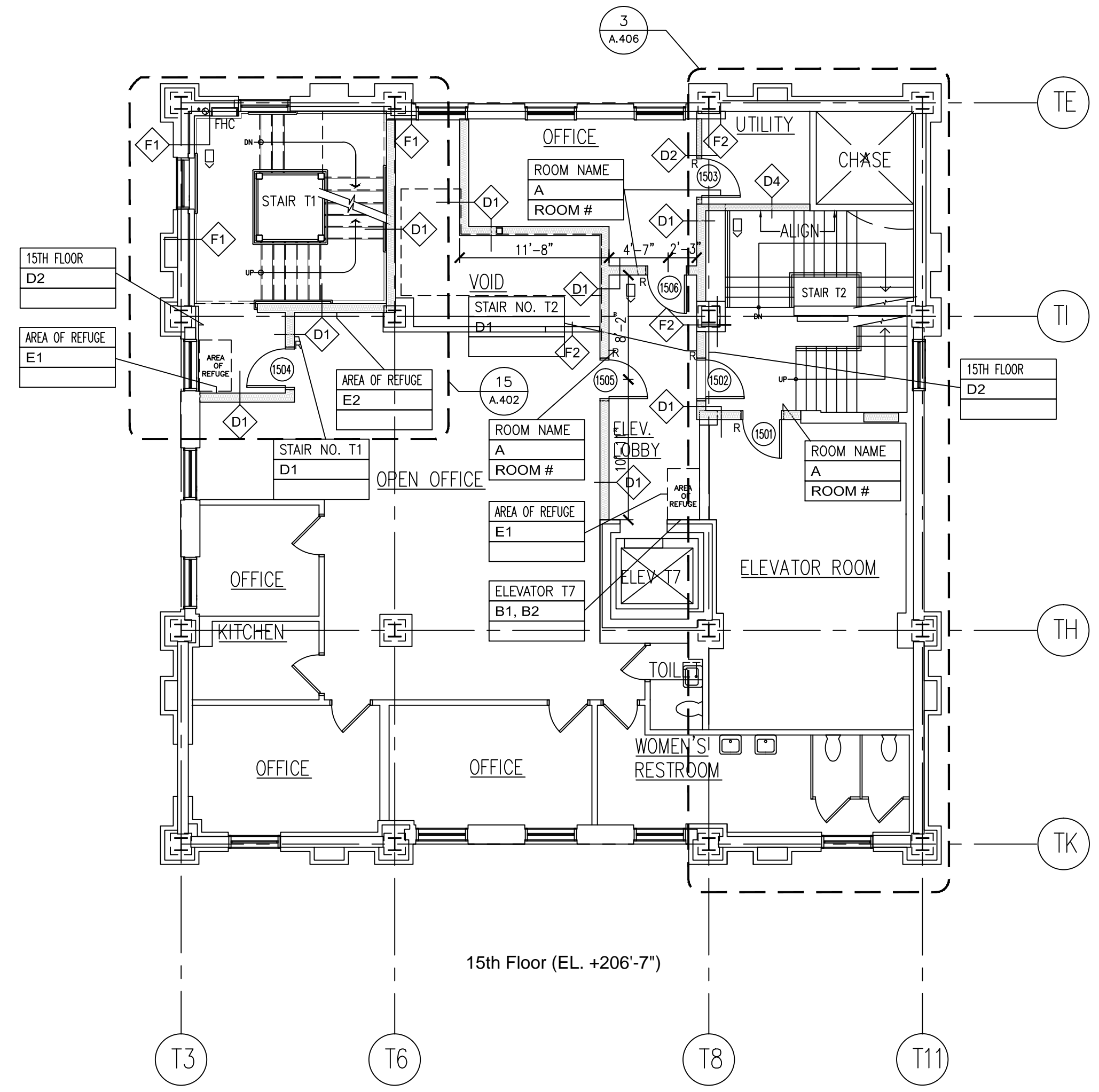
TWELFTH & THIRTEENTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 51 OF: 160
									DWG NO

A.111



1 FOURTEENTH FLOOR PLAN
SCALE: 1/8"=1'-0"



2 FIFTEENTH FLOOR PLAN
SCALE: 1/8"=1'-0"

CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL.
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
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- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS. P
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMATIC EXPRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.

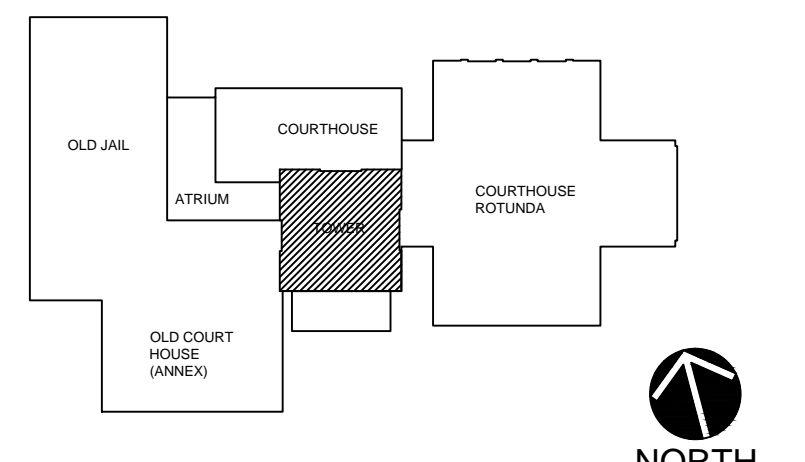
LEGEND

ROOM ID SIGN	
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

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W	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
CV	SECURITY VIDEO CAMERA
R	CARD READER
RK	CARD READER AND KEY PAD
MHC	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

KEYPLAN



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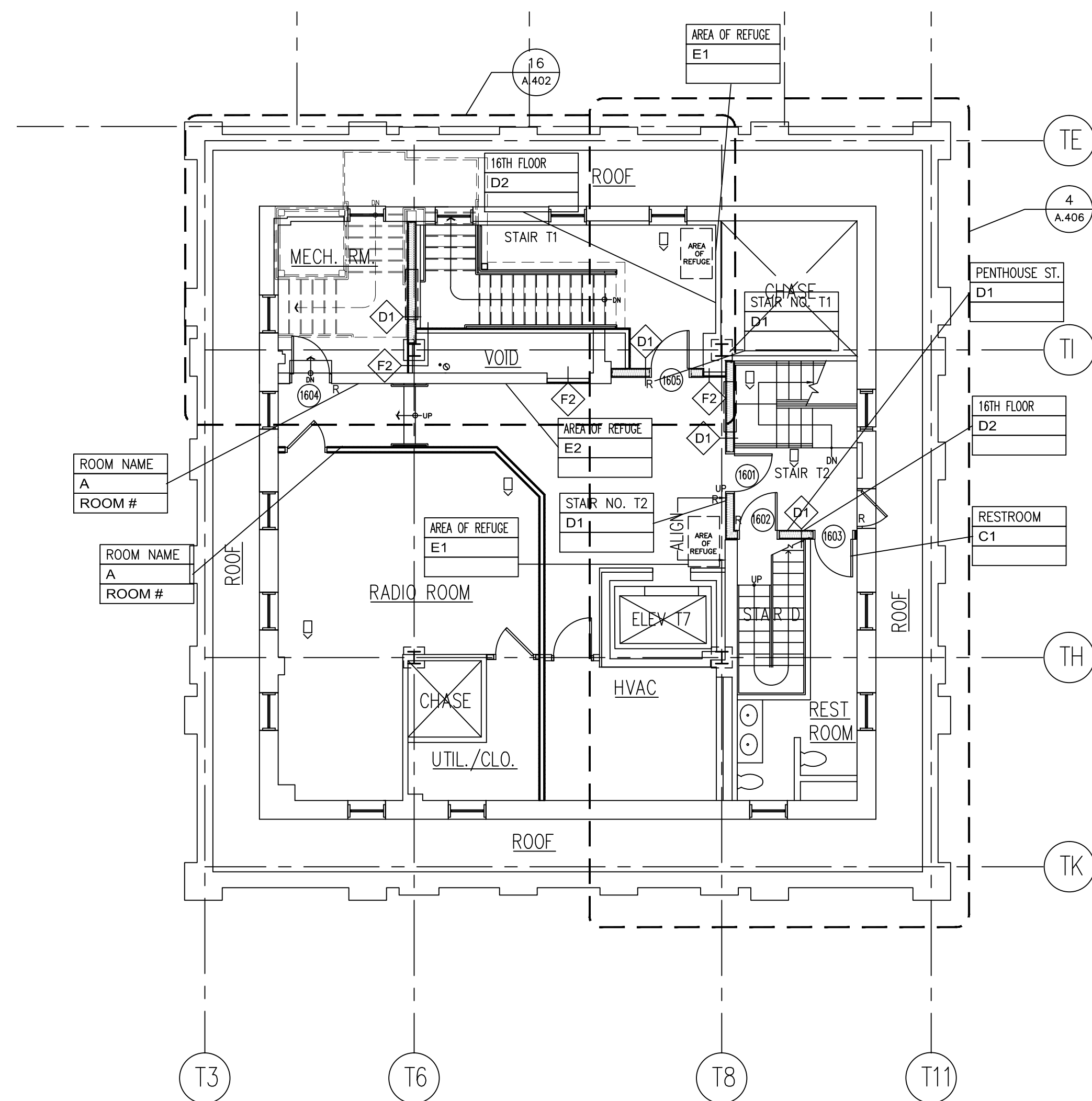
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.376.0098 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

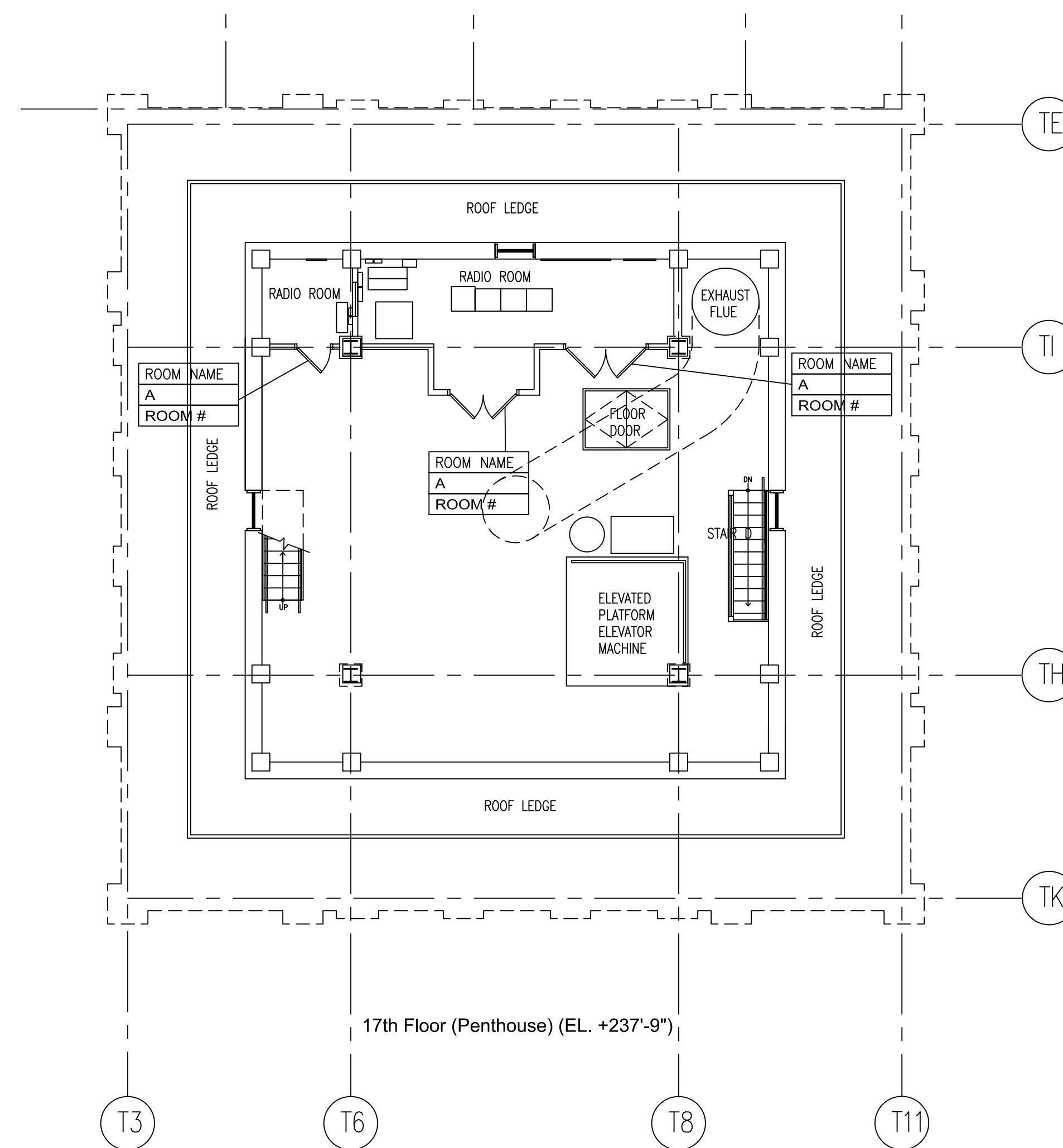
SHEET CONTENTS:
FOURTEENTH & FIFTEENTH FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 52 OF: 160
									DWG NO

A.112



1 SIXTEENTH FLOOR PLAN
SCALE: 1/8"=1'-0"



2 PENTHOUSE FLOOR PLAN
SCALE: 1/8"=1'-0"

CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
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- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
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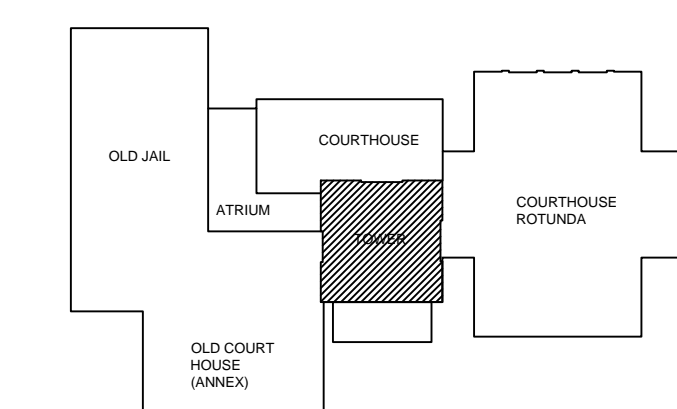
LEGEND

ROOM ID SIGN	ROOM #
A	ROOM #
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

(1)	CONSTRUCTION KEYNOTES REFER TO DWG.
(W)	WINDOW TAG REFER TO DWG. A301 FOR WINDOW SCHEDULE.
(D)	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
(C)	SECURITY VIDEO CAMERA
(R)	CARD READER
(R)	CARD READER AND KEY PAD
(M)	MAGNETIC CARD HOLDER
(DPS)	DOOR POSITIONS SWITCH

KEYPLAN



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PROJECT:

**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

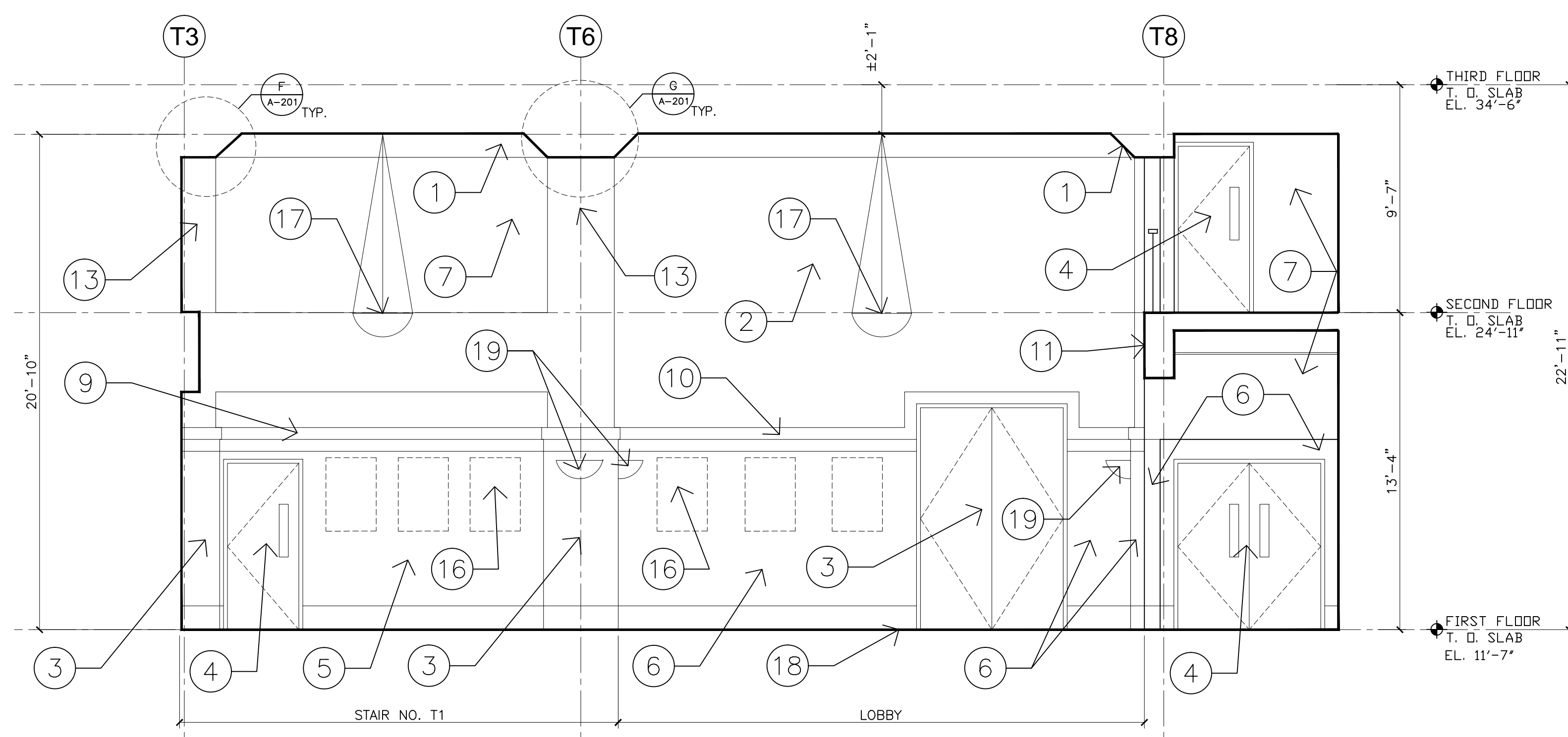
SIXTEENTH & PENTHOUSE FLOOR PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 53 OF: 160
									DWG NO

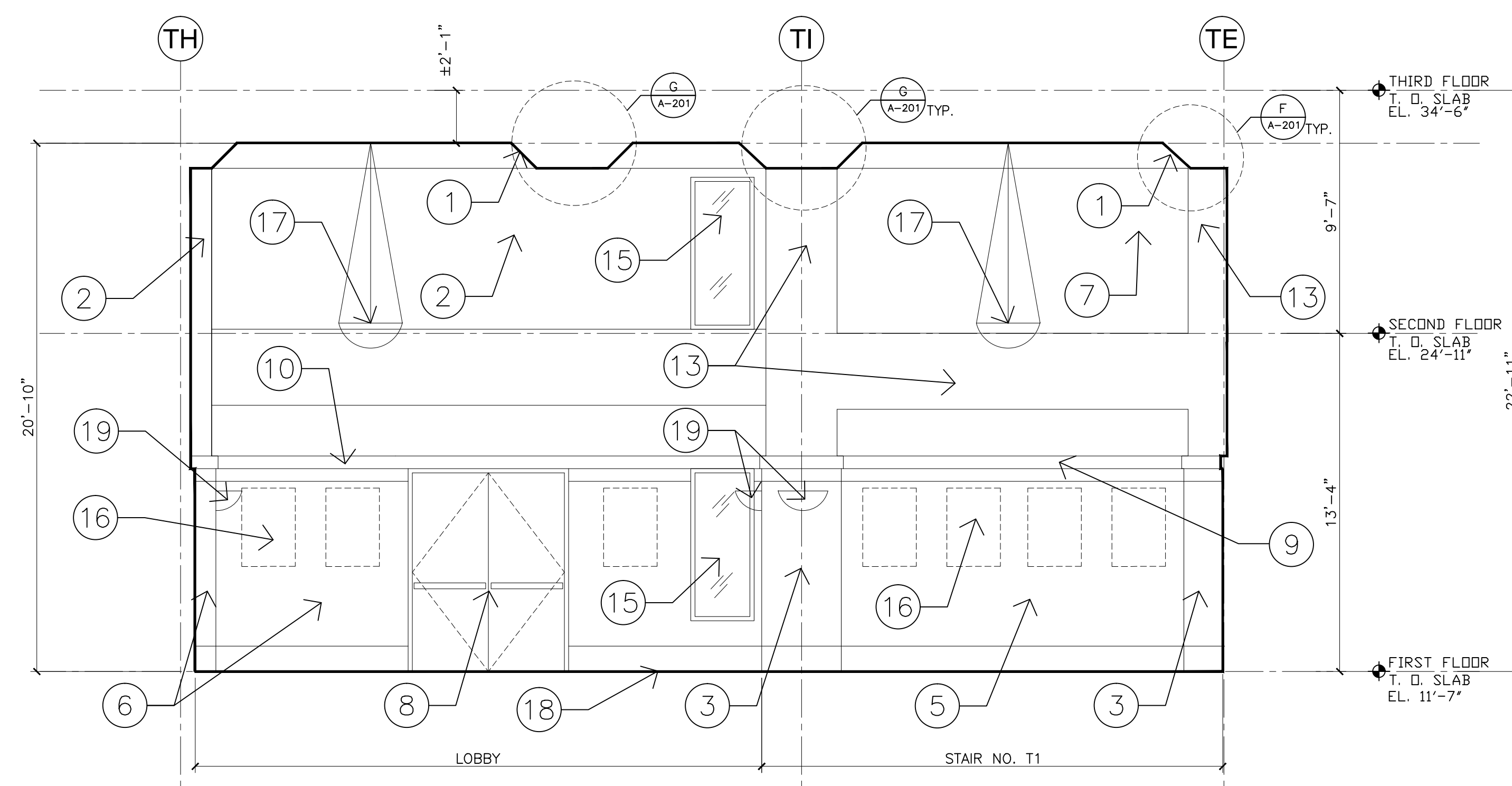
A.113

KEYNOTES THIS DRAWING

- 1 EXISTING CORNICE & TRIMS
- 2 EXISTING GYP. BD. WALL PAINTED FIN.
- 3 EXISTING BRONZE DOORS & FRAMES TO REMAIN
- 4 NEW HOLLOW METAL EXIT DOOR & FRAMES SEE DOOR SCHEDULE
- 5 NEW MARBLE PANELS, BASE & TRIMS
- 6 EXISTING MARBLE PANELS, BASE & TRIMS
- 7 NEW GYP. BD. WALL PAINTED FIN.
- 8 EXISTING ENTRANCE DOORS TO REMAIN
- 9 NEW WIRE MANAGEMENT TYP.
- 10 EXISTING WIRE MANAGEMENT TO REMAIN
- 11 EXISTING FASCIA & TRIMS
- 12 EXISTING PLASTER CEILING PAINTED FIN.
- 13 NEW GYP. BD. COLUMN & BEAM COVERS TYP.
- 14 NEW MARBLE PANEL COLUMN COVERS TYP.
- 15 EXISTING FIRE RATED GLAZING TO REMAIN
- 16 REINSTALL EXISTING JUDGES PAINTINGS
- 17 EXISTING CHANDELIER LIGHTING TO REMAIN
- 18 EXISTING TERRAZZO FLOOR TO REMAIN
- 19 EXISTING SCOFFCE LIGHTING TO REMAIN & THOSE AFFECTED TO BE RELOCATED SEE ELECT. DWGS.



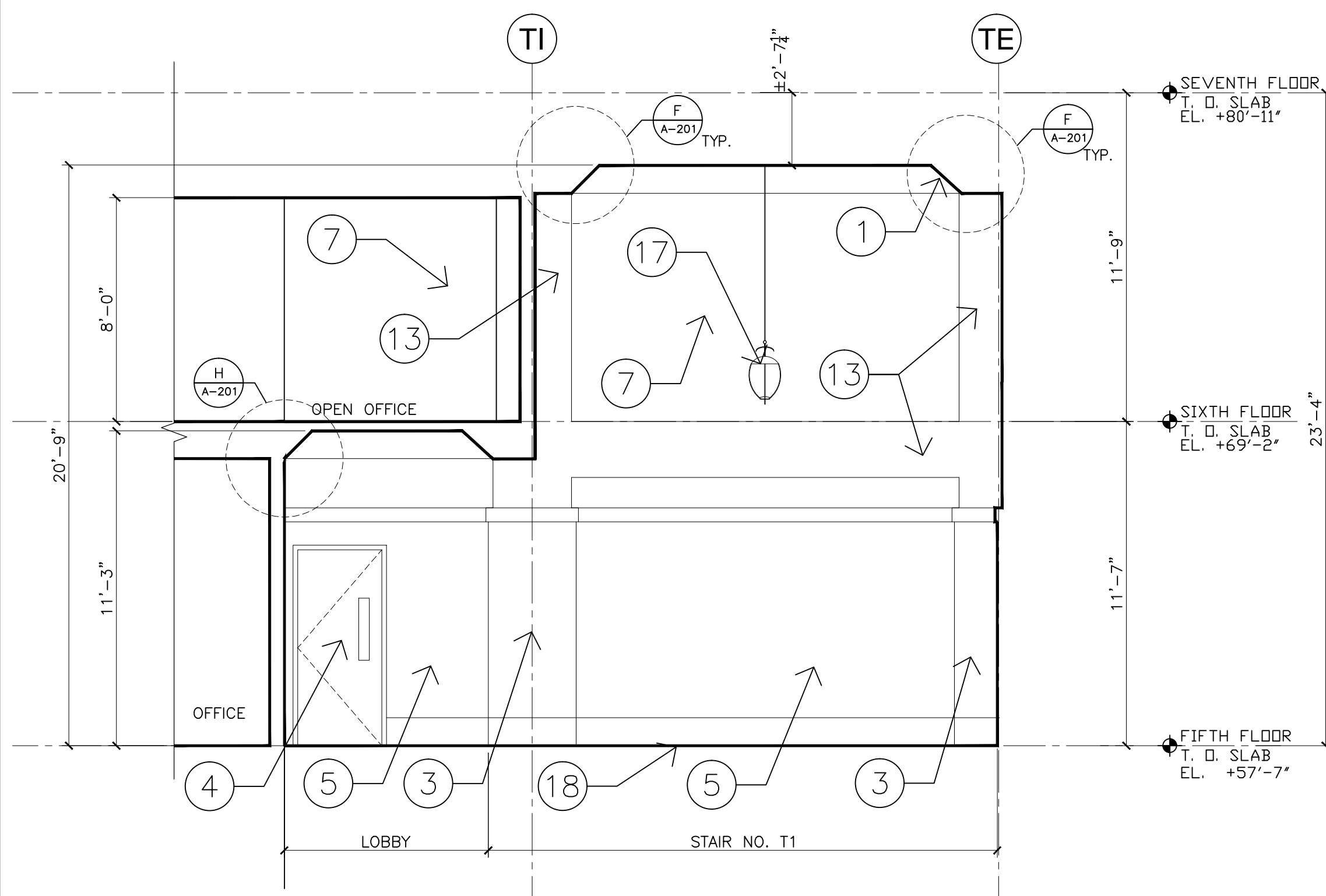
A 1ST & 2ND INTERIOR ELEVATION
SCALE: 1/4"=1'-0"



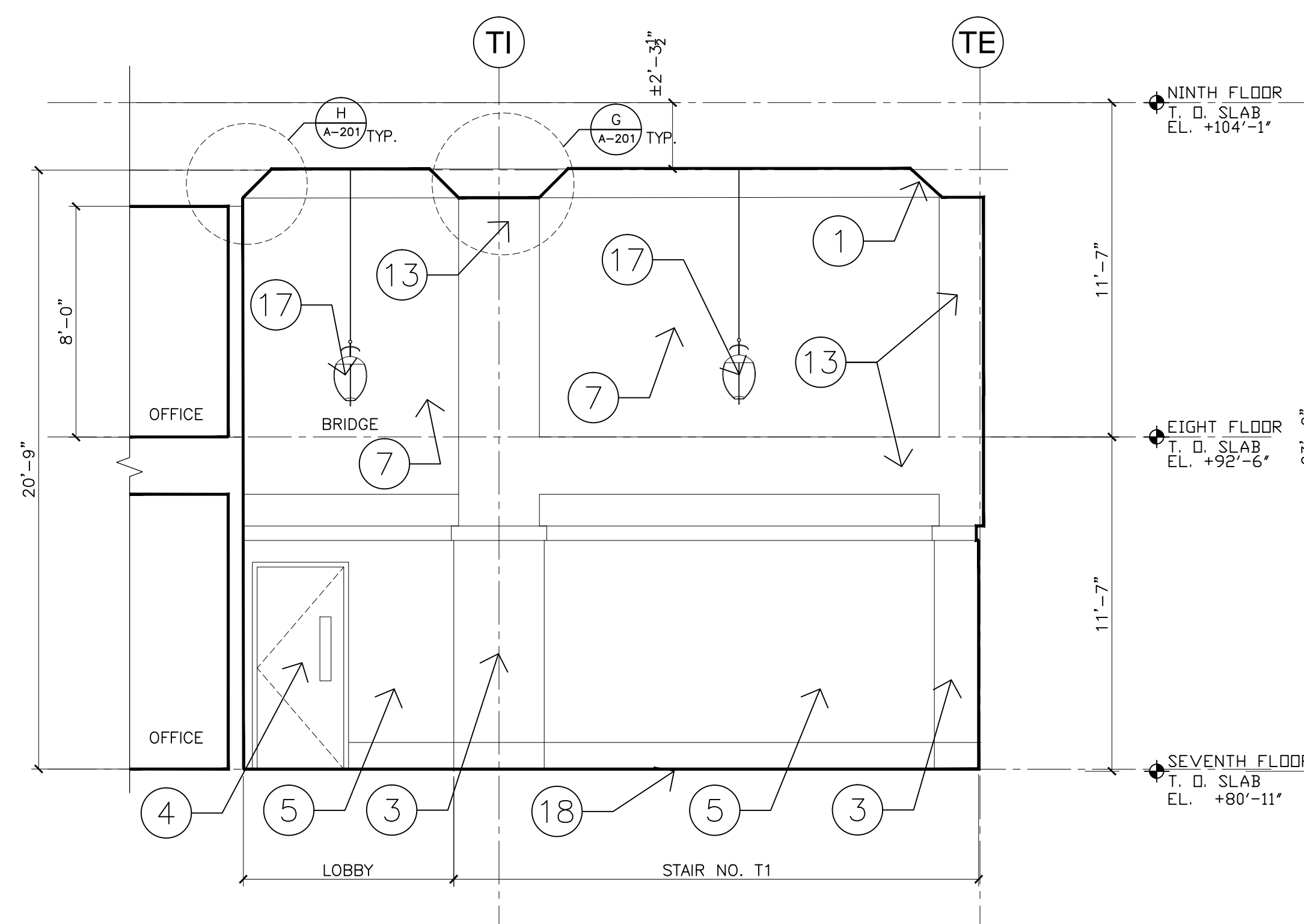
B 1ST & 2ND INTERIOR ELEVATION
SCALE: 1/4"=1'-0"

NOTE:

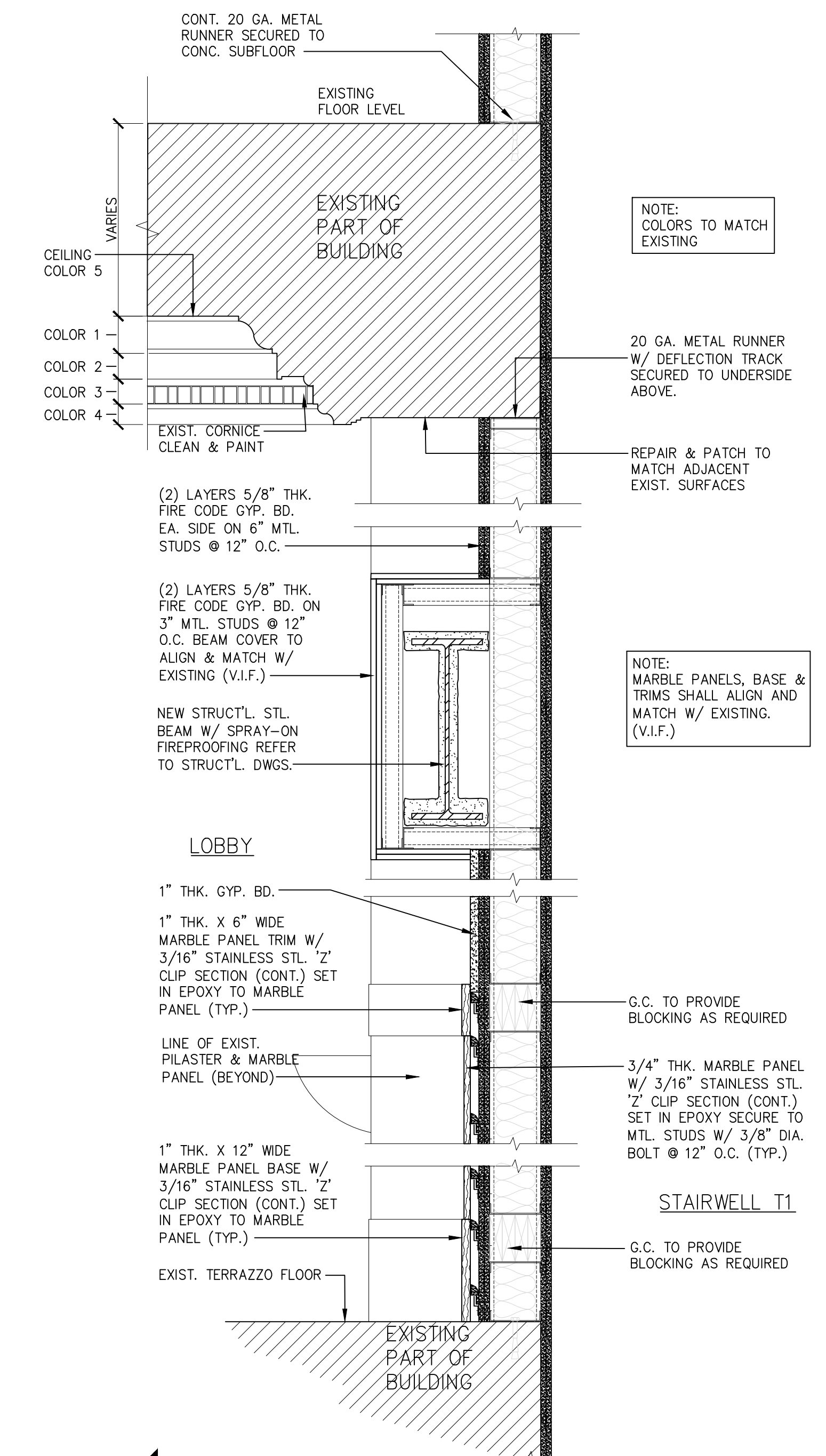
1. CONTRACTOR TO PHOTOGRAPH AND FULLY DOCUMENT SIZE, SHAPE AND COLOR OF ALL EXISTING CONDITIONS AT ALL CEILING TRIM AND CORNICE BEFORE REMOVAL.
2. CONTRACTOR TO SUBMIT DETAILED SHOP DRAWINGS OF NEW CORNICE TO MATCH EXISTING IN SIZE, SHAPE AND COLOR.
3. CONTRACTOR TO COORDINATE INSTALLATION OF NEW CEILING/CORNICE WITH FIRE SUPPRESSION INSTALLATION.



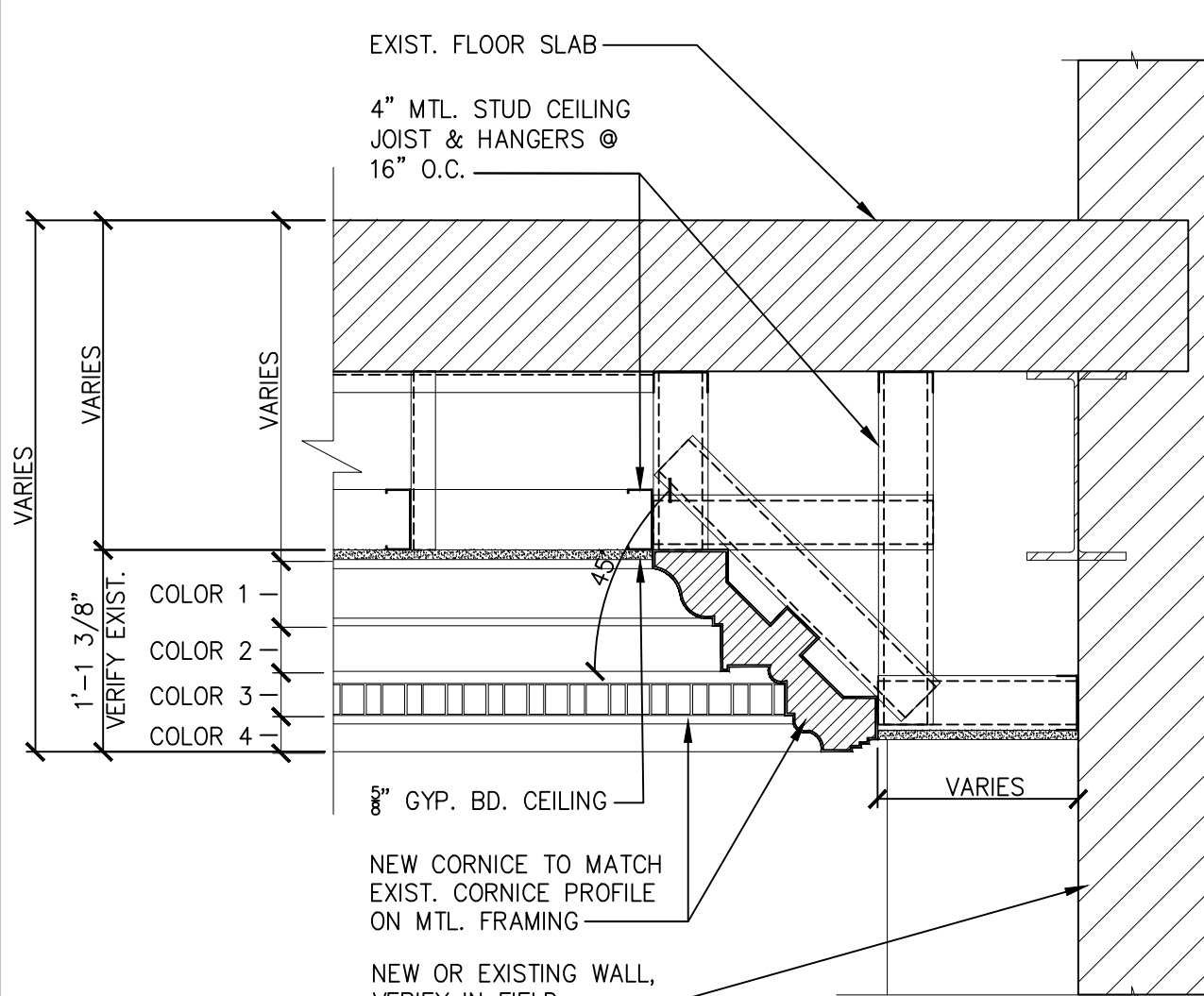
C 5TH & 6TH INTERIOR ELEVATION
SCALE: 1/4"=1'-0"



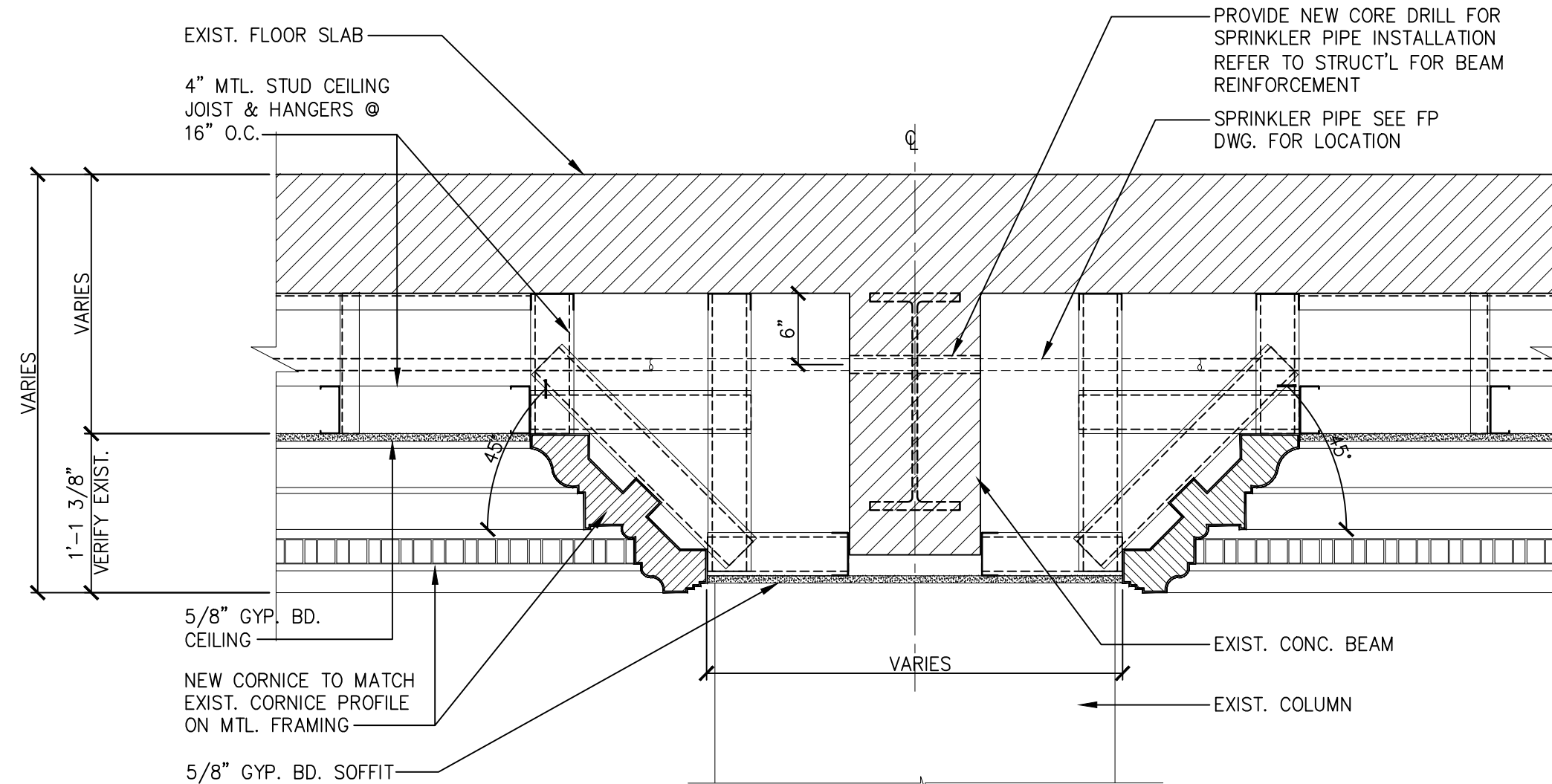
D 7TH & 8TH INTERIOR ELEVATION
SCALE: 1/4"=1'-0"



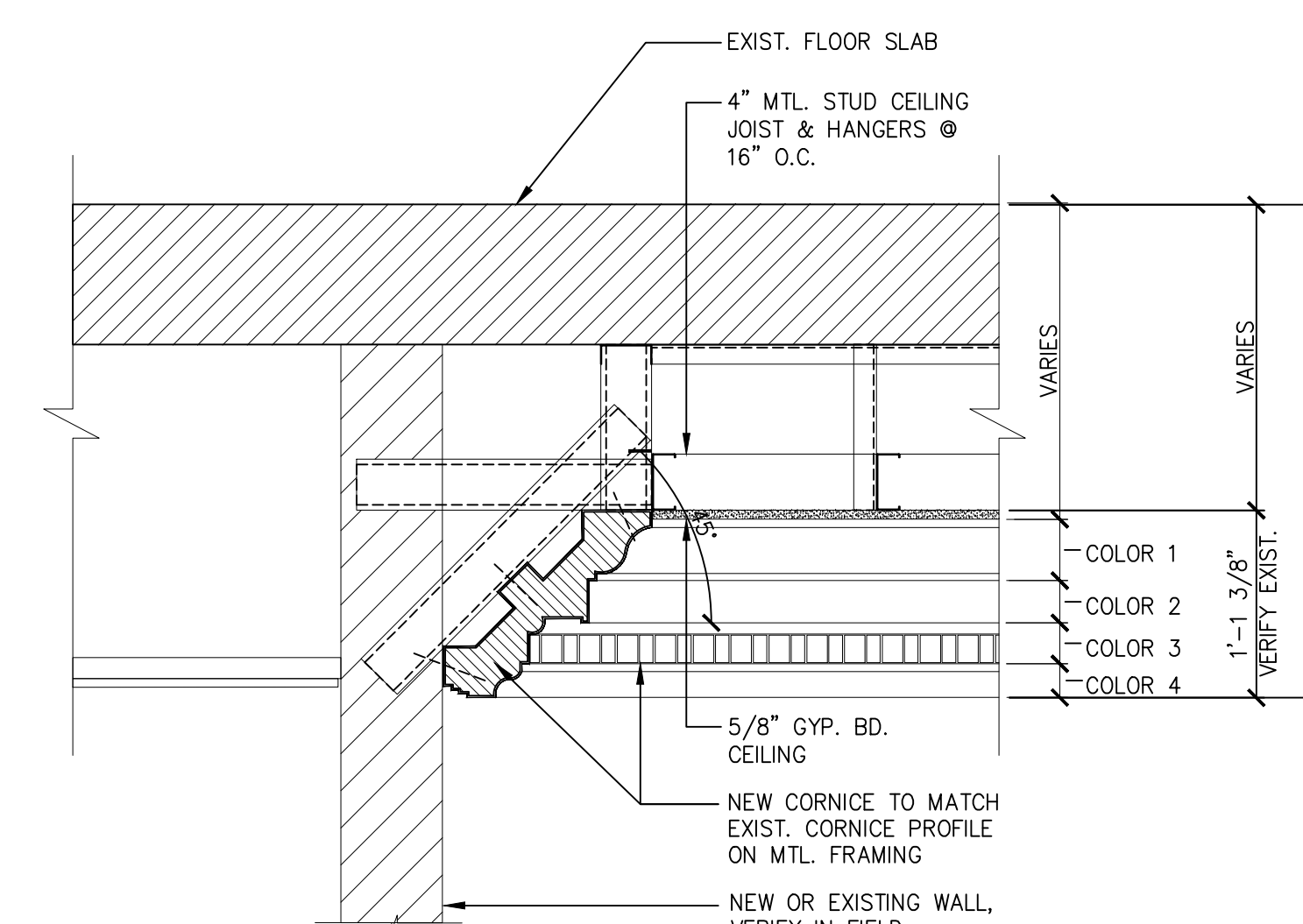
E TYP. SECTION DETAIL AT NEW WALL
SCALE: 1"=1'-0"



F TYP. CEILING CORNICE DETAIL
SCALE: 1"=1'-0"



G TYP. CEILING CORNICE DETAIL
SCALE: 1"=1'-0"



H TYP. CEILING CORNICE DETAIL
SCALE: 1"=1'-0"

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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

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PROJECT:

**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

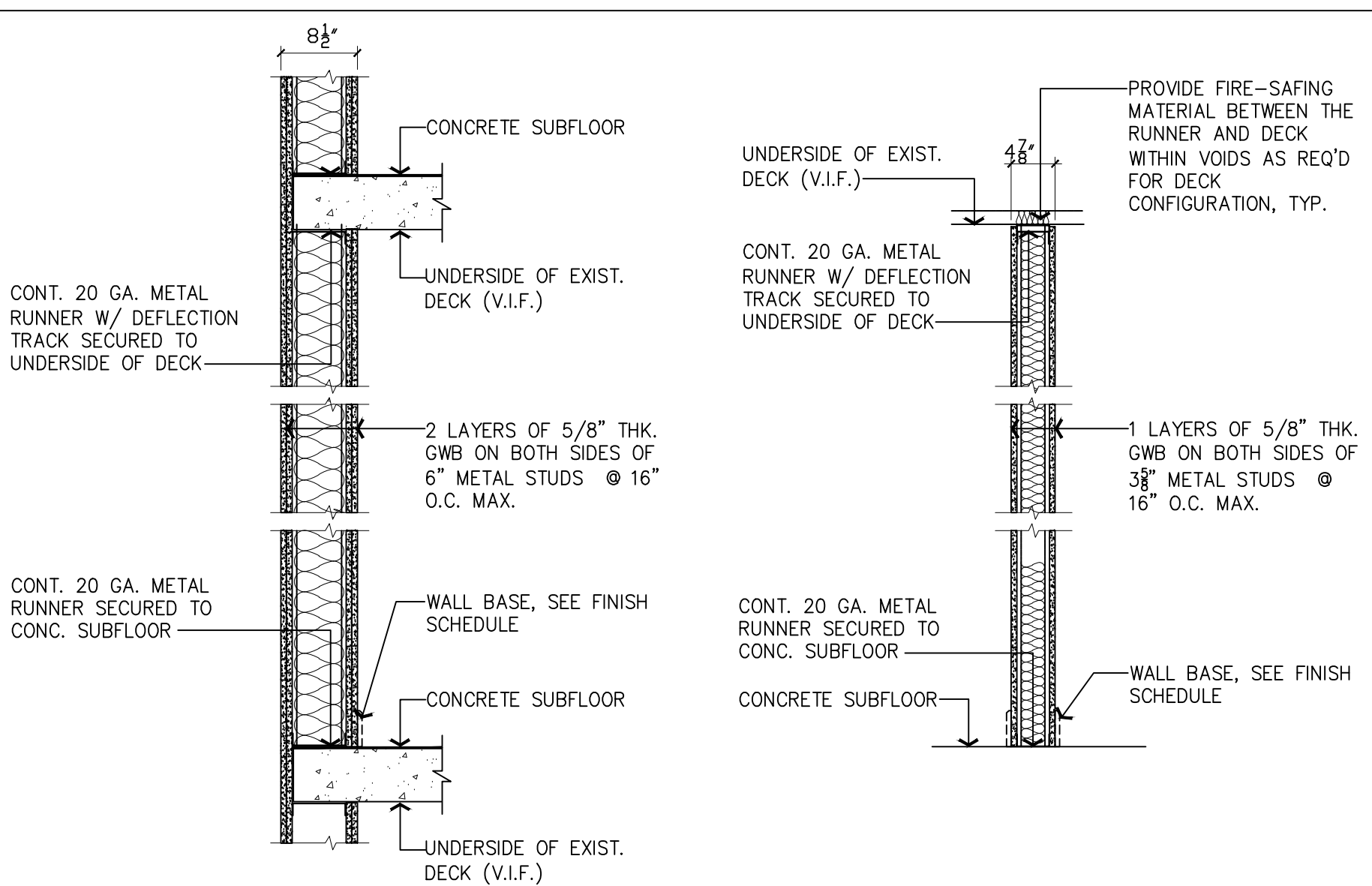
INTERIOR ELEVATIONS

SUBMISSIONS				REVISIONS				DATE	
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10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 54 OF: 160
									DWG NO

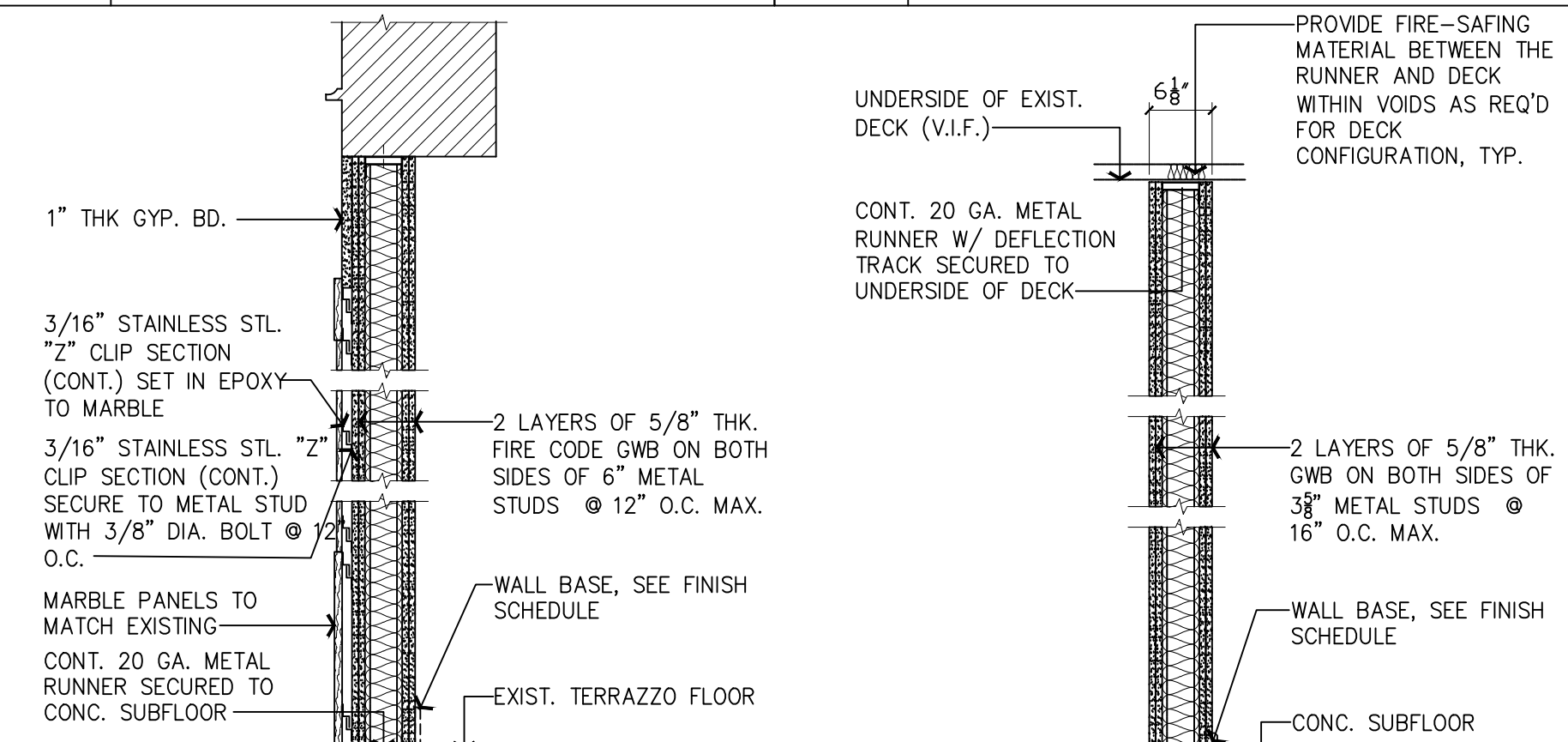
A.201

PARTITION TYPES

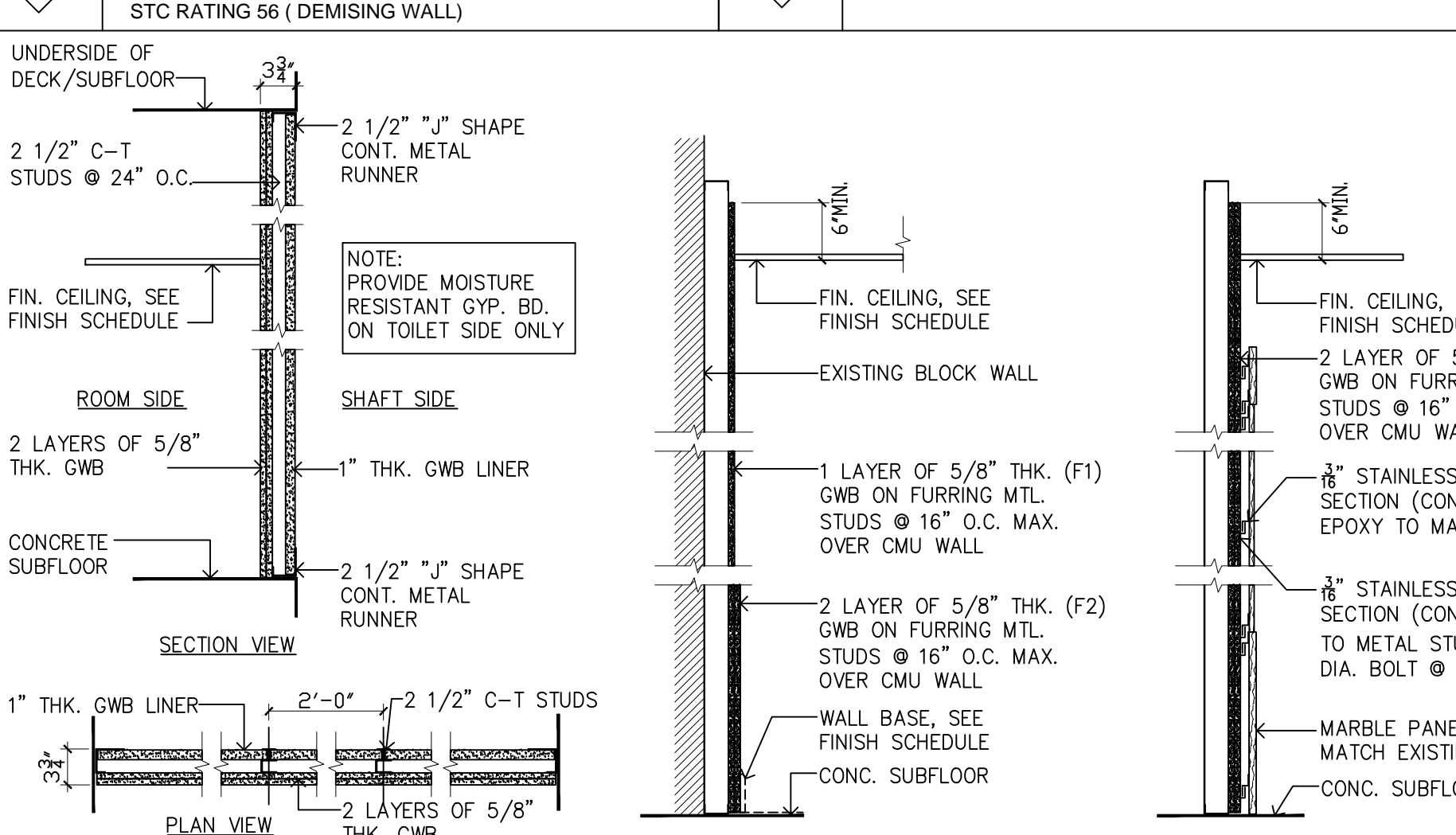
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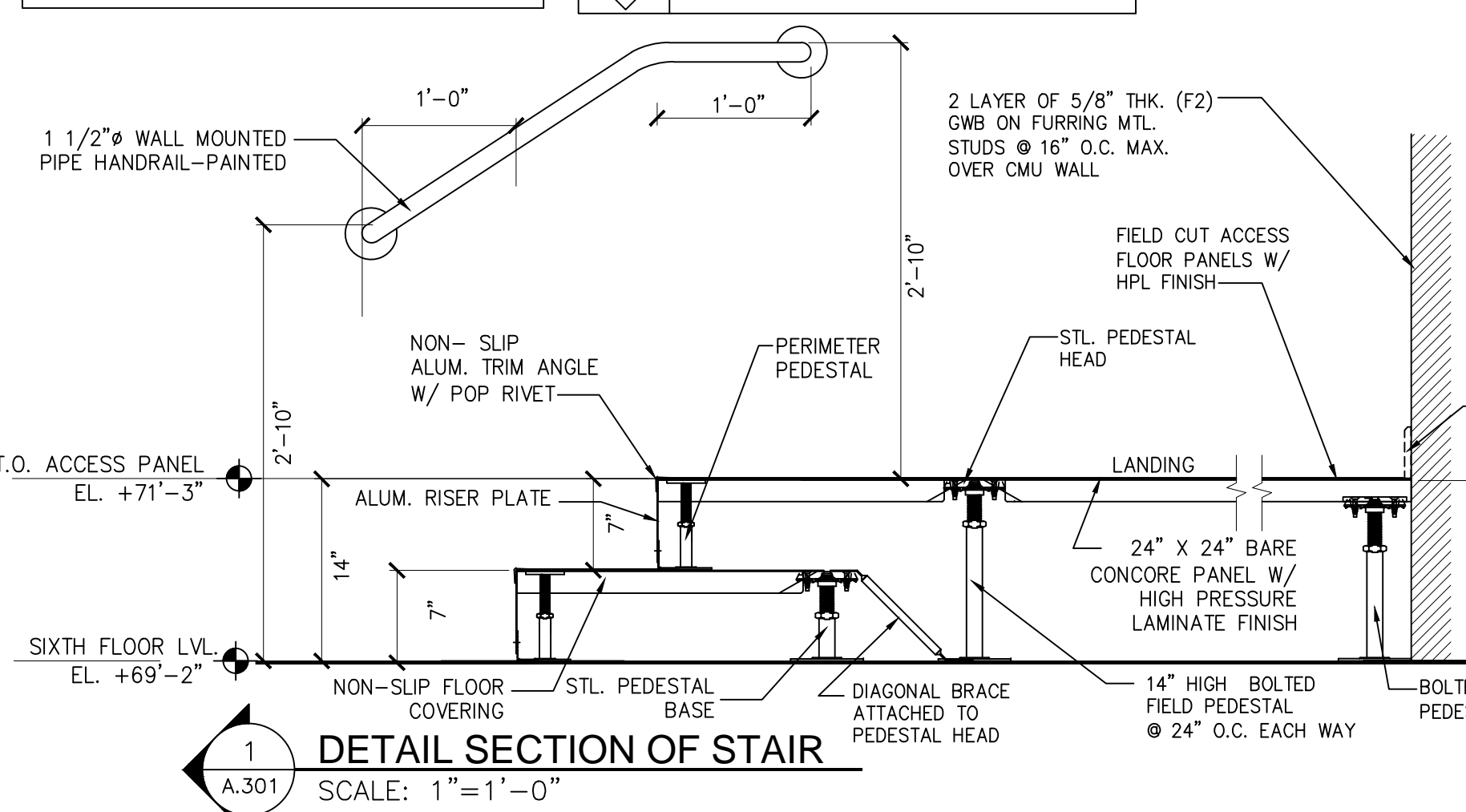
D1	DRYWALL PARTITION TYPE 2 HOUR RATED PARTITION UL DESIGN NO. U495 STC RATING: 56 (DEMISING WALL)	D2	DRYWALL PARTITION TYPE NON-RATED PARTITION WITH SOUND ATTENUATION BLANKET
-----------	--	-----------	--



D3	DRYWALL PARTITION TYPE 2 HOUR RATED PARTITION UL DESIGN NO. U495 STC RATING: 56 (DEMISING WALL)	D4	DRYWALL PARTITION TYPE 2 HR FIRE RATED (UL-428) PARTITION W/ BATT INSULATION
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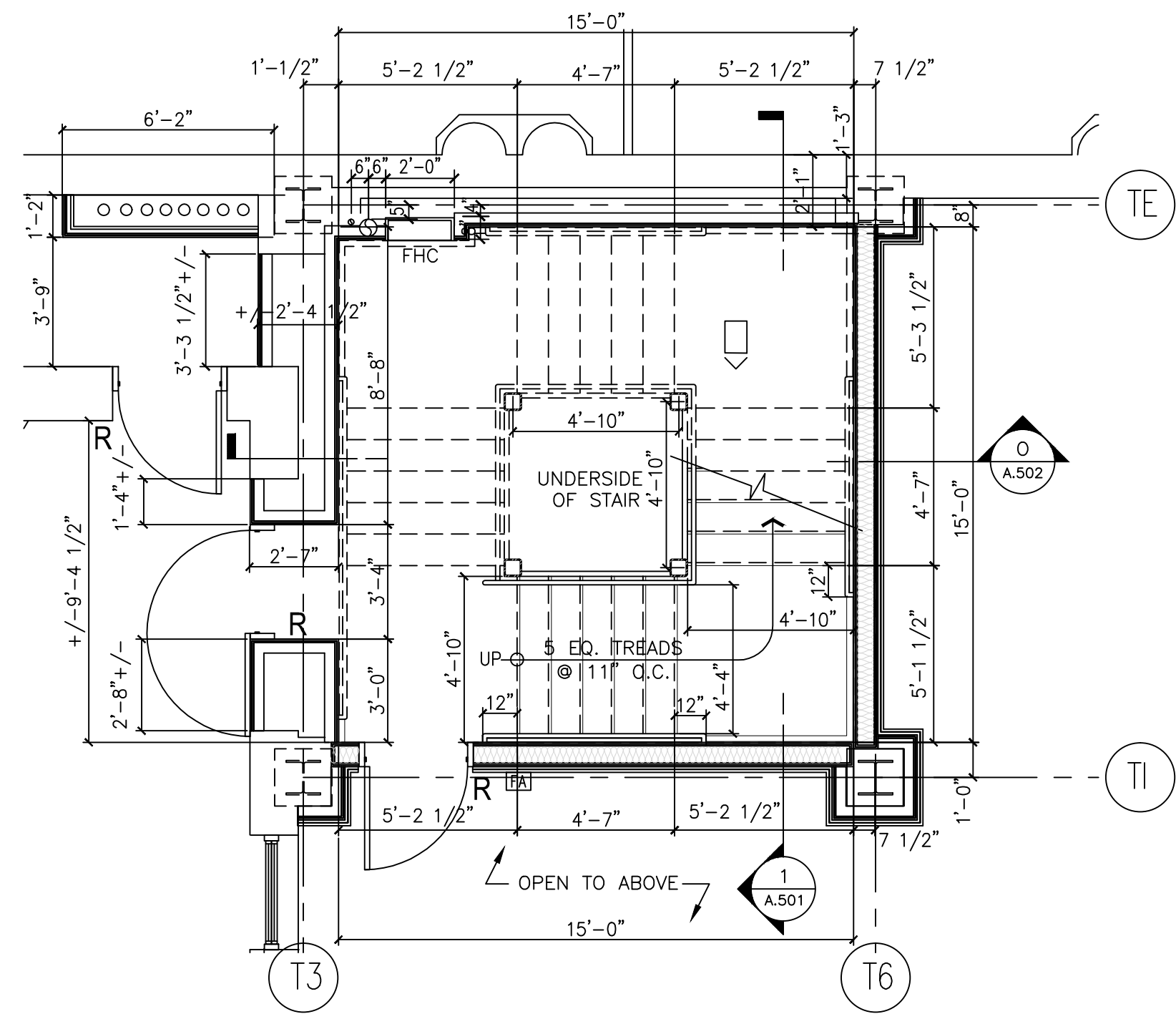
S1	SHAFTWALL PARTITION TYPE 1-HOUR FIRE-RATED WALL UL DESIGN NO. U415 (SYSTEM B)	F1	FURRED-OUT PARTITION 3 1/2" METAL STUD @ 16" O.C.	F2A	FURRED-OUT PARTITION 2 HR RATED FURRED WALL ON 3 5/8" MTL. STUDS @ 16" O.C.
		F2	FURRED-OUT PARTITION 2 HR RATED FURRED WALL ON 3 5/8" MTL. STUDS @ 16" O.C.	F3	FURRED-OUT PARTITION 7/8" HAT FURRING CHANNEL @ 16" O.C.



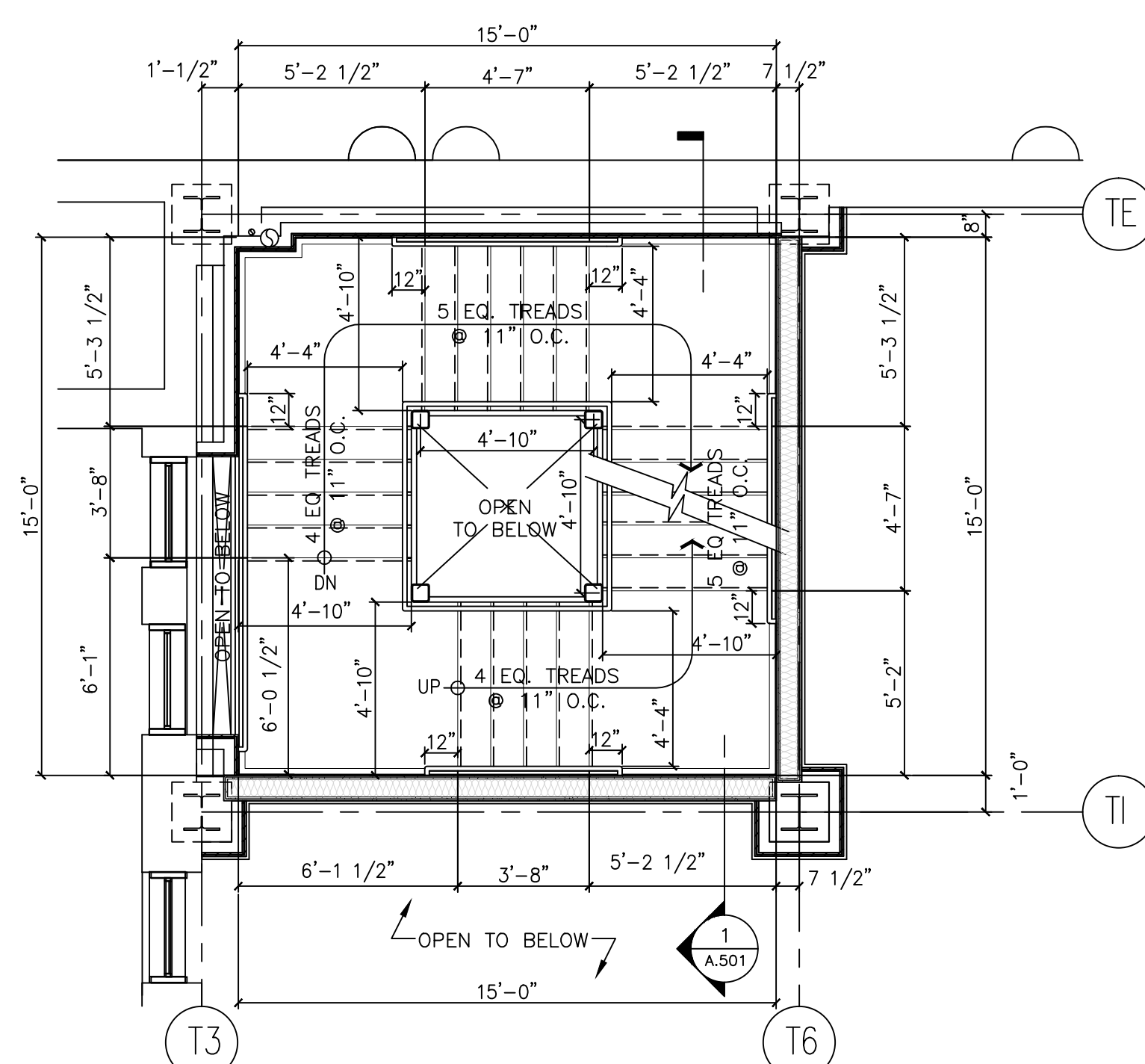
1 DETAIL SECTION OF STAIR
SCALE: 1" = 1'-0"

DOOR AND FRAME SCHEDULE

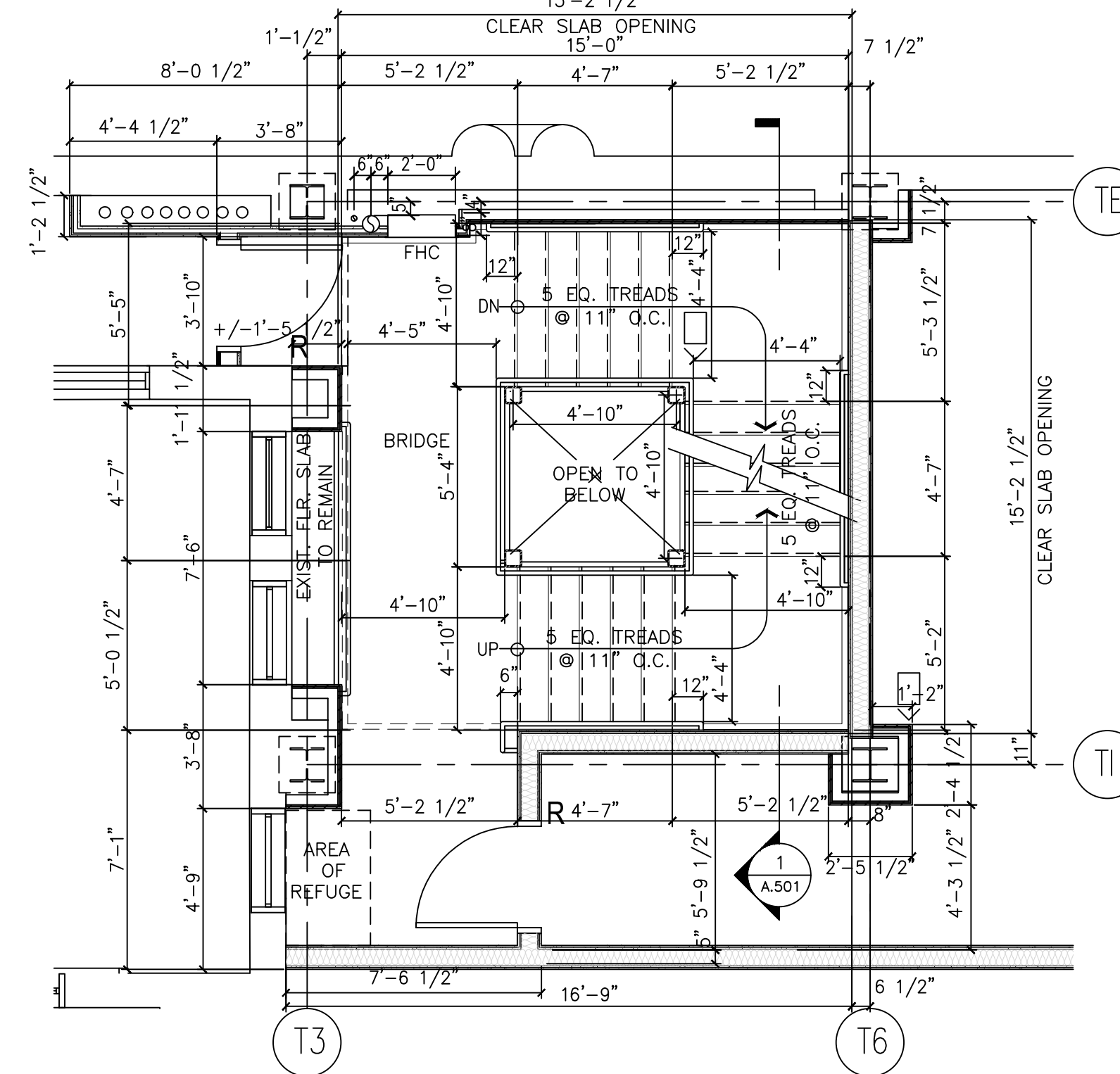
DOOR NO.	DOOR LOCATION		DOOR			FRAME			SILL	H.M. FRAME SET	REMARKS								
	FROM	TO	WIDTH	HEIGHT	THICKNESS	MATERIAL	FINISH	GLAZING				MATERIAL	FINISH	TYPE	DETAILS	HEAD	JAMB	TYPE	DETAILS
GROUND FLOOR																			
003	CORRIDOR	EXTERIOR	4'-0"	8'-0"	---	---	---	---	---	---	---	---	---	---	---	---	---	01 TOW	CHARLINK FENCE GATE W/ LOCK
1ST FLOOR																			
101	ELEV. LOBBY	STAR T2	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	2	J2	H2	SI	---	90 MN.	04 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/W/O
102	STAR T1	UPPER LOBBY	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	07B TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY
103	STAR T1	UPPER STAR LANDING	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J1	H1	SI	---	90 MN.	07A TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY
104	CORRIDOR	UPPER STAR LANDING	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J1	H1	SI	---	45 MN.	07B TOW	FIRE RATED ASSEMBLY/COR
105	CLERK ROOM	CORRIDOR	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	08 TOW	FIRE RATED ASSEMBLY
2ND FLOOR																			
201	ELEV. LOBBY	STAR T2	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	09 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/W/O
202	OFFICE	ELEV. LOBBY	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J3	H3	SI	---	45 MN.	10 TOW	FIRE RATED ASSEMBLY/COR
203	OFFICE	MEYER RM.	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	11 TOW	FIRE RATED ASSEMBLY
3RD FLOOR																			
301	ELEV. LOBBY	STAR T2	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	09 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/W/O
302	LOBBY	CLOSET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J1	H1	SI	---	45 MN.	02 TOW	FIRE RATED ASSEMBLY/COR
303	CORRIDOR	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J1	H1	SI	---	90 MN.	07C TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
304	CORRIDOR	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	07A TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY
305	CLERK	CORRIDOR	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J2	H2	SI	---	45 MN.	08 TOW	FIRE RATED ASSEMBLY
306	OPEN OFFICE	ELEV. LOBBY	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	2	J2	H2	SI	---	45 MN.	10 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
307	OPEN OFFICE	MEYER'S TOILET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	10 TOW	FIRE RATED ASSEMBLY
4TH FLOOR																			
401	ELEV. LOBBY	STAR T2	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	09 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/W/O
402	OPEN OFFICE	CLOSET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J1	H1	SI	---	45 MN.	02 TOW	FIRE RATED ASSEMBLY/COR
403	OPEN OFFICE	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	07C TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
404	OPEN OFFICE	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	2	J3	H3	SI	---	45 MN.	14 TOW	FIRE RATED ASSEMBLY/COR
405	OPEN OFFICE	WOMEN'S TOILET	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	2	J3	H3	SI	---	45 MN.	11 TOW	FIRE RATED ASSEMBLY
406	ELEV. LOBBY	MEYER'S TOILET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	11 TOW	FIRE RATED ASSEMBLY
5TH FLOOR																			
501	ELEV. LOBBY	STAR T2	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	09 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/W/O
502	LOBBY	CLOSET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J1	H1	SI	---	45 MN.	02 TOW	FIRE RATED ASSEMBLY/COR
503	CORRIDOR	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	07C TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
504	CORRIDOR	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J1	H1	SI	---	90 MN.	07A TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY
505	CLERK	CORRIDOR	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J1	H1	SI	---	45 MN.	08 TOW	FIRE RATED ASSEMBLY
506	OPEN OFFICE	ELEV. LOBBY	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	2	J2	H2	SI	---	45 MN.	10 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
507	ELEV. LOBBY	MEYER'S TOILET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	11 TOW	FIRE RATED ASSEMBLY
6TH FLOOR																			
601	ELEV. LOBBY	STAR T2	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	09 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/W/O
602	OPEN OFFICE	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	45 MN.	02 TOW	FIRE RATED ASSEMBLY/COR
603	ELEV. LOBBY	OPEN OFFICE	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	2	J3	H3	SI	---	45 MN.	15 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
604	ELEV. LOBBY	WOMEN'S TOILET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	11 TOW	FIRE RATED ASSEMBLY
7TH FLOOR																			
701	ELEV. LOBBY	STAR T2	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	09 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/W/O
702	LOBBY	CLOSET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J1	H1	SI	---	45 MN.	02 TOW	FIRE RATED ASSEMBLY/COR
703	LOBBY	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	07C TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
704	CORRIDOR	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J1	H1	SI	---	90 MN.	07A TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY
705	CLERK	CORRIDOR	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J1	H1	SI	---	45 MN.	08 TOW	FIRE RATED ASSEMBLY
706	OPEN OFFICE	ELEV. LOBBY	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	2	J2	H2	SI	---	45 MN.	14 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
707	ELEV. LOBBY	WOMEN'S TOILET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	11 TOW	FIRE RATED ASSEMBLY
8TH FLOOR																			
801	ELEV. LOBBY	STAR T2	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	09 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/W/O
802	OPEN OFFICE	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	45 MN.	02 TOW	FIRE RATED ASSEMBLY/COR
803	OPEN OFFICE	ELEV. LOBBY	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	2	J3	H3	SI	---	45 MN.	14 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
804	CORRIDOR	ELEV. LOBBY	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	10A TOW	FIRE RATED ASSEMBLY
805	ELEV. LOBBY	MEYER'S TOILET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	11 TOW	FIRE RATED ASSEMBLY
9TH FLOOR																			
901	ELEV. LOBBY	STAR T2	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	09 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/W/O
902	OFFICE	CLOSET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J1	H1	SI	---	45 MN.	02 TOW	FIRE RATED ASSEMBLY/COR
903	TOILET	OFFICE	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J1	H1	SI	---	16 TOW	---	---
904	OPEN OFFICE	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	07C TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
905	OPEN OFFICE	ELEV. LOBBY	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	2	J3	H3	SI	---	45 MN.	10 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
906	OFFICE	ELEV. LOBBY	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	10B TOW	FIRE RATED ASSEMBLY/COR
907	ELEV. LOBBY	WOMEN'S TOILET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	11 TOW	FIRE RATED ASSEMBLY
10TH FLOOR																			
1001	ELEV. LOBBY	STAR T2	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	09 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/W/O
1002	OFFICE	UTILITY	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J1	H1	SI	---	45 MN.	02 TOW	FIRE RATED ASSEMBLY/COR
1003	OFFICE	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	16A TOW	---	---
1004	OPEN OFFICE	STAR T1	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	90 MN.	07C TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
1005	OPEN OFFICE	ELEV. LOBBY	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	2	J3	H3	SI	---	45 MN.	10 TOW	WIRE GLASS VISION PANEL/FIRE RATED ASSEMBLY/COR
1006	OFFICE	ELEV. LOBBY	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	10B TOW	FIRE RATED ASSEMBLY/COR
1007	ELEV. LOBBY	MEYER'S TOILET	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	---	H.M.	FP1	1	J3	H3	SI	---	45 MN.	11 TOW	FIRE RATED ASSEMBLY
11TH FLOOR																			
1101	ELEV. LOBBY	STAR T2	3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	1	J2	H2	SI	---	9		



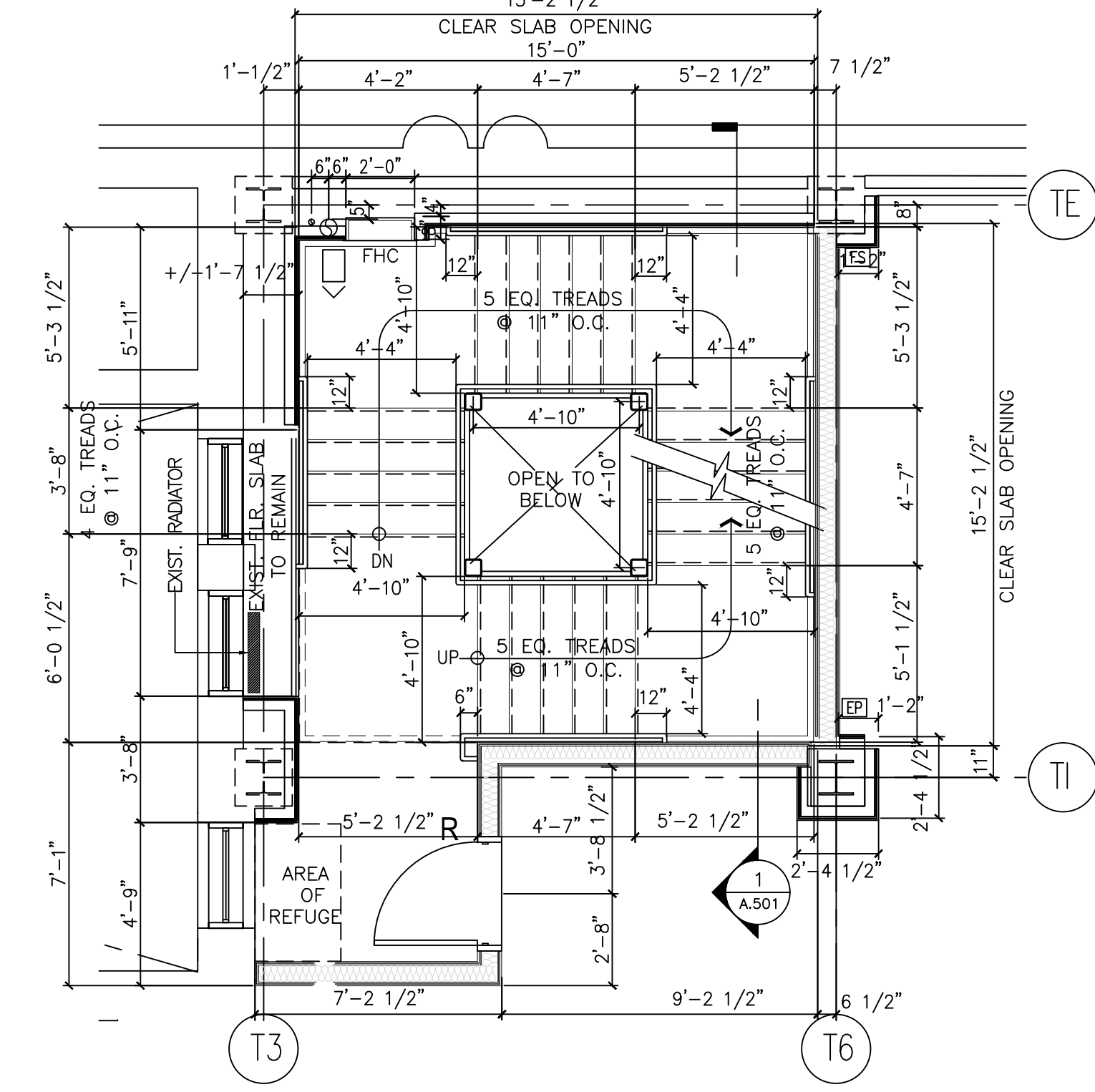
1 1ST FLOOR ENLARGED STAIR PLAN
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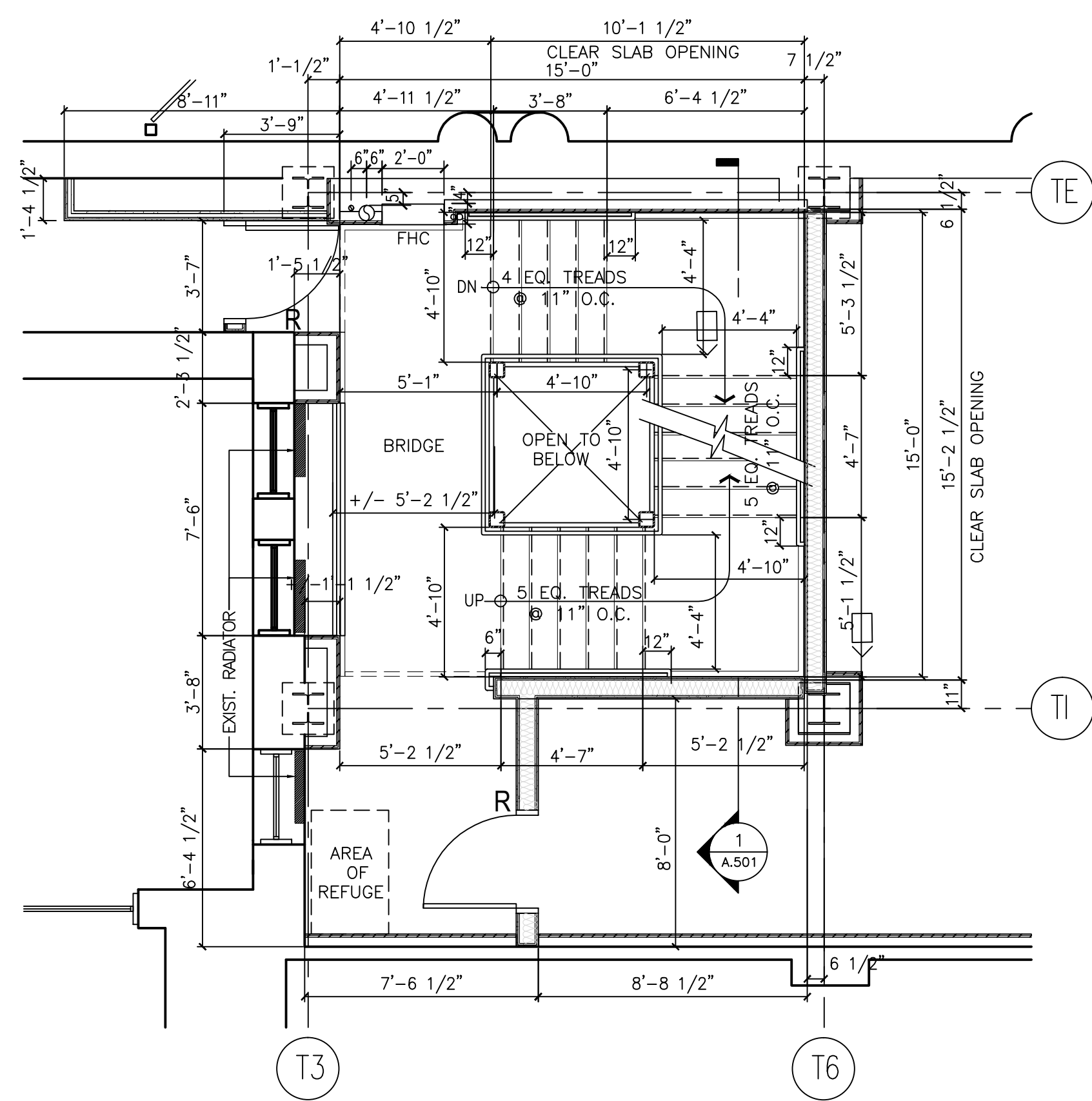
2 2ND FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



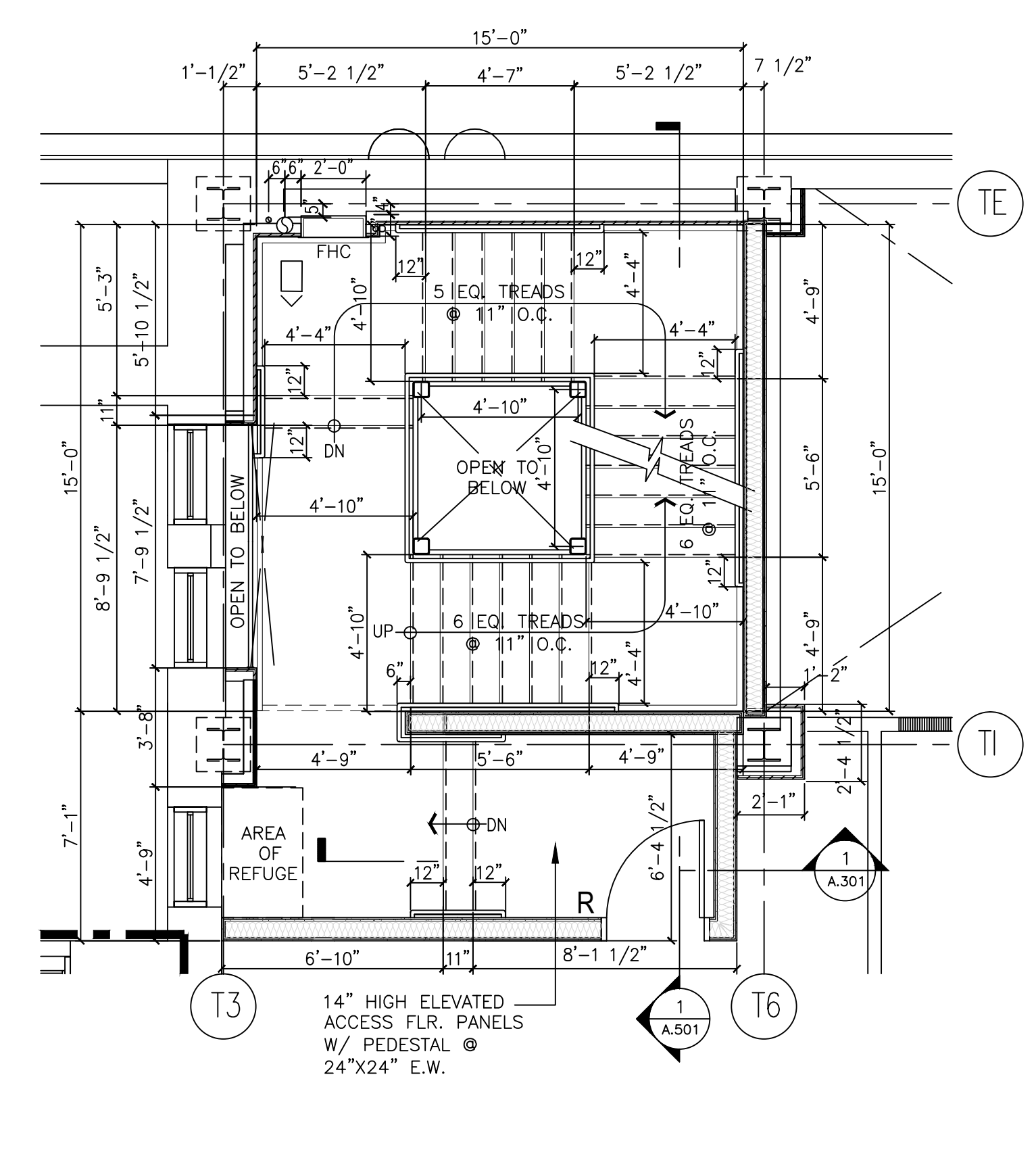
3 3RD FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



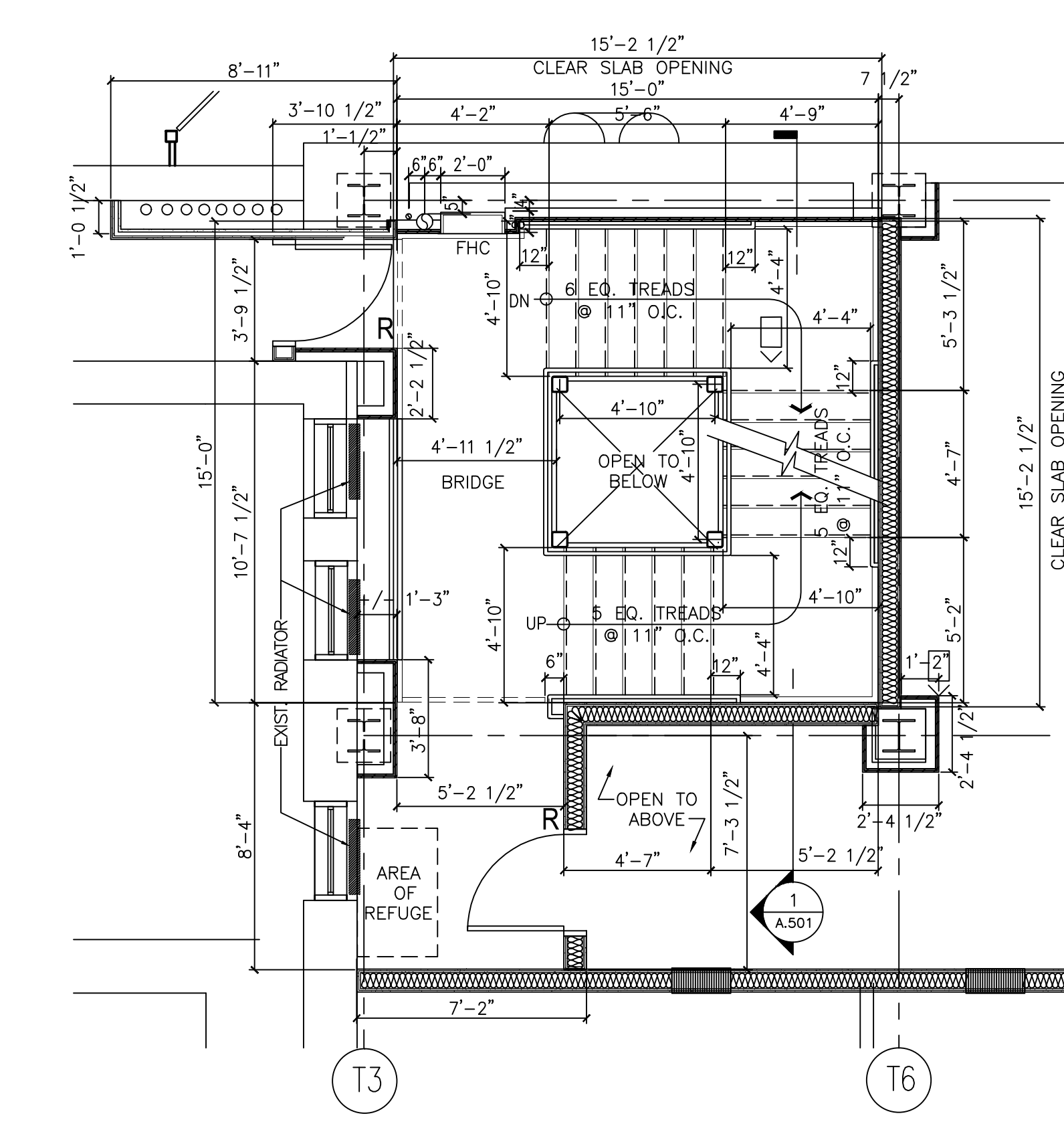
4 4TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



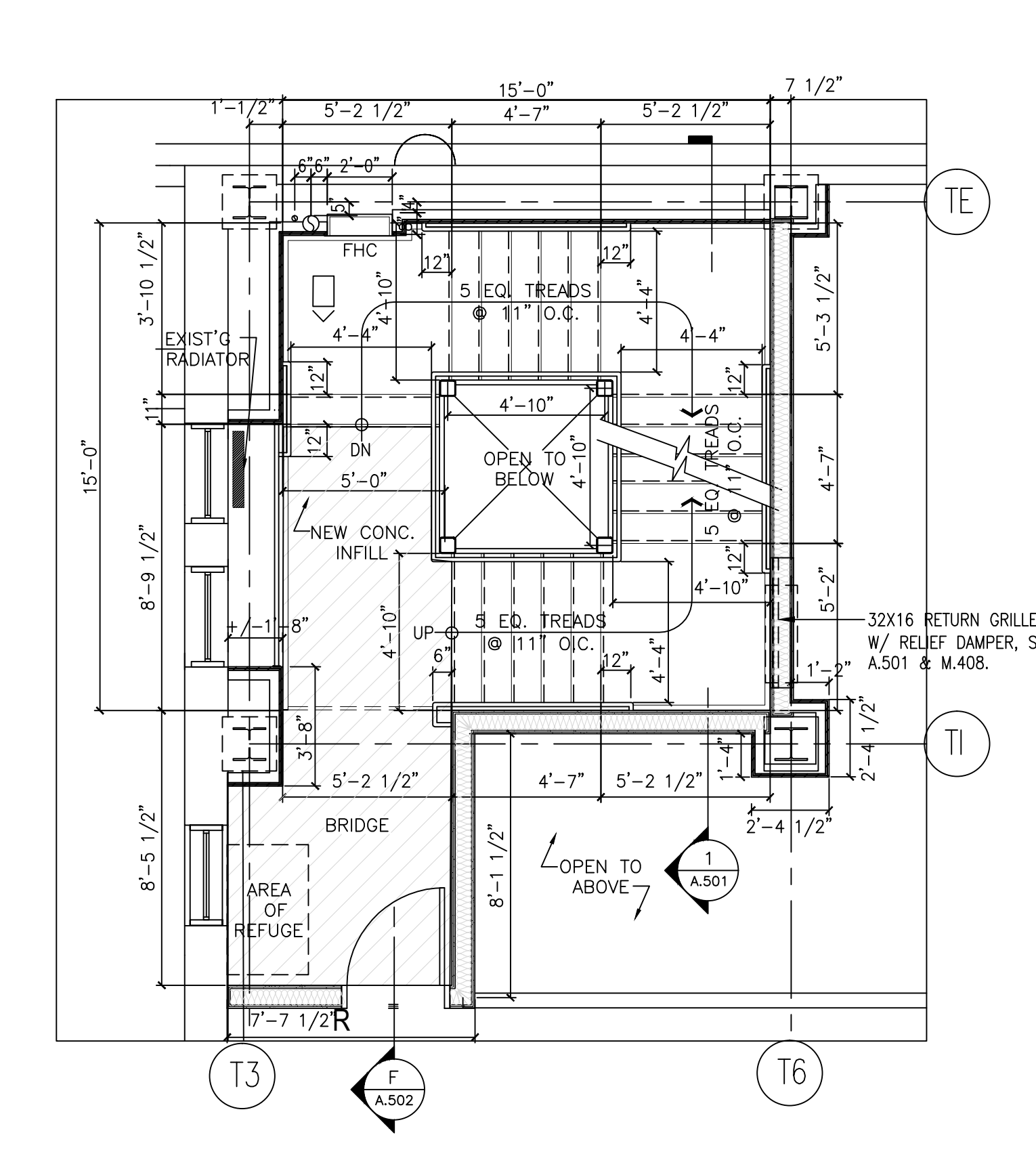
5 5TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



6 6TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"

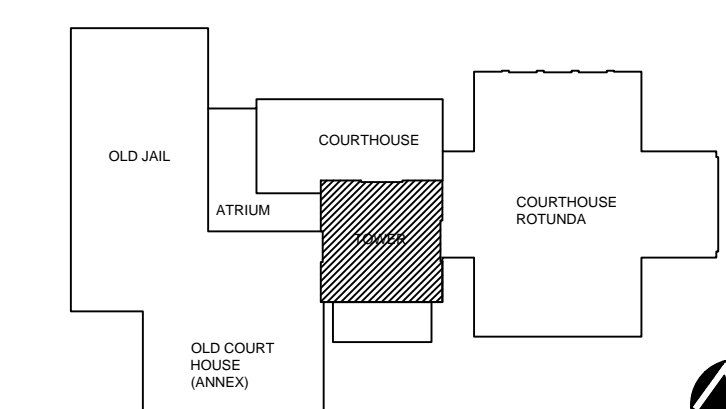


7 7TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



8 8TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"

KEYPLAN



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PROJECT:

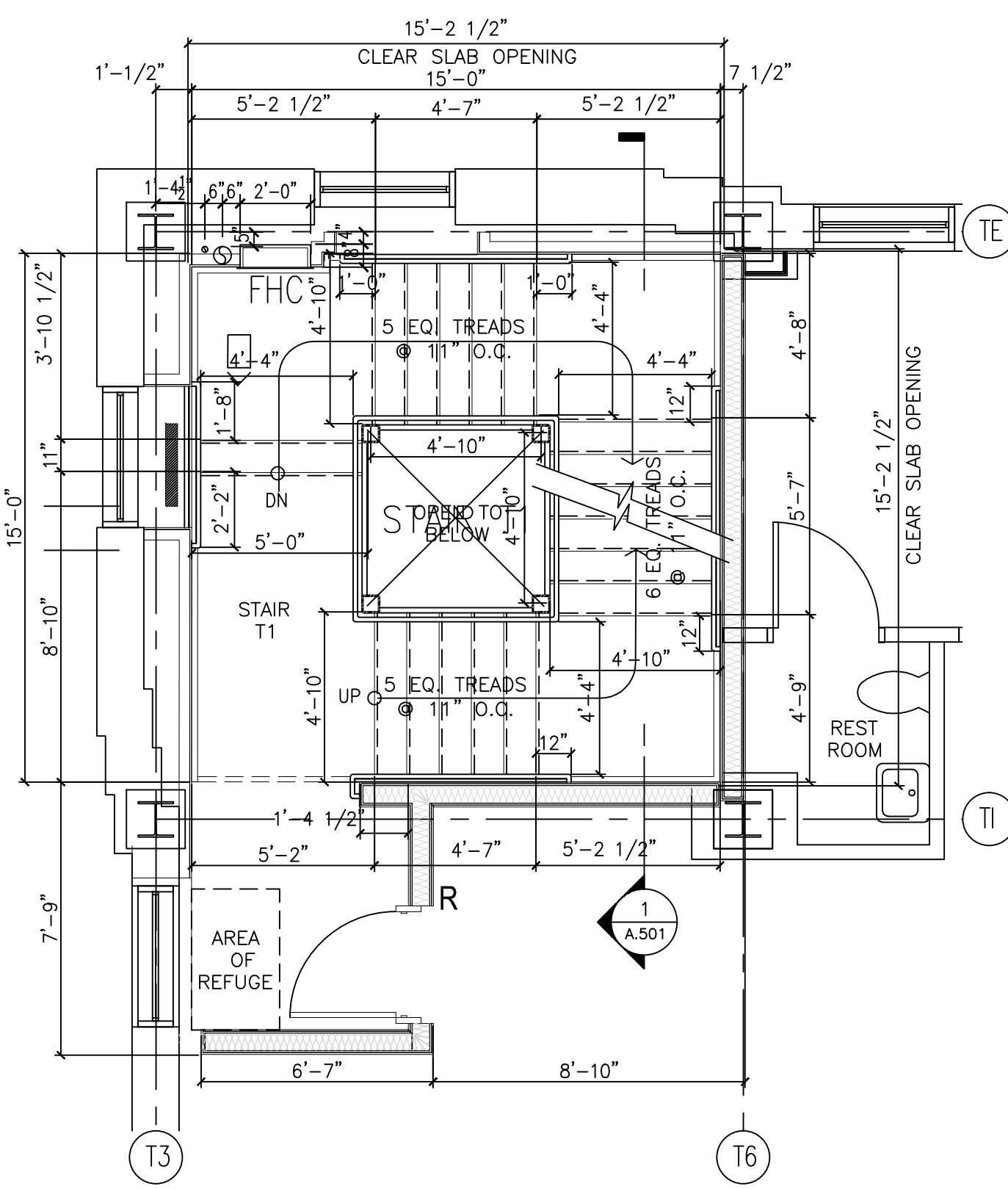
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

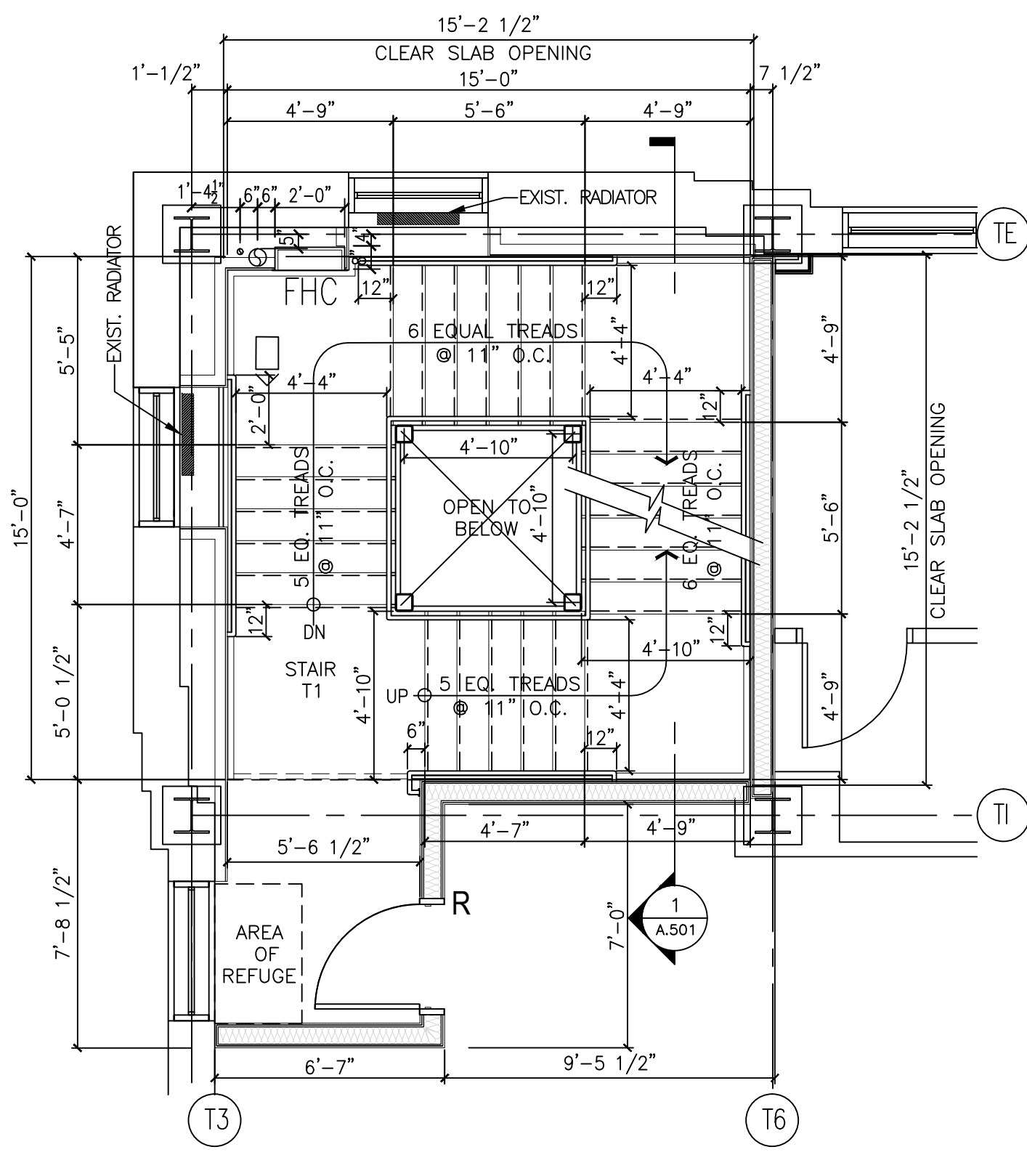
ENLARGED STAIR PLANS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 56 OF: 160
									DWG NO

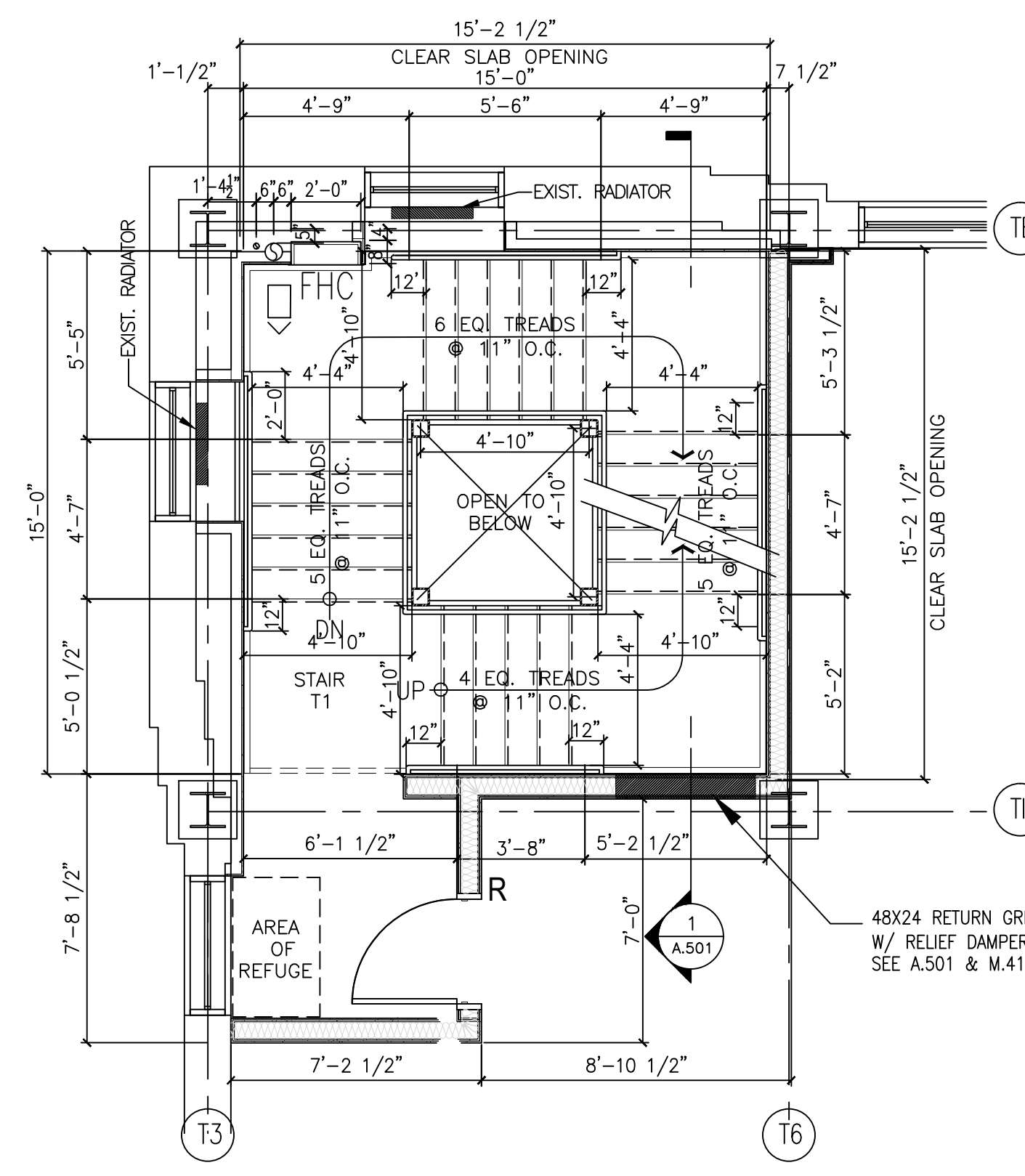
A.401



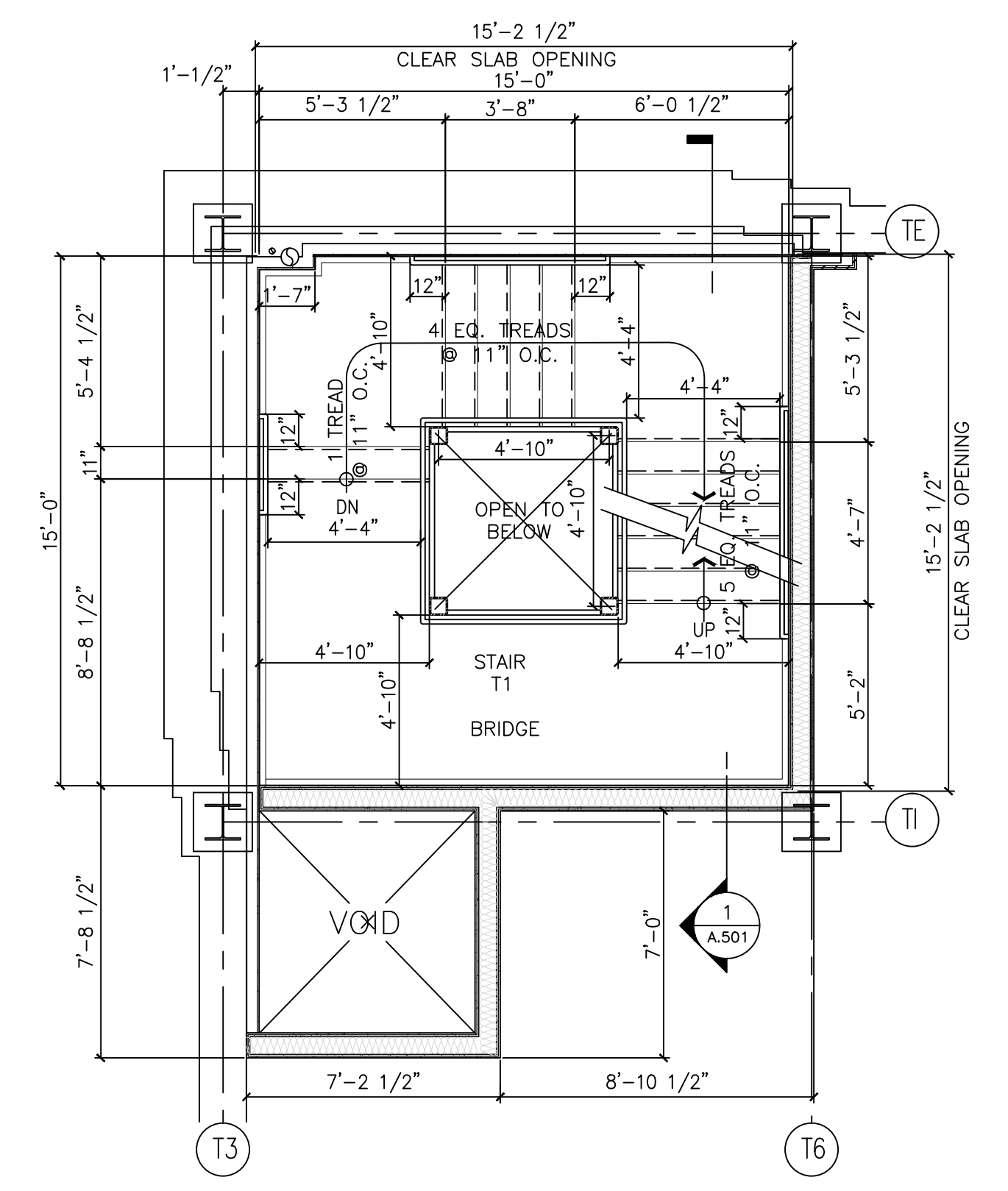
9 9TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



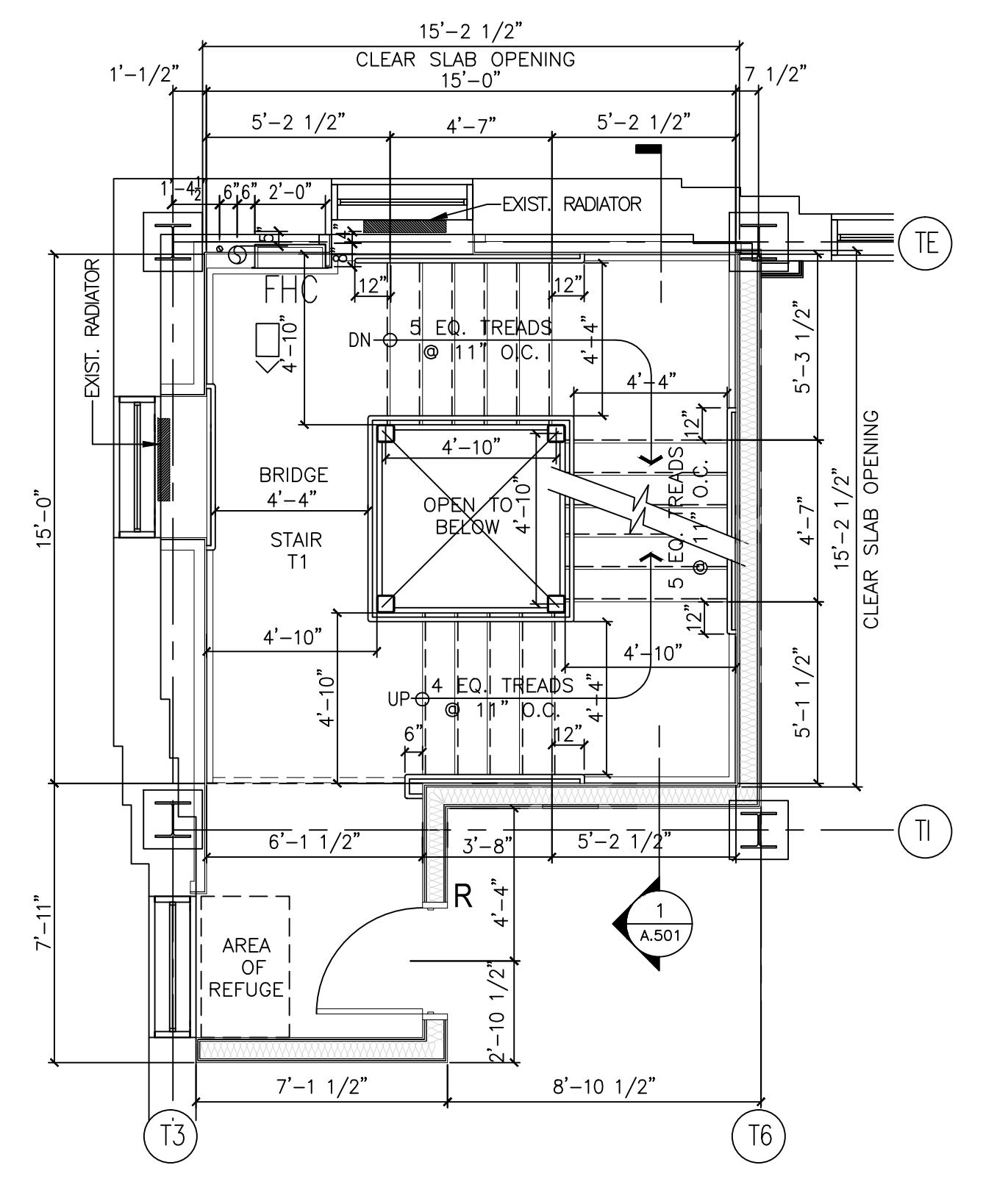
10 10TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



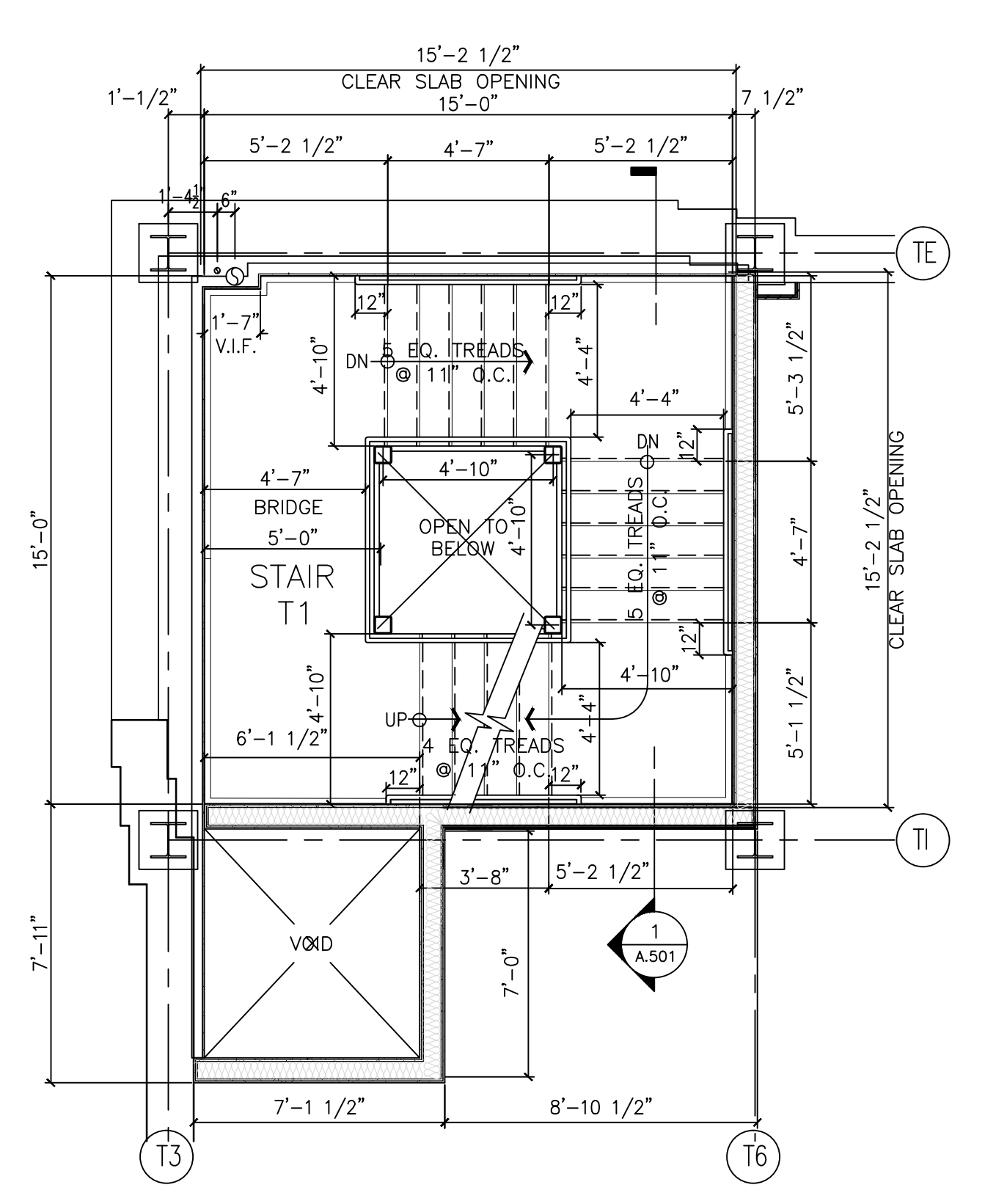
11 11TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



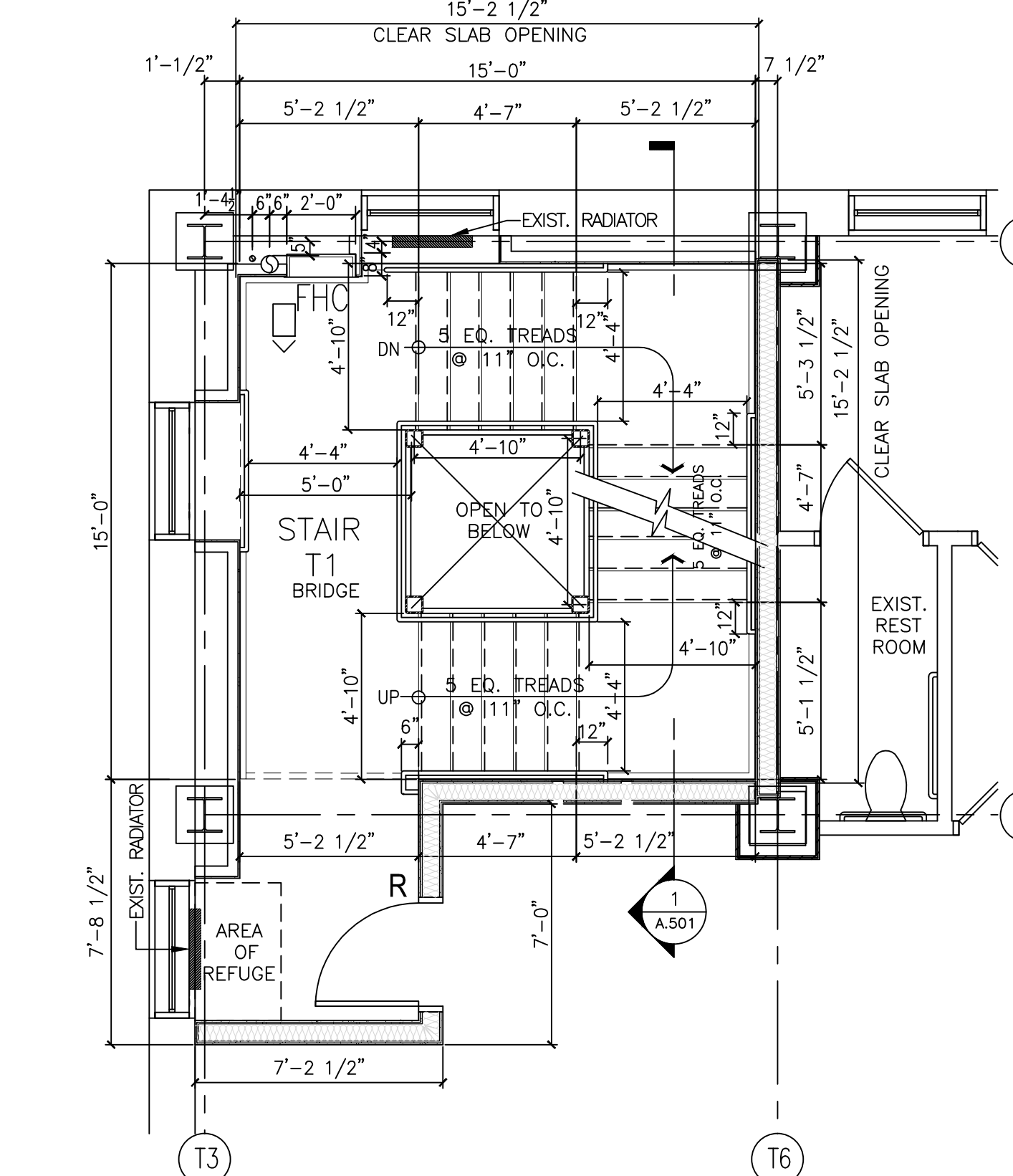
11.1 11TH & 12TH INTERMEDIATE FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



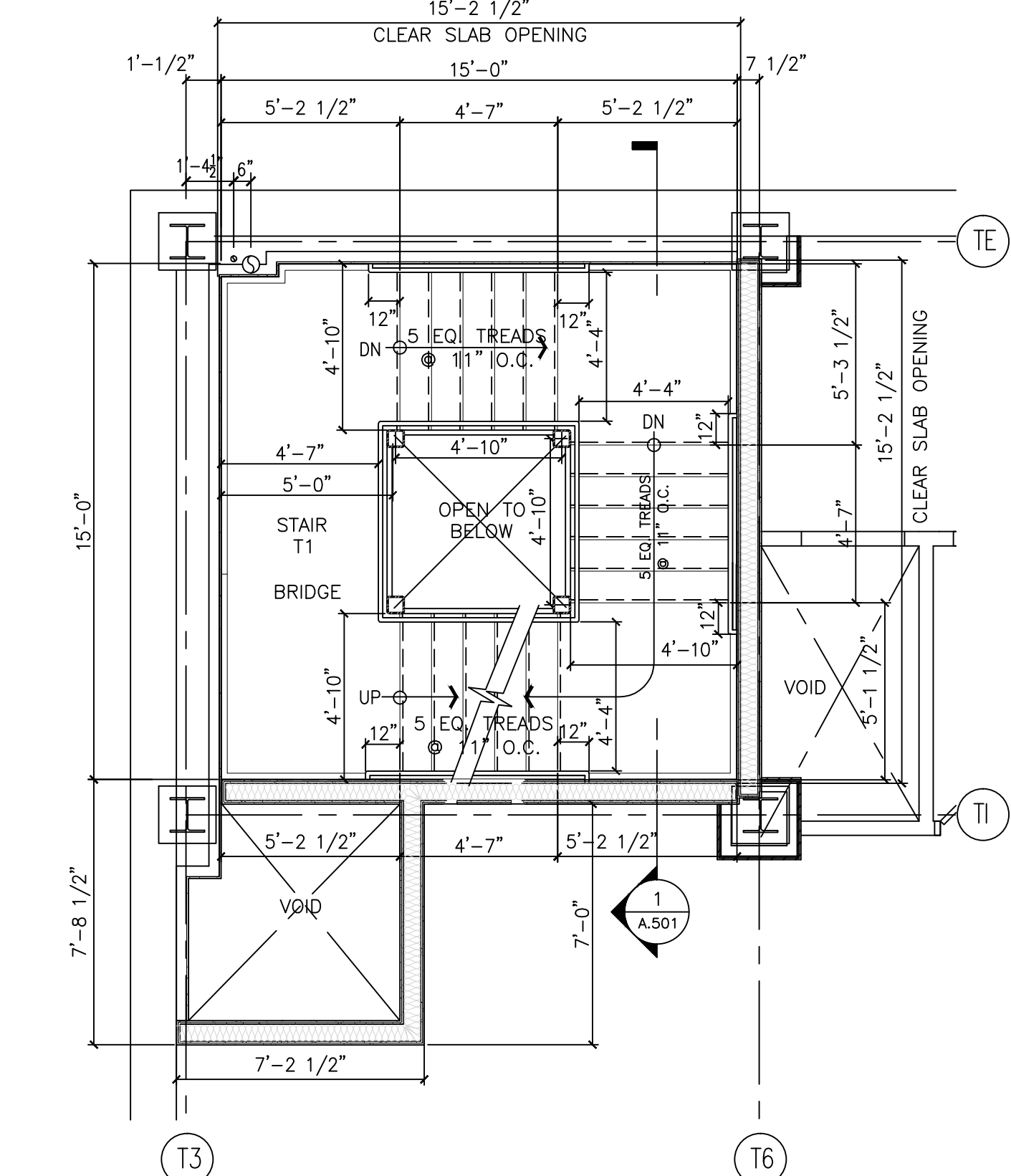
12 12TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



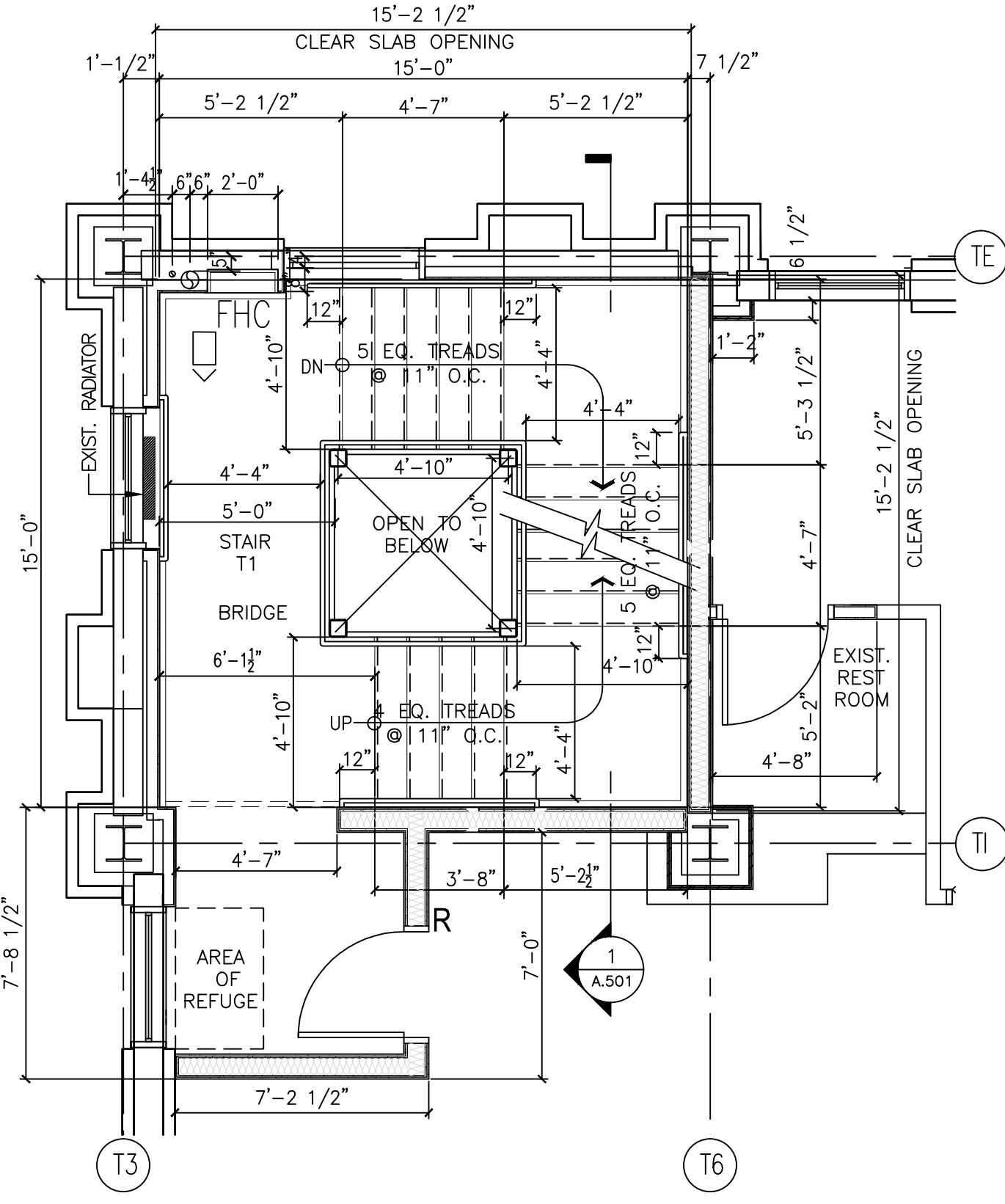
12.1 12TH & 13TH INTERMEDIATE FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



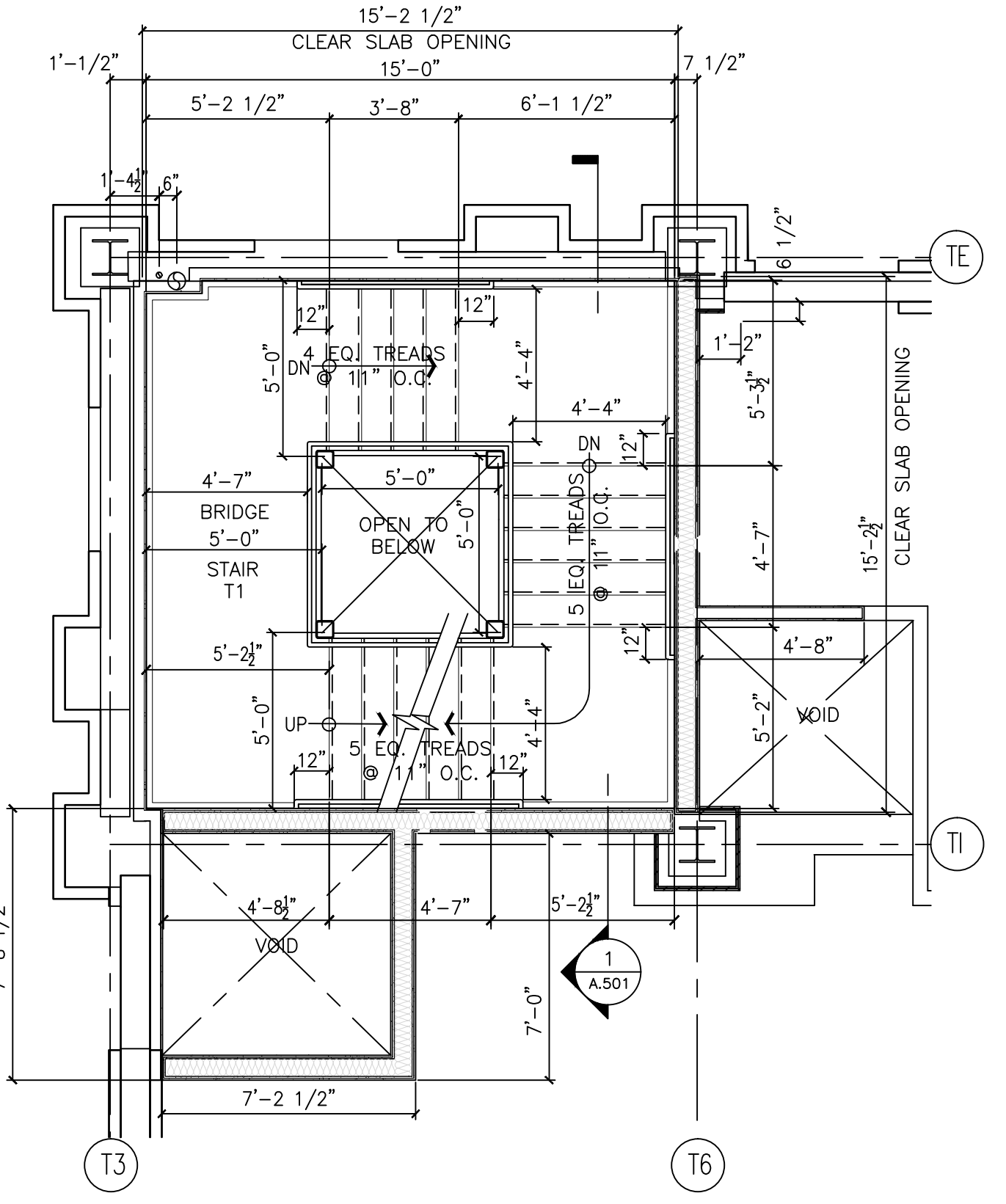
13 13TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



13.1 13TH & 14TH INTERMEDIATE FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"

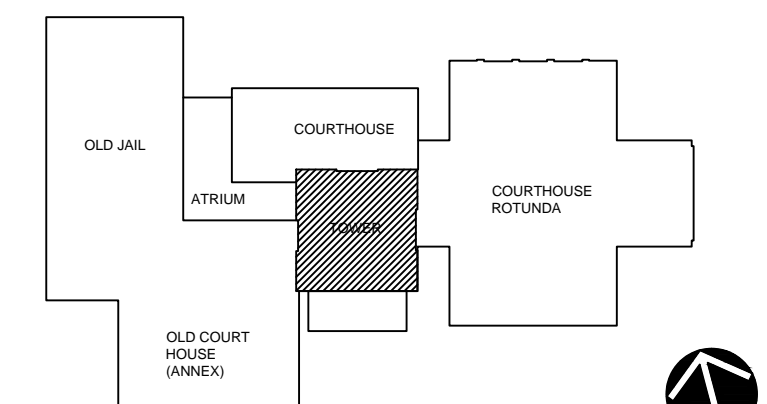


14 14TH FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"



14.1 14TH & 15TH INTERMEDIATE FLOOR ENLARGED STAIR PLAN
SCALE: 1/4"=1'-0"

KEYPLAN



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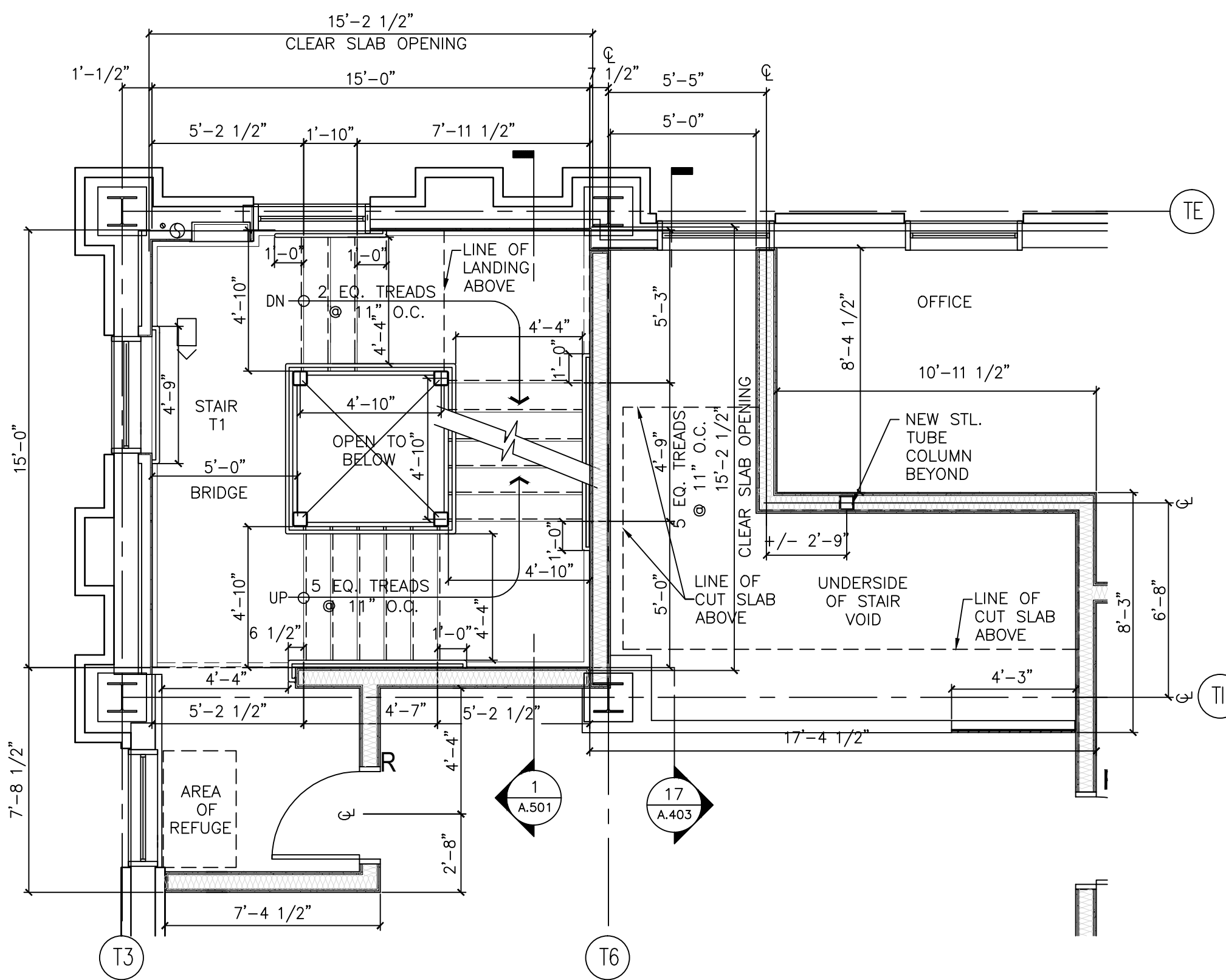


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

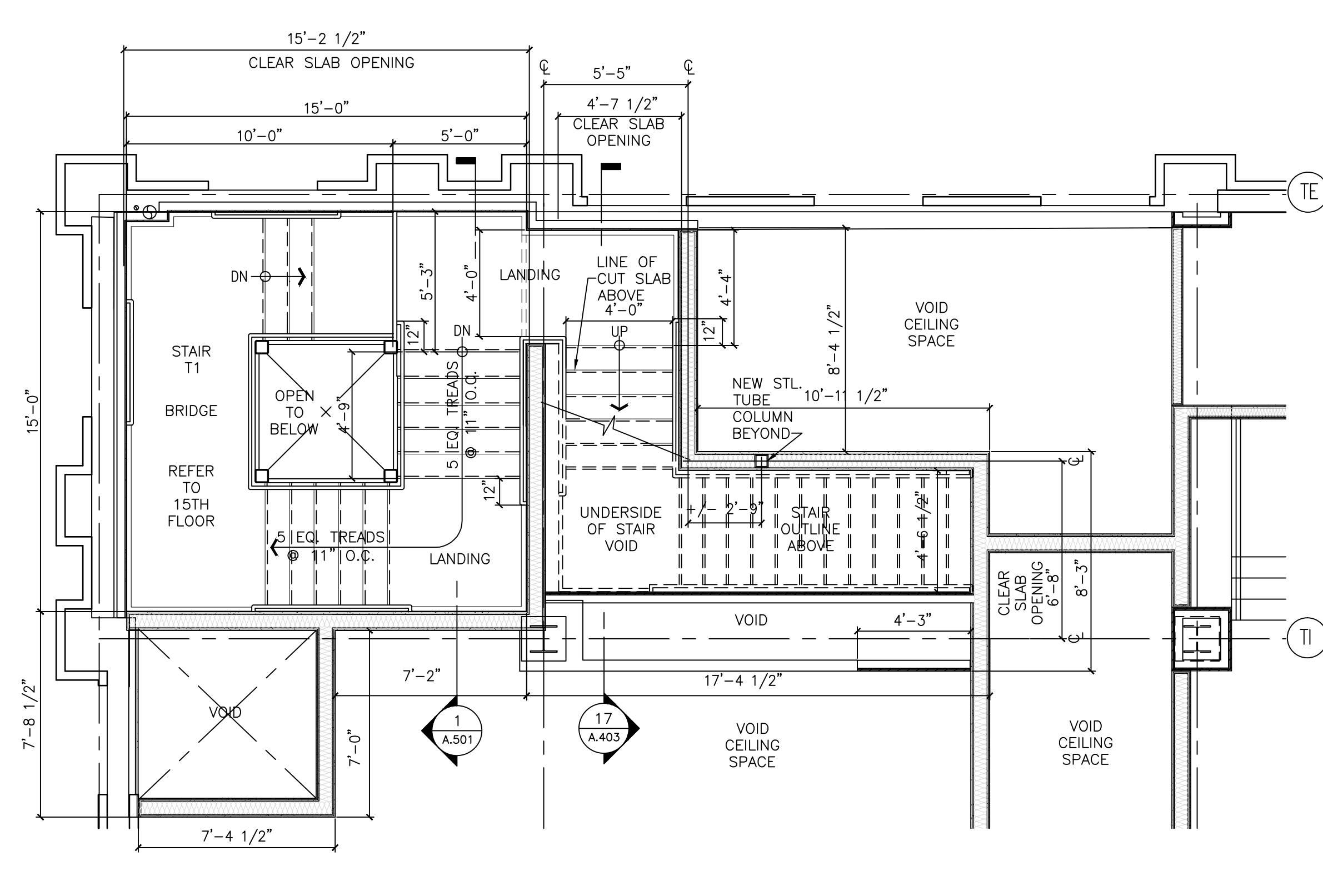
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ENLARGED STAIR PLANS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 57 OF:160
									DWG NO

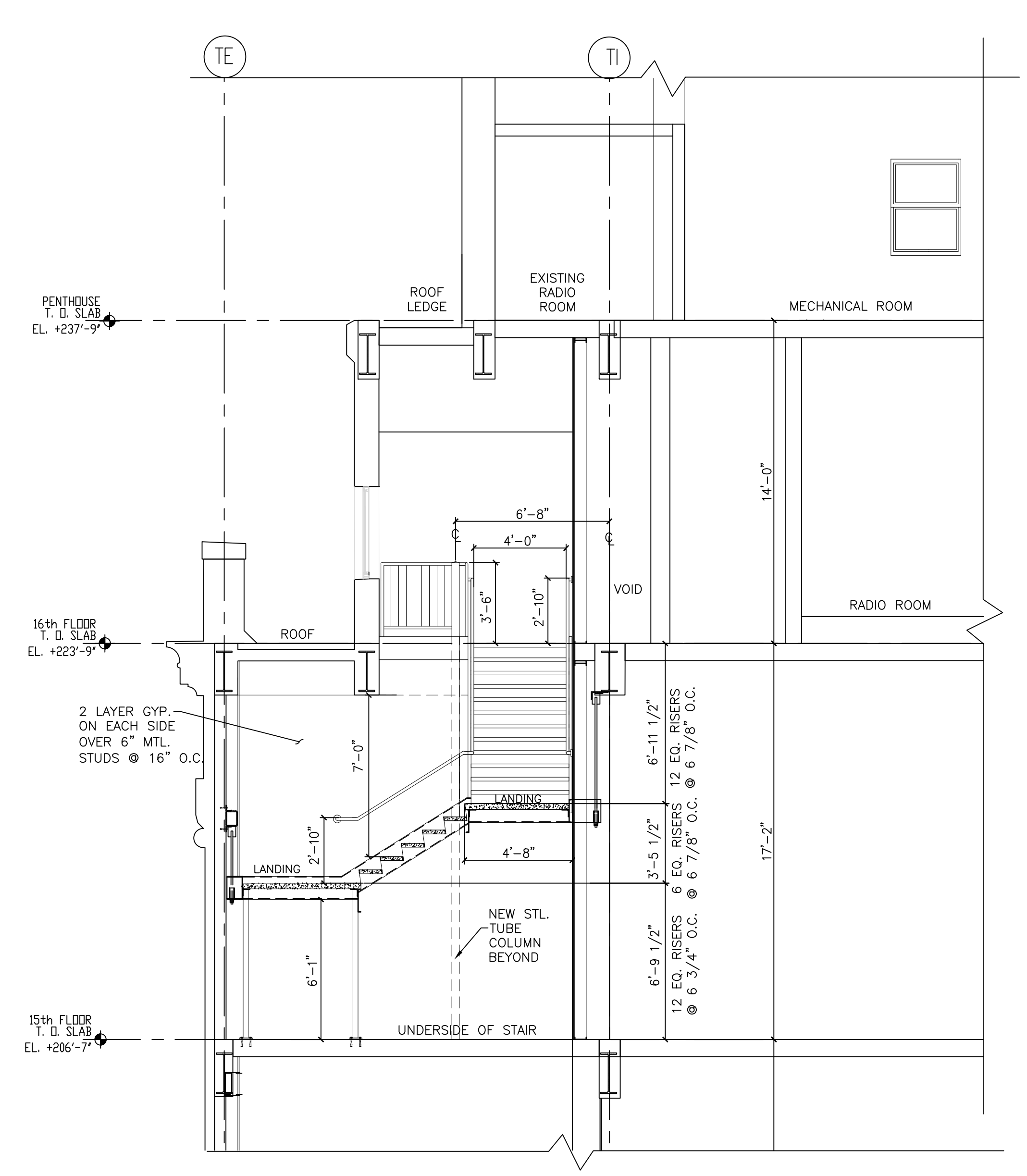
A.402



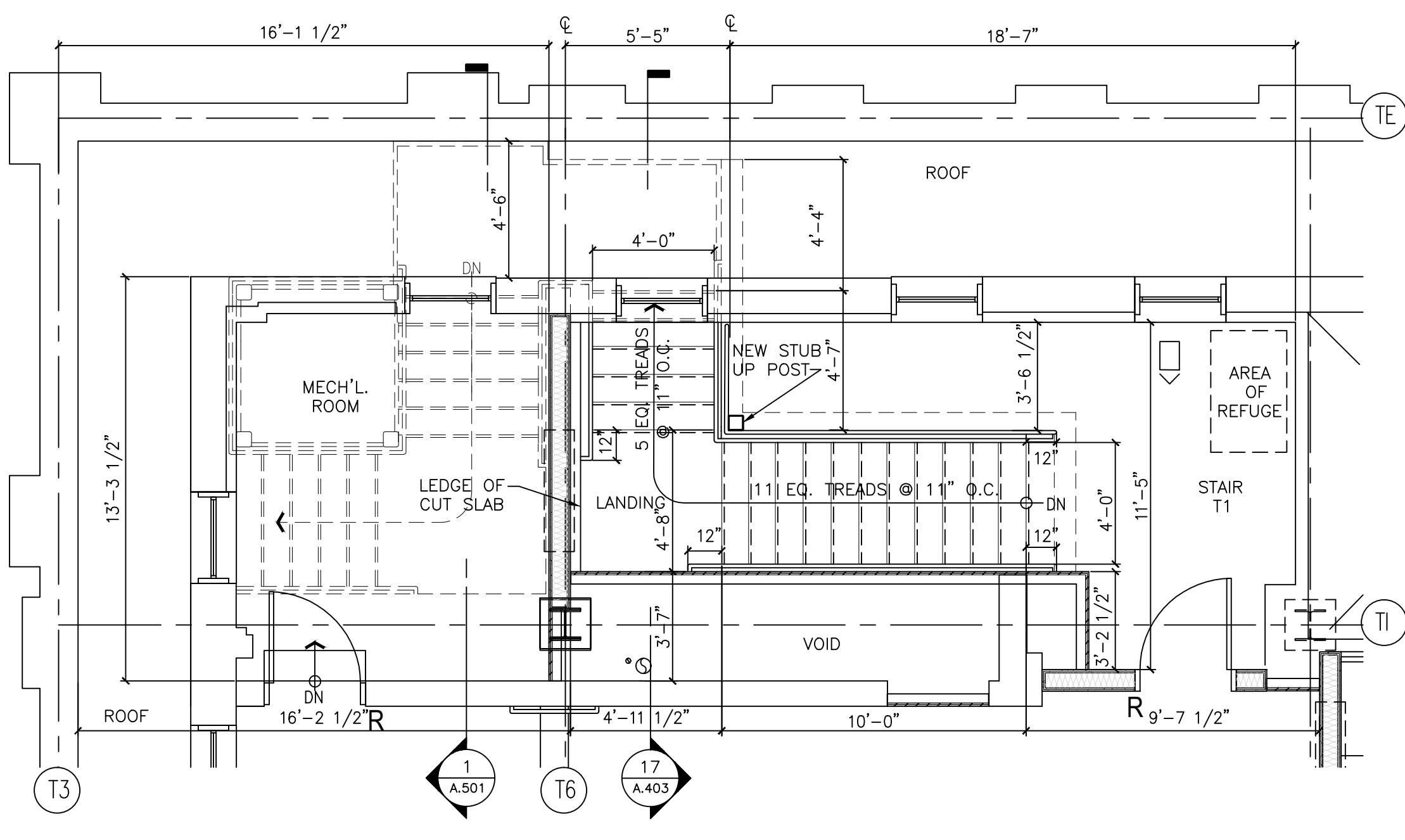
15 15TH FLOOR ENLARGED STAIR PLAN
 A.403 SCALE: 1/4"=1'-0"



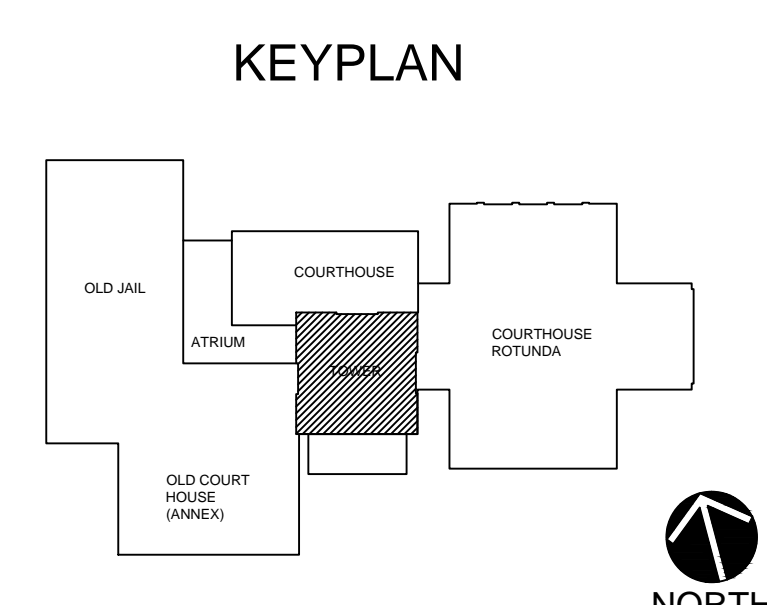
15.1 15TH & 16TH INTERMEDIATE FLOOR ENLARGED STAIR PLAN
 A.403.1 SCALE: 1/4"=1'-0"



17 DETAIL STAIR SECTION @ 15TH & 16TH FLOOR
 A.403 SCALE: 1/4"=1'-0"



16 16TH FLOOR ENLARGED STAIR PLAN
 A.402 SCALE: 1/4"=1'-0"



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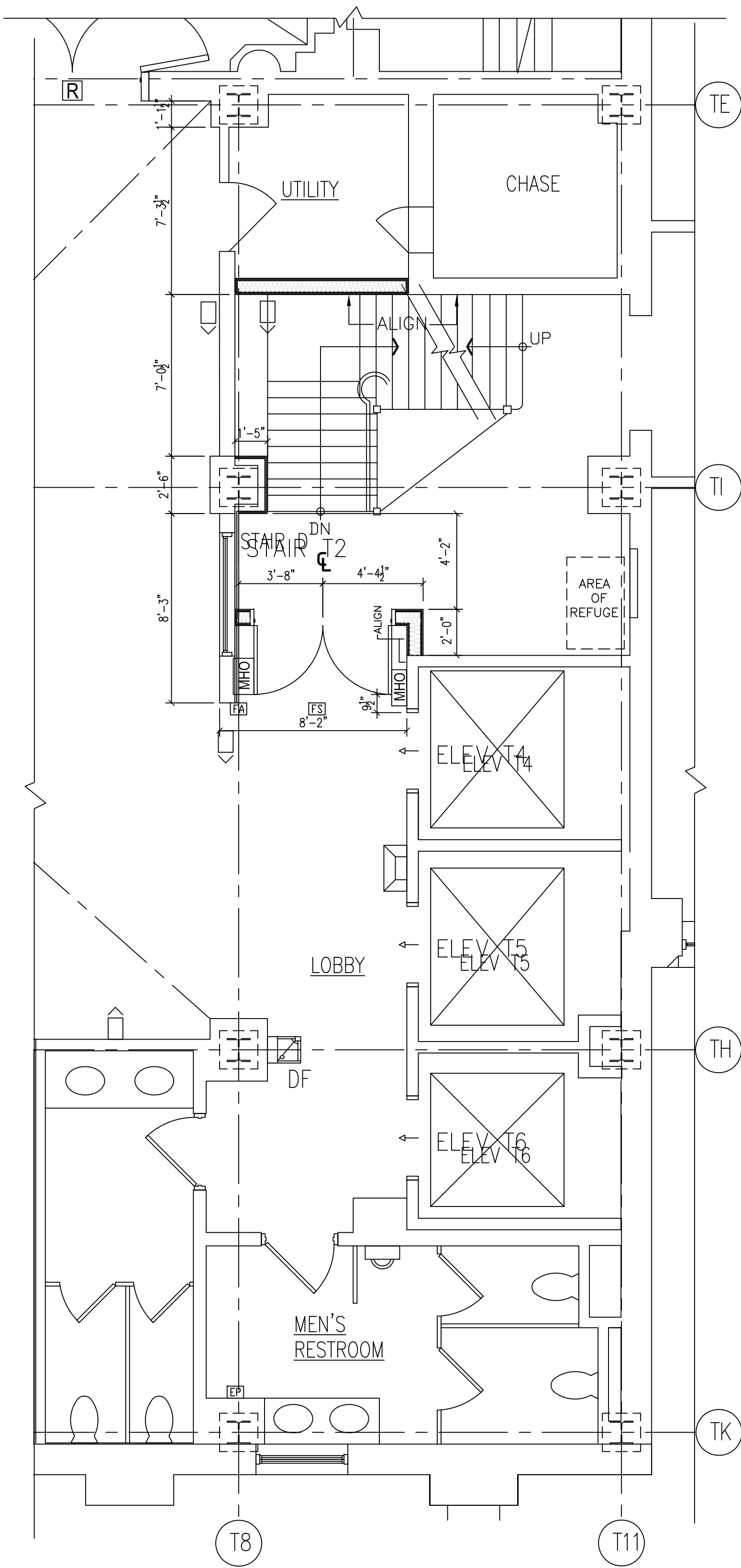


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

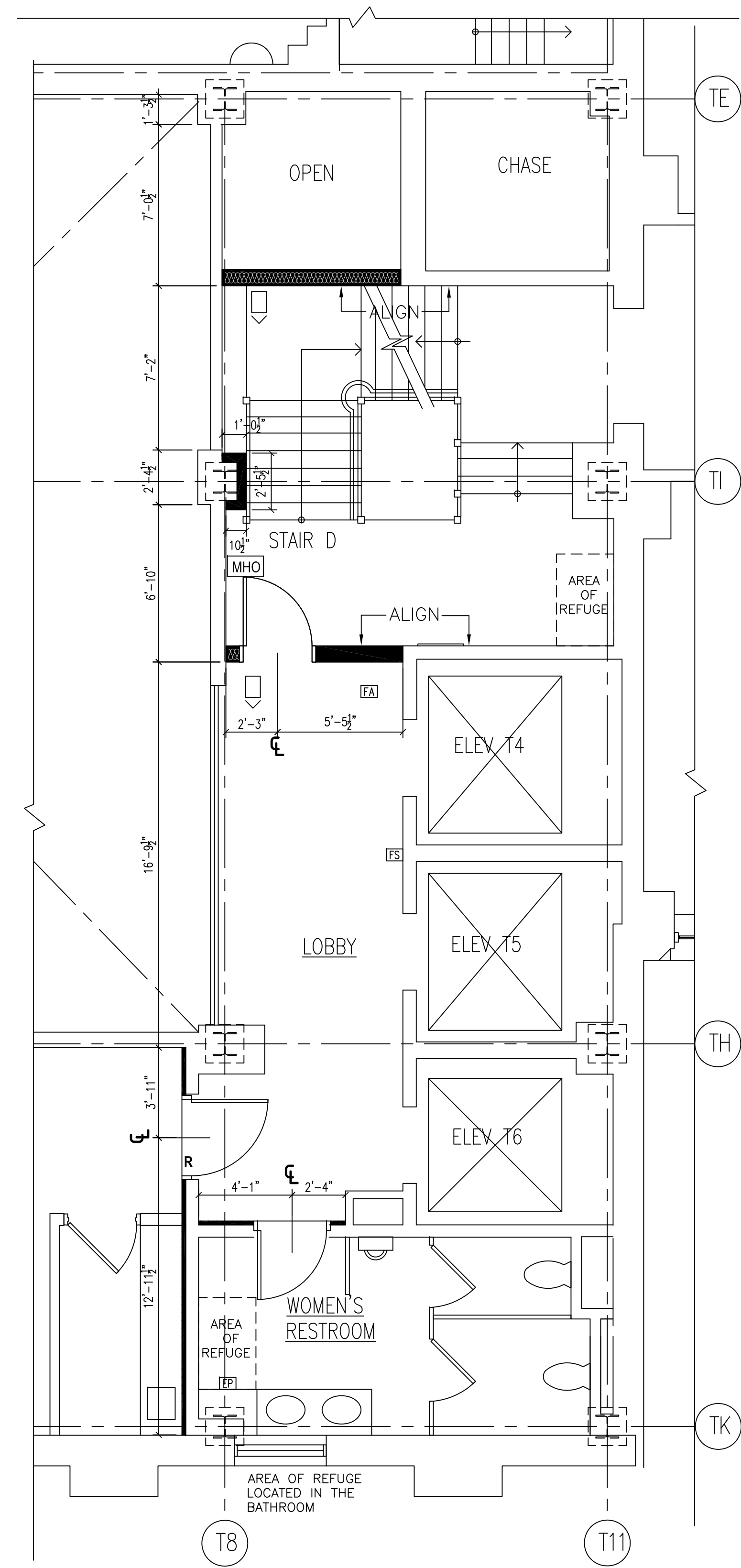
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ENLARGED PLANS & DETAIL SECTION OF STAIR

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 58 OF:160
									DWG NO

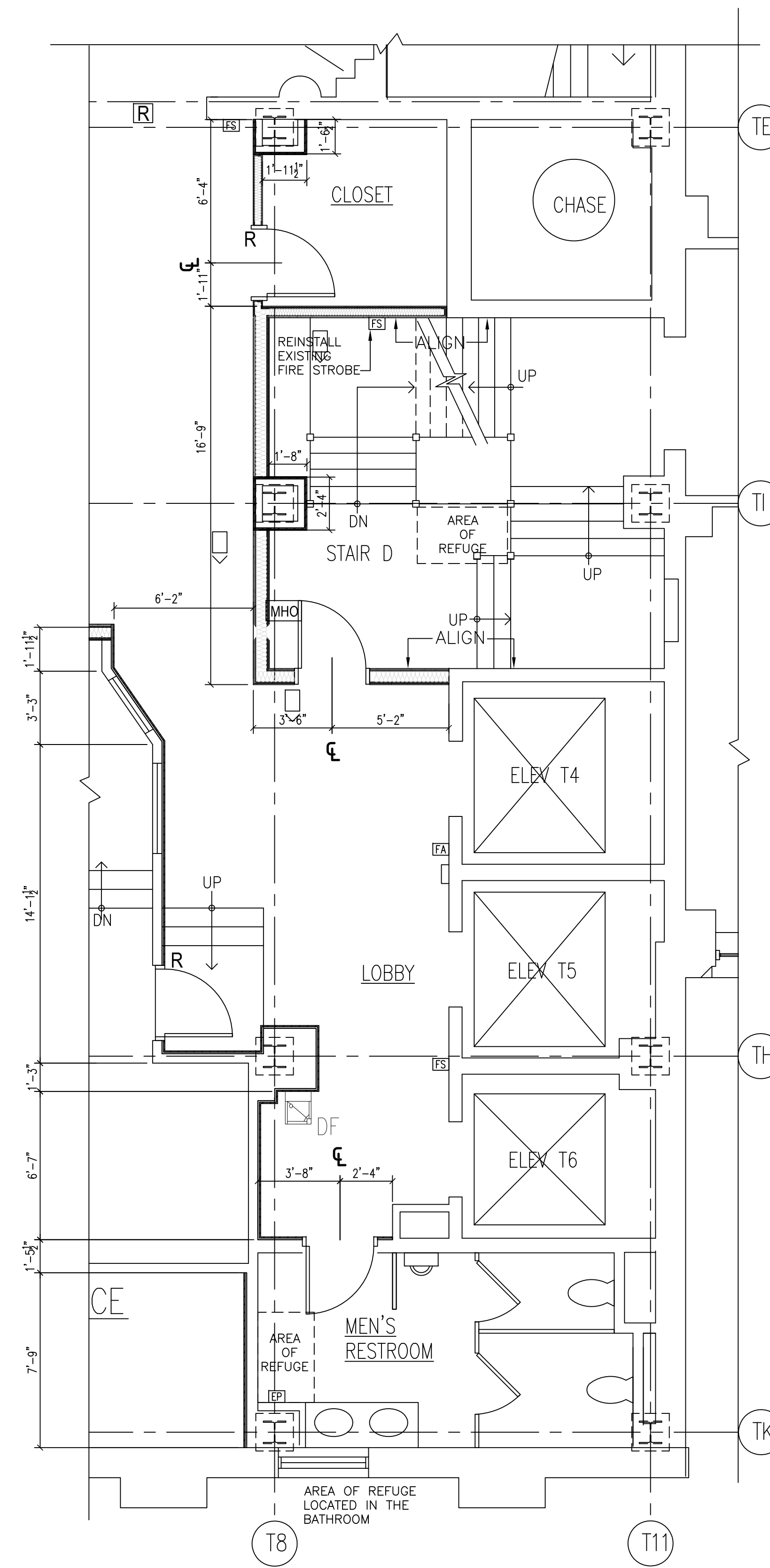
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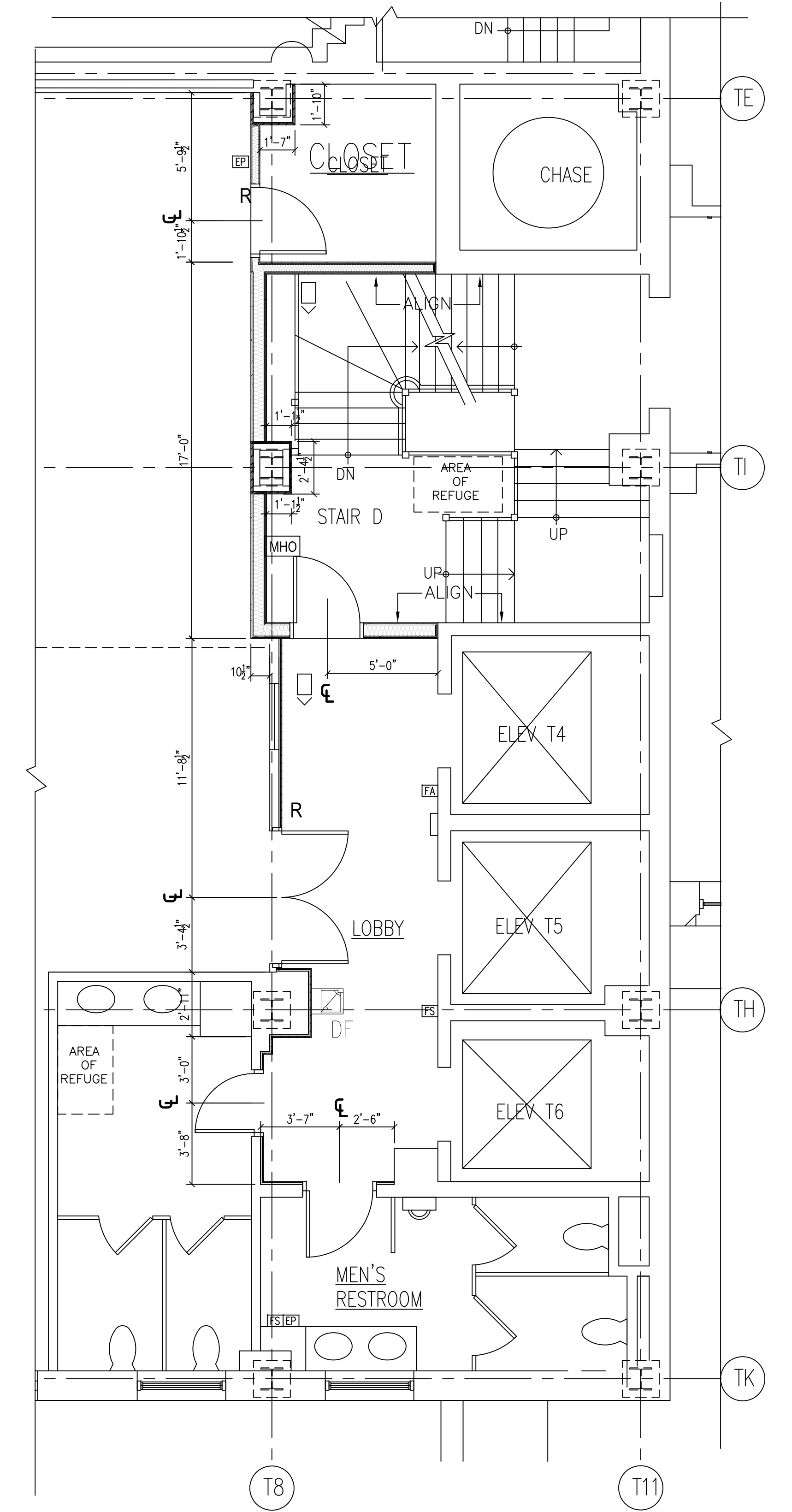
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SCALE: 1/4"=1'-0"



2 2ND FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"

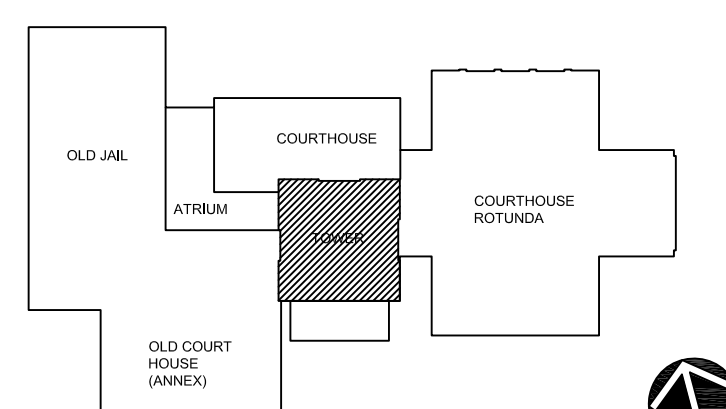


3 3RD FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"



4 4TH FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"

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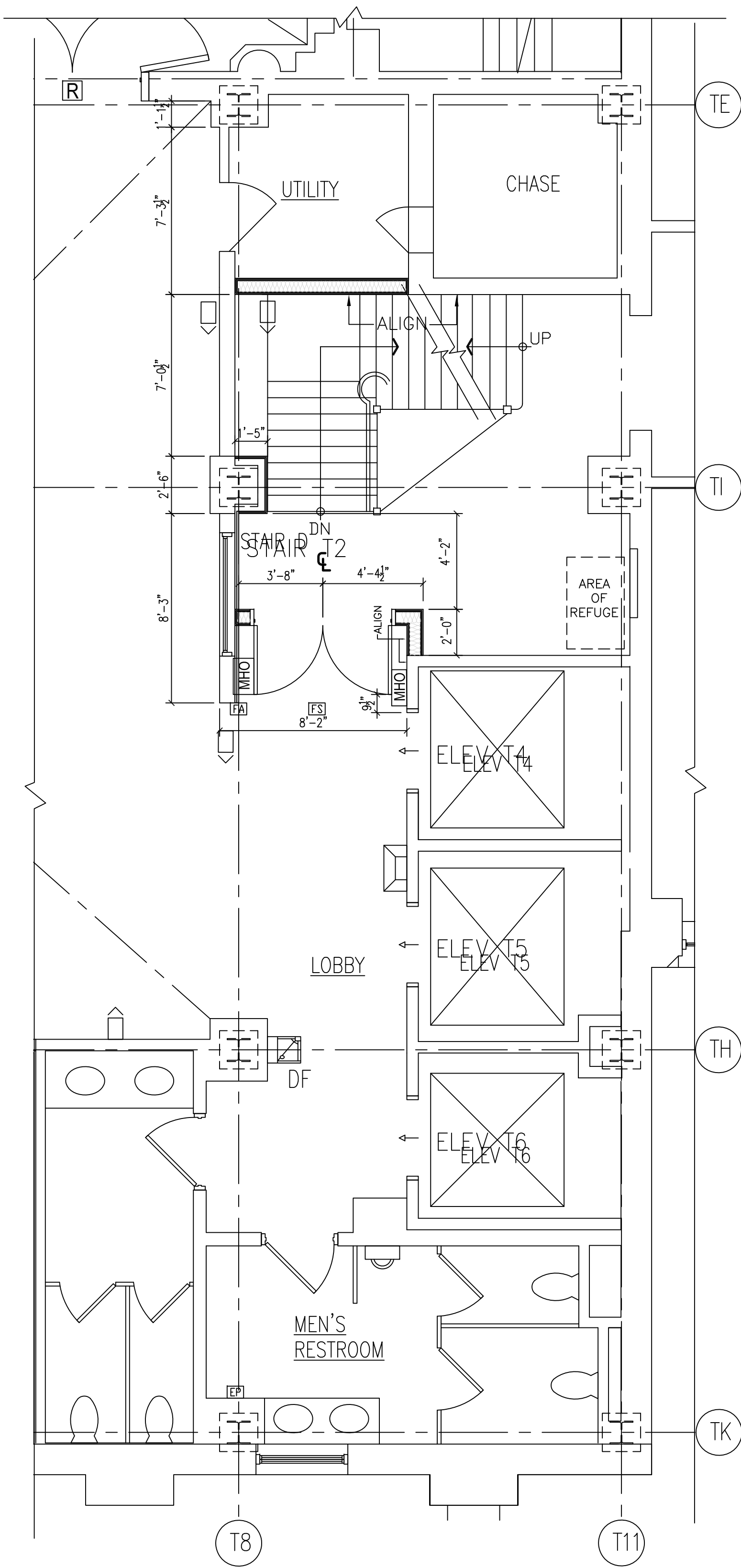
UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

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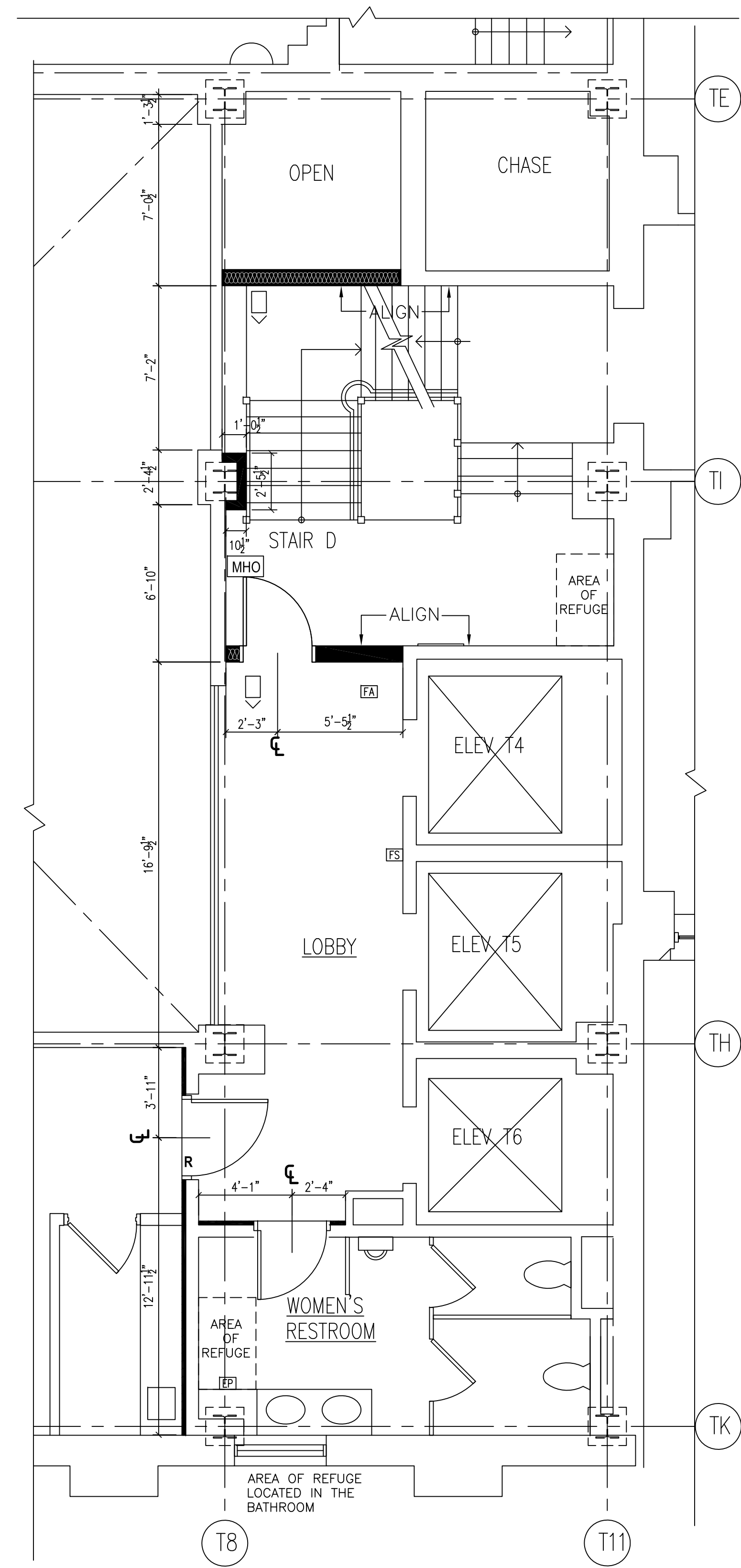
ENLARGED FIRST THRU FOURTH FLOOR STAIR PLANS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 59 OF: 160
									DWG NO

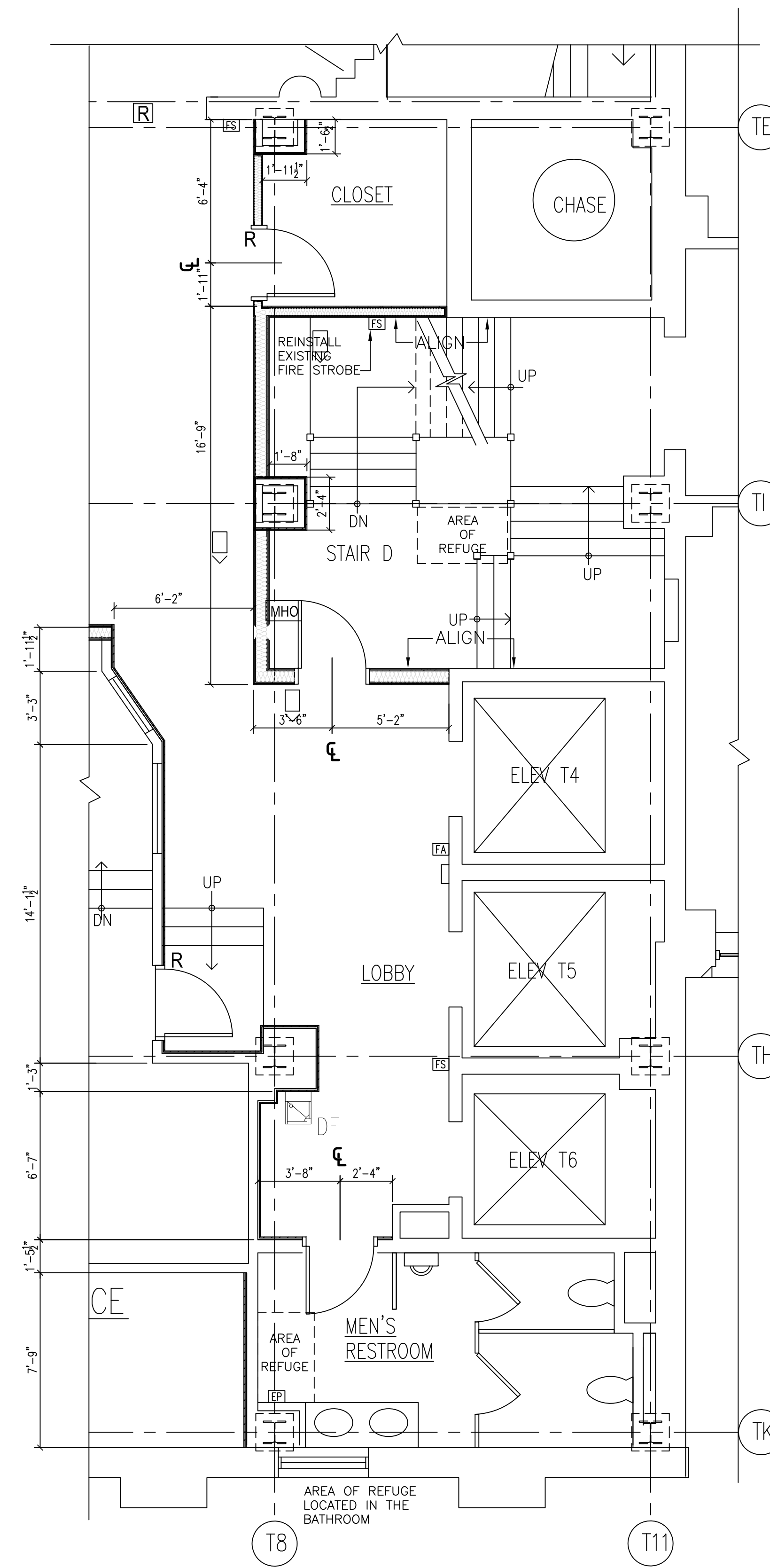
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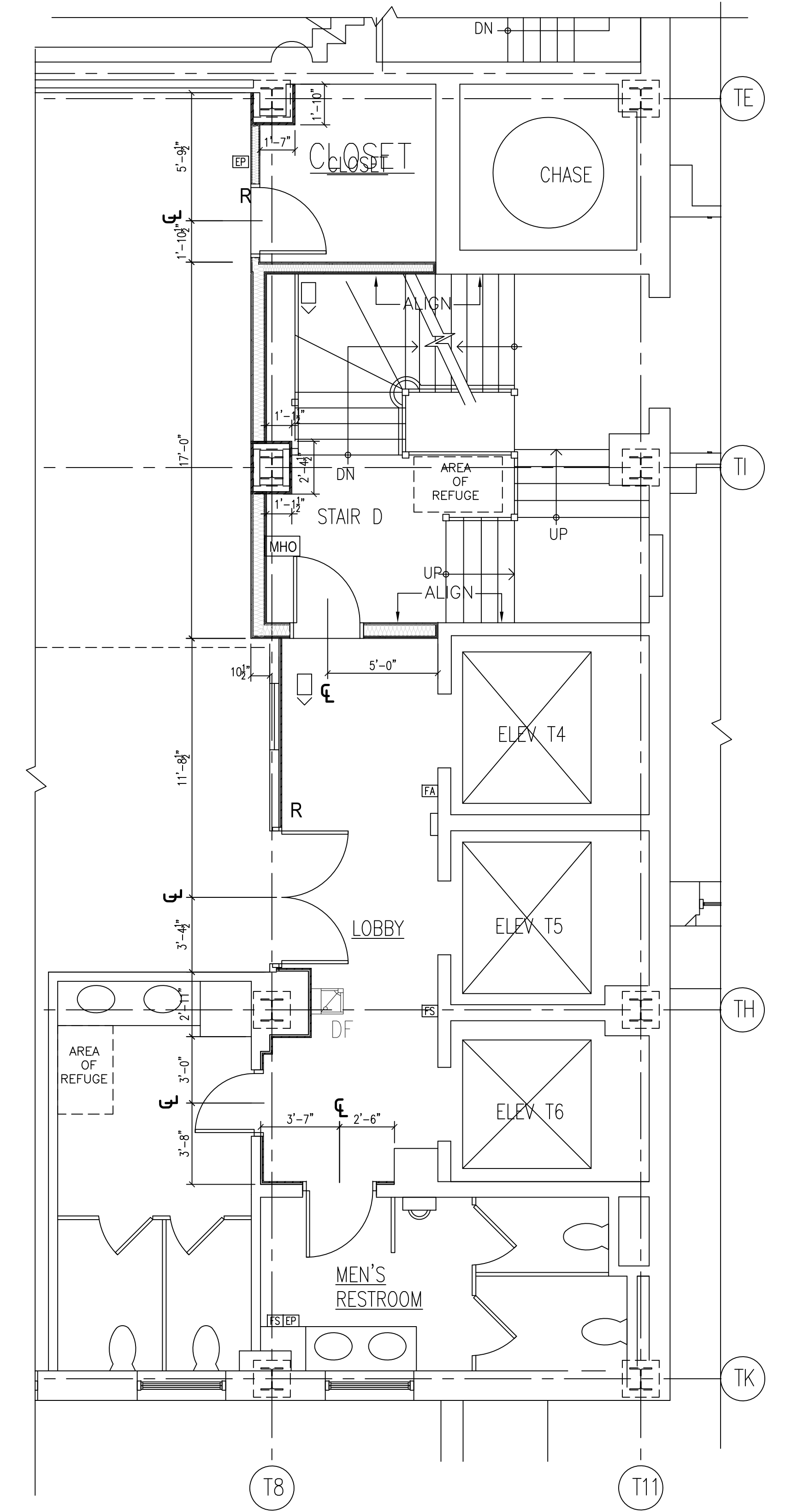
1 1ST FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"



2 2ND FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"

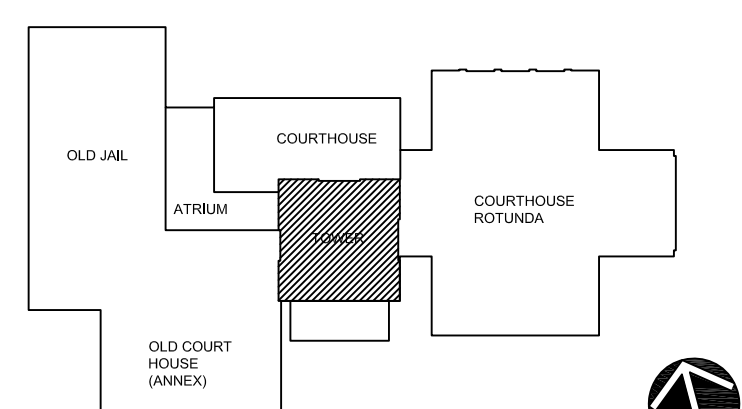


3 3RD FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"



4 4TH FLOOR STAIR PLAN
SCALE: 1/4"=1'-0"

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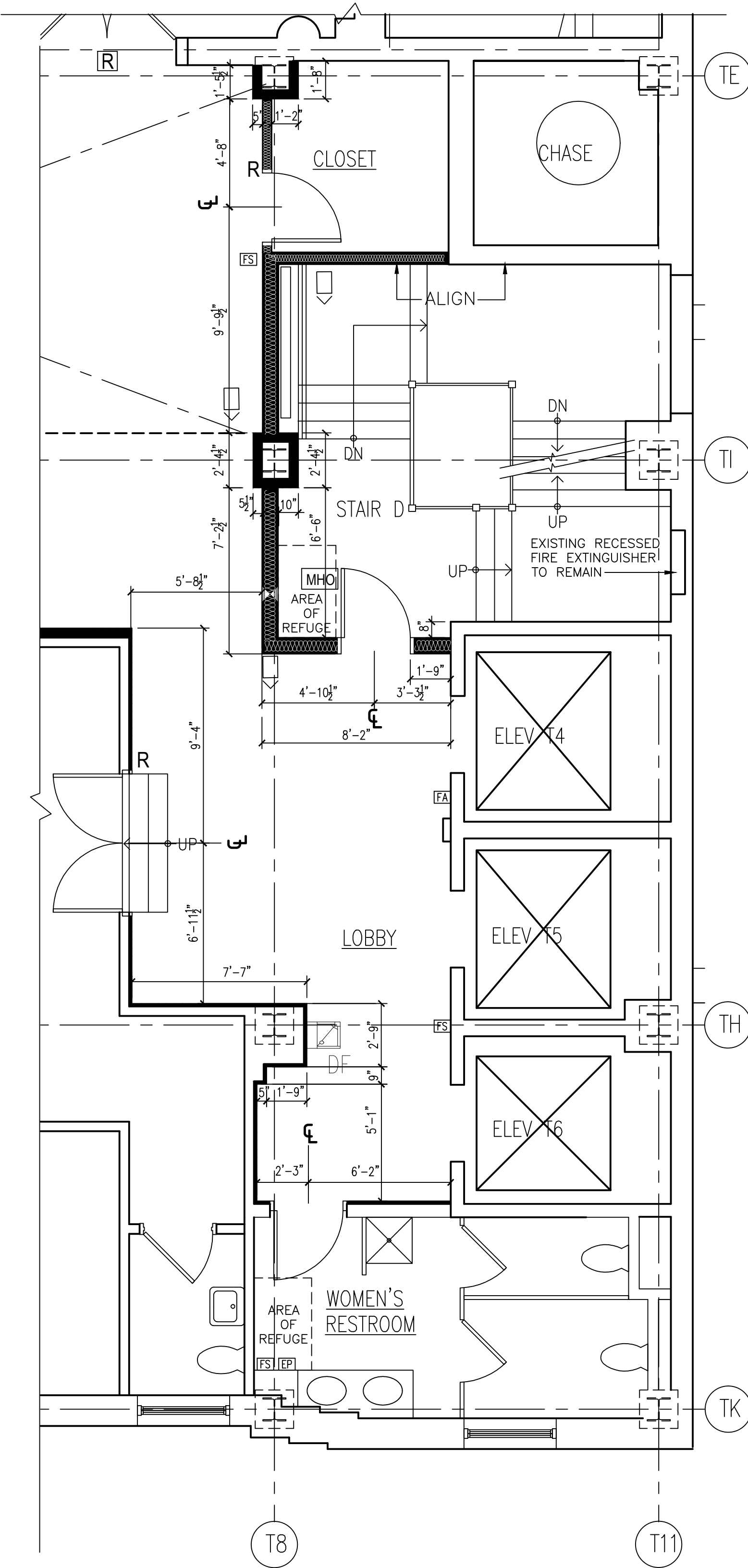
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

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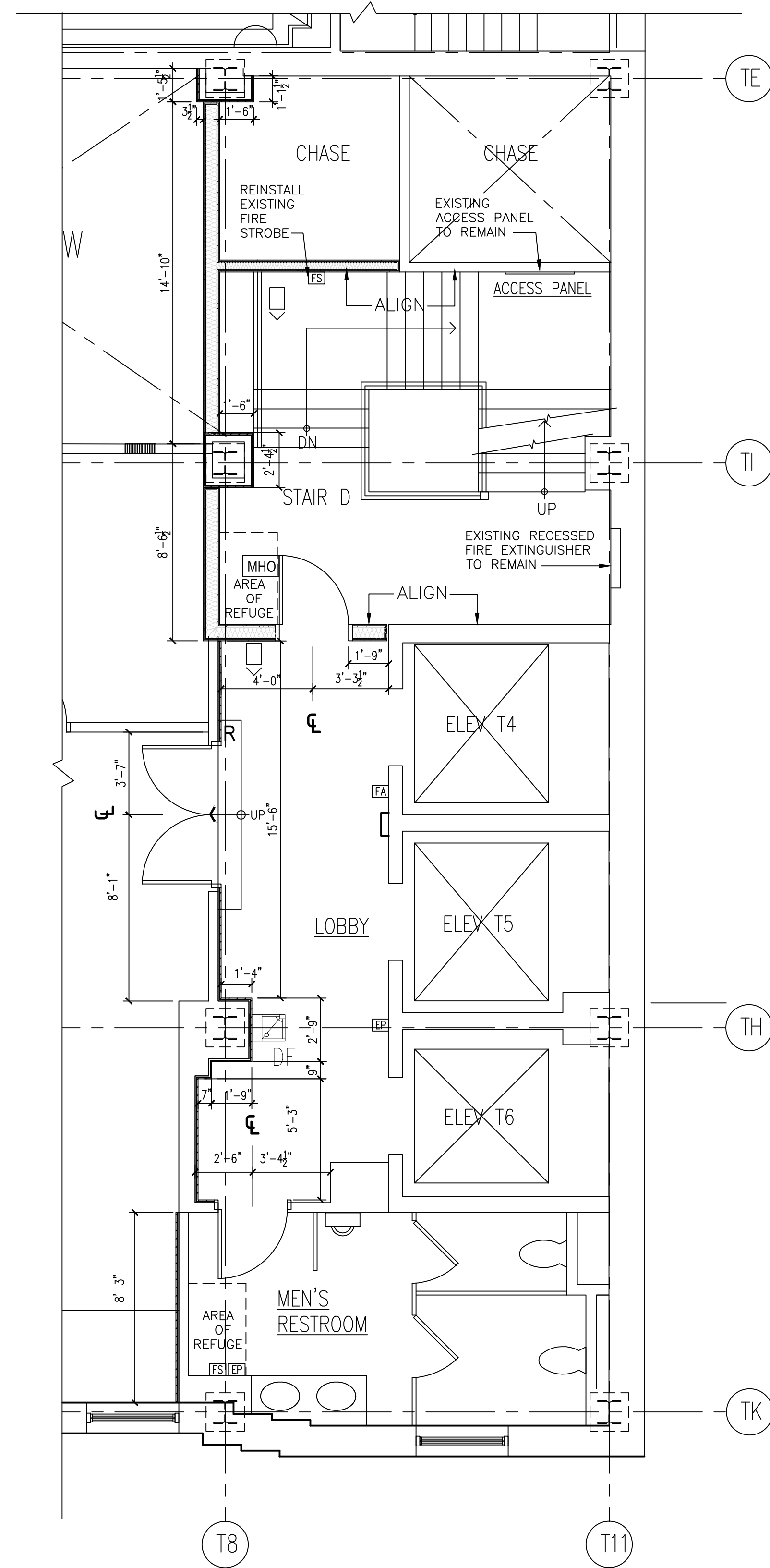
ENLARGED FIRST THRU FOURTH FLOOR STAIR PLANS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 59 OF: 160
									DWG NO

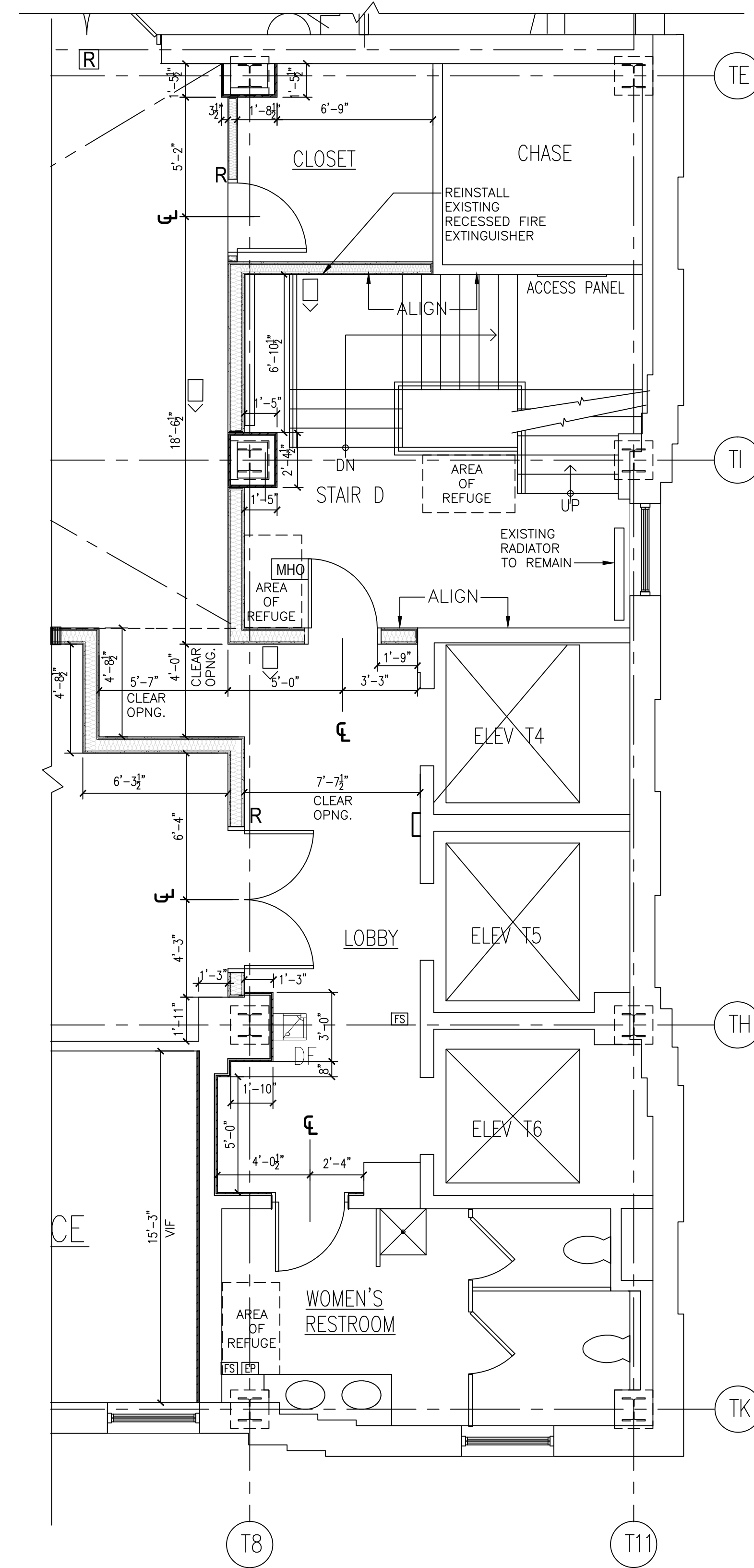
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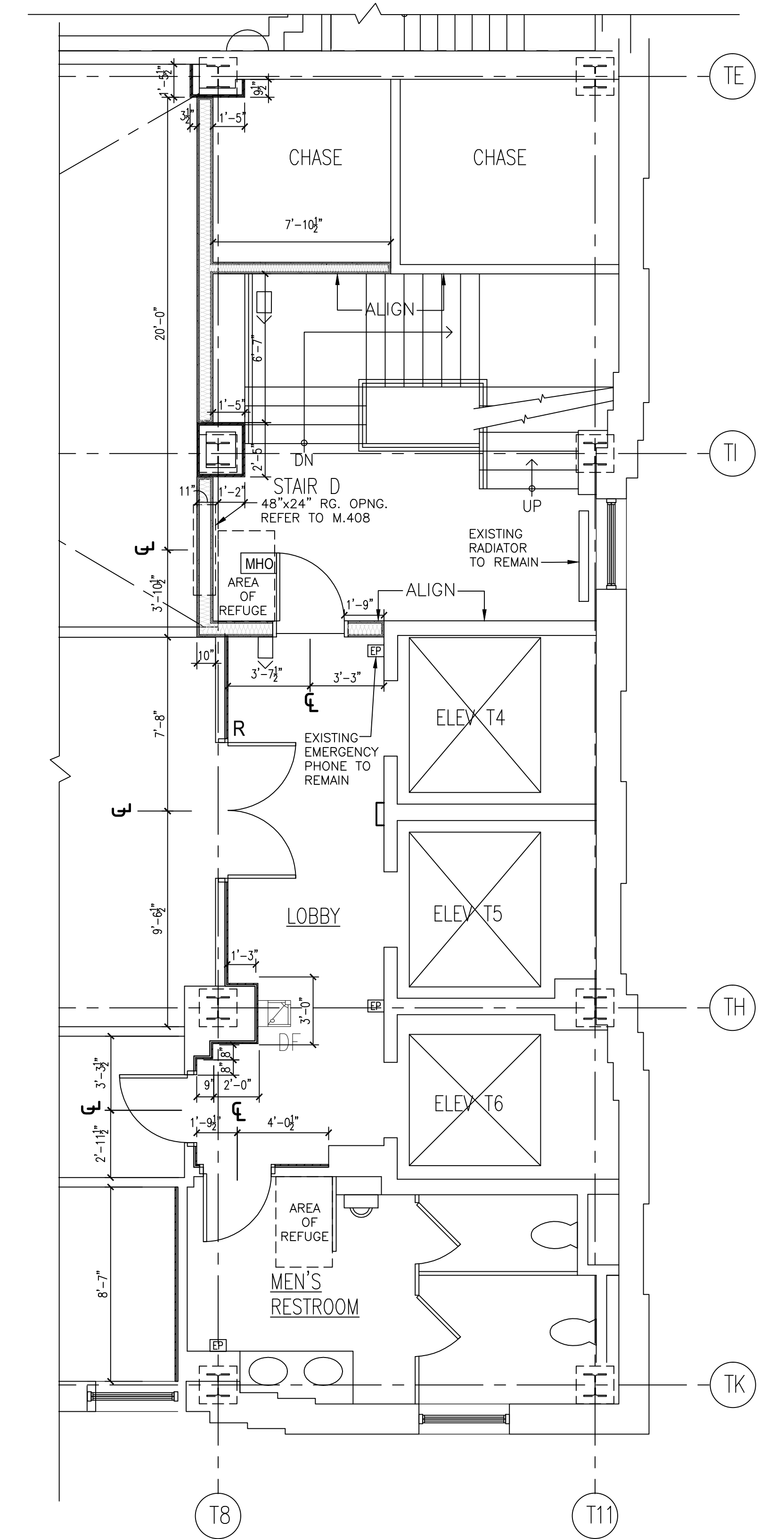
1 5TH FLOOR STAIR PLAN
A.405 SCALE: 1/4"=1'-0"



2 6TH FLOOR STAIR PLAN
A.405 SCALE: 1/4"=1'-0"

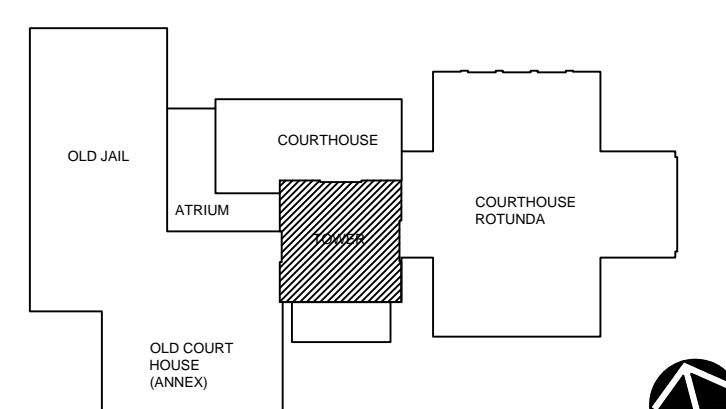


3 7TH FLOOR STAIR PLAN
A.405 SCALE: 1/4"=1'-0"



4 8TH FLOOR STAIR PLAN
A.405 SCALE: 1/4"=1'-0"

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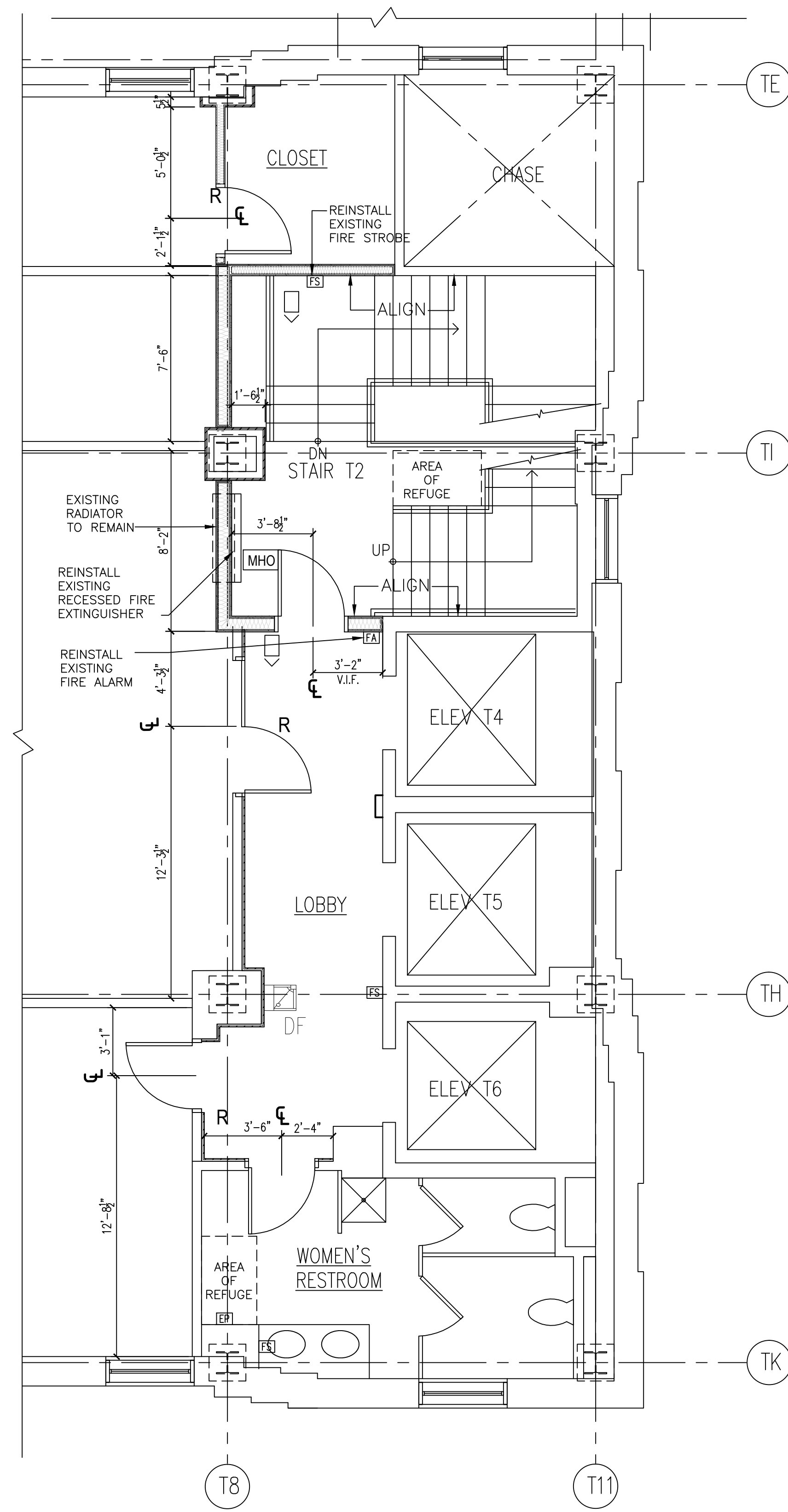
UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

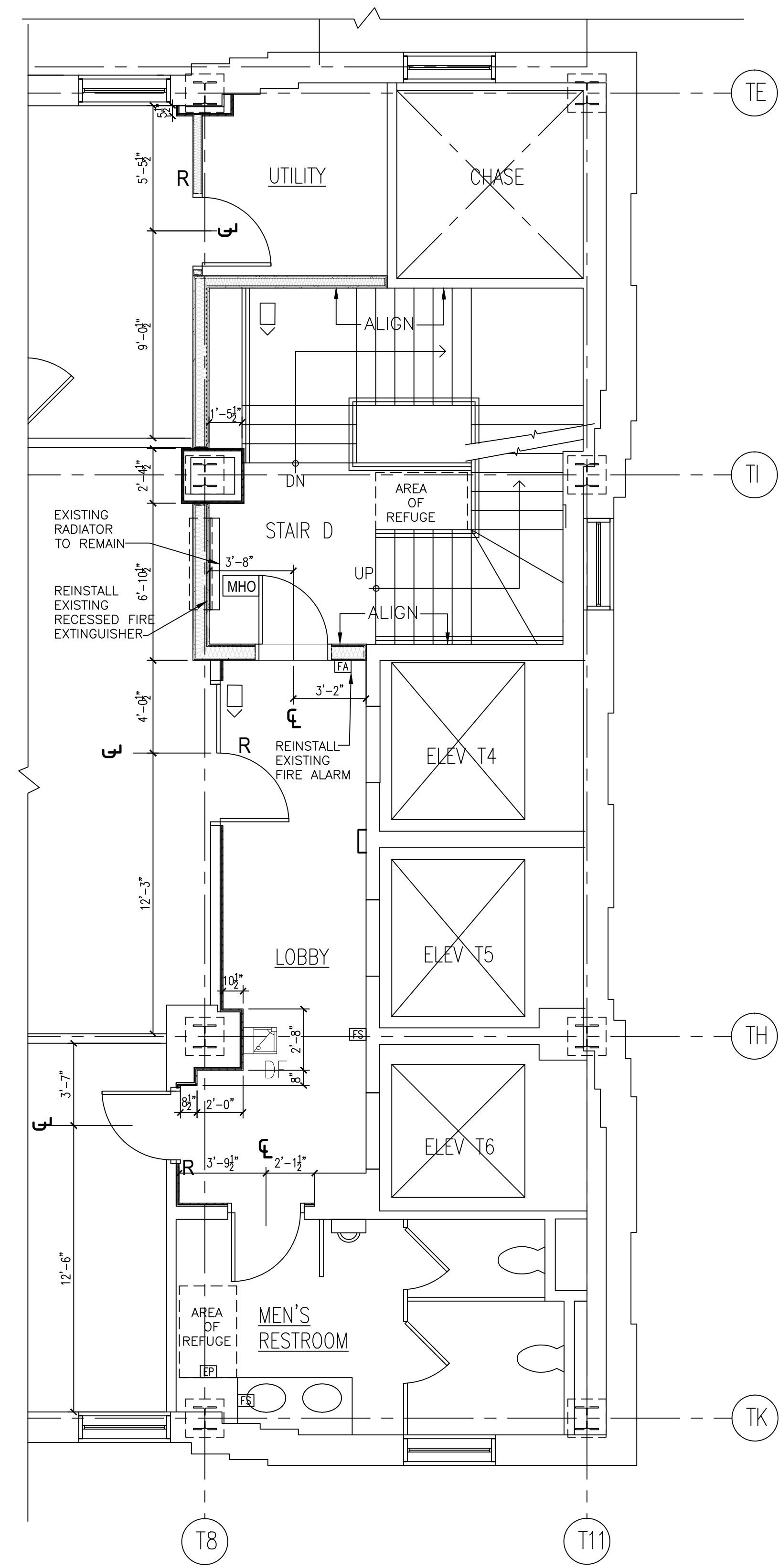
ENLARGED FIFTH THRU EIGHTH STAIR PLANS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 60 OF: 160
									DWG NO

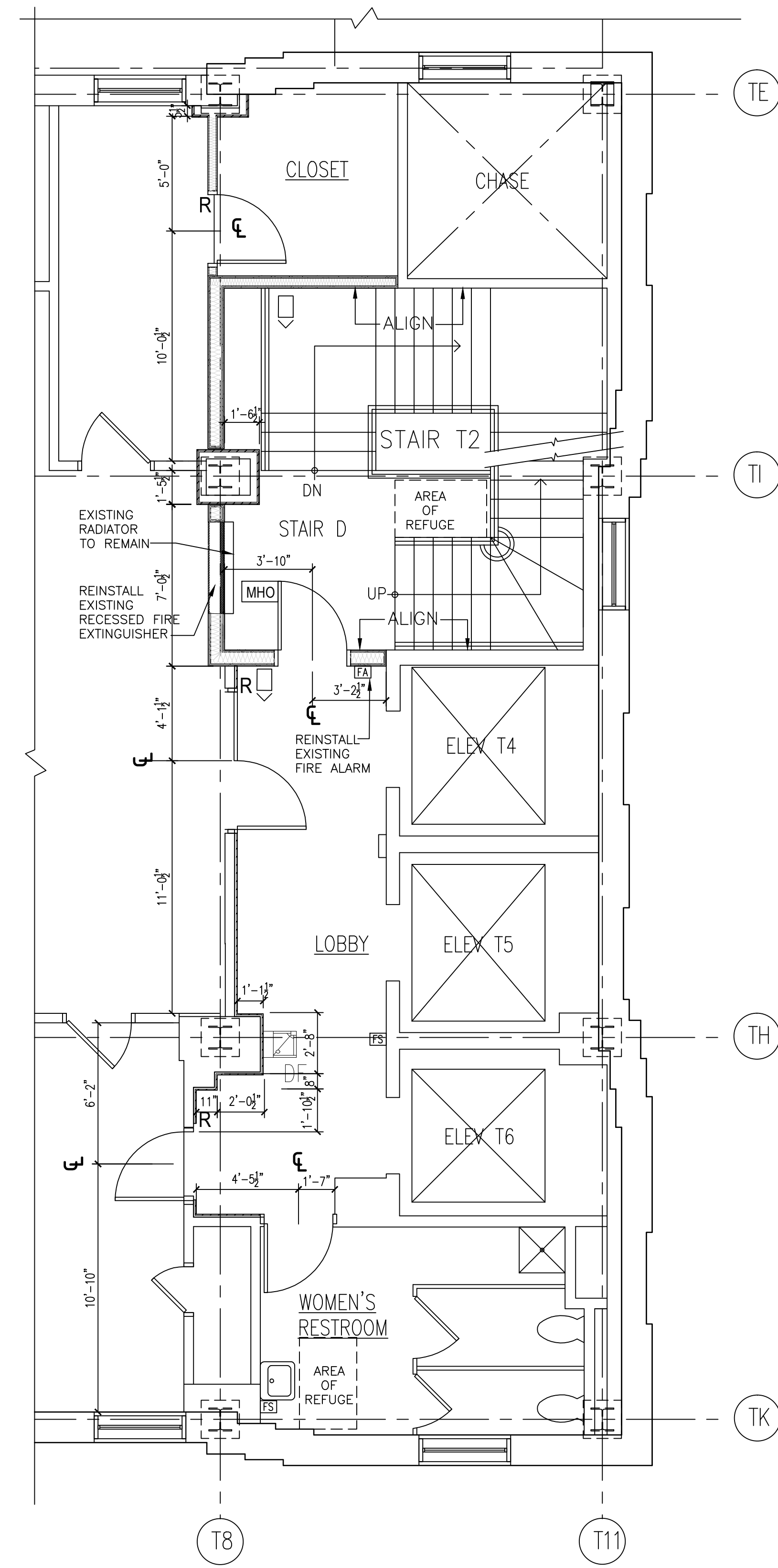
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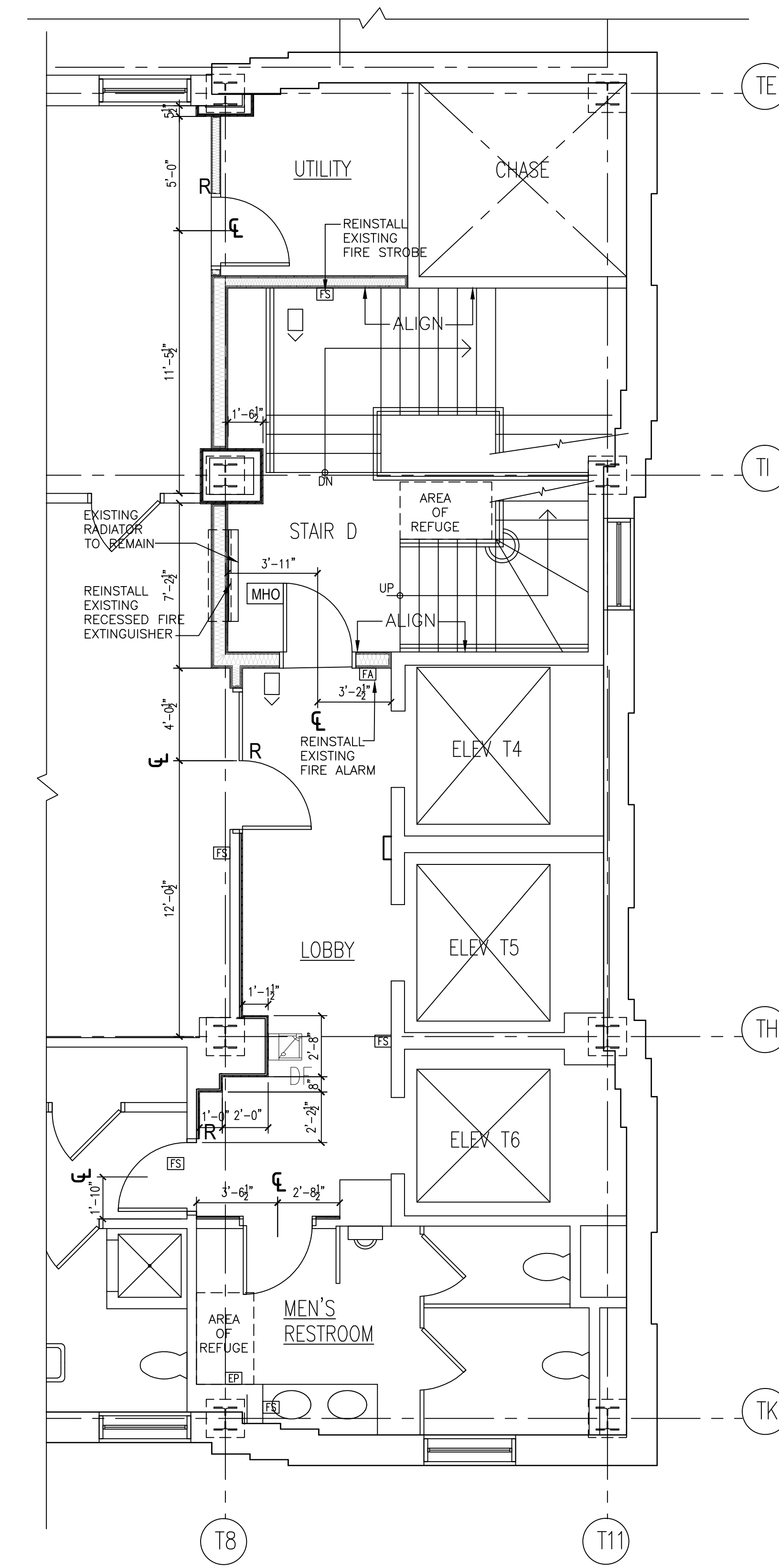
1 9TH FLOOR STAIR PLAN
A.406 SCALE: 1/4"=1'-0"



2 10TH FLOOR STAIR PLAN
A.406 SCALE: 1/4"=1'-0"

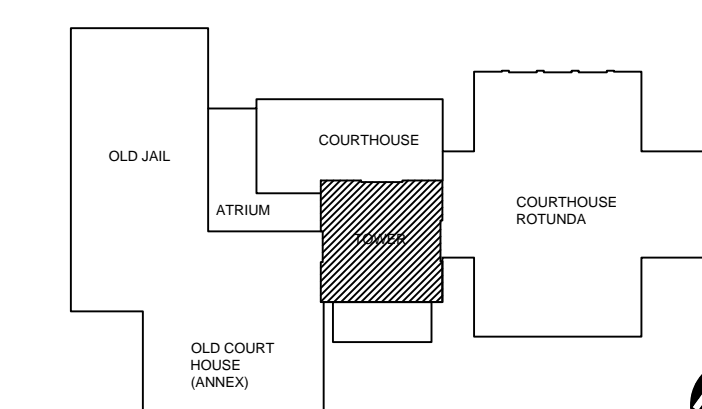


3 11TH FLOOR STAIR PLAN
A.406 SCALE: 1/4"=1'-0"



4 12TH FLOOR STAIR PLAN
A.406 SCALE: 1/4"=1'-0"

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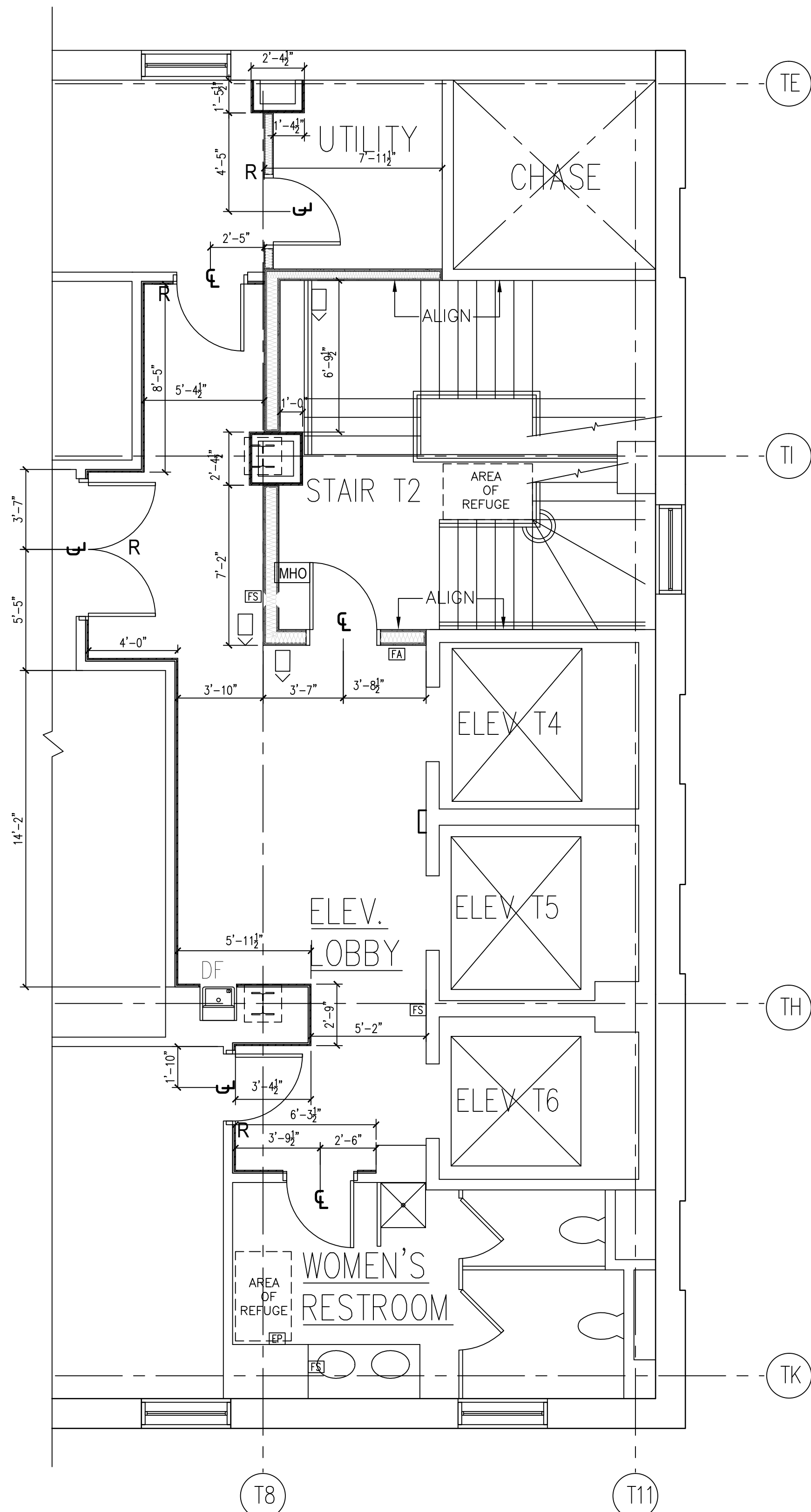
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

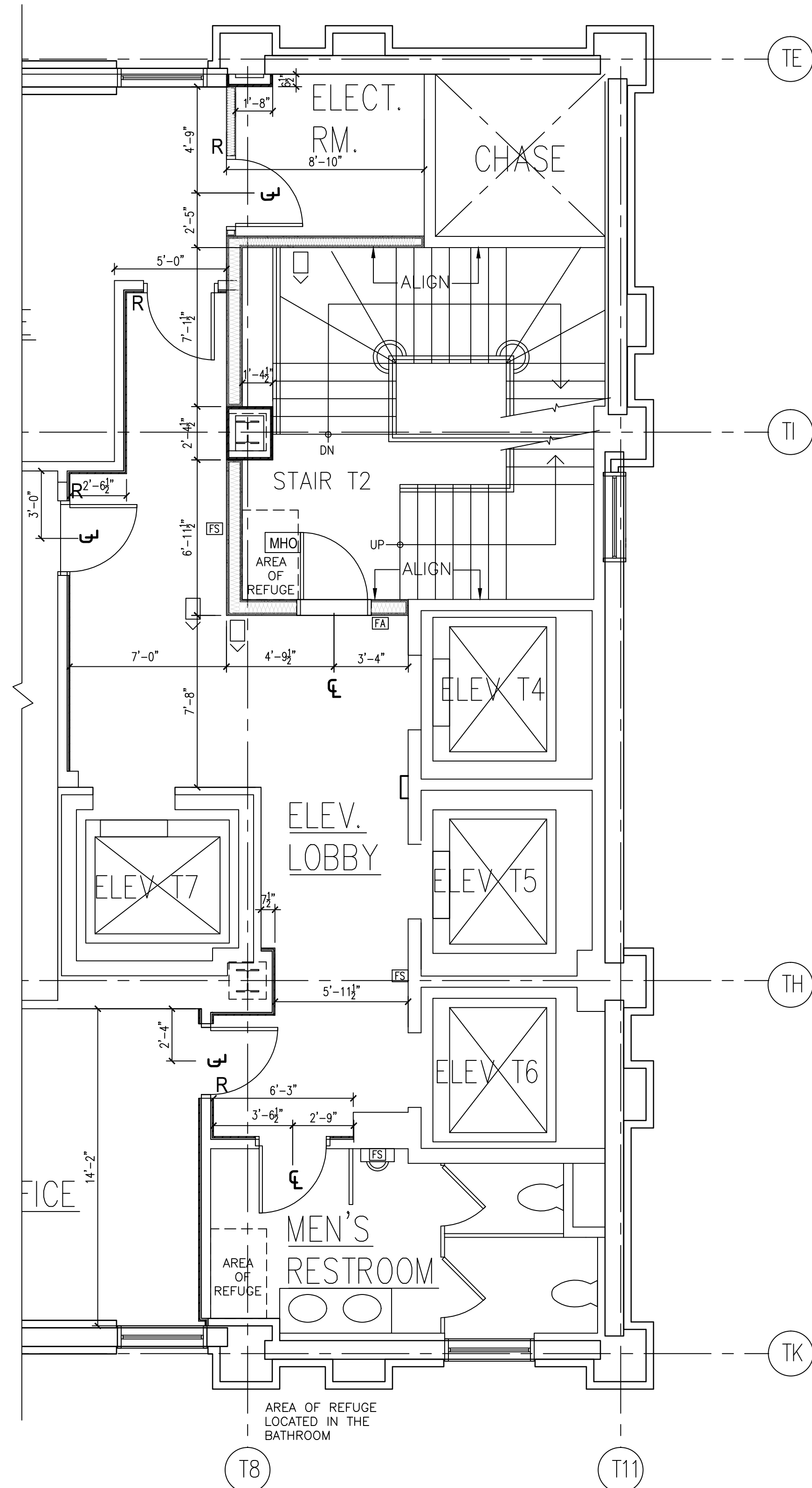
ENLARGED NINTH THRU TWELFTH STAIR PLANS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 61 OF: 160
									DWG NO

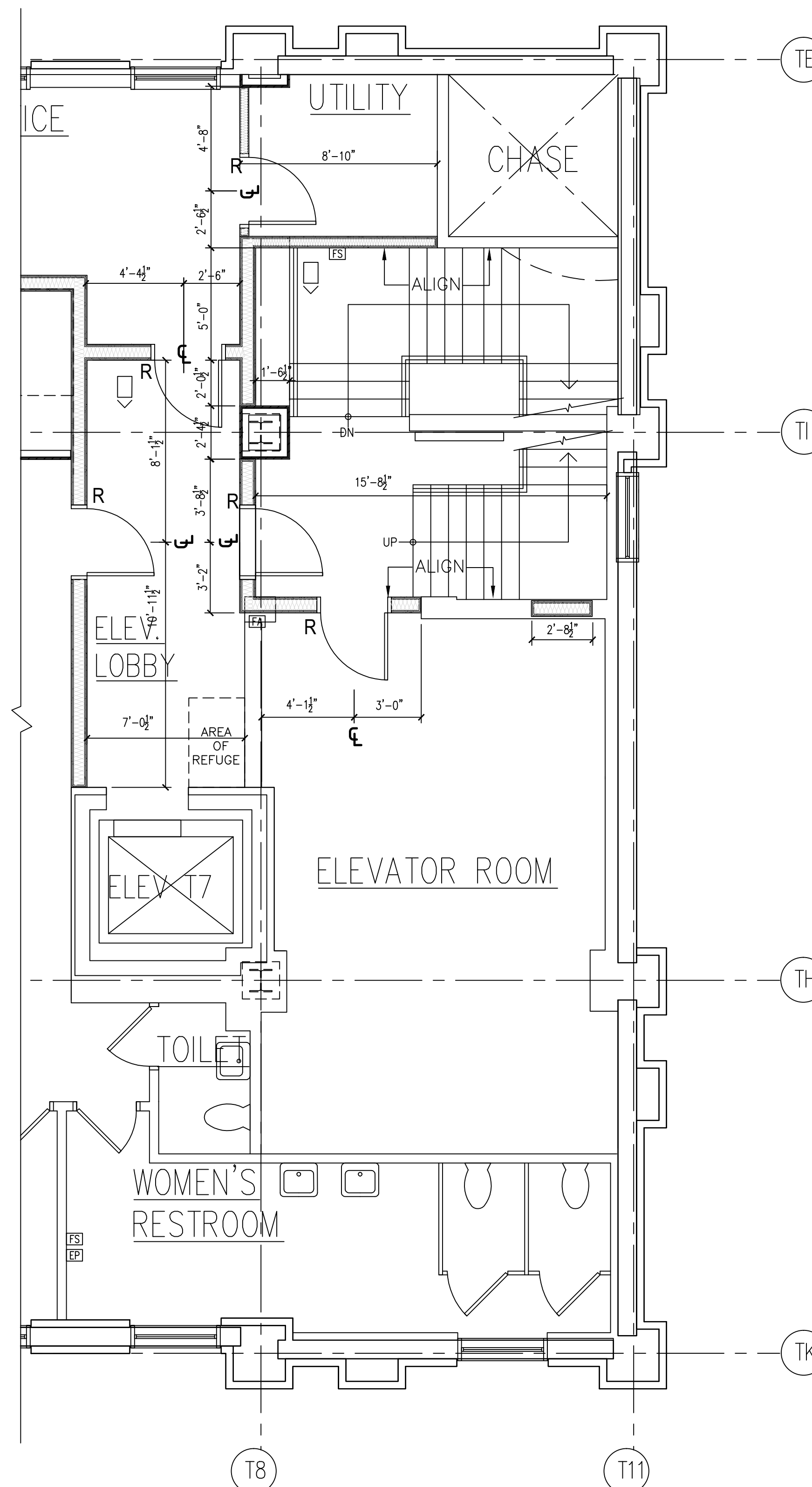
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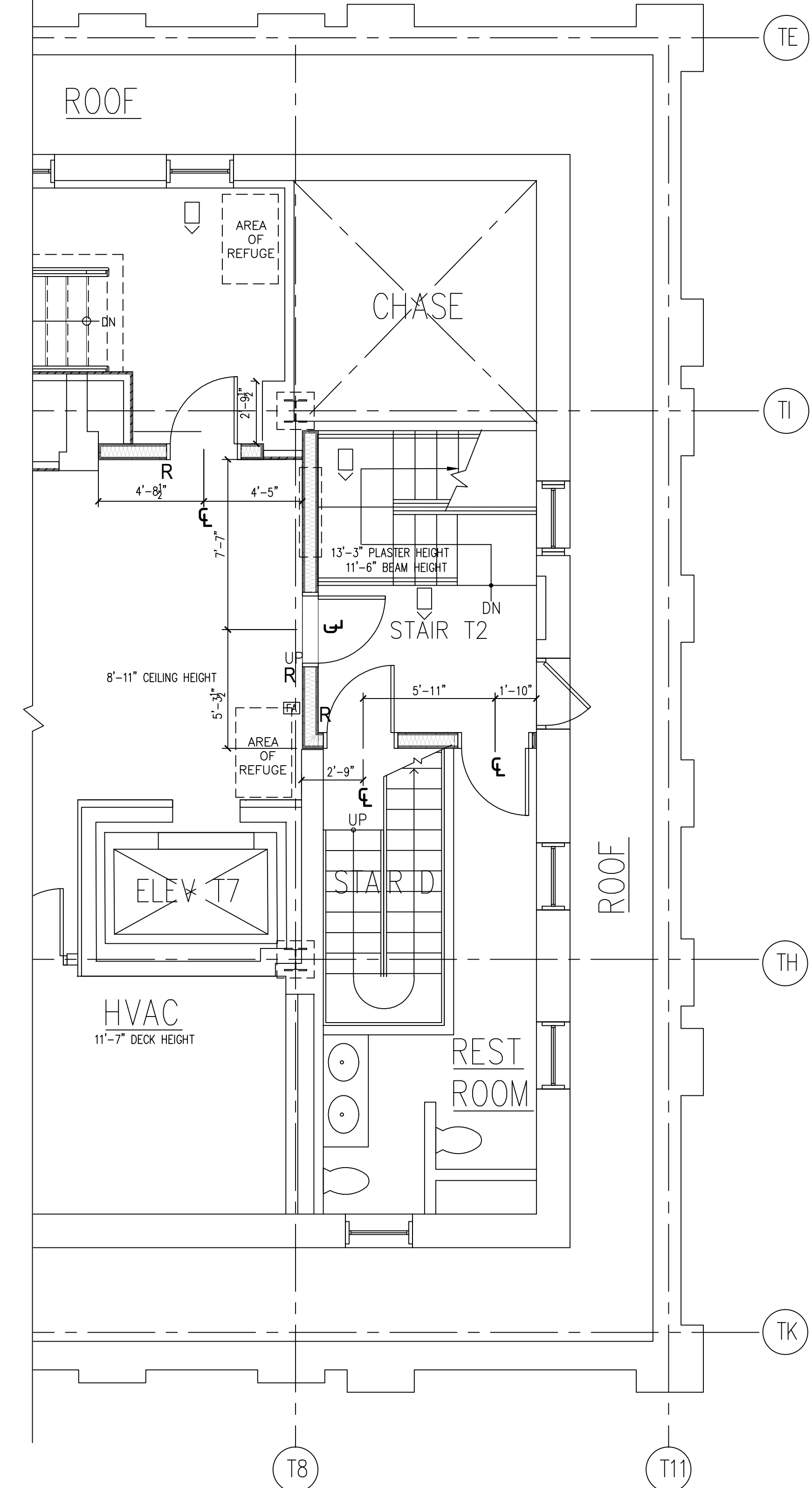
1 13TH FLOOR STAIR PLAN
 SCALE: 1/4"=1'-0"



2 14TH FLOOR STAIR PLAN
 SCALE: 1/4"=1'-0"

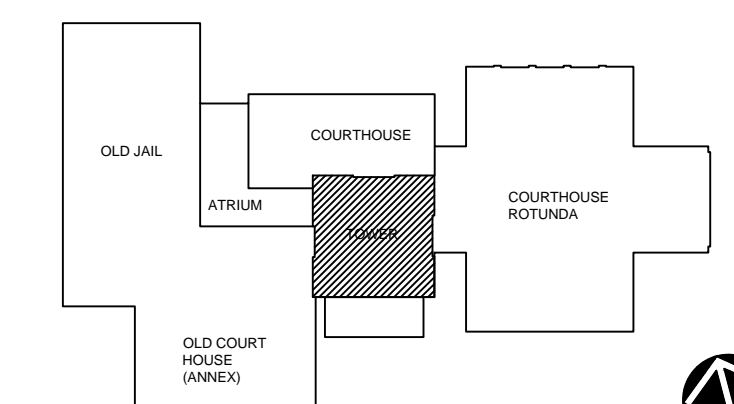


3 15TH FLOOR STAIR PLAN
 SCALE: 1/4"=1'-0"



4 16TH FLOOR STAIR PLAN
 SCALE: 1/4"=1'-0"

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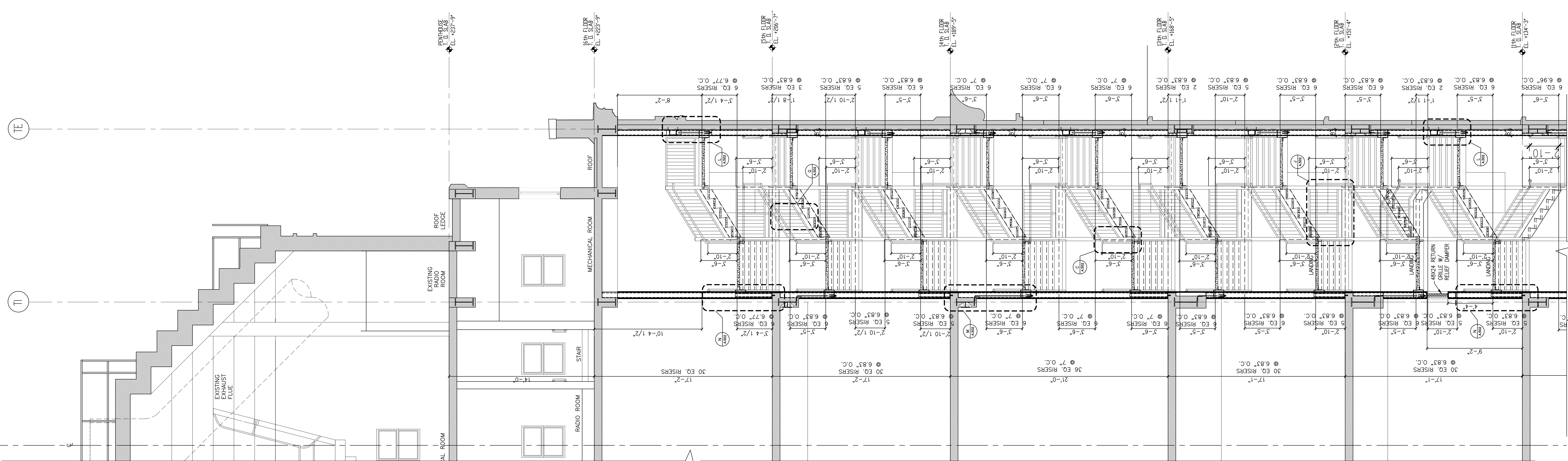
**UC COURTHOUSE
 INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

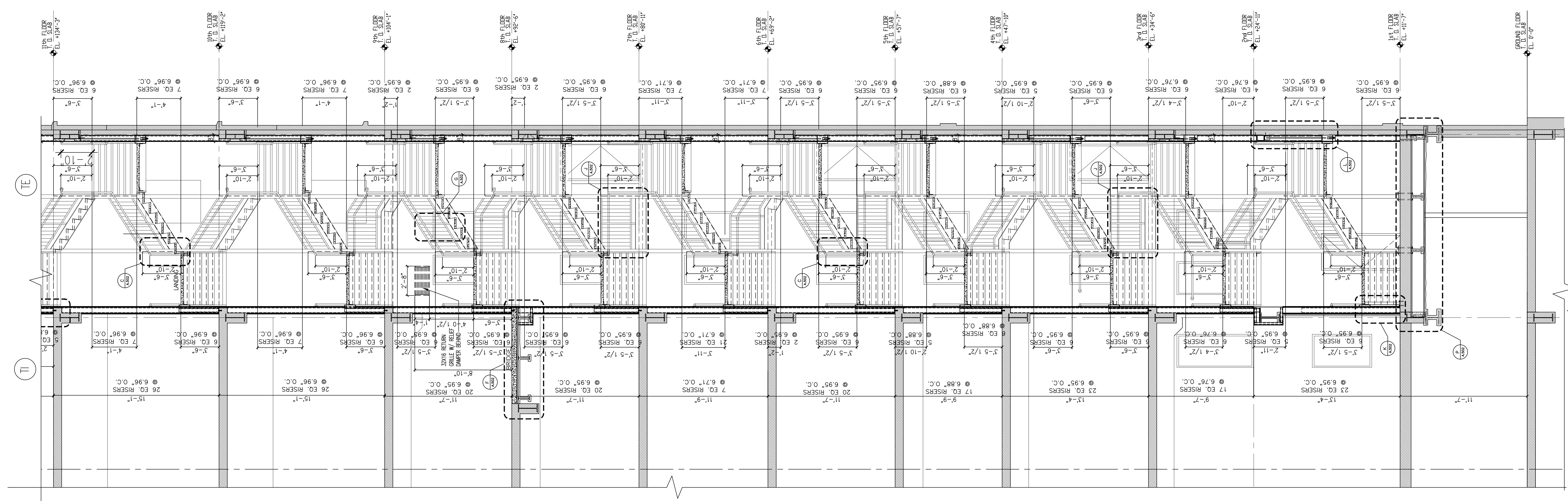
ENLARGED THIRTEENTH THRU PENTHOUSE STAIR PLANS

SUBMISSIONS				REVISIONS				DATE	10-10-15
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10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 62 OF: 160
									DWG NO

A.407



2. STAIR SECTION
SCALE: 1/4"=1'-0"



1. STAIR SECTION
SCALE: 1/4"=1'-0"

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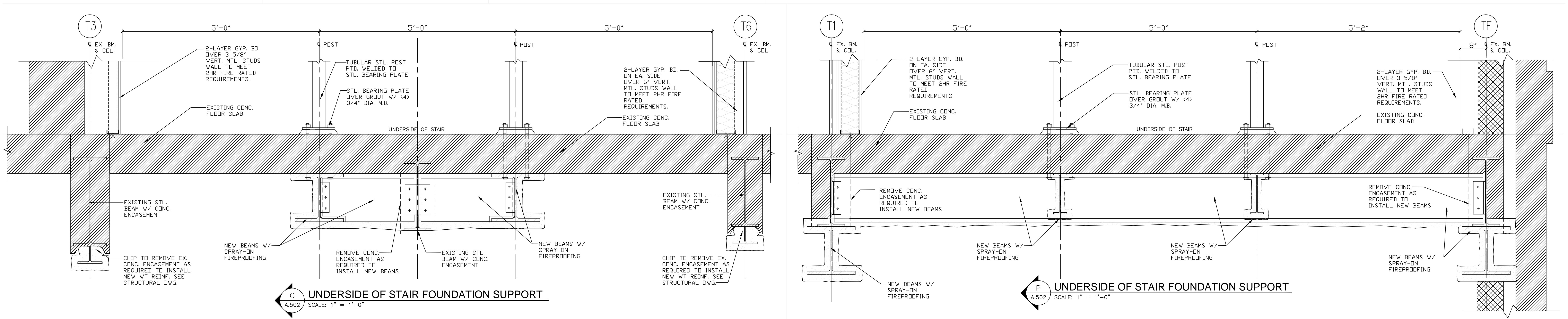
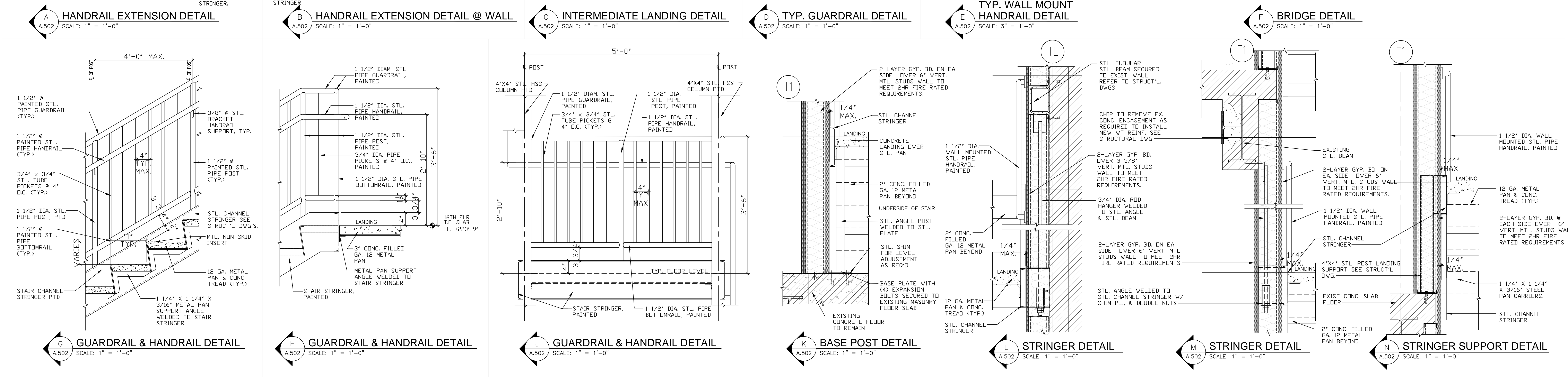
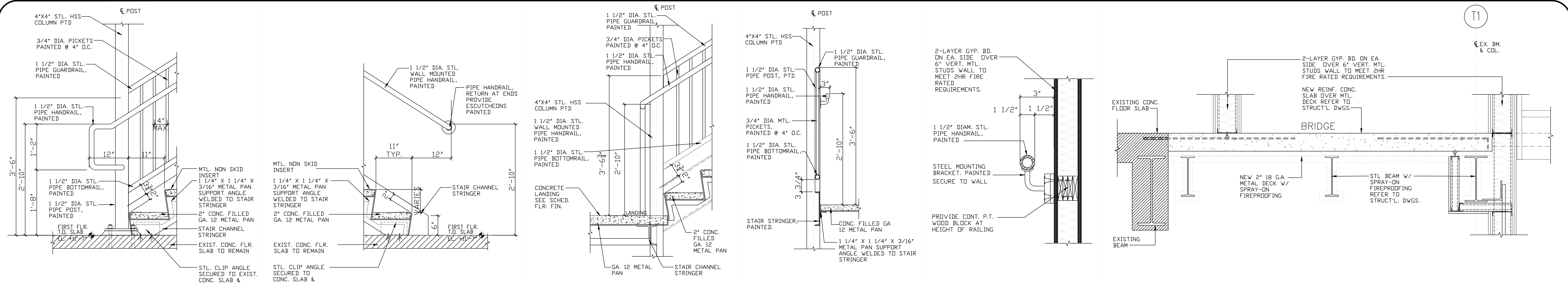


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**INTERNAL STAIR (TOWER)
BUILDING SECTIONS**

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DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
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10.30.15	95% SUBMISSION	KD	FM					AS SHOWN
05.31.17	100% SUBMISSION	MC	FM					DRAWN BY BT/WJT
08.30.17	ISSUED FOR BID	MC	FM					CHKD BY NJN
								JOB NO 2141151
								SHEET: 63 OF: 160
								DWG NO

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NJ License No. AI 12541

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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

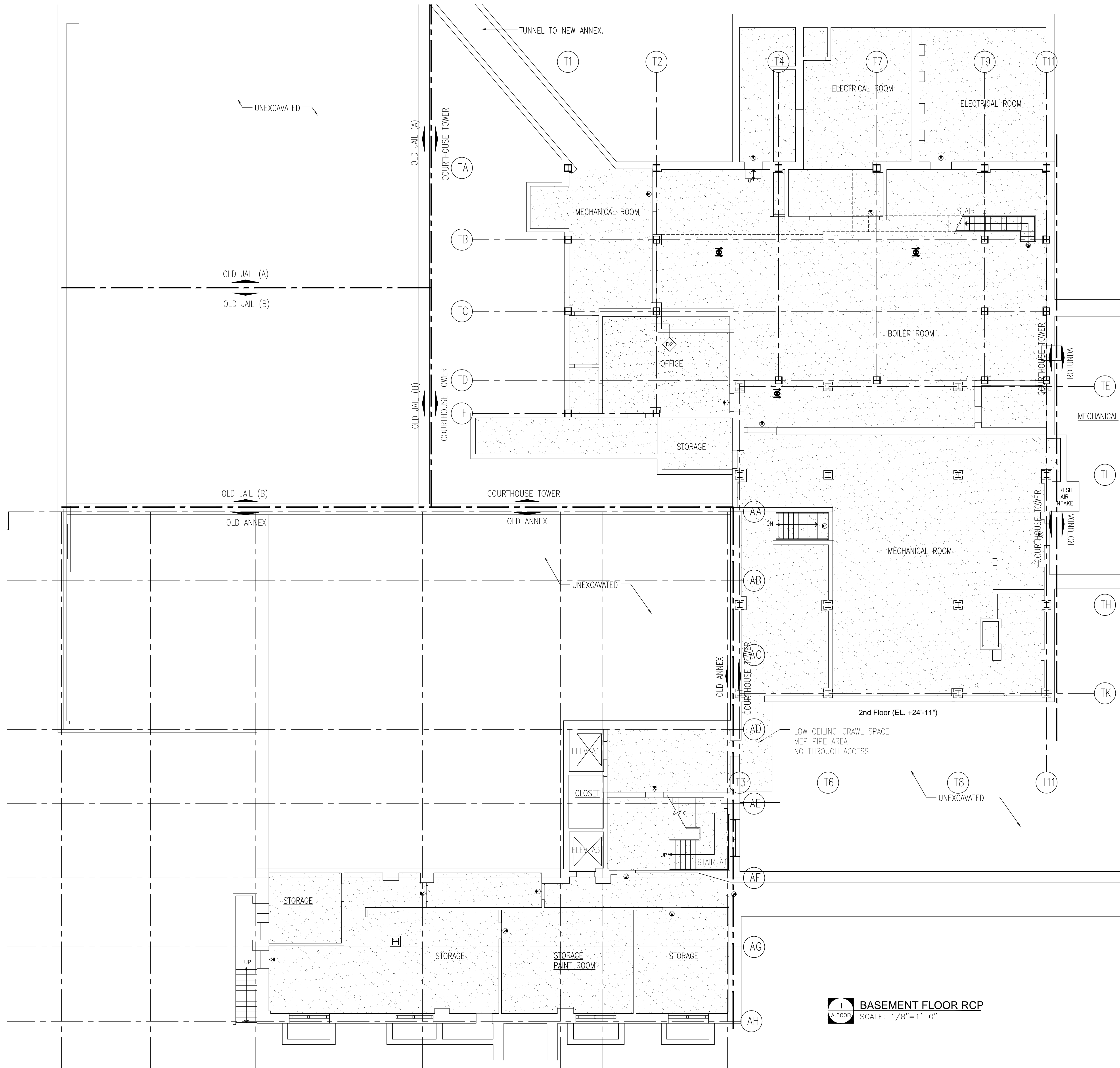
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-376-0098 FAX: 973-376-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS: **STAIR DETAILS**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 64 OF: 160
									DWG NO

A.502



LEGEND:

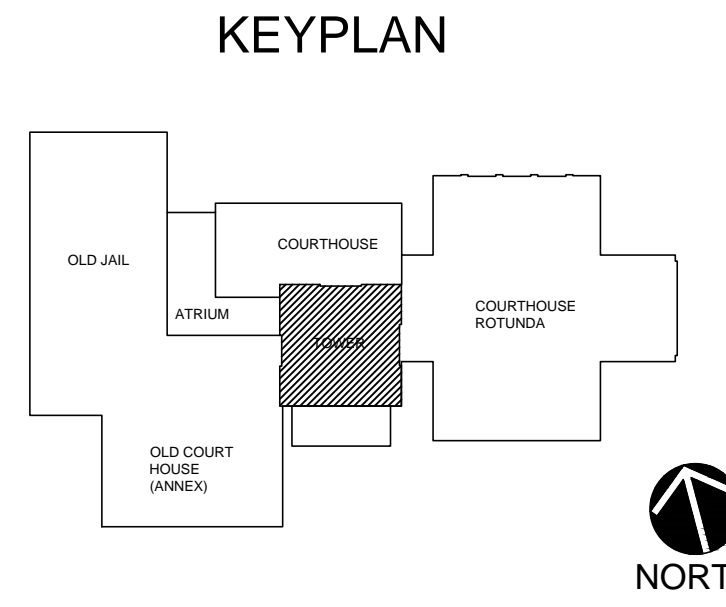
- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- EXISTING CEILING MOUNTED LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

EXISTING CEILING TYPE LEGEND:

1. **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
2. **GYPSON BOARD:** CONTRACTOR TO PATCH AND PAINT TO MATCH ANY GYPSON BOARD CEILING DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
3. **PLASTER:** CONTRACTOR SHALL PATCH AND PAINT TO MATCH ANY PLASTER DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
4. **STEEL PLATE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
5. **OPEN TO STRUCTURE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
6. **ACOUSTICAL CEILING:** GC TO REMOVE & RE-INSTALL THE CEILING TILES @ AREAS REQUIRE ACCESS FOR MECH. & PLUMBING WORKS. REFER TO MECH. DWGS.
7. **CORE DRILL THRU EXISTING BEAM THE FIRE SPRINKLER PIPES**

NOTE:

1. ALL CEILINGS TO BE FIELD VERIFIED BY CONTRACTOR. IMMEDIATELY NOTIFY THE ARCHITECT IF FIELD CONDITIONS DIFFERS FROM WHAT IS INDICATED ON DRAWINGS.



1
A.600B
BASEMENT FLOOR RCP
SCALE: 1/8"=1'-0"

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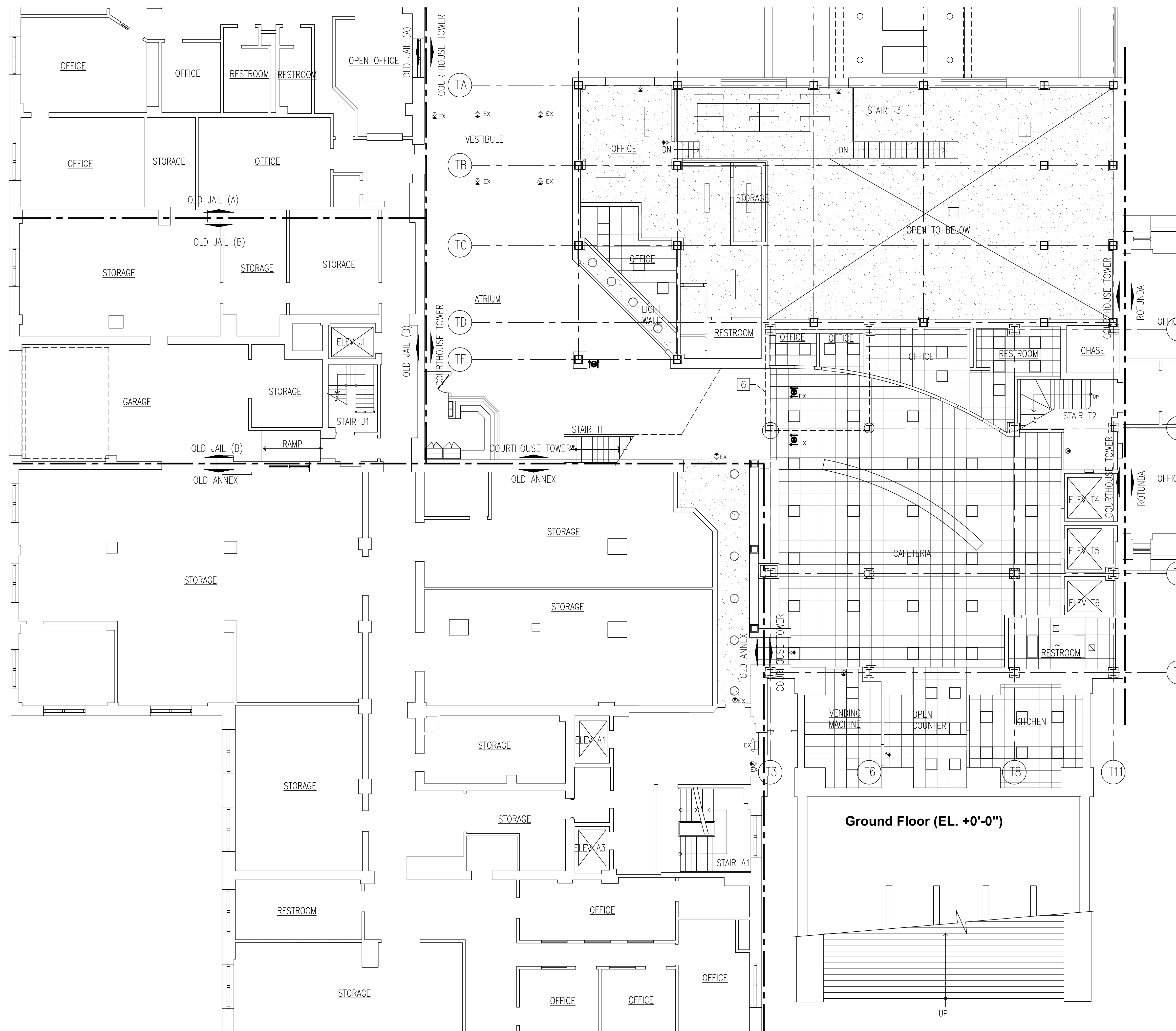


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
BASEMENT FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 65 OF 160
									DWG NO

A.600B



1
A.600G
GROUND FLOOR RCP
SCALE: 1/8"=1'-0"

LEGEND:

- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2x2 LIGHT FIXTURE
- EXISTING 2x4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

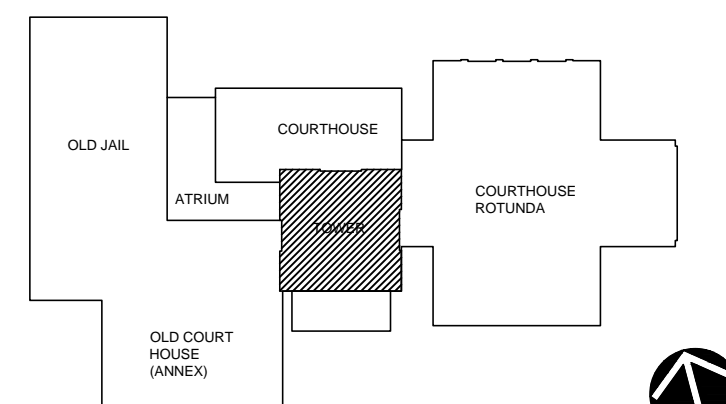
EXISTING CEILING TYPE LEGEND:

1. **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
2. **GYPSON BOARD:** CONTRACTOR TO PATCH AND PAINT TO MATCH ANY GYPSON BOARD CEILING DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
3. **PLASTER:** CONTRACTOR SHALL PATCH AND PAINT TO MATCH ANY PLASTER DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
4. **STEEL PLATE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
5. **OPEN TO STRUCTURE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
6. **ACOUSTICAL CEILING:** GC TO REMOVE & RE-INSTALL THE CEILING TILES @ AREAS REQUIRE ACCESS FOR MECH. & PLUMBING WORKS. REFER TO MECH. DWGS.
7. **CORE DRILL THRU EXISTING BEAM THE FIRE SPRINKLER PIPES**

NOTE:

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KEYPLAN



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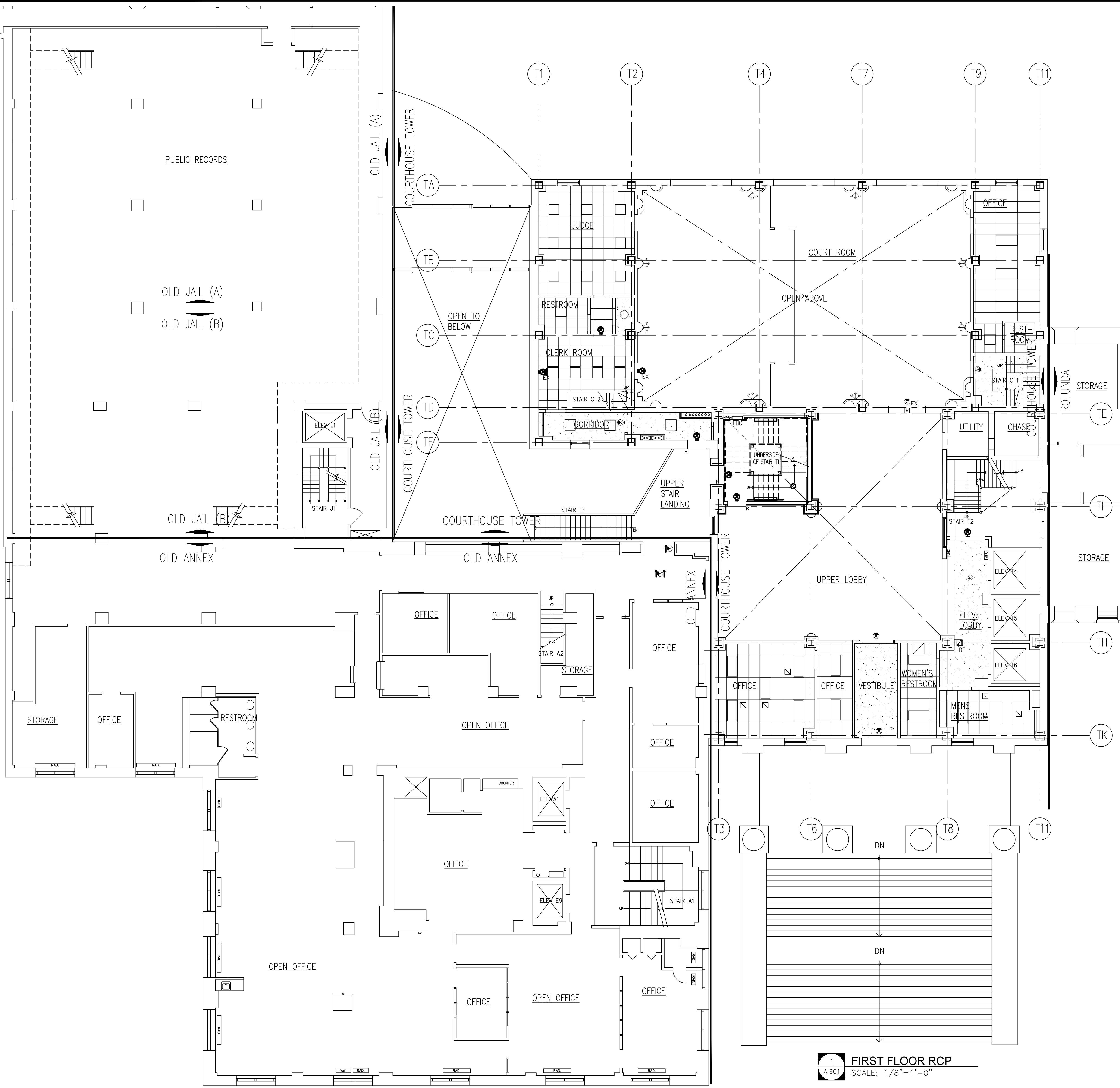
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 92 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-376-0098 FAX: 973-376-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
GROUND FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 66 OF 160
									DWG NO

A.600G



LEGEND:

- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

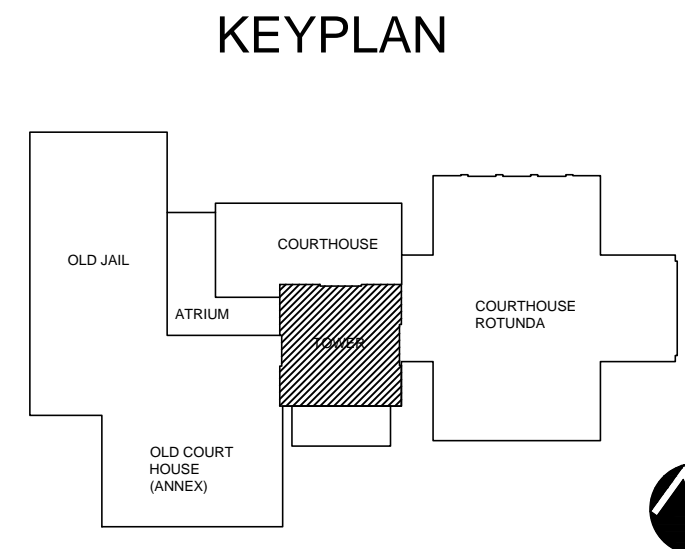
EXISTING CEILING TYPE LEGEND:

1. **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
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3. **PLASTER:** CONTRACTOR SHALL PATCH AND PAINT TO MATCH ANY PLASTER DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
4. **STEEL PLATE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
5. **OPEN TO STRUCTURE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
6. **ACOUSTICAL CEILING:** GC TO REMOVE & RE-INSTALL THE CEILING TILES @ AREAS REQUIRE ACCESS FOR MECH. & PLUMBING WORKS. REFER TO MECH. DWGS.
7. **CORE DRILL THRU EXISTING BEAM THE FIRE SPRINKLER PIPES**

NOTE:

1. ALL CEILINGS TO BE FIELD VERIFIED BY CONTRACTOR. IMMEDIATELY NOTIFY THE ARCHITECT IF FIELD CONDITIONS DIFFERS FROM WHAT IS INDICATED ON DRAWINGS.

1
A.601
FIRST FLOOR RCP
SCALE: 1/8"=1'-0"



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NJ License No. AI 12541

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NJ License No. AI 14394

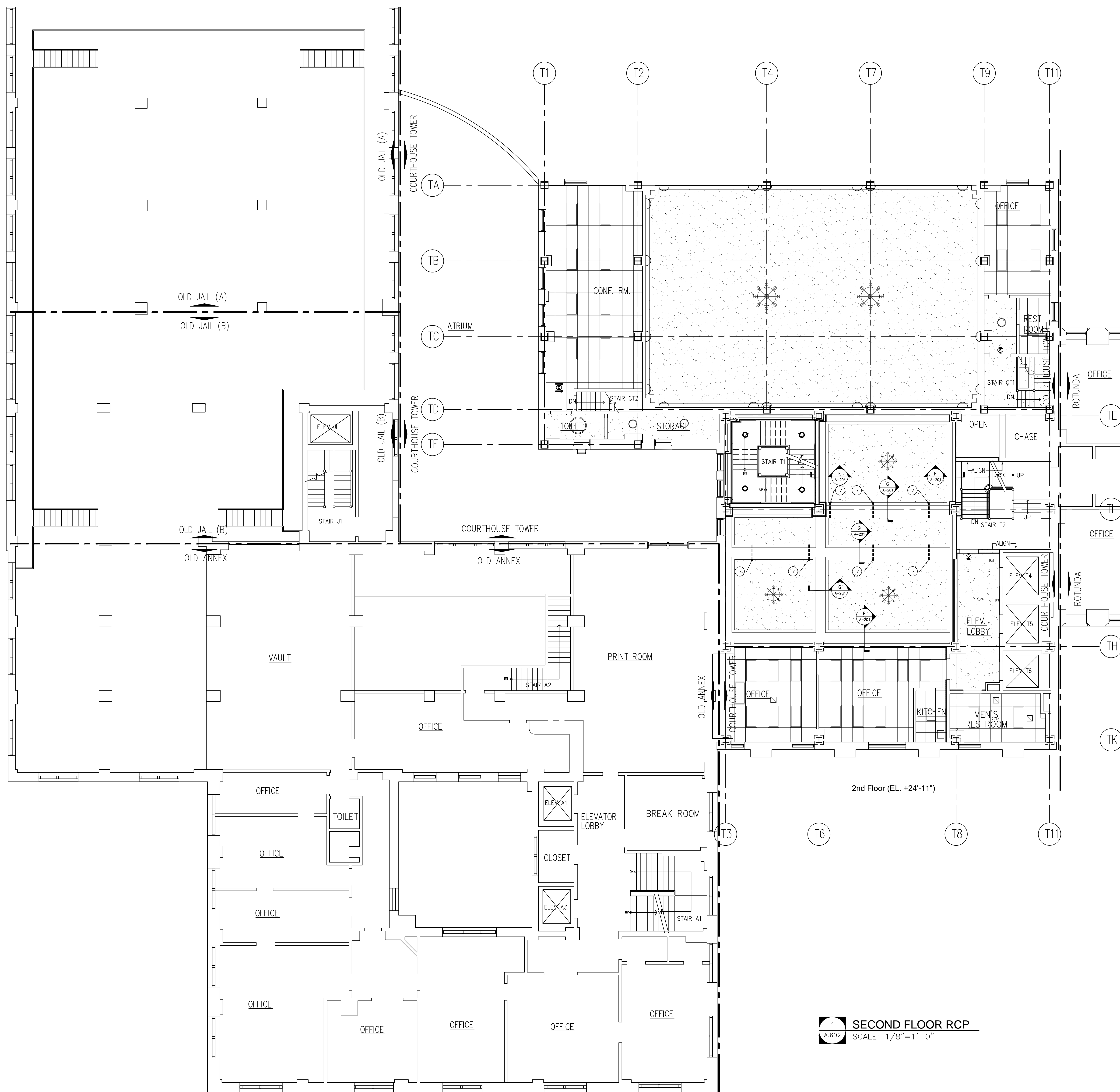
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TEL: 973.376.0098 FAX: 973.376.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FIRST FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	50% SUBMISSION	KD	FM						DRAWN BY BV
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 67 OF: 160
									DWG NO

A.601



1 SECOND FLOOR RCP
SCALE: 1/8" = 1'-0"

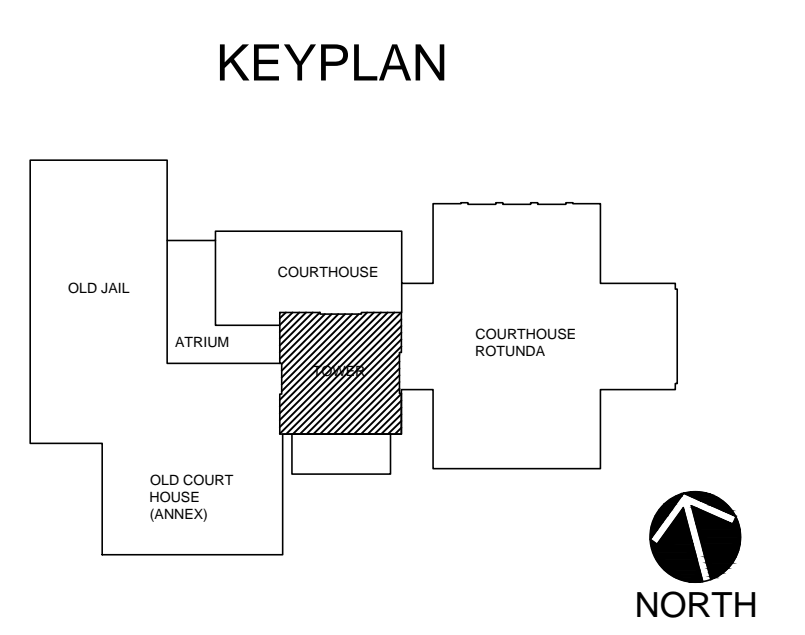
LEGEND:

- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2x2 LIGHT FIXTURE
- EXISTING 2x4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

EXISTING CEILING TYPE LEGEND:

1. **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
2. **GYPSON BOARD:** CONTRACTOR TO PATCH AND PAINT TO MATCH ANY GYPSUM BOARD CEILING DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
3. **PLASTER:** CONTRACTOR SHALL PATCH AND PAINT TO MATCH ANY PLASTER DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
4. **STEEL PLATE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
5. **OPEN TO STRUCTURE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
6. **ACOUSTICAL CEILING:** GC TO REMOVE & RE-INSTALL THE CEILING TILES @ AREAS REQUIRE ACCESS FOR MECH. & PLUMBING WORKS. REFER TO MECH. DWGS.
7. **CORE DRILL THRU EXISTING BEAM FOR FIRE SPRINKLER PIPES.**

NOTE:
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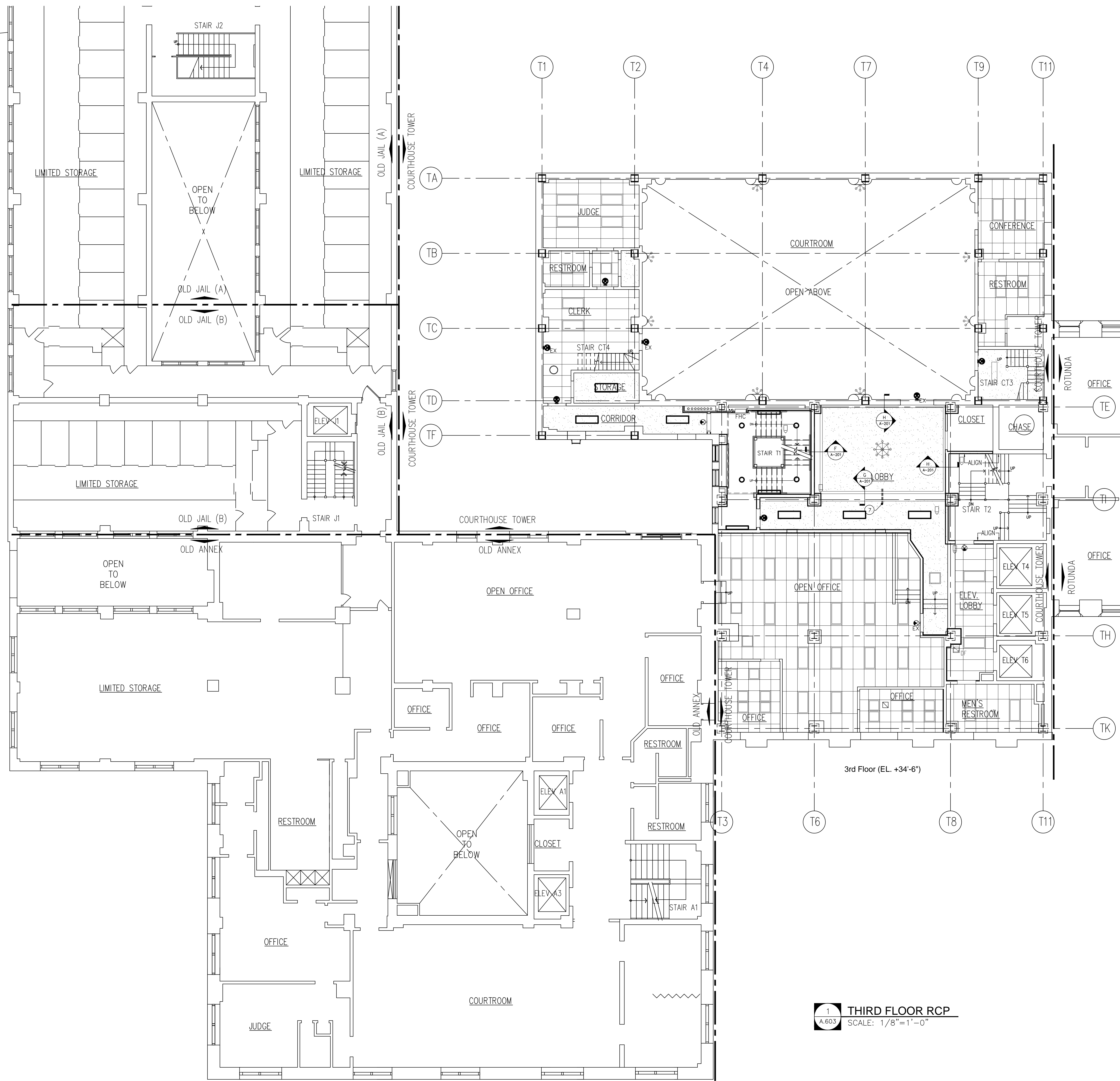


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SECOND FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 68 OF: 160
									DWG NO

A.602



LEGEND:

- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- EXISTING CEILING MOUNTED LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

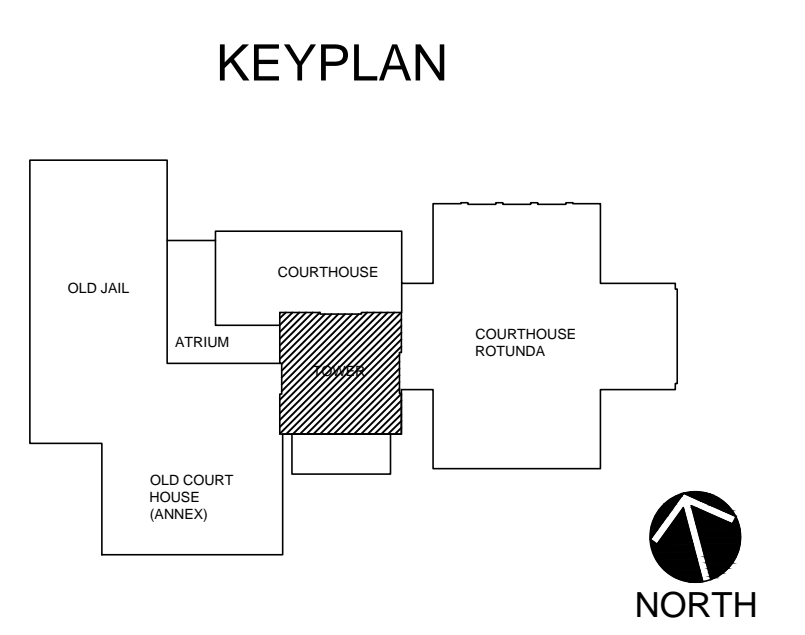
EXISTING CEILING TYPE LEGEND:

1. **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
2. **GYPSUM BOARD:** CONTRACTOR TO PATCH AND PAINT TO MATCH ANY GYPSUM BOARD CEILING DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
3. **PLASTER:** CONTRACTOR SHALL PATCH AND PAINT TO MATCH ANY PLASTER DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
4. **STEEL PLATE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
5. **OPEN TO STRUCTURE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
6. **ACOUSTICAL CEILING:** GC TO REMOVE & RE-INSTALL THE CEILING TILES @ AREAS REQUIRE ACCESS FOR MECH. & PLUMBING WORKS. REFER TO MECH. DWGS.
7. **CORE DRILL THRU EXISTING BEAM FOR FIRE SPRINKLER PIPES.** REFER TO MEP DWG.

NOTE:

1. ALL CEILINGS TO BE FIELD VERIFIED BY CONTRACTOR. IMMEDIATELY NOTIFY THE ARCHITECT IF FIELD CONDITIONS DIFFERS FROM WHAT IS INDICATED ON DRAWINGS.

1 THIRD FLOOR RCP
SCALE: 1/8" = 1'-0"



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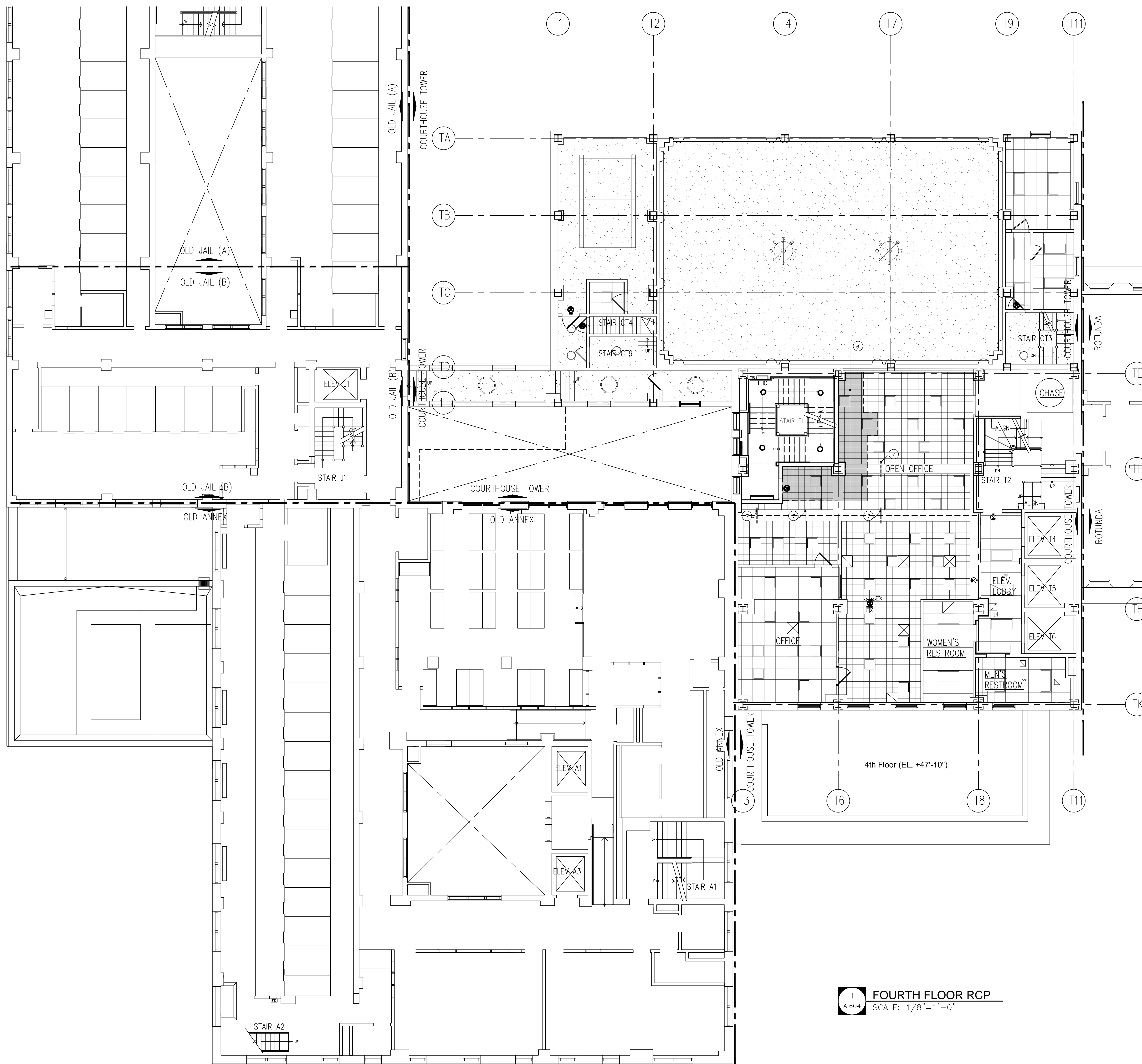


PROJECT: **UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
THIRD FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 69 OF 160
									DWG NO

A.603



1 FOURTH FLOOR RCP
SCALE: 1/8" = 1'-0"

LEGEND:

- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- EXISTING CEILING MOUNTED LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

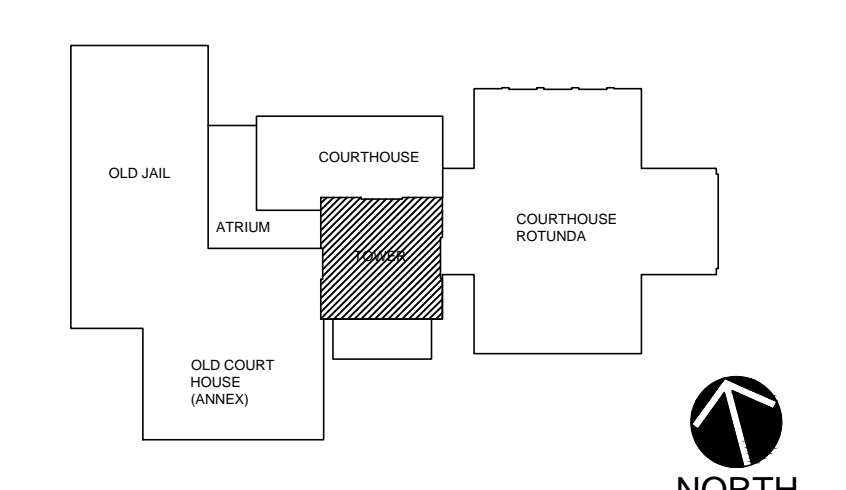
EXISTING CEILING TYPE LEGEND:

1. **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
2. **GYPSON BOARD:** CONTRACTOR TO PATCH AND PAINT TO MATCH ANY GYPSON BOARD CEILING DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
3. **PLASTER:** CONTRACTOR SHALL PATCH AND PAINT TO MATCH ANY PLASTER DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
4. **STEEL PLATE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
5. **OPEN TO STRUCTURE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
6. **ACOUSTICAL CEILING:** GC TO REMOVE & RE-INSTALL THE CEILING TILES @ AREAS REQUIRE ACCESS FOR MECH. & PLUMBING WORKS. REFER TO MECH. DWGS.
7. **CORE DRILL THRU EXISTING BEAM FOR FIRE SPRINKLER PIPES.** REFER AND COORDINATE WITH MEP DRAWINGS.

NOTE:

1. ALL CEILINGS TO BE FIELD VERIFIED BY CONTRACTOR. IMMEDIATELY NOTIFY THE ARCHITECT IF FIELD CONDITIONS DIFFERS FROM WHAT IS INDICATED ON DRAWINGS.

KEYPLAN



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LAURENCE K. UHER, AIA, LEED, AP
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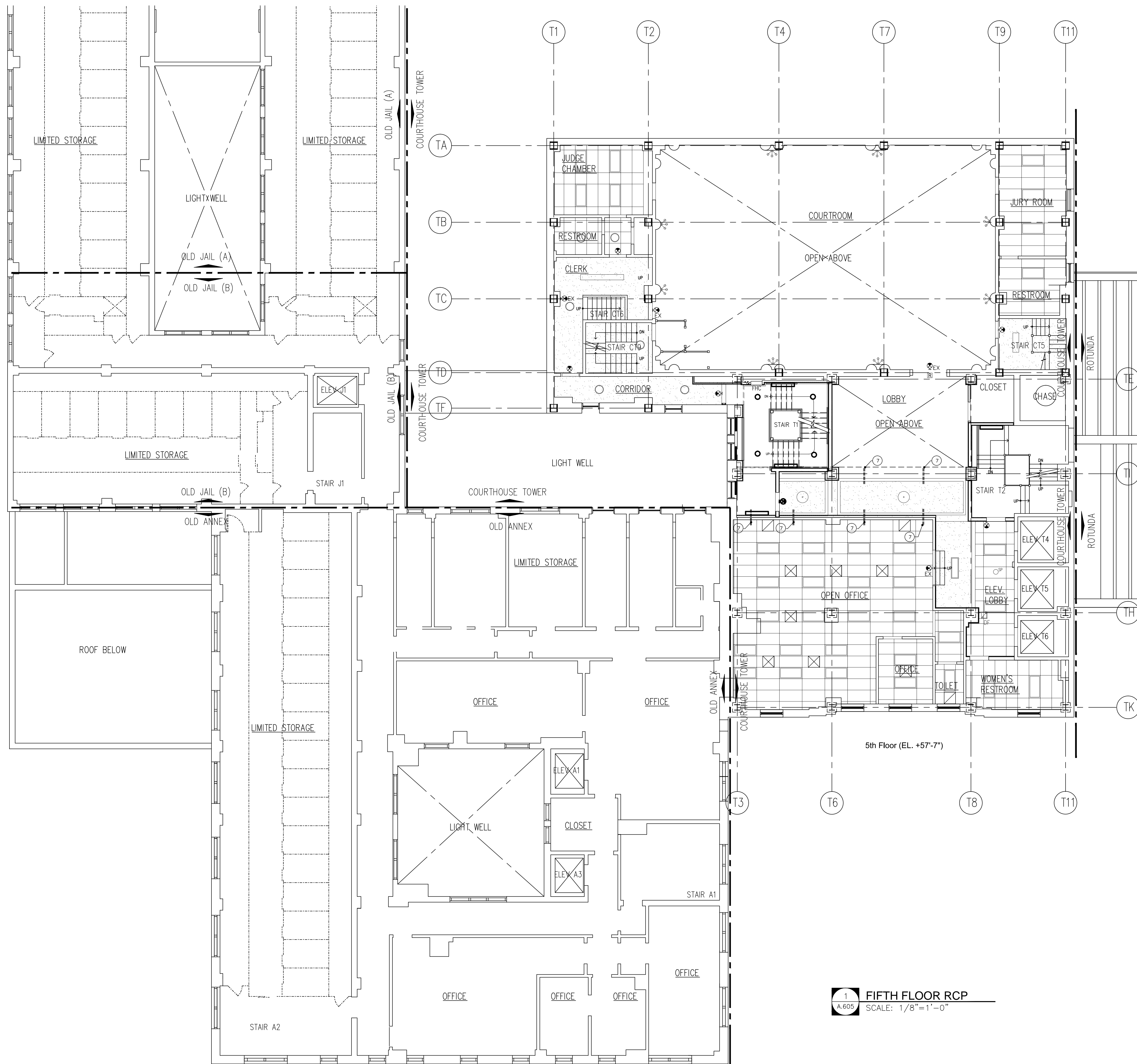


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FOURTH FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 70 OF 160
									DWG NO

A.604



LEGEND:

- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- 4' WALL MTD. LIGHT FIXTURE
- SURFACE MTD. 17" ROUND FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

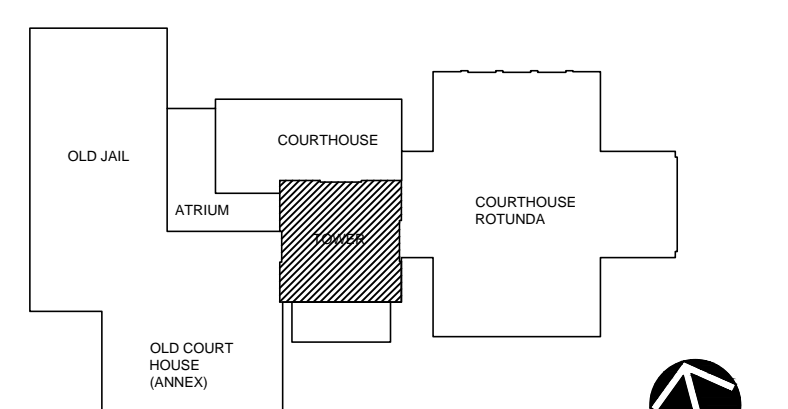
EXISTING CEILING TYPE LEGEND:

- ① **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
- ② **GYPSON BOARD:** CONTRACTOR TO PATCH AND PAINT TO MATCH ANY GYPSUM BOARD CEILING DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
- ③ **PLASTER:** CONTRACTOR SHALL PATCH AND PAINT TO MATCH ANY PLASTER DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
- ④ **STEEL PLATE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
- ⑤ **OPEN TO STRUCTURE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
- ⑥ **ACOUSTICAL CEILING:** GC TO REMOVE & RE-INSTALL THE CEILING TILES @ AREAS REQUIRE ACCESS FOR MECH. & PLUMBING WORKS. REFER TO MECH. DWGS.
- ⑦ **CORE DRILL THRU EXISTING BEAM FOR FIRE SPRINKLER PIPES.** REFER AND COORDINATE WITH MEP DRAWINGS.

NOTE:

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KEYPLAN



1 FIFTH FLOOR RCP
SCALE: 1/8" = 1'-0"

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NJ License No. AI 14394

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PROJECT:

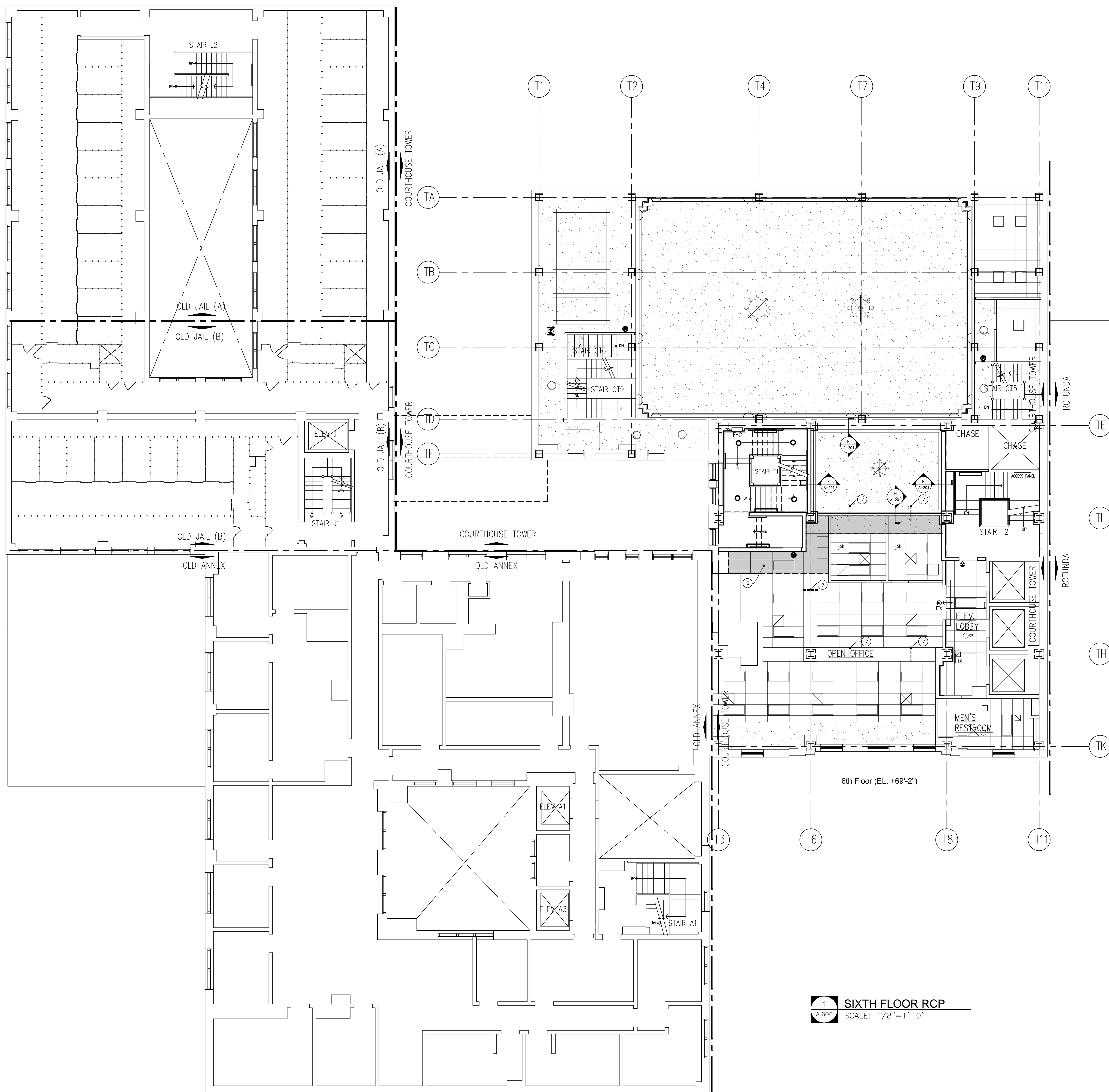
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

FIFTH FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY KD
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 71 OF 160
									DWG NO

A.605



LEGEND:

- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

EXISTING CEILING TYPE LEGEND:

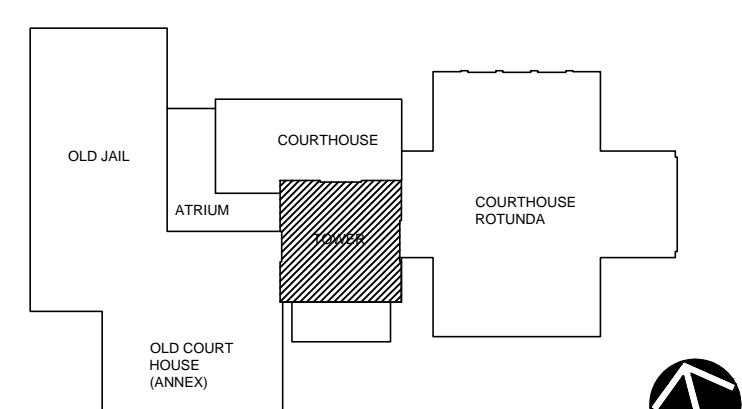
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NOTE:

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1
A.606
SIXTH FLOOR RCP
SCALE: 1/8" = 1'-0"

KEYPLAN



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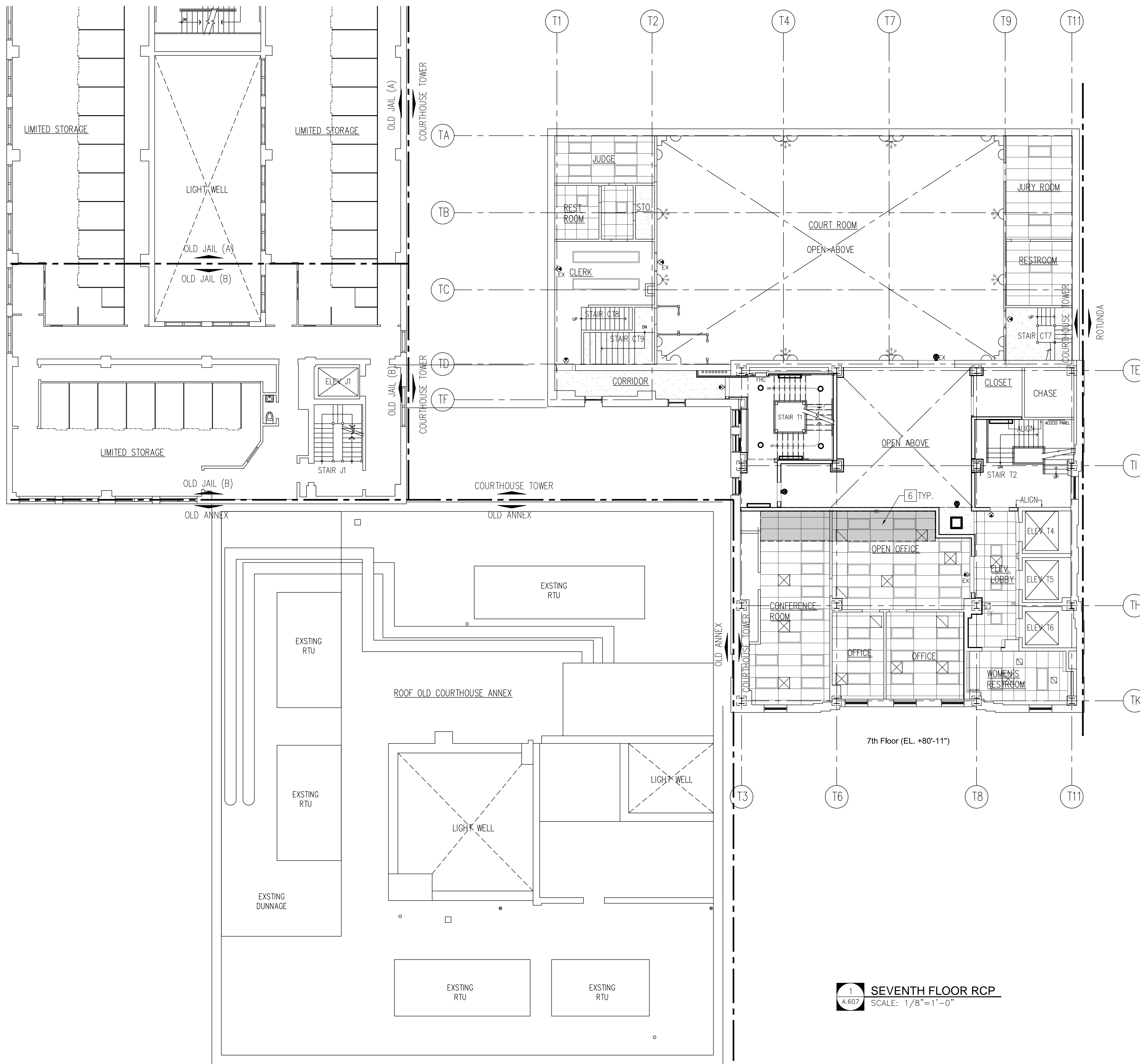
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

SIXTH FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY WTJ
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 72 OF: 160
									DWG NO

A.606



LEGEND:

- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCENCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

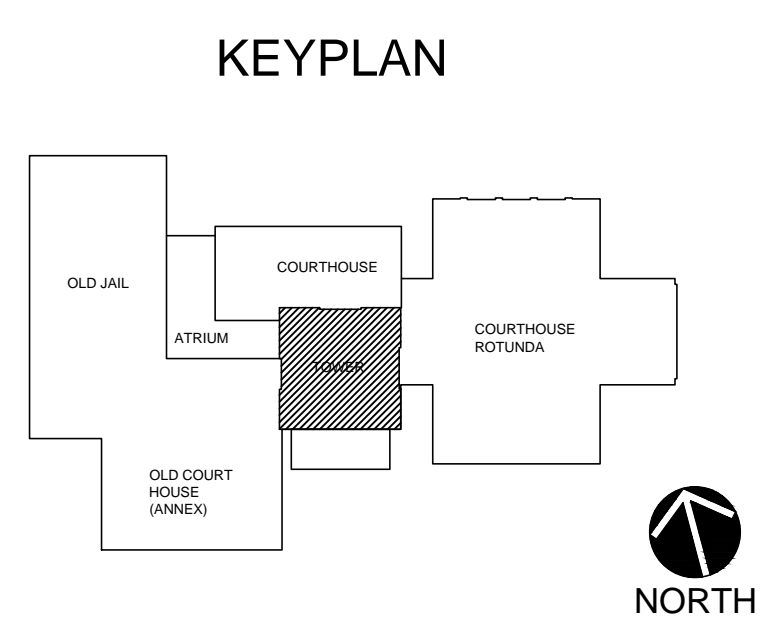
EXISTING CEILING TYPE LEGEND:

1. **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
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4. **STEEL PLATE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
5. **OPEN TO STRUCTURE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
6. **ACOUSTICAL CEILING:** GC TO REMOVE & RE-INSTALL THE CEILING TILES @ AREAS REQUIRE ACCESS FOR MECH. & PLUMBING WORKS. REFER TO MECH. DWGS.
7. **CORE DRILL THRU EXISTING BEAM THE FIRE SPRINKLER PIPES**

NOTE:

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1 SEVENTH FLOOR RCP
SCALE: 1/8"=1'-0"



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NJ License No. AI 12541

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MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SEVENTH FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY: WTJ
10.30.15	95% SUBMISSION	KD	FM						CHKD BY: NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO: 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 73 OF: 160
									DWG NO

A.607

LEGEND:

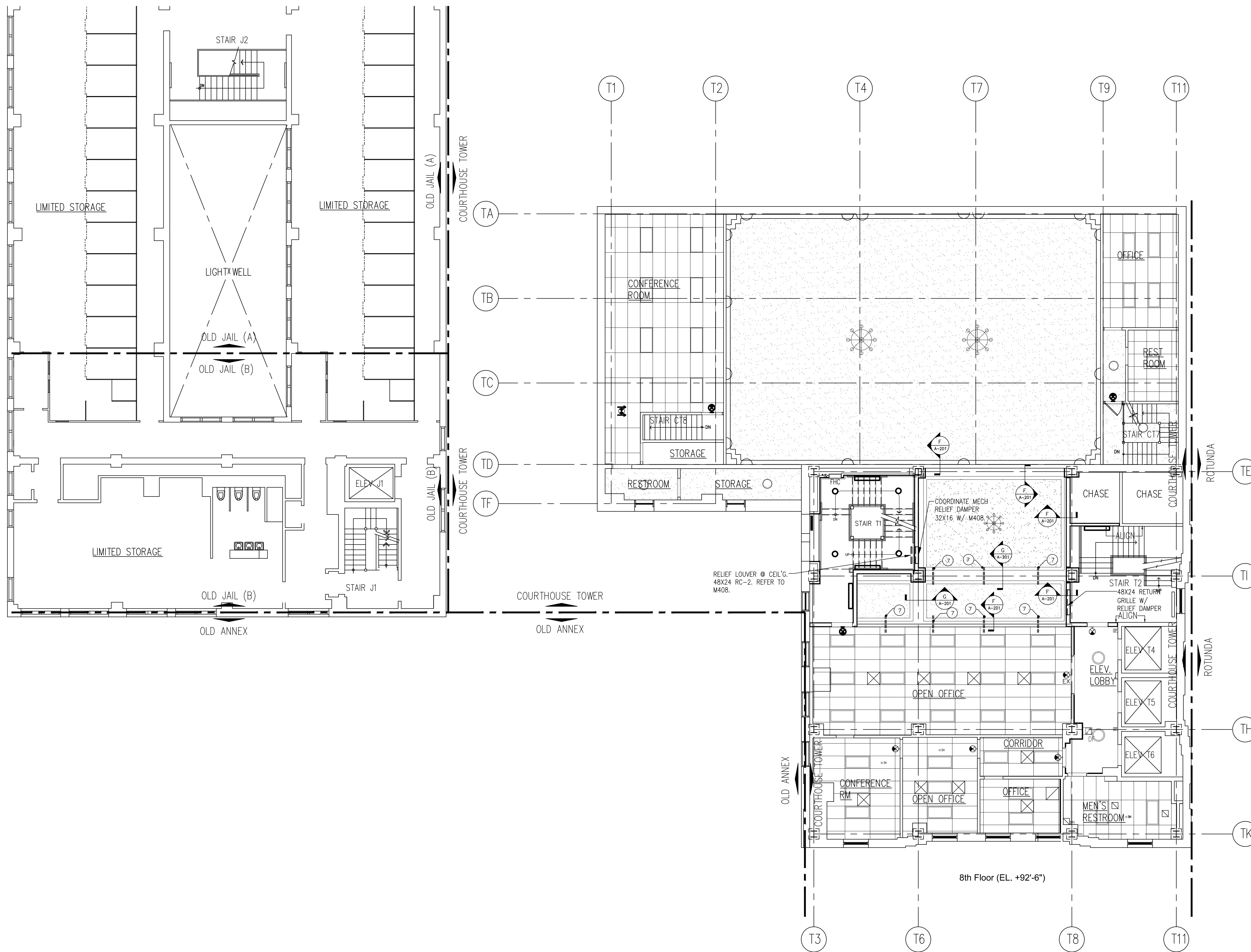
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- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

EXISTING CEILING TYPE LEGEND:

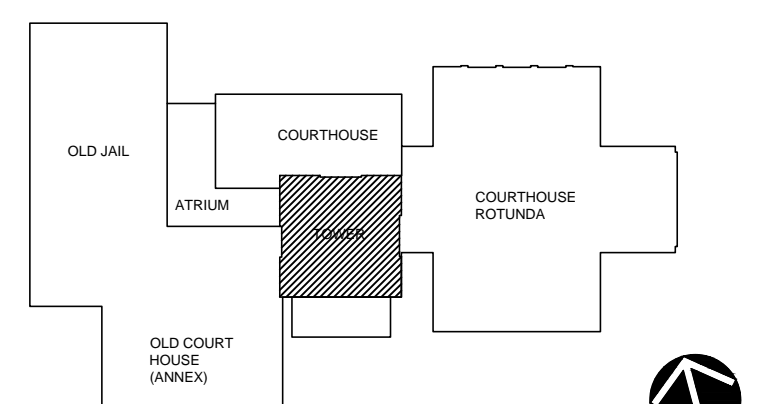
1. **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
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MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

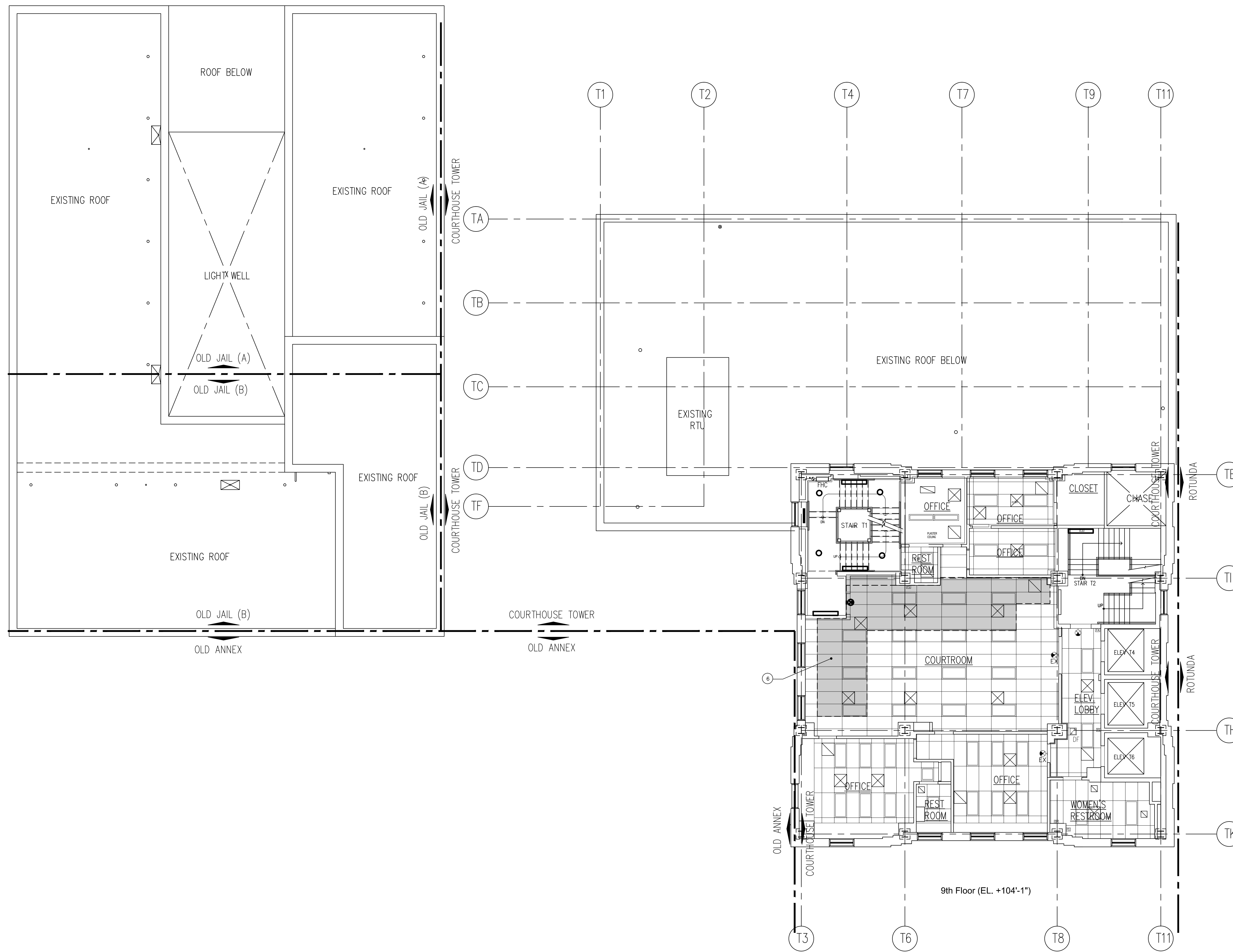
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

EIGHTH FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	WTJ
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	NJN
05.31.17	100% SUBMISSION	MC	FM					JOB NO	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	74 OF 160
								DWG NO	

A.608



LEGEND:

- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

EXISTING CEILING TYPE LEGEND:

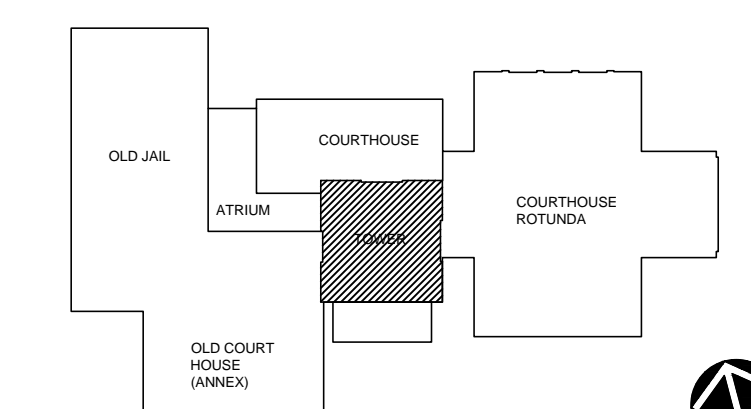
- ① **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
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- ⑦ **CORE DRILL THRU EXISTING BEAM FOR FIRE SPRINKLER PIPES.** REFER AND COORDINATE WITH MEP DRAWINGS.

NOTE:

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1
A.609
NINTH FLOOR RCP
SCALE: 1/8" = 1'-0"

KEYPLAN



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PROJECT:

**UC COURTHOUSE
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2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

NINTH FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY BT
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 75 OF: 160
									DWG NO

A.609

LEGEND:

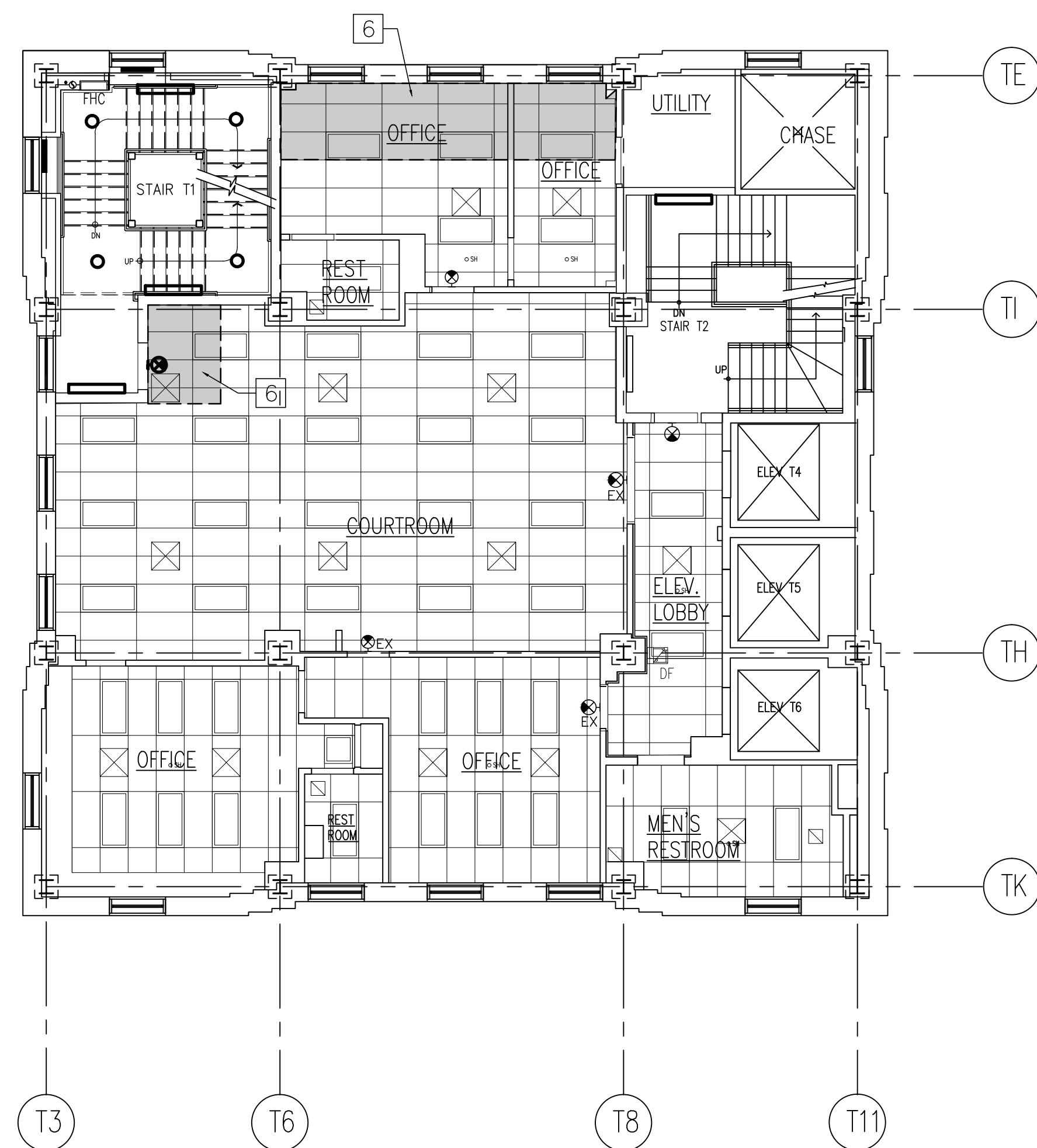
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- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
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- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
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- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

EXISTING CEILING TYPE LEGEND:

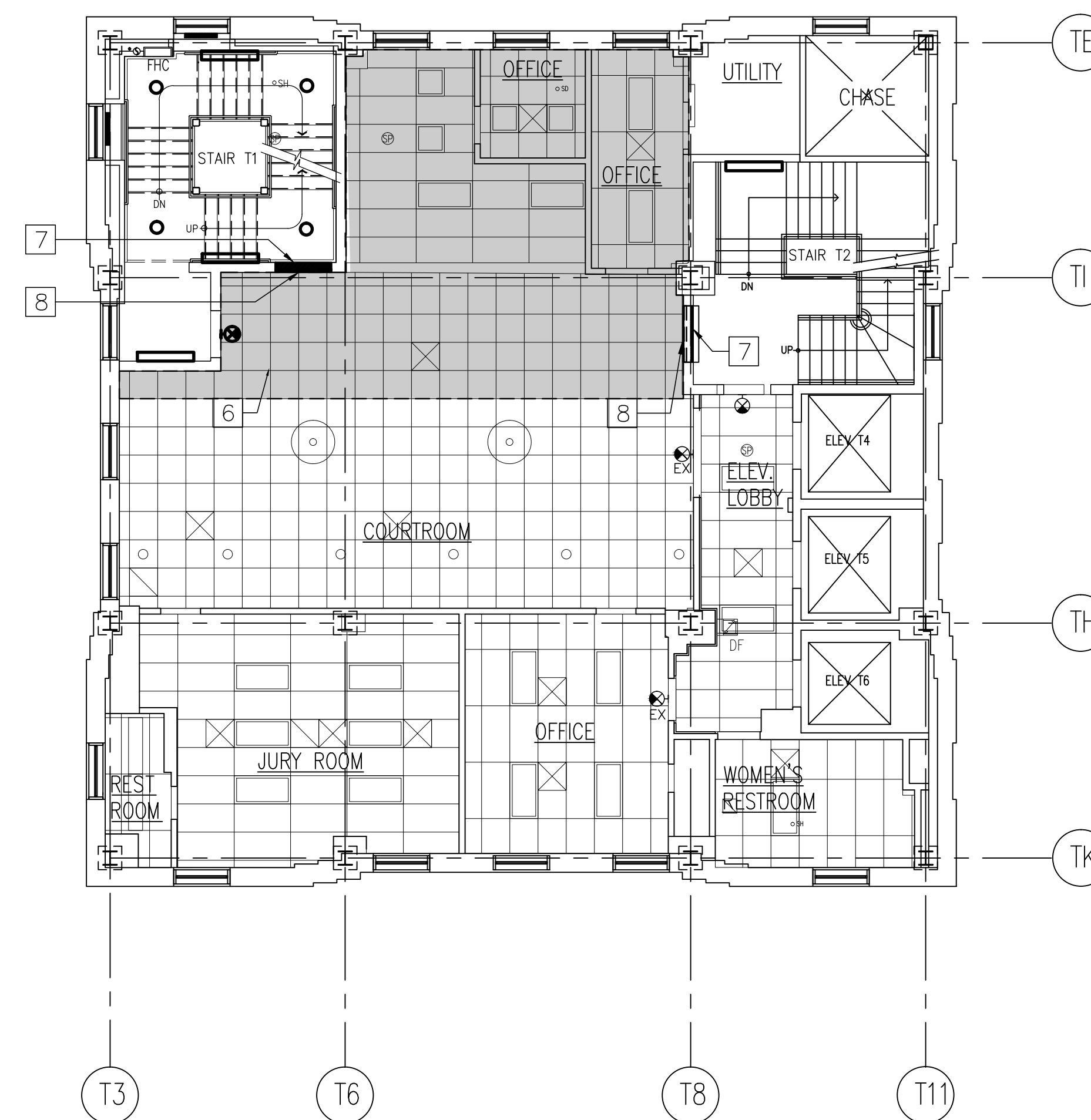
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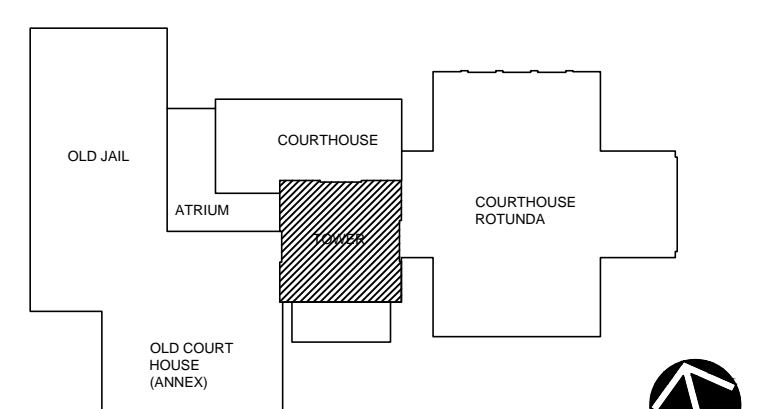


1
A.610
TENTH FLOOR RCP
SCALE: 1/8"=1'-0"



2
A.610
ELEVENTH FLOOR RCP
SCALE: 1/8"=1'-0"

KEYPLAN



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PROJECT:

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INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

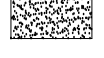

SHEET CONTENTS:

TENTH & ELEVENTH FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY WTJ
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 76 OF: 160
									DWG NO

A.610

LEGEND:

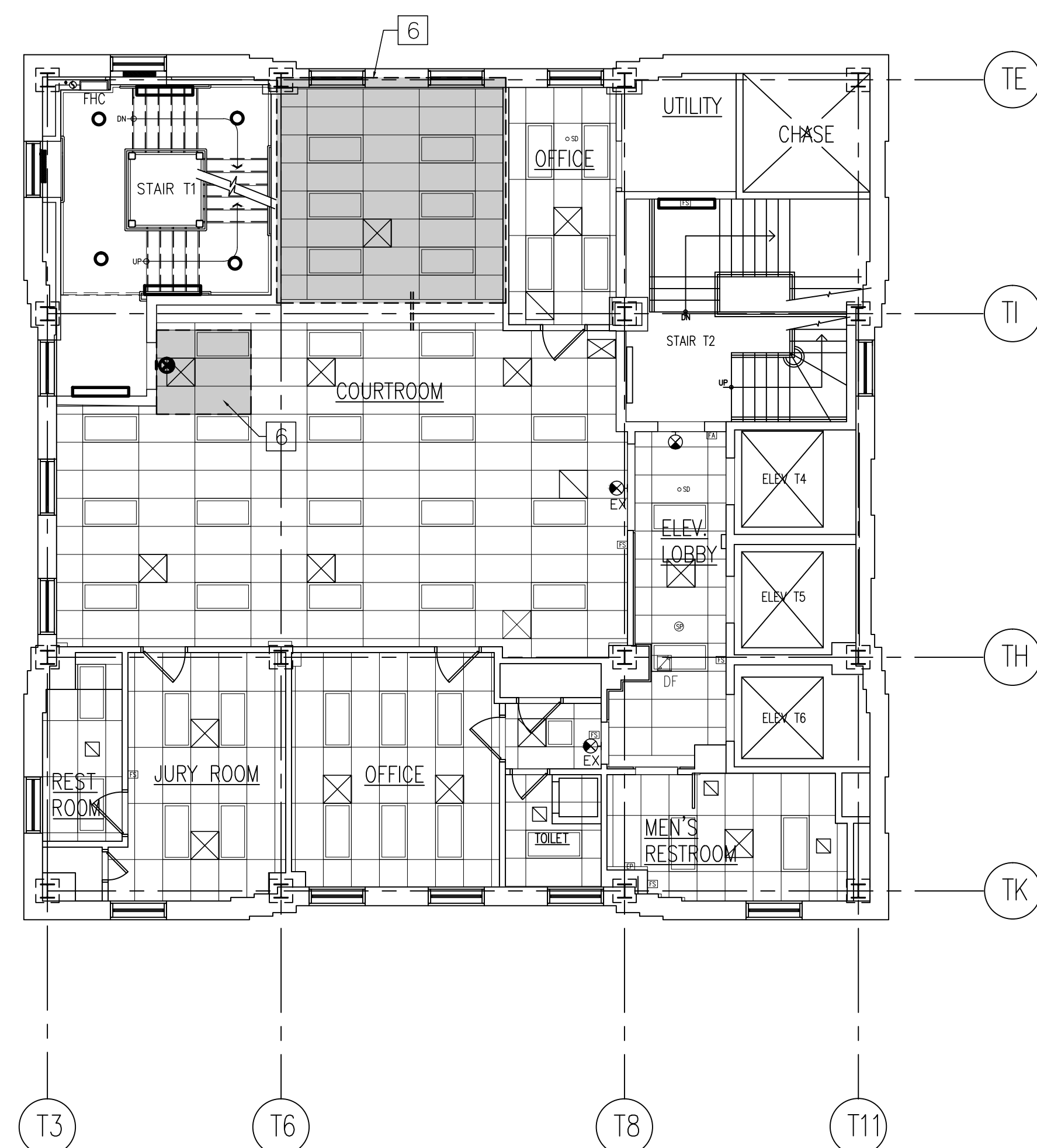
-  EXISTING PLASTER CEILING GRID
-  EXISTING 2'x4' CEILING GRID
-  EXISTING 2'x2' CEILING GRID
-  EXISTING 2X2 LIGHT FIXTURE
-  EXISTING 2X4 LIGHT FIXTURE
-  EXISTING LIGHT FIXTURE
-  EXISTING DOWNLIGHT FIXTURE
-  EXISTING CHANDELIER FIXTURE
-  EXISTING SCONCE FIXTURE
-  CEILING MOUNTED LIGHT FIXTURE
-  4' WALL-MOUNTED LIGHT FIXTURE
-  MECH. SUPPLY DIFFUSER
-  MECH. RETURN DIFFUSER
-  WALL-MOUNTED EXIT SIGN
-  EXISTING WALL-MOUNTED EXIT SIGN
-  CEILING-MOUNTED EXIT SIGN
-  EXISTING CEILING-MOUNTED EXIT SIGN
-  EMERGENCY LIGHT
-  EXISTING EMERGENCY LIGHT

EXISTING CEILING TYPE LEGEND:

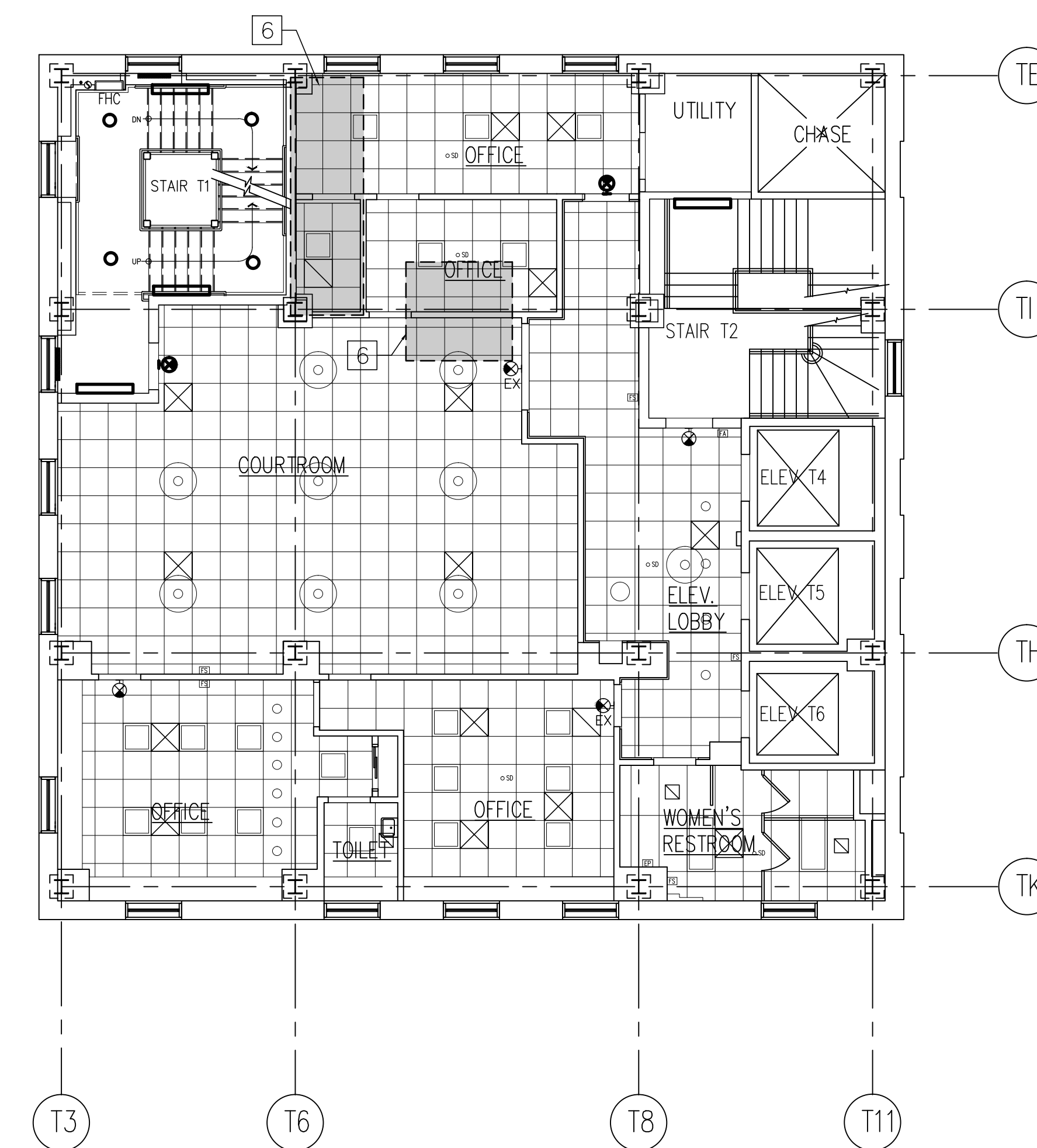
1. **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
2. **GYPSUM BOARD:** CONTRACTOR TO PATCH AND PAINT TO MATCH ANY GYPSUM BOARD CEILING DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
3. **PLASTER:** CONTRACTOR SHALL PATCH AND PAINT TO MATCH ANY PLASTER DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
4. **STEEL PLATE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
5. **OPEN TO STRUCTURE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
6. **ACOUSTICAL CEILING:** GC TO REMOVE & RE-INSTALL THE CEILING TILES @ AREAS REQUIRE ACCESS FOR MECH. & PLUMBING WORKS. REFER TO MECH. DWGS.
7. **CORE DRILL THRU EXISTING BEAM THE FIRE SPRINKLER PIPES**

NOTE:

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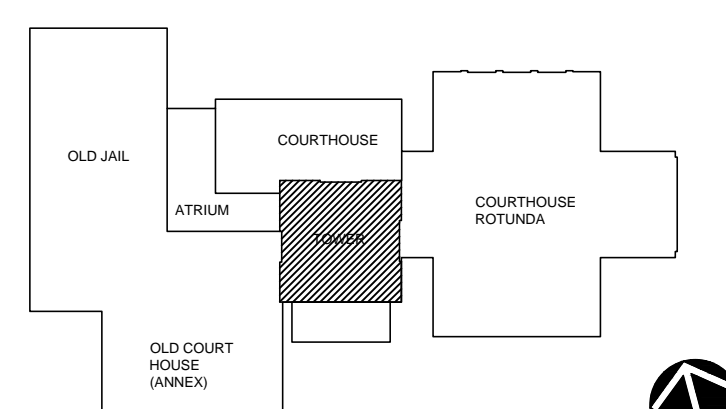


1 TWELFTH FLOOR RCP
A.611 SCALE: 1/8"=1'-0"



2 THIRTEENTH FLOOR RCP
A.611 SCALE: 1/8"=1'-0"

KEYPLAN



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PROJECT:

**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

TWELFTH & THIRTEENTH FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY: WTJ
10.30.15	95% SUBMISSION	KD	FM						CHKD BY: NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO: 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 77 OF: 160
									DWG NO

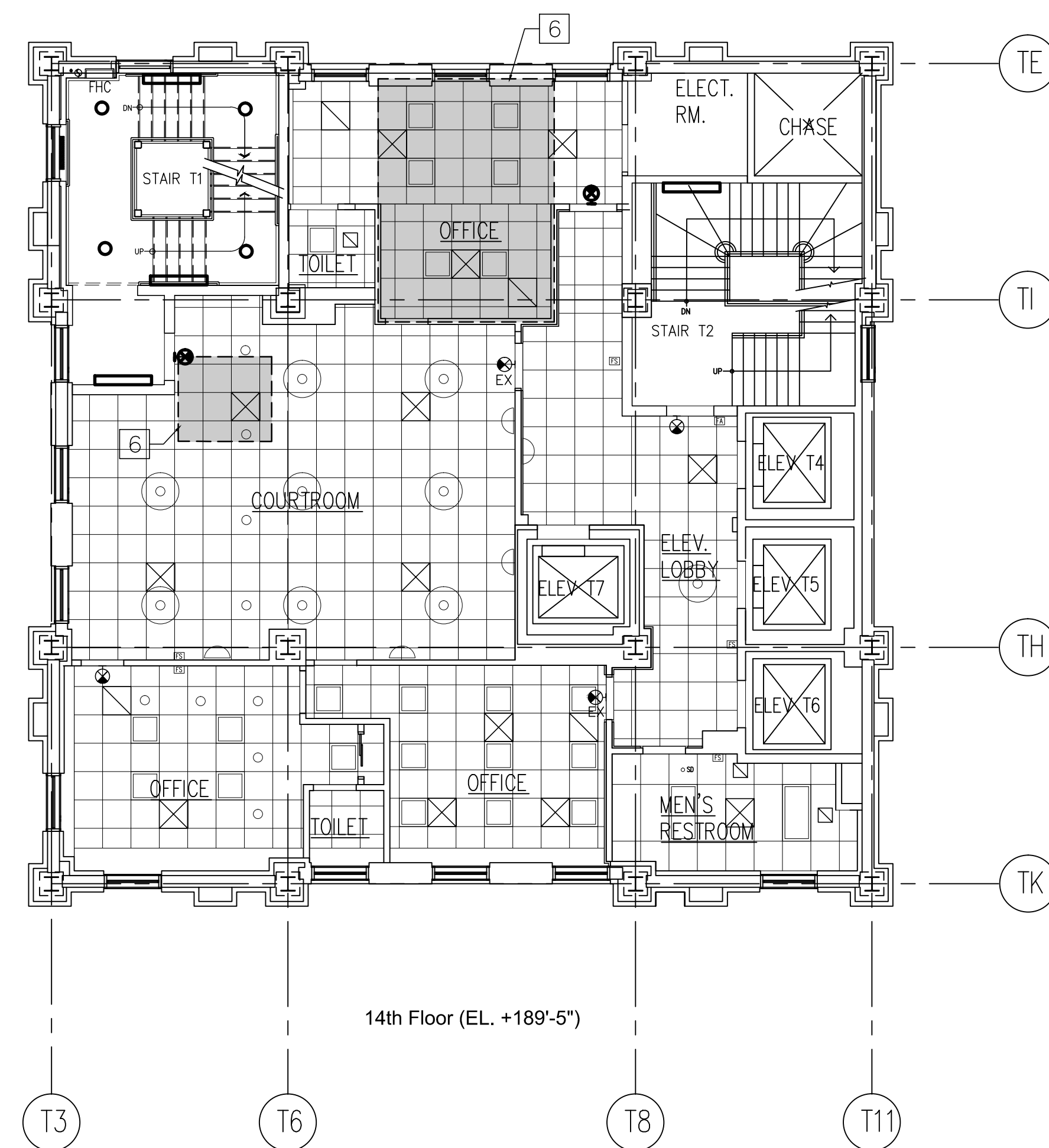
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LEGEND:

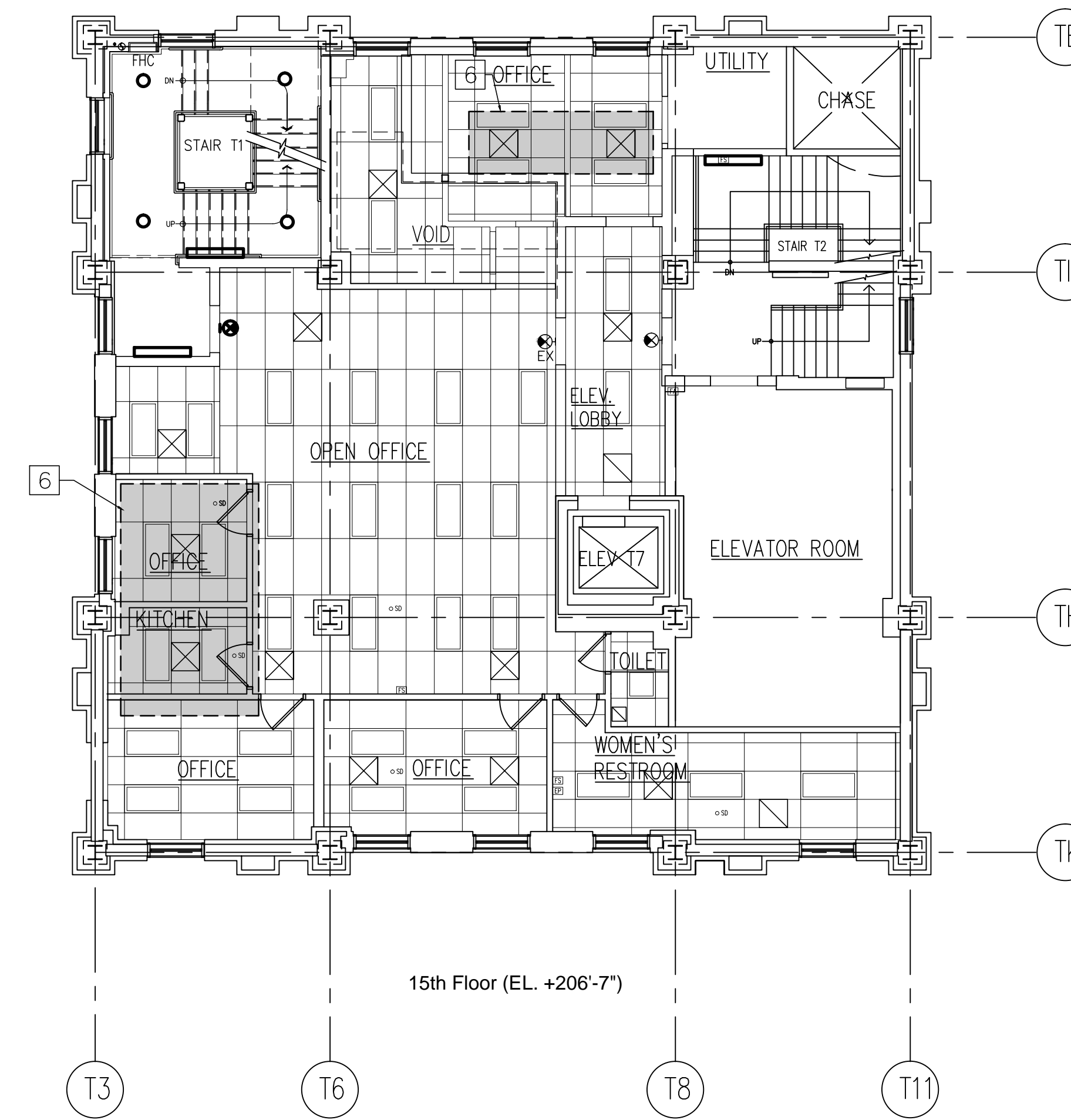
- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

EXISTING CEILING TYPE LEGEND:

1. **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
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4. **STEEL PLATE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
5. **OPEN TO STRUCTURE:** SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
6. **ACOUSTICAL CEILING:** GC TO REMOVE & RE-INSTALL THE CEILING TILES @ AREAS REQUIRE ACCESS FOR MECH. & PLUMBING WORKS. REFER TO MECH. DWGS.
7. **CORE DRILL THRU EXISTING BEAM THE FIRE SPRINKLER PIPES**



1 FOURTEENTH FLOOR RCP
SCALE: 1/4"=1'-0"

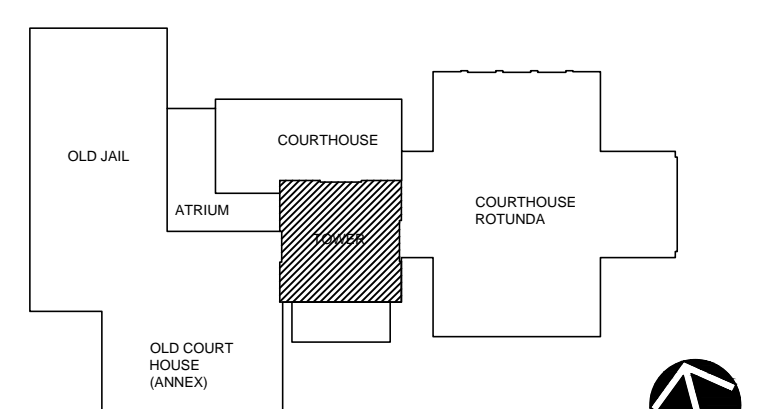


2 FIFTEENTH FLOOR RCP
SCALE: 1/4"=1'-0"

NOTE:

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PROJECT:

**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey




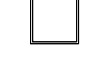


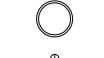










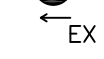
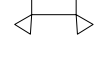
SHEET CONTENTS:

FOURTEENTH & FIFTEENTH FLOOR RCP

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY: WTJ
10.30.15	95% SUBMISSION	KD	FM						CHKD BY: NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO: 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 78 OF: 160
									DWG NO:

A.612

LEGEND:

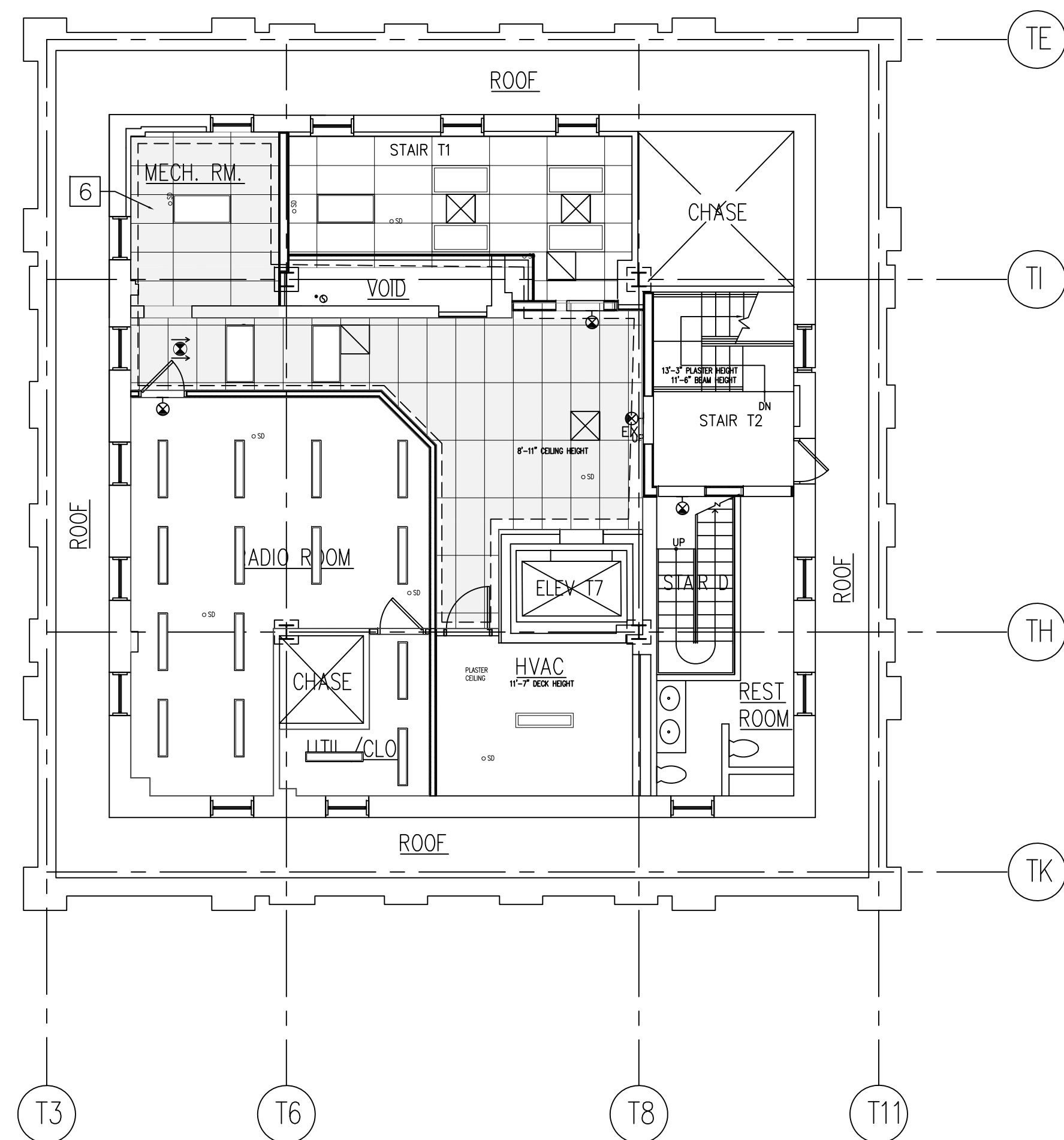
-  EXISTING PLASTER CEILING GRID
-  EXISTING 2'x4' CEILING GRID
-  EXISTING 2'x2' CEILING GRID
-  EXISTING 2X2 LIGHT FIXTURE
-  EXISTING 2X4 LIGHT FIXTURE
-  EXISTING LIGHT FIXTURE
-  EXISTING DOWNLIGHT FIXTURE
-  EXISTING CHANDELIER FIXTURE
-  EXISTING SCONCE FIXTURE
-  EXISTING CEILING MOUNTED LIGHT FIXTURE
-  EXISTING 4' WALL-MOUNTED LIGHT FIXTURE
-  MECH. SUPPLY DIFFUSER
-  MECH. RETURN DIFFUSER
-  WALL-MOUNTED EXIT SIGN
-  EXISTING WALL-MOUNTED EXIT SIGN
-  CEILING-MOUNTED EXIT SIGN
-  EXISTING CEILING-MOUNTED EXIT SIGN
-  EMERGENCY LIGHT
-  EXISTING EMERGENCY LIGHT

EXISTING CEILING TYPE LEGEND:

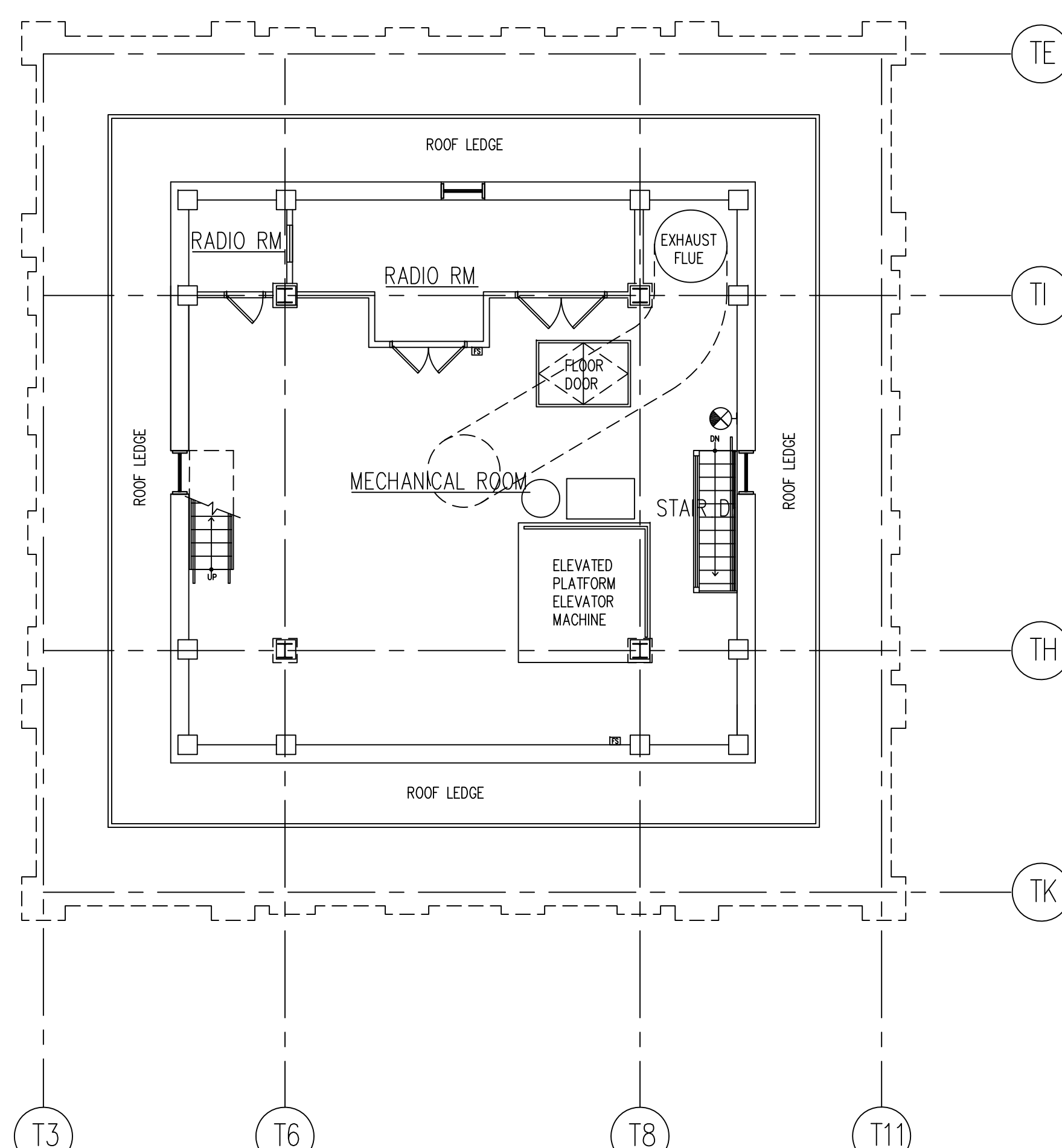
1. **ACOUSTICAL CEILING:** CONTRACTOR TO REMOVE AND REPLACE ALL AFFECTED TILES AND REPLACE ANY CEILING GRID DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
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7. **CORE DRILL THRU EXISTING BEAM THE FIRE SPRINKLER PIPES**

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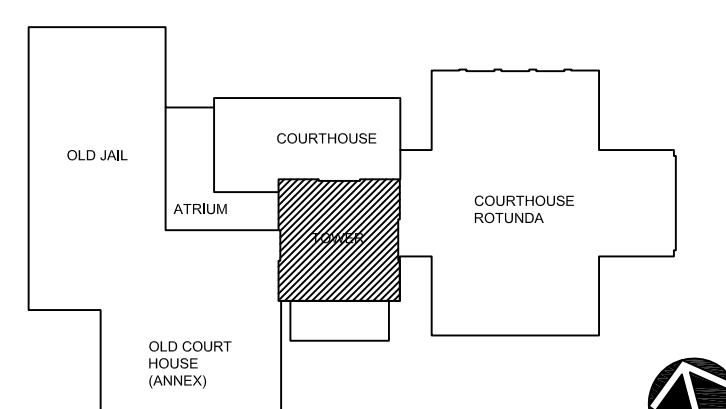


1 SIXTEENTH FLOOR RCP
A.613 SCALE: 1/8"=1'-0"



2 PENTHOUSE FLOOR RCP
A.613 SCALE: 1/8"=1'-0"

KEYPLAN



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NJ License No. AI 14394

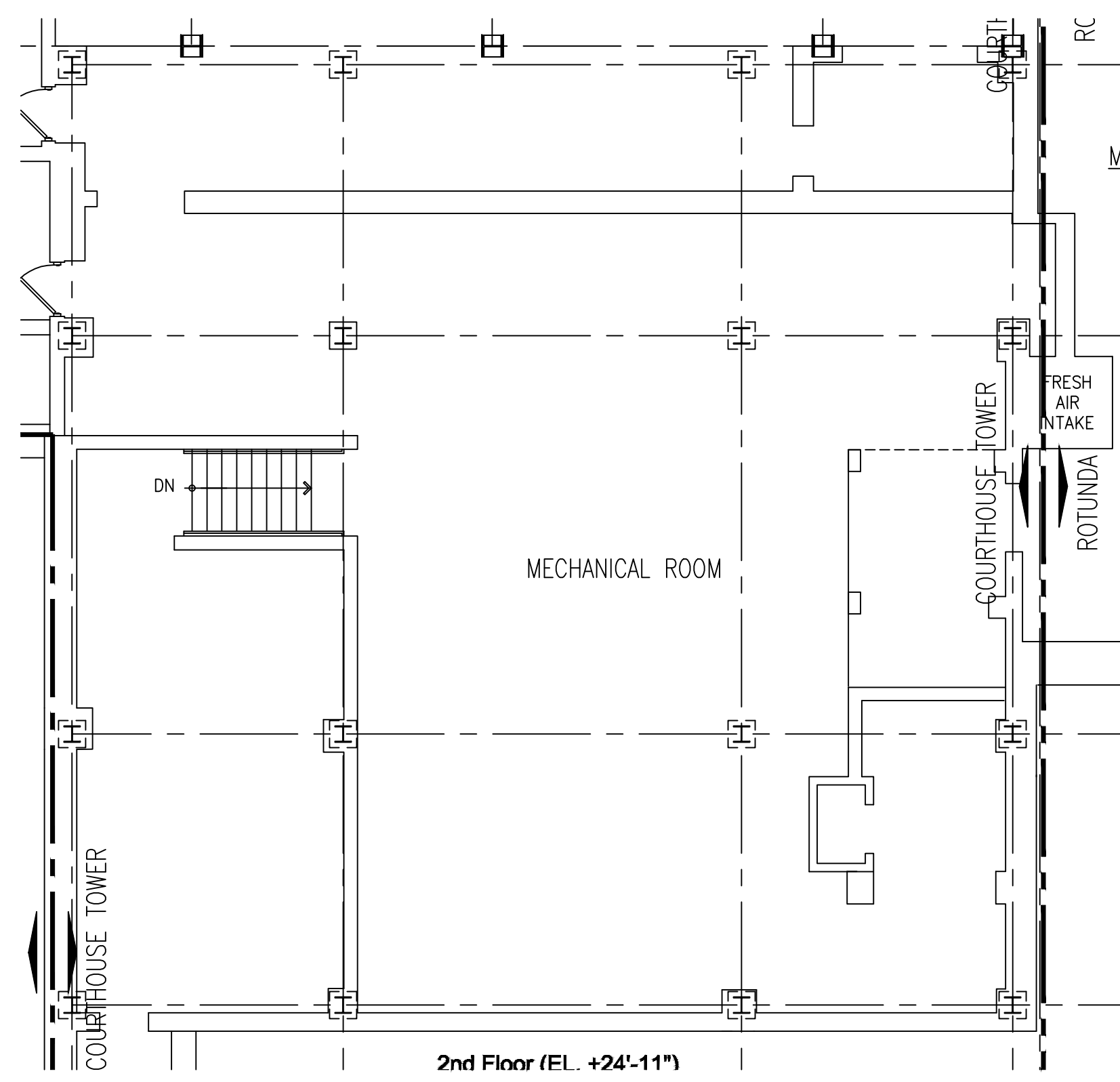


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SIXTEENTH & PENTHOUSE RCP

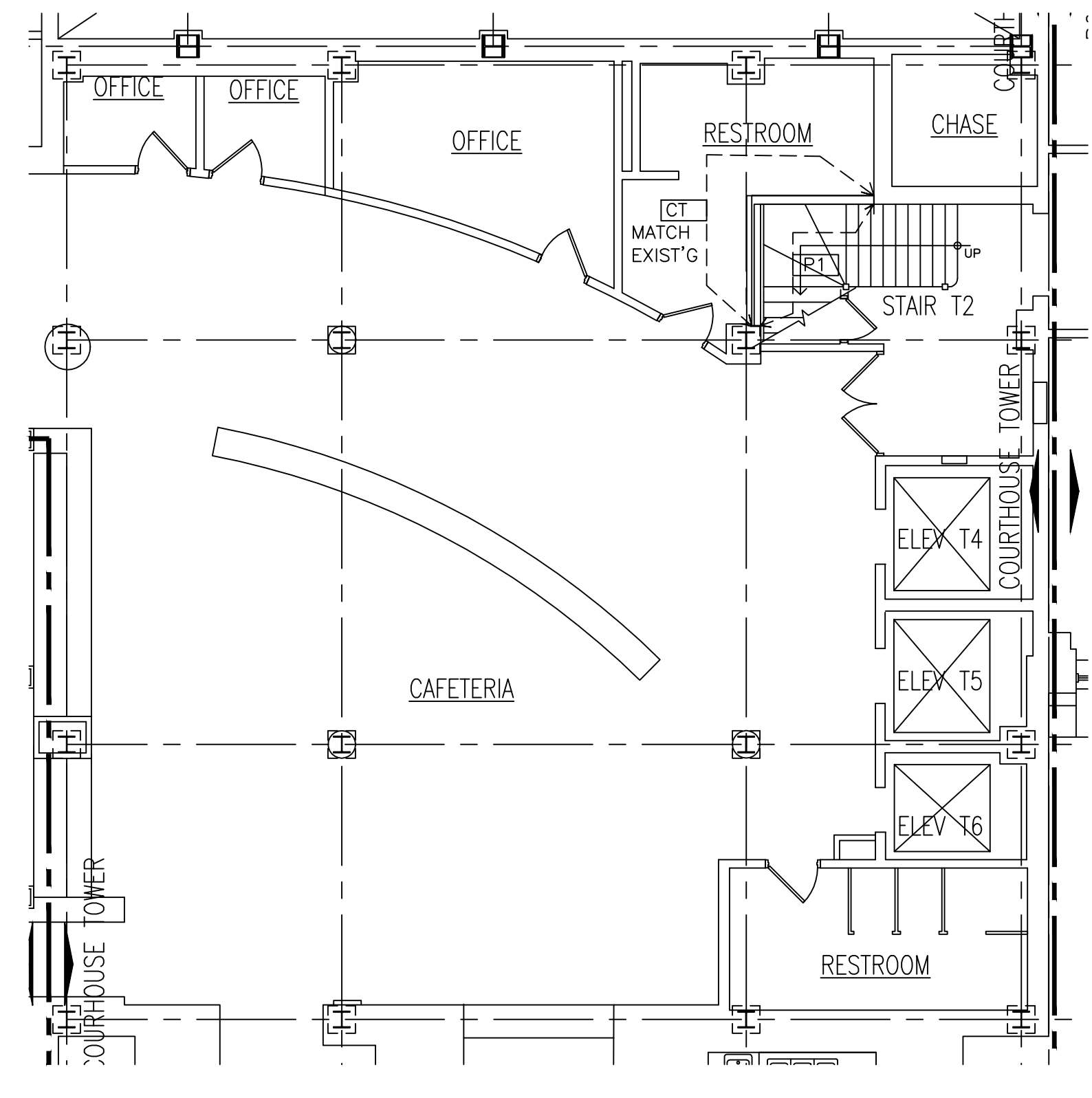
SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY WTJ
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 79 OF 160
									DWG NO

A.613



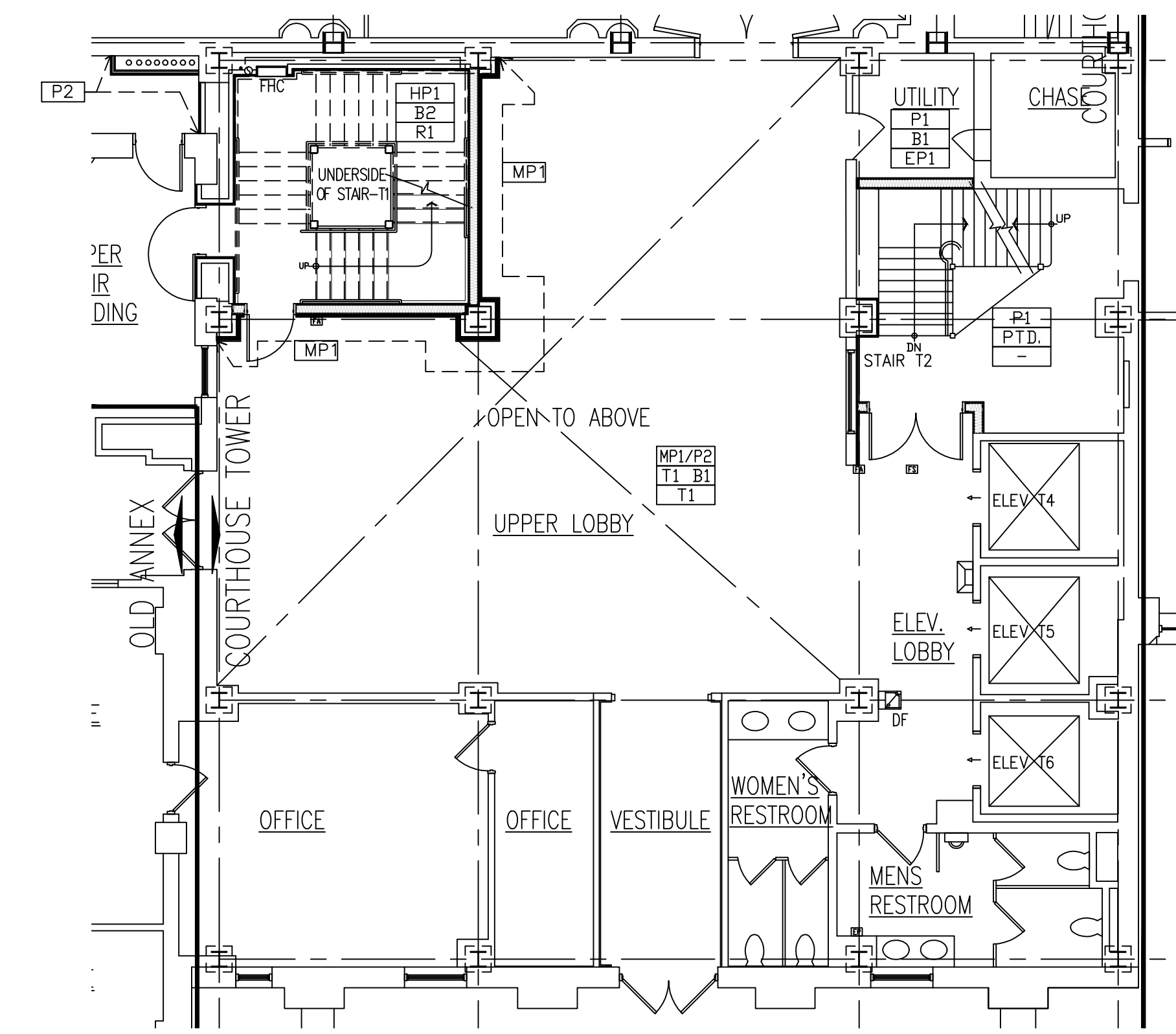
1 BASEMENT FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

NO WORK AT BASEMENT LEVEL



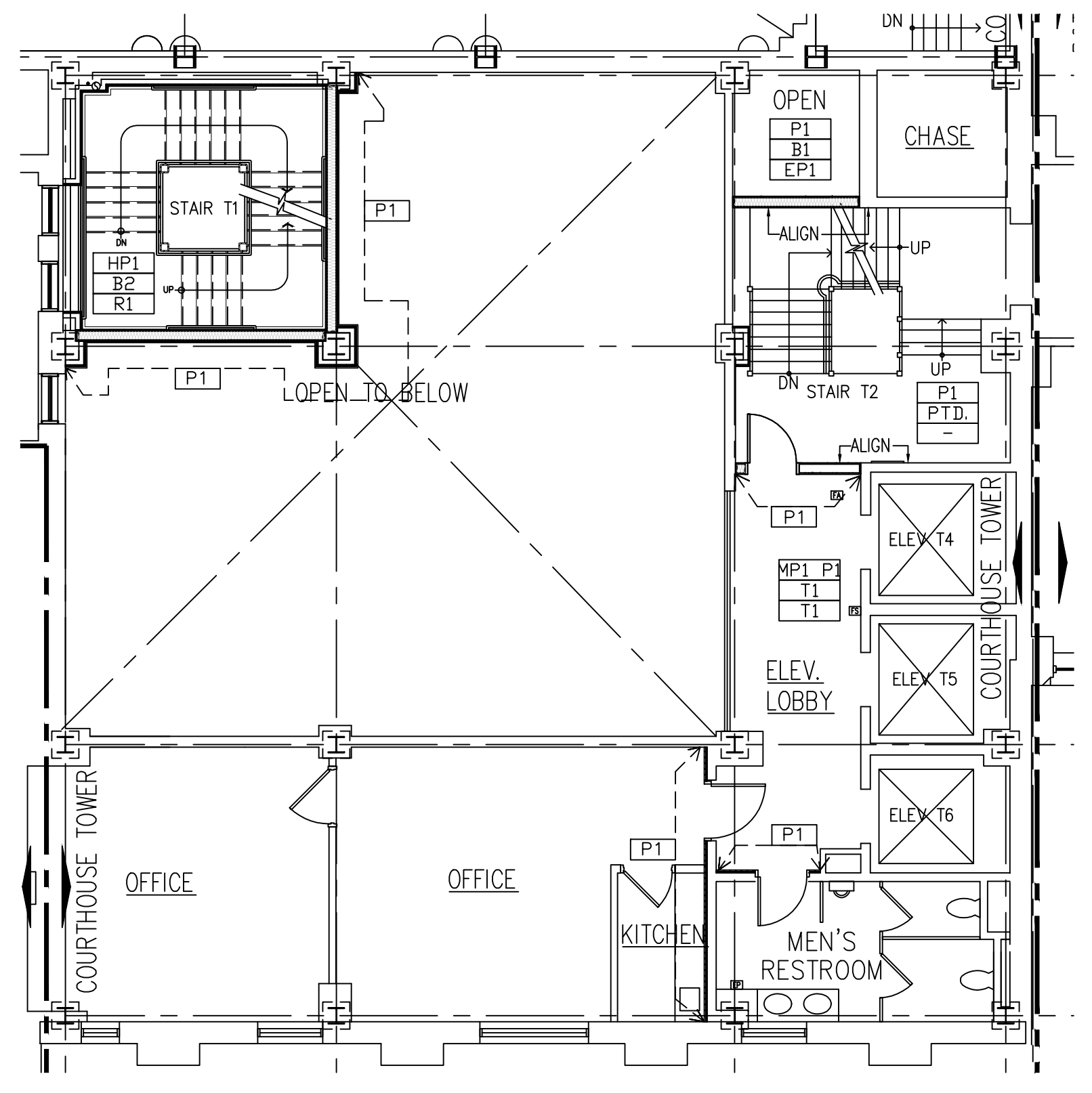
2 GROUND FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



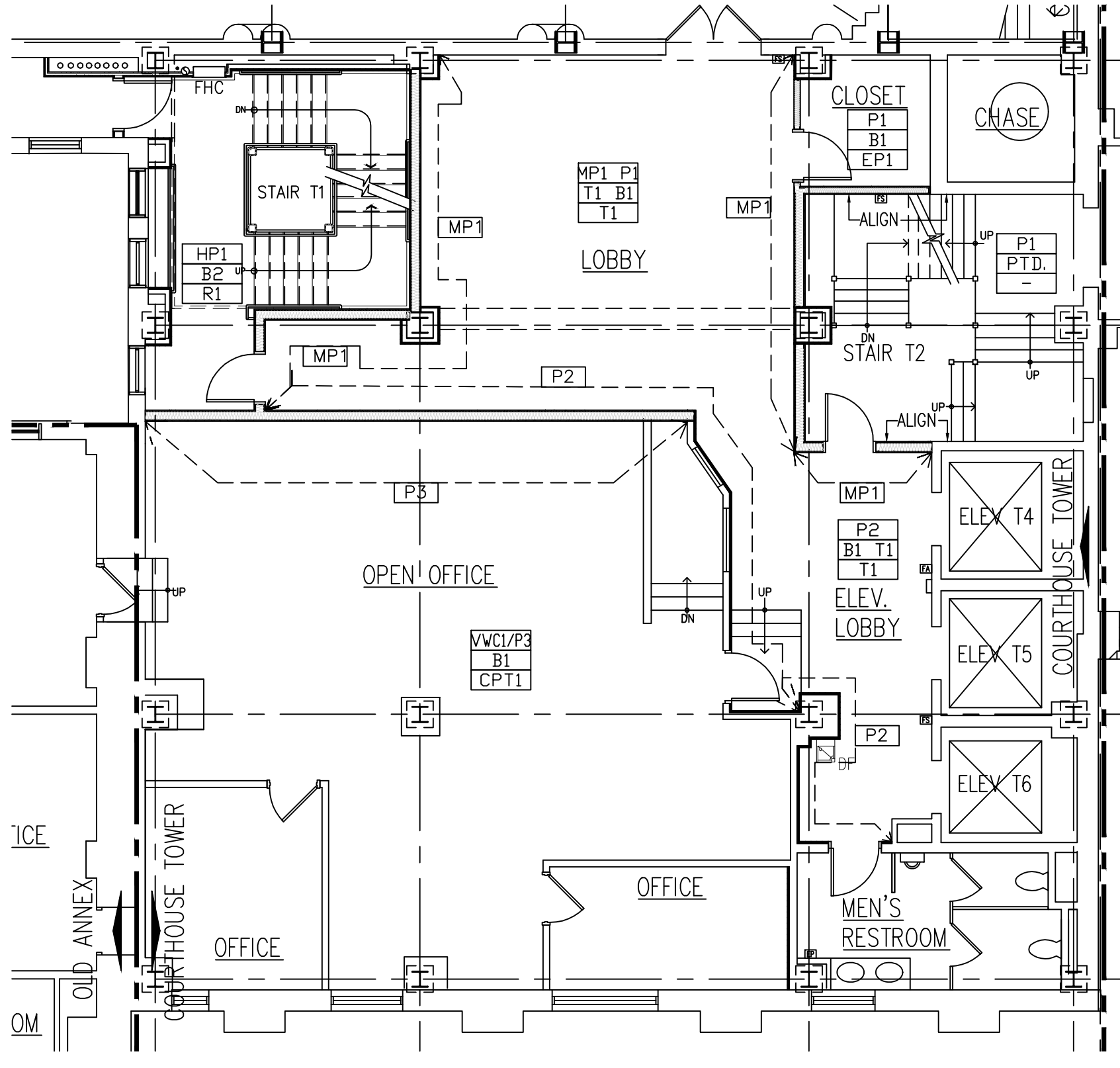
3 FIRST FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



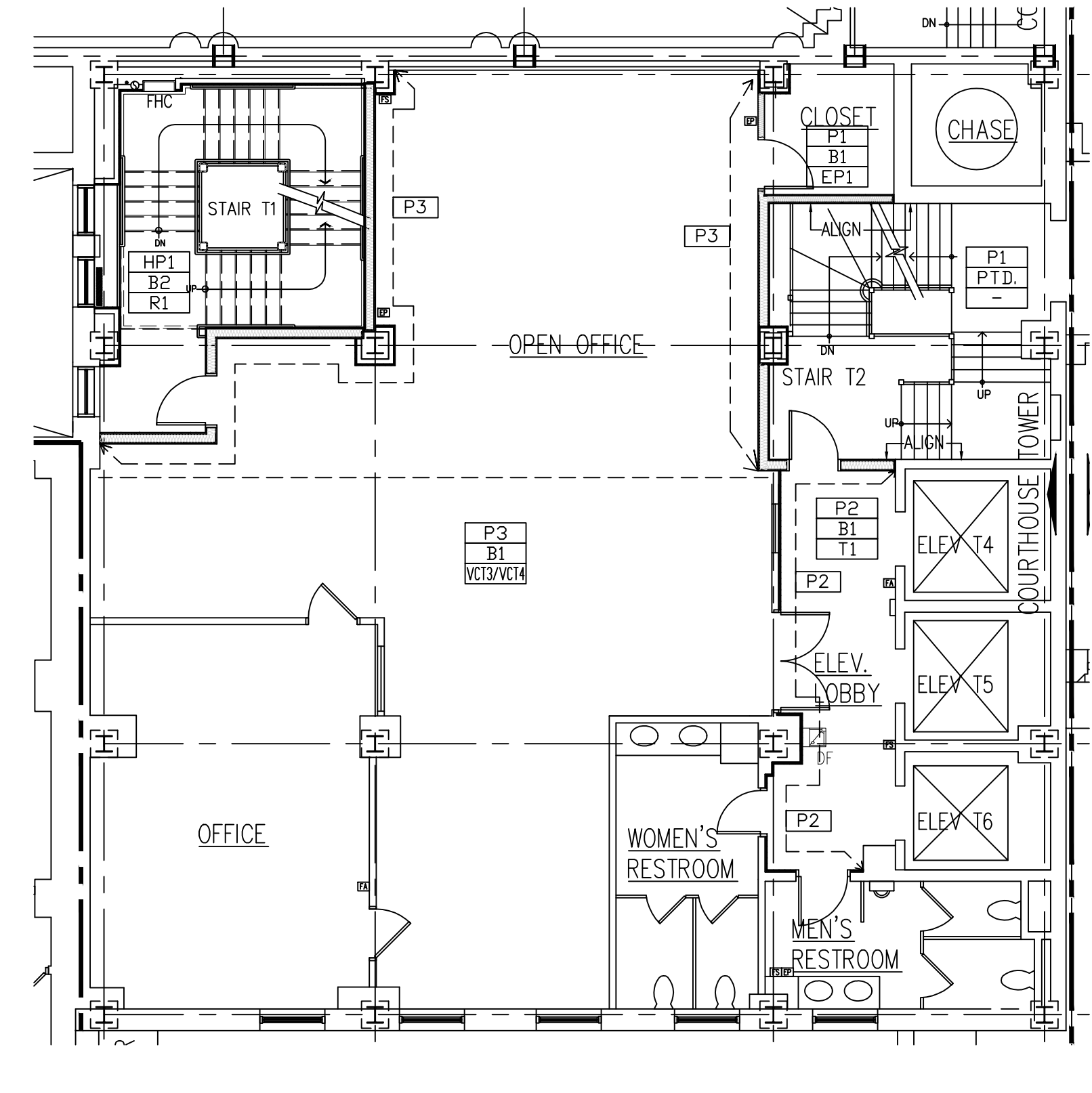
4 SECOND FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



5 THIRD FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH



6 FOURTH FLOOR FINISH PLAN
SCALE: 1/8"=1'-0"

WALL FINISH
BASE BD.
FLOOR FINISH

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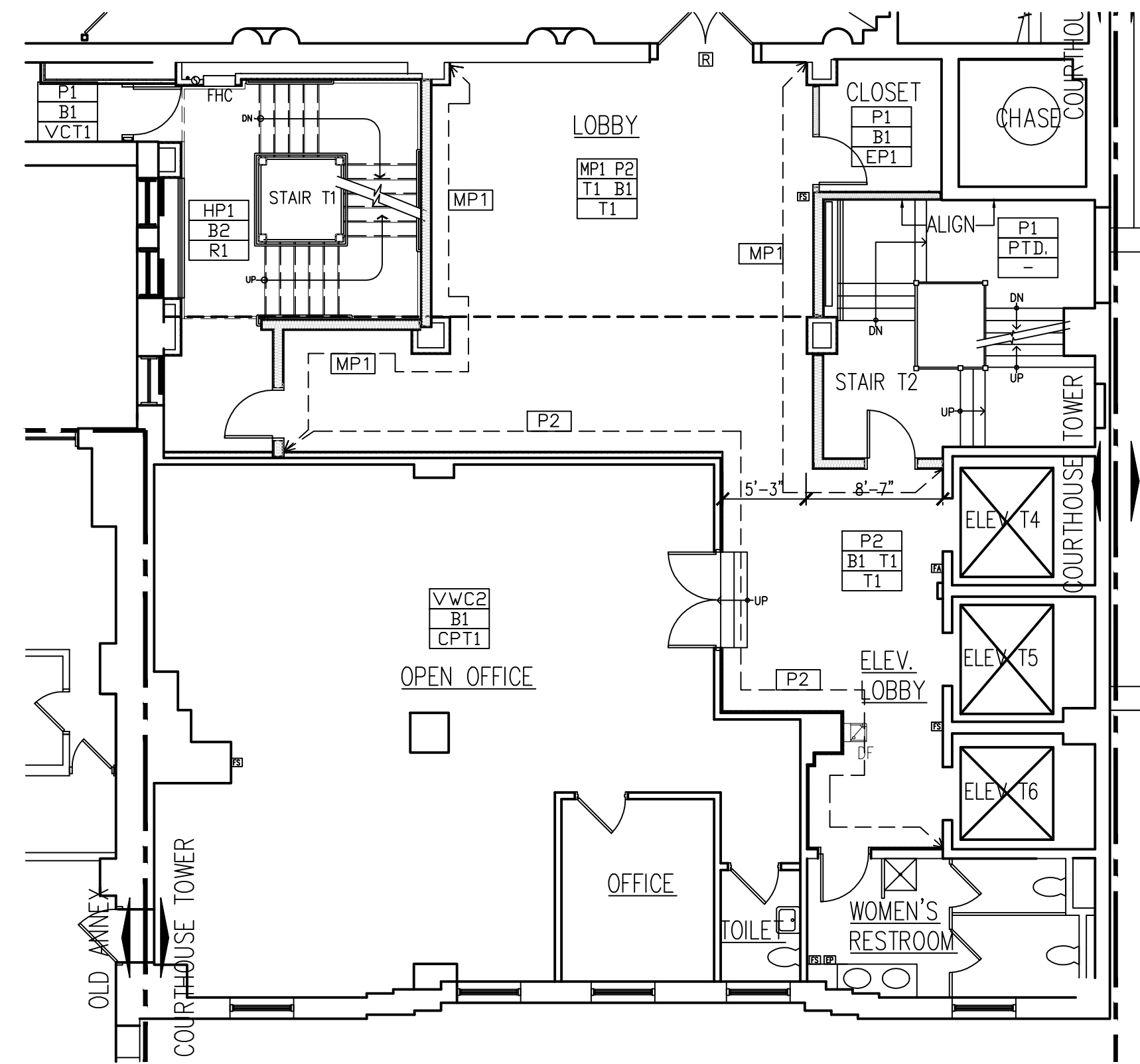


PROJECT:
**UC COURTHOUSE
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2 Broad Street, Elizabeth New Jersey

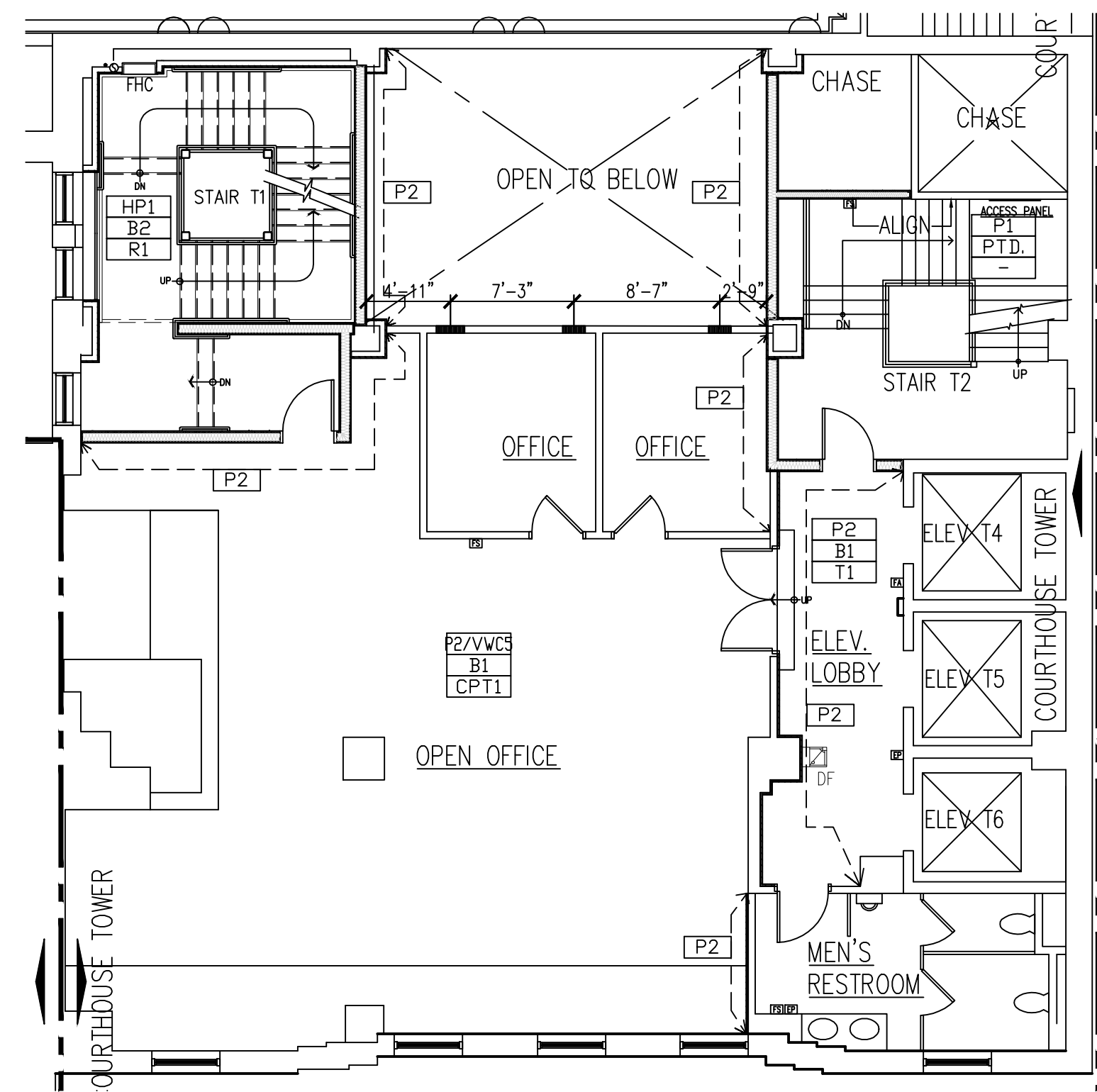
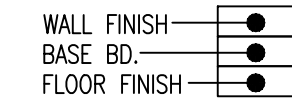
SHEET CONTENTS:
**BASEMENT, GROUND, FIRST, SECOND, THIRD &
FOURTH FLOOR FINISH PLAN**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY WTJ
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 80 OF: 160
									DWG NO

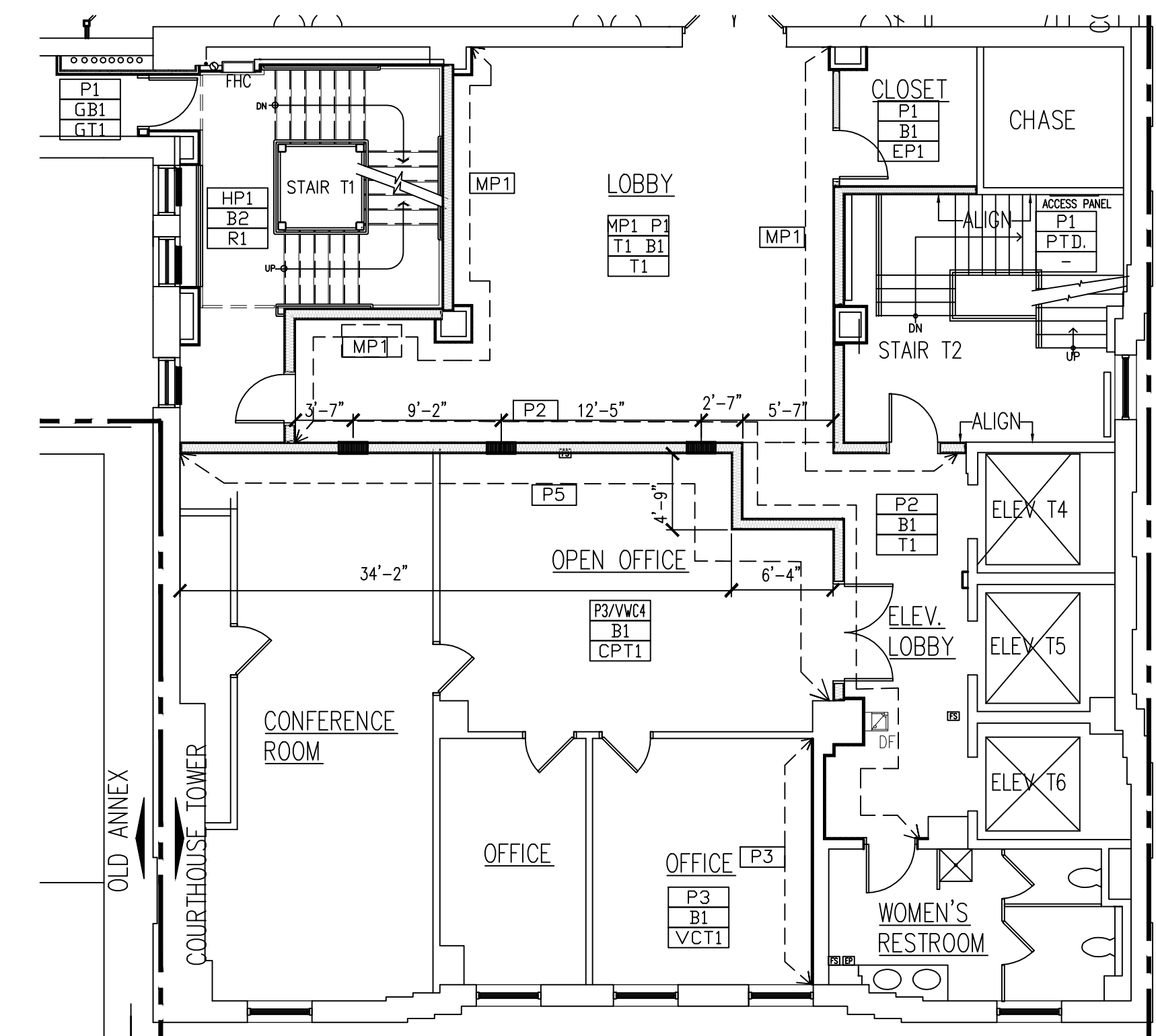
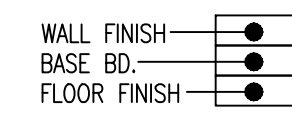
A.701



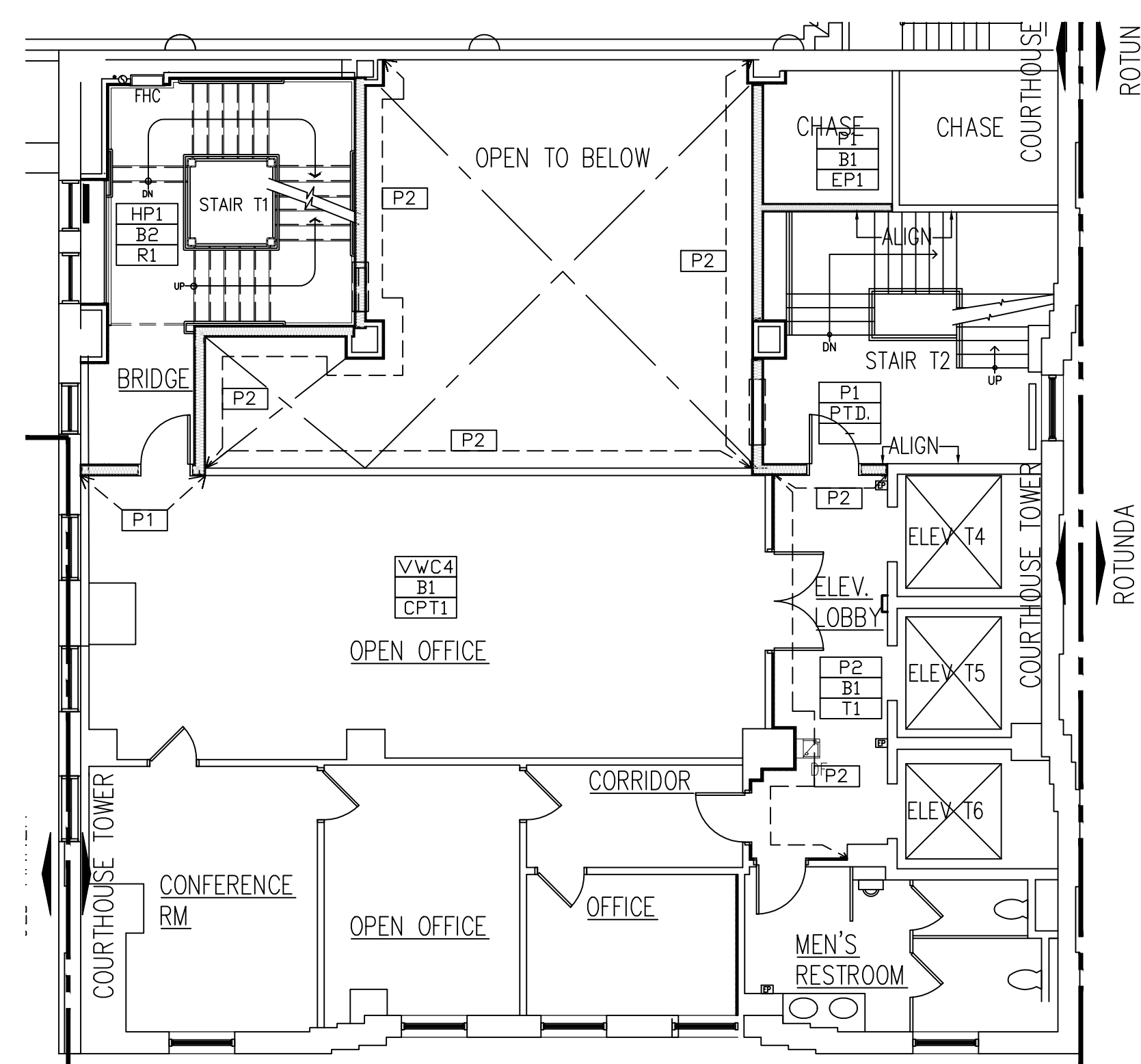
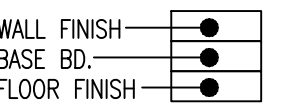
1 FIFTH FLOOR FINISH PLAN
A.702 SCALE: 1/8"=1'-0"



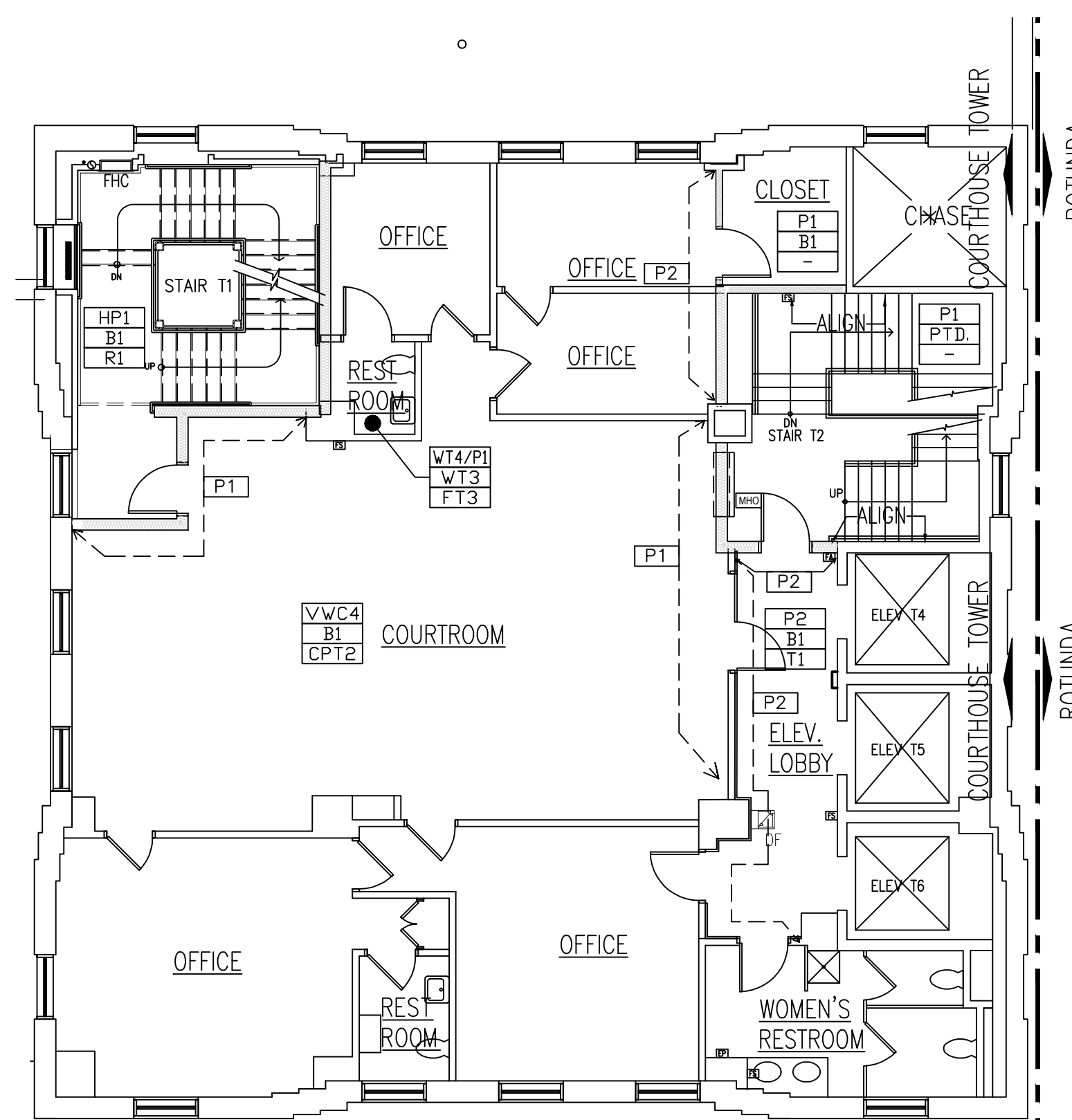
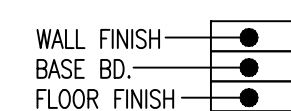
2 SIXTH FLOOR FINISH PLAN
A.702 SCALE: 1/8"=1'-0"



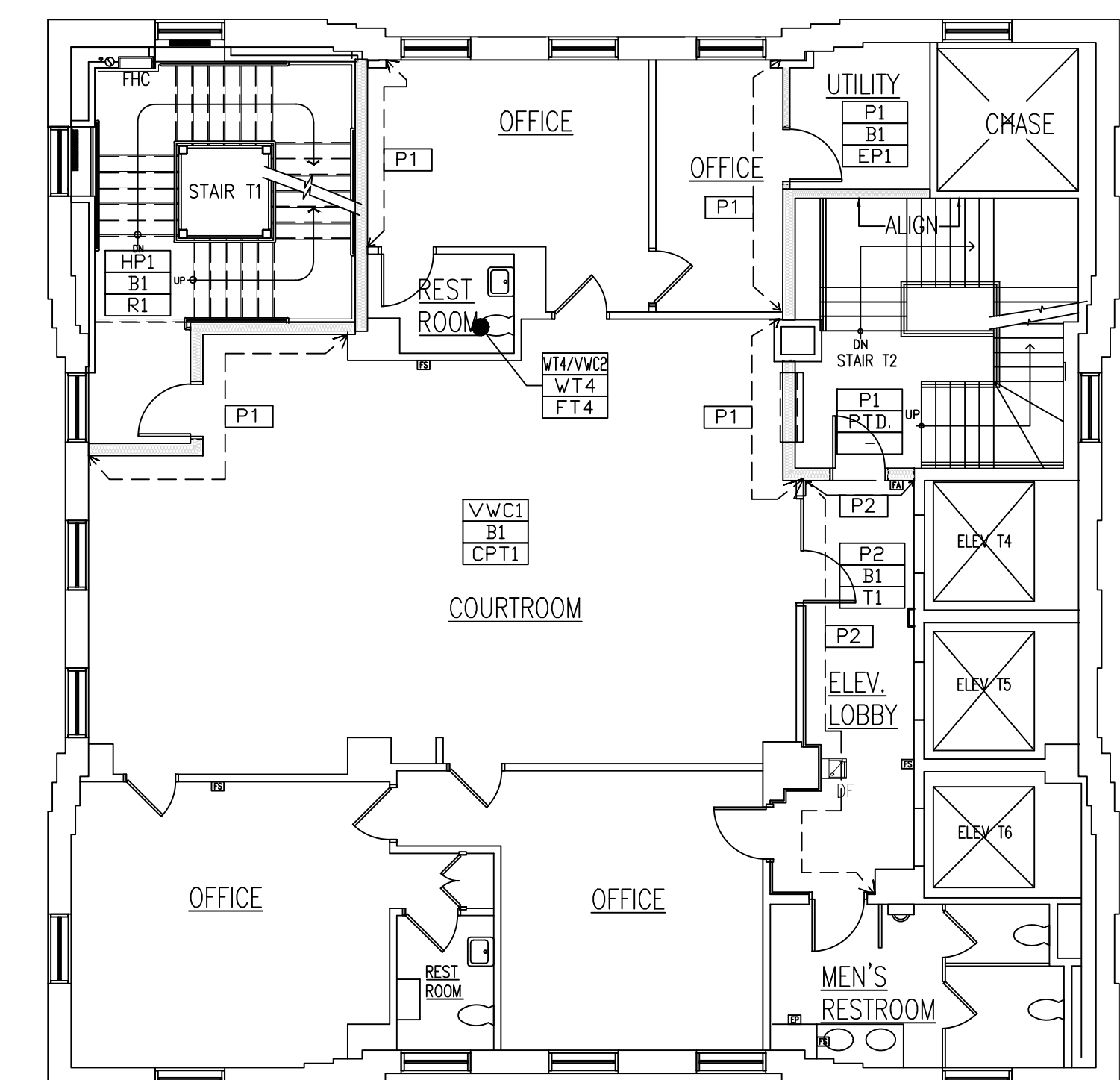
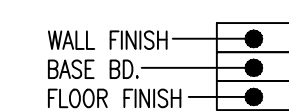
3 SEVENTH FLOOR FINISH PLAN
A.702 SCALE: 1/8"=1'-0"



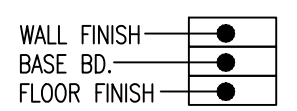
4 EIGHTH FLOOR FINISH PLAN
A.702 SCALE: 1/8"=1'-0"



5 NINTH FLOOR FINISH PLAN
A.702 SCALE: 1/8"=1'-0"



6 TENTH FLOOR FINISH PLAN
A.702 SCALE: 1/8"=1'-0"



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PROJECT:

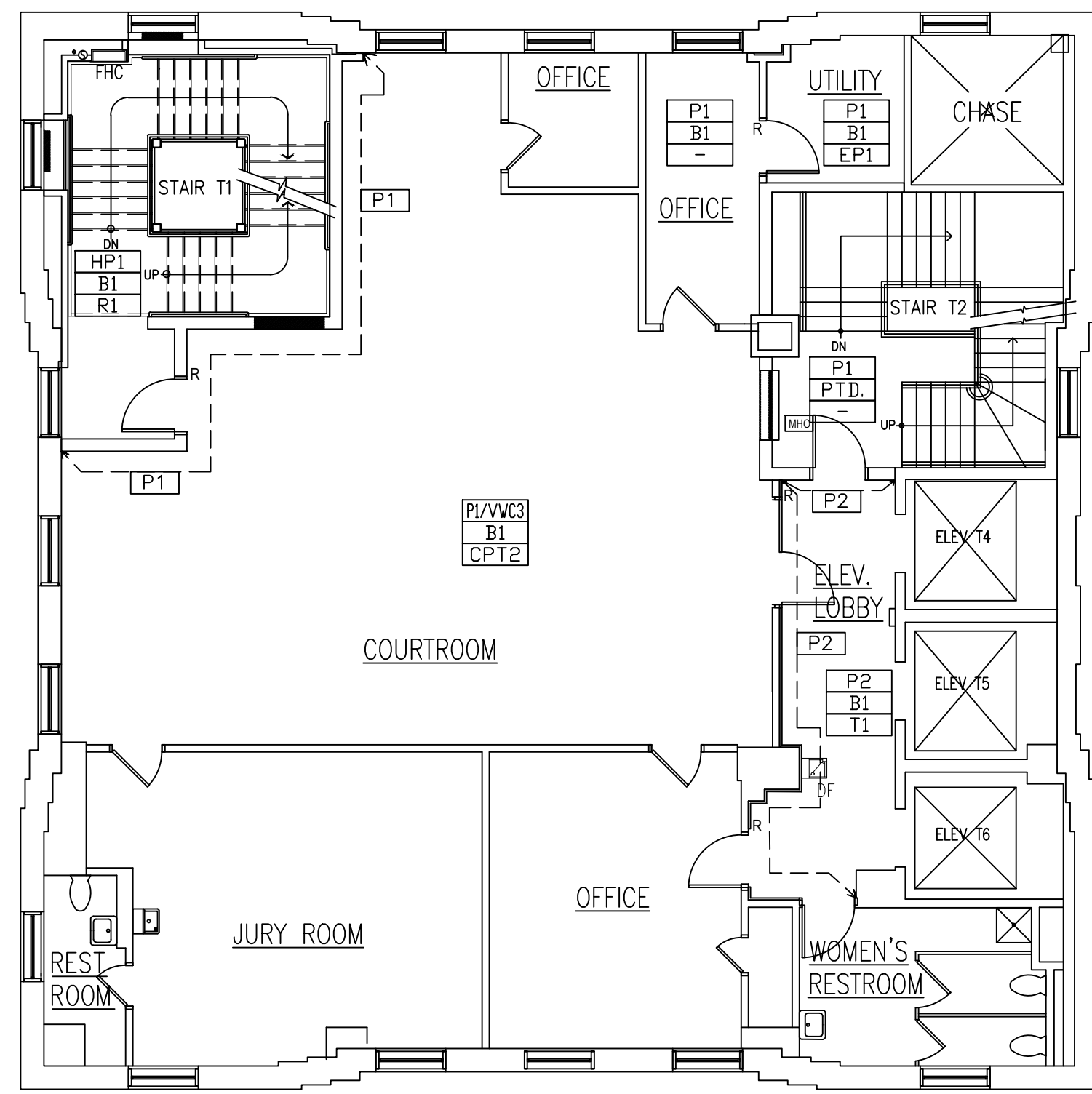
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

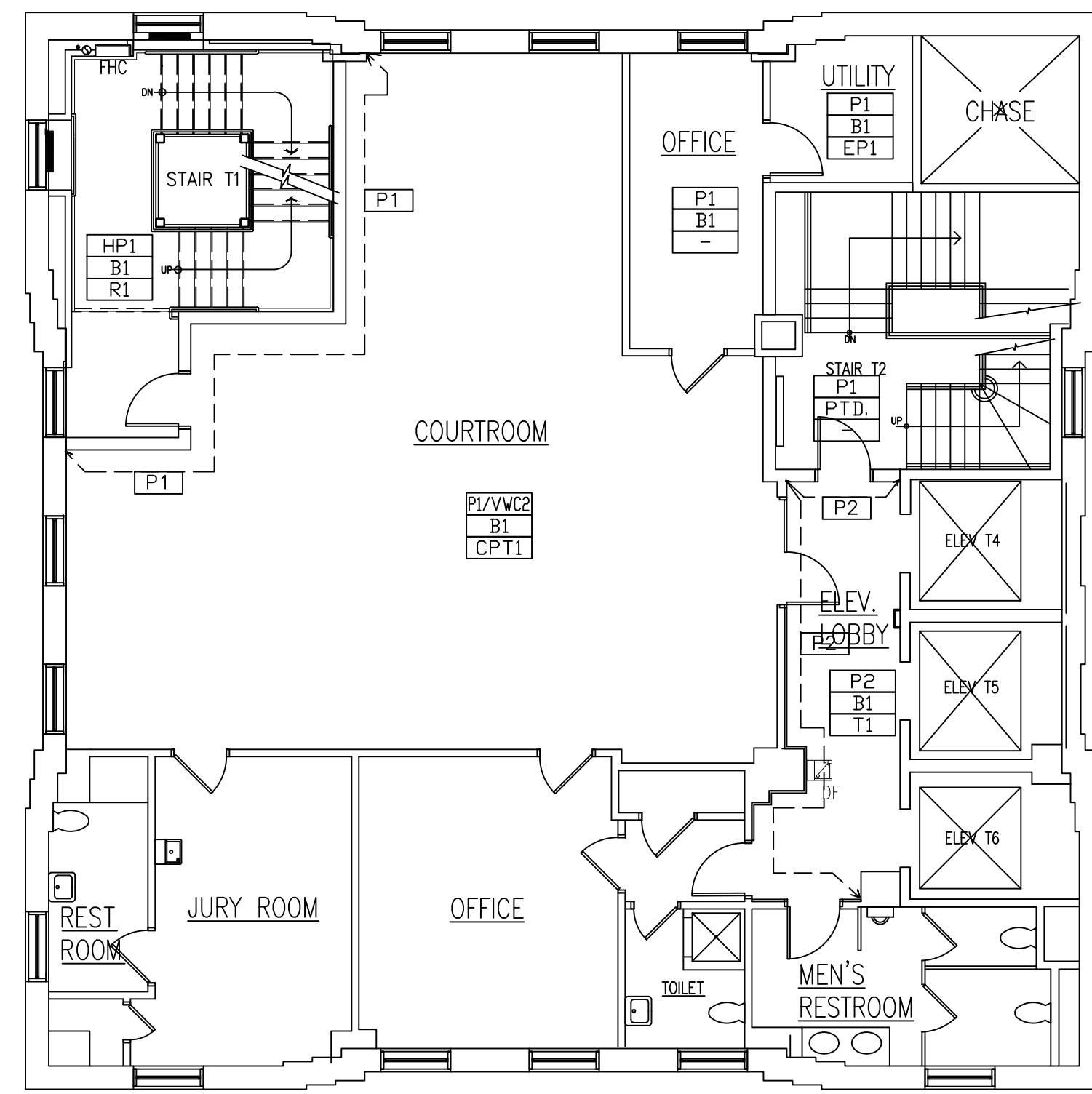
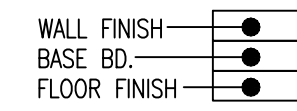
FIFTH, SIXTH, SEVENTH, EIGHTH, NINTH & TENTH FLOOR FINISH PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY WTJ
10.30.15	95% SUBMISSION	KD	FM						CHKD BY NJN
05.31.17	100% SUBMISSION	MC	FM						JOB NO 2141151
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 81 OF: 160
									DWG NO

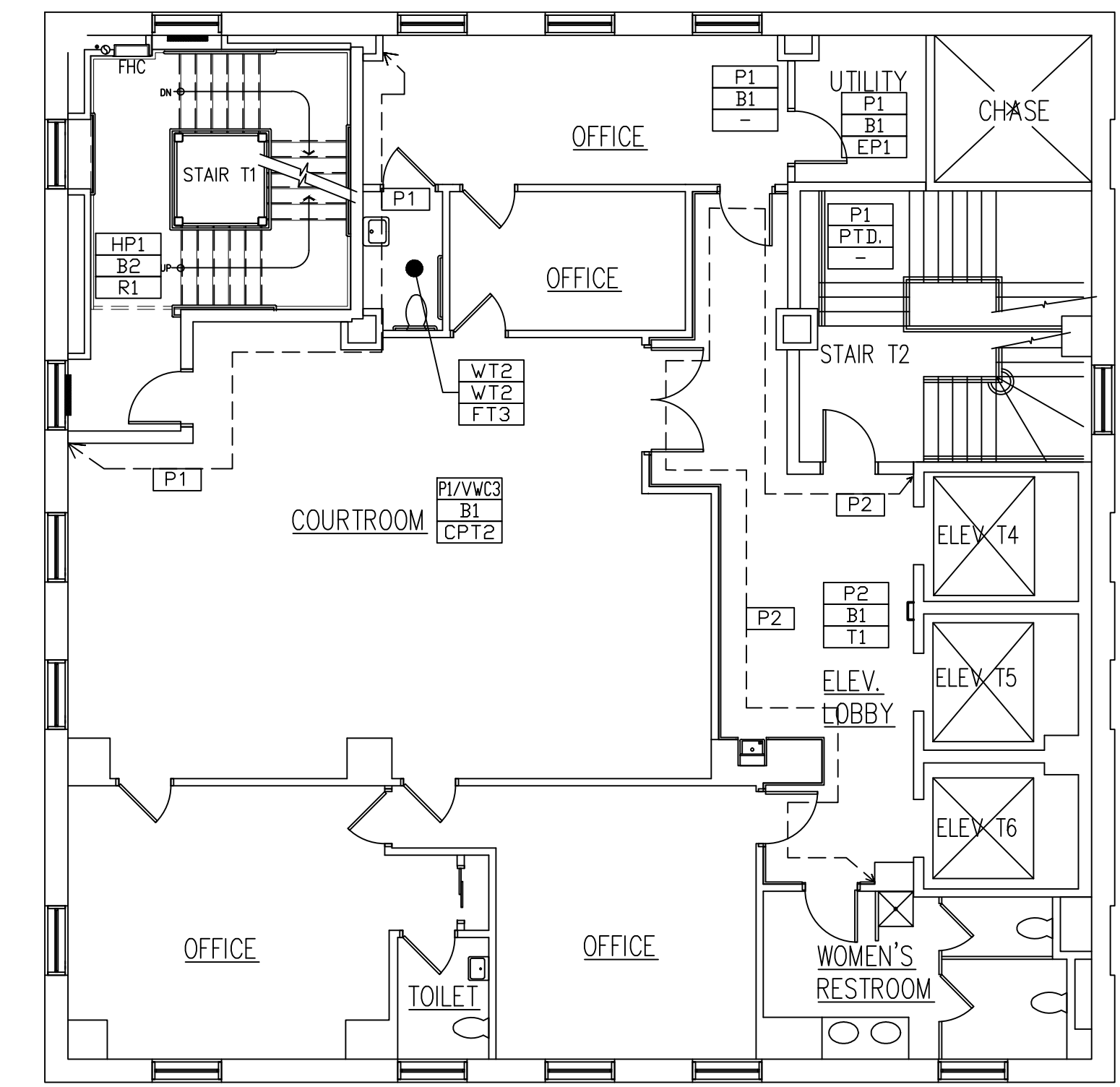
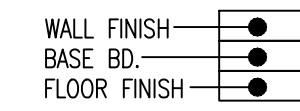
A.702



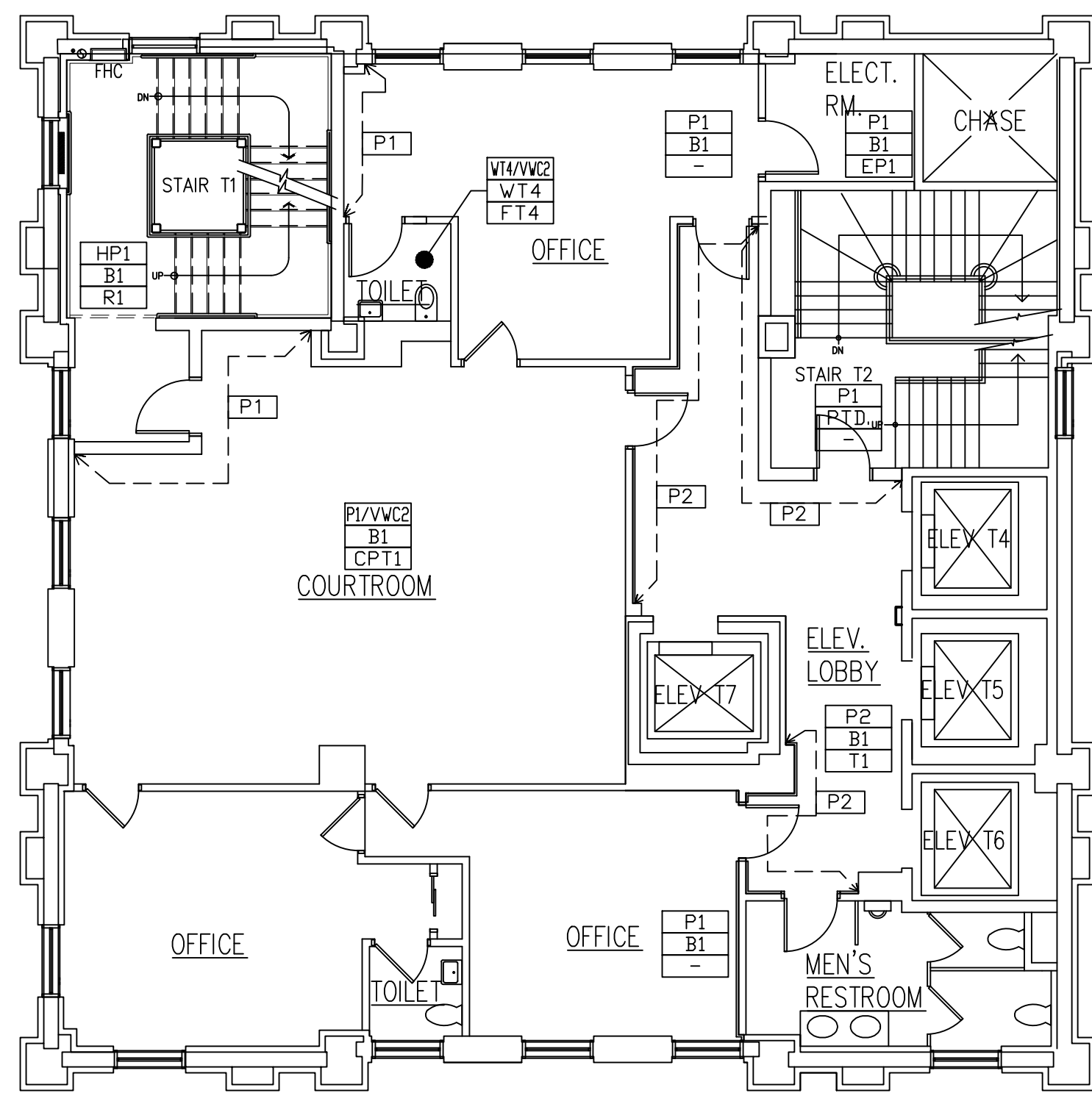
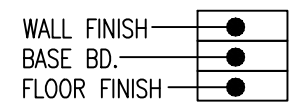
1 ELEVENTH FLOOR EGRESS PLAN
A.703 SCALE: 1/8"=1'-0"



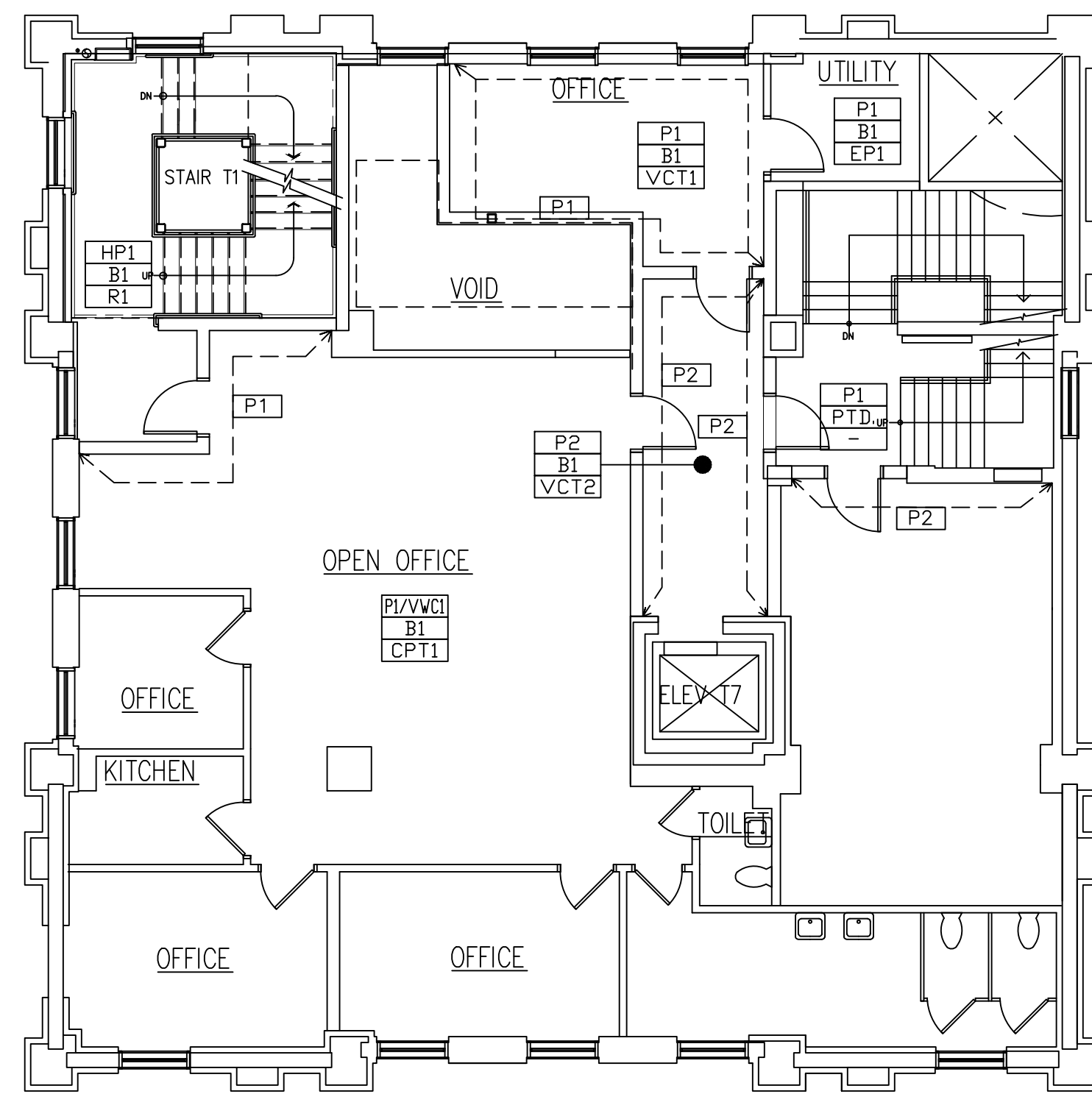
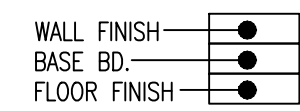
2 TWELFTH FLOOR EGRESS PLAN
A.703 SCALE: 1/8"=1'-0"



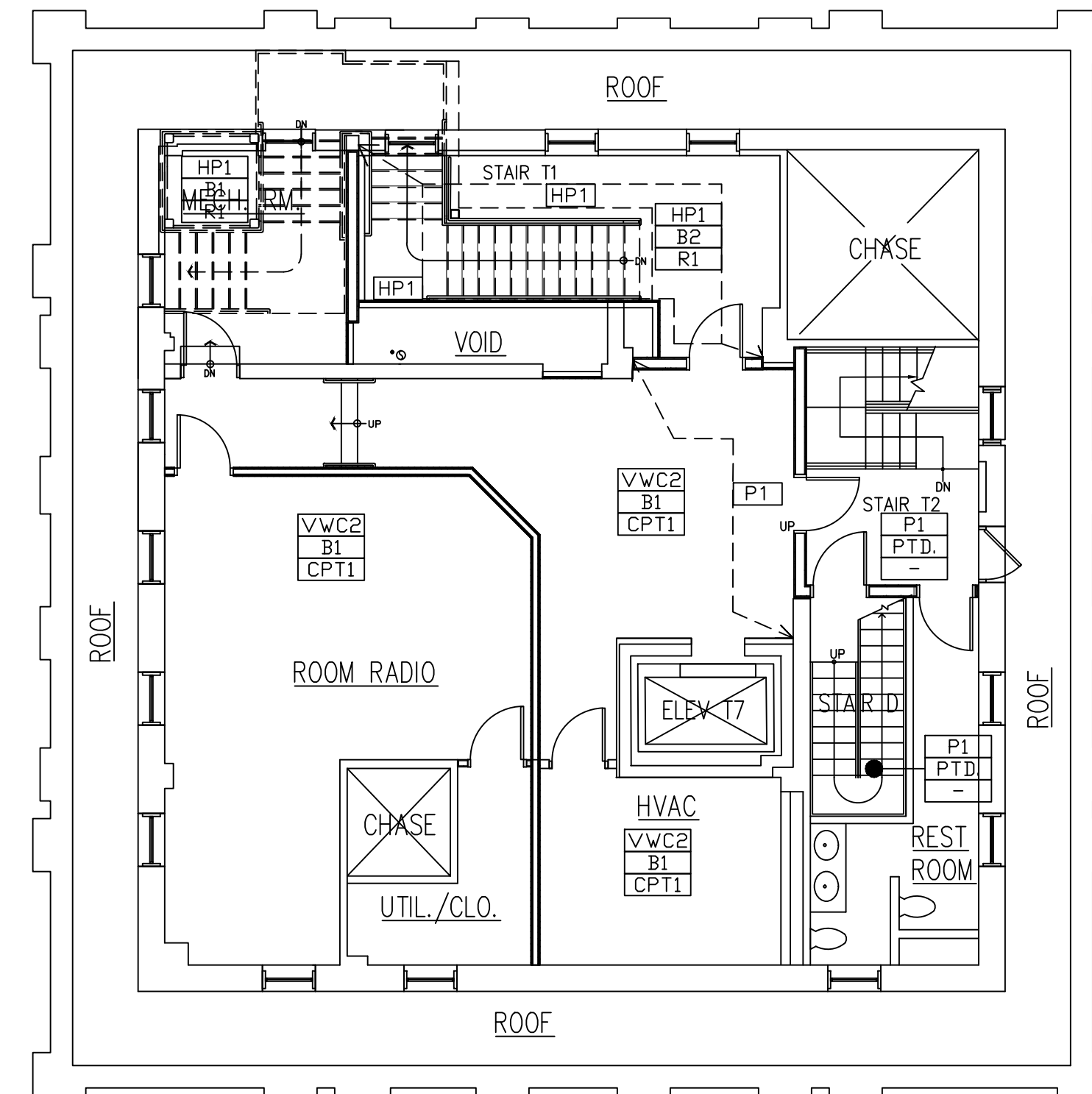
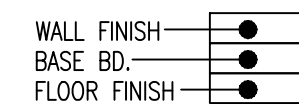
3 THIRTEENTH FLOOR EGRESS PLAN
A.703 SCALE: 1/8"=1'-0"



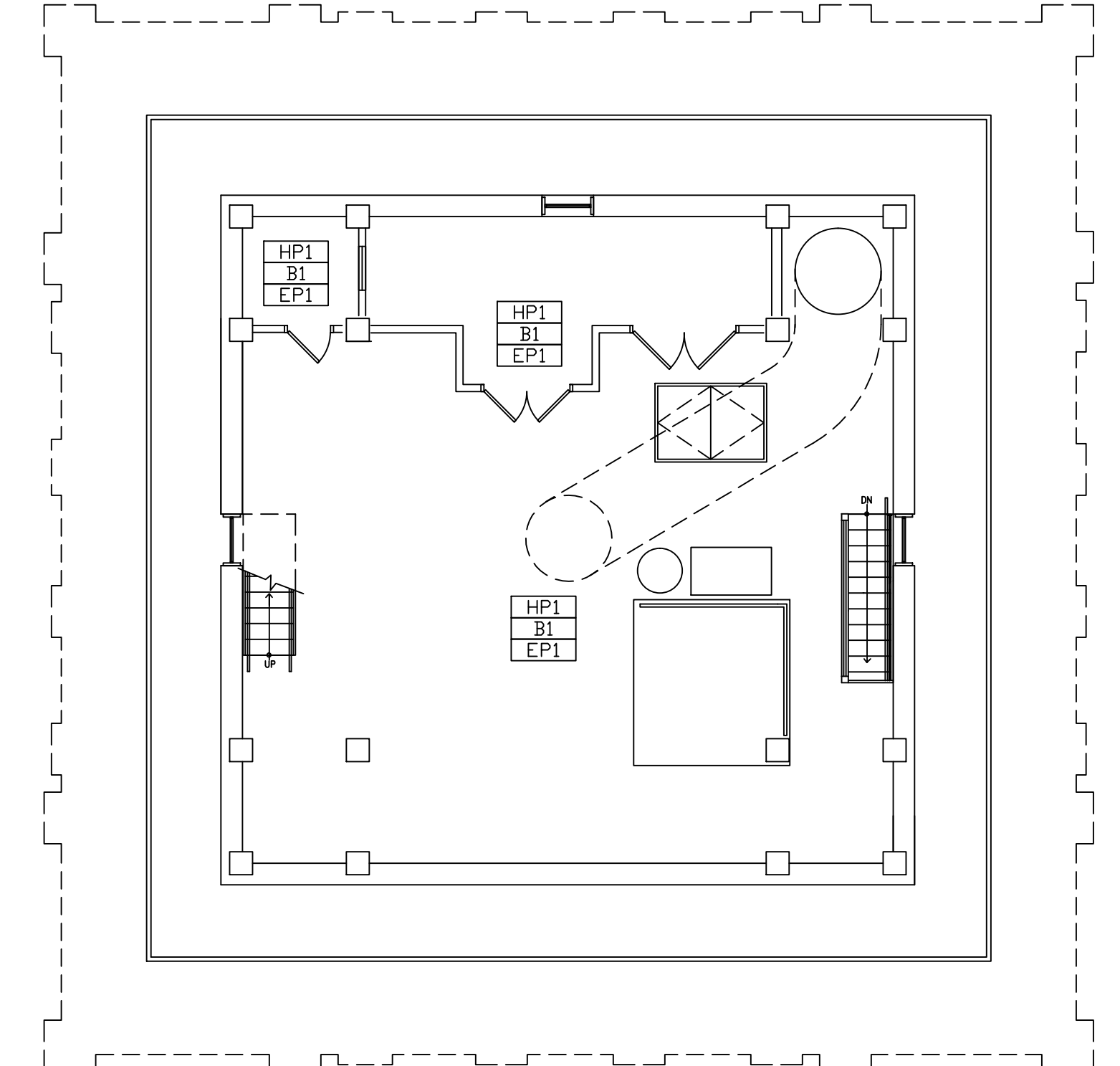
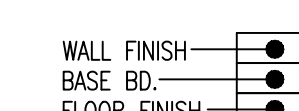
4 FOURTEENTH FLOOR EGRESS PLAN
A.703 SCALE: 1/8"=1'-0"



5 FIFTEENTH FLOOR EGRESS PLAN
A.703 SCALE: 1/8"=1'-0"



6 SIXTEENTH FLOOR EGRESS PLAN
A.703 SCALE: 1/8"=1'-0"



7 PENTHOUSE FLOOR EGRESS PLAN
A.703 SCALE: 1/8"=1'-0"



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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELEVENTH, TWELFTH, THIRTEENTH,
FOURTEENTH, FIFTEENTH, SIXTEENTH,
& PENTHOUSE FLOOR FINISH PLAN

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	WTJ
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	NJN
05.31.17	100% SUBMISSION	MC	FM					JOB NO	2141151
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	82 OF: 160
								DWG NO	

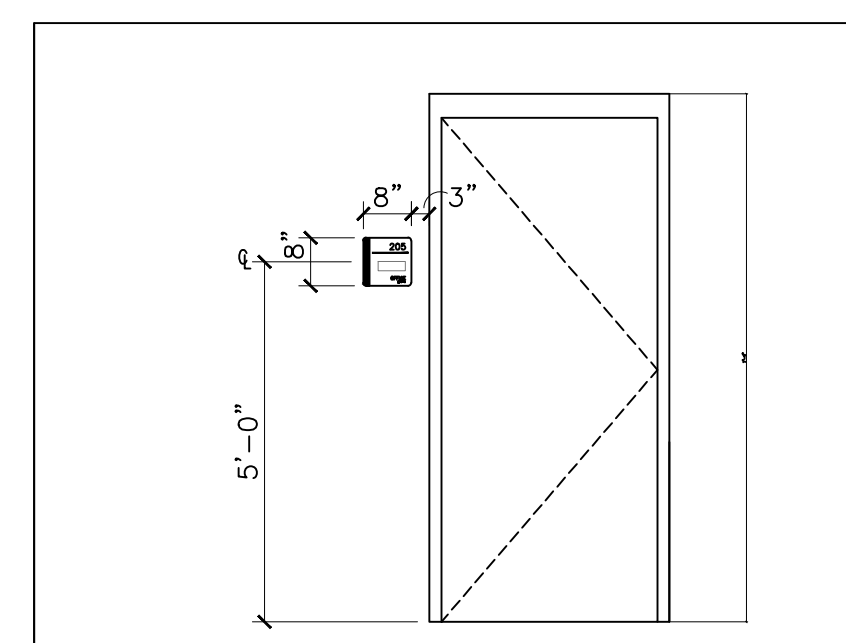
A.703

ROOM FINISH SCHEDULE						
ROOM NAME	FLOORS	BASE	WALLS	CEILING	CEILING HEIGHT	REMARKS
NO WORK						
GROUND FLOOR PLAN						
STAIR T2	-	PTD. EXISTING	PTD. GYP. BD.	PTD. EXISTING	-	
RESTROOM	-	CT1	-	-	8'-0"	C.T. TO MATCH EXISTING
OFFICE	-	-	-	ACT	8'-2"	
OFFICE	-	-	-	ACT	8'-2"	
CARETAKER CORRIDOR	-	-	-	ACT	8'-2"	
FIRST FLOOR PLAN						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	HP1 PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
UPPER STAR LANDING	GRANITE TILES TO MATCH EXISTING	GRANITE TO MATCH EXISTING	VINYL WALL COVER	-	-	
UPPER LOBBY	TERRAZO FLOOR TO MATCH EXISTING	MARBLE BASE TO MATCH EXISTING	MARBLE PANELS & TRIMS TO MATCH EXISTING	-	19'-10"	
STAIR T2	-	PTD. EXISTING	PTD. EXISTING	-	-	
UTILITY	EP1 EPOXY FLR. PAINT	B1 RUBBER WALL BASE	PTD. NEW & EXISTING	PTD. EXISTING	V.I.F.	
SECOND FLOOR PLAN						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	HP1	PTD. EXPOSED STRUCTURE	-	
OPEN TO BELOW	-	-	PTD. GYP. BD.	PTD. CORNICE & CEILING	-	
STAIR T2	-	PTD. EXISTING	PTD. EXISTING	PTD. EXISTING	-	
ELEV. LOBBY	MP1/P1	T1 TERRAZO WALL BASE	PTD. GYP. BD.	ACT	8'-0"	
THIRD FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	HP1 PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
ELEV. LOBBY	MP1/P1 GRANITE TILES TO MATCH EXISTING	T1:GRANITE TO MATCH EXIST/G/ B1: RUBBER WALL BASE	P2 PTD. GYP. BD.	ACT	10'-11"	
LOBBY	T1: GRANITE TILES TO MATCH EXISTING	T1:GRANITE TO MATCH EXIST/G/ B1: RUBBER WALL BASE	MP1:MARBLE PANELS & TRIMS TO MATCH EXISTING & P2: PTD. GYP. BD.	PTD. CORNICE & CEILING	10'-11"	
OPEN OFFICE	CP11 CARPET TILES	B1 RUBBER WALL BASE	WVC1/P3	ACT	8'-0"	
STAIR T2	-	PTD. EXISTING	P1: PTD. GYP. BD. & EXISTING WALLS	PTD. EXISTING	-	
CORRIDOR	T1: GRANITE TILES	B1 RUBBER WALL BASE	PTD. GYP. BD.	ACT	V.I.F.	
CLOSET	EP1: EPOXY FLR. PAINT	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXISTING	V.I.F.	
FOURTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	P1 PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
OPEN OFFICE	VCT1/VCT2	B1 RUBBER WALL BASE	P1/ VINYL WALL COVER	ACT	7'-3" & 7'-9"	
CLOSET	EP1 EPOXY FLR. PAINT	B1 RUBBER WALL BASE	P3 PTD. GYP. BD.	PTD. EXISTING	V.I.F.	
ELEV. LOBBY	GRANITE TILES TO MATCH EXISTING	B1 RUBBER WALL BASE	P4 PTD. GYP. BD.	ACT	8'-0"	
STAIR T2	-	PTD. EXISTING	PTD. GYP. BD.	PTD. EXISTING	-	
FIFTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
LOBBY	GRANITE TILES	GRANITE TO MATCH EXISTING B1: RUBBER WALL BASE	MARBLE PANELS & TRIMS TO MATCH EXISTING & PTD. GYP. BD.	PTD. CORNICE & CEILING	11'-8"	
OPEN OFFICE	CP11: CARPET TILES	B1 RUBBER WALL BASE	WVC2: VINYL WALL COVER	ACT	7'-10"	
CLOSET	EP1 EPOXY FLR. PAINT	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXISTING	V.I.F.	
ELEV. LOBBY	T1: GRANITE TILES	B1 RUBBER WALL BASE	PTD. GYP. BD.	ACT	11'-8"	
STAIR T2	-	PTD. EXISTING	PTD. GYP. BD.	PTD. EXISTING	-	
CORRIDOR	T1: GRANITE TILES	B1 RUBBER WALL BASE	PTD. GYP. BD.	ACT	V.I.F.	
SIXTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
OPEN TO BELOW	-	-	PTD. GYP. BD.	PTD. CORNICE & CEILING	20'-9"	
OPEN OFFICE	CP11: CARPET TILES	B1 RUBBER WALL BASE	P2/WVC3: VINYL WALL COVER	ACT	8'-0"	
ELEV. LOBBY	T1: GRANITE TILES	B1 RUBBER WALL BASE	PTD. GYP. BD.	ACT	8'-4"	
STAIR T2	-	PTD. EXISTING	PTD. GYP. BD.	PTD. EXISTING	-	
SEVENTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	HP1: PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
CORRIDOR	GRANITE TILES	B1 RUBBER WALL BASE	P2: PTD. GYP. BD.	ACT	V.I.F.	
LOBBY	GRANITE TILES	MARBLE BASE TO MATCH EXISTING	MARBLE PANELS & TRIMS TO MATCH EXISTING & PTD. GYP. BD.	-	20'-9"	
OPEN OFFICE	CP11: CARPET TILES	B1 RUBBER WALL BASE	P3/ WVC4 VINYL WALL COVER	ACT	8'-0"	
ELEV. LOBBY	T1: GRANITE TILES	B1 RUBBER WALL BASE	P2: PTD. GYP. BD.	ACT	8'-0"	
CLOSET	EP1 EPOXY FLR. PAINT	B1 RUBBER WALL BASE	P2: PTD. GYP. BD.	PTD. EXISTING	V.I.F.	
STAIR T2	-	PTD. EXISTING	P1: PTD. GYP. BD.	PTD. EXISTING	-	
EIGHTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
OPEN TO BELOW	-	-	PTD. GYP. BD.	PTD. CORNICE & CEILING	20'-9"	
OPEN OFFICE	CP11: CARPET TILES	B1 RUBBER WALL BASE	WVC4: VINYL WALL COVER	ACT	8'-0"	
ELEV. LOBBY	T1: GRANITE TILES	B1 RUBBER WALL BASE	P2: PTD. GYP. BD.	PTD. CEILING	8'-0"	
STAIR T2	-	PTD. EXISTING	P1: PTD. GYP. BD.	PTD. EXISTING	-	
NINTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
COURTROOM	CP2: CARPET TILES	B1 RUBBER WALL BASE	WVC4: VINYL WALL COVER	ACT	10'-2"	
ELEV. LOBBY	GRANITE TILES	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. CEILING	9'-10"	
CLOSET	EP1 EPOXY FLR. PAINT	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXISTING	V.I.F.	
STAIR T2	-	PTD. EXISTING	P1: PTD. GYP. BD.	PTD. EXISTING	-	
TOILET	FT3: CERAMIC FLR TILE	WT2: CERAMIC TILE BASE	WT2: CERAMIC TILE	ACT	8'-0"	
TENTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	HP1: PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
COURTROOM	CP11: CARPET TILES	B1 RUBBER WALL BASE	WVC1: VINYL WALL COVER	ACT	10'-2"	
UTILITY	EP1 EPOXY FLR. PAINT	B1 RUBBER WALL BASE	P1: PTD. GYP. BD.	PTD. EXISTING	V.I.F.	
ELEV. LOBBY	T1: GRANITE TILES	B1 RUBBER WALL BASE	P2: PTD. GYP. BD.	ACT	10'-2"	
STAIR T2	-	PTD. EXISTING	PTD. GYP. BD.	PTD. EXISTING	-	
TOILET	FT4: CERAMIC FLOOR TILES	WT4: CERAMIC TILE BASE	WT4: CERAMIC TILE WVC2: VINYL WALL COVERING	ACT	8'-0"	
ELEVENTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	HP1: PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	

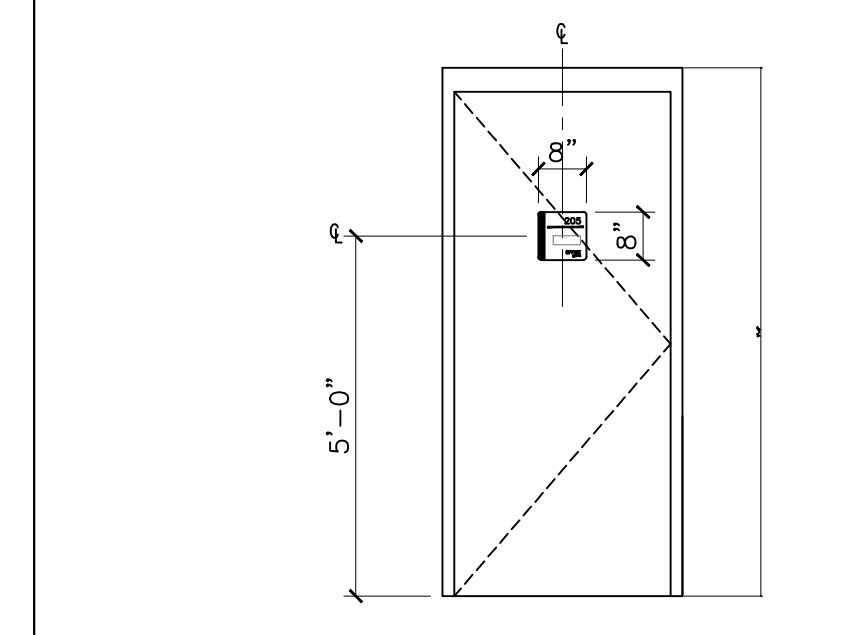
ROOM FINISH SCHEDULE						
ROOM NAME	FLOORS	BASE	WALLS	CEILING	CEILING HEIGHT	REMARKS
TWELFTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
COURTROOM	CP11: CARPET TILES	B1 RUBBER WALL BASE	WVC2: VINYL WALL COVER	ACT	9'-5"	
ELEV. LOBBY	GT1: GRANITE TILES	B1 RUBBER WALL BASE	P2: PTD. GYP. BD.	ACT	11'-6"	
UTILITY	EP1 EPOXY FLR. PAINT	B1 RUBBER WALL BASE	P1: PTD. GYP. BD.	PTD. EXISTING	V.I.F.	
STAIR T2	-	PTD. EXISTING	PTD. GYP. BD.	PTD. EXISTING	-	
THIRTEENTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
COURTROOM	CP2: CARPET TILES	B1 RUBBER WALL BASE	WVC3: VINYL WALL COVER	ACT	8'-3"	
ELEV. LOBBY	GRANITE TILES	B1 RUBBER WALL BASE	PTD. GYP. BD.	ACT	9'-6"	
UTILITY	EP1 EPOXY FLR. PAINT	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXISTING	V.I.F.	
STAIR T2	-	PTD. EXISTING	PTD. GYP. BD.	PTD. EXISTING	-	
TOILET	FT3: CERAMIC FLOOR TILE	WT2: CERAMIC WALL BASE TILE	WT2: CERAMIC WALL TILE	ACT	8'-0"	
FOURTEENTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
OPEN OFFICE	CARPET TILES	B1 RUBBER WALL BASE	VINYL WALL COVER	ACT	8'-11"	
ELECT. RM.	EP1 EPOXY FLR. PAINT	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXISTING	V.I.F.	
ELEV. LOBBY	VCT	B1 RUBBER WALL BASE	PTD. GYP. BD.	ACT	11'-6"	
UTILITY	EP1 EPOXY FLR. PAINT	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXISTING	V.I.F.	
STAIR T2	-	PTD. EXISTING	PTD. GYP. BD.	PTD. EXISTING	-	
TOILET	CT1	-	CT1	ACT	8'-0"	
FIFTEENTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
OPEN OFFICE	CARPET TILES	B1 RUBBER WALL BASE	WVC1: VINYL WALL COVER	ACT	8'-11"	
ELEV. LOBBY	VCT2: VINYL FLOOR TILE	B1 RUBBER WALL BASE	PTD. GYP. BD.	ACT	8'-11"	
UTILITY	EP1 EPOXY FLR. PAINT	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXISTING	V.I.F.	
STAIR T2	-	PTD. EXISTING	PTD. GYP. BD.	PTD. EXISTING	-	
SIXTEENTH FLOOR						
STAIR T1	R1 RUBBER FLR TILE R51 RUBBER TREADS SP1 GUARDRAIL, HANDRAIL, & POST	B1 RUBBER WALL BASE	PTD. GYP. BD.	PTD. EXPOSED STRUCTURE	-	
OFFICE	CP11: CARPET TILES	B1 RUBBER WALL BASE	WVC2: INVL WALL COVERING	ACT	8'-11"	
OFFICE	CP11: CARPET TILES	B1 RUBBER WALL BASE	WVC2: VINYL WALL COVERING	ACT	8'-11"	
ELEV. LOBBY	CP11: CARPET TILES	B1 RUBBER WALL BASE	WVC2: VINYL WALL COVERING	ACT	8'-11"	
STAIR T2	-	PTD. EXISTING	HP1: PTD. GYP. BD.	PTD. EXISTING	-	
PENTHOUSE STAIR	-	PTD. EXISTING	HP1: PTD. GYP. BD.	PTD. EXISTING	-	
RADIO RM.	REFER TO UC COURTHOUSE RADIO ROOM (TOWER) DESIGN BY NETTA ARCHITECTS					
UTILITY/ CLOSET	REFER TO UC COURTHOUSE RADIO ROOM (TOWER) DESIGN BY NETTA ARCHITECTS					
PENTHOUSE FLOOR GS&VE						
PENTHOUSE STAIR	-	PTD. EXISTING	-	-	-	
MECHANICAL ROOM	EP1 EPOXY FLR. PAINT	PTD. EXISTING	HP1: PTD. EXISTING	PTD. EXISTING	-	
RADIO RM.	EP1 EPOXY FLR. PAINT	PTD. EXISTING	HP1: PTD. EXISTING	PTD. EXISTING	8'-0"	
RADIO RM.	EP1 EPOXY FLR. PAINT	PTD. EXISTING	HP1: PTD. EXISTING	PTD. EXISTING	8'-0"	

FINISH SCHEDULE						
MATERIAL	TYPE	DESCRIPTION	MANUFACTURER	CONTACT	REMARKS	
TERRAZZO FLOORING & BASE	T1	3/8" THIN-SET EPOXY TERRAZZO FLOORING W/ 6" PRECAST EPOXY TERRAZZO BASE	CONCRETE COLLABORATIVE	SALLY SWIRWICK TEL: 917.439.8059	LOBBY	
GRANITE TILE & BASE	FT1	12"x24" PORCELAIN FLOOR TILE SLAM COLLECTION COLOR TO BE SELECTED	FINISHES RESOURCE	PATRICK T. MULLEN TEL: 888.853.6544	UPPER STAR LANDING & ELEV. LOBBY	
CERAMIC TILE	FT2	12"x12" CERAMIC FLOOR TILE COLLECTION: NATURAL HUES COLOR: BUCK LATE	DAILETILE NEW JERSEY	KELLY HOLLAND-YOUNG TEL: 908.340.8400	TOILET	
CERAMIC TILE	FT3	12"x12" CERAMIC FLOOR TILE COLLECTION: HEATHLAND COLOR: WHITE/ROCK HL01	DAILETILE NEW JERSEY	KELLY HOLLAND-YOUNG TEL: 908.340.8400	TOILET	
CERAMIC TILE	FT4	12"x12" CERAMIC FLOOR TILE COLLECTION: HEATHLAND COLOR: ASHLAND HL05	DAILETILE NEW JERSEY	KELLY HOLLAND-YOUNG TEL: 908.340.8400	TOILET	
VCT	VCT1	12"x12" VCT FLOORING STYLE: STANDARD EXCELOX IMPERIAL TEXTURE COLOR: 51862 SERENE BLUE	ARMSTRONG		OPEN OFFICES	
VCT	VCT2	12"x12" VCT FLOORING STYLE: STANDARD EXCELOX IMPERIAL TEXTURE COLOR: 51904 STERLING	ARMSTRONG		OFFICE	
VCT	VCT3	12"x12" VCT FLOORING STYLE: CHROMASPIN COLOR: 54828 VENERE GREEN	ARMSTRONG		OPEN OFFICE	
VCT	VCT4	12"x12" VCT FLOORING STYLE: CHROMASPIN COLOR: 54823 FLASH RED	ARMSTRONG		OPEN OFFICE	
RUBBER TILE	R1	3.5 MM RUBBER TILE FLOORING 100 CM X 100 CM 39.53" X 39.53" STYLE NORMAND SATURN COLOR: HYDRA 5121	NORA	TOM CARROLL TEL: 908.309.8709	STAIR T1	
EPOXY PAINT	EP1	ARMOSEAL HEAVY DUTY FLOOR-FLEX 7100 EPOXY FLOOR COATING COLOR: BROWN GRAY	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	SERVICE AREAS	
HIGH PRESSURE LAMINATED FLOOR PANEL	LF1	HIGH PRESSURE LAMINATED FLOOR PANEL, 35 LBS. 6.75 PSF.	TATE ACCESS FLOORS, INC.	ARI PRODUCTS INC. TEL: 973-773-2777	STAIR T1 (6TH FLOOR)	
RUBBER	B1	4" RUBBER WALL BASE COLOR: BLACK 6201	NORA	TOM CARROLL TEL: 908.309.8709	CORRIDORS	
GRANITE	GB1	-	FINISHES RESOURCE	PATRICK T. MULLEN TEL: 888.853.6544	ELEV. LOBBY	
CERAMIC	WT3	X				
PANT	B2	INTERIOR ACRYLIC LATEX PAINT PROGRESS 200 EGGSHELL FINISH COLOR: SW9611 HONORABLE BLUE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	STAIR 1, STAIR 2, ALL NEW WALLS UNLESS OTHERWISE NOTED	
PANT	P1	INTERIOR ACRYLIC LATEX PAINT PROGRESS 200 EGGSHELL FINISH COLOR: SW7586 WESTHIGHLAND WHITE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709		
PANT	P2	INTERIOR ACRYLIC LATEX PAINT PROGRESS 200 EGGSHELL FINISH COLOR: SW7447 CRYSTAL ICE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709		
PANT	P3	INTERIOR ACRYLIC LATEX PAINT PROGRESS 200 EGGSHELL FINISH COLOR: FN162 SW6161 NONCHALANT WHITE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	OFFICES	
PANT	P4	INTERIOR ACRYLIC LATEX PAINT PROGRESS 200 EGGSHELL FINISH COLOR: SW7843 PUSHTWLOW	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	STAIRWELL	
HIGH PERFORMANCE COATING	HP1	INDUSTRIAL PRO-OPT UNIVERSAL 886-600 SERIES, SEMI-GLOSS FINISH COATING	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	3RD FLOOR	
VINYL WALL COVERING	WVC1	KOROSEAL, STYLE: TULANE COLOR: EMERALD JK03-89	KOROSEAL INTERIOR PRODUCTS		4TH, 14TH FLOOR COURTROOM, RESTROOM	
VINYL WALL COVERING	WVC2	KOROSEAL, STYLE: ARTE COLOR: STRATOS 47108	KOROSEAL INTERIOR PRODUCTS		9TH FLOOR COURTROOM	
VINYL WALL COVERING	WVC3	KOROSEAL, STYLE: EVANS & BROWN COLOR: POSEIDON MEXONG 2521-45	KOROSEAL INTERIOR PRODUCTS			
VINYL WALL COVERING	WVC4	KOROSEAL, STYLE: TULANE COLOR: MINT JULEP JK03-84	KOROSEAL INTERIOR PRODUCTS			
CERAMIC TILE	WT1	CERAMIC WALL TILE TO BE MATCH EXISTING			RESTROOM TO MATCH EXISTING	
CERAMIC TILE	WT2	DAILETILE COLLECTION: HEATHLAND COLOR: WHITE ROCK HL01 SIZE: 4"x8" WALL TILE	DAILETILE NEW JERSEY	KELLY HOLLAND-YOUNG TEL: 908.340.8400		
CERAMIC TILE	WT3	DAILETILE COLLECTION: NATURAL HUES COLOR: BUCK LATE SIZE: 4"x8" WALL TILE	DAILETILE NEW JERSEY	KELLY HOLLAND-YOUNG TEL: 908.340.8400		
CERAMIC TILE	WT4	DAILETILE COLLECTION: NATURAL HUES COLOR: CINDER GHOSE SIZE: 4"x8" WALL TILE	DAILETILE NEW JERSEY	KELLY HOLLAND-YOUNG TEL: 908.340.8400	ELEVATOR LOBBY, UPPER LOBBY	
MARBLE PANELS	MP1	MARBLE PANELS TO MATCH EXISTING				

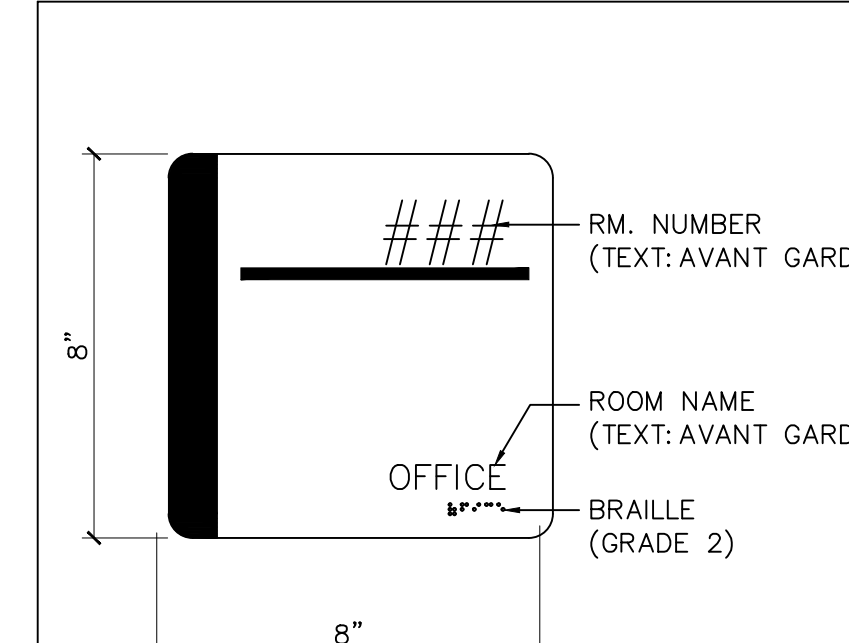
ACUSTIC CEILING PANEL	TYPE	DESCRIPTION	MANUFACTURER	CONTACT	REMARKS
ACUSTIC CEILING PANEL	ACT1	24" x 48" x 7/8" ULTRA HIGH-NRC 9/16" BEVELED TEGULAR ITEM No. 1945 COLOR: WHITE	ARMSTRONG	KATE WALSH TEL: 609.240.6936	OPEN OFFICES, OFFICE TOILETS & ELEVATOR LOBBY
ACUSTIC CEILING PANEL	ACT2	24" x 96" x 1" OPTIMA PLANT BASED ITEM No. 3662PB COLOR: WHITE	ARMSTRONG	KATE WALSH TEL: 609.240.6936	CORRIDOR
ACUSTIC CEILING PANEL	ACT3	24" x 96" x 1" OPTIMA PLANT BASED ITEM No. 3250PB COLOR: WHITE	ARMSTRONG	KATE WALSH TEL: 609.240.6936	
SUSPENDED SYSTEM	SS1	9/16" SQUARE TEGULAR SUPRAME 9/16" EXPOSED TEE SYSTEM 9/16" SHADOW MOLDING	ARMSTRONG	KATE WALSH TEL: 609.240.6936	
PANT	CP1	INTERIOR ACRYLIC LATEX PAINT PROGRESS 200 FLAT FINISH COLOR: CEILING WHITE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	GENERAL AREA
PANT	CP2	INTERIOR ACRYLIC LATEX PAINT PROGRESS 200 FLAT FINISH COLOR: SW 7665 WALL STREET	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	



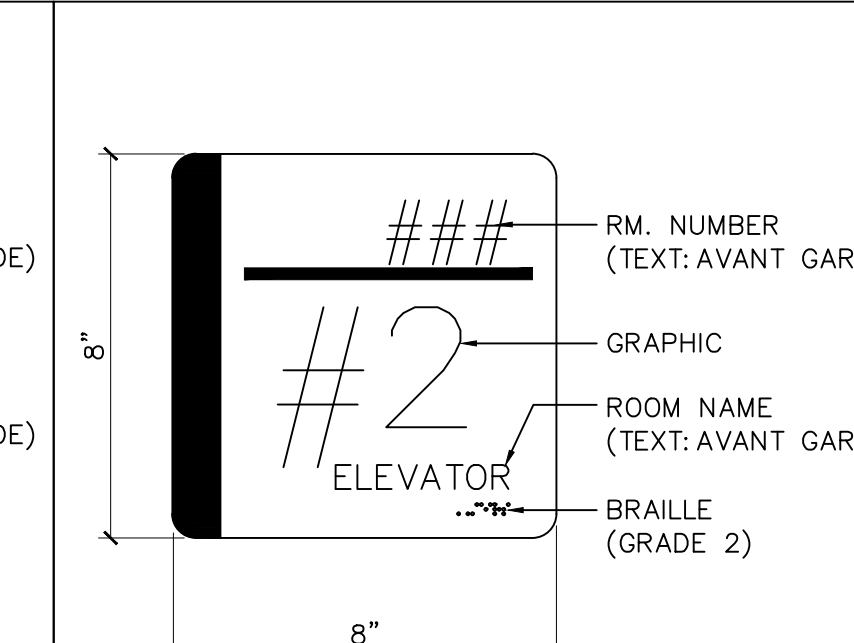
1 TYP. SIGN MTD. TO WALL
WITH OR WITHOUT WINDOW SCALE: 3/8" = 1'-0"



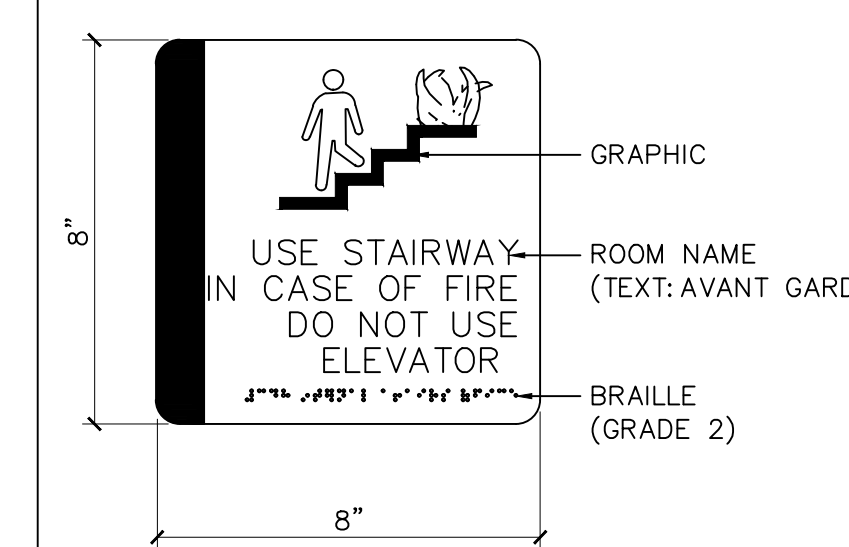
2 TYP. SIGN MTD. TO DOOR
WITH OR WITHOUT WINDOW SCALE: 3/8" = 1'-0"



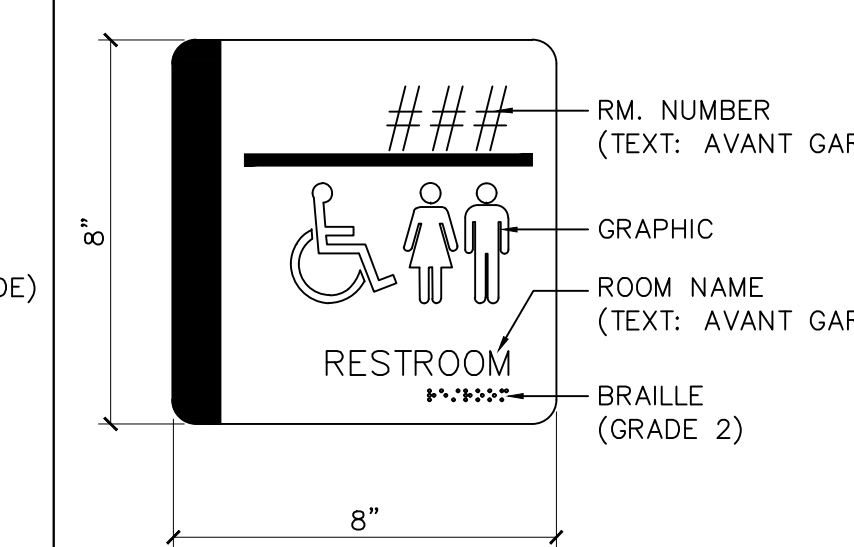
A ROOM ID SIGN
SCALE: 3" = 1'-0"



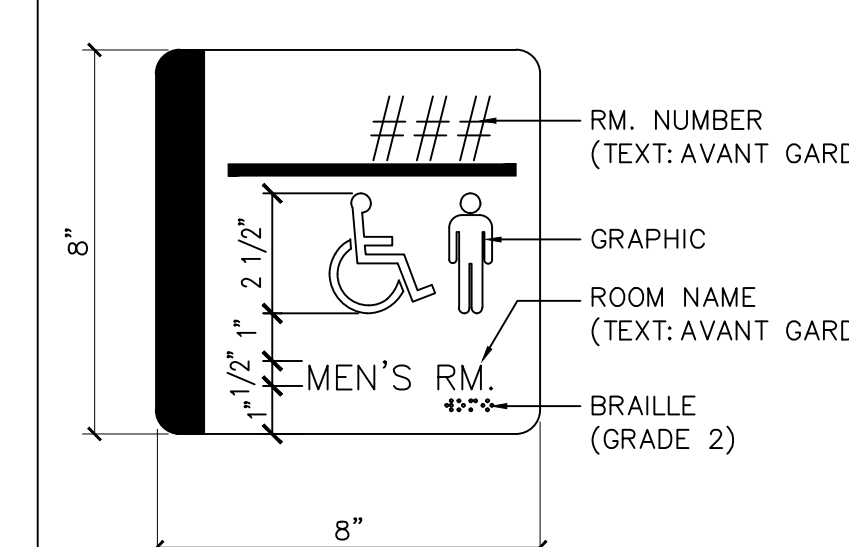
B1 TYP. ELEVATOR ID SIGN
SCALE: 3" = 1'-0"



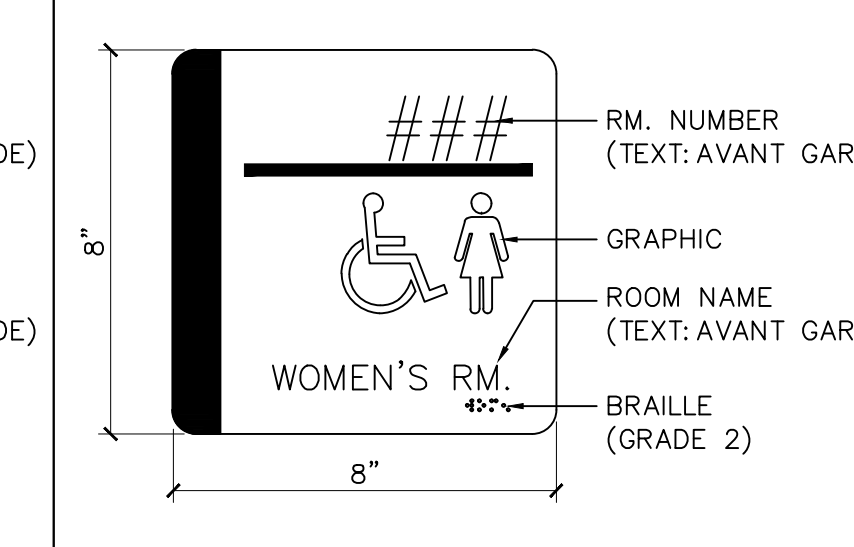
B2 TYP. ELEVATOR ID SIGN
SCALE: 3" = 1'-0"



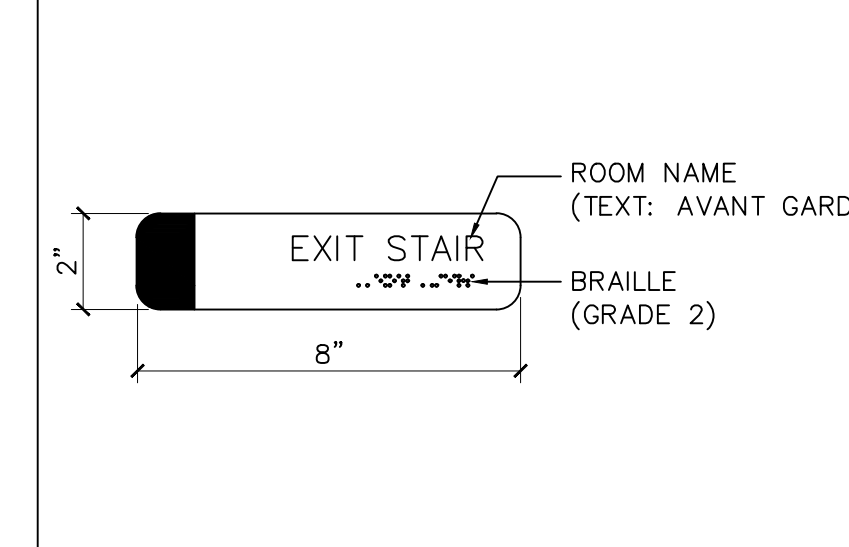
C1 TYP. RESTROOM ID SIGN
SCALE: 3" = 1'-0"



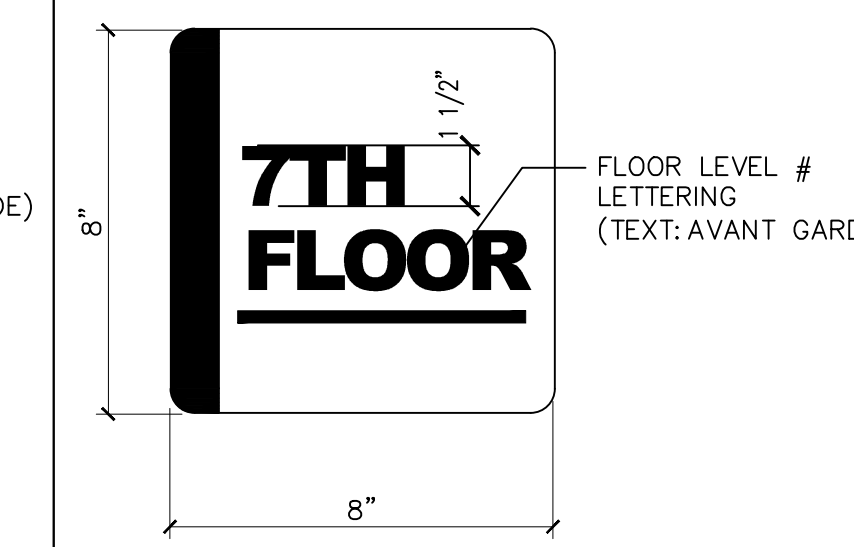
C2 TYP. RESTROOM ID SIGN
SCALE: 3" = 1'-0"



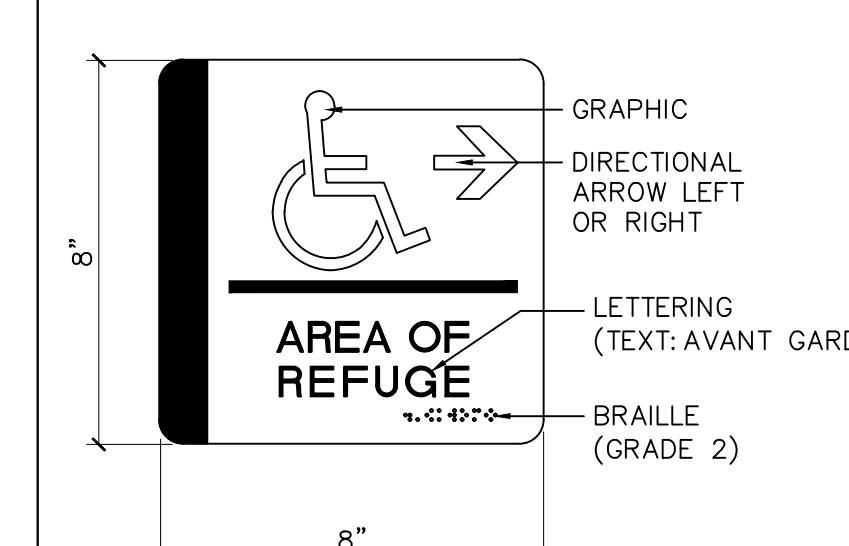
C3 TYP. RESTROOM ID SIGN
SCALE: 3" = 1'-0"



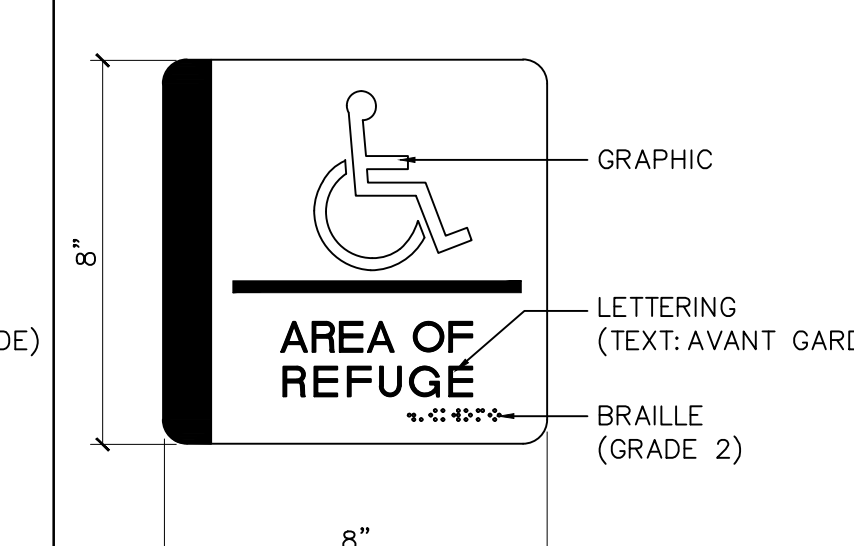
D1 TYP. STAIR ID SIGN
SCALE: 3" = 1'-0"



D2 TYP. INSIDE STAIR ID SIGN
SCALE: 3" = 1'-0"

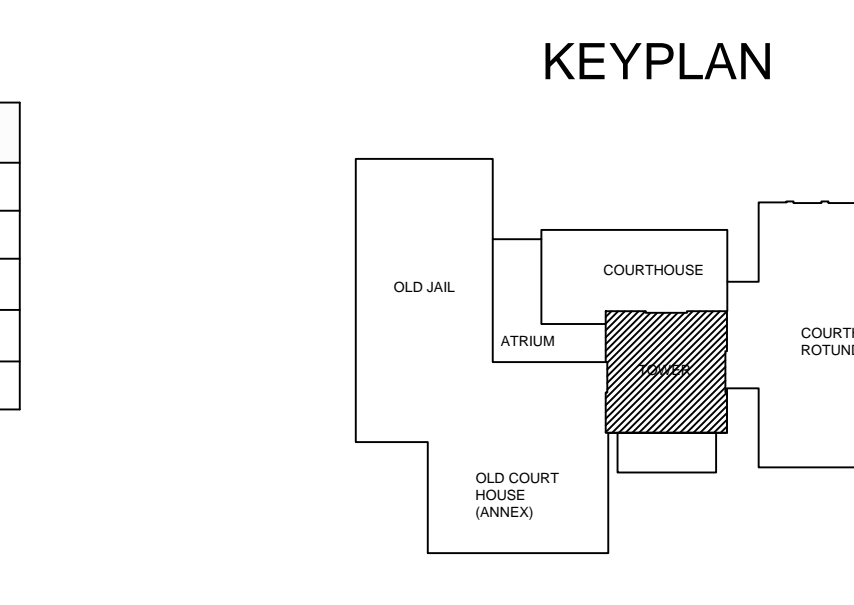


E1 TYP. AREA OF REFUGE DIRECTIONAL ID SIGN
NTS



E2 TYP. AREA OF REFUGE ID SIGN
NTS

LEGEND				
A	ROOM ID SIGN			
B	ELEVATOR ID SIGN			
C	RESTROOM ID SIGN			
D	STAIR/EXIT ID SIGN			
E	AREA OF REFUGE ID SIGN			



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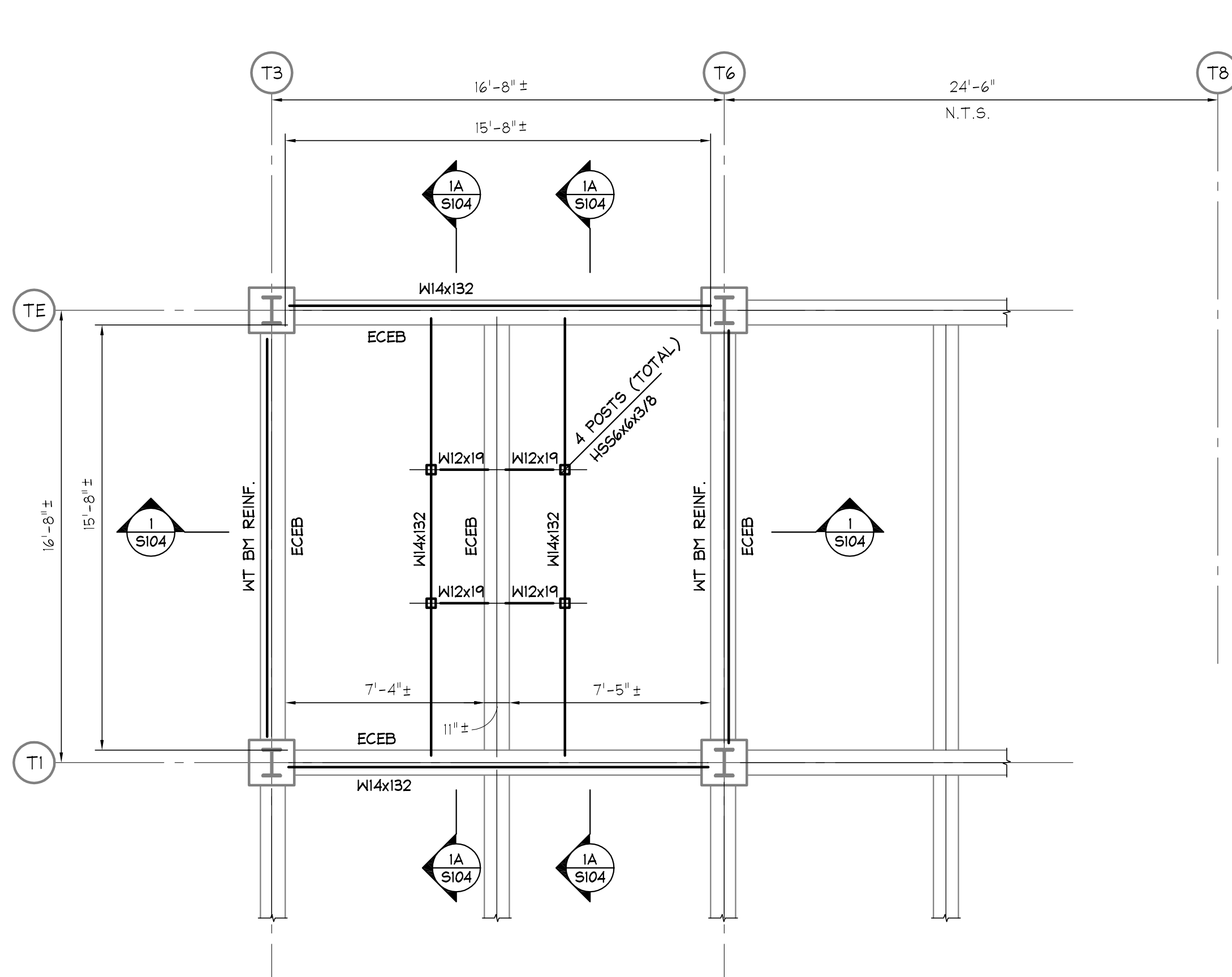


PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS: **SIGNAGE DETAIL**

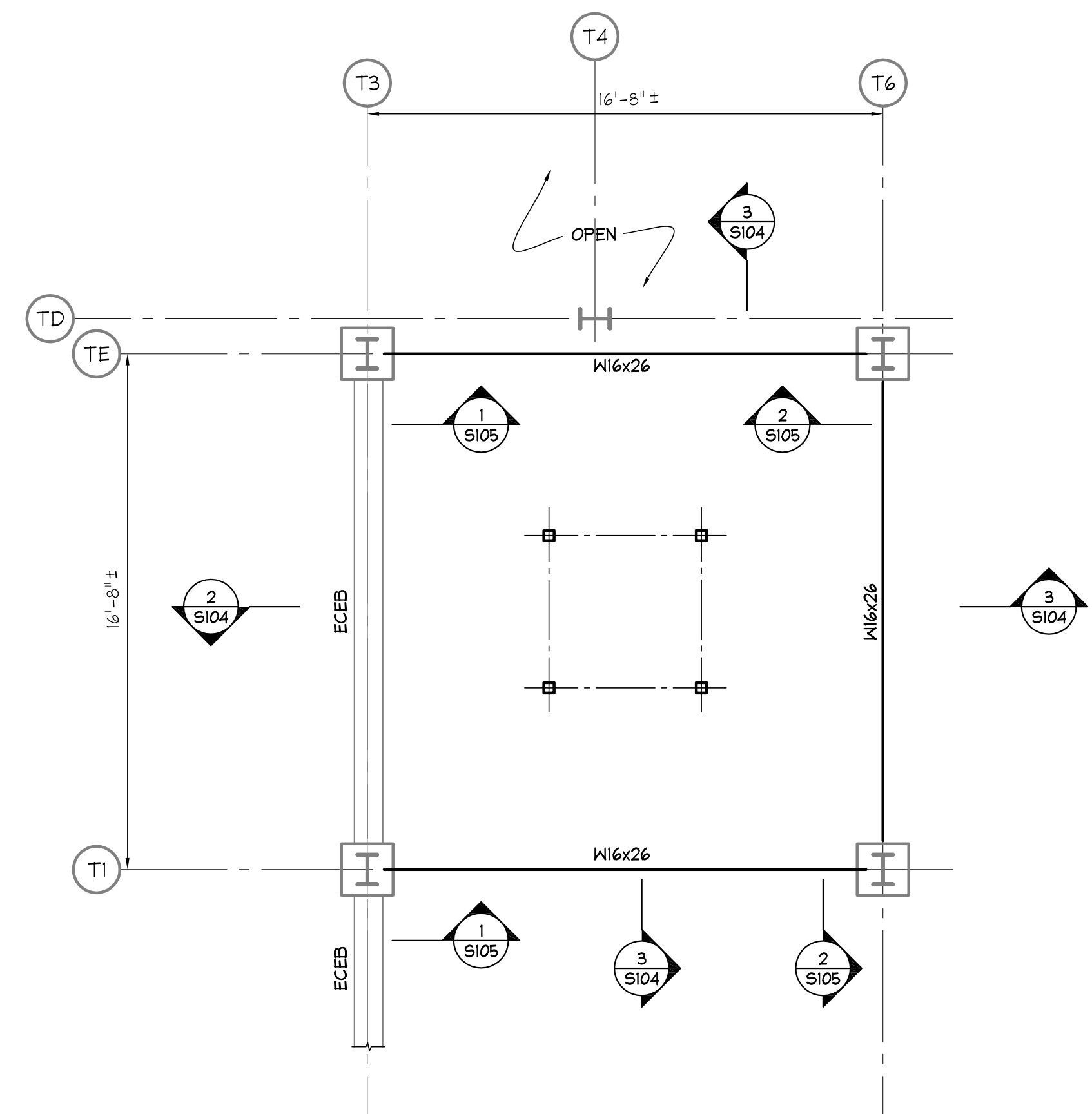
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DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						BT
10.30.15	95% SUBMISSION	KD	FM						NJN
05.31.17	100% SUBMISSION	MC	FM						2141151
08.30.17	ISSUED FOR BID	MC	FM						84 OF: 160
									DWG NO

A.801



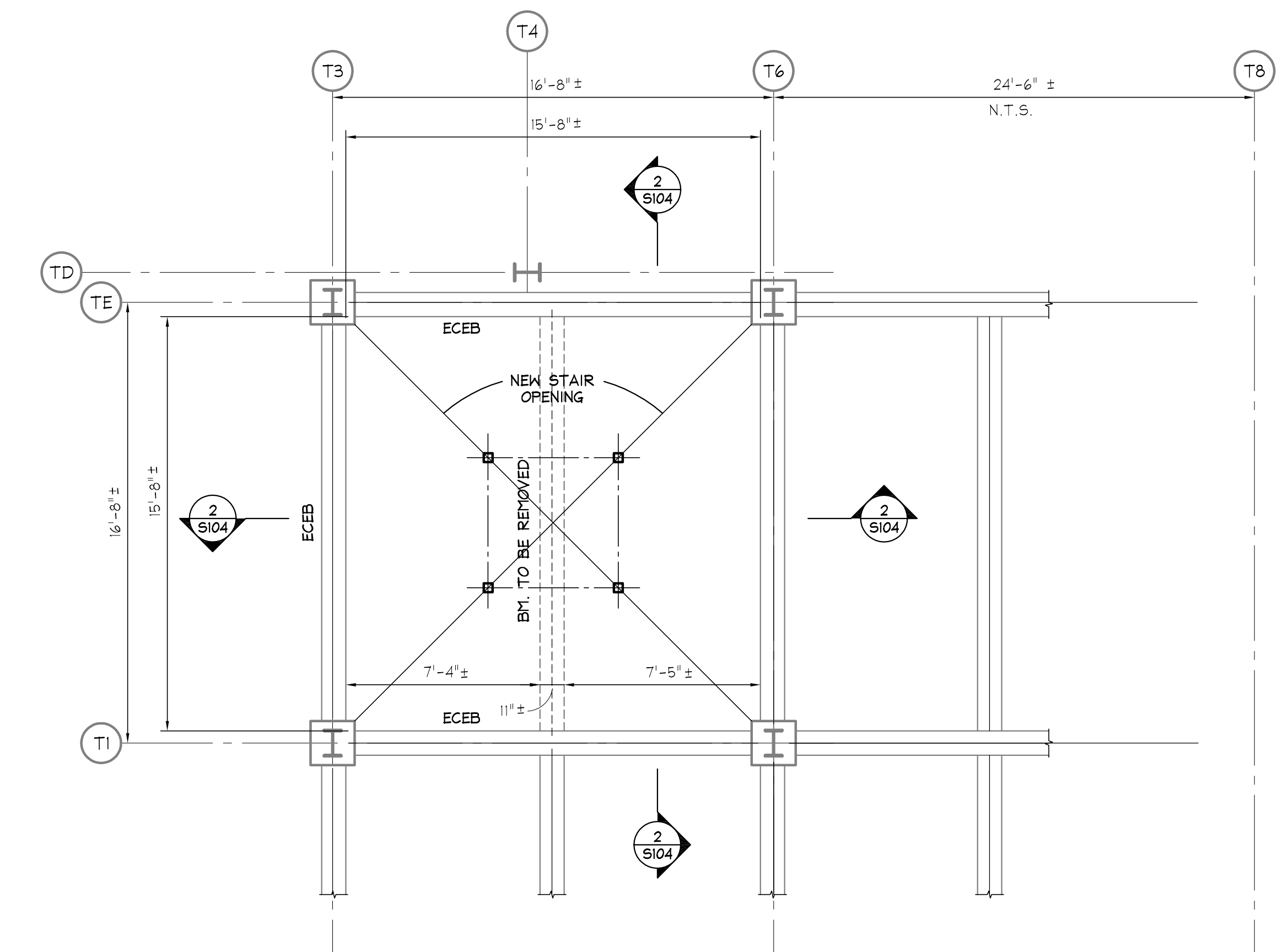
PART FIRST FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"
NOTES:
1) TOP OF SLAB ELEVATION = 11'-7", UNLESS NOTED OTHERWISE.
2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.

SHORING NOTE
PROVIDE TEMPORARY SHORINGS AND BRACINGS OF EXTERIOR WALLS AS REQUIRED FOR THE DEMOLITION OF THE EXISTING SLAB.

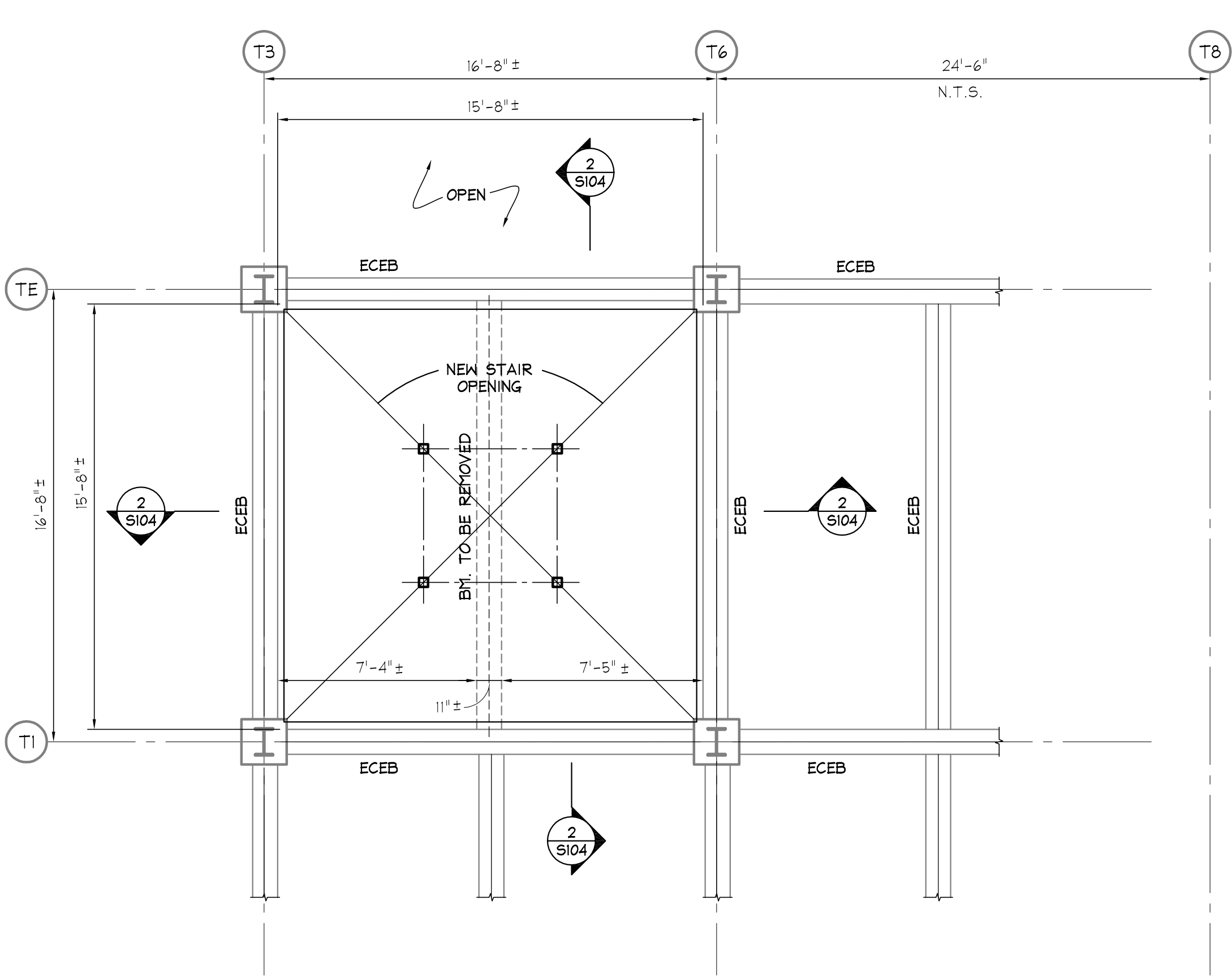


PART SECOND FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"
NOTES:
1) TOP OF SLAB ELEVATION = 24'-11", UNLESS NOTED OTHERWISE.
2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.

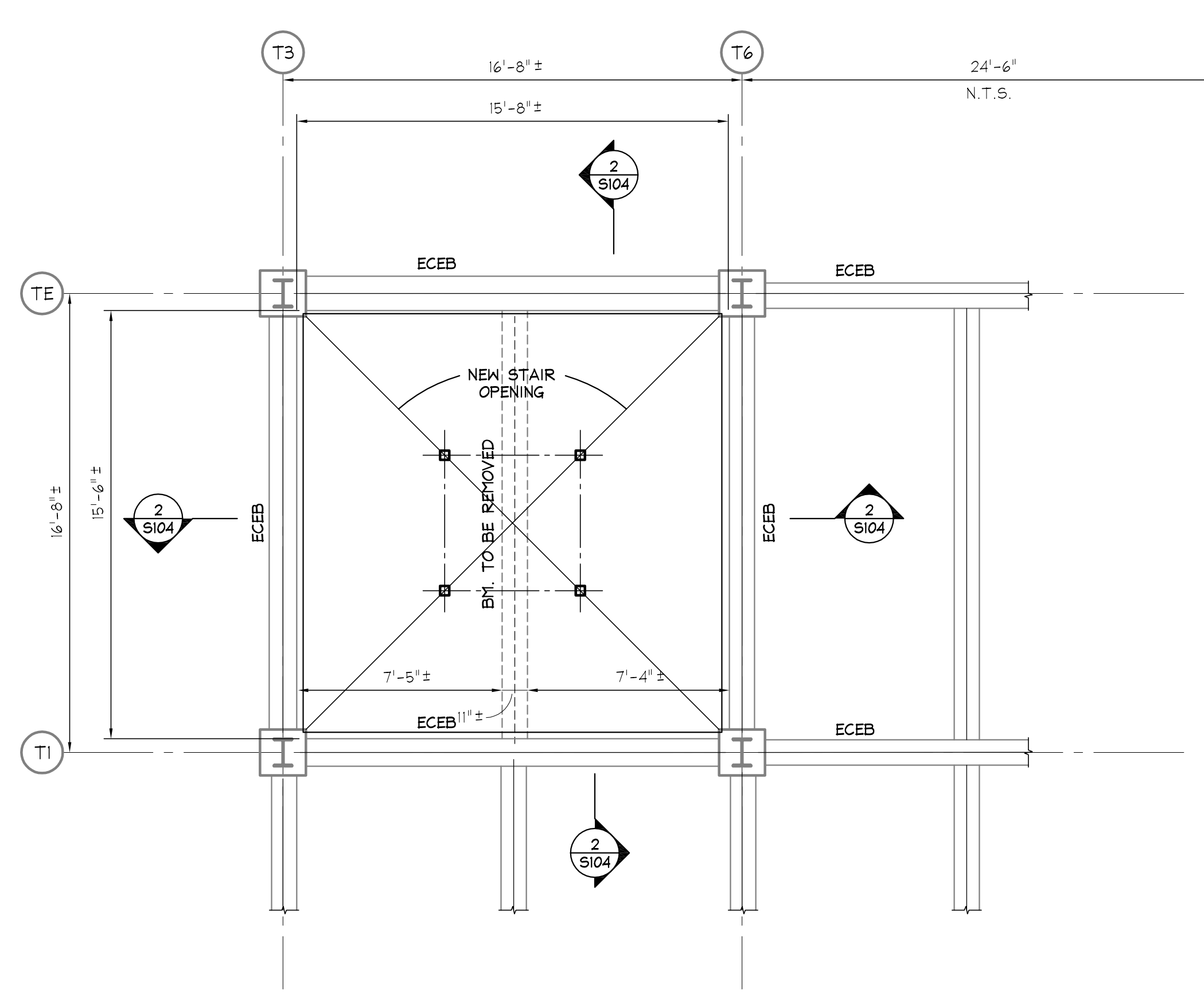
TYPICAL
FOR CONNECTIONS TO STAIR STRINGERS AT BOTH NEW AND EXISTING BEAMS SEE SECTIONS 2 AND 3/S104.



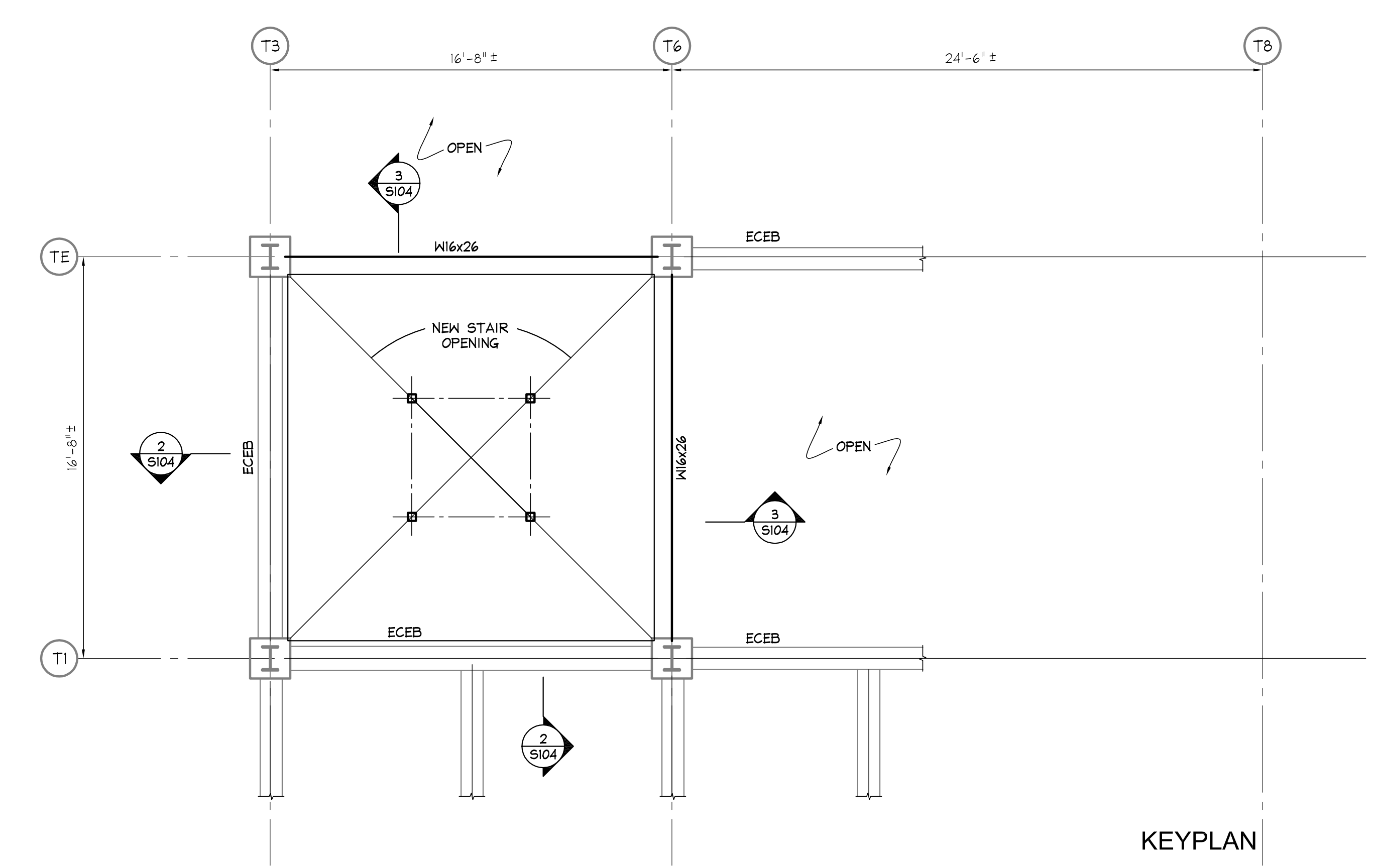
PART THIRD FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"
NOTES:
1) TOP OF SLAB ELEVATION = 34'-6", UNLESS NOTED OTHERWISE.
2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.



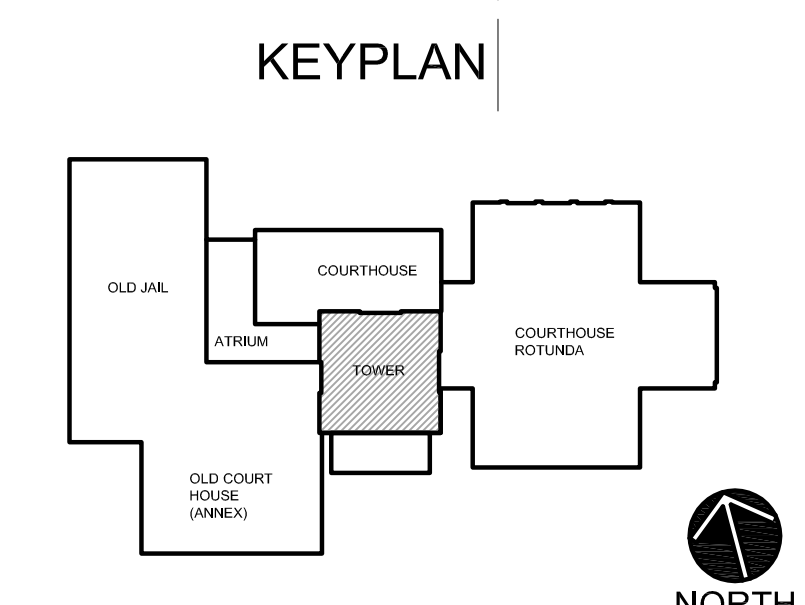
PART 4TH FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"
NOTES:
1) TOP OF EXISTING SLAB ELEVATION = 47'-10", UNLESS NOTED OTHERWISE.
2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.



PART 5TH FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"
NOTES:
1) TOP OF EXISTING SLAB ELEVATION = 57'-7", UNLESS NOTED OTHERWISE.
2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.



PART 6TH FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"
NOTES:
1) TOP OF EXISTING SLAB ELEVATION = 69'-2", UNLESS NOTED OTHERWISE.
2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.



ODONNELL & NACCARATO, INC.
STRUCTURAL ENGINEERS
160 ROUTE 22 WEST
2ND FLOOR
MOUNTAINSIDE, NJ 07092
TELEPHONE: (908) 379-2911
FAX: (201) 627-0551
Project No. 3823.0010.00
Paul Peter Panzolino, P.E.
N.J. Cert. No. 42798
Date:

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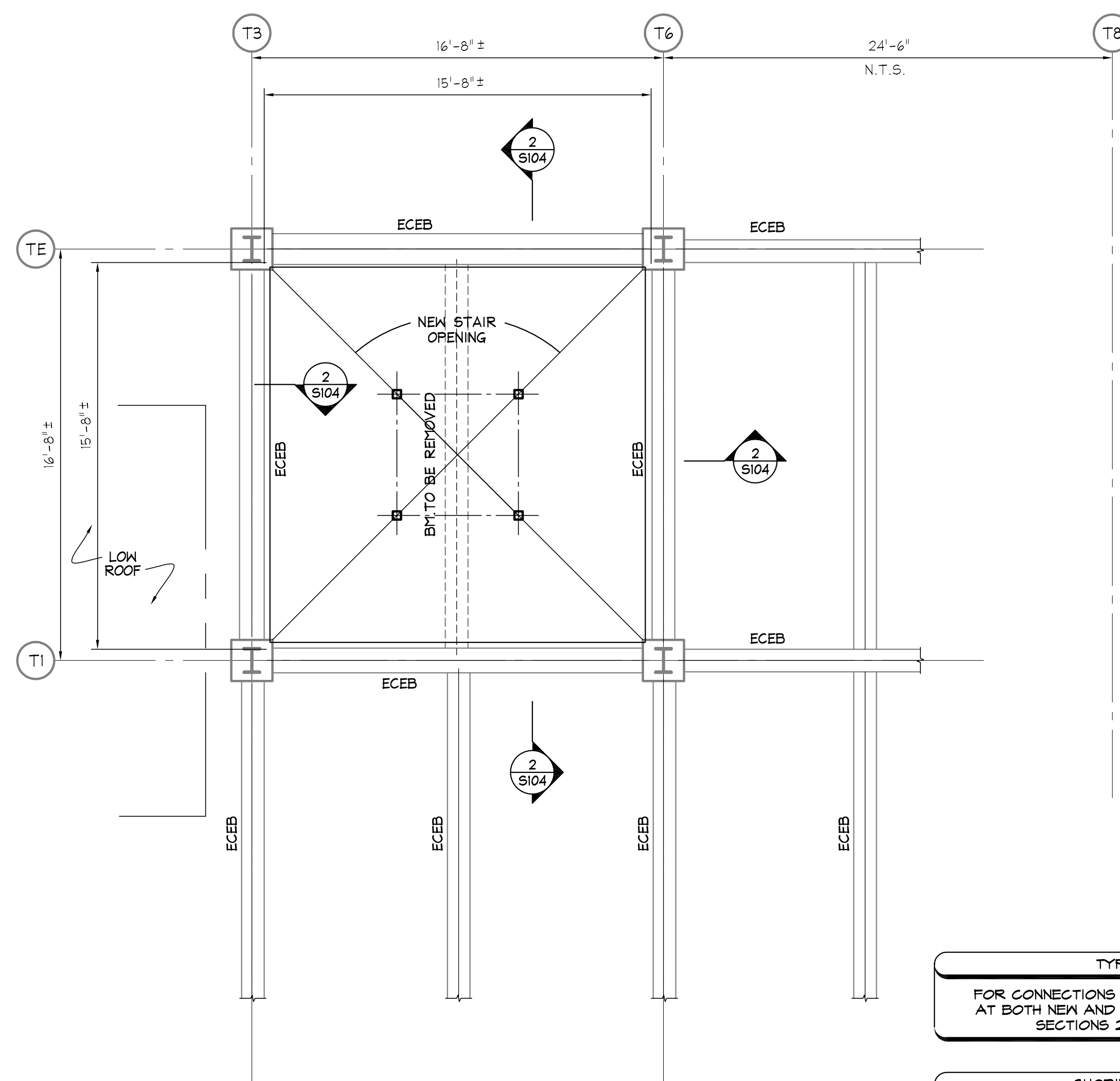
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NJ License No. AI 12541
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NJ License No. AI 16160
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NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0008 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey
SHEET CONTENTS:
**PART FRAMING PLANS FIRST
THRU SIXTH FLOORS**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
2-25-15	DD SET	JD	M1					DRWN BY	JPD
10-30-15	95% CONST. DOC.	JD	M1					CHKD BY	BJ
05-31-17	100% CD REVIEW	JD	M1					JOB NO	2141151
09-07-17	ISSUED FOR BID	JD	M1					SHEET:	85 OF: 160
								DRWG NO	

S.101

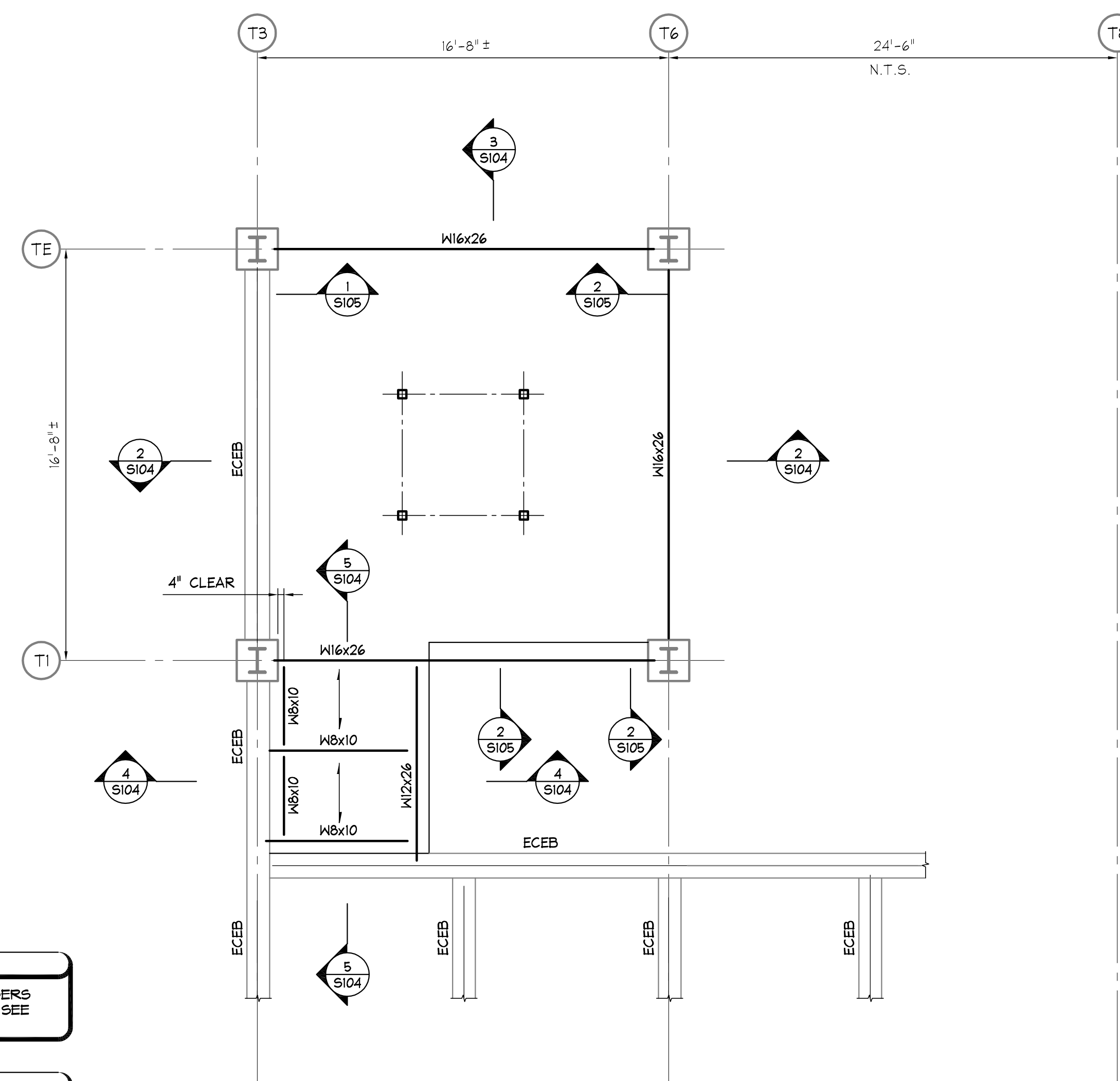


PART 7TH FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"

- NOTES:
1) TOP OF EXISTING SLAB ELEVATION = 80'-11", UNLESS NOTED OTHERWISE.
2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.

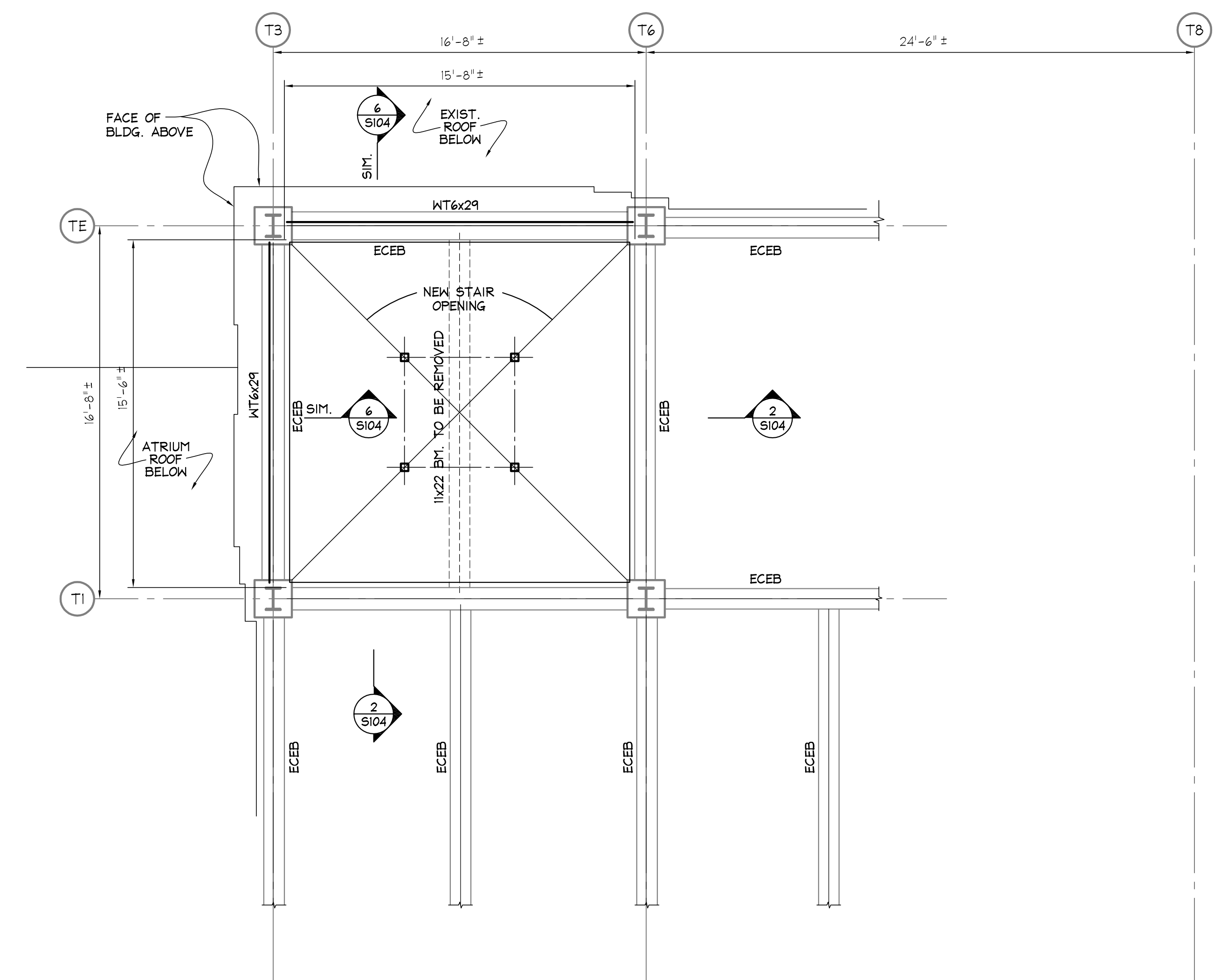
TYPICAL
FOR CONNECTIONS TO STAIR STRISERS
AT BOTH NEW AND EXISTING BEAMS SEE
SECTIONS 2 AND 3/S104

SHORING NOTE
PROVIDE TEMPORARY SHORING AND BRACING
OF EXTERIOR WALLS AS REQUIRED
FOR THE DEMOLITION OF THE EXISTING SLAB.



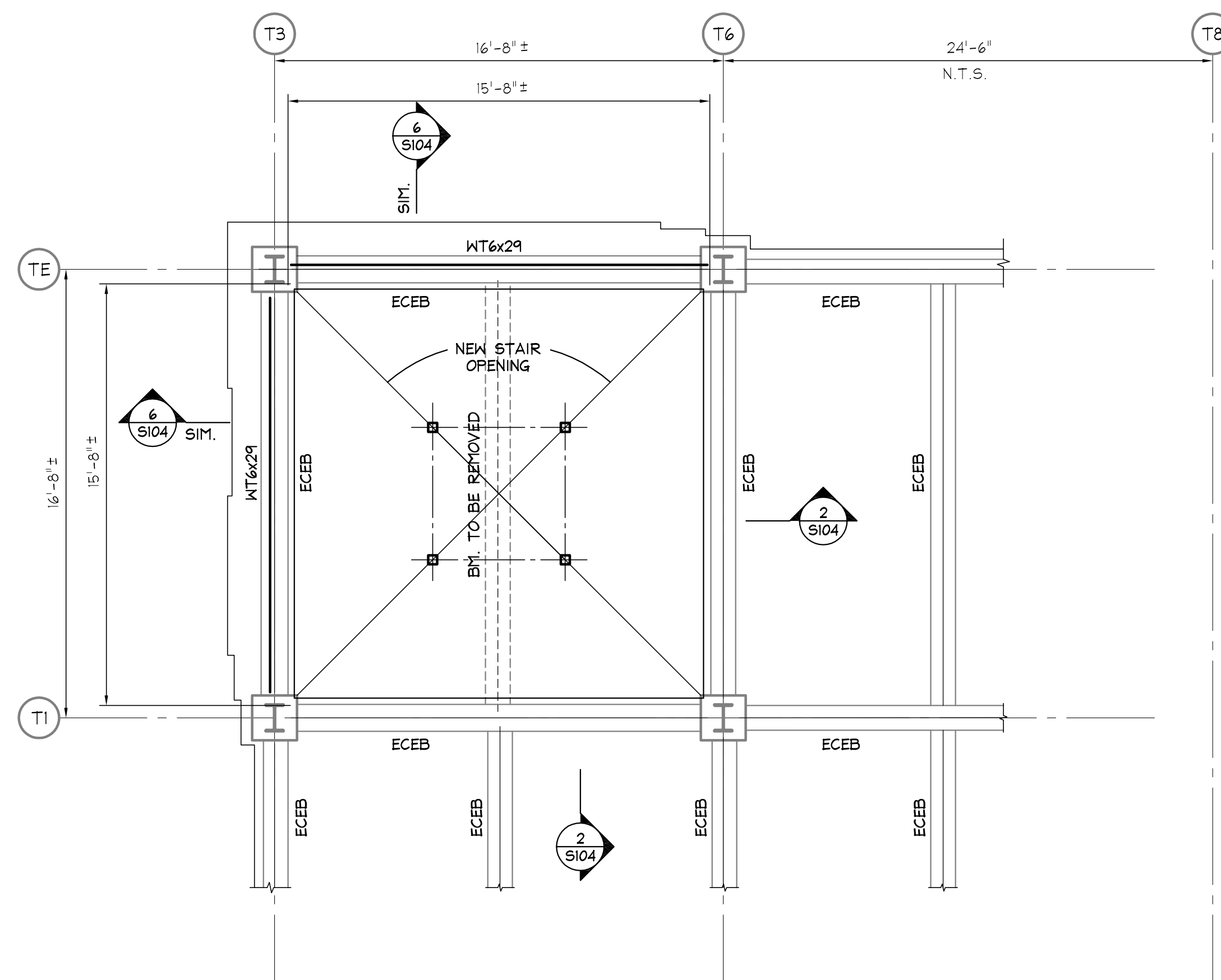
PART 8TH FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"

- NOTES:
1) TOP OF EXISTING SLAB ELEVATION = 92'-6", UNLESS NOTED OTHERWISE.
2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.



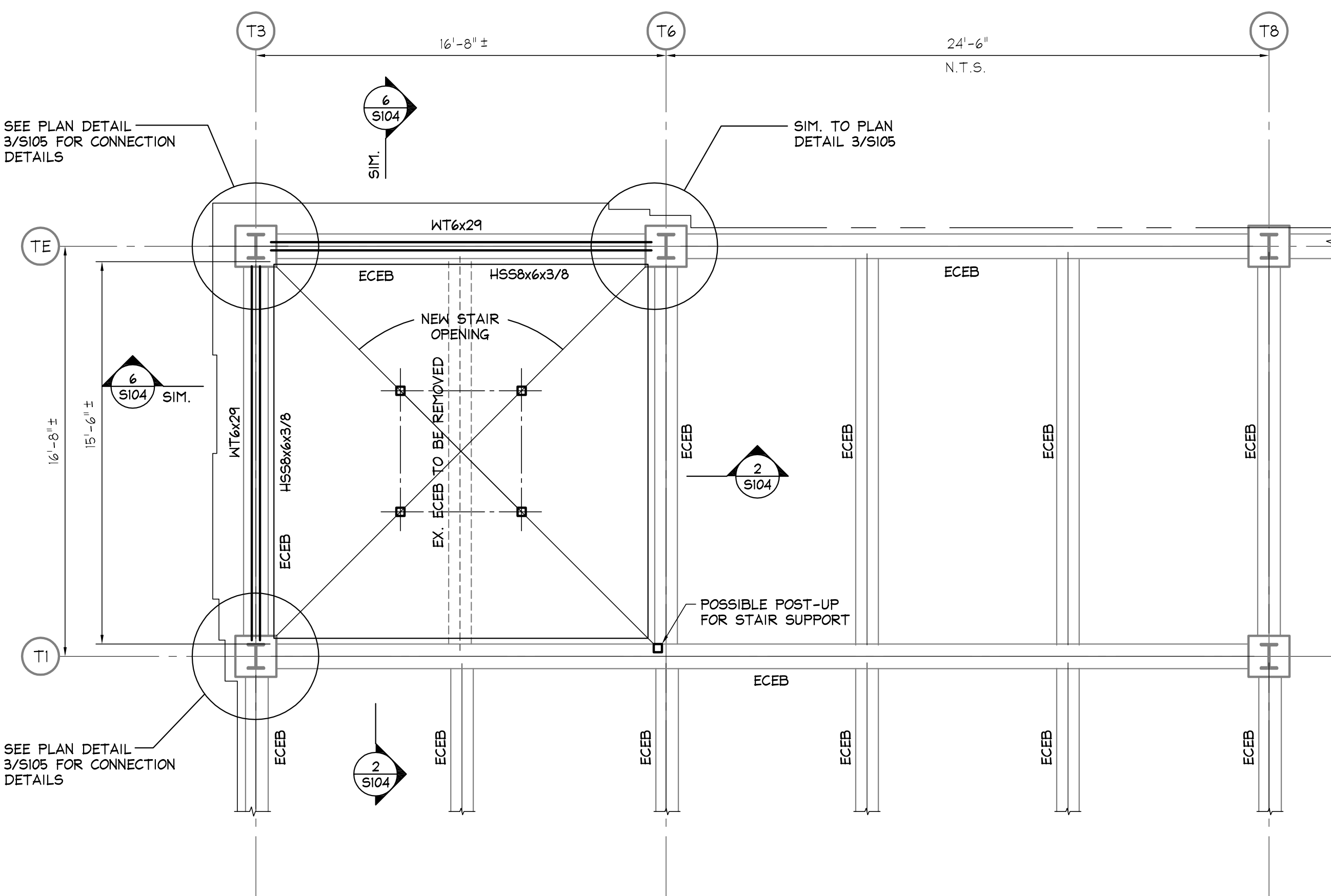
PART 9TH FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"

- NOTES:
1) TOP OF EXISTING SLAB ELEVATION = 104'-1", UNLESS NOTED OTHERWISE.
2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.



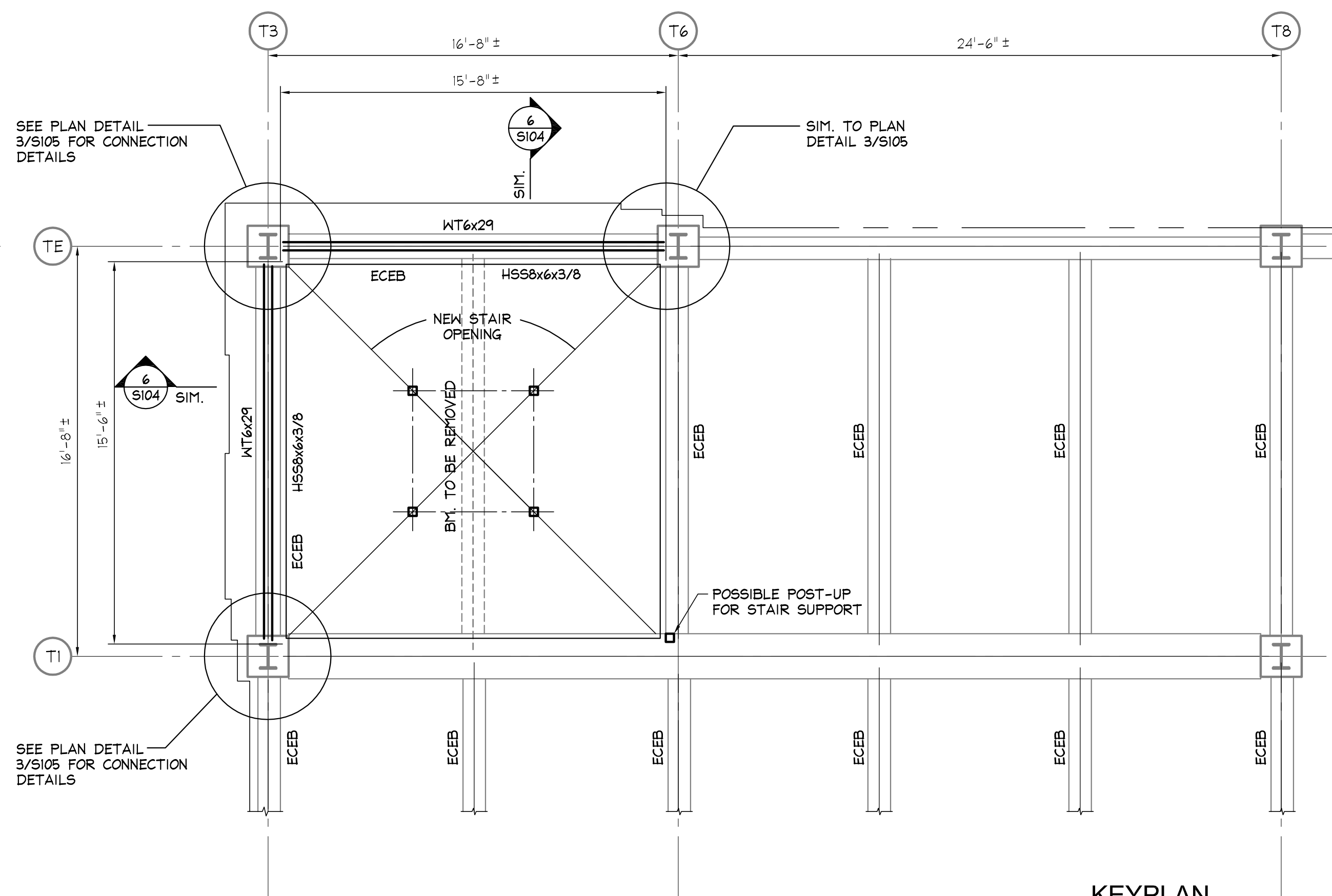
PART 10TH FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"

- NOTES:
1) TOP OF EXISTING SLAB ELEVATION = 119'-2"± UNLESS NOTED OTHERWISE.
2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.



PART 11TH FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"

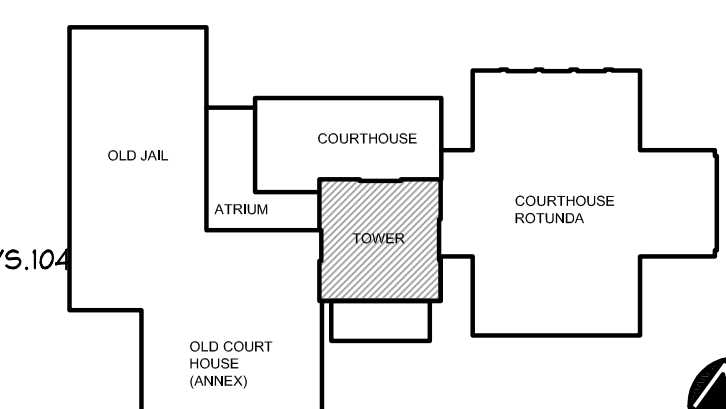
- NOTES:
1) TOP OF EXISTING SLAB ELEVATION = 134'-3"± UNLESS NOTED OTHERWISE.
2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.
3) PROVIDE POST-UP OR HSS6x6x3/8 WITH HANGER RODS SIMILAR TO SECTION 6/S.104 AT INSIDE CORNER OF COL. GRID LINES T1/T6



PART 12TH FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"

- NOTES:
1) TOP OF EXISTING SLAB ELEVATION = 151'-4"± UNLESS NOTED OTHERWISE.
2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.
3) PROVIDE POST-UP OR HSS6x6x3/8 WITH HANGER RODS SIMILAR TO SECTION 6/S.104 AT INSIDE CORNER OF COL. GRID LINES T1/T6

KEYPLAN



ODONNELL & NACCARATO, INC.
STRUCTURAL ENGINEERS
160 ROUTE 22 WEST
2ND FLOOR
MOUNTAINVIEW, NJ 07092
TELEPHONE: (908) 379-2911
FAX: (908) 427-1051
Project No. 3823.0010.00
Paul Peter Panzolino, P.E.
N.J. Cert. No. 42798
Date:

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NJ License No. AI 12118

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NJ License No. AI 16160

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NJ License No. AI 14394

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINVIEW, NEW JERSEY 07092
TEL: 973.379.0008 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

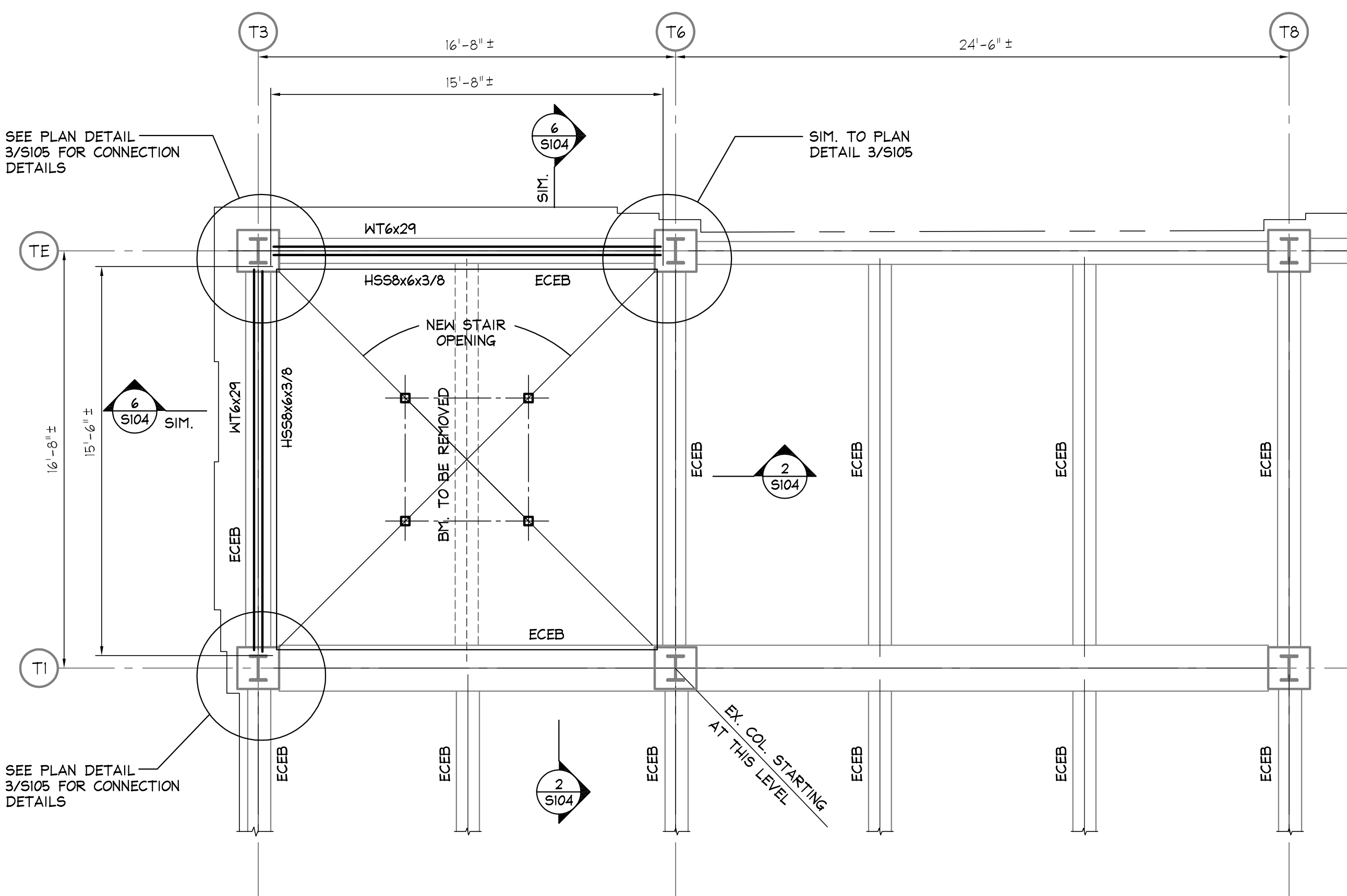
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**PART FRAMING PLANS
SEVENTH THRU TWELFTH
FLOORS**

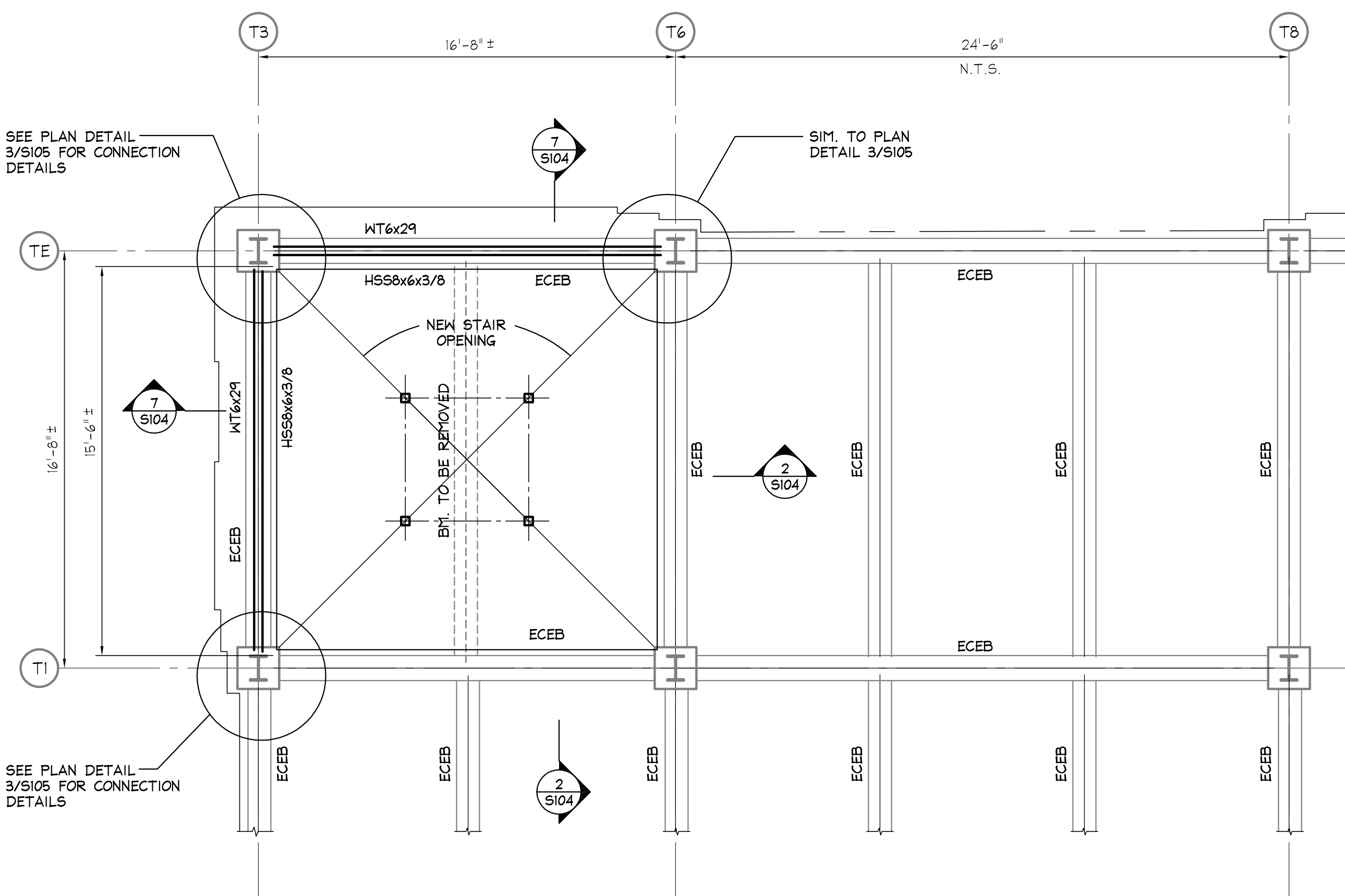
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DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
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10-30-15	95% CONST. DOC.	JD	M1					AS SHOWN
05-31-17	100% CD REVIEW	JD	M1					DRWN BY JPD
08-07-17	ISSUED FOR BID	JD	M1					CHKD BY BJ
								JOB NO 2141151
								SHEET: 86 OF: 160
								DRWG NO

S.102



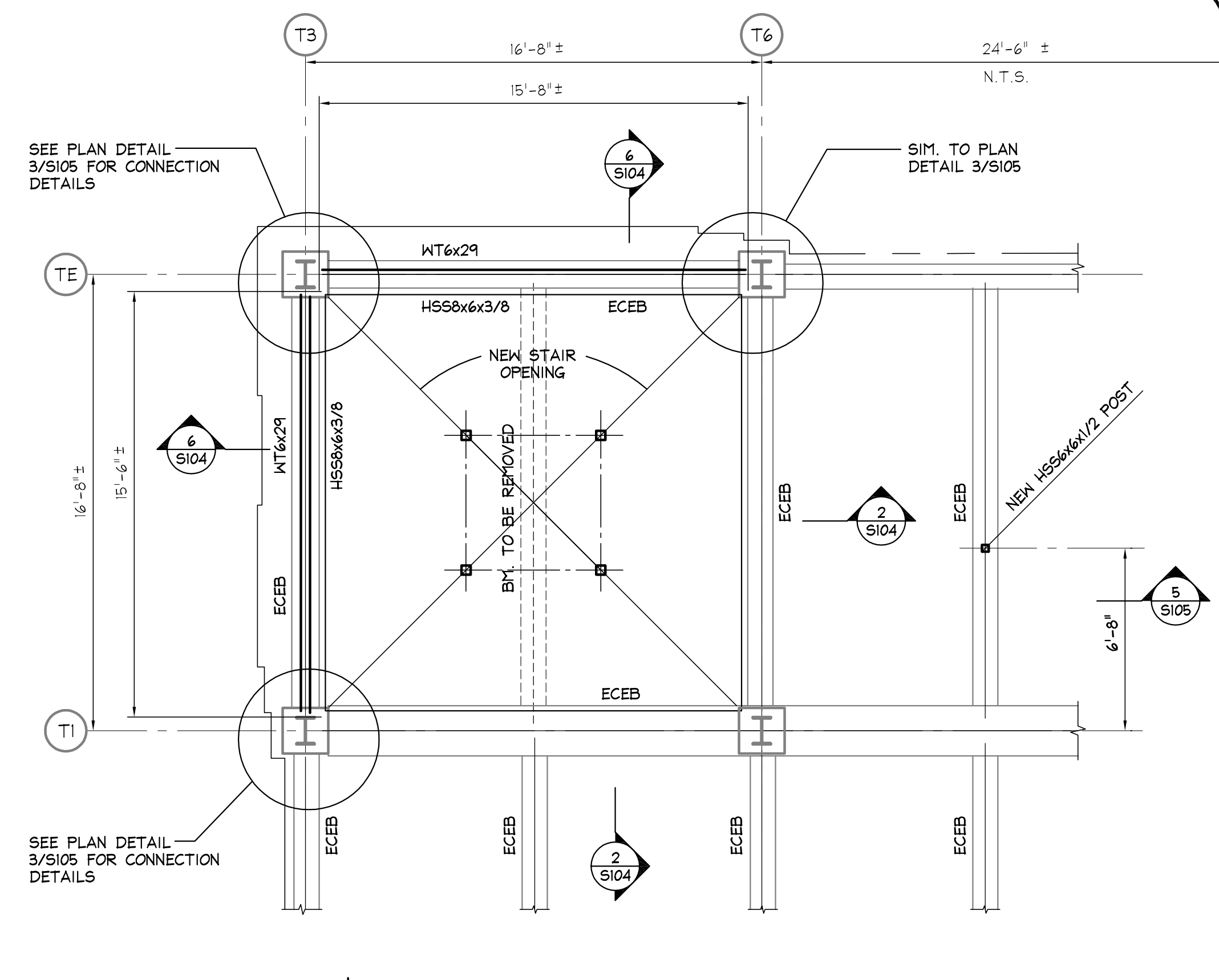
PART 13TH FLOOR FRAMING PLAN

SCALE: 1/4"=1'-0"
 NOTES:
 1) TOP OF EXISTING SLAB ELEVATION = 160'-5"± UNLESS NOTED OTHERWISE.
 2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.



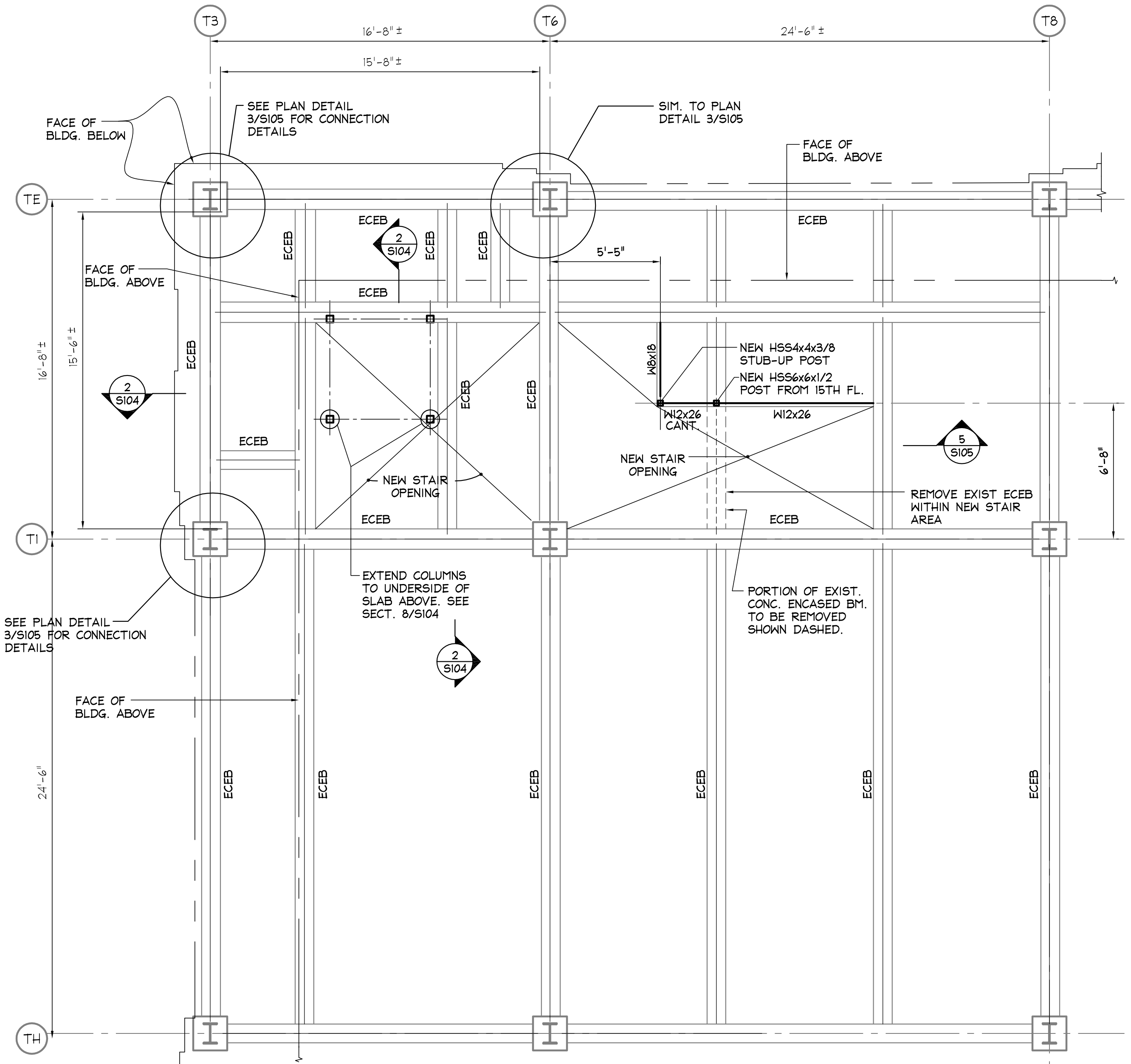
PART 14TH FLOOR FRAMING PLAN

SCALE: 1/4"=1'-0"
 NOTES:
 1) TOP OF EXISTING SLAB ELEVATION = 189'-5"± UNLESS NOTED OTHERWISE.
 2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.



PART 15TH FLOOR FRAMING PLAN

SCALE: 1/4"=1'-0"
 NOTES:
 1) TOP OF EXISTING SLAB ELEVATION = 206'-7"± UNLESS NOTED OTHERWISE.
 2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.

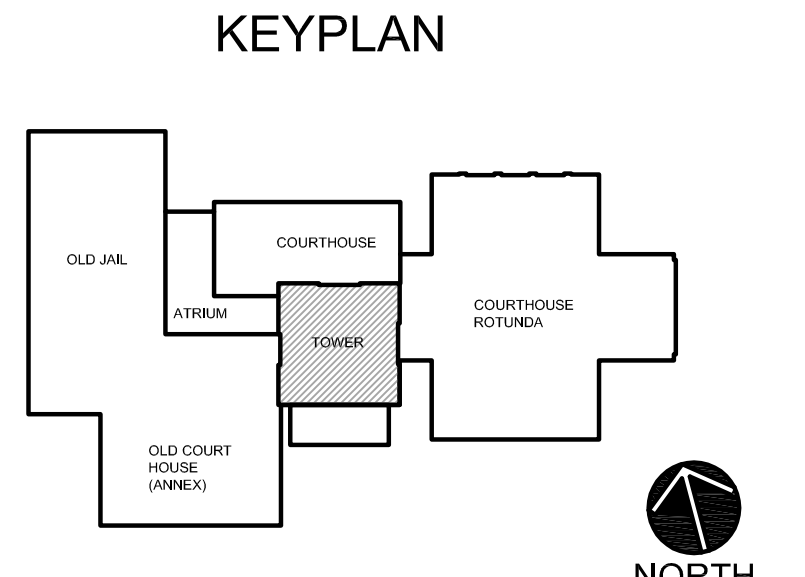


PART 16TH FLOOR FRAMING PLAN

SCALE: 1/4"=1'-0"
 NOTES:
 1) TOP OF EXISTING SLAB ELEVATION = 223'-9"± UNLESS NOTED OTHERWISE.
 2) ECEB.....INDICATES EXISTING CONCRETE ENCASED BEAM.

SHORING NOTE
 PROVIDE TEMPORARY SHORING AND BRACING OF EXTERIOR WALLS AS REQUIRED FOR THE DEMOLITION OF THE EXISTING SLAB.

TYPICAL
 FOR CONNECTIONS TO STAIR STRINGERS AT BOTH NEW AND EXISTING BEAMS SEE SECTIONS 2 AND 3/S104



ODONNELL & NACCARATO, INC.
 STRUCTURAL ENGINEERS
 160 ROUTE 22 WEST
 2ND FLOOR
 MOUNTAINSIDE, NJ 07092
 TELEPHONE: (908) 379-2911
 FAX: (908) 427-0561
 Project No. 3823.0010.00
 Paul Peter Panzarino, P.E.
 N.J. Cert. No. 42798
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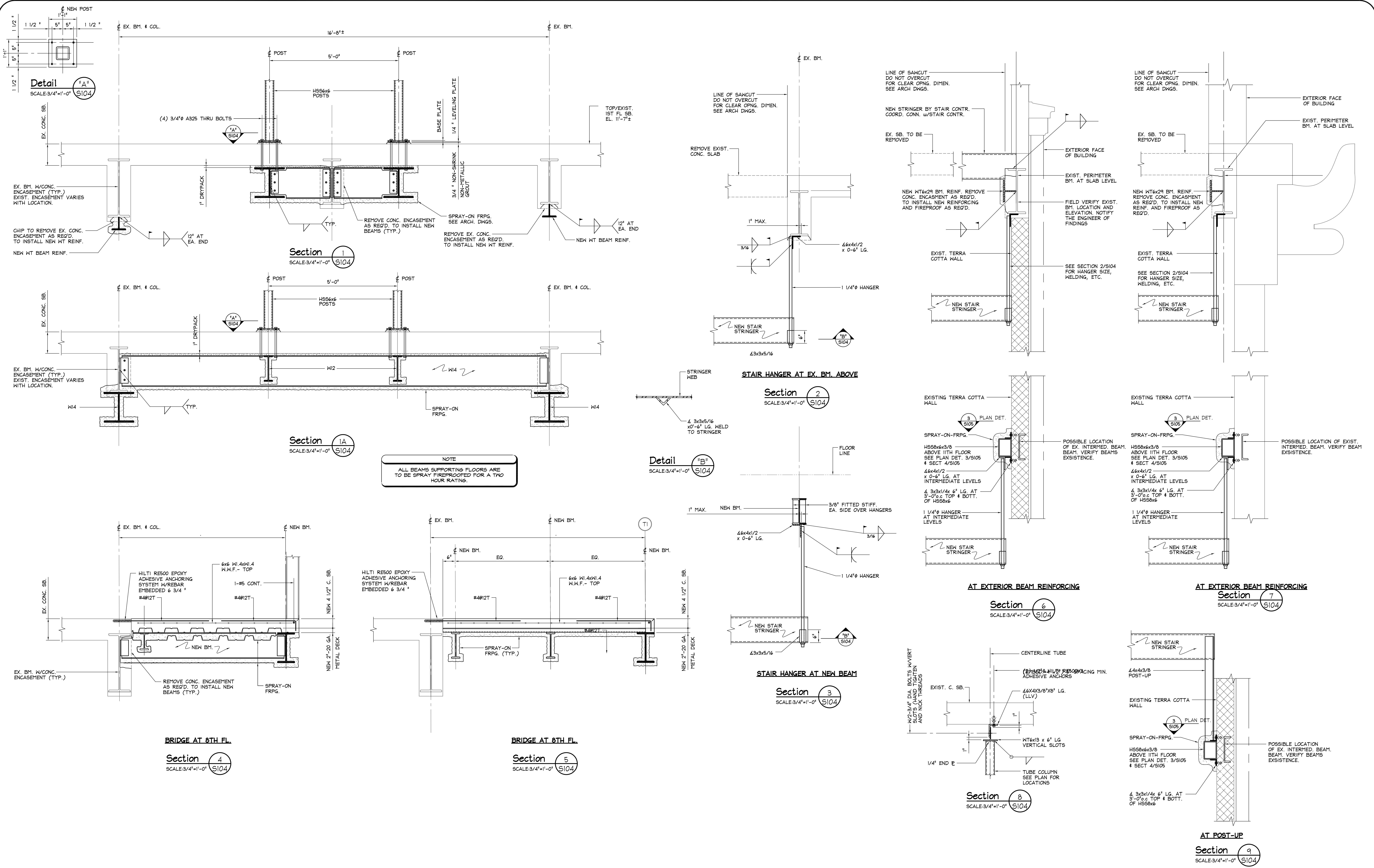
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NETTA ARCHITECTS
 ARCHITECTURE - PLANNING - INTERIOR DESIGN
 1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
 TEL: 973-379-0008 FAX: 973-379-1061
 CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:
**UC COURTHOUSE
 INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey
 SHEET CONTENTS:
**PART FRAMING PLANS
 THIRTEENTH THRU SIXTEENTH
 FLOORS**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
2-25-15	DD SET	JD	M1					DRWN BY	JPD
10-30-15	95% CONST. DOC.	JD	M1					CHKD BY	BJ
05-31-17	100% CD REVIEW	JD	M1					JOB NO	2141151
09-07-17	ISSUED FOR BID	JD	M1					SHEET:	87 OF 160
								DRWG NO	

S.103



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STRUCTURAL ENGINEERS
160 ROUTE 22 WEST
2ND FLOOR
MOUNTAINSIDE, NJ 07092
TELEPHONE: (908) 379-2911
FAX: (908) 427-1251
Project No. 3823.0010.00
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N.J. Cert. No. 42798
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NJ License No. AI 14394

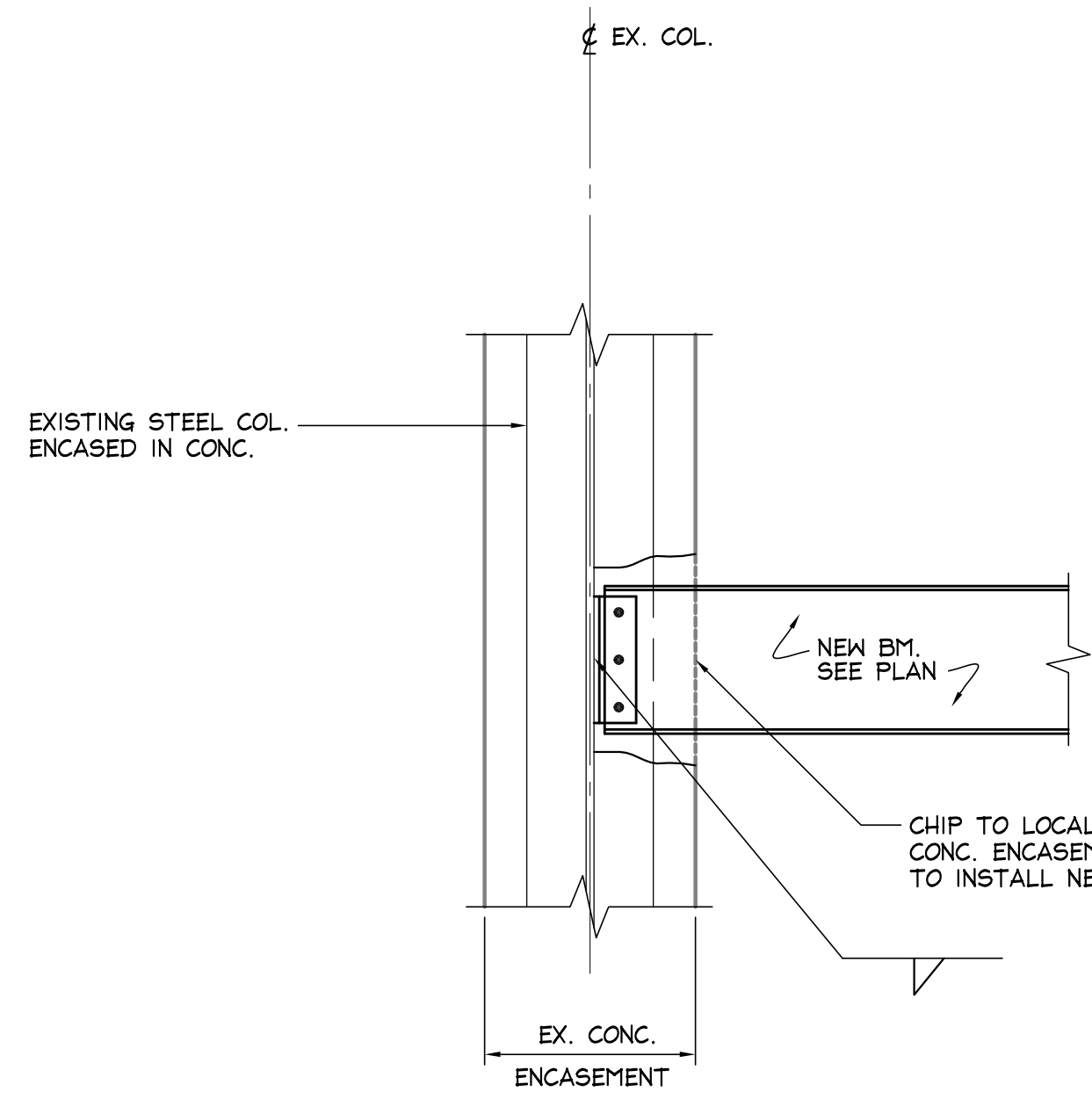
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TEL: 973-379-0006 FAX: 973-379-1061
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PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SECTIONS

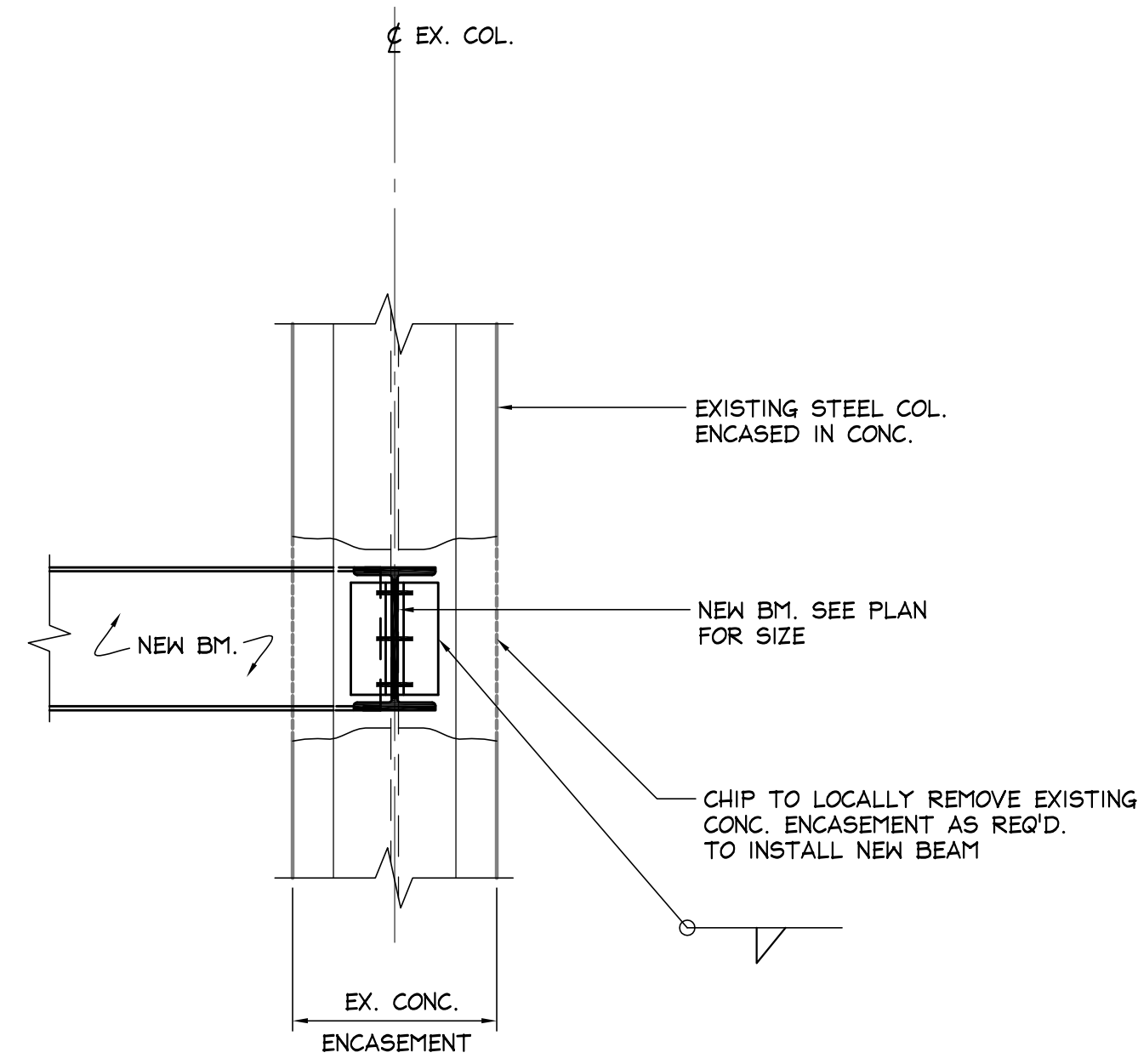
SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
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10-30-15	95% CONST. DOC.	JD	M1					AS SHOWN
05-31-17	100% CD REVIEW	JD	M1					DRWN BY JPD
09-07-17	ISSUED FOR BID	JD	M1					CHKD BY B.J.
								JOB NO 2141151
								SHEET: 88 OF: 160
								DRWG NO

S.104



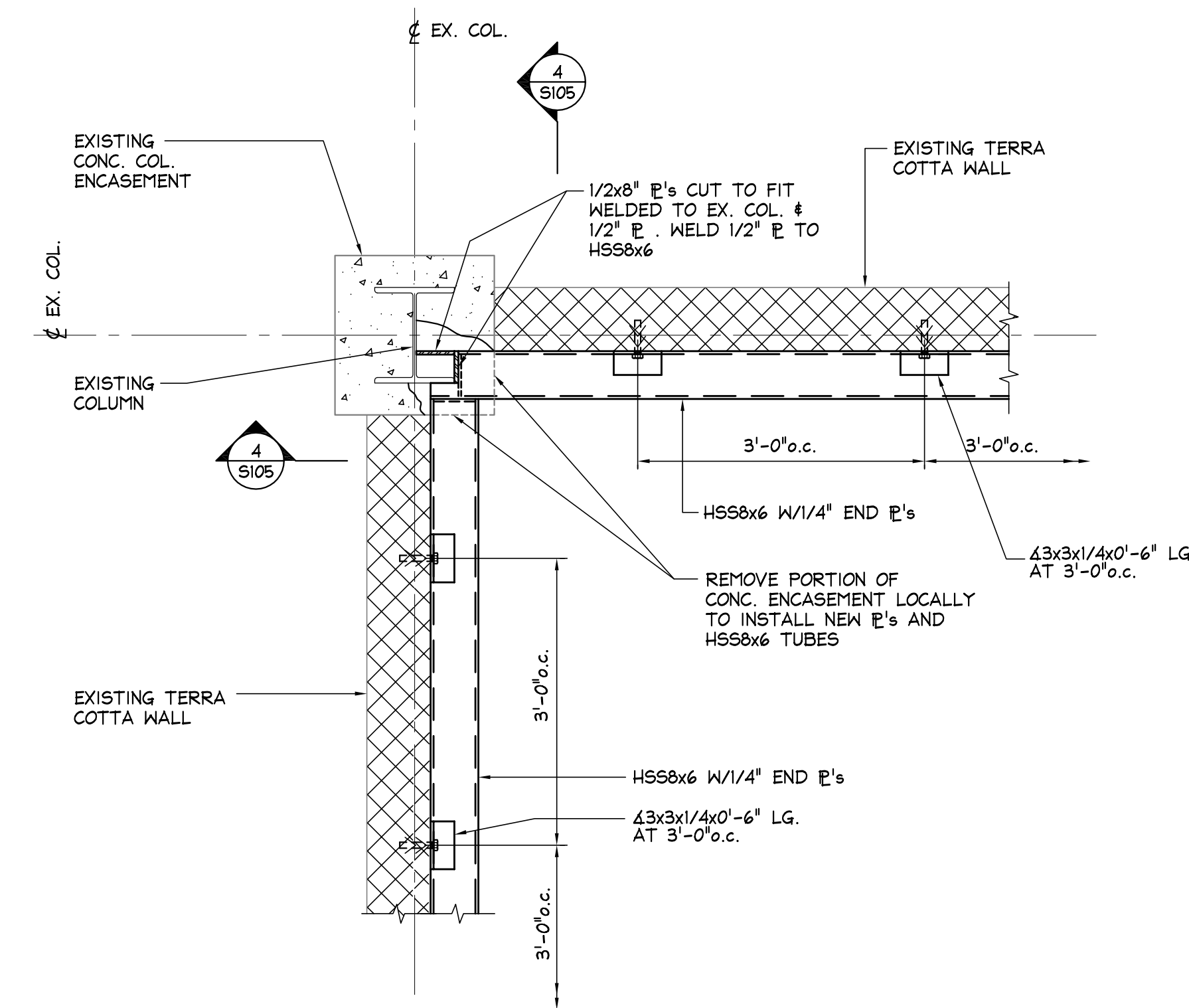
CONNECTION TO EX. COL. WEB

Section 1
SCALE: 3/4"=1'-0" S105

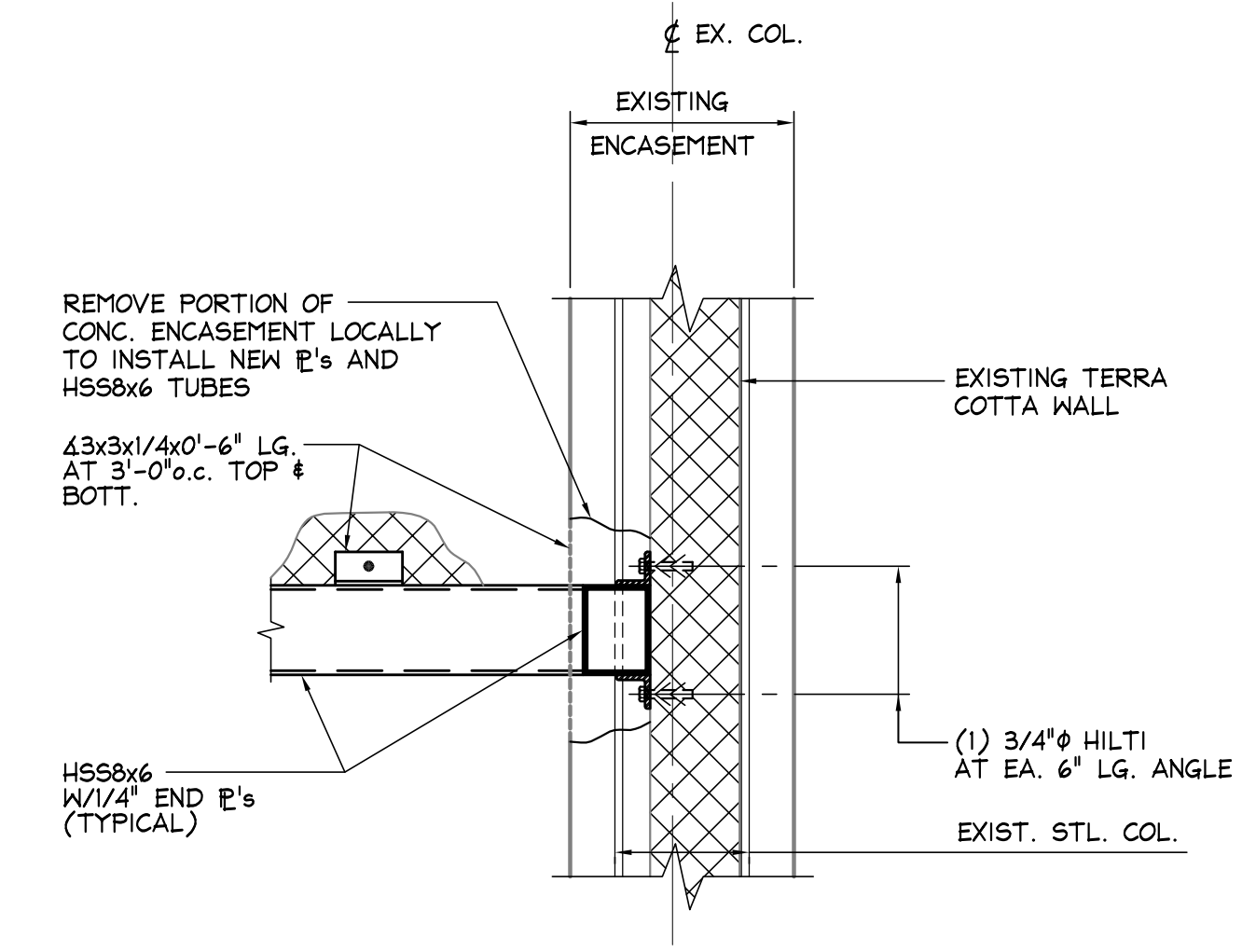


CONNECTION TO EX. COL. FLANGE

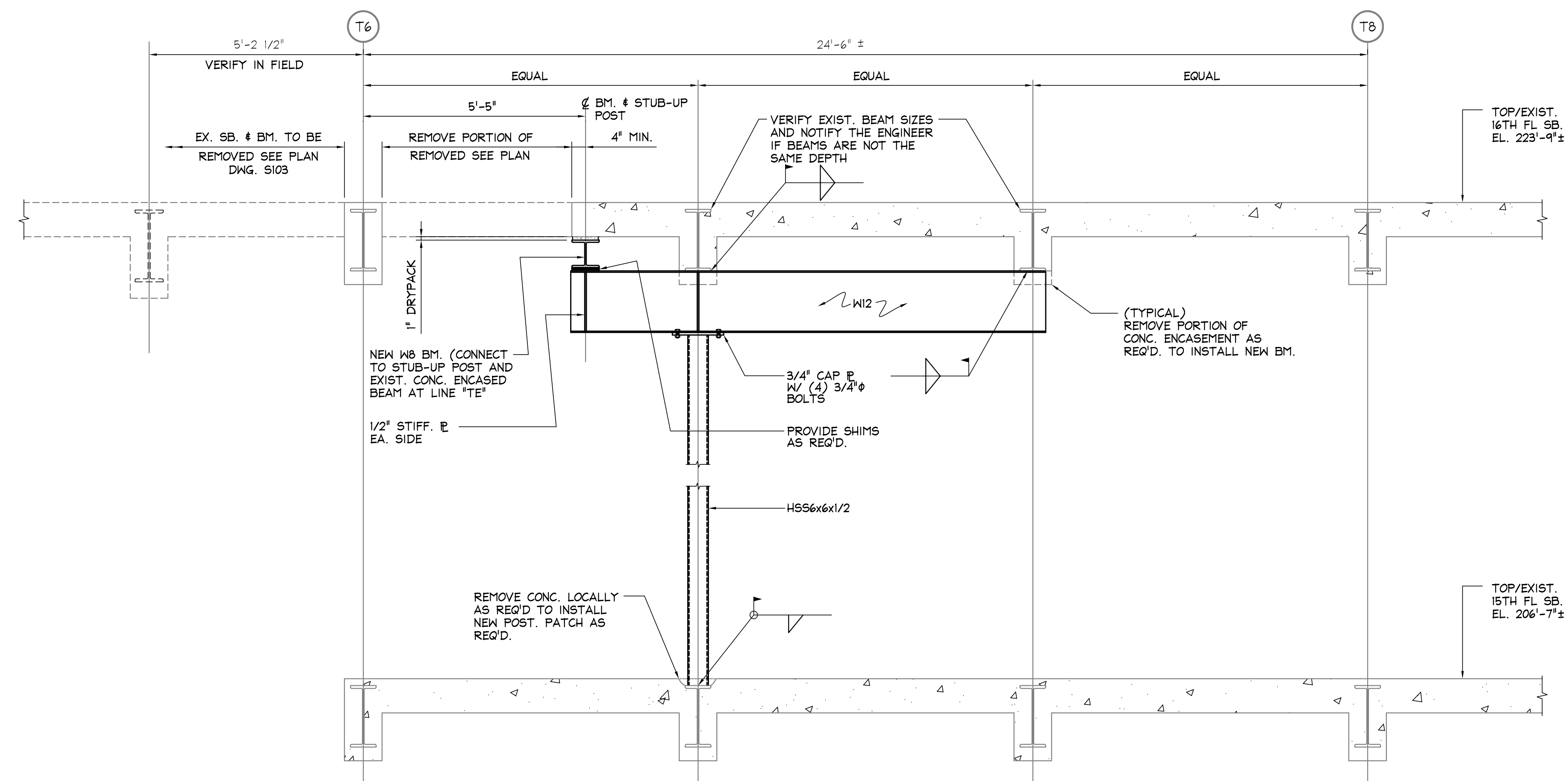
Section 2
SCALE: 3/4"=1'-0" S105



Section 3
SCALE: 3/4"=1'-0" S105



Section 4
SCALE: 3/4"=1'-0" S105



Section 5
SCALE: 1/2"=1'-0" S105

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STRUCTURAL ENGINEERS
160 ROUTE 22 WEST
2ND FLOOR
MOUNTAINSIDE, NJ 07092
TELEPHONE: (908) 379-2911
FAX: (201) 627-0251
Project No. 3823.0010.00
Paul Peter Panzarino, P.E.
N.J. Cert. No. 42798
Date:

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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1094 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.8008 FAX: 973.379.1051
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

SECTIONS

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
2-25-15	DD SET	JD	M1					AS SHOWN
10-30-15	95% CONST. DOC.	JD	M1					DRWN BY JPD
05-31-17	100% CD REVIEW	JD	M1					CHKD BY BJ
09-07-17	ISSUED FOR BID	JD	M1					JOB NO 2141151
								SHEET: 89 OF: 160
								DRWG NO

S.105

GENERAL HVAC NOTES:

- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE INTERNATIONAL MECHANICAL CODE (IMC), NEW JERSEY UNIFORM CONSTRUCTION CODE, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
- PROVIDE A COMPLETE OPERABLE SYSTEM INSTALLED IN A WORKMANLIKE MANNER. OUTLINE DESCRIPTION AND EQUIPMENT DOES NOT LIMIT CONTRACTOR'S LIABILITY FOR THE INSTALLATION OF A COMPLETE OPERABLE SYSTEM.
- CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
- CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
- CONTRACTOR SHALL NOT FASTEN ANY EQUIPMENT AND MATERIAL FROM ROOF DECKING. CONTRACTOR SHALL SUPPORT EQUIPMENT AND MATERIAL FROM BEAMS. IF NECESSARY, CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT STEEL ON METAL TO ATTACH TO BEAMS.
- FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
- THE WORK INDICATED ON THESE DRAWINGS IS DIAGRAMMATIC AND IS INTENDED TO SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND DESIGN INTENT. CONTRACTOR MAY MAKE FIELD CHANGES TO THE DESIGN DOCUMENTS ONLY WHEN REQUESTING AND RECEIVING APPROVAL FROM THE ENGINEER. CONTRACTOR FIELD CHANGES SHALL NOT RESULT IN ANY ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL WARRANT ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
- CONTRACTOR SHALL PROVIDE PROTECTION FOR THE OWNER AND CONSTRUCTION WORKERS IN AND AROUND THE CONSTRUCTION AREA. ADEQUATE BARRIERS SHALL BE PROVIDED TO EXPOSE CONTROL OF SAFE INGRESS AND EGRESS OF PREMISES. FIRE EXITS SHALL AT NO TIME BE BLOCKED.
- ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
- CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
- WHERE INFORMATION IN DIFFERENT PARTS OF THE CONTRACT DOCUMENTS ARE INTERPRETED BY THE CONTRACTOR TO BE DUPLICATED, THE CONTRACTOR SHALL OBTAIN A WRITTEN APPROVAL OF HIS INTERPRETATION FROM THE OWNER BEFORE DELETING THE SCOPE OR WORK HE INTERPRETS AS BEING A DUPLICATION. IN THE ABSENCE OF SUCH WRITTEN APPROVAL, THE CONTRACTOR SHALL NOT EXCLUDE ANY ITEM SHOWN IN DIFFERENT PARTS OF THE CONTRACT. FOR EITHER CONTRACTOR'S INTERPRETATION OF DUPLICATION OR CONTRADICTION AS INDICATED ABOVE, THE OWNER'S DETERMINATION SHALL BE FINAL AND SHALL NOT ENTITLE THE CONTRACTOR TO ANY ADDITIONAL COMPENSATION.
- DUCTS AND PIPES SHALL BE RUN AS HIGH AS POSSIBLE AND AS CLOSED AS POSSIBLE TO ALIGN FLOOR STRUCTURE TO MAINTAIN CEILING HEIGHTS SHOWN ON ARCHITECTURAL. EQUIPMENT SIZE IS BASED ON INFORMATION FROM THE SCHEDULE. CONTRACTOR SHALL VERIFY ACTUAL EQUIPMENT SIZES BASED ON APPROVED SHOP DRAWINGS BEFORE COORDINATING PENETRATIONS AND CONCRETE EQUIPMENT PADS.
- PROVIDE DUCT TRANSITION TO MATCH HVAC EQUIPMENT ACTUAL OPENINGS. DUCT TRANSITIONS SHALL BE FABRICATED WITH FLAT BOTTOMS UNLESS OTHERWISE NOTED.
- WHERE TRANSFER DUCTS ARE INDICATED ON THE DRAWINGS, GRILLES SHALL BE PROVIDED ON BOTH SIDES OF THE WALL.
- LOCATIONS OF ROOM THERMOSTATS/TEMPERATURE SENSOR ARE APPROXIMATE AND FINAL LOCATIONS SHALL BE COORDINATED WITH ENGINEER.
- ALL DUCTWORK, PIPING, CONDUITS, AND TUBING SHALL BE RUN CONCEALED IN FINISHED AREAS. COORDINATE LOCATIONS WITH GENERAL CONSTRUCTION. ALL RUNS SHALL BE APPROVED BY ENGINEER. ANY MODIFICATION REQUIRED BY ENGINEER DUE TO FIELD CONFLICTS SHALL BE DONE AT NO ADDITIONAL COST.
- PROVIDE VALVED AND CAPPED CONNECTIONS AT ALL LOW POINTS IN PIPING SYSTEMS REQUIRED FOR DRAINING SYSTEM.
- PROVIDE ALL AUTOMATIC OR MANUAL AIR VENTS AT ALL HIGH POINTS OF PIPING SYSTEM.
- CONTRACTOR SHALL PROVIDE ALL NECESSARY PIPING TO CONNECT ALL EQUIPMENT TO COMPLETE THE SYSTEM AS PER PLANS AND SPECIFICATIONS WITHOUT ANY ADDITIONAL COST TO THE OWNER.
- HVAC CONTRACTOR SHALL PROVIDE ALL CEILING DIFFUSERS, REGISTERS, AND GRILLES. FRAME TYPE TO MATCH CEILING CONSTRUCTION IN WHICH UNITS ARE TO BE INSTALLED.
- HVAC AND MECHANICAL SYSTEMS/SERVICES SHALL BE MAINTAINED FULLY OPERATIONAL IN AREAS/SPACES OF AREA OF WORK DURING CONSTRUCTION.
- DUCTWORK SHALL BE FABRICATED IN ACCORDANCE WITH SMACNA AND ASHRAE'S LATEST EDITION AS NECESSARY TO MEET THE PERFORMANCE REQUIREMENTS OF THE DESIGN. ALL DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS. WHERE INTERNAL LINING OCCURS, INCREASE DUCT SIZES ACCORDINGLY BY THE LINING THICKNESS. ALL DUCTS SHALL BE ASSEMBLED WITH A GASKETED FLANGED SYSTEM SUCH AS DUCT MATE.
- WHEN HVAC SYSTEMS ARE COMPLETELY INSTALLED AND OPERATIONAL, CONTRACTOR SHALL PROVIDE AIR AND WATER SIDE BALANCING IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. CONTRACTOR SHALL SUBMIT A REPORT TO THE ENGINEER FOR APPROVAL. ADJUSTMENTS AND MODIFICATIONS TO EQUIPMENT TO ACHIEVE DESIGN QUANTITIES SHALL BE MADE AT NO COST TO THE OWNER.
- FOR EXACT LOCATION AND MOUNTING HEIGHT OF CEILING DIFFUSERS REFER TO ARCHITECTURAL REFLECTED CEILING PLANS.

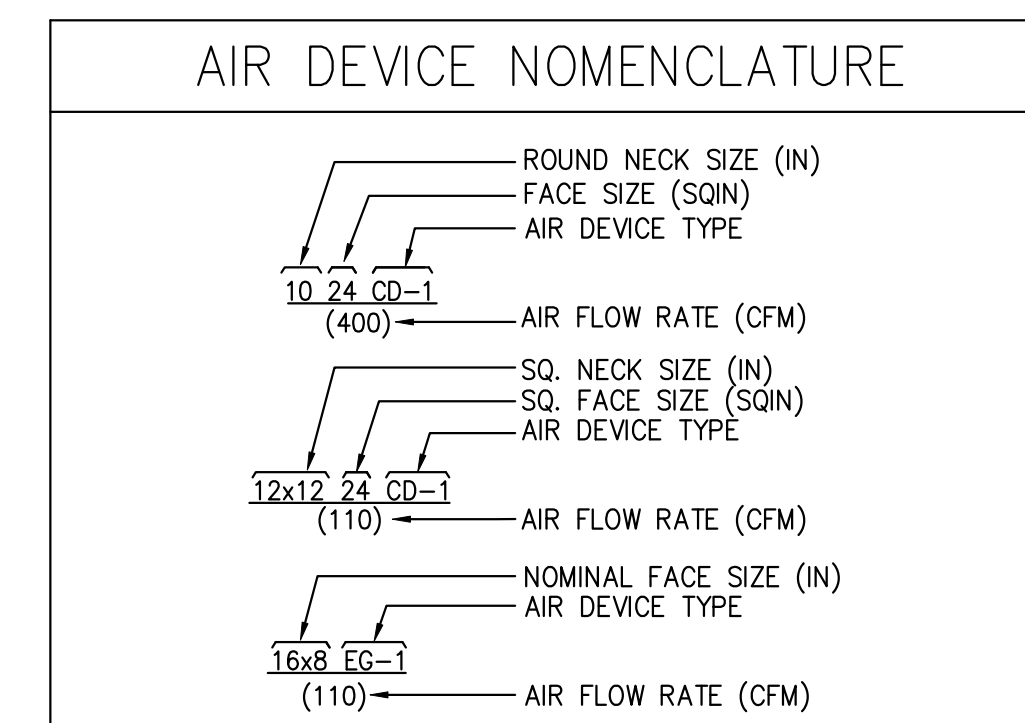
HVAC DEMOLITION GENERAL NOTES:

- CONTRACTOR SHALL REMOVE ALL EXISTING HVAC SYSTEMS, DUCTWORK, DIFFUSERS, PIPING, CONTROL SYSTEMS, AND SUPPORTS ON THE PROJECT AS INDICATED. ALL DEMOLISHED EQUIPMENT SHALL BE REMOVED OFFSITE AND DISPOSED OF IN A SAFE AND LAWFUL MANNER.
- CONTRACTOR SHALL VISIT THE SITE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AS WELL AS THE MEANS AND METHODS OF THE WORK. FAILURE TO DO SO WILL NOT QUALIFY FOR LATER CLAIMS DUE TO THE SCOPE OF WORK REQUIRED.
- PROTECT ALL EXISTING SPACES AND SURFACES WHILE PERFORMING THE CONTRACT SCOPE OF WORK. CONTRACTOR SHALL PATCH, PAINT, AND REPAIR ANY EXISTING OR NEW SURFACES DAMAGED DURING THE COURSE OF WORK TO THE EXISTING CONDITIONS OR BETTER.
- CONTRACTOR SHALL CAP EXISTING PIPES AND DUCTS NOT TO BE DEMOLISHED FLUSH WITH EXISTING SURFACES. SEAL OPENING AIR TIGHT.
- COORDINATE ALL DEMOLITION WORK WITH THE GENERAL CONTRACTOR OR OWNER'S REPRESENTATIVE BEFORE PROCEEDING WITH WORK.

MECHANICAL DUCT SYMBOLS		
SINGLE LINE DUCTWORK	DOUBLE LINE DUCTWORK	DESCRIPTION
		SUPPLY AIR
		SUPPLY AIR DUCT OR FRESH AIR DUCT
		RETURN AIR DUCT OR EXHAUST AIR DUCT
		SUPPLY DUCT UP
		RETURN DUCT UP
		RETURN DOWN
		LINEAR DIFFUSER
		CEILING DIFFUSER
		CEILING GRILLE
		CEILING DIFFUSERS MOUNTED ON BOTTOM OF DUCT
		SUPPLY TOP REGISTER OR GRILLE
		EXHAUST OR RETURN TOP REGISTER OR GRILLE
		EXHAUST CEILING REGISTER OR GRILLE
		EXHAUST FAN
		NEW DUCT - WIDTH x DEPTH
		FLEXIBLE CONNECTION
		INCLINED RISE, IN DIRECTION OF AIR FLOW
		INCLINED DROP, IN DIRECTION OF AIR FLOW
		FLEXIBLE DUCTWORK
		FLEXIBLE CONNECTION
		VOLUME DAMPER
		FIRE DAMPER
		MOTORIZED DAMPER
		VANED ELBOW, PROVIDE ALL ELBOWS WITH VANES EVEN IF SYMBOL MISSING
		VANED ELBOW (SHORT RADIUS)
		STANDARD RADIUS ELBOW
		SPLITTER DAMPER
		TAKE OFF COLLAR
		LOUVERED DOOR
		REDUCER
		DUCT SMOKE DETECTOR
		TEMPERATURE SENSOR (STRAP ON)
		TEMPERATURE SENSOR (WELL)
		FLOW SWITCH
		AQUASTAT
		SPACE TEMPERATURE SENSOR
		SPACE THERMOSTAT

PIPING SYMBOLS	
PIPING/VALVES	DESCRIPTION
	TOP CONNECTION, 45° OR 90°
	BOTTOM CONNECTION, 45° OR 90°
	SIDE CONNECTION
	TOP CONNECTION CAPPED
	PIPE UP RISE
	PIPE UP @ END
	PIPE DOWN @ END
	PIPE CAP
	NAME INDICATES PIPE'S SERVICE
	DIRECTION OF FLOW
	STRAINER
	STRAINER WITH BLOW DOWN
	ISOLATION VALVE
	BALL VALVE
	BUTTERFLY VALVE
	DRAIN VALVE
	BACKFLOW PREVENTER
	STRAINER WITH SHUT OFF VALVE & HOSE COUPLING
	GATE VALVE
	GLOBE VALVE
	CHECK VALVE
	CONTROL VALVE
	ANGLE VALVE
	AUTOMATIC AIR VENT PIPED TO NEAREST DRAIN
	MOTOR OPERATED VALVE
	SOLENOID VALVE
	PRESSURE REDUCING VALVE
	CIRCUIT SETTER
	BALANCING VALVE
	TRIPLE DUTY VALVE
	VALVE WITH PNEUMATIC OPERATOR
	THERMOMETER
	PRESSURE GAUGE
	GAUGE WITH PETCOCK
	RELIEF VALVE WITH DISCHARGE TO NEAREST FLR DR
	SCREWED UNION
	FLANGED UNION
	FLEXIBLE CONNECTOR
	SENSOR OR SWITCH FOR MONITOR OR CONTROL
	FINNED-TUBE RADIATION
	FINNED-TUBE RADIATION - TYPE A
	EFFECTIVE HEATING ELEMENT LENGTH LINEAR FEET
	BREAK
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	HOSE BIBB
	FLOW METER
	VACUUM BREAKER
	AUTO AIR VENT
	BACK FLOW PREVENTER
	SIGHT GLASS
	STEAM TRAP
	STEAM, WATER OR REFRIGERANT COIL
	PIPE ANCHOR

GENERAL SYMBOLS	
	DESCRIPTION
	CENTER LINE
	EXISTING CONSTRUCTION & EQUIPMENT
	EXISTING TO BE REMOVED
	NEW WORK
	CONTINUED
	END CAP
	CONNECT TO EXISTING
	DISCONNECT FROM EXISTING
	PIPE PITCH
	DIRECTION OF FLOW
	PIPE BREAK DOUBLE LINE
	WORK NOTE
	REVISION CLOUD (AREA OF CHANGE)
	REVISION NUMBER
	SECTION CUT
	SECTION LINE
	DRAWING/DETAIL TITLE
	ROOM NAME/NUMBER
	BREAK LINE



GENERAL ABBREVIATIONS	
SYMBOLS	DESCRIPTION
AC	AIR CONDITIONING
AD	ACCESS DOOR
AF	AIR FILTER
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AL	ACOUSTICAL LINING
BD	BLOW DOWN
BI	BLACK IRON
BS	BIRD SCREEN
BSA	BOARD OF STANDARDS AND APPEAL
BG	BOTTOM GRILLE
BHP	BRAKE HORSE POWER
BWF	BOILER WATER FEED
BR	BOTTOM REGISTER
CA	COMPRESSED AIR
CC	COOLING COIL
CD	CEILING DIFFUSER
CF	CHEMICAL FEED
CG	CEILING GRILLE
CHWP/CWS	STANDBY
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CR	CEILING REGISTER
CO	CLEAN OUT
COND	CONDENSATE DRAIN LINE (GRAVITY)
CUH	CABINET UNIT HEATER
CV	CONVECTOR
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
D	DRAIN
DD	DRUM DIFFUSER
DX	DIRECT EXPANSION
DB	DRY BULB TEMPERATURE, °F
EA	EXHAUST AIR
EDH	ELECTRIC COIL DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
ESP	EXTERNAL STATIC PRESSURE
EXIST	EXISTING
FL	FLOOR
FACP	FIRE ALARM CONTROL PANEL
FC	FLEXIBLE CONNECTION
FD	FIRE DAMPER AND ACCESS DOOR
FAI OR OAI	FRESH AIR INTAKE OR OUTSIDE AIR INTAKE
FA	FREE AREA SQUARE FEET
FLA	FULL LOAD AMPS
FPM	FEET PER MINUTE
FRP	FIBERGLASS REINFORCED PLASTIC
FTR	FIN TUBE RADIATION
GPM	GALLONS PER MINUTE
HC	HEATING COIL
HOA	HAND/OFF/AUTO SWITCH
HP	HORSE POWER
HPS	HIGH PRESSURE STEAM (81+PSI)
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HZ	HERTZ
KX	KITCHEN EXHAUST FAN
LD	LINEAR DIFFUSER
LID	LOUVER IN DOOR
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM (0-20 PSI)
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MFS	MAXIMUM FUSE SIZE
MIN	MINIMUM
MER	MECHANICAL EQUIPMENT ROOM
MPS	MEDIUM PRESSURE STEAM (21-80 PSI)
MUA	MAKE UP AIR
NOM	NOMINAL
NC	NOT IN CONTRACT
NTS	NOT TO SCALE
NK	NECK
OA	OUTSIDE AIR
OAD	OUTSIDE AIR DAMPER
OV	OUTLET VELOCITY
PC	PUMPED CONDENSATE
PD	PRESSURE DROP
PDL	PUMP DISCHARGE LINE
PF	PRE-FILTER
PH	PHASE
RA	RETURN AIR
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SP	STATIC PRESSURE
SF	SUPPLY FAN
ST/ST	STAINLESS STEEL
TG	TOP GRILLE
TR	TOP REGISTER
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
TX	TOILET EXHAUST
UH	UNIT HEATER
VD	VOLUME DAMPER
V	VENT
WB	WET BULB TEMPERATURE, °F
WC	WATER COLUMN GAUGE (INCH)
WMS	WIRE MESH SCREEN
W/	WITH

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NJ License No. AI 12118

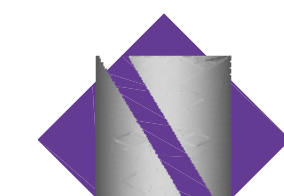
MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



ASSOCIATED TECHNOLOGY INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.378.0081 FAX: 973.378.1081
WWW.ATIARCHITECTS.COM
CERTIFICATE OF AUTHORIZATION AC-438

JOSEPH J. HENDERSON, PE
NJ License No. 36087



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.378.0081 FAX: 973.378.1081
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL
GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY JBH
10.30.15	95% SUBMISSION	KD	FM						CHKD BY RJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

M.101

STAIRWELL PRESSURIZATION FAN SCHEDULE														
UNIT NO.	MANUFACTURER	MODEL	LOCATION	AREA SERVED	TYPE	CFM	SP (IN. WG)	FAN RPM	ELECTRICAL				WEIGHT (LBS)	NOTES
									VOLTS	PHASE	HERTZ	MOTOR HP		
SF-1	GREENHECK	TBI-FS-4L24-75	16TH FL MECH ROOM	STAIRWELL T1	AXIAL	9600	1.5	1962	460	3	60	7.5	375	1
SF-2	GREENHECK	TBI-FS-4L24-75	16TH FL MECH ROOM	STAIRWELL T2	AXIAL	9600	1.5	1962	460	3	60	7.5	375	1

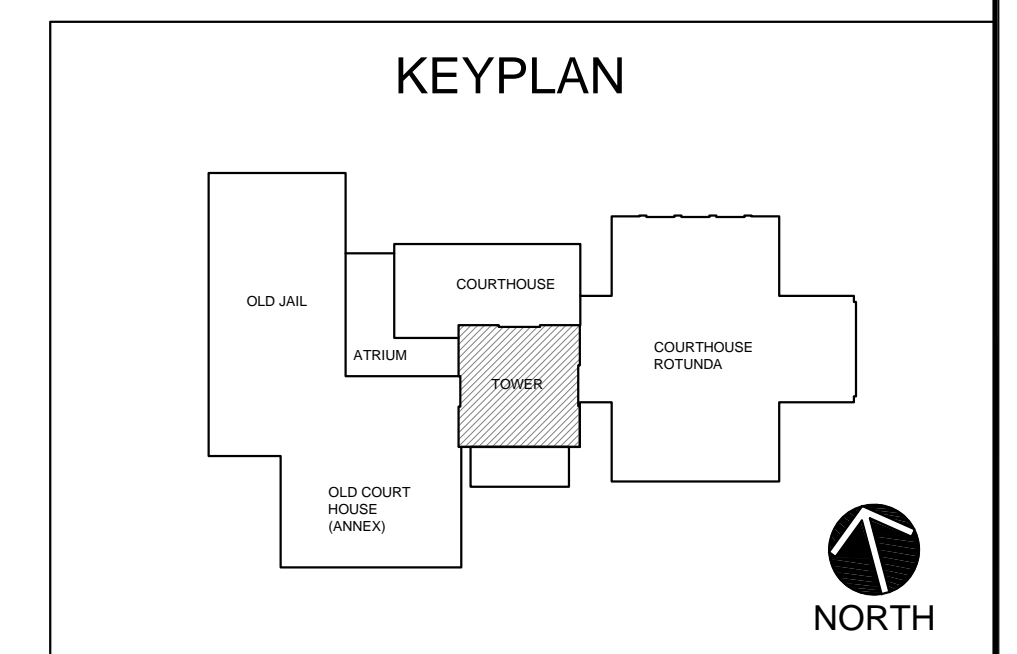
NOTES:
1. FAN TO BE PROVIDED WITH HANGING RODS W/ ISOLATORS, MOUNTING SUPPORT, BELT GUARDS, VFD DRIVE WITH FIRE ALARM INPUT.

AIR DEVICE SCHEDULE							
DESIGNATION	TYPE	MANUFACTURER	MODEL	FINISH	MOUNTING	MATERIAL	NOTES
CD-1	CEILING DIFFUSEER	TITUS	TMS	WHITE	LAY-IN	STEEL	1
SR-1	SUPPLY GRILLE	TITUS	301RL	WHITE	WALL	STEEL	3
RG-1	RETURN GRILLE	TITUS	355RL	WHITE	LAY-IN	STEEL	2
RG-2	RETURN GRILLE	TITUS	355RL	WHITE	WALL	STEEL	2
EG-1	EXHAUST GRILLE	TITUS	355FL	WHITE	LAY-IN	ALUMINUM	2

NOTES:
1. PROVIDE WITH R-6 INSULATION BLANKET.
2. 3/8" DEFLECTION, 1/2" BLADE SPACING.
3. PROVIDE WITH OPPOSED BLADE DAMPERS.

EXISTING VAV BOX SCHEDULE					
UNIT NO	SIZE	CFM	MIN CFM	HEATING COIL GPM	NOTES
VAV-6-3	12	700	300	1.5	1
VAV-7-4	8	700	300	1.5	1
VAV-7-5	8	700	300	1.5	1
VAV-9-1	12	800	250	1.0	1
VAV-9-2	12	1250	400	2.0	1
VAV-10-1	12	750	300	1.5	1
VAV-11-3	12	1050	350	1.5	1
VAV-12-2	8	750	300	1.5	1
VAV-12-6	8	400	150	1.0	1
VAV-13-2	10	900	300	1.5	1
VAV-14-2	10	900	300	1.5	1
VAV-15-3	8	575	200	1.0	1
VAV-15-5	10	800	250	1.0	1
VAV-16-3	10	800	250	1.0	1

NOTES:
1. EXISTING VAV BOX SHALL BE RE-BALANCED TO CFM AND HOT WATER GPM SHOWN ON THIS SCHEDULE.



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NJ License No. AI 14394



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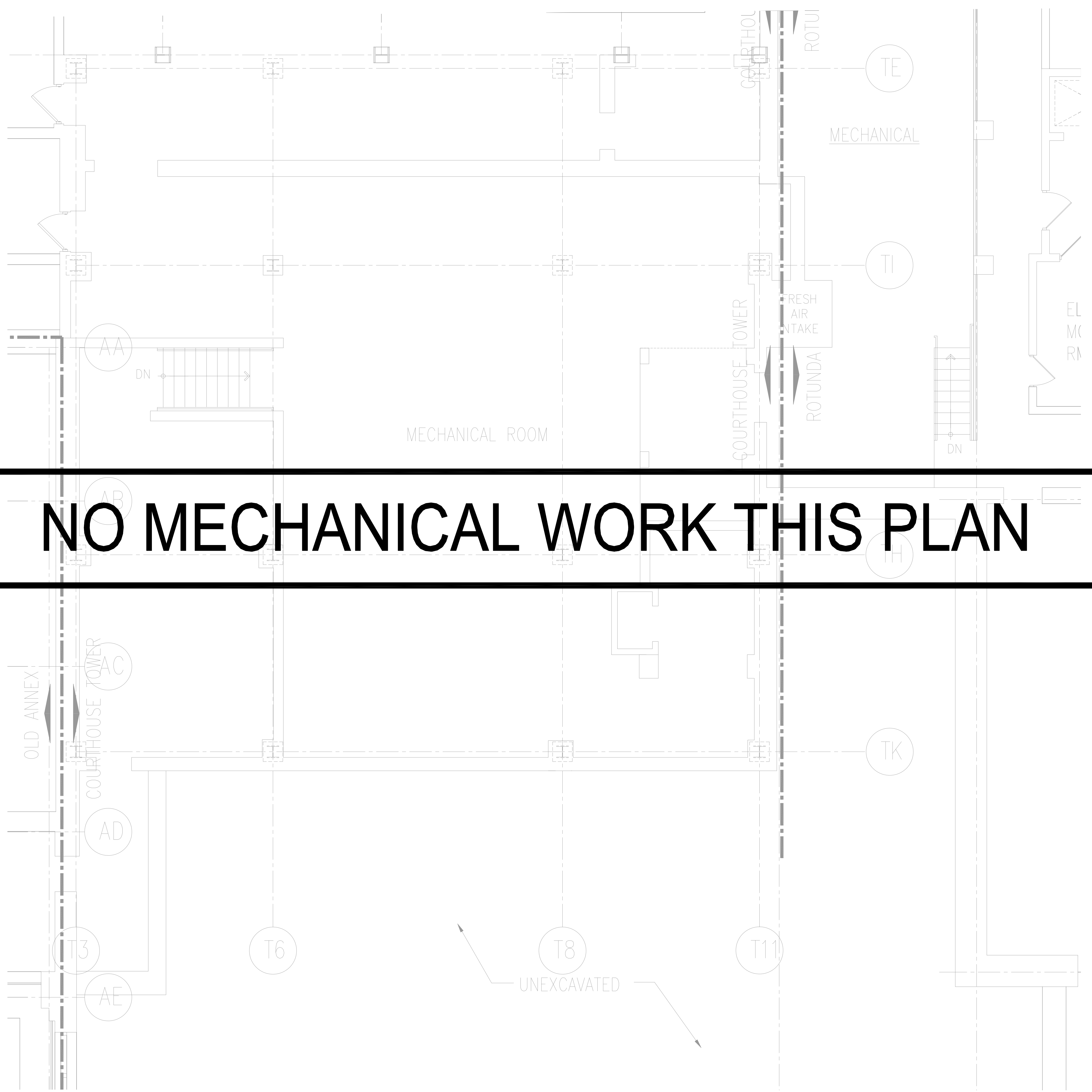
UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

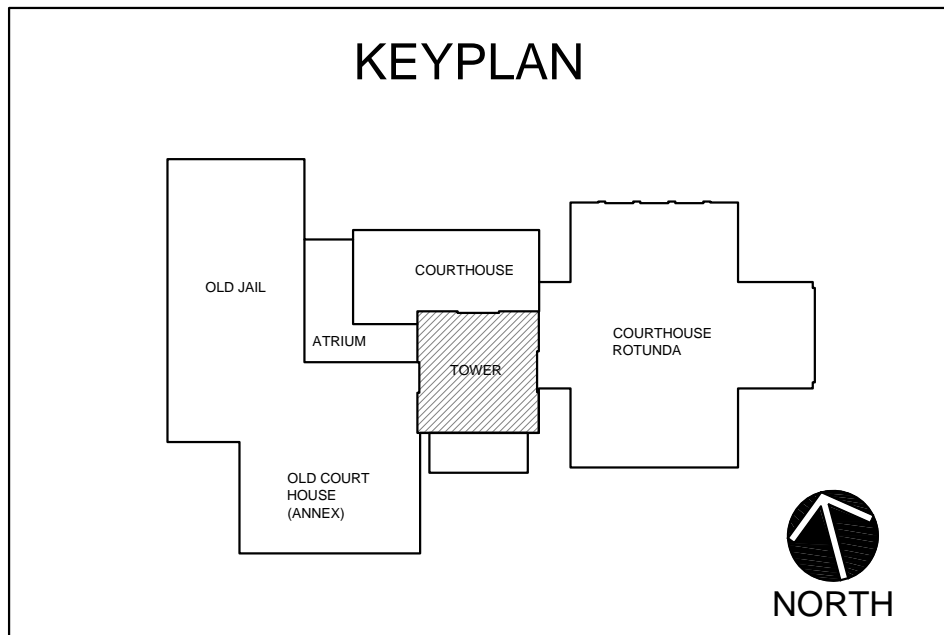
MECHANICAL - SCHEDULES

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	RB
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	JJH
09.07.17	ISSUED FOR BID	KD	FM					JOB NO	2141151
								SHEET:	_ OF:
								DWG NO	

M.201



NO MECHANICAL WORK THIS PLAN



DRAWING NOTES:
 1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.

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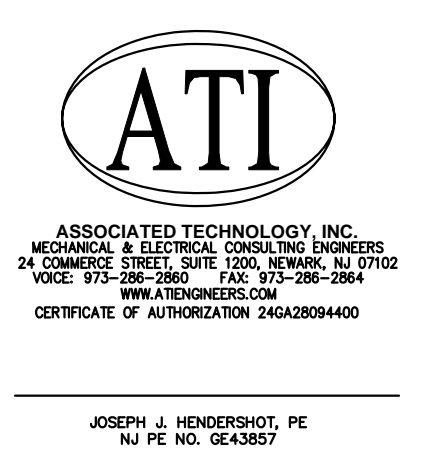
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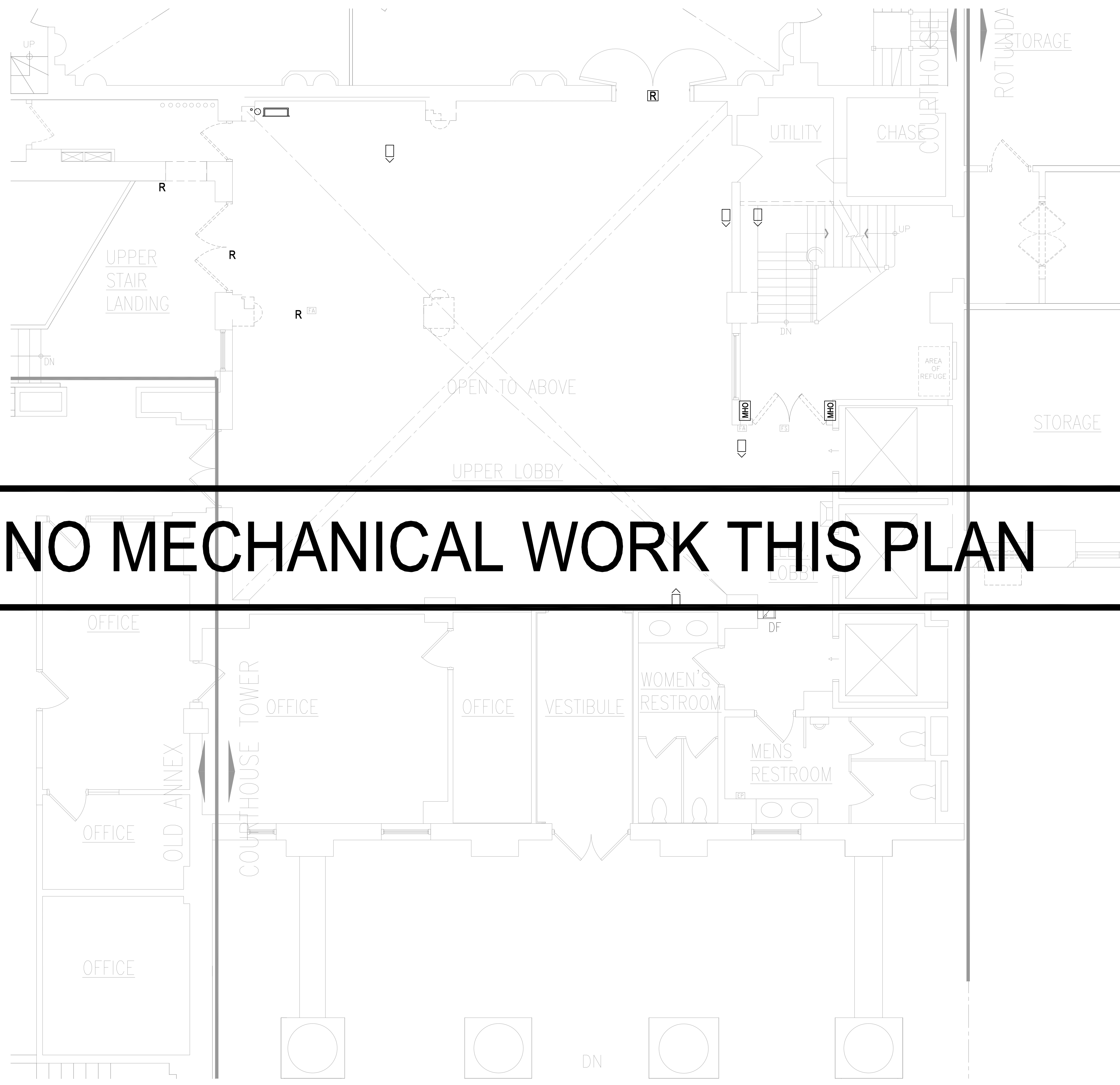


PROJECT:
**UC COURTHOUSE
 INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - DEMOLITION PLAN
 BASEMENT FLOOR**

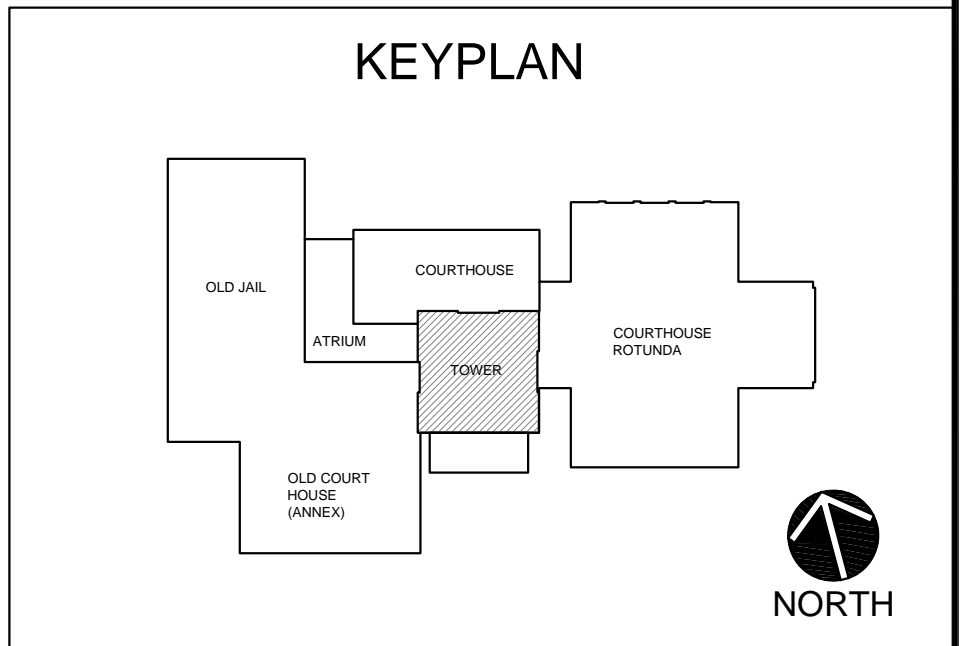
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								SHEET:	_ OF:
								DWG NO	

DM.400B



NO MECHANICAL WORK THIS PLAN

FIRST FLOOR — DEMOLITION PLAN
SCALE: 1/4"=1'-0"



DRAWING NOTES:
1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.

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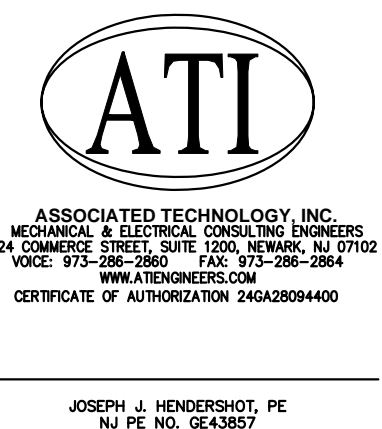
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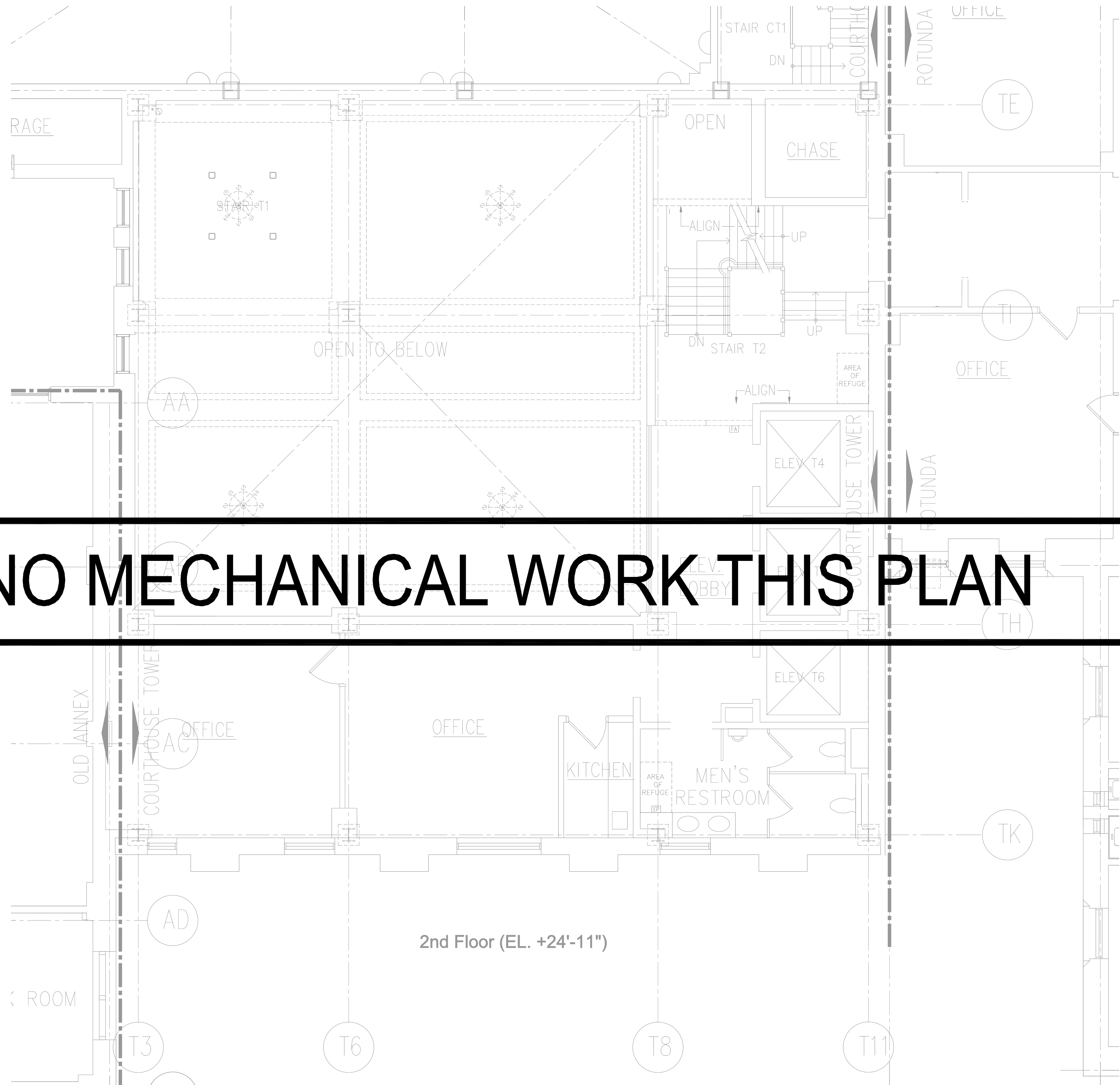
PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - DEMOLITION PLAN
FIRST FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

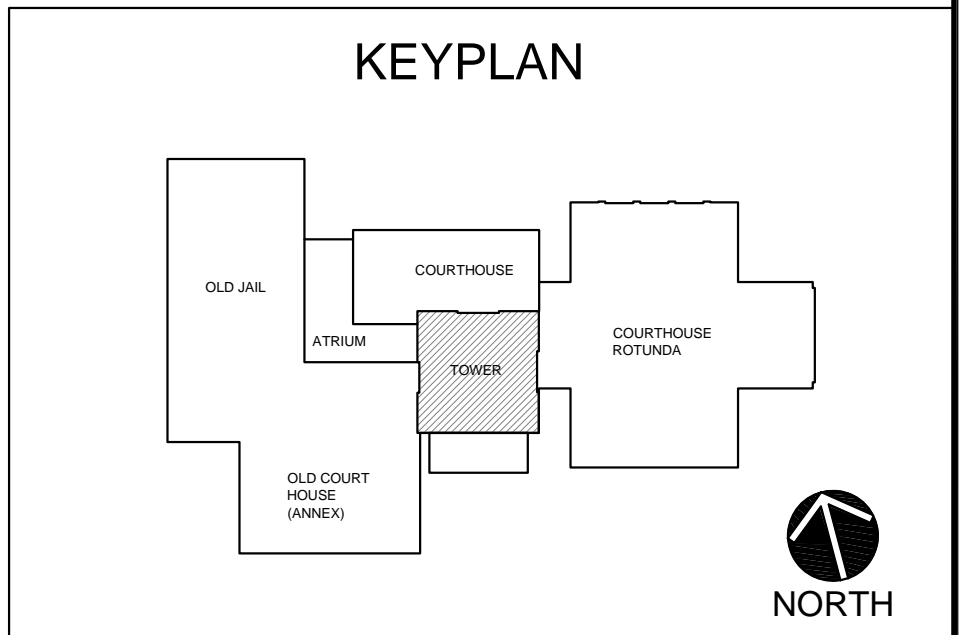
DM.401

NO MECHANICAL WORK THIS PLAN



2nd Floor (EL. +24'-11")

SECOND FLOOR - DEMOLITION PLAN
SCALE: 1/4"=1'-0"



DRAWING NOTES:
1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.

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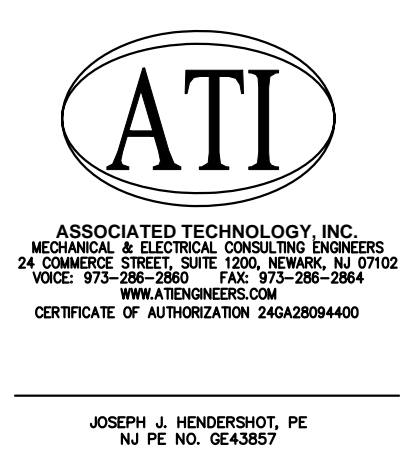
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MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

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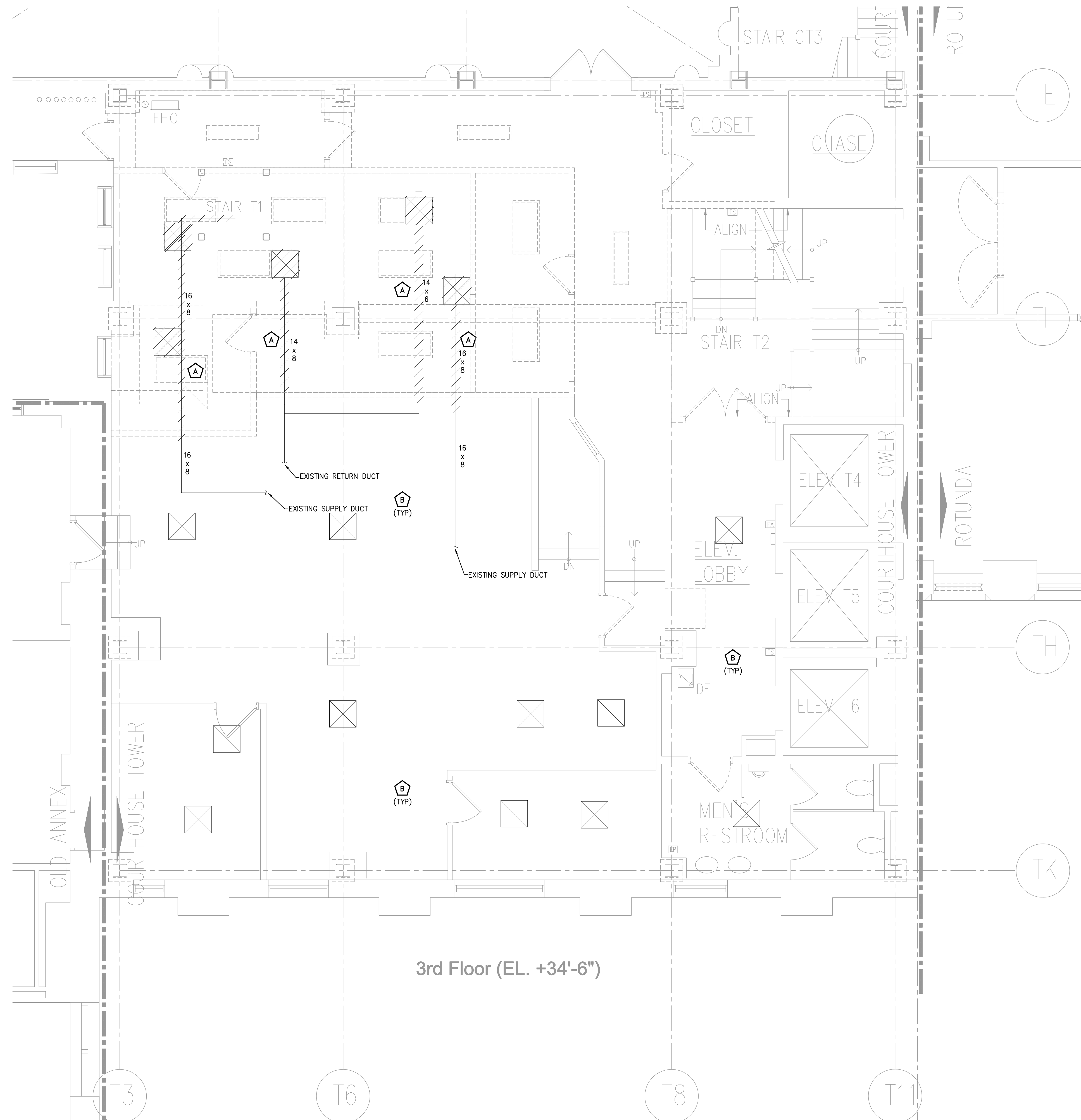


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - DEMOLITION PLAN
SECOND FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

DM.402



3rd Floor (EL. +34'-6")

THIRD FLOOR - DEMOLITION PLAN

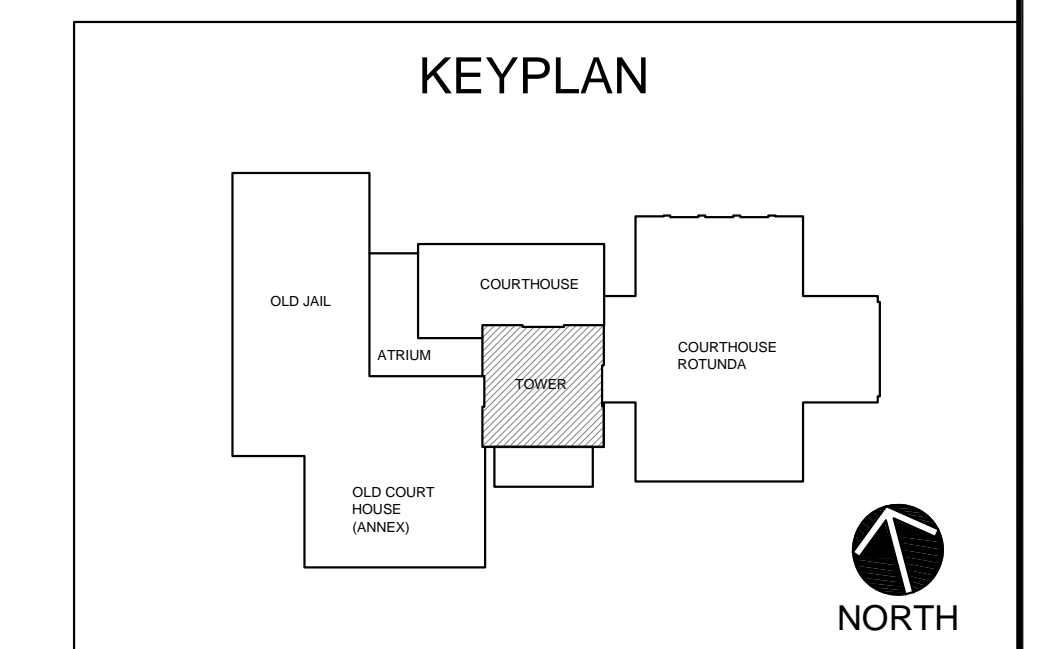
SCALE: 1/4"=1'-0"

KEYED DEMOLITION WORK NOTES:

- A** REMOVE EXISTING SUPPLY AND RETURN DUCTWORK BRANCH ALONG WITH AIR DEVICES MARKED FOR REMOVAL. CAP BRANCH DUCT AS SHOWN ON DRAWING.
- B** CONTRACTOR SHALL PERFORM A PRE-CONSTRUCTION BALANCE OF THE EXISTING AIR SYSTEM AND DEVICES. AFTER INSTALLATION/COMMISSIONING OF RELOCATED VAV BOXES AND NEW/RELOCATED AIR DEVICES, CONTRACTOR SHALL RE-BALANCE EXISTING SYSTEM TO THE PRE-EXISTING CONDITIONS.

DRAWING NOTES:

1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.



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NJ License No. AI 16160
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PROJECT:

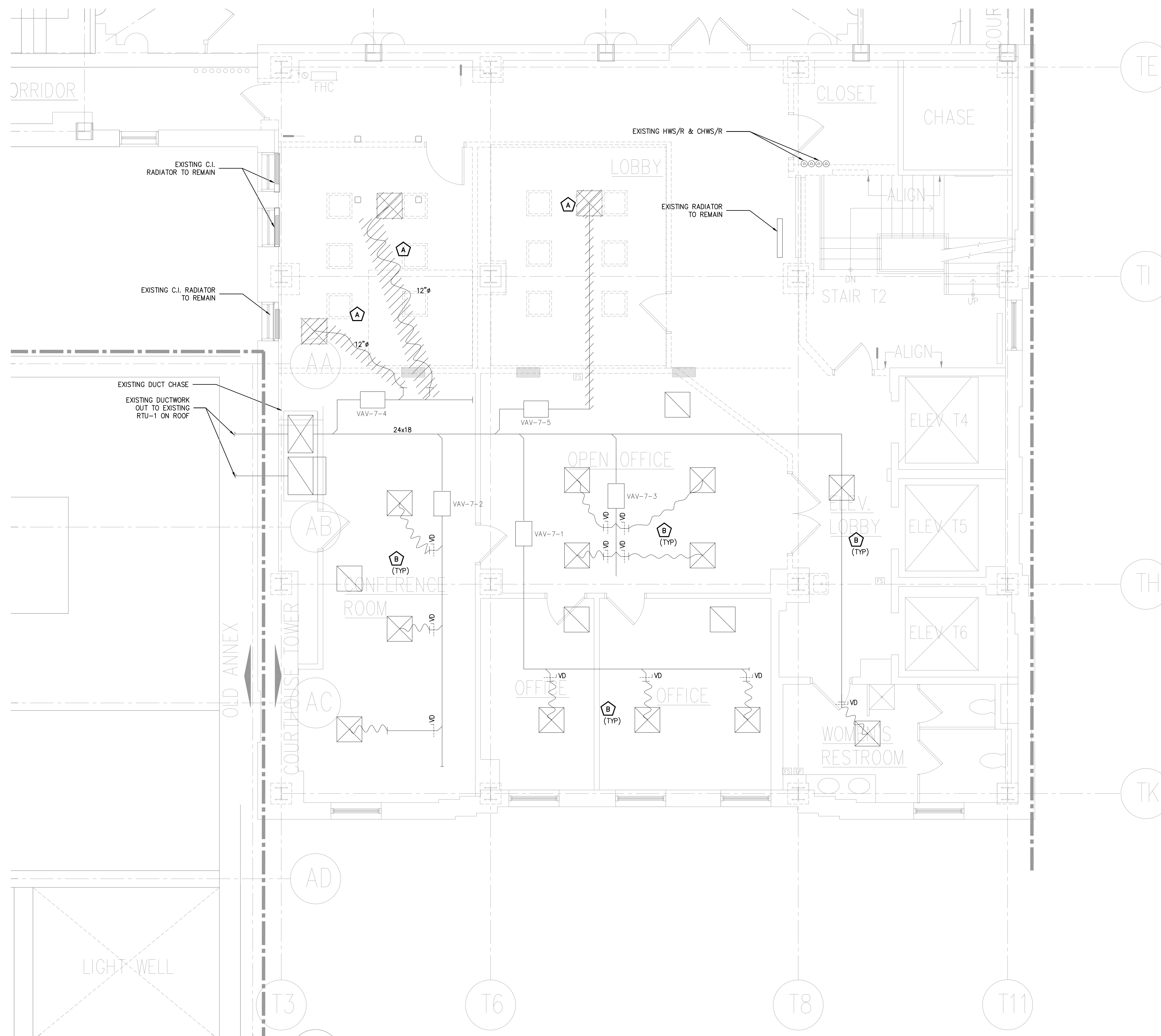
UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL - DEMOLITION PLAN
THIRD FLOOR

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

DM.403



KEYED DEMOLITION WORK NOTES:

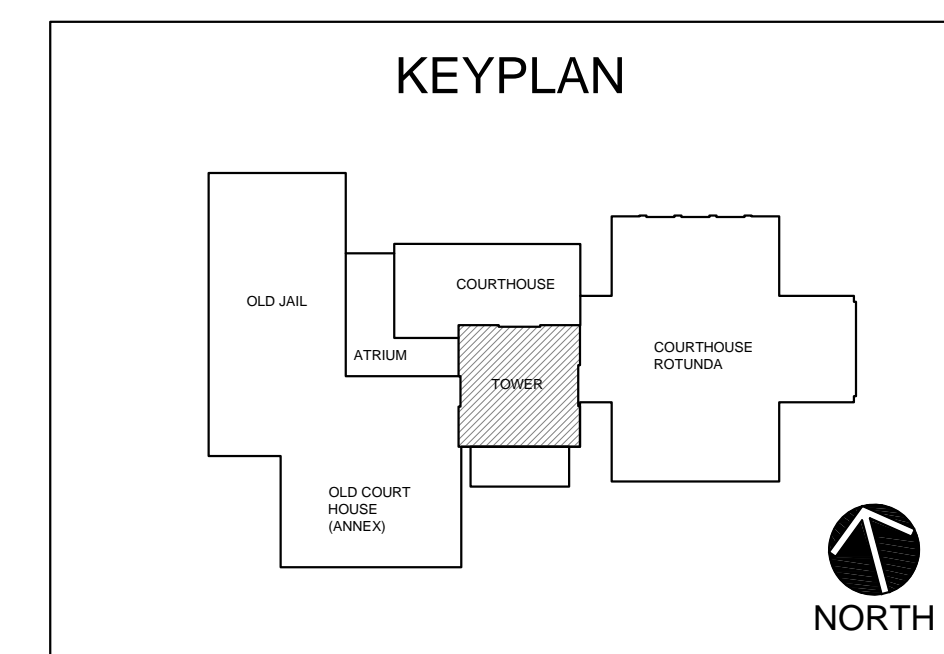
- A** REMOVE DUCTWORK AND ASSOCIATED AIR DEVICE.
- B** CONTRACTOR SHALL PERFORM A PRE-CONSTRUCTION BALANCE OF THE EXISTING AIR SYSTEM AND DEVICES. AFTER INSTALLATION/COMMISSIONING OF RELOCATED VAV BOXES AND NEW/RELOCATED AIR DEVICES, CONTRACTOR SHALL RE-BALANCE EXISTING SYSTEM TO THE PRE-EXISTING CONDITIONS.

DRAWING NOTES:

1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.

SEVENTH FLOOR - DEMOLITION PLAN

SCALE: 1/8"=1'-0"



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PROJECT:

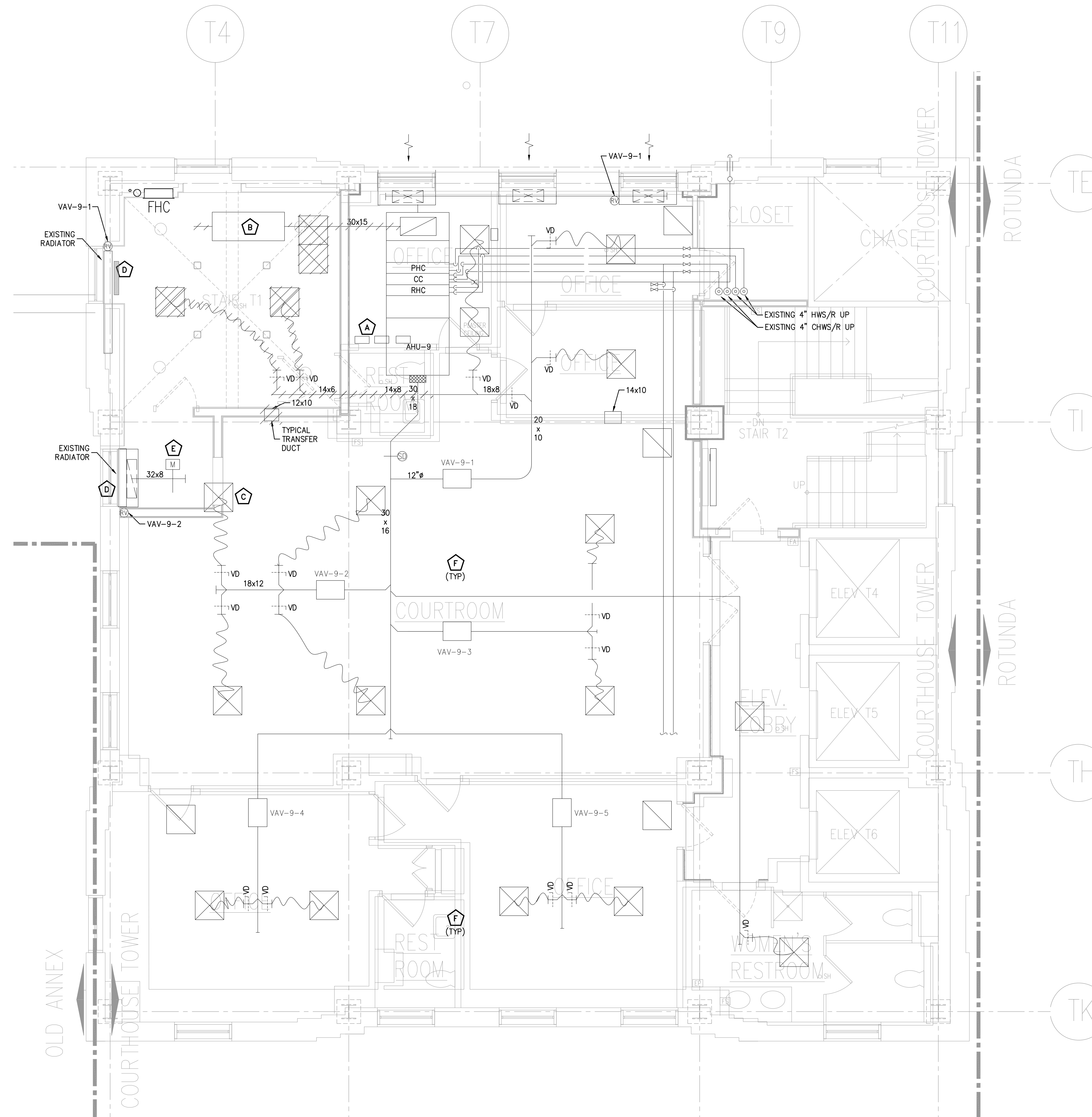
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**MECHANICAL - DEMOLITION PLAN
SEVENTH FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
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									DWG NO

DM.407



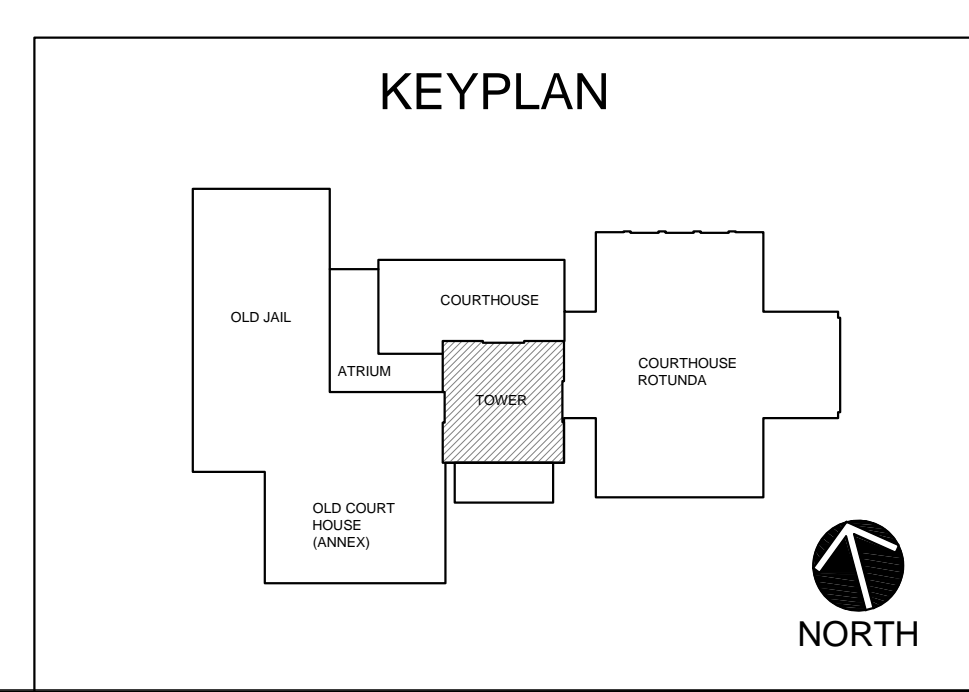
NINTH FLOOR – DEMOLITION PLAN
SCALE: 1/4"=1'-0"

KEYED DEMOLITION WORK NOTES:

- A** EXISTING CONTROL PANELS SHALL BE RELOCATED IN SAME ROOM TO ACCOMMODATE NEW ARCHITECTURAL LAYOUT. SEE NEW WORK PLANS.
- B** EXISTING DUCT SILENCER SHALL BE RELOCATED. SEE NEW WORK PLANS.
- C** EXISTING CEILING AIR DEVICE SHALL BE RELOCATED. REFER TO NEW WORK PLANS.
- D** EXISTING RADIATOR TO REMAIN. REMOVE CONTROL WIRING FROM RADIATOR TO LOCAL VAV BOX. RADIATOR TO RECEIVE NEW INDEPENDENT CONTROL VALVE. SEE NEW WORK PLANS.
- E** EXISTING MOTORIZED DAMPER TO BE RELOCATED. SEE NEW WORK PLANS. REPAIR DUCT AS REQUIRED.
- F** CONTRACTOR SHALL PERFORM A PRE-CONSTRUCTION BALANCE OF THE EXISTING AIR SYSTEM AND DEVICES. AFTER INSTALLATION/COMMISSIONING OF RELOCATED VAV BOXES AND NEW/RELOCATED AIR DEVICES, CONTRACTOR SHALL RE-BALANCE EXISTING SYSTEM TO THE PRE-EXISTING CONDITIONS.

DRAWING NOTES:

1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.



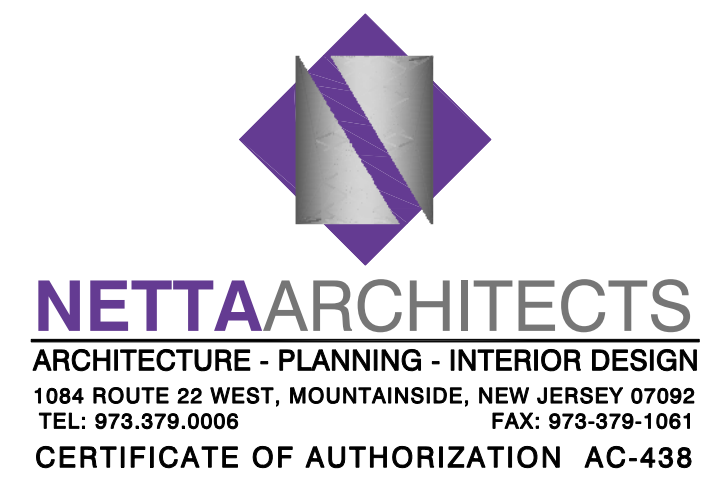
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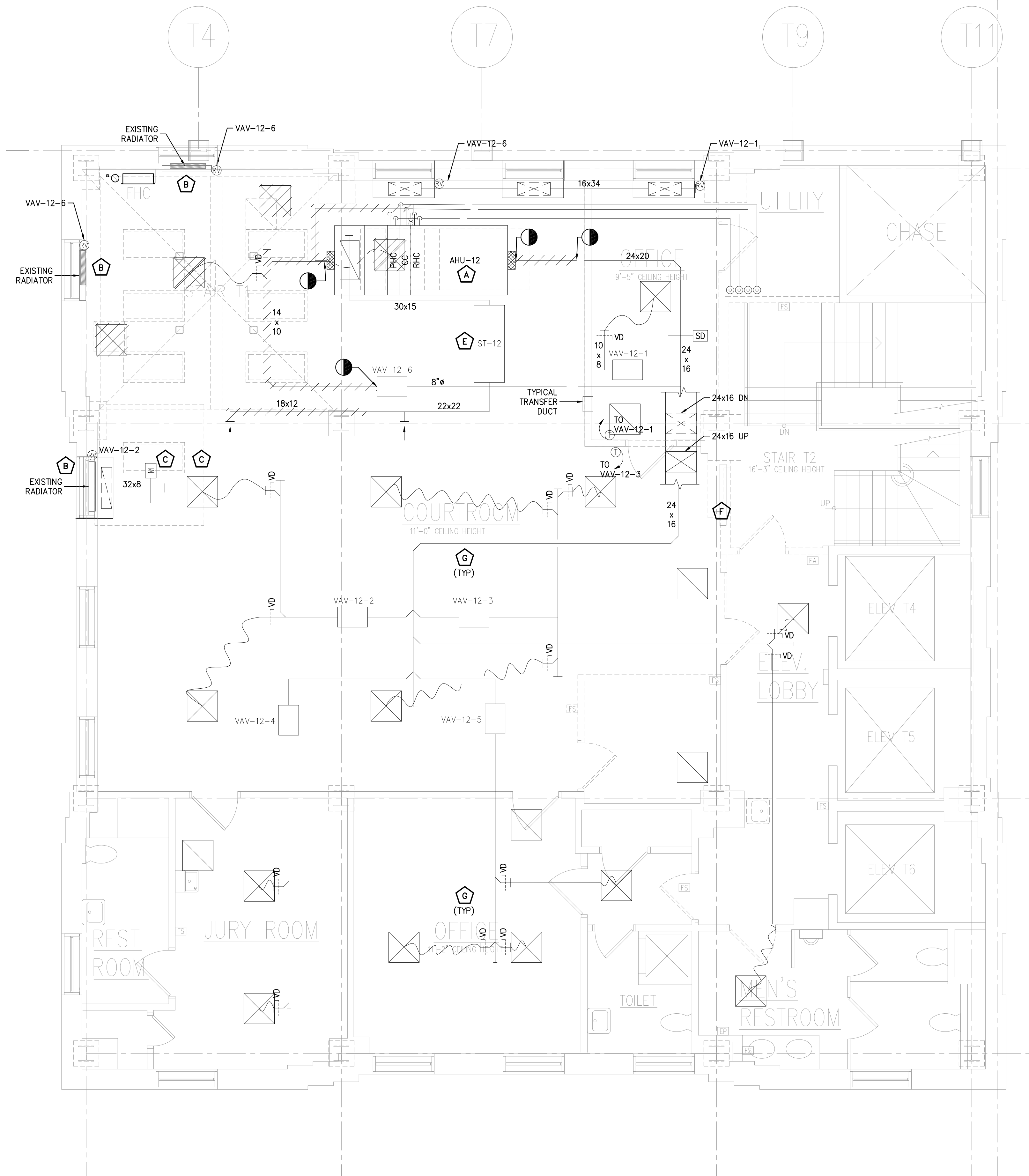


PROJECT:
**UC COURTHOUSE
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2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - DEMOLITION PLAN
NINTH FLOOR**

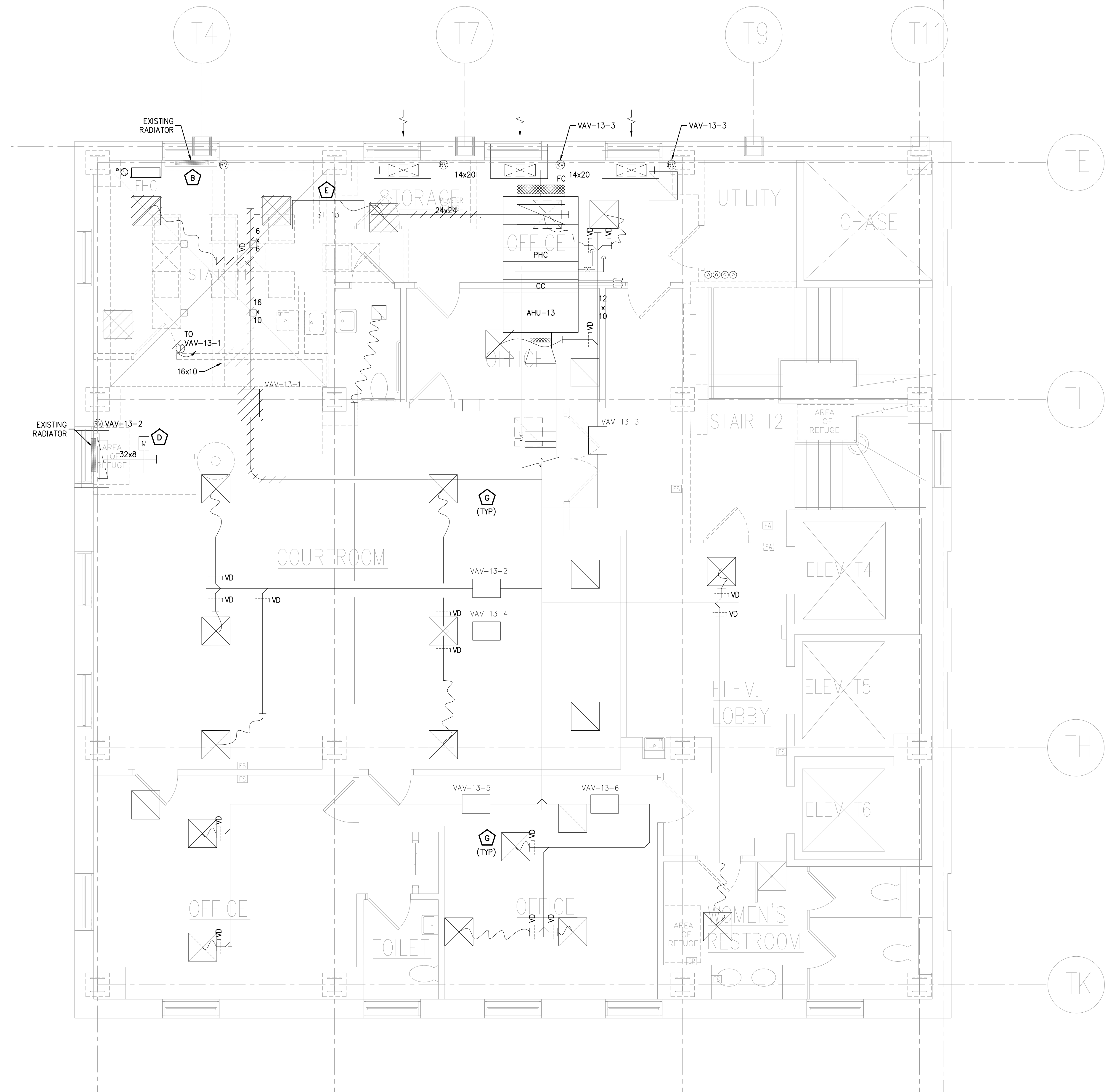
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DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

DM.409



TWELFTH FLOOR - DEMOLITION PLAN

SCALE: 1/4"=1'-0"



THIRTEENTH FLOOR - DEMOLITION PLAN

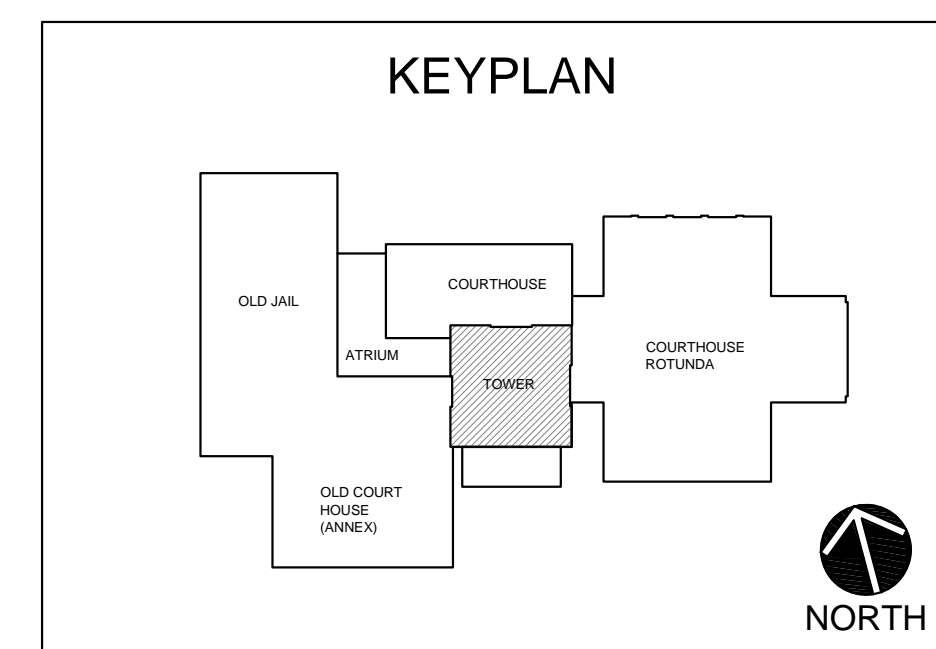
SCALE: 1/4"=1'-0"

KEYED DEMOLITION WORK NOTES:

- A EXISTING AIR HANDLING UNIT SHALL BE RELOCATED TO AVOID NEW STAIRWELL. SEE NEW WORK PLANS. ALL PIPING, DUCTWORK, CONTROLS, ELECTRICAL, ETC. SHALL BE TEMPORARILY DISCONNECTED FROM UNIT AND RECONNECTED AT NEW UNIT LOCATION.
- B EXISTING RADIATOR TO REMAIN. REMOVE CONTROL WIRING FROM RADIATOR TO LOCAL VAV BOX. RADIATOR TO RECEIVE NEW INDEPENDENT CONTROL VALVE. SEE NEW WORK PLANS.
- C EXISTING AIR DEVICE TO BE RELOCATED. SEE NEW WORK PLANS.
- D EXISTING MOTORIZED DAMPER TO BE RELOCATED. SEE NEW WORK PLANS. REPAIR DUCT AS REQUIRED.
- E SOUND TRAP TO BE RELOCATED. SEE NEW WORK PLANS.
- F EXISTING THERMOSTAT TO BE REMOVED AND RELOCATED TO SUITE NEW CONDITIONS.
- G CONTRACTOR SHALL PERFORM A PRE-CONSTRUCTION BALANCE OF THE EXISTING AIR SYSTEM AND DEVICES. AFTER INSTALLATION/COMMISSIONING OF RELOCATED VAV BOXES AND NEW/RELOCATED AIR DEVICES, CONTRACTOR SHALL RE-BALANCE EXISTING SYSTEM TO THE PRE-EXISTING CONDITIONS.

DRAWING NOTES:

1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.



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PROJECT:

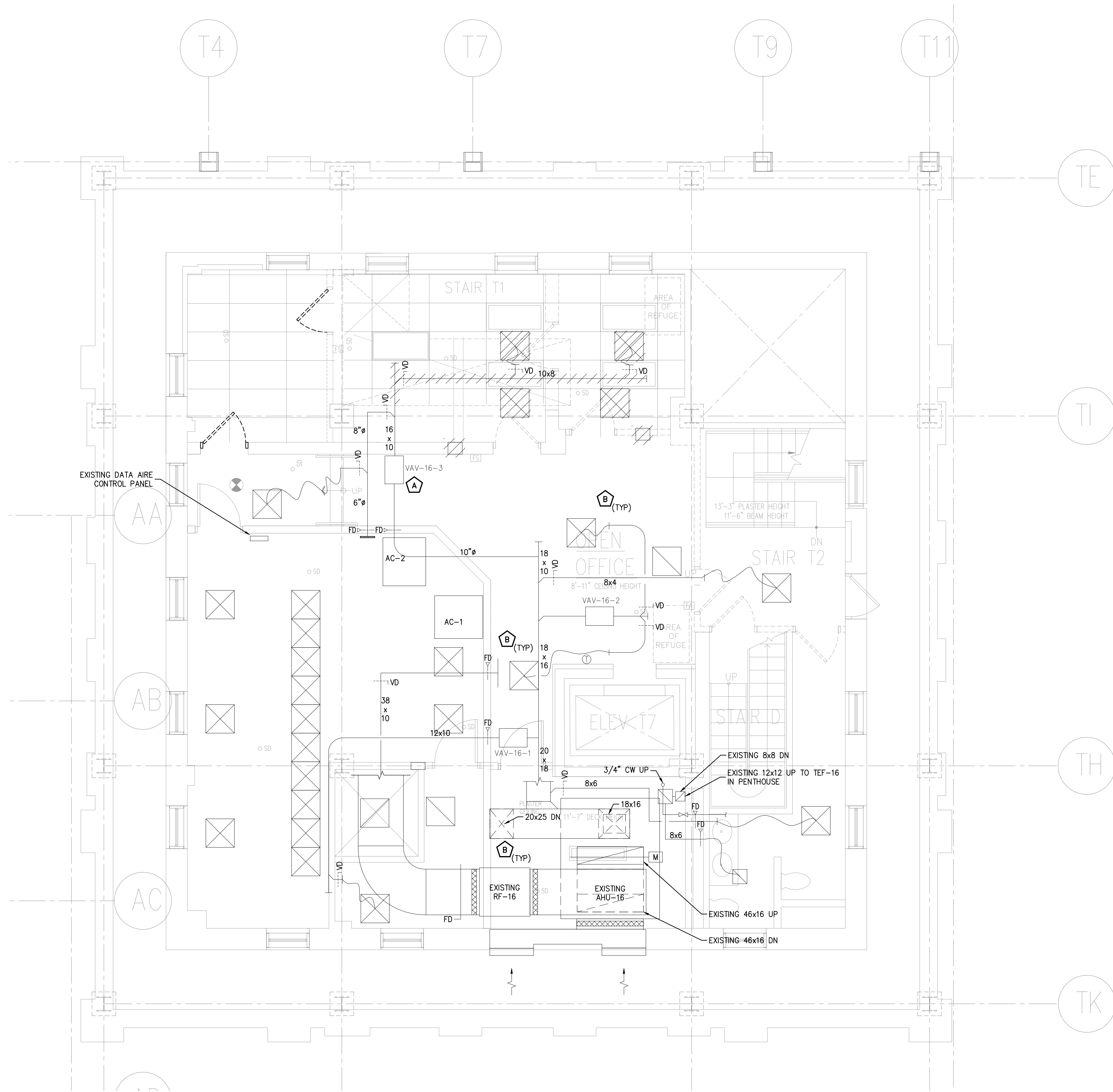
UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL - DEMOLITION PLAN
TWELFTH & THIRTEENTH FLOOR

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY JRB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJB
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

DM.411



SIXTEENTH FLOOR – DEMOLITION PLAN

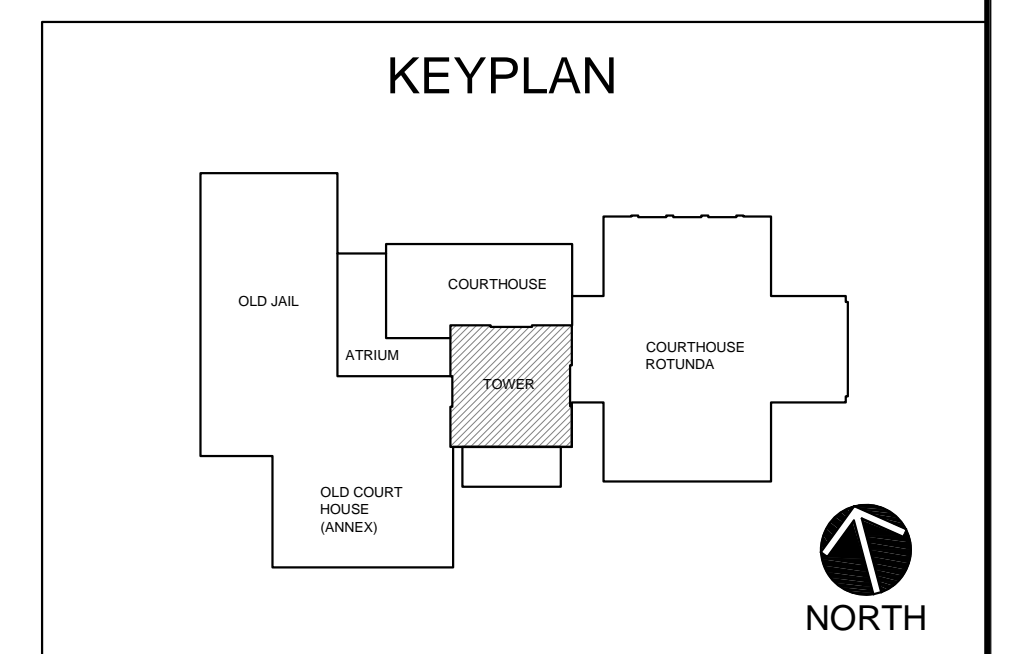
SCALE: 1/4"=1'-0"

KEYED DEMOLITION WORK NOTES:

- A** EXISTING VAV BOX TO BE REUSED. SEE NEW WORK PLANS.
- B** CONTRACTOR SHALL PERFORM A PRE-CONSTRUCTION BALANCE OF THE EXISTING AIR SYSTEM AND DEVICES. AFTER INSTALLATION/COMMISSIONING OF RELOCATED VAV BOXES AND NEW/RELOCATED AIR DEVICES, CONTRACTOR SHALL RE-BALANCE EXISTING SYSTEM TO THE PRE-EXISTING CONDITIONS.

DRAWING NOTES:

1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.



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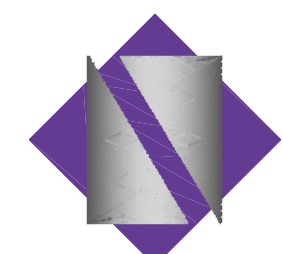
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ASSOCIATED TECHNOLOGY INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 CHAMBERS STREET, 5TH FLOOR, NEWARK, NJ 07102
PHONE: 973.278.2800 FAX: 973.278.2804
WWW.ATIMECHANICAL.COM

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NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.378.0088 FAX: 973.378.1081
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

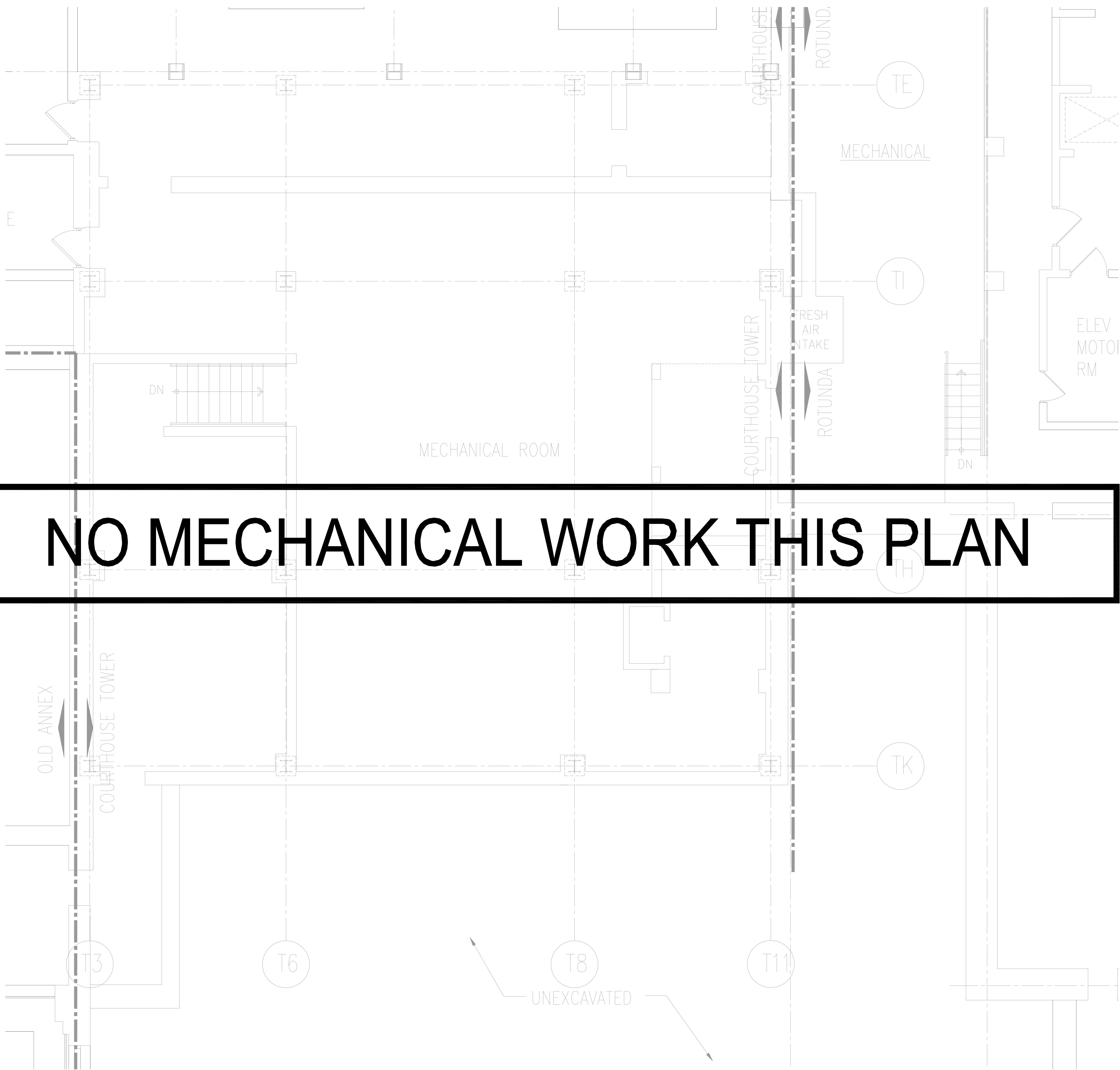
**UC COURTHOUSE
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2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**MECHANICAL - DEMOLITION PLAN
SIXTEENTH FLOOR & PENTHOUSE**

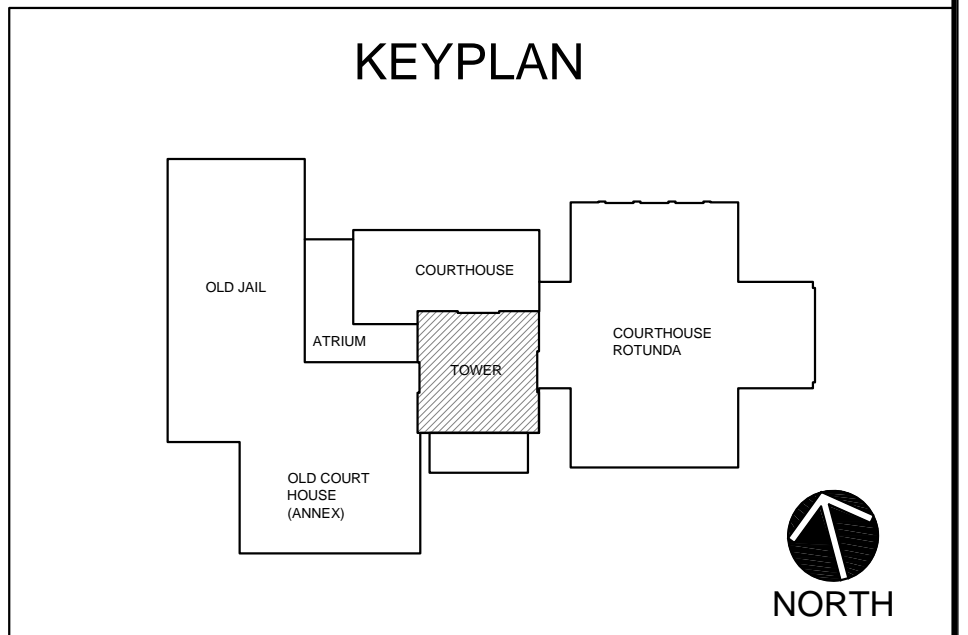
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04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF: _
									DWG NO

DM.413



NO MECHANICAL WORK THIS PLAN

- DRAWING NOTES:**
1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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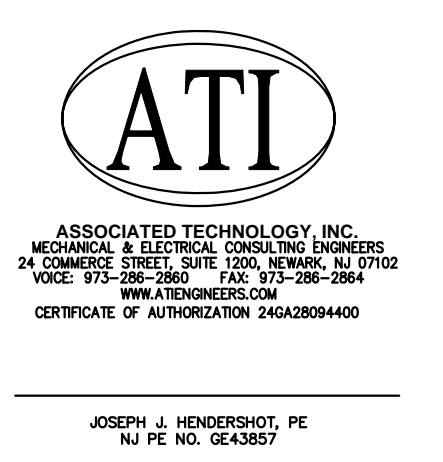
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NJ License No. AI 16160

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NJ License No. AI 14394

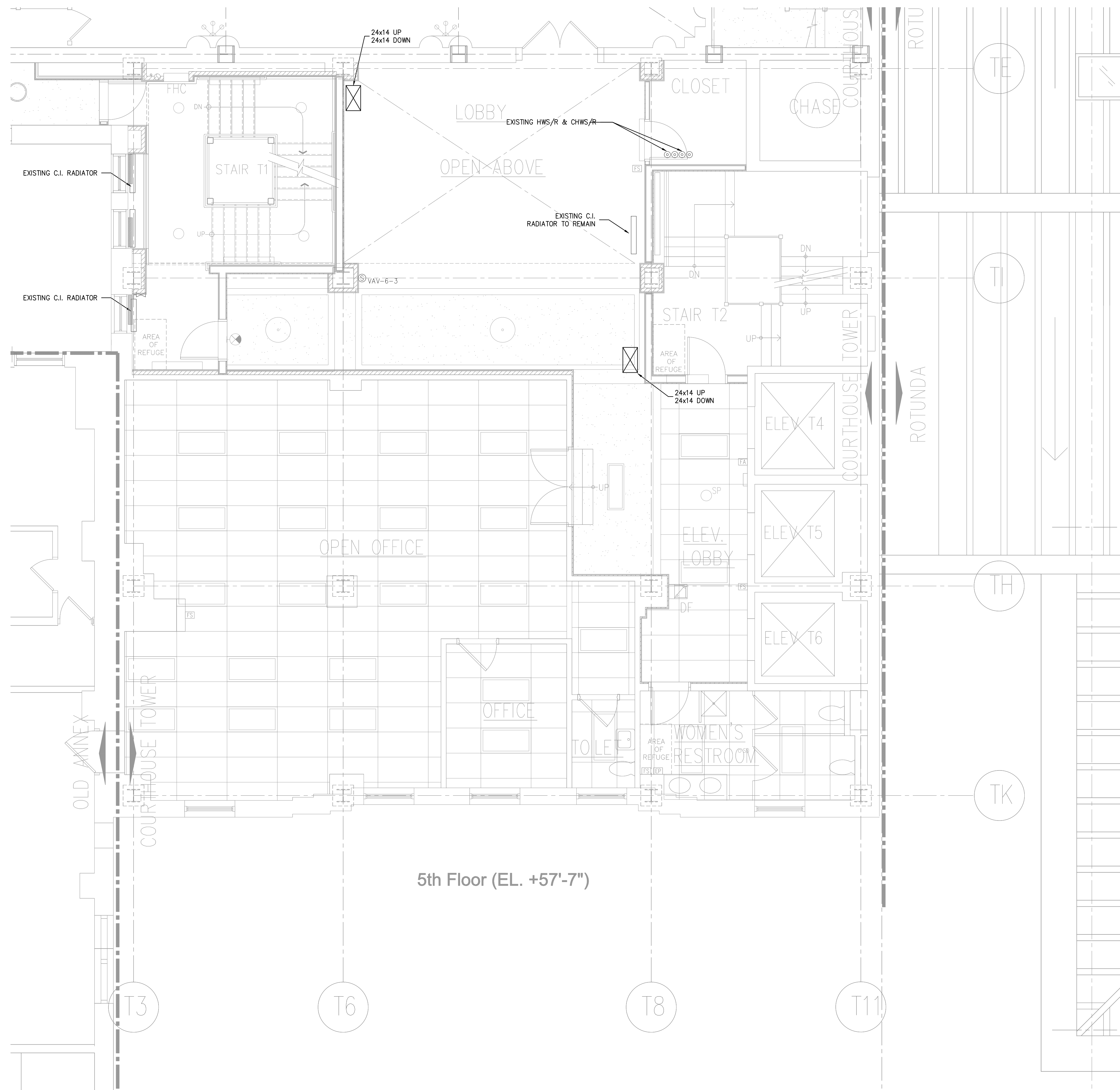


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - HVAC PLAN
BASEMENT FLOOR**

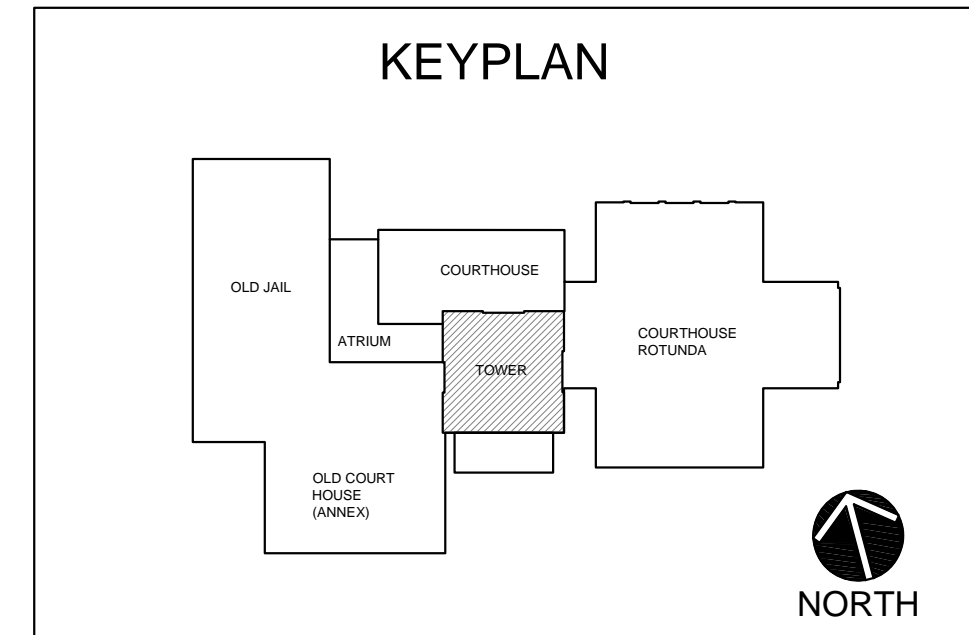
SUBMISSIONS				REVISIONS				DATE	10-10-15
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10.30.15	95% SUBMISSION	KD	FM					CHKD BY	JJH
09.07.17	ISSUED FOR BID	KD	FM					JOB NO	2141151
								SHEET	_ OF:
								DWG NO	

M.400B



FIFTH FLOOR – HVAC PLAN
SCALE: 1/8"=1'-0"

- DRAWING NOTES:**
- REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
 - ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
 - CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
 - ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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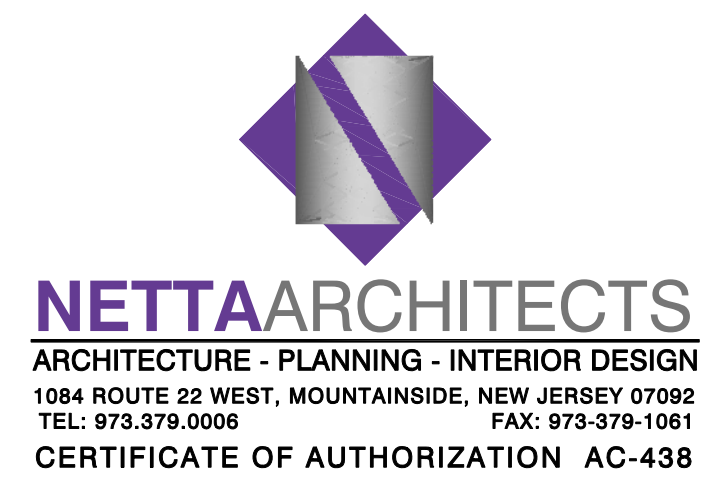
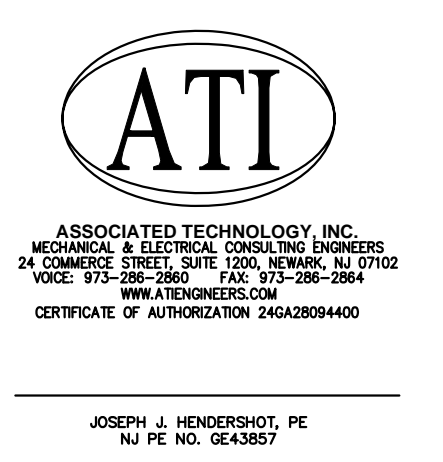
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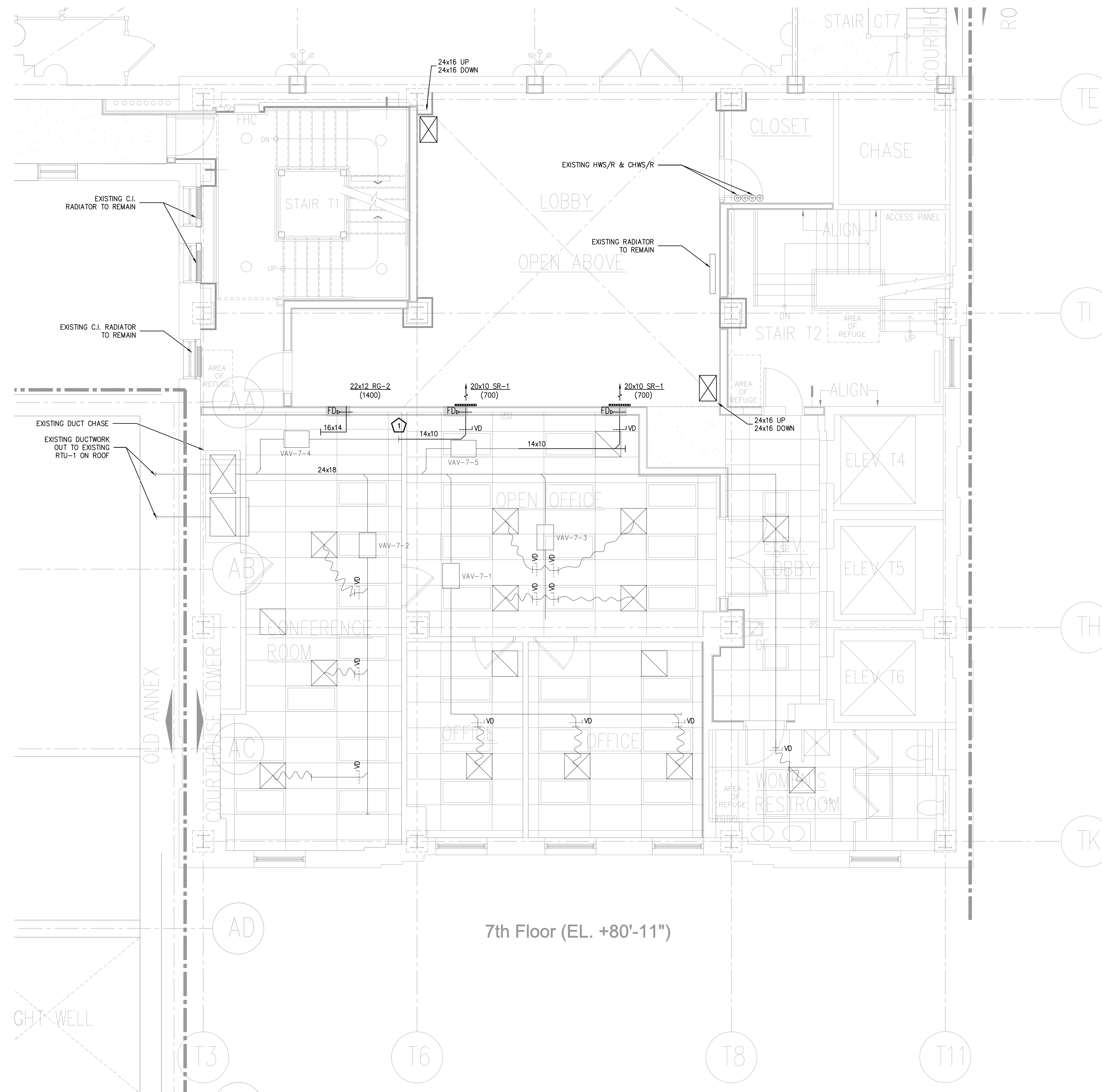


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - HVAC PLAN
FIFTH FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

M.405



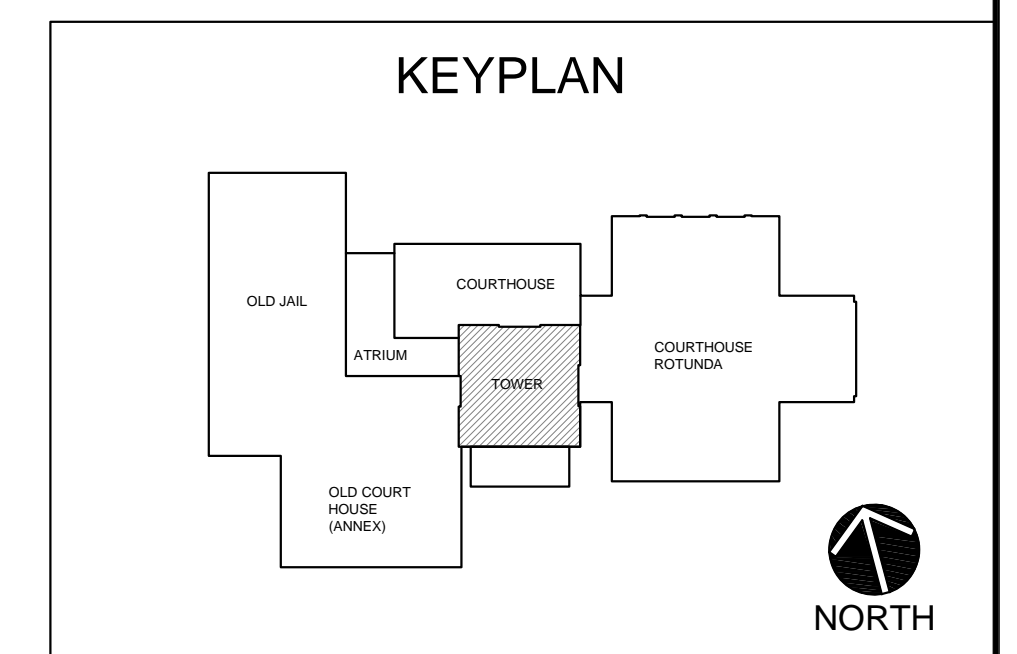
SEVENTH FLOOR - HVAC PLAN
SCALE: 1/4"=1'-0"

KEYED NEW WORK NOTES:

- 1. EXTEND EXISTING DUCTWORK.

DRAWING NOTES:

1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

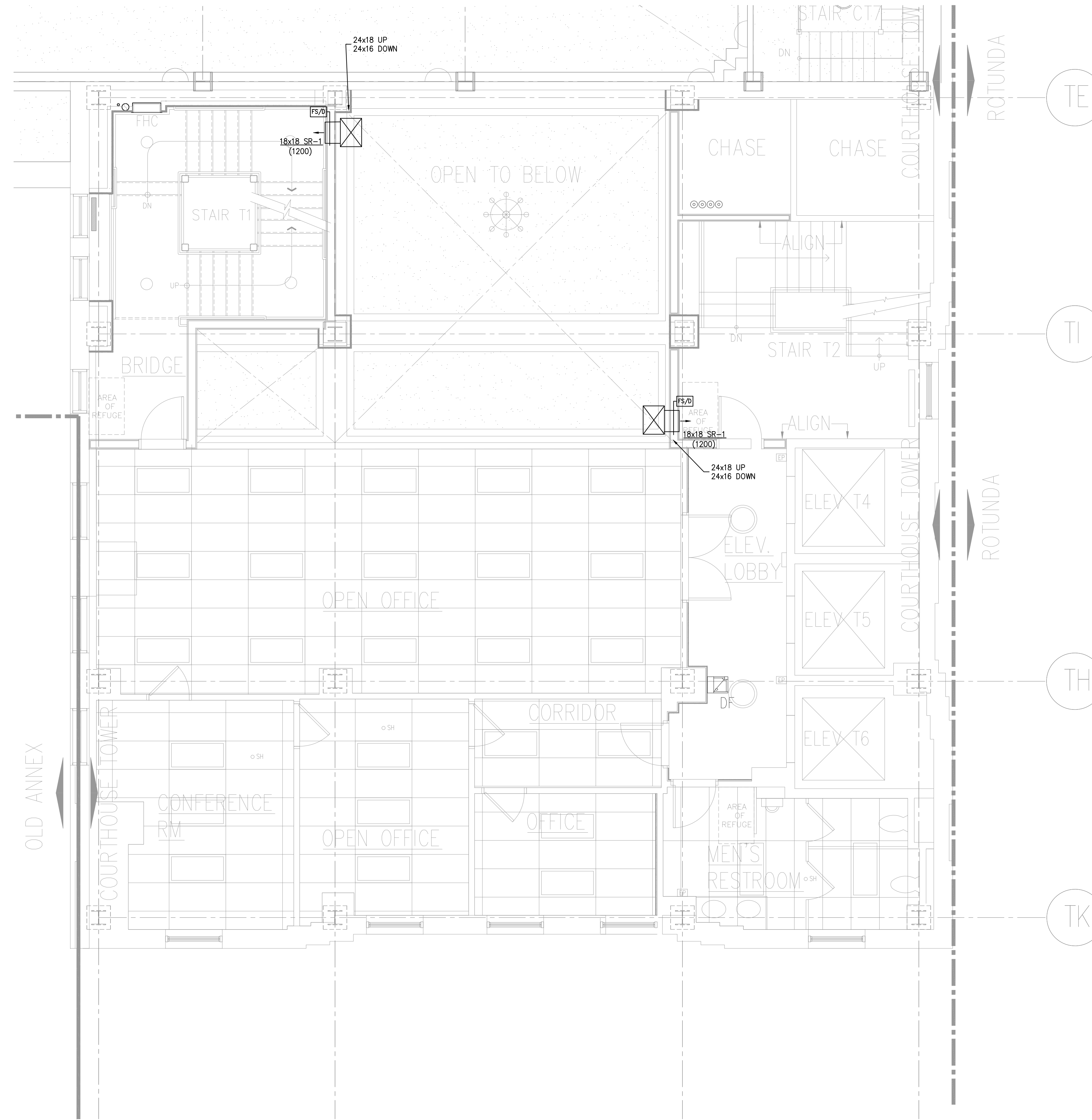
UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL - HVAC PLAN
SEVENTH FLOOR

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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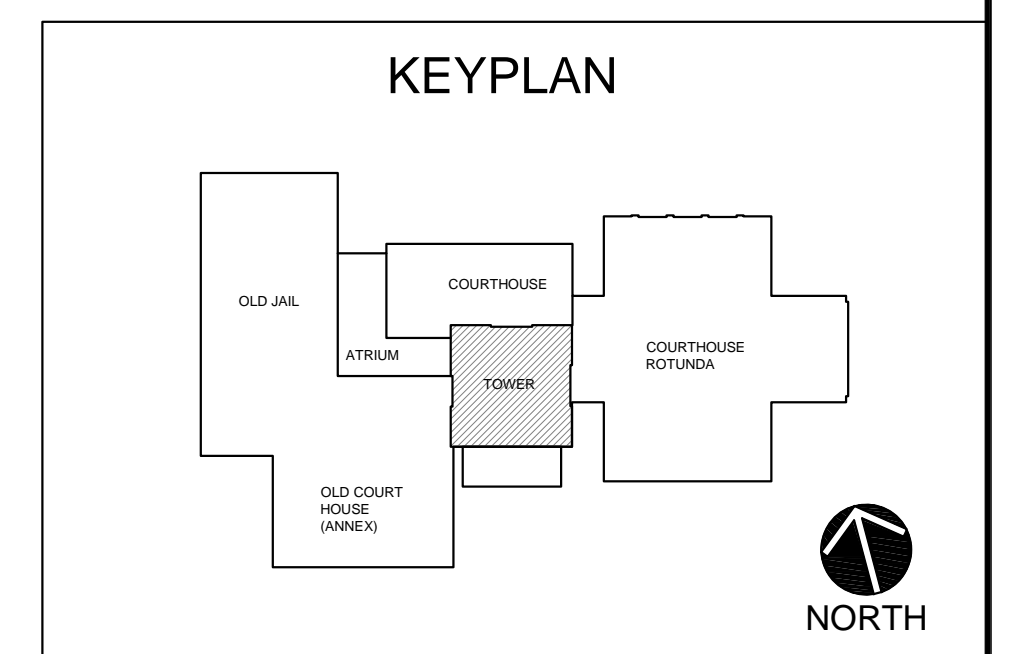
M.407



EIGHTH FLOOR – HVAC PLAN
SCALE: 1/4"=1'-0"

DRAWING NOTES:

1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



JOSEPH J. HENDERSON, PE
NJ License No. 354857



PROJECT:

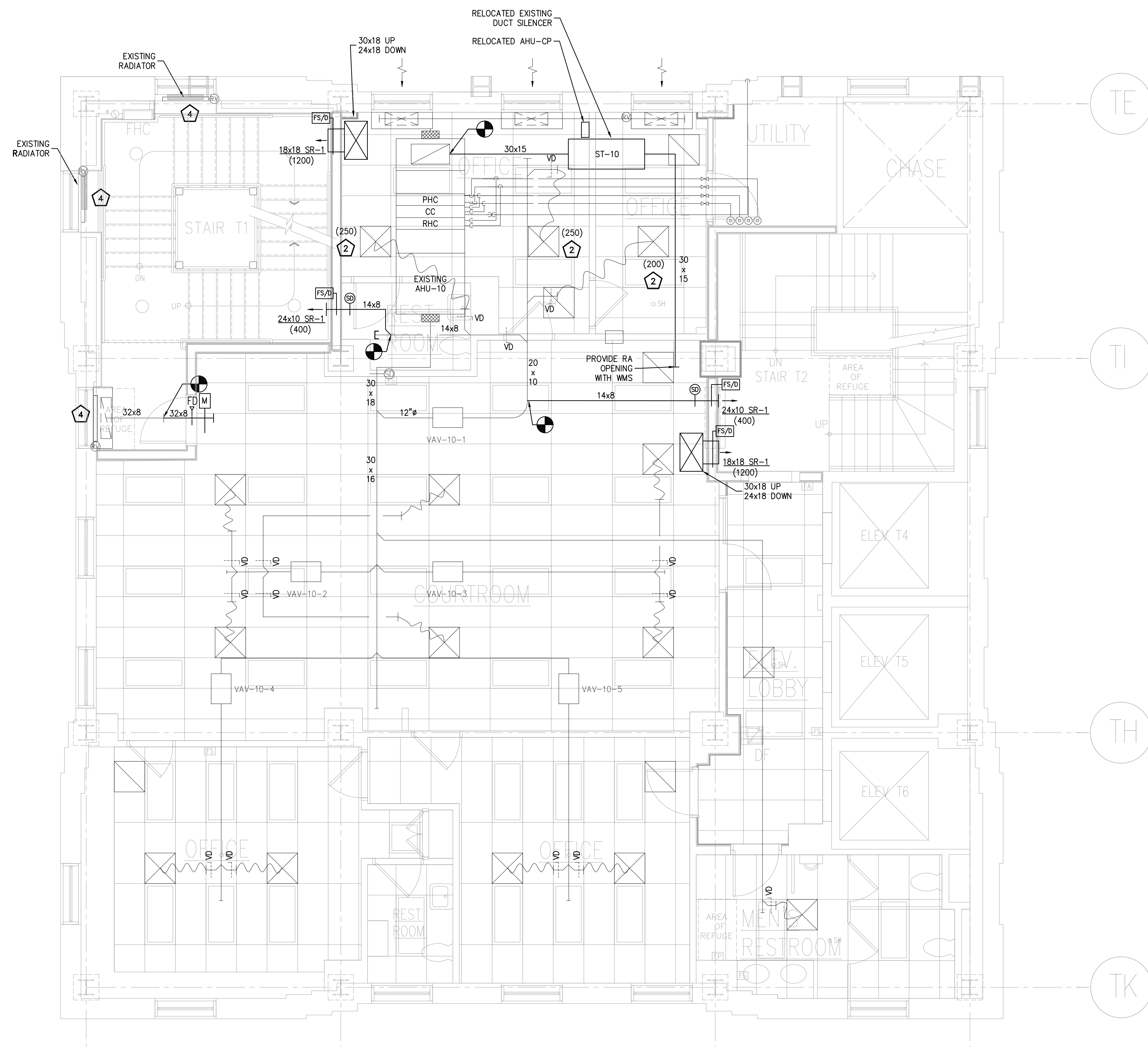
UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

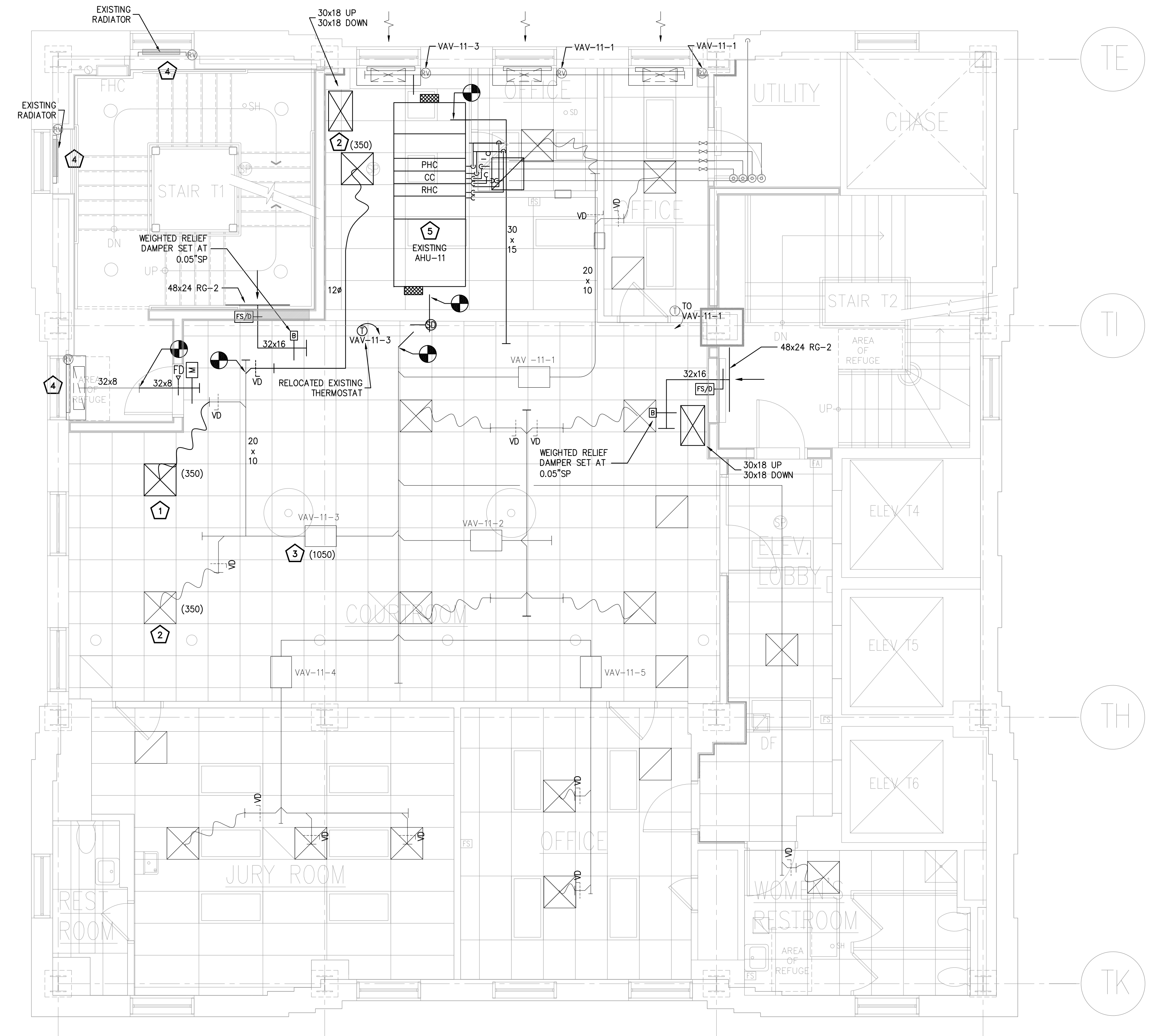
MECHANICAL - HVAC PLAN
EIGHTH FLOOR

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF: _
									DWG NO

M.408



TENTH FLOOR – HVAC PLAN
SCALE: 1/8"=1'-0"



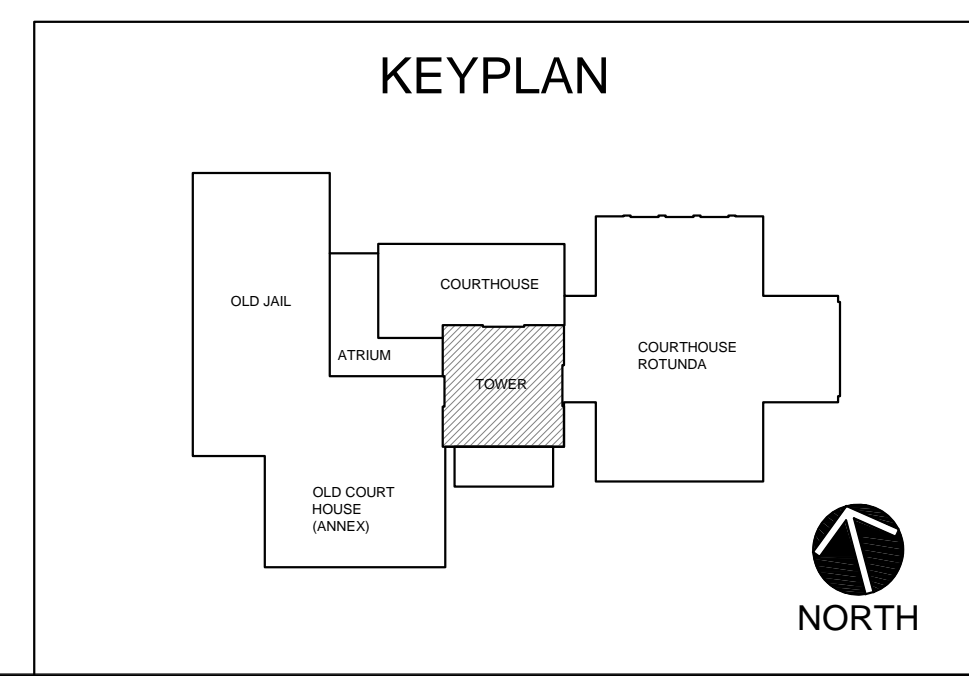
ELEVENTH FLOOR – HVAC PLAN
SCALE: 1/8"=1'-0"

KEYED NEW WORK NOTES:

- 1 RELOCATED EXISTING AIR DEVICE. REBALANCE TO CFM VALUE SHOWN.
- 2 REBALANCE EXISTING AIR DEVICE TO CFM VALUE SHOWN.
- 3 REBALANCE EXISTING VAV BOX TO CFM VALUE SHOWN.
- 4 PROVIDE NEW RADIATOR CONTROL VALVE, DANFOSS RA2000 ACTUATOR OR EQUAL.
- 5 RELOCATED AIR HANDLING UNIT.

DRAWING NOTES:

- 1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
- 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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NJ License No. AI 14394



PROJECT:

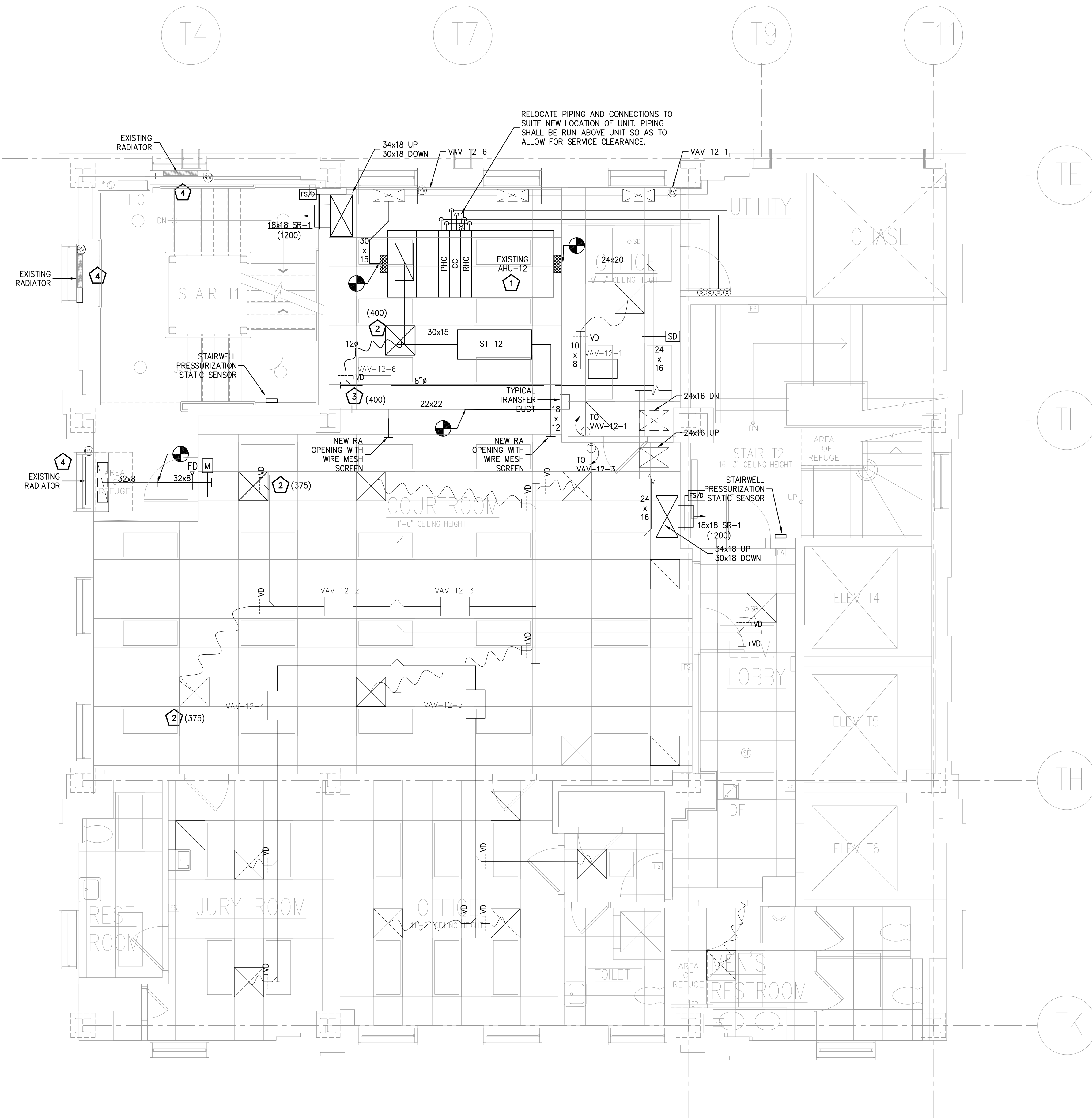
UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

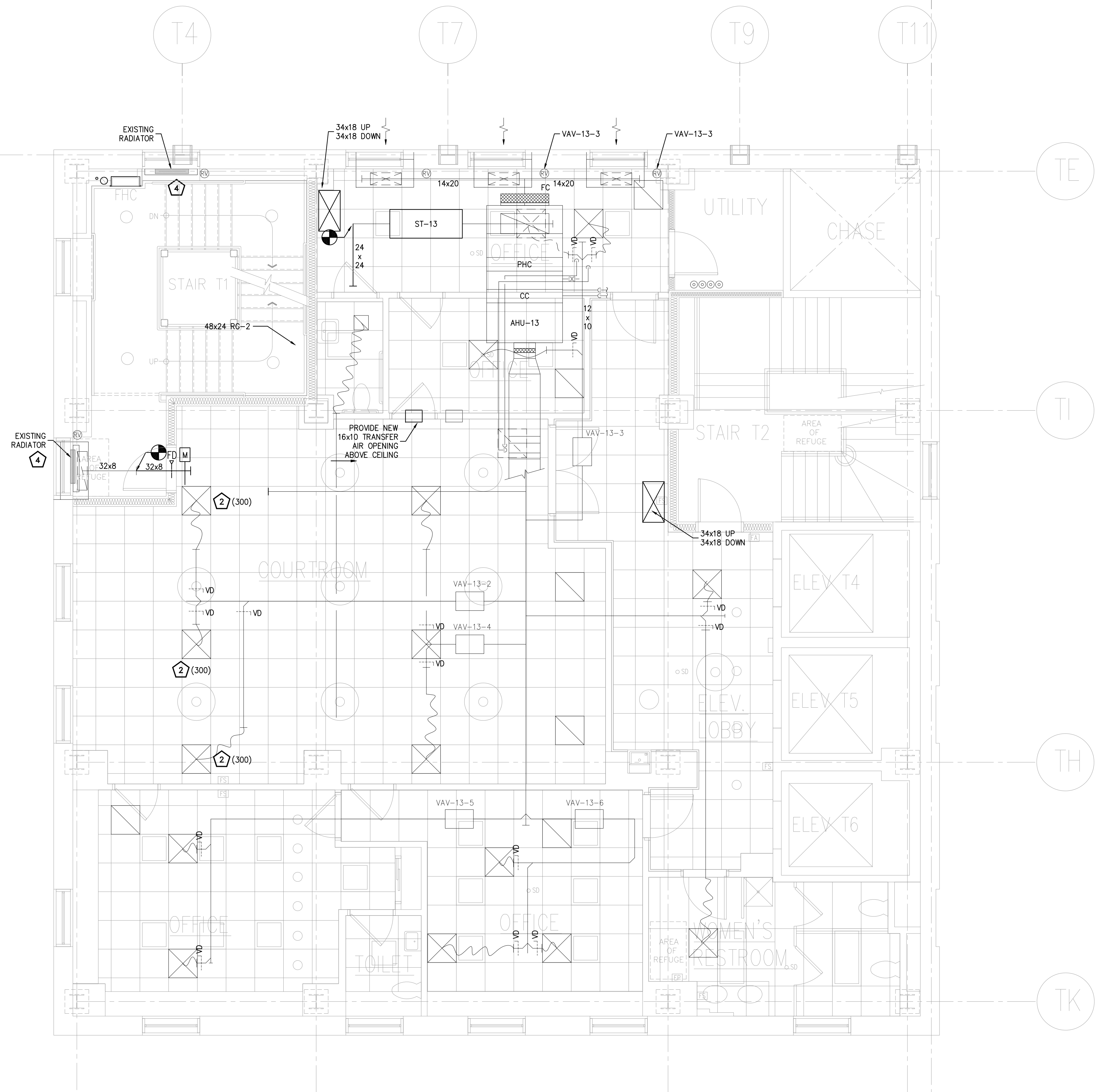
MECHANICAL - HVAC PLAN
TENTH & ELEVENTH FLOOR

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						
10.30.15	95% SUBMISSION	KD	FM						
09.07.17	ISSUED FOR BID	KD	FM						
								DRAWN BY	JB
								CHKD BY	JJH
								JOB NO	2141151
								SHEET:	_ OF:
								DWG NO	

M.410



TWELFTH FLOOR — HVAC PLAN
SCALE: 1/4"=1'-0"



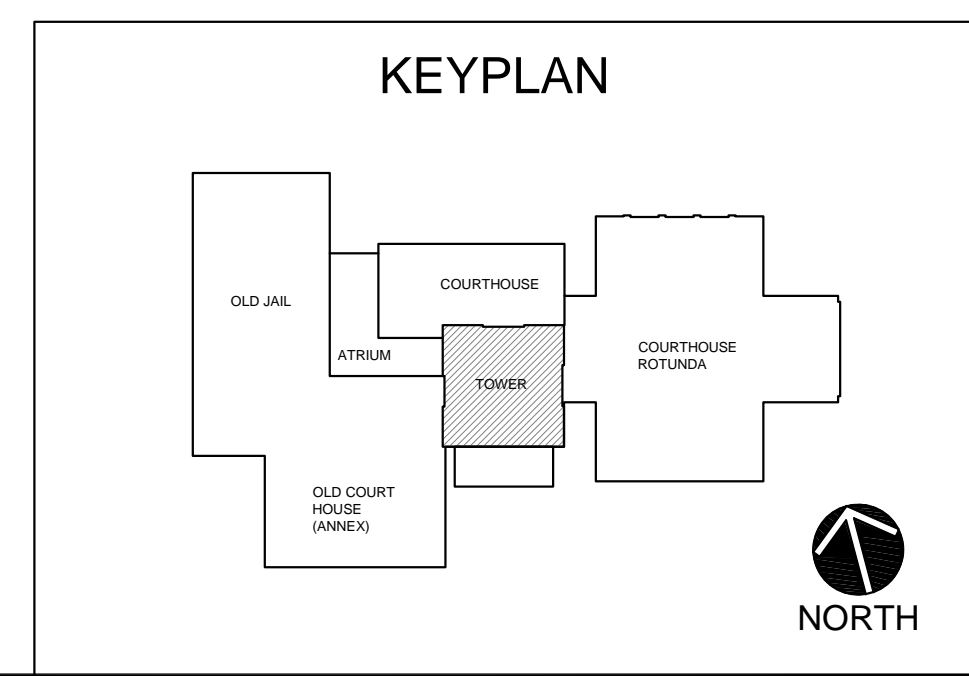
THIRTEENTH FLOOR — HVAC PLAN
SCALE: 1/4"=1'-0"

KEYED NEW WORK NOTES:

- 1 RELOCATED AIR HANDLING UNIT.
- 2 REBALANCE EXISTING AIR DEVICE TO CFM VALUE SHOWN ON DRAWING.
- 3 REBALANCE EXISTING VAV BOX TO CFM VALUE SHOWN ON DRAWING.
- 4 PROVIDE NEW RADIATOR CONTROL VALVE, DANFOSS RA2000 ACTUATOR OR EQUAL.

DRAWING NOTES:

- 1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
- 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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NJ License No. AI 16160
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NJ License No. AI 14394



PROJECT:

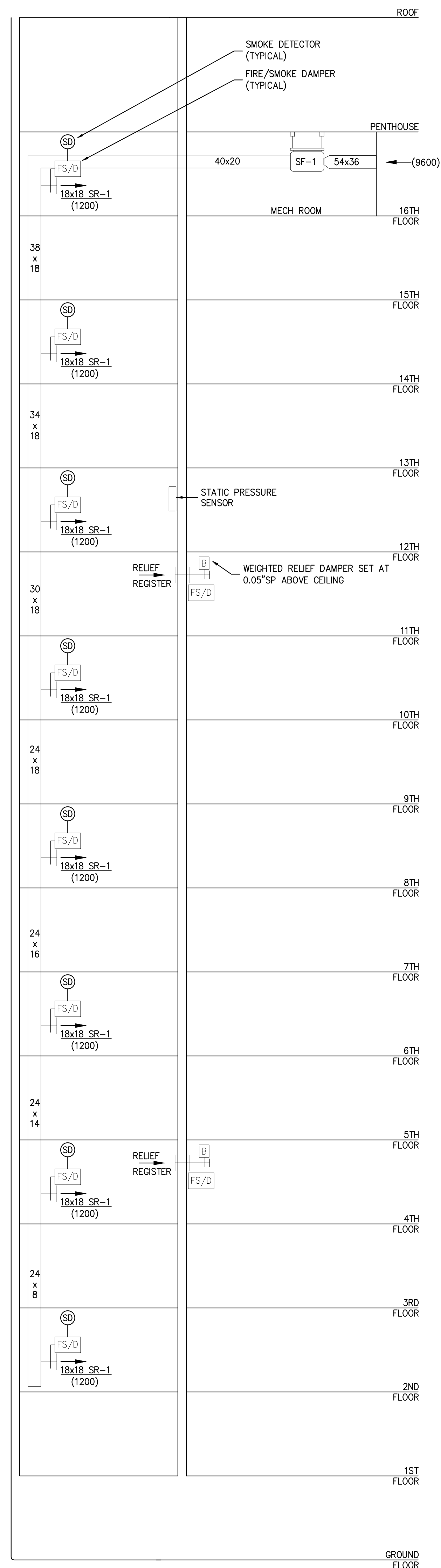
UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

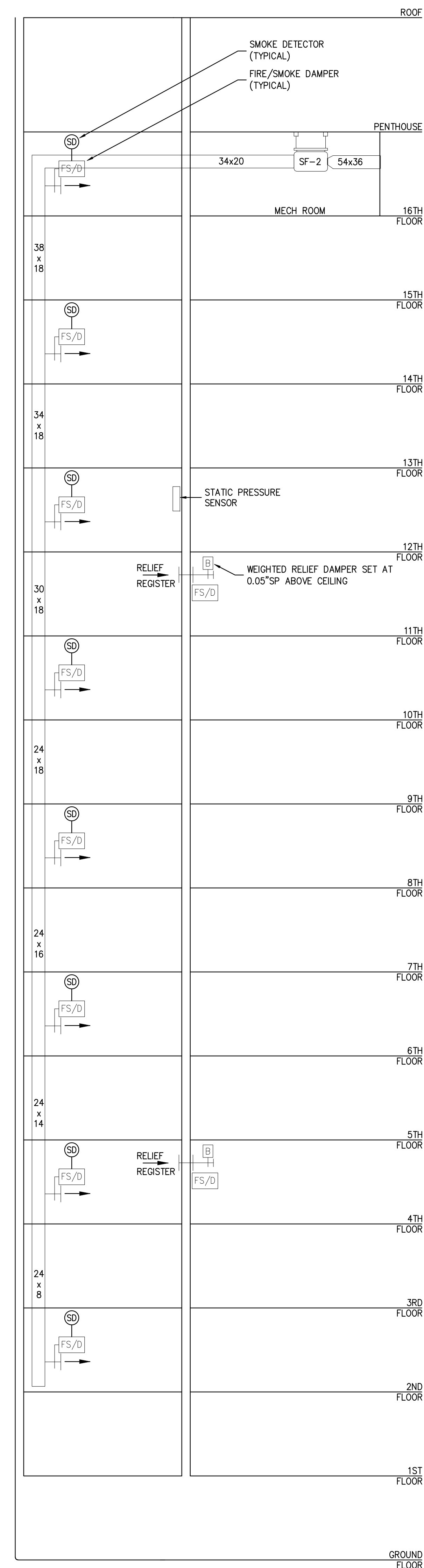
MECHANICAL - HVAC PLAN
TWELFTH & THIRTEENTH FLOOR

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						
10.30.15	95% SUBMISSION	KD	FM						
09.07.17	ISSUED FOR BID	KD	FM						
								DRAWN BY	RB
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								JOB NO	2141151
								SHEET:	_ OF:
								DWG NO	

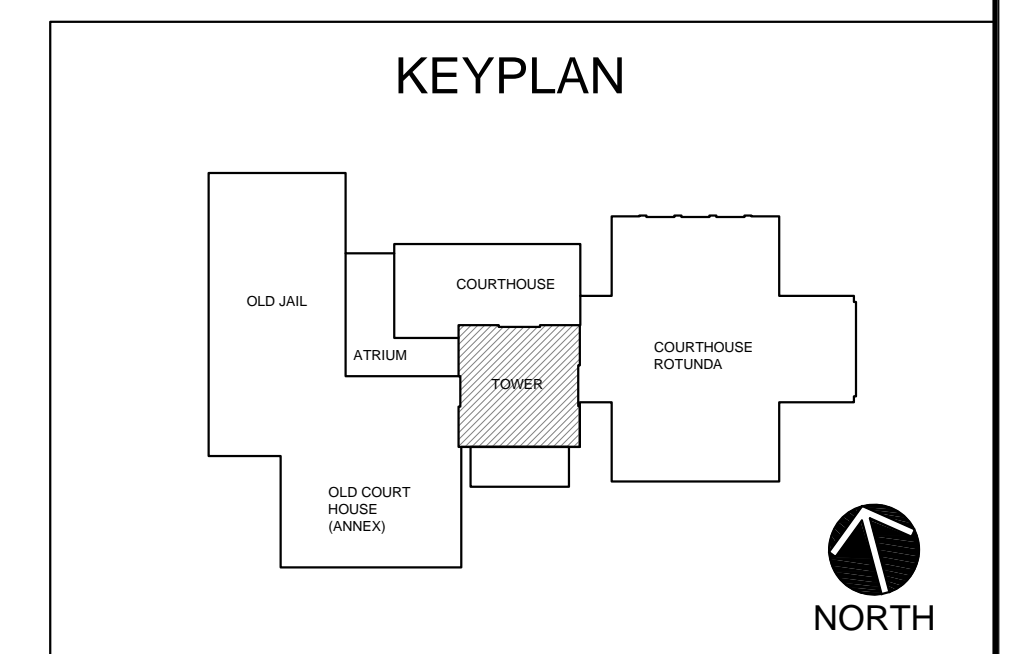
M.411



STAIRWELL T1



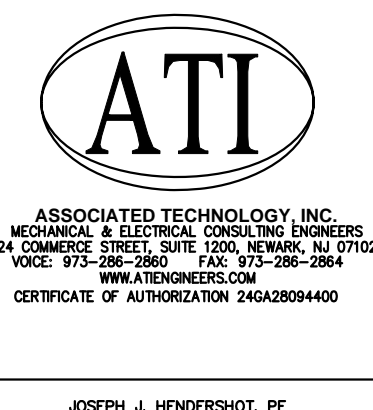
STAIRWELL T2



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PROJECT:

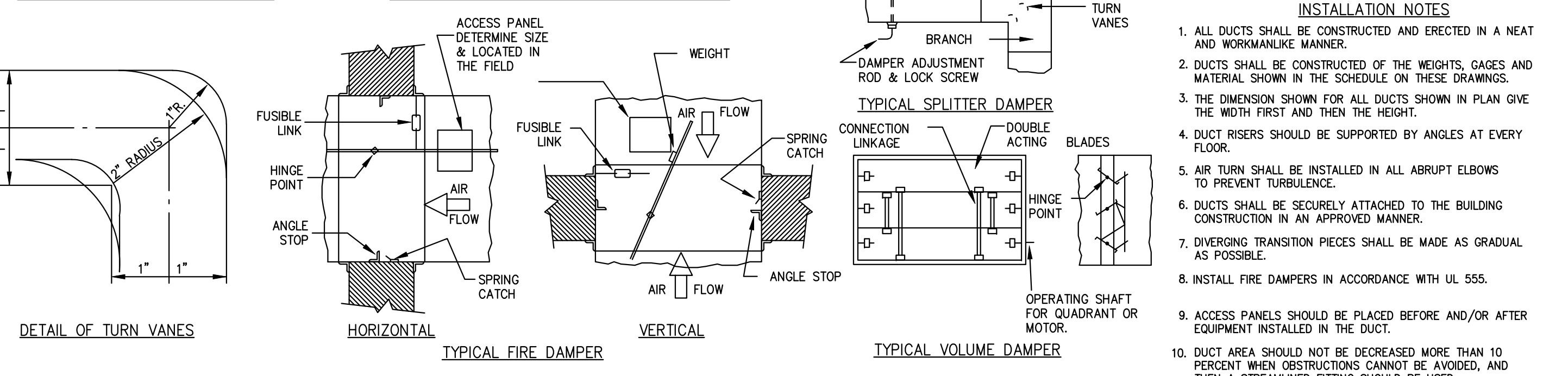
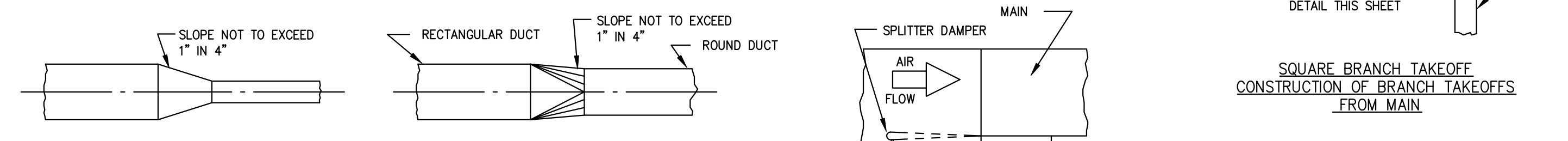
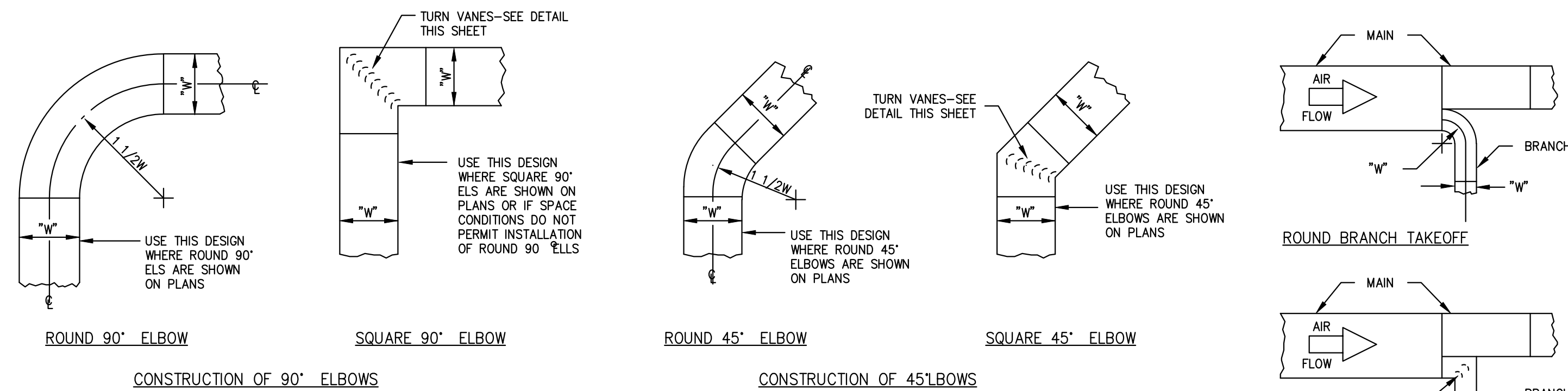
UC COURTHOUSE
 INTERNAL STAIR (TOWER)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL - STAIRWELL PRESSURIZATION
 RISER DIAGRAM

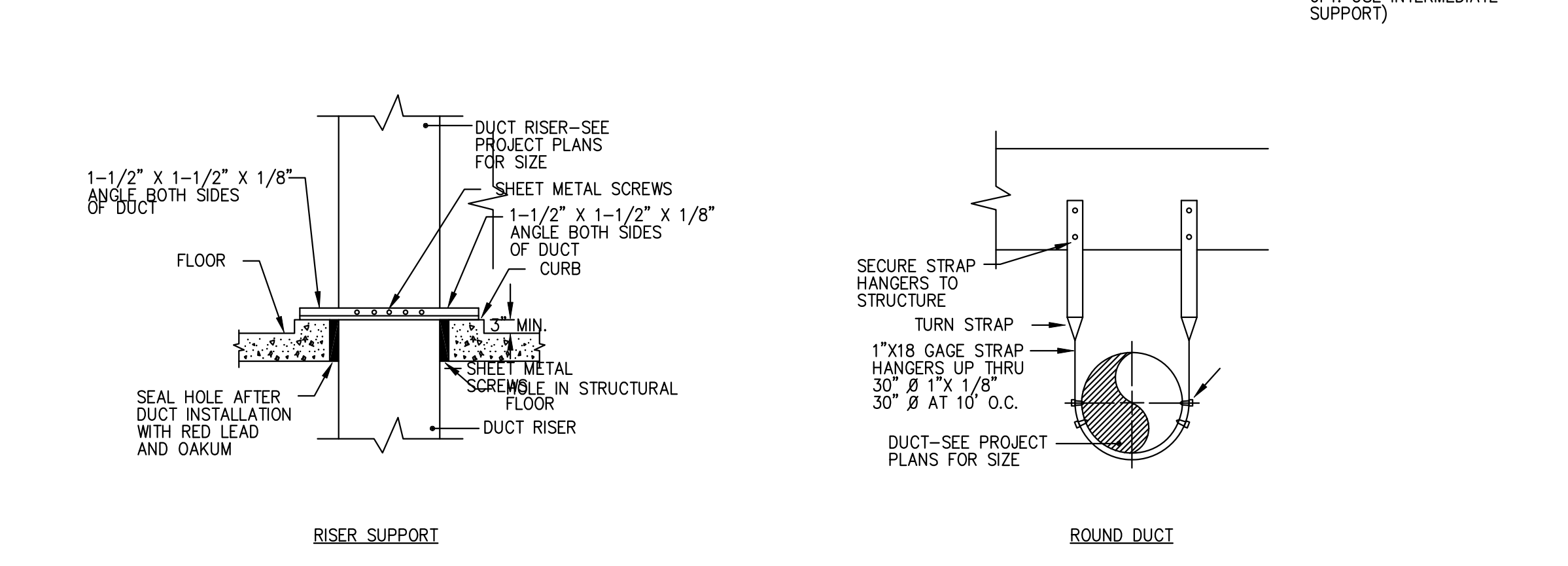
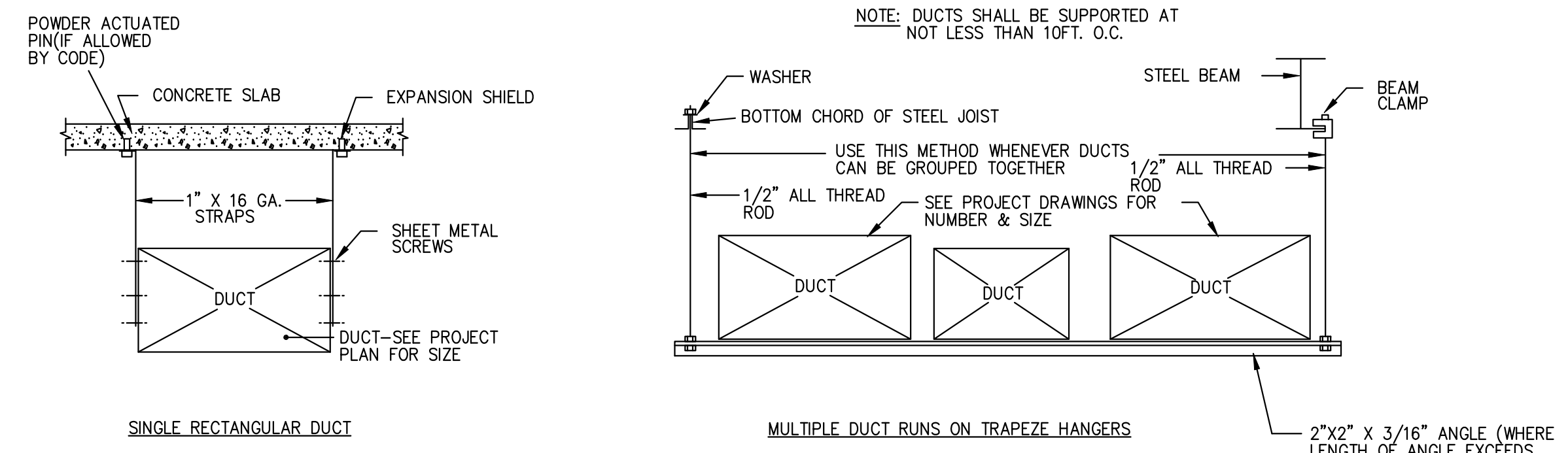
SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	RB
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	JJH
09.07.17	ISSUED FOR BID	KD	FM					JOB NO	2141151
								SHEET:	_ OF:
								DWG NO	

M.601



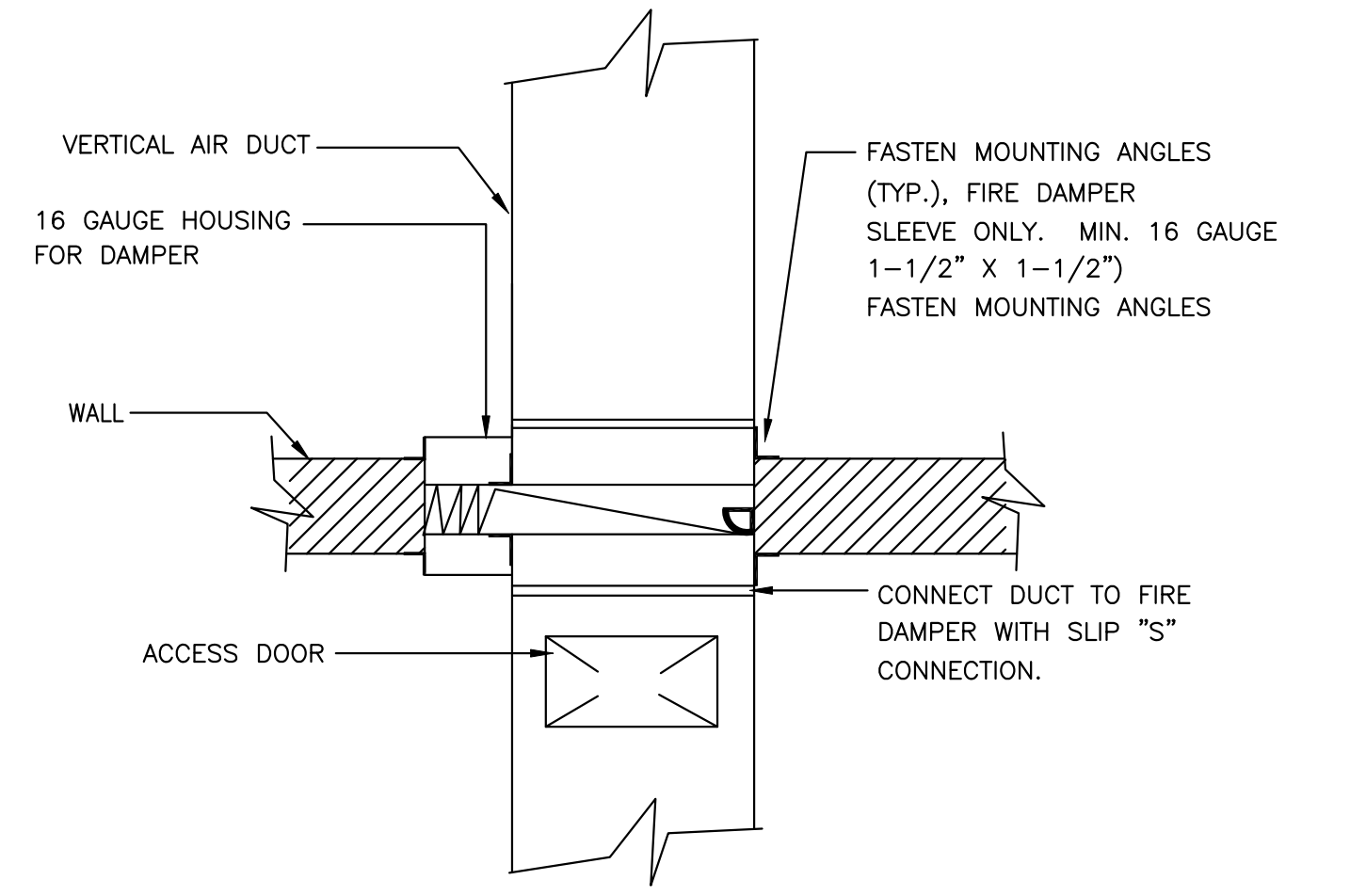
TYPICAL DETAILS OF THE LOW VELOCITY DUCT LAYOUT

SCALE: NONE



HANGER AND SUPPORT DETAILS FOR LOW PRESSURE DUCTWORK (UP THRU 2" WG)

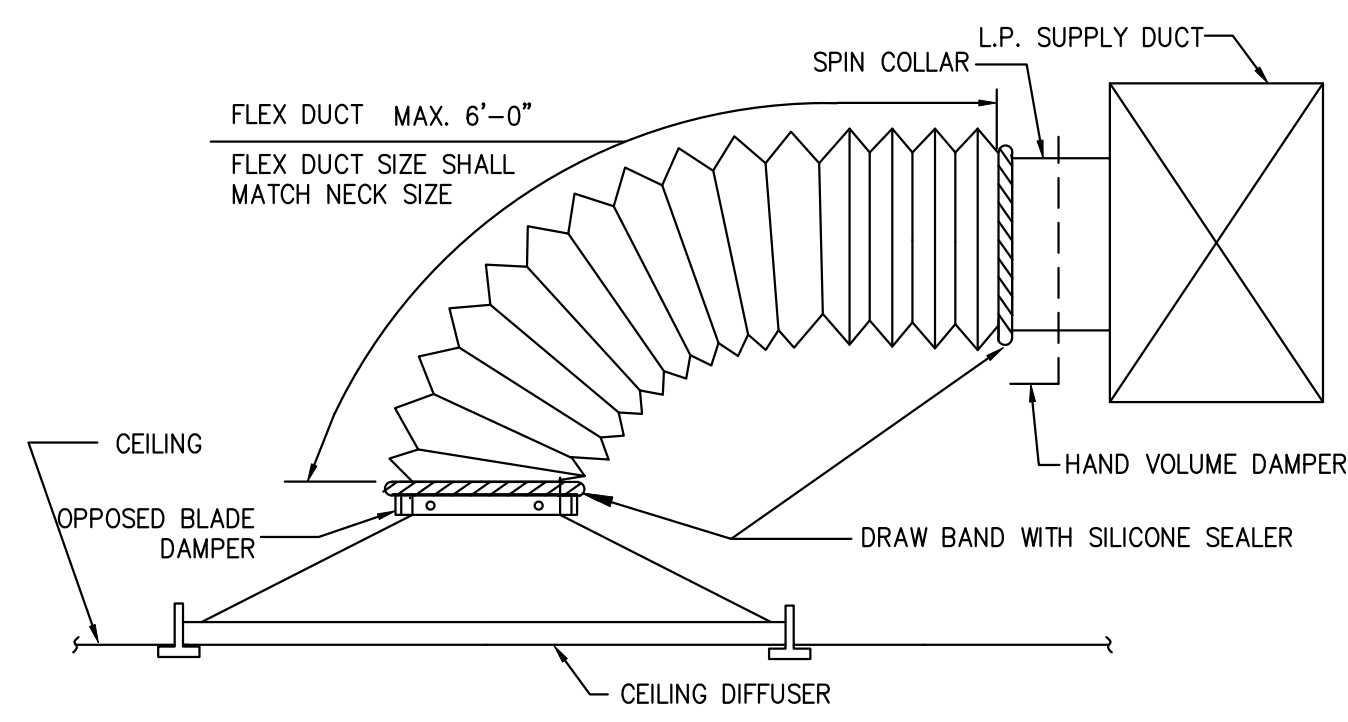
SCALE: NONE



- NOTES:
- DAMPER ASSEMBLY INSTALLED IN AND FASTENED TO THE SLEEVE.
 - MAINTAIN FULL DUCT SIZE. DAMPER HOUSING SHALL NOT OBSTRUCT AIR FLOW, (TYPE "B").
 - MOUNTING SHOWN IS VERTICAL INSTALLATION, HORIZONTAL INSTALLATION IS SIMILAR.

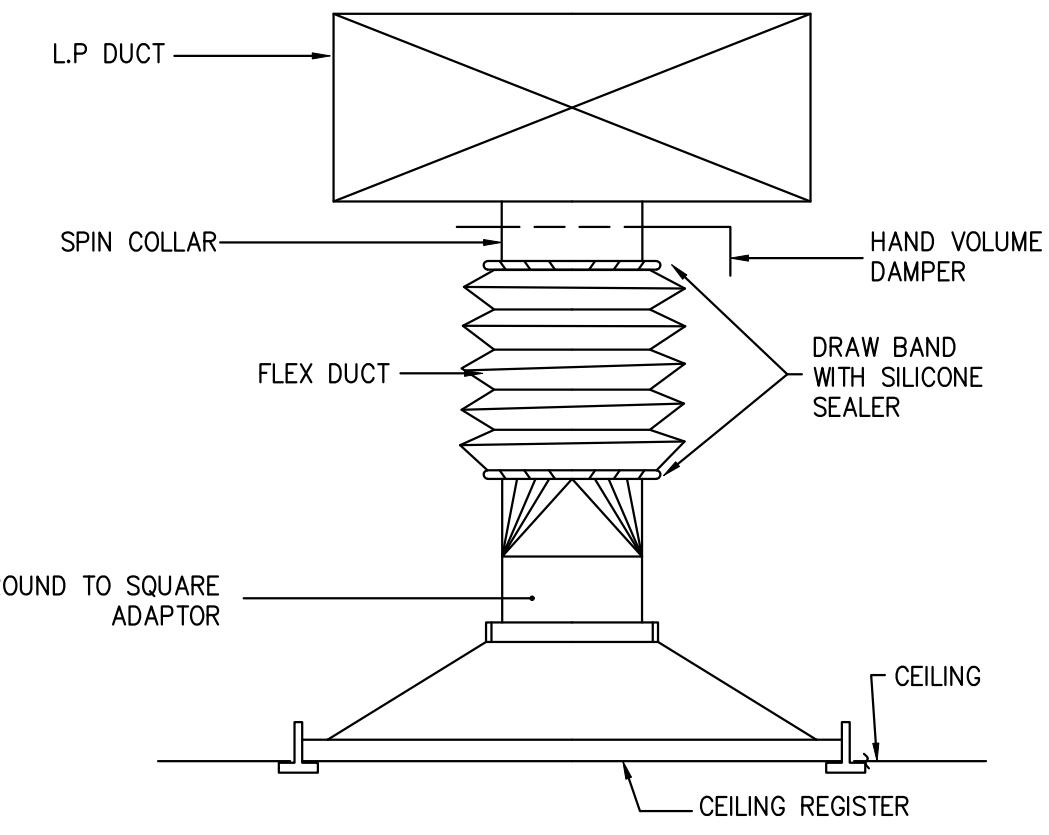
FIRE DAMPER INSTALLATION DETAIL

SCALE: NONE



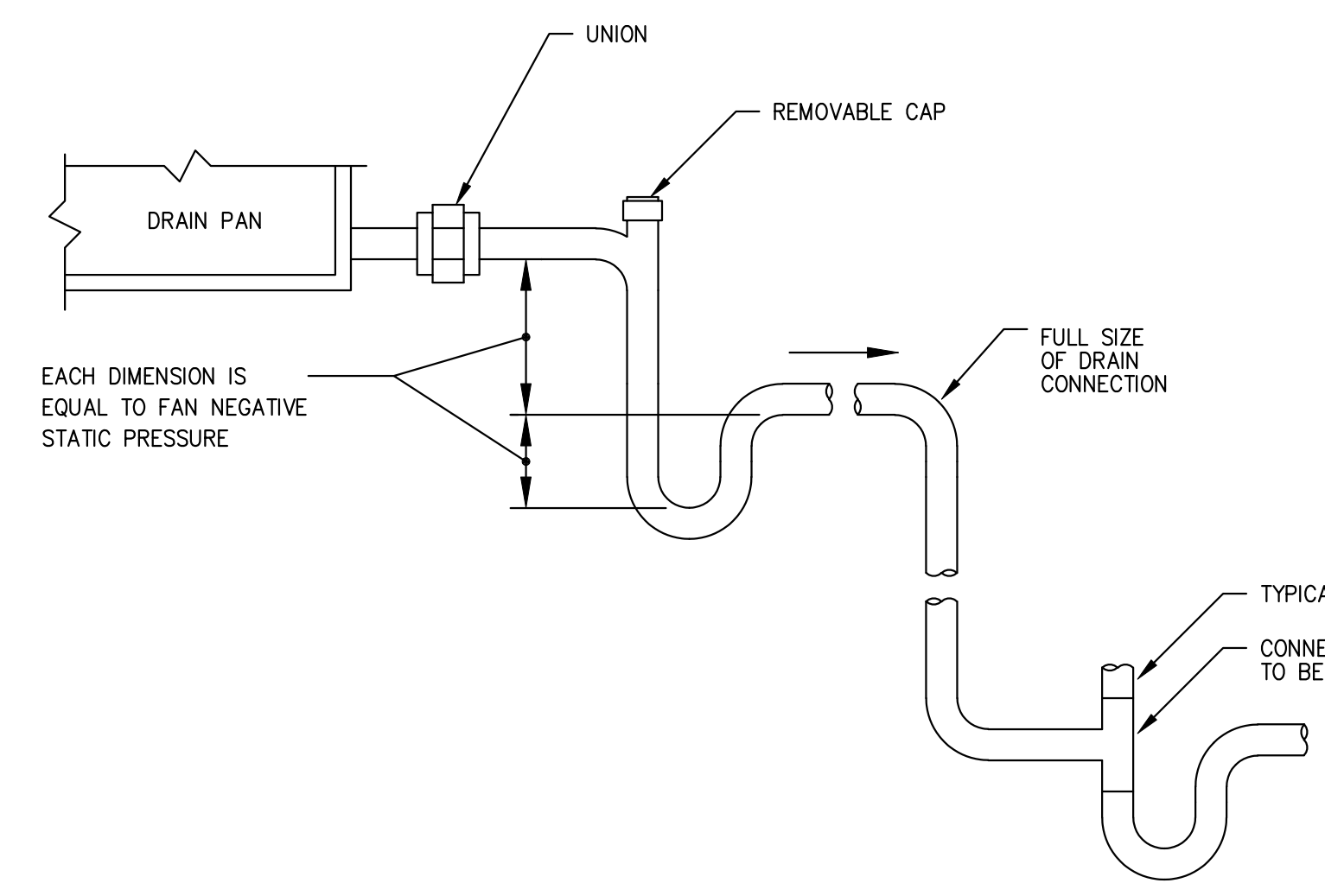
TYPICAL DIFFUSER CONNECTION (SIDE OF DUCT CONNECTION)

SCALE: NONE



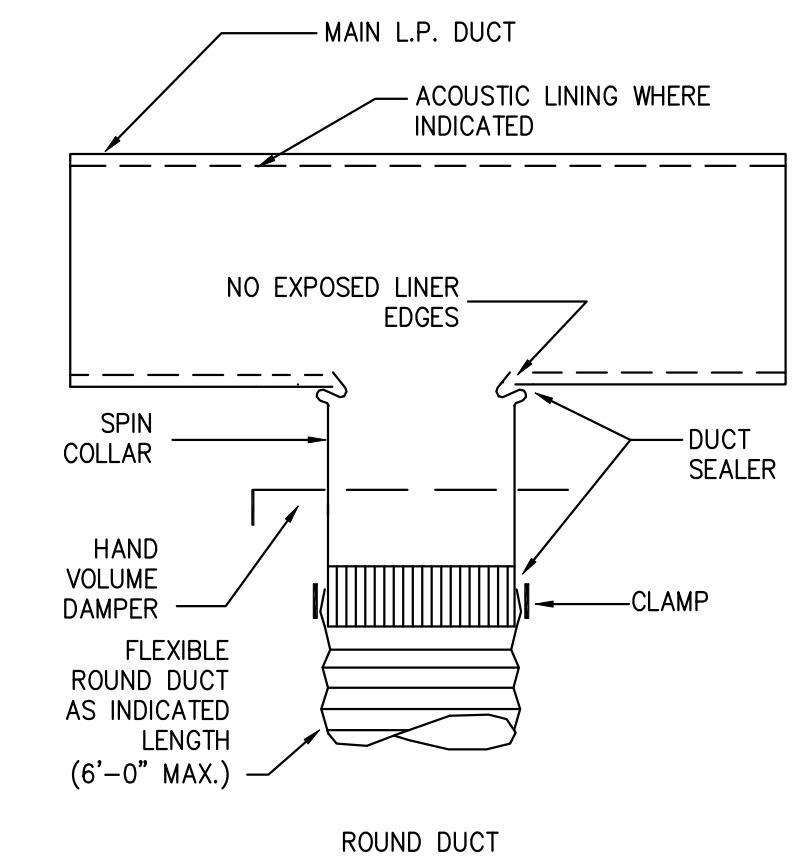
TYPICAL DIFFUSER CONNECTION (BOTTOM OF DUCT CONNECTION)

SCALE: NONE



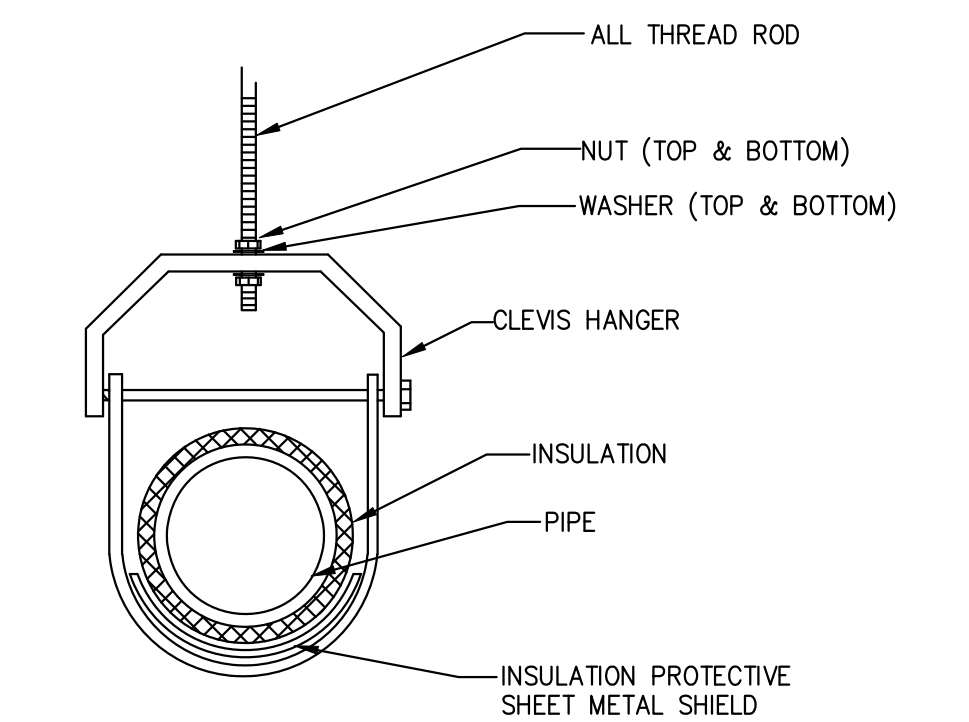
CONDENSATE DRAIN DETAIL

SCALE: NONE



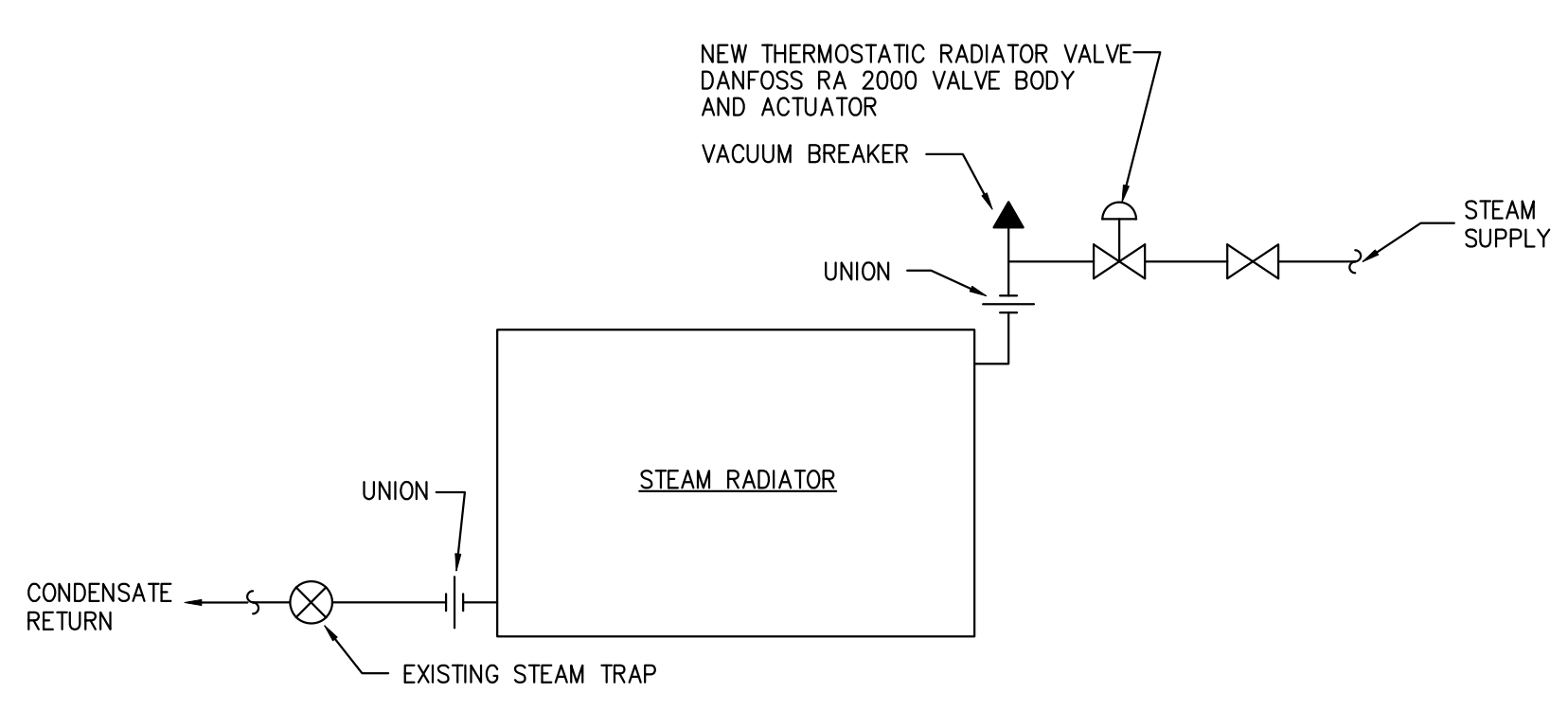
TYPICAL LOW PRESSURE BRANCH DUCT TAKE-OFF

SCALE: NONE



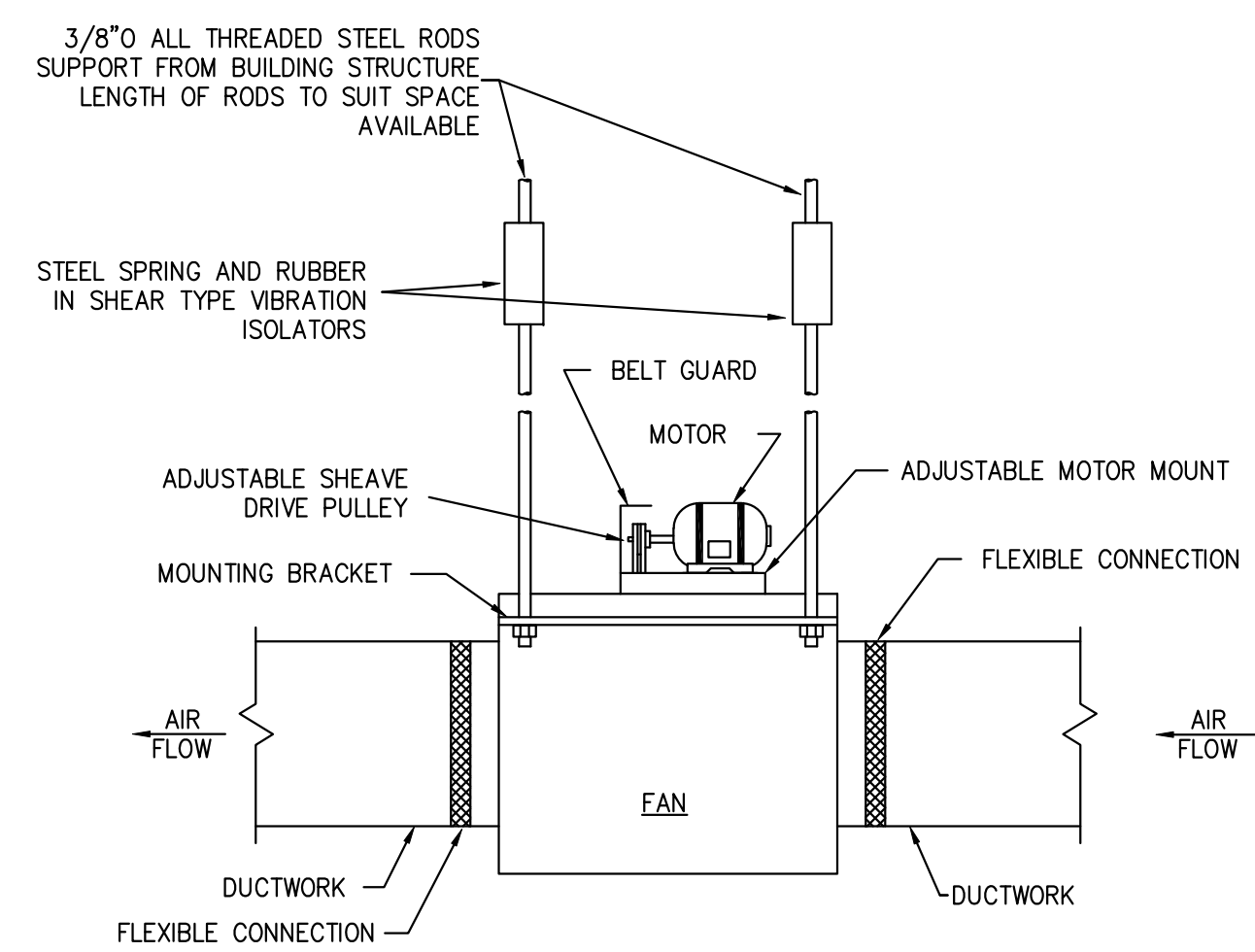
TYPICAL CLEVIS HANGER DETAIL

NOT TO SCALE



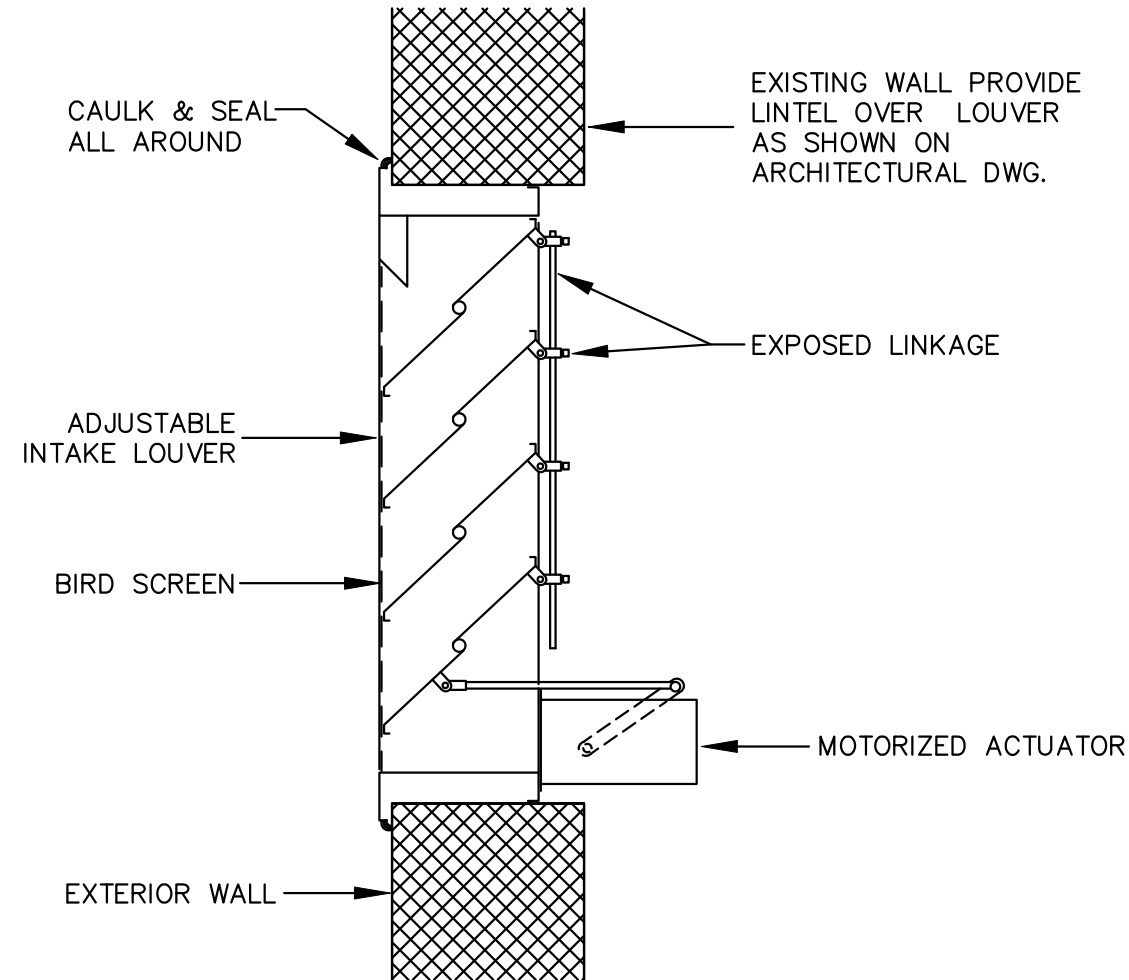
TYPICAL STEAM RADIATOR DETAIL

SCALE: NONE



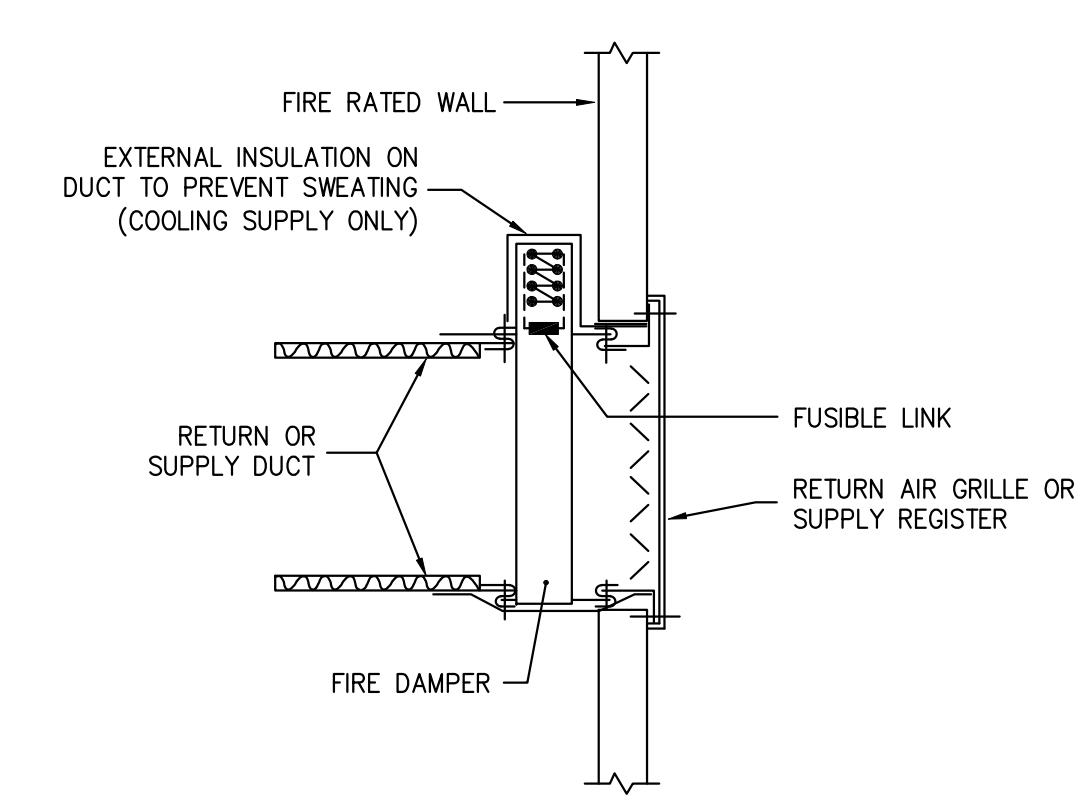
TYPICAL FAN DETAIL

SCALE: NONE



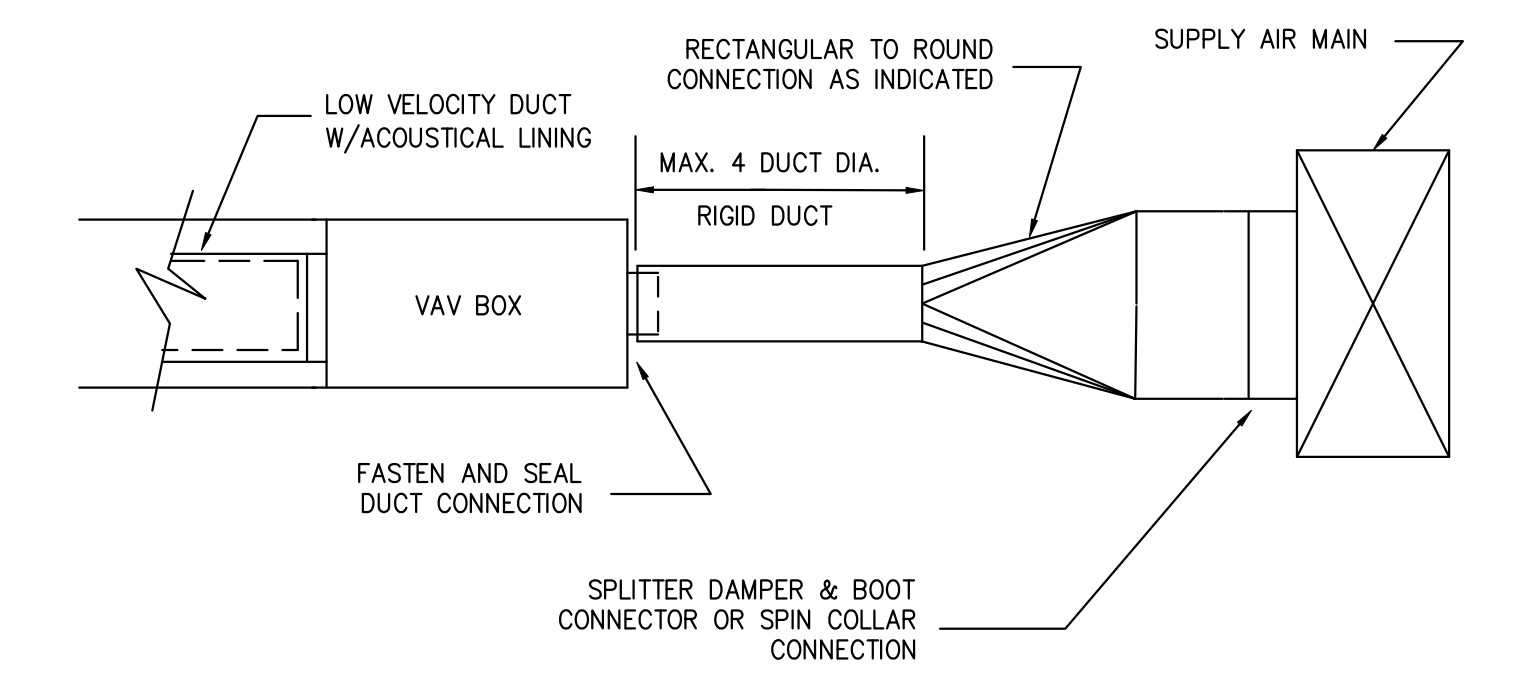
MOTORIZED LOUVER DETAIL

SCALE: NONE



FIRE DAMPER AT SUPPLY REGISTER OR RETURN AIR GRILLE DETAIL

SCALE: NONE



TERMINAL BOX CONNECTION

SCALE: NONE

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NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: UC COURTHOUSE INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
MECHANICAL DETAILS (SHEET 1)

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF: _
									DWG NO

M.801

ELECTRICAL PROJECT GENERAL NOTES:

- INSTALL ALL WORK IN ACCORDANCE WITH THE 2014 NATIONAL ELECTRIC CODE, NFPA CONSTRUCTION CODE, AND ALL APPLICABLE STATE AND LOCAL CODES. WHERE THE PROJECT DRAWINGS AND/OR SPECIFICATIONS DIFFER FROM THE GOVERNING CODE(S), THE MORE STRINGENT REQUIREMENTS SHALL GOVERN THE INSTALLATION. BASE BID ACCORDINGLY.
- WHERE INFORMATION IN DIFFERENT PARTS OF THE CONTRACT DOCUMENTS ARE INTERPRETED BY THE CONTRACTOR TO BE DUPLICATED OR IN CONTRAST, THE CONTRACTOR SHALL OBTAIN A WRITTEN INTERPRETATION FROM THE ENGINEER BEFORE COMMENCEMENT OF SUCH WORK. IN THE ABSENCE OF SUCH WRITTEN APPROVAL, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN. THE OWNER'S INTERPRETATION SHALL BE FINAL AND SHALL NOT ENTITLE THE CONTRACTOR TO ANY ADDITIONAL COMPENSATION.
- AS A MINIMUM, INSTALL WORK IN ACCORDANCE WITH NECA 1-2010 STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION.
- WORK UNDER THIS CONTRACT INCLUDES THE FURNISHING OF EQUIPMENT, MATERIAL, TOOLS, TRANSPORTATION, SERVICES, SCAFFOLDING, SUPERVISION, LABOR AND OTHER APPURTENANCES REQUIRED FOR THE FABRICATION, INSTALLATION, OR APPLICATION AND COMPLETION OF THE WORK UNDER THIS SECTION AS SHOWN OR IMPLIED ON THE PROJECT DRAWINGS AND SPECIFICATIONS.
- ALL EQUIPMENT SUPPLIED SHALL BE UL LISTED AND/OR FACTORY LISTED (FM) APPROVED FOR ITS USE. INSTALLATION PRACTICES SHALL MAINTAIN THE UL AND/OR FM LABEL AND/OR LISTING OF ALL NEW AND/OR EXISTING, IMPACTED EQUIPMENT.
- PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL SUBMIT CUTSHEET INFORMATION, AND CALCULATIONS WHERE APPLICABLE, FOR ANY EQUIPMENT OR DEVICES THAT DIFFER FROM THOSE SPECIFIED ON PROJECT DRAWINGS OR SPECIFICATIONS PRIOR TO THE START OF WORK. ONLY SUBSTITUTIONS THAT REDUCE THE OWNER'S OVERALL INSTALLED COST OR PROVIDE A SUBSTANTIALLY BETTER FINISHED PROJECT WILL BE GRANTED.
- THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS, AND SHALL PAY ALL PERMIT FEES. CONTRACTOR SHALL OBTAIN ALL REQUIRED INSPECTIONS AS REQUIRED BY THE GOVERNING AUTHORITY.
- CONTRACTOR'S WORK SHALL COMPLY WITH ALL SAFETY RELATED WORK PRACTICES DETAILED IN THE LATEST EDITION OF NFPA 70E.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PLANNING HIS OWN WORK AND FOR ANY DAMAGE CAUSED TO THE OWNER OR OTHER CONTRACTORS BY IMPROPER WORK EXECUTION OR PLACEMENT OF RACEWAYS, WIRING, AND EQUIPMENT.
- UNDER NO CIRCUMSTANCES SHALL POWER BE INTERRUPTED TO ANY AREA WITHOUT PRIOR WRITTEN APPROVAL FROM BUILDING MANAGEMENT.
- THE CONTRACTOR SHALL DEVELOP A CLEAR UNDERSTANDING OF, AND SHALL ABIDE BY, ALL OWNER SITE AND SAFETY REQUIREMENTS/PROTOCOL.
- THE ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ALL WORK AS SHOWN ON THE PROJECT DRAWINGS AND SPECIFICATIONS WITH THE FOLLOWING STIPULATION:
 - THE PROJECT DRAWINGS ARE ONLY DIAGRAMMATIC IN NATURE AND ARE INTENDED TO OUTLINE THE BASIC SYSTEMS TO BE PROVIDED. THEREFORE, MINOR DETAILS AND APPURTENANCES MAY OR MAY NOT BE EXPLICITLY SHOWN. THE OMISSION OF A MINOR COMPONENT SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO FURNISH AND INSTALL ALL SUCH ITEMS NECESSARY TO PROVIDE A COMPLETE, OPERATIVE, AND CODE COMPLIANT SYSTEM AS IS INTENDED. IF THERE ARE ANY DOUBTS TO THE EXTENT OR SCOPE OF THE WORK REQUIRED, THE ENGINEER SHALL BE CONTACTED TO PROVIDE CLARIFICATION DURING THE BID PHASE.
 - THE PROJECT DRAWINGS SHOW INTENDED EQUIPMENT LOCATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MINOR ADJUSTMENTS OR RELOCATION NECESSARY DUE TO THE CHOICE OF EQUIPMENT AND COORDINATION CONFLICTS WITH NEW AND EXISTING FACILITIES. ANY SIGNIFICANT EQUIPMENT RELOCATION SHALL BE COORDINATED WITH THE OWNER AND OTHER TRADE CONTRACTORS, AND APPROVED BY THE ENGINEER.
- THE ARCHITECTURAL, MECHANICAL, AND PLUMBING DRAWINGS SHALL GOVERN THE INTENDED LOCATION OF ALL EQUIPMENT REQUIRING ELECTRICAL SERVICE. CONTRACTOR SHALL COORDINATE WITH THE ARCHITECTURAL, MECHANICAL, AND PLUMBING DRAWINGS, AND CONFIRM FINAL LOCATIONS IN FIELD WITH ALL INVOLVED TRADE CONTRACTORS AS REQUIRED.
- REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY. BASE BID ACCORDINGLY.
- REFER TO MECHANICAL AND PLUMBING EQUIPMENT SCHEDULES FOR NAMEPLATE INFORMATION PERTAINING TO ANY MECHANICAL AND PLUMBING EQUIPMENT REQUIRING ELECTRICAL PROVISIONS. CONTRACTOR SHALL COORDINATE ALL SUCH PROVISIONS WITH MECHANICAL AND PLUMBING DRAWINGS AS REQUIRED. BASE BID ACCORDINGLY.
- ALL WORK AND EQUIPMENT IS SHOWN IN ITS APPROXIMATE LOCATION. THE CONTRACTOR SHALL VISIT THE SITE, FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS, AND BASE HIS BID ACCORDINGLY. NO ADDITIONAL COMPENSATION SHALL BE GRANTED FOR THE CONTRACTOR'S FAILURE TO VISIT AND INSPECT THE SITE.
- THE CONTRACTOR SHALL NOT SOLELY RELY ON SCALED DRAWINGS TO OBTAIN REQUIRED DIMENSIONS AND QUANTITIES DURING BIDDING AND CONSTRUCTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD AS REQUIRED.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS, PROCEDURES, AND TECHNIQUES. BY SUBMITTING A PROPOSAL, THE CONTRACTOR AGREES AND WARRANTS THAT HE HAS COMPLETELY EXAMINED THE SITE, EXISTING FACILITIES, THE CONSTRUCTION DOCUMENTS, AND THE NATURE OF THE WORK TO BE PERFORMED. THE OWNER SHALL BE ADVISED OF ANY CONFLICTS IN THE CONTRACT DOCUMENTS DURING THE BID PHASE.
- PROJECT WORK SHALL NOT INTERFERE WITH DAILY OPERATIONS, OR COMPROMISE THE INTEGRITY OF EXISTING FACILITIES AND OPERATIONS AND/OR SERVICES WITHOUT THE OWNER'S PRIOR APPROVAL.
- COORDINATE ALL WORK WITH THAT OF OTHER TRADES AFFECTING, OR AFFECTED BY THE WORK. COOPERATE WITH OTHER TRADES TO ASSURE THE STEADY PROGRESS OF ALL WORK UNDER THIS CONTRACT.
- ARRANGE ALL WORK TO PROCEED AS RAPIDLY AS POSSIBLE IN COOPERATION WITH OTHER TRADES. COOPERATE WITH OTHER TRADES TO HAVE ALL WORK, RACEWAY, WIRING, ETC. INSTALLED AS EFFICIENTLY AS POSSIBLE.
- CONTRACTOR SHALL INSTALL ALL EQUIPMENT WITH WORKING AND DEDICATED EQUIPMENT SPACES PER NEC 110.
- WIRING METHODS SHALL CONFORM WITH NEC 300.

WIRE SIZE AND CONDUIT FILL SCHEDULE FOR 15A & 20A-120, 208 AND 277V, 1Ø CIRCUITS	
NO. OF CIRCUITS	WIRE, SIZE, FILL AND CONDUIT SIZE
1	2-#12, 1-#12G, 3/4" C
2	4-#12, 1-#12G, 3/4" C
3	6-#12, 1-#12G, 3/4" C
4	8-#10, 1-#10G, 3/4" C

IF RUNS EXCEED 100 FEET, AND IF WIRE HAS NOT ALREADY BEEN INCREASED DUE TO CONDUIT FILL DERATING FACTORS, WIRE SIZES IN THIS TABLE SHALL BE INCREASED 1 SIZE FOR EACH 100 LINEAR FEET. OTHER SIZES AND FILL AS NOTED ON DRAWINGS.

- IN UNFINISHED SPACES SUCH AS BOILER ROOM, FAN ROOMS, PIPE SPACES, ETC., LOCATIONS OF CONDUIT AND OUTLETS ARE APPROXIMATE AND SHALL CLEAR PIPING AND ALL OTHER NEW AND EXISTING CONSTRUCTION. ALL OUTLETS MUST BE UNOBSTRUCTED AND EXTENDED AS DIRECTED TO CLEAR ANY INTERFERENCE WITH FIXTURES, PIPING EQUIPMENT, ETC. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL COORDINATE HIS LAYOUT OF ELECTRICAL EQUIPMENT WITH EXISTING FIELD CONDITIONS, AND ALL INVOLVED TRADE WORK.
- UNLESS OTHERWISE INDICATED ON THE PLANS, CONDUIT SHALL NOT BE ROUTED ON EXTERIOR WALLS. ALL CONDUITS FEEDING EXTERIOR UTILIZATION EQUIPMENT MOUNTED ON OR ADJACENT TO BUILDING WALLS SHALL BE RUN INSIDE THE BUILDING.
- ALL CONDUIT TERMINATING AT MOTORS, SOLENOID VALVES, VIBRATING DEVICES, DUCT AND PIPE MOUNTED SWITCHES AND DEVICES SHALL TERMINATE WITH COATED, LIQUID-TIGHT FLEXIBLE METAL CONDUIT (LFMC) UNLESS OTHERWISE INDICATED OR INTENDED. LFMC SHALL BE SUPPLIED AND INSTALLED PER NEC 350.
- UNLESS OTHERWISE INDICATED ON THE DRAWINGS, OR IN THE PROJECT SPECIFICATIONS, ALL CONDUIT SHALL BE 3/4" MINIMUM SIZE. A NYLON DRAG LINE AND CONDUIT CAP SHALL BE PROVIDED FOR ALL EMPTY CONDUITS.
- PROVIDE INSULATING BUSHINGS FOR CONDUCTOR PROTECTION AT ALL CONDUIT TERMINATIONS.
- PROVIDE ANY AND ALL ROOF PENETRATIONS IN A MANNER APPLICABLE FOR THE ROOFING SYSTEM, AND IN A MANNER THAT MAINTAINS ANY EXISTING ROOF WARRANTY.
- ALL ANNULAR SPACES AROUND EQUIPMENT PENETRATIONS SHALL BE SEALED WITH A "3M" FIRE BARRIER CP 25WB+ CAULK, OR APPROVED EQUIVALENT. PENETRATIONS SHALL BE PREPARED AND SEALED PER CALLING MANUFACTURER'S INSTRUCTIONS TO MAINTAIN THE MAXIMUM FIRE RESISTANCE RATINGS.
- THE MEANS AND METHODS OF CONSTRUCTION SHALL INCLUDE ALL MISCELLANEOUS JUNCTION BOXES, CONDUIT, AND/OR RACEWAY EXTENSIONS AND APPURTENANCES RECEIVED REGARDLESS OF WHETHER OR NOT THEY ARE EXPLICITLY SHOWN ON THE DRAWINGS. THE CONTRACTOR IS AT LIBERTY TO DISCOUNT THE USE OF EXPLICITLY SHOWN JUNCTION AND/OR PULL BOXES TO OPTIMIZE HIS OVERALL MEANS AND METHODS OF CONSTRUCTION AS LONG AS SUCH ACTION MAINTAINS THE INTENT OF THE DESIGN, IS IN STRICT ACCORDANCE WITH APPLICABLE SECTIONS OF THE LATEST EDITION OF NEC, AND AT NO EXTRA COST TO THE OWNER.
- ALL EQUIPMENT SHALL BE LISTED FOR THE ENVIRONMENT FOR WHICH THEY ARE INSTALLED IN. UNLESS OTHERWISE INDICATED, ALL OUTDOOR EQUIPMENT ENCLOSURES AND JUNCTION BOXES SHALL BE NEMA 3R (MINIMUM), AND SHALL BE TIGHTLY GASKETED FOR A DUST-TIGHT AND WEATHER-TIGHT INSTALLATION AS INTENDED. FINAL INSTALLATION OF ENCLOSURES AND RACEWAY INTERCONNECTIONS SHALL EFFECTIVELY MITIGATE THE MIGRATION OF MOISTURE DUE TO CONDENSATION, AND SHALL NOT DEGRADE THE LISTED/LABELED NEMA INTEGRITY OF ANY NEW AND/OR EXISTING EQUIPMENT.
- ALL EXTERIOR, 120V, CONVENIENCE POWER RECEPTACLES SHALL BE GFCI-PROTECTED AND MOUNTED IN AN IN-USE WEATHERPROOF ENCLOSURE AS REQUIRED.
- PROVIDE MOUNTING FRAMES AND STRUCTURAL SUPPORT FROM PLATFORMS, FLOORS, WALLS, AND STRUCTURAL STEEL AS REQUIRED FOR ALL ELECTRICAL EQUIPMENT (INCLUDED HOWEVER NOT NECESSARILY LIMITED TO RACEWAY, CONDUIT, TRANSFORMERS, SWITCHES AND PANELS). STRUCTURAL SUPPORT SYSTEMS SHALL MAINTAIN A SAFETY FACTOR OF 4 WITH A 200 LB MINIMUM.
- UNLESS OTHERWISE INDICATED OR SPECIFICALLY SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL NOT FASTEN ANY EQUIPMENT AND/OR MATERIALS FROM ROOF DECKING. CONTRACTOR SHALL SUPPORT EQUIPMENT AND MATERIAL FROM STRUCTURAL BEAMS. IF NECESSARY, CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT STEEL ON METAL TO ATTACH TO BEAMS.
- THE INTENT OF THE DEMOLITION AND/OR RELOCATION WORK REQUIREMENTS INCLUDE ALL LABOR AND EQUIPMENT REQUIRED TO ATTAIN THE FINAL CONDITIONS AS SHOWN ON THE ARCHITECTURAL, MECHANICAL, PLUMBING, STRUCTURAL, TEMPERATURE CONTROL, AND/OR ELECTRICAL DRAWINGS. THE CONTRACTOR SHALL REVIEW ALL OTHER TRADE DRAWINGS, AND COORDINATE WITH ALL OTHER TRADE CONTRACTORS, AND BASE HIS BID ACCORDINGLY.
- THE CONTRACTOR SHALL DISPOSE OF ALL DEMOLISHED EQUIPMENT AND CONSTRUCTION DEBRIS OFFSITE UNLESS OTHERWISE DIRECTED BY THE OWNER OR OWNER'S CONSTRUCTION REPRESENTATIVE.
- CONTRACTOR SHALL COORDINATE STORAGE OF MATERIAL, DUMPSTERS, AND PARKING WITH THE OWNER PRIOR TO MOBILIZATION.
- CONTRACTOR SHALL PROVIDE PROTECTION FOR THE OWNER AND CONSTRUCTION WORKERS IN AND AROUND THE ACTIVE CONSTRUCTION AREA(S). ADEQUATE BARRIERS AND SIGNAGE SHALL BE PROVIDED TO EXERCISE CONTROL OF SAFE INGRESS AND EGRESS OF PREMISES. FIRE EXITS SHALL AT NO TIME BE BLOCKED.
- ANY OPENINGS CREATED DURING CONSTRUCTION FROM DEMOLITION OR PREPARATION OF NEW EQUIPMENT SHALL BE TEMPORARILY CLOSED UNTIL THE OPENING IS SEALED OR THE EQUIPMENT IS INSTALLED.
- PRIOR TO THE COMMENCEMENT OF WORK, ELECTRICAL POWER SHALL BE DISCONNECTED AND/OR SAFFED OFF AS REQUIRED, AND TO THE EXTENT REQUIRED TO SAFELY COMPLETE THE CONTRACT WORK, PROVIDE TEMPORARY CONSTRUCTION LIGHTING AND POWER AS REQUIRED BY ALL TRADES. PROVIDE RECONNECTIONS AND TEMPORARY INSTALLATIONS AS REQUIRED. REMOVE ALL TEMPORARY FACILITIES AT JOB COMPLETION.
- CONTRACTOR IS RESPONSIBLE FOR DAILY SITE CLEANING FOR THEIR ACTIVITIES. BROOM CLEAN DAILY AND REMOVE ALL CONSTRUCTION DEBRIS FROM THE BUILDING AND GROUNDS DAILY, OR AS AGREED TO WITH OWNER.
- THE CONTRACTOR SHALL PATCH ALL DISTURBED AREAS OF EXISTING FACILITIES TO A CONDITION EQUAL TO OR BETTER THAN SIMILAR ADJACENT AREAS.
- PROVIDE TYPED ELECTRICAL LABELING AND IDENTIFICATION AS REQUIRED. MODIFY EXISTING PANEL SCHEDULES TO REFLECT THE AS-BUILT CIRCUITING. LABEL ALL NEW ELECTRICAL EQUIPMENT AND PANELS WITH MINIMUM 1/2" LETTERS USING A PERMANENT THERMAL TRANSFER LABEL SYSTEM.
- BEFORE ENERGIZING OR STARTING ANY DEVICE OR PIECE OF EQUIPMENT, VERIFY THAT IT HAS BEEN INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. ADHERE TO ALL MANUFACTURER'S GUIDELINES AND START-UP REQUIREMENTS.

ELECTRICAL PROJECT DEMOLITION NOTES:

- PRIOR TO SUBMITTING A PROPOSAL, THE ELECTRICAL CONTRACTOR SHALL VISIT AND CAREFULLY INVESTIGATE THE EXISTING AREAS AFFECTED BY THIS WORK IN ORDER TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. THE CONTRACTOR SHALL SUBMIT A PROPOSAL, INCLUDING A SUBMISSION OF THE PROPOSAL WILL BE CONSTRUED AS CONFIRMATION THAT A THOROUGH EXAMINATION OF THE SITE HAS BEEN MADE BY THE CONTRACTOR. LATER CLAIMS FOR UNFORESEEN EXTRA LABOR, EQUIPMENT OR MATERIALS WILL NOT BE ACCEPTED IF SAID CLAIM(S) COULD HAVE BEEN FORESEEN DURING THE SITE INVESTIGATION.
- CONTRACTOR'S WORK SHALL COMPLY WITH ALL SAFETY RELATED WORK PRACTICES DETAILED IN THE LATEST EDITION OF NFPA 70E.
- THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL ELECTRICAL FACILITIES RENDERED INACTIVE OR OBSOLETE BY THE SCOPE OF THE ARCHITECTURAL, MECHANICAL, AND PLUMBING DEMOLITION WORK. THE CONTRACTOR IS ALERTED THAT SUCH ELECTRICAL FACILITIES MAY NOT BE EXPLICITLY SHOWN ON THE ELECTRICAL DEMOLITION DRAWINGS. THE CONTRACTOR SHALL VISIT THE SITE, REFER TO THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS, AND COORDINATE WITH THE GENERAL, MECHANICAL, AND PLUMBING CONTRACTOR(S), AND INCLUDE ALL ELECTRICAL DEMOLITION WORK INCLUDING, BUT NOT LIMITED TO, THE COMPLETE REMOVAL OF ALL ELECTRICAL AND CONTROL WIRES, CONDUIT, JUNCTION BOXES, ENCLOSURE AND RACEWAY SUPPORT SYSTEMS, DISCONNECT SWITCHES, CIRCUIT BREAKERS ETC. INTENDED FOR REMOVAL AS REQUIRED TO COMPLETE THE WORK.
- THE INTENT OF THE DEMOLITION WORK REQUIREMENTS INCLUDE ALL LABOR AND EQUIPMENT REQUIRED TO ATTAIN THE FINAL CONDITIONS AS SHOWN ON THE ARCHITECTURAL, MECHANICAL, PLUMBING, STRUCTURAL, TEMPERATURE CONTROL, AND ELECTRICAL NEW WORK PLANS. THE CONTRACTOR SHALL REVIEW ALL OTHER TRADE DRAWINGS, AND COORDINATE WITH ALL OTHER TRADE CONTRACTORS, AND BASE HIS BID ACCORDINGLY.
- WHERE THE REMOVAL OF EXISTING FACILITIES RESULT IN THE DENERGIZATION OF EXISTING REMAINING FACILITIES, THE CONTRACTOR SHALL INSTALL JUNCTION BOXES AND/OR OTHER DEVICES, AND PROVIDE BYPASS CONNECTIONS NECESSARY TO MAKE THE AFFECTED CIRCUITS CONTINUOUS AND READY FOR OPERATION OR AS OTHERWISE INDICATED OR INTENDED.
- THE CONTRACTOR SHALL REMOVE AND/OR RELOCATE ALL EXISTING ELECTRICAL FACILITIES THAT INTERFERE WITH THE NEW ARCHITECTURAL, MECHANICAL, PLUMBING, STRUCTURAL, AND ELECTRICAL LAYOUTS AND SCHEMES. REFER TO THE ARCHITECTURAL, MECHANICAL, PLUMBING AND STRUCTURAL DRAWINGS, AND COORDINATE WITH THE ARCHITECTURAL, MECHANICAL, PLUMBING AND TEMPERATURE CONTROL CONTRACTORS.
- PRIOR TO THE COMMENCEMENT OF WORK, ELECTRICAL POWER SHALL BE DISCONNECTED AND/OR SAFFED OFF AS REQUIRED. TEMPORARY LIGHTING AND POWER FOR ALL TRADES, REMAINING BUILDING OCCUPANTS, AND CRITICAL BUILDING SERVICES SHALL BE PROVIDED AS REQUIRED WITHOUT EXCEPTION. UNDER NO CIRCUMSTANCES SHALL POWER BE INTERRUPTED TO ANY AREA WITHOUT PRIOR WRITTEN APPROVAL FROM BUILDING MANAGEMENT.
- TEMPORARY LIGHT STREAMERS, WHERE SPLICED, ARE TO EMPLOY COMPRESSION-TYPE FITTINGS OR SOLDERED CONNECTIONS, AND MADE UP NEATLY AND SAFELY AS REQUIRED.
- MAINTAIN CONTINUOUS ELECTRICAL SERVICE TO ALL ACTIVE AREAS AT ALL TIMES EXCEPT WHERE GIVEN WRITTEN PERMISSION BY BUILDING/PROPERTY MANAGEMENT FOR A SCHEDULED OUTAGE FOR A DECLARED OUTAGE DURATION.
- REMOVE EXPOSED CONDUITS, WIRE WAYS, OUTLET BOXES, HANGERS, SUPPORTS AND DEVICES MADE OBSOLETE BY THIS WORK UNLESS BEING REUTILIZED FOR THE NEW INSTALLATION. THE REUTILIZATION OF EXISTING FACILITIES BY THE CONTRACTOR SHALL RENDER A FINISHED INSTALLATION IN STRICT ACCORDANCE WITH THE NEC WITHOUT EXCEPTION.
- ALL ADJACENT FACILITIES IMPACTED OR TEMPORARILY DISCONNECTED TO FACILITATE DEMOLITION WORK SHALL BE RECONNECTED AND RESTORED TO A CONDITION EQUAL TO OR BETTER THAN ORIGINALLY FOUND PRIOR TO THE COMMENCEMENT OF WORK. WHERE EXISTING CONDITIONS DO NOT MEET NEC REQUIREMENTS, THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK.
- PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL TRACE EXISTING CIRCUITS AND CONFIRM OR IDENTIFY TYPE AND LOCATION OF LOAD SERVED.
- WHERE EXISTING ELECTRICAL PANELS ARE CALLED FOR REMOVAL AND OR REPLACEMENT, THE CONTRACTOR SHALL REMOVE ALL SERVING FEEDER WIRE AND CONDUIT BACK TO ITS RESPECTIVE SOURCE OF POWER OR AS OTHERWISE INDICATED.
- ALL OPEN FLOOR OUTLETS SHALL BE CAPPED WITH WALKER PARKERSBURG DUCT BLANKING PLATE NO. 1043-S (OR APPROVED EQUAL). ANY AND ALL PANEL, ENCLOSURE OR EQUIPMENT TERMINAL BOX COMPARTMENTS WITH UNOCCUPIED KNOCKOUT, RACEWAY OR CABLE ASSEMBLY PENETRATIONS SHALL BE PLUGGED WITH A LISTED DEVICE. ANY AND ALL UNOCCUPIED BREAKER SPACES IN EXISTING AND/OR NEW PANELS SHALL BE PLUGGED WITH A LISTED DEVICE OR FURNISHED WITH A SPARE, OPERABLE CIRCUIT BREAKER LISTED FOR USE IN THE PANEL. PROVIDE LISTED PLATES ON ALL UNUSED OUTLET AND JUNCTION BOXES.
- ELECTRIC PANEL COVERS ARE NOT TO BE LEFT OFF AT ANY TIME UNLESS MEN ARE WORKING ON, ADEQUATELY PROTECTING AND BARRICADING THEM AS REQUIRED. COVERS SHALL BE REPLACED EACH NIGHT BEFORE LEAVING JOB SITE.

- REMOVE AND PROPERLY DISPOSE OF ALL REMOVALS IN ACCORDANCE WITH APPLICABLE LAWS AND ENVIRONMENTAL REGULATIONS UNLESS OTHERWISE REQUESTED OR DIRECTED BY THE BUILDING PROPERTY MANAGER.
- THE REMOVAL AND/OR RELOCATION OF ALL FIRE ALARM, COMMUNICATIONS, DATA AND SECURITY EQUIPMENT, AND ASSOCIATED CABLING SHALL BE COORDINATED WITH BUILDING OPERATING PERSONNEL. EXISTING BASE BUILDING FIRE ALARM SYSTEM (AND FLOOR SECURITY SYSTEMS WHERE APPLICABLE) INTEGRITY SHALL BE MAINTAINED AT ALL TIMES BEFORE, DURING AND AFTER DEMOLITION.
- CONTRACTOR SHALL PERFORM THE FOLLOWING PRIOR TO THE START OF ANY TRADES DEMOLITION:
 - TRACE ALL INCOMING AND OUTGOING FEEDS (LOW VOLTAGE AND HIGH VOLTAGE) AS WELL AS LIGHTING CIRCUITS BACK TO THEIR ORIGINAL SOURCE OF POWER (I.E. SWITCHBOARDS, PANELBOARDS, ETC.)
 - IDENTIFY ALL CONDUITS, CABLES, ETC. WITH CLEARLY IDENTIFIABLE MARKINGS. IDENTIFICATION SHALL BE PROVIDED FROM EACH LOAD TO THE MOST UPSTREAM SOURCE PANEL. IDENTIFICATION SHALL BE PROVIDED AT ALL JUNCTION AND PULL BOXES, TERMINATION/SPLICE, AND PANEL LOCATIONS AS REQUIRED.
 - REVIEW LOCATIONS, CONFIGURATION AND SERVICE AREAS OF ALL FEEDER AND BRANCH CIRCUIT POWER SOURCES INCLUDING CONSTRUCTION MANAGER/GENERAL CONTRACTOR SO AS TO ENSURE SERVICES WILL REMAIN SERVICED OR INTERRUPTED AS ANTICIPATED. REFER TO EXISTING BUILDING RECORD DRAWINGS PRIOR TO COMMENCEMENT OF WORK.
 - COORDINATE ALL WORK WITH BUILDING/PROPERTY MANAGEMENT.
 - EXISTING ELECTRICAL EQUIPMENT/FACILITIES WHEN REUSED, SHALL BE THOROUGHLY CLEANED AND REFORMED PRIOR TO REUSE. ANY AND ALL EXISTING REUSED SET SCREW-TYPE CONDUIT CONNECTORS SHALL BE THOROUGHLY TIGHTENED.

FIRE ALARM NOTES:

- PROVIDE AN EXPANDED FIRE ALARM SYSTEM AS SHOWN ON CONTRACT DRAWINGS. SYSTEM SHALL BE DESIGNED, INSTALLED, AND TESTED IN ACCORDANCE WITH THE GOVERNING EDITION OF THE INTERNATIONAL BUILDING CODE AND THE GOVERNING ADDITION OF NFPA 72.
- FIRE ALARM CONTRACTOR SHALL PROVIDE A FIRE ALARM SYSTEM FOR THE BUILDING AS INDICATED. SCOPE OF WORK SHALL INCLUDE BUT MAY NOT BE LIMITED TO THE FOLLOWING:
 - PROVIDE MAIN AND REMOTE FIRE ALARM CONTROL PANELS AS REQUIRED. PROVIDE NEW ZONES, NEW CONTACTS, ADDITIONAL POWER SUPPLIES AND ALL OTHER ACCESSORIES FOR A COMPLETE AND OPERATIONAL SYSTEM.
 - PROVIDE ALL ALARMING DEVICES AND DEVICE CABLING AS REQUIRED.
 - PROVIDE MANUAL PULL STATIONS AS REQUIRED.
 - PROVIDE BATTERY BACKUP AS REQUIRED BY NFPA 72. DURATION OF BACKUP AS DICTATED BY CODE.
 - PROVIDE ALL NECESSARY RELAYS, WIRING, ALARMING DEVICES, PROGRAMMING, ETC FOR A FULLY FUNCTIONAL SYSTEM.
- FIRE ALARM CONTRACTOR SHALL PROVIDE SHALL SUBMIT THE FOLLOWING INFORMATION TO THE AUTHORITY HAVING JURISDICTION FOR REVIEW AND APPROVAL PRIOR TO PURCHASING MATERIALS AND PRIOR THE START OF WORK:
 - A FLOOR PLAN WITH THE LOCATIONS OF ALL ALARM-INITIATING AND NOTIFICATION APPLIANCES.
 - ALARM CONTROL AND TROUBLE SHOOTING EQUIPMENT.
 - SIZES OF CONDUCTORS AND TYPE OF WIRING.
 - VOLTAGE DROP AND BATTERY CALCULATIONS.
 - MANUFACTURER, MODEL NUMBER, AND LISTING INFORMATION FOR EQUIPMENT, DEVICES AND MATERIALS.
 - INTERFACE OF FIRE SAFETY AND CONTROL FUNCTIONS.
- REFER TO FIRE ALARM PLANS FOR PRELIMINARY STROBE AND HORN LOCATIONS, AND FOR PRELIMINARY STROBE AND HORN RATINGS.
- REFER TO MECHANICAL DRAWINGS FOR QUANTITIES AND LOCATIONS OF ALL FIRE ALARM DEVICES ASSOCIATED WITH MECHANICAL SYSTEMS, SMOKE/FIRE DAMPERS, AND THE SEQUENCE OF OPERATION FOR ROOF TOP UNIT AND EXHAUST FAN SHUTDOWN AND DAMPER OPERATION.
- REFER TO FIRE PROTECTION AND/OR PLUMBING DRAWINGS FOR QUANTITIES AND LOCATIONS OF ALL FIRE ALARM DEVICES ASSOCIATED WITH THE FIRE PROTECTION SYSTEM.
- PROVIDE CONNECTIONS TO ELEVATOR EQUIPMENT AS REQUIRED FOR ELEVATOR SHUTDOWN AND RECALL AS REQUIRED.
- COORDINATE ALL TESTING REQUIREMENTS WITH OWNER AND AUTHORITY HAVING JURISDICTION. A MINIMUM OF 3 DAYS NOTICE SHALL BE GIVEN TO ALL PARTIES WHICH WILL BE PRESENT DURING THE TESTING PROCESS.
- PROVIDE ALL STROBE SYNCHRONIZATION DEVICES. STROBES SHALL BE SYNCHRONIZED BY FLOOR.
- FIRE ALARM SYSTEM SHALL BE CAPABLE OF FUTURE EXPANSION FOR FULL USE OF THE BUILDING AS INTENDED.

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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118



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MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

JOSEPH J. HENDERSON, PE
NJ License No. 36488

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1004 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-378-0088 FAX: 973-378-1081
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL GENERAL NOTES

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JHH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

SYMBOL LEGEND

POWER AND LIGHTING		POWER AND LIGHTING (CONTINUED)		POWER AND LIGHTING (CONTINUED)		MISCELLANEOUS (CONTINUED)	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	BRANCH CIRCUIT HOME RUN TO PANELBOARD OR SWITCHBOARD. NO. OF ARROWS DENOTES NO. OF CIRCUITS. GROUND CONDUCTOR MUST BE PROVIDED FOR ALL BRANCH CIRCUITS. P - INDICATES PANEL CN - INDICATES CIRCUIT NUMBER(S) XA - WHEN USED DENOTES OVERCURRENT DEVICE AMPERE TRIP RATING XP - WHEN USED DENOTES NUMBER OF OVERCURRENT DEVICES ZV - WHEN USED DENOTES SUPPLY SYSTEM VOLTAGE YA - WHEN USED DENOTES VOLT-AMPERE LOAD LOC - WHEN USED DENOTES ISOLATED GROUND REQUIRED		AIR CONDITIONING DISCONNECT SWITCH AS REQUIRED. RATED AS SHOWN ON DRAWINGS (EG. 30/30/3 INDICATES 30-AMP SWITCH, 30-AMP FUSES, 3-POLE). PROVIDED WITH INTEGRAL 20A GFI SERVICE RECEPTACLE. INSTALLED IN NEMA-1 ENCLOSURE UNLESS OTHERWISE NOTED. SUBSCRIPT "WP" INDICATES WEATHERPROOF (NEMA-3R ENCLOSURE).		BELL TRANSFORMER		CARD READER (BY SECURITY VENDOR). PROVIDE 3/4" C AND DRAGLINE FROM ACCESS CARD SYSTEM PANEL TO JBOX IN AN ACCESSIBLE LOCATION AHC. COORDINATE EXACT LOCATION WITH SECURITY VENDOR AND HOOKUP TO DOOR CONTROL EQUIPMENT. REFER TO ELECTRICAL DETAILS FOR ADDITIONAL INFORMATION.
	INTERMEDIATE BRANCH CIRCUIT WIRING WHERE SHOWN, NUMBER OF TIC MARKS INDICATES THE QUANTITY OF CURRENT CARRYING CONDUCTORS.		MAGNETIC CONTACTOR RATED AND AS SHOWN ON THE DRAWINGS.		DOOR CHIME		CARD READER & KEY PAD (BY SECURITY VENDOR). PROVIDE 3/4" C AND DRAGLINE FROM ACCESS CARD SYSTEM PANEL TO JBOX IN AN ACCESSIBLE LOCATION AHC. COORDINATE EXACT LOCATION WITH SECURITY VENDOR AND HOOKUP TO DOOR CONTROL EQUIPMENT. REFER TO ELECTRICAL DETAILS FOR ADDITIONAL INFORMATION.
	SINGLE WALL POWER RECEPTACLE		COMBINATION NON-FUSIBLE DISCONNECT SWITCH/MOTOR STARTER W/ OVERLOAD PROTECTION AND AUTO/OFF/HAND SELECTOR SWITCH OR START/STOP CONTROL STATION AS NOTED. DISCONNECT SWITCH RATED AS SHOWN ON DRAWINGS (EG. 30/30/3 INDICATES 30-AMP SWITCH, 3-POLE W/ 30-AMP FUSES). STARTER TYPE SHALL BE SELECTED AS DIRECTED IN MECHANICAL DRAWINGS. STARTER AND OVERLOAD SIZES SHALL BE SELECTED ACCORDING TO MOTOR HORSEPOWER RATING. INSTALLED IN NEMA-1 ENCLOSURE U.O.N. SUBSCRIPT "WP" INDICATES WEATHERPROOF (NEMA-3R ENCLOSURE).		DOOR CHIME PUSHBUTTON, INCHES INDICATES HEIGHT ABOVE FINISHED GRADE TO THE CENTER OF THE DEVICE.		SECURITY CAMERA (BY SECURITY VENDOR). PROVIDE 3/4" C AND DRAGLINE FROM ACCESS SECURITY SYSTEM PANEL TO JBOX IN AN ACCESSIBLE LOCATION AHC. COORDINATE EXACT LOCATION WITH SECURITY VENDOR.
	SINGLE WALL POWER RECEPTACLE - ABOVE COUNTER		COMBINATION FUSIBLE DISCONNECT SWITCH/MOTOR STARTER W/ OVERLOAD PROTECTION AND AUTO/OFF/HAND SELECTOR SWITCH OR START/STOP CONTROL STATION AS NOTED. DISCONNECT SWITCH RATED AS SHOWN ON DRAWINGS (EG. 30/30/3 INDICATES 30-AMP SWITCH, 3-POLE W/ 30-AMP FUSES). STARTER TYPE SHALL BE SELECTED AS DIRECTED IN MECHANICAL DRAWINGS. STARTER AND OVERLOAD SIZES SHALL BE SELECTED ACCORDING TO MOTOR HORSEPOWER RATING. INSTALLED IN NEMA-1 ENCLOSURE U.O.N. SUBSCRIPT "WP" INDICATES WEATHERPROOF (NEMA-3R ENCLOSURE).		THERMOSTAT		EMERGENCY EXIT SIGN
	SINGLE CEILING POWER RECEPTACLE		MOLDED CASE CIRCUIT BREAKER 3 POLE UNLESS OTHERWISE NOTED X AF - INDICATES AMPERE FRAME SIZE X AT - INDICATES AMPERE TRIP SIZE MANUF - BASIS-OF-DESIGN MANUFACTURER MOD - BASIS-OF-DESIGN MODEL NUMBER KAIC - SYMMETRICAL INTERRUPTING RATING		FIRE ALARM CONTROL PANEL		CENTER LINE
	DUPLEX WALL POWER RECEPTACLE		NON-FUSIBLE DISCONNECT SWITCH 3 POLE UNLESS OTHERWISE NOTED X AS - INDICATES SWITCH AMPERE RATING		FIRE COMMAND CENTER		EXISTING CONSTRUCTION & EQUIPMENT
	DUPLEX FLOOR POWER RECEPTACLE		FUSIBLE DISCONNECT SWITCH 3 POLE UNLESS OTHERWISE NOTED X AS - INDICATES SWITCH AMPERE RATING X AF - INDICATES FUSE AMPERE RATING		DIGITAL GATHERING PANEL		EXISTING TO BE REMOVED
	DUPLEX CEILING POWER RECEPTACLE		FUSE RATED AS SHOWN ON DRAWINGS (EG. 30AF INDICATES 30-AMP FUSE AMPERE RATING)		DIGITAL ALARM COMMUNICATOR TRANSMITTER		NEW WORK
	DUPLEX POWER RECEPTACLE - MOUNTED WITHIN SURFACE RACEWAY		WIRE TROUGH/SPLICE BOX. SIZE AS REQUIRED TO MEET CODE REGULATIONS		REMOTE POWER SUPPLY		BREAK
	QUAD WALL POWER RECEPTACLE		DISTRIBUTION TRANSFORMER. RATING AS NOTED IN DRAWINGS. SUBSCRIPT INDICATES TRANSFORMER DESIGNATION		REMOTE/SIGNALING/TEST STATION		END CAP
	QUAD FLOOR POWER RECEPTACLE		3-PHASE SECONDARY WYE-CONNECTION (GROUNDED)		REMOTE FIRE ALARM SYSTEM ANNUNCIATOR		CONNECT TO EXISTING
	QUAD CEILING POWER RECEPTACLE		CURRENT ELECTRODE		FUSE CUTOFF PANEL		REMOVE FROM EXISTING
	DUPLEX POWER RECEPTACLE - MOUNTED WITHIN SURFACE RACEWAY		GROUND TRANSFORMER. SUBSCRIPT DENOTES QUANTITY		MANUAL PULL STATION WITH INTEGRAL ADDRESSABLE MODULE.		PIPE/CONDUIT PITCH
	QUAD WALL POWER RECEPTACLE - SPLIT WIRED		KILOWATT HOUR METER. "UM" DENOTES UTILITY METER, "SM" DENOTES SUBMETER.		ADA COMPLIANT AUDIBLE ALARM NOTIFICATION APPLIANCE. (Y - MIN. UL dBA RATINGS)		DIRECTION OF FLOW
	QUAD FLOOR POWER RECEPTACLE - SPLIT WIRED		UTILIZATION EQUIPMENT MOTOR, NUMBER INDICATES HORSE POWER RATING.		ADA COMPLIANT VISUAL ALARM NOTIFICATION APPLIANCE. (X - MIN. UL CANDELA RATINGS)		PIPE/CONDUIT BREAK DOUBLE LINE
	QUAD CEILING POWER RECEPTACLE - SPLIT WIRED		SINGLE POLE AC TOGGLE SWITCH - (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. SUBSCRIPT "K" WHEN USED DENOTES KEY-TYPE SWITCH.		ADA COMPLIANT COMBINATION AUDIBLE AND VISUAL ALARM NOTIFICATION APPLIANCE. (X - MIN. UL CANDELA RATINGS) (Y - MIN. UL dBA RATINGS)		WORK NOTE
	QUAD POWER RECEPTACLE - MOUNTED WITHIN SURFACE RACEWAY		THREE WAY AC TOGGLE SWITCH - (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. SUBSCRIPT "K" WHEN USED DENOTES KEY-TYPE SWITCH.		ADDRESSABLE AREA SMOKE DETECTOR. SUBSCRIPT "B/A" WHEN USED DENOTES TWO DETECTORS, ONE LOCATED BELOW FINISHED CEILING AND ONE ABOVE FINISHED CEILING. SUBSCRIPT "A" WHEN USED DENOTES DETECTOR ABOVE FINISHED CEILING. SUBSCRIPT "B" WHEN USED DENOTES DETECTOR BELOW FINISHED CEILING.		REVISION CLOUD (AREA OF CHANGE)
	STRAIGHT BLADE, 2-POLE, 3-WIRE, 15/20 AMP (PER BRANCH CIRCUIT AMPACITY), 125-VOLT, NEMA 5-20R.		SPECIAL PURPOSE SWITCH - FLUSH MOUNTED, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION, AS SPECIFIED OR INDICATED ON THE DRAWINGS.		ADDRESSABLE AREA HEAT DETECTOR. SUBSCRIPT "B/A" WHEN USED DENOTES TWO DETECTORS, ONE LOCATED BELOW FINISHED CEILING AND ONE ABOVE FINISHED CEILING. SUBSCRIPT "A" WHEN USED DENOTES DETECTOR ABOVE FINISHED CEILING. SUBSCRIPT "B" WHEN USED DENOTES DETECTOR BELOW FINISHED CEILING.		REVISION NUMBER
	SUBSCRIPT "WP" - INDICATES WEATHERPROOF ENCLOSURE W/ WEATHERPROOF LIFT COVER PLATE.		MULTI-SERVICE POWER POLE - SEPARATE POWER AND DATA COMPARTMENTS, WITH POWER AND DATA RECEPTACLES AS SHOWN ON THE DRAWINGS OR AS OTHERWISE REQUIRED.		PHOTOELECTRIC TYPE ADDRESSABLE (OR WITH ADDRESSABLE MODULE) DUCT SMOKE DETECTOR (S - SUPPLY, R - RETURN, X - SERVING EQUIPMENT, Y - CONTROL VOLTAGE)		SECTION CUT
	SUBSCRIPT "OF" - INDICATES WITH CLASS 'A' GROUND FAULT CIRCUIT INTERRUPTER.		MULTI-SERVICE POWER POLE - SEPARATE POWER AND DATA COMPARTMENTS, WITH TELE/DATA STUB AND FLEXIBLE FURNITURE SERVICE WHIPS AS REQUIRED. (N) WHEN USED DENOTES NUMBER OF INDIVIDUAL CUBICLES SERVED, FLUSH-MOUNTED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION.		COMBINATION SMOKE/FIRE DAMPER (S - SUPPLY, R - RETURN, X - SERVING EQUIPMENT, Y - CONTROL VOLTAGE)		SECTION LINE
	SUBSCRIPT "HG" - INDICATES UNIT SHALL BE LISTED AS HOSPITAL GRADE.		MULTI-SERVICE MODULAR FURNITURE WALL BOX - SEPARATE POWER AND DATA COMPARTMENTS, WITH TELE/DATA STUB AND FLEXIBLE FURNITURE SERVICE WHIPS AS REQUIRED. (N) WHEN USED DENOTES NUMBER OF INDIVIDUAL CUBICLES SERVED, FLUSH-MOUNTED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION.		SMOKE DAMPER (S - SUPPLY, R - RETURN, X - SERVING EQUIPMENT, Y - CONTROL VOLTAGE)		DRAWING/DETAIL TITLE
	SUBSCRIPT "TR" - INDICATES UNIT SHALL BE LISTED AS TAMPER RESISTANT.		MULTI-SERVICE MODULAR FURNITURE FLOOR BOX - SEPARATE POWER AND DATA COMPARTMENTS, WITH TELE/DATA STUB AND FLEXIBLE FURNITURE SERVICE WHIPS AS REQUIRED. (N) WHEN USED DENOTES NUMBER OF INDIVIDUAL CUBICLES SERVED, FLUSH-MOUNTED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION.		FIRE PROTECTION SYSTEM TAMPER SWITCH (PROVIDED BY OTHERS)		DIAMETER
	SUBSCRIPT "SW" - INDICATES SWITCHED (CONTROLLED) OUTLET.		JUNCTION BOX - WALL MOUNTED - "WP" INDICATES WEATHERPROOF ENCLOSURE W/ WEATHERPROOF LIFT COVER PLATE. SUBSCRIPT "CG" DENOTES CEILING MOUNTED. SUBSCRIPT "FLR" DENOTES FLOOR MOUNTED. SUBSCRIPT "XP" INDICATES EXPLOSION-PROOF. # SUBSCRIPT WHEN USED DENOTES PANEL AND/OR CIRCUIT NUMBER.		FIRE PROTECTION SYSTEM FLOW SWITCH (PROVIDED BY OTHERS)		
	SUBSCRIPT "FM" - INDICATES FURNITURE MOUNTED (COORDINATE WITH FURNITURE VENDOR).		EQUIPMENT TERMINAL BOX/BLOCK. XX WHEN USED, DENOTES REFERENCE TO SPECIFIC EQUIPMENT, ABBREVIATION, NEMA CONFIGURATION, OR EQUIPMENT SCHEDULE DESIGNATION. REFER TO MECHANICAL AND PLUMBING EQUIPMENT SCHEDULES IN MECHANICAL AND PLUMBING DRAWINGS FOR EQUIPMENT DESIGNATIONS AND CHARACTERISTICS. # SUBSCRIPT WHEN USED DENOTES PANEL AND/OR CIRCUIT NUMBER.		ADDRESSABLE INTERFACE MODULE		
	SUBSCRIPT "IG" - INDICATES ISOLATED GROUND.		SINGLE POLE AUTOMATIC WALL SENSOR SWITCH - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC. (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF). "VS" SUPERSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.		ADDRESSABLE CONTROL MODULE		
	SUBSCRIPT "DED" - INDICATES DEDICATED CIRCUIT.		THREE WAY AUTOMATIC WALL SENSOR DIMMER - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC. (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF). "VS" SUPERSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.		ADDRESSABLE RELAY MODULE		
	SUBSCRIPT "USB" - INDICATES UNIT SHALL INCLUDE TWO USB CHARGING PORTS.		SINGLE POLE AUTOMATIC WALL SENSOR DIMMER - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC. (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF). "VS" SUPERSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.		WARDEN PHONE JACK		
	SUBSCRIPT "OPT" - WHEN USED, DENOTES COMPUTER RECEPTACLE. PROVIDE RECEPTACLE WITH GRAY FINISH. WHEN USED WITH A SPLIT-WIRED QUAD RECEPTACLE, THE SUBSCRIPT APPLIES TO ONLY ONE OF THE TWO RECEPTACLES.		THREE WAY AUTOMATIC WALL SENSOR DIMMER - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC. (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF). "VS" SUPERSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.				
	SUBSCRIPT "TV" - INDICATES FOR TV MONITOR MOUNTED AT 7'-6" AFF.		OCCUPANCY SENSOR - LOW-VOLTAGE CONTROL WITH RELAY POWER PACK(S) AS REQUIRED. DIRECTIONAL SENSING AS SHOWN ON THE DRAWINGS. DASHED LINES INDICATE CONTROL WIRING. (a) SUBSCRIPT(S) INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF). "VS" SUPERSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED OR SCHEDULED.				
	# SUBSCRIPT - WHEN USED DENOTES PANEL AND/OR CIRCUIT NUMBER.		DIMMING CONTROL STATION. SUBSCRIPT "M" WHEN USED DENOTES MASTER UNIT, SUBSCRIPT "R" WHEN USED DENOTES REMOTE UNIT				
	SPECIAL PURPOSE POWER RECEPTACLE - NEMA DESIGNATION AS INDICATED ON PLANS. "IG" SUBSCRIPT WHEN USED DENOTES ISOLATED GROUND, WITH FACEPLATE, SUBMIT FINISHES TO ARCHITECT FOR SELECTION.		MOTORIZED ACTUATOR				
	MULTI-SERVICE POKE-THROUGH FLOOR BOX - SEPARATE POWER AND DATA COMPARTMENTS, WITH POWER AND DATA RECEPTACLES AS SHOWN ON THE DRAWINGS OR AS OTHERWISE REQUIRED.		PUSH BUTTON SWITCH				
	MULTI-SERVICE CEILING BOX - SEPARATE POWER AND DATA COMPARTMENTS, WITH POWER AND DATA RECEPTACLES AS SHOWN ON THE DRAWINGS OR AS OTHERWISE REQUIRED.		LOW VOLTAGE TRANSFORMER				

SYMBOL LEGEND NOTES:

SUBSCRIPT "GL" - WHEN USED, DENOTES CEILING LEVEL DEVICE. VERIFY FINAL LOCATION ON ARCHITECTURAL DRAWINGS.

DESIGNATION "XX" - WHEN USED, DENOTES REFERENCE TO SPECIFIC EQUIPMENT, ABBREVIATION, NEMA CONFIGURATION, OR EQUIPMENT SCHEDULE DESIGNATION. REFER TO MECHANICAL EQUIPMENT SCHEDULES IN MECHANICAL DRAWINGS FOR MECHANICAL EQUIPMENT DESIGNATIONS.

DESIGNATION "X" - WHEN USED DENOTES DEVICE HEIGHT ABOVE FINISHED FLOOR. CONFIRM FINAL HEIGHT OF DEVICES WITH THE ARCHITECTURAL DRAWINGS.

SUBSCRIPT "(E)" - WHEN USED, DENOTES EXISTING EQUIPMENT.

SUBSCRIPT "(ER)" - WHEN USED, DENOTES EXISTING EQUIPMENT RELOCATED TO NEW POSITION.

SUBSCRIPT "(ETR)" - WHEN USED, DENOTES EXISTING EQUIPMENT TO REMAIN.

SUBSCRIPT "(RE)" - WHEN USED, DENOTES EXISTING EQUIPMENT TO BE RELOCATED.

REFER TO ELECTRICAL, MECHANICAL AND PLUMBING ABBREVIATIONS FOR OTHER POSSIBLE SYMBOL MARKINGS.

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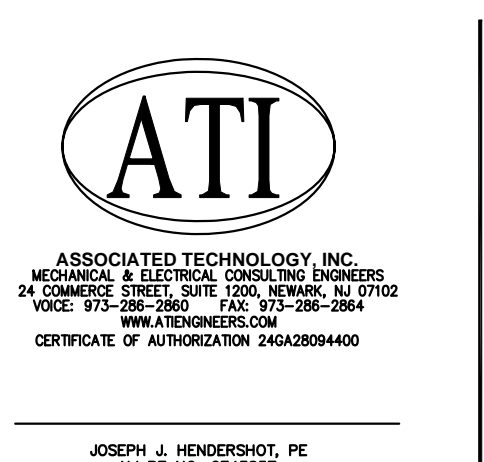
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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL
SYMBOL LEGENDS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JHH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

ABBREVIATIONS					
ABBREV.	DESCRIPTION	ABBREV.	DESCRIPTION	ABBREV.	DESCRIPTION
A, AMPS	AMPERE	EP1-A	(EP) EM. PNL, (1) 1ST FL, (-A) SCT A	OC	ON CENTER
AC	ALTERNATING CURRENT			P	POLE
AC-1	AIR CONDITIONING UNIT #1	ER	EXISTING RELOCATED	OCPO	OVERCURRENT PROTECTION DEV.
ACCU-1	AIR-COOLED CONDENSING UNIT 1	ETB	EQUIPMENT TERMINAL BLOCK/BOX	PB	PULL BOX
A/C	AIR CONDITIONING	ETR	EXISTING TO REMAIN	PNL	PANEL
AHC	ABOVE HUNG CEILING	EUH	ELECTRIC UNIT HEATER	PP	POWER PANELBOARD
AHU-1	AIR HANDLING UNIT #1	EXH	EXHAUST	PT	POTENTIAL TRANSFORMER / PNEUMATIC TUBE SYSTEM
AIC	AMPERE INTERRUPTING CAPACITY	EXIST	EXISTING		
AF/AT	AMPERE FRAME/AMPERE TRIP	EWC	ELECTRIC WATER COOLER	PTR	PRINTER
AFF	ABOVE FINISHED FLOOR	EWB	ELECTRIC WATER HEATER	RA	RANGE
AFG	ABOVE FINISHED GRADE	FA	FIRE ALARM	RC	RICE COOKER
AP	ANNUNCIATOR PANEL	FACP	FIRE ALARM CONTROL PANEL	RE	RELOCATE EXISTING
ARCH	ARCHITECTURAL	FAU	FAUCET	REC	RECEPTACLE
AS/AF	AMPERE SWITCH/AMPERE FUSE	FBO	FURNISHED BY OTHERS	REF, REFRIG	REFRIGERATOR
ATM	AUTOMATED TELLER MACHINE	FL	FLOOR	RGS	RIGID GALVANIZED STEEL
AV	AUDIO/VISUAL	FMC	FLEXIBLE METALLIC CONDUIT	RM	ROOM
AVPS	AUDIO/VISUAL POWER STRIP	FS	FILE SERVER	RMC	RIGID METALLIC CONDUIT
AWG	AMERICAN WIRE GAUGE	GA	GAUGE	RNC	RIGID NON-METALLIC CONDUIT
BG	BREAK GLASS	GAL	GALLON	RP	RECEPTACLE PANEL
BO	BY OTHERS	GAVL	GALVANIZED	RP1-A	(RP) REC. PNL, (1) 1ST FL, (-A) SCT A
C	CONDUIT/COIL	GEN	GENERATOR		
CAB	CABINET	GFI, GFCI	GROUND FAULT CIRCUIT INTERRUPTER	RTU	ROOF-TOP UNIT
CAM	CAMERA			SAC-1	SPLIT AIR CONDITIONING UNIT #1
CAT	CATEGORY	GI	GREASE INTERCEPTOR	SCH	SCHEDULE
CB	CIRCUIT BREAKER	G, GND	GROUND	SEC	SECURITY
CCTV	CLOSED CIRCUIT TELEVISION	H	HEIGHT	SHD	SHUT DOWN
CH	COUNTER HEIGHT	HP	HORSEPOWER	SP	SPARE
CKT(S)	CIRCUIT(S)	HWCP	HOT WATER CIRCULATING PUMP	SPD	SURGE PROTECTION DEVICE
CL	CLOSET	HWH	HOT WATER HEATER	SS	STAINLESS STEEL
CLG	CEILING	IC	INTERRUPTING CAPACITY	SSB	SOLID STATE BALLAST
CM	CONSTRUCTION MANAGER / CONTROL MODULE	IDF	INTERMEDIATE DISTRIBUTION FR	STD	STANDARD
		IG	ISOLATED GROUND	SW	SWITCH
CONST	CONSTRUCTION	I/L	INTERLOCKED	SWBD	SWITCHBOARD
CO	CERTIFICATE OF OCCUPANCY / COMPANY / CONDUIT ONLY	JB	JUNCTION BOX	TC	TIME CLOCK
		KHU	KITCHEN HOOD UNIT	TCO	TEMPORARY CERT. OF OCC.
COL	COLUMN	KVA	KILOVOLT AMPERE	TECO	TELEPHONE COMPANY
COMP/CPT	COMPUTER	KW	KILOWATT	TELE	TELEPHONE
CONF	CONFERENCE	KWH	KILOWATT HOUR	TR	TAMPER RESISTANT
CORR	CORRIDOR	L	LENGTH	TS	TAMPER SWITCH
CP	CONTROL PANEL/COMPUTER PANELBOARD	LC	LIGHTING CONTACTOR	TV	TELEVISION
		LP	LIGHTING PANELBOARD	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
CP1-A	(CP) COMP. PNL, (1) 1ST FL, (-A) SCT A	LP1-A	(LP) LTG. PNL, (1) 1ST FL, (-A) SCT A	TX-1	TOILET EXHAUST FAN #1
CR	CONTROL RELAY	LFMC	LIQUID FLEXIBLE METALLIC COND.	TYP	TYPICAL
CRS	COLD ROLLED STEEL	LTG	LIGHTING	UC	UNDERCOUNTER
CS	CONTROL STATION	MAX	MAXIMUM	UH	UNIT HEATER
C/T, CT	CURRENT TRANSFORMER	MCC	MOTOR CONTROL CENTER	UL	UNDERWRITERS LABORATORIES
CT-1	COOLING TOWER #1	MC	MECHANICAL CONTRACTOR	UM	UTILITY METER
CU	COPPER	MCM	THOUSAND CIRCULAR MILLS	UON	UNLESS OTHERWISE NOTED
CUH	CABINET UNIT HEATER	MD	MOTORIZED DAMPER	UTP	UNSHIELDED TWISTED PAIR
CWP-1	CONDENSATE WATER PUMP #1	MDP	MAIN DISTRIBUTION PANELBOARD	V	VOLT
DE	DEMO EXISTING	MDF	MAIN DISTRIBUTION FRAME	VA	VOLT-AMPERE
DH	DOOR HOLDER	MECH	MECHANICAL	W	WIRE / WIDTH / WALL-MOUNTED
DISC	DISCONNECT	MGCV	MASTER GAS CONTROL VALVE	WC	WATER COOLER
DIST	DISTRIBUTION	MIN	MINIMUM	WF	WATER FOUNTAIN
DP	DISTRIBUTION PANEL	MLO	MAIN LUGS ONLY	W/	WITH
DP1-B	(DP) DIST. PNL, (1) 1ST FL, (-B) SCT B	MP	MECHANICAL PANEL	WP	WEATHERPROOF
		MM	MONITOR MODULE	XFMR	TRANSFORMER
DPG	(DP) DISTRIBUTION PANEL, (G) GENERATOR	MP1-A	(MP) MEC. PNL, (1) 1ST FL, (-A) SCT A	Ø	PHASE
D/S, DS	DISTRIBUTION SECTION	MDS	MAIN DISTRIBUTION SWITCHBOARD		
DWH-1	DOMESTIC WATER HEATER #1	MS	METER SOCKET		
DWG	DRAWING	MSD	METER SERVICE DISCONNECT		
E	EXISTING	MTD	MOUNTED		
EC	ELECTRICAL CONTRACTOR / EMPTY CONDUIT	MW	MICROWAVE OVEN		
		N	NEW		
ECUH	ELECTRIC CABINET UNIT HEATER	N, NEU	NEUTRAL		
EDPB	(EDP) EM. DIST. PNL, (B) BASEMENT	NA N/A	NOT APPLICABLE		
		NC	NORMALLY CLOSED		
EF-1	EXHAUST FAN #1	NDB	NIGHT DEPOSIT BOX		
EG	EQUIPMENT GROUND	NEC	NATIONAL ELECTRICAL CODE		
EH	ELECTRIC HEAT	NFPA	NATIONAL FIRE PROTECTION ASS.		
ELEC	ELECTRIC	NIC	NOT IN CONTRACT		
EM	EMERGENCY	NL	NIGHT LIGHT		
EMT	ELECTRIC METALLIC TUBING	NO	NORMALLY OPEN		
EP	EMERGENCY PANEL	NTS	NOT TO SCALE		

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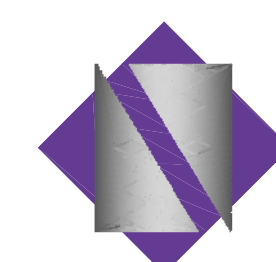
MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
100 ROUTE 22 WEST, MOUNTAINVIEW, NJ 07092
TEL: 973-378-0008 FAX: 973-378-1061
WWW.ATIARCHITECTS.COM

JOSEPH J. HENDERSON, PE
NJ License No. 36049



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1004 ROUTE 22 WEST, MOUNTAINVIEW, NEW JERSEY 07092
TEL: 973-378-0008 FAX: 973-378-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**ELECTRICAL
ABBREVIATIONS**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
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10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

E.103

KEYED ONE LINE NOTES:

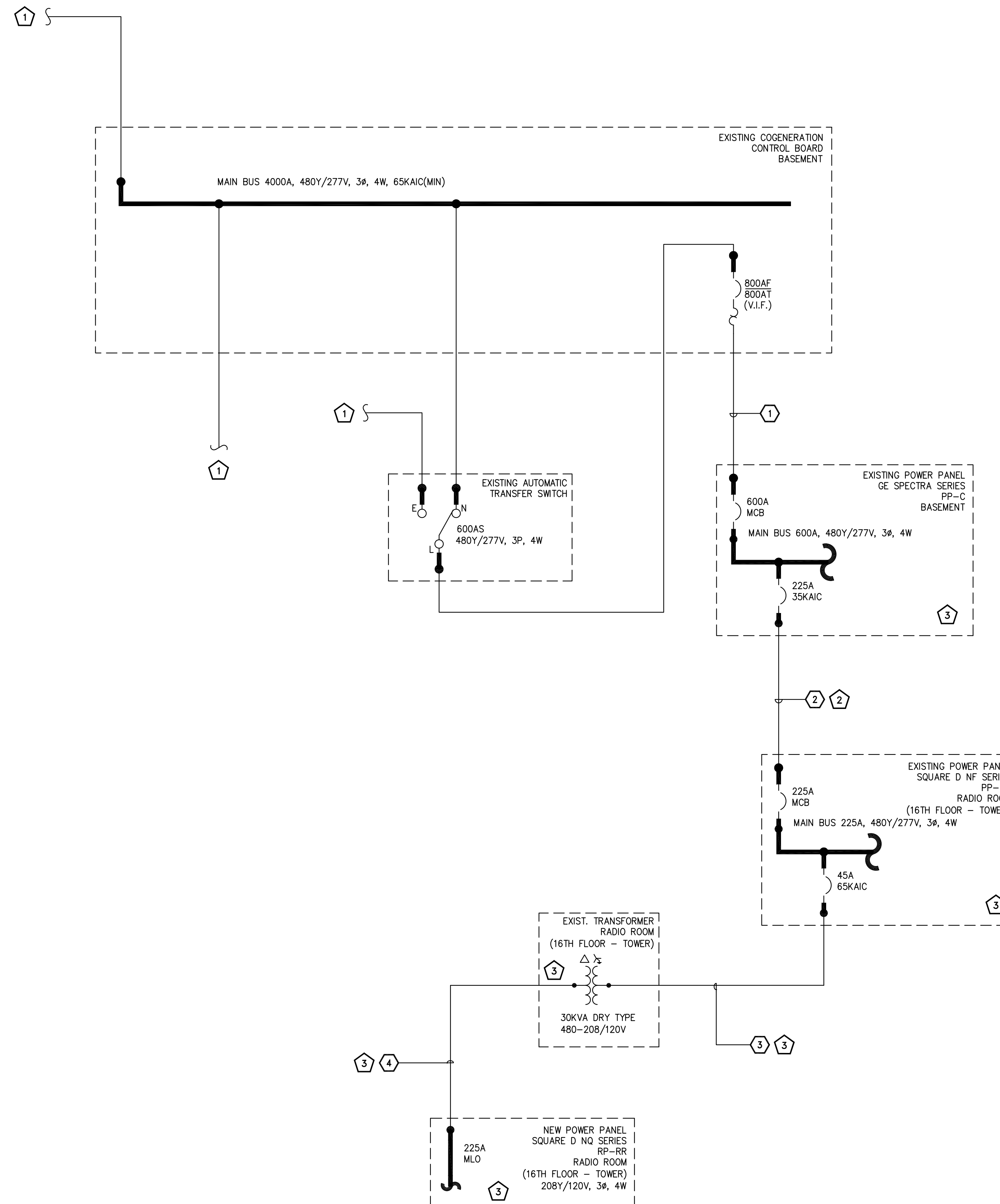
- 1 THE COMPONENTS OF THE LOCAL NORMAL AND EMERGENCY ELECTRICAL DISTRIBUTION SYSTEM, CONNECTED TO THE MAIN BUS OF THE COGENERATION CONTROL BOARD BUT BEYOND THE SCOPE OF WORK OF THIS PROJECT, ARE NOT REPRESENTED OR FURTHER DETAILED IN THIS ONE LINE DIAGRAM.
- 2 CONDUIT RUNNING FROM THE BASEMENT TO THE RADIO ROOM LOCATED AT SIXTEENTH FLOOR IN THE TOWER OF THE COURTHOUSE. THE INSTALLATION OF THIS CONDUIT IS PAID UNDER THE CONTRACT FOR THE UPGRADE OF THAT RADIO ROOM. THIS CONDUIT IS ALSO USED FOR THE CURRENT PROJECT.
- 3 THE INSTALLATION OF THIS EQUIPMENT IS PAID UNDER THE CONTRACT FOR THE UPGRADE OF THE RADIO ROOM LOCATED AT SIXTEENTH FLOOR IN THE TOWER OF THE COURTHOUSE. THIS EQUIPMENT IS ALSO USED FOR THE CURRENT PROJECT.

CABLE AND CONDUIT:

- 1 2 SETS 4-350MCM & #1 AWG GND IN 4" C
- 2 4-#4/O AWG & #4AWG GND IN 2" C
- 3 3-#8 AWG & #10AWG GND IN 3/4" C
- 4 3-#3 AWG & #8AWG GND IN 1" C

DRAWING NOTES:

1. PRIOR TO THE COMMENCEMENT OF WORK, COORDINATE ALL WORK WITH ALL OTHER TRADE CONTRACTORS, THE OWNER, AND THE LOCAL POWER UTILITY (PSE&G).
2. ALL OVERCURRENT DEVICES SHOWN SHALL BE ASSUMED 3-POLE UNLESS OTHERWISE INDICATED.
3. ALL CONDUCTORS SHALL BE COPPER, UNLESS OTHERWISE INDICATED OR SHOWN.
4. PROVIDE SIGNAGE AT ALL NEW ELECTRICAL DISTRIBUTION EQUIPMENT FACILITIES AS PER NEC 110.16.
5. REFER TO DWG E.101 FOR ELECTRICAL PROJECT NOTES.
6. REFER TO DWG E.102 FOR ELECTRICAL PROJECT SYMBOLS.
7. REFER TO DWG E.103 FOR ELECTRICAL PROJECT ABBREVIATIONS.
8. REFER TO DWG E.202 FOR PANEL SCHEDULES.



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PROJECT:

**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**ELECTRICAL
ONE LINE DIAGRAM**

SUBMISSIONS				REVISIONS				DATE	10-10-15
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10.30.15	95% SUBMISSION	KD	FM					CHKD BY	JJH
09.07.17	ISSUED FOR BID	KD	FM					JOB NO	2141151
								SHEET:	_ OF:
								DWG NO	

E.201

PANELBOARD CIRCUITING SCHEDULE														
PANELBOARD NAME: PP-RR				PANELBOARD LOCATION: RADIO ROOM										
CKT NO.	DESCRIPTION	LOAD (VA)	CIRCUIT BREAKER			NOTES	WIRE AND RACEWAY	WIRE SIZE	LINE	WIRE SIZE	NOTES	CIRCUIT BREAKER	LOAD (VA)	DESCRIPTION
			FRAME (A)	TRIP (A)	POLES									
1	RP-RR (THROUGH 30 KVA TRANSFORMER)	14,499	100	45	3		3-#8A WG, #10A WG G, 3/4"	1 L1 2	4-#8A WG, #10A WG G, 3/4"	100	40	3	7675	AC-2
2		14,499											7675	
3		14,499											7675	
4		7,675	100	40	3		4-#8A WG, #10A WG G, 3/4"	7 L1 8	4-#12A WG, #12A WG G, 3/4"	100	20	3	3771	ACCU-2
5		7,675											3771	
6		7,675											3771	
7		13,350	100	20	3		3-#8A WG, #10A WG G, 3/4"	13 L1 14	2-#12A WG, #12A WG G, 3/4"	100	20	1	1275	GENERAL LIGHTING
8		14,534											1514	STAIR TOWER LTG - FLS 1 THRU 7
9		15,613											2135	STAIR TOWER LTG - FLS 8 THRU 16
10		0	100	20	1		-	19 L1 20	-	100	20	1	0	SPARE
11		0	100	20	1		-	21 L2 22	-	100	20	1	0	SPARE
12		0	100	20	1		-	23 L3 24	-	100	20	1	0	SPARE
13		0	100	20	1		-	25 L1 26	-	100	20	1	0	SPARE
14		0	100	20	1		-	27 L2 28	-	100	20	1	0	SPARE
15		0	100	20	1		-	29 L3 30	-	100	20	1	0	SPARE
16		0	100	20	1		-	31 L1 32	-	100	20	1	0	SPARE
17		0	100	20	1		-	33 L2 34	-	100	20	1	0	SPARE
18		3,047					3-#12A WG, #12A WG G, 3/4"	35 L3 36	3-#12A WG, #12A WG G, 3/4"	2.6	100	20	3	3047
19		3,047						37 L1 38					3047	SP-2
20		3,047						39 L2 40					3047	
21		0	100	-	1		-	41 L3 42	-	100	-	1	0	SPACE

CONNECTED LOAD SUMMARY			
PHASE	VA	AMPS	
L1	54,339	196	
L2	55,762	201	
L3	57,462	207	
THREE-PHASE CONNECTED LOAD	167,562	202	

PANEL CONSTRUCTION:
 INCOMING SERVICE: 277/480 VOLTS, 3-PHASE, 4-WIRE
 FEEDER SIZE: REFER TO THE ONE LINE DIAGRAM
 MAIN BUS: 225A
 MAIN LUGS: N/A
 MAIN BREAKER: 225A
 BRANCH BREAKER RATINGS AS INDICATED ABOVE
 ASSEMBLY WITHSTAND/INTERRUPTING RATING: 65KAC SYM
 MOUNTING SURFACE

PANELBOARD SPECIFICATIONS

EXISTING PANEL BOARD

SCHEDULE NOTES:

- INTERIOR CONCEALED CABLE AND CONDUIT SHALL BE PERMITTED TO BE SUBSTITUTED WITH METAL-CLAD CABLE (TYPE MC) AS REQUIRED AND INDICATED ON THE DRAWINGS. USE OF MC CABLE SHALL COMPLY WITH NEC 330, AND MEET ALL INTENDED GROUNDING REQUIREMENTS.
- PRIOR TO COMMENCEMENT OF WORK, COORDINATE FINAL BRANCH CIRCUIT EQUIPMENT AND DEVICE LOCATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, AND APPROVED MILLWORK SHOP DRAWINGS.
- CONTRACTOR SHALL PROVIDE BRANCH CIRCUIT BREAKER AS REQUIRED.
- CONTROLLED CIRCUIT OPERATION REQUIRED. PROVIDE CONTROLLABLE BRANCH CIRCUIT BREAKER AS REQUIRED.
- PROVIDE A LISTED BREAKER BLOCKING DEVICE IN ORDER TO PREVENT INADVERTENT BREAKER OPERATION, WHILE MAINTAINING PROPER TRIPPING FUNCTIONS.
- CONTRACTOR SHALL MEASURE PHASE LOADS (TRUE RMS) OF PANELBOARD DURING A NORMAL OPERATING DEMO SCENARIO, AND BALANCE BRANCH CIRCUIT LOADING ACCORDINGLY. UPON COMPLETION OF LOAD BALANCING, MODIFY BRANCH CIRCUIT PHASING IDENTIFICATION.

PANELBOARD CIRCUITING SCHEDULE																
PANELBOARD NAME: RP-RR				PANELBOARD LOCATION: 16TH FLR RADIO ROOM												
CKT NO.	DESCRIPTION	LOAD (VA)	CIRCUIT BREAKER			NOTES	WIRE AND RACEWAY	WIRE SIZE	LINE	WIRE SIZE	NOTES	CIRCUIT BREAKER	LOAD (VA)	DESCRIPTION		
			FRAME (A)	TRIP (A)	POLES										FRAME (A)	TRIP (A)
1	ISS RACK UPS	1,992	100	20	1		2-#12A WG, #12A WG G, 3/4"	1 L1 2	2-#10A WG, #10A WG G, 3/4"	100	30	1	1400	MW RACK RECTIFIER		
2		1,992											1400	MW RACK RECTIFIER		
3		1,992											1400	MW RACK RECTIFIER		
4		1,992	100	20	1		2-#12A WG, #12A WG G, 3/4"	3 L2 4	2-#10A WG, #10A WG G, 3/4"	100	30	1	1400	MW RACK RECTIFIER		
5		1,992											429	ELIZABETH RACK 1 TRACK		
6		1,992											816	ELIZABETH RACK 2 TRACK		
7		1,992											800	GENERAL RECEP/CLES		
8		1,992											500	MECHANICAL CONTROL POWER		
9		1,992	100	20	1		2-#12A WG, #12A WG G, 3/4"	9 L2 10	2-#12A WG, #12A WG G, 3/4"	100	20	1	800	GENERAL RECEP/CLES		
10		1,992											500	MECHANICAL CONTROL POWER		
11		1,992											500	MECHANICAL CONTROL POWER		
12		300	100	20	1		2-#12A WG, #12A WG G, 3/4"	11 L3 12	2-#12A WG, #12A WG G, 3/4"	100	20	1	500	MECHANICAL CONTROL POWER		
13		300											500	BMS PANEL		
14		1,400	100	30	1		2-#10A WG, #10A WG G, 3/4"	13 L1 14	2-#12A WG, #12A WG G, 3/4"	100	20	1	500	BMS PANEL		
15		1,400											500	FIRE ALARM PANEL		
16		1,400											1500	FSD FOR STAIR T1 - FLS 2 THRU 8		
17		300	100	20	1		2-#12A WG, #12A WG G, 3/4"	15 L2 16	2-#12A WG, #12A WG G, 3/4"	1,2,3,5,6	100	20	1	1500	FSD FOR STAIR T1 - FLS 10 THRU 16	
18		300											1500	FSD FOR STAIR T1 - FLS 10 THRU 16		
19		500	100	20	1		1,2,3,5,6	2-#12A WG, #12A WG G, 3/4"	19 L1 20	2-#12A WG, #12A WG G, 3/4"	1,2,3,5,6	100	20	1	1500	FSD FOR STAIR T2 - FLS 2 THRU 8
20		500											1500	FSD FOR STAIR T2 - FLS 2 THRU 8		
21		500	100	20	1		1,2,3,5,6	2-#12A WG, #12A WG G, 3/4"	21 L2 22	2-#12A WG, #12A WG G, 3/4"	1,2,3,5,6	100	20	1	1500	FSD FOR STAIR T2 - FLS 2 THRU 8
22		500											1800	FSD FOR STAIR T2 - FLS 10 THRU 16		
23		500	100	20	1		1,2,3,5,6	2-#12A WG, #12A WG G, 3/4"	23 L3 24	2-#12A WG, #12A WG G, 3/4"	1,2,3,5,6	100	20	1	1800	FSD FOR STAIR T2 - FLS 10 THRU 16
24		500											700	DOOR HOLD FOR STAIR T2 - FLS 10 THRU 16		
25		500	100	20	1		1,2,3,5,6	2-#12A WG, #12A WG G, 3/4"	25 L1 26	2-#12A WG, #12A WG G, 3/4"	1,2,3,5,6	100	20	1	700	DOOR HOLD FOR STAIR T2 - FLS 10 THRU 16
26		500											0	SPARE		
27		500	100	20	1		1,2,3,5,6	2-#12A WG, #12A WG G, 3/4"	27 L2 28	-	100	20	1	0	SPARE	
28		2,250											0	SPARE		
29		2,250											0	SPARE		
30		2,250	100	30	2		2-#10A WG, #10A WG G, 3/4"	29 L3 30	-	100	20	1	0	SPARE		
31		2,250											0	SPARE		
32		200	100	20	1		1,2,3,6	2-#12A WG, #12A WG G, 3/4"	31 L1 32	2-#10A WG, #10A WG G, 3/4"	100	30	2	2250	ISS RACK UPS	
33		200											2250	ISS RACK UPS		
34		500	100	20	1		1,2,3,6	2-#12A WG, #12A WG G, 3/4"	33 L2 34	2-#10A WG, #10A WG G, 3/4"	100	30	2	2250	ISS RACK UPS	
35		500											600	FSD FOR STAIR T1 - FLS 10 & 16		
36		500	100	20	1		1,2,3,6	2-#12A WG, #12A WG G, 3/4"	35 L3 36	2-#12A WG, #12A WG G, 3/4"	1,2,3,5,6	100	20	1	600	FSD FOR STAIR T1 - FLS 10 & 16
37		500											900	FSD FOR STAIR T2 - FLS 10, 15 & 16		
38		500	100	20	1		1,2,3,6	2-#12A WG, #12A WG G, 3/4"	37 L1 38	2-#12A WG, #12A WG G, 3/4"	1,2,3,5,6	100	20	1	900	FSD FOR STAIR T2 - FLS 10, 15 & 16
39		500											0	SPACE		
40		500	100	20	1		1,2,3,6	2-#12A WG, #12A WG G, 3/4"	39 L2 40	2-#12A WG, #12A WG G, 3/4"	1,2,3,5,6	100	-	1	0	SPACE

CONNECTED LOAD SUMMARY			
PHASE	VA	AMPS	
L1	13,350	111	
L2	14,534	121	
L3	15,613	130	
THREE-PHASE CONNECTED LOAD	43,497	121	

PANEL CONSTRUCTION:
 INCOMING SERVICE: 120/208 VOLTS, 3-PHASE, 4-WIRE
 FEEDER SIZE: REFER TO THE ONE LINE DIAGRAM
 MAIN BUS: 225A
 MAIN LUGS: 225A
 MAIN BREAKER: N/A
 BRANCH BREAKER RATINGS AS INDICATED ABOVE
 ASSEMBLY WITHSTAND/INTERRUPTING RATING: 22KAC SYM
 MOUNTING SURFACE

PANELBOARD SPECIFICATIONS

EXISTING PANEL BOARD

SCHEDULE NOTES:

- INTERIOR CONCEALED CABLE AND CONDUIT SHALL BE PERMITTED TO BE SUBSTITUTED WITH METAL-CLAD CABLE (TYPE MC) AS REQUIRED AND INDICATED ON THE DRAWINGS. USE OF MC CABLE SHALL COMPLY WITH NEC 330, AND MEET ALL INTENDED GROUNDING REQUIREMENTS.
- PRIOR TO COMMENCEMENT OF WORK, COORDINATE FINAL BRANCH CIRCUIT EQUIPMENT AND DEVICE LOCATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, AND APPROVED MILLWORK SHOP DRAWINGS.
- CONTRACTOR SHALL PROVIDE BRANCH CIRCUIT BREAKER AS REQUIRED.
- CONTROLLED CIRCUIT OPERATION REQUIRED. PROVIDE CONTROLLABLE BRANCH CIRCUIT BREAKER AS REQUIRED.
- PROVIDE A LISTED BREAKER BLOCKING DEVICE IN ORDER TO PREVENT INADVERTENT BREAKER OPERATION, WHILE MAINTAINING PROPER TRIPPING FUNCTIONS.
- CONTRACTOR SHALL MEASURE PHASE LOADS (TRUE RMS) OF PANELBOARD DURING A NORMAL OPERATING DEMO SCENARIO, AND BALANCE BRANCH CIRCUIT LOADING ACCORDINGLY. UPON COMPLETION OF LOAD BALANCING, MODIFY BRANCH CIRCUIT PHASING IDENTIFICATION.

KEYED NEW WORK NOTES:

- THE INSTALLATION OF THIS PANELBOARD IS PAID UNDER THE CONTRACT FOR THE UPGRADE OF THE RADIO ROOM LOCATED AT SIXTEENTH FLOOR IN THE TOWER OF THE COURTHOUSE. THIS PANELBOARD IS ALSO USED FOR THE CURRENT PROJECT.
- THE CONNECTION OF THIS ELECTRIC LOAD TO THE PANELBOARD AND THE CONDUIT AND THE WIRING NEEDED FOR THAT ARE PAID UNDER THE CONTRACT FOR THE UPGRADE OF THE RADIO ROOM LOCATED AT SIXTEENTH FLOOR IN THE TOWER OF THE COURTHOUSE.

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 NJ License No. AI 12118

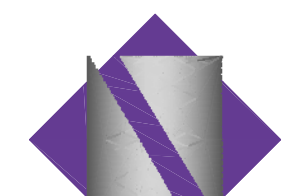
MARK E. BESS, AIA, NCARB
 NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
 NJ License No. AI 14394



ASSOCIATED TECHNOLOGY, INC.
 MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
 100 ROUTE 22 WEST, MOUNTAINVIEW, NEW JERSEY 07092
 TEL: 973.378.0088 FAX: 973.378.2844
 WWW.ATINETWORKS.COM

JOSEPH J. HENDERSON, PE
 NJ License No. 36487



NETTA ARCHITECTS
 ARCHITECTURE - PLANNING - INTERIOR DESIGN
 1084 ROUTE 22 WEST, MOUNTAINVIEW, NEW JERSEY 07092
 TEL: 973.378.0088 FAX: 973.378.1081
 CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

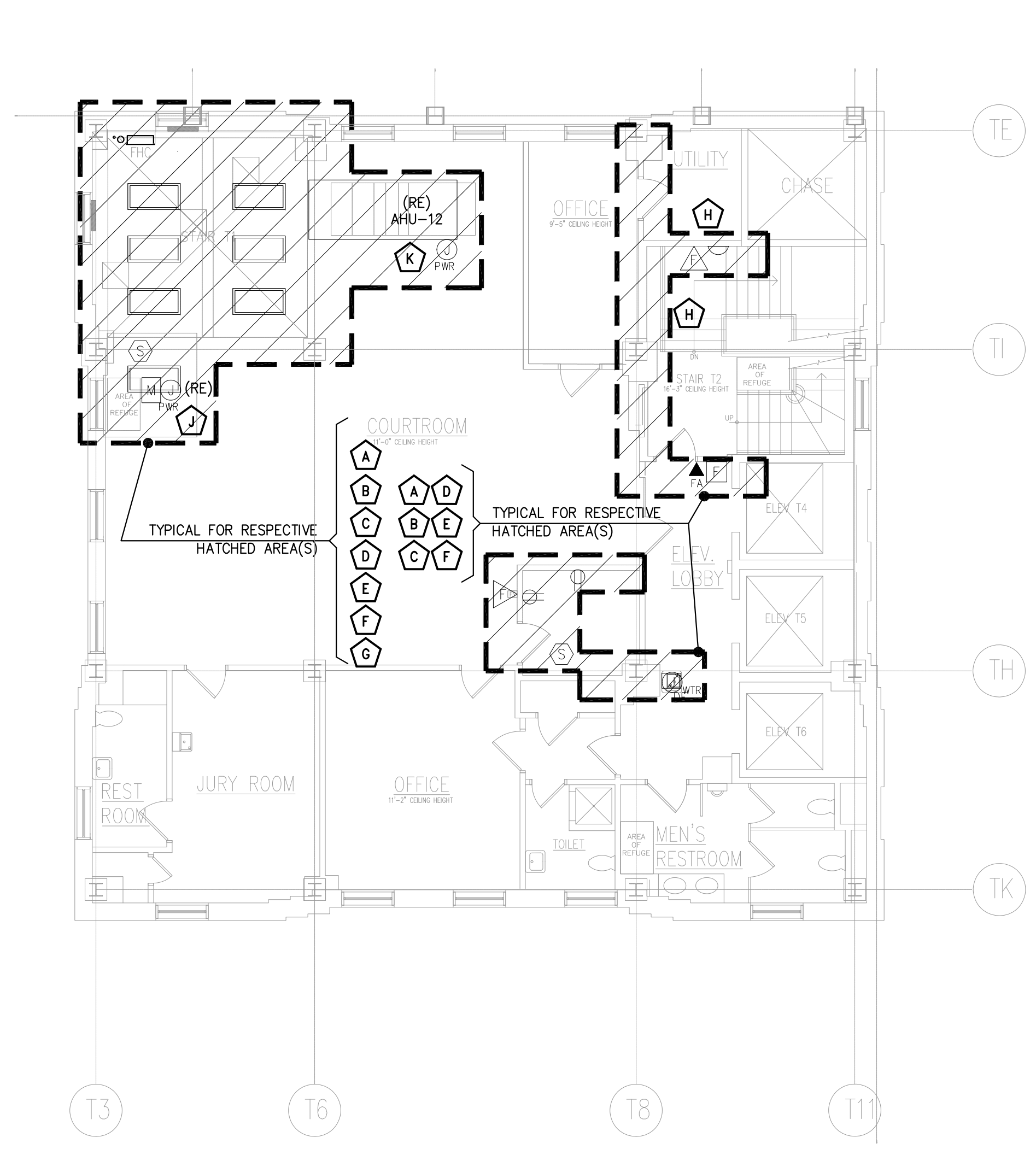
UC COURTHOUSE
 INTERNAL STAIR (TOWER)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

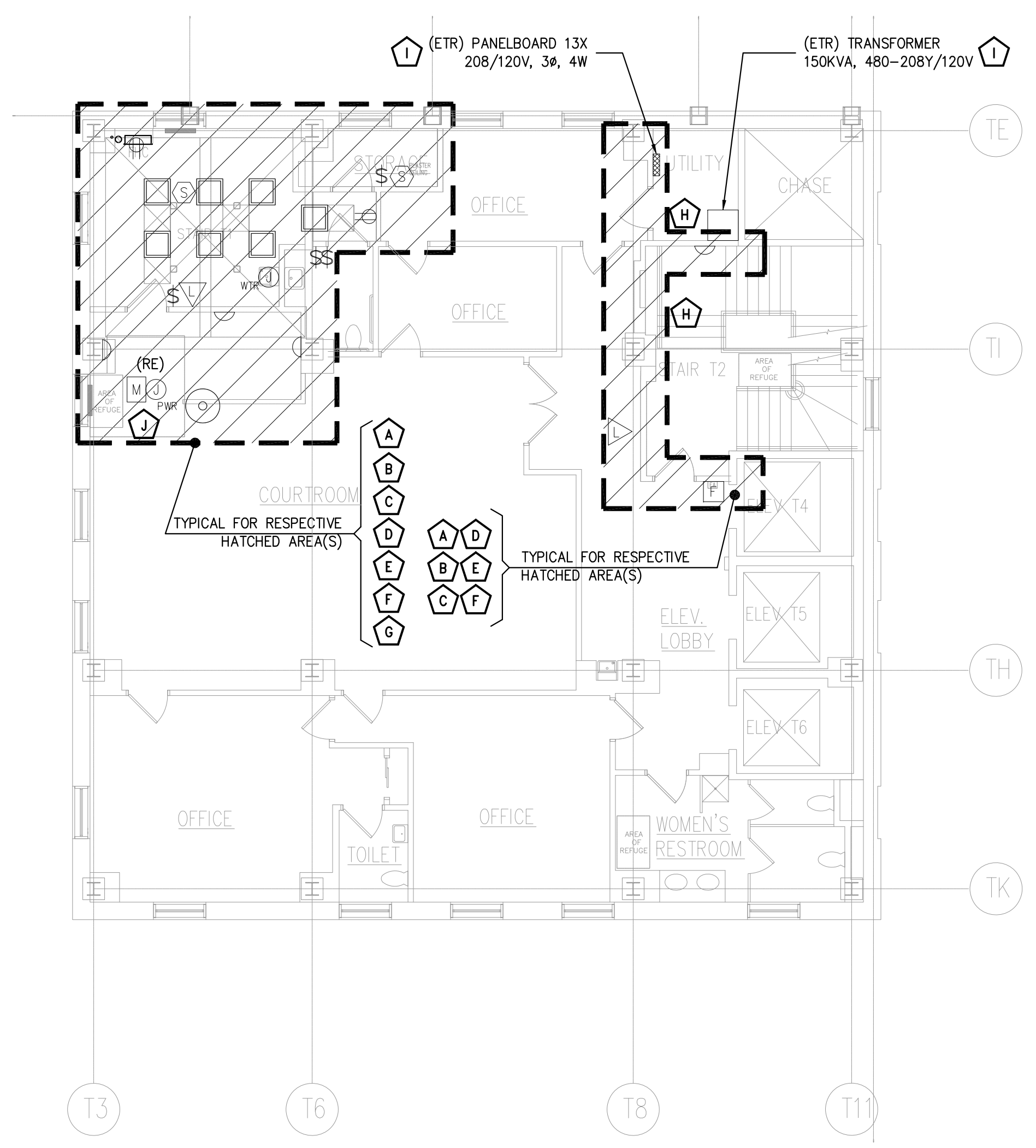
ELECTRICAL
 PANEL SCHEDULES

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	
04.02.15	DD SUBMISSION	KD	FM						10-10-15
10.30.15	95% SUBMISSION	KD	FM						NONE
09.07.17	ISSUED FOR BID	KD	FM						DRAWN BY RB
									CHKD BY JHH
									JOB NO 2141151
									SHEET: _ OF:
									DWG NO

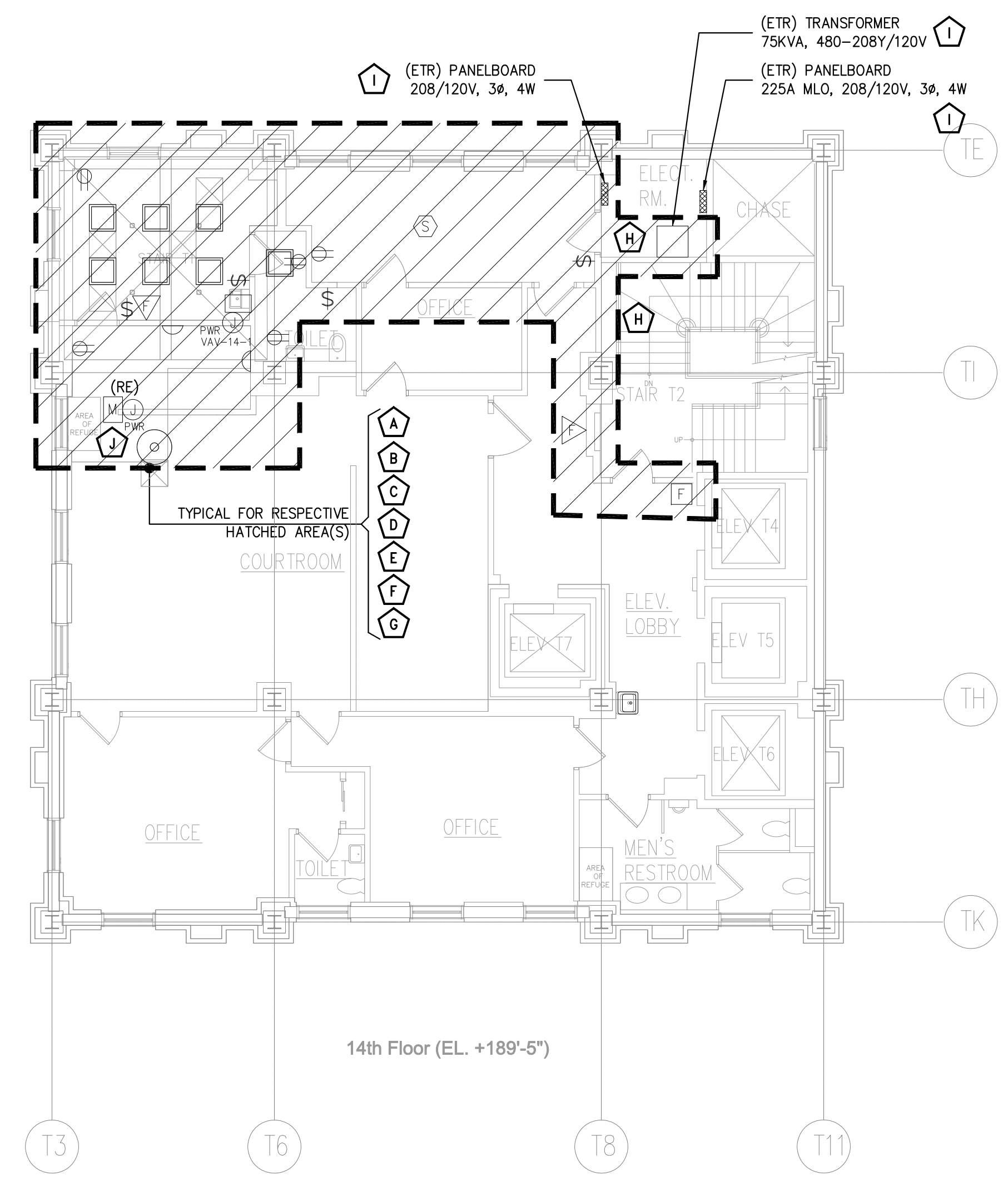
E.202



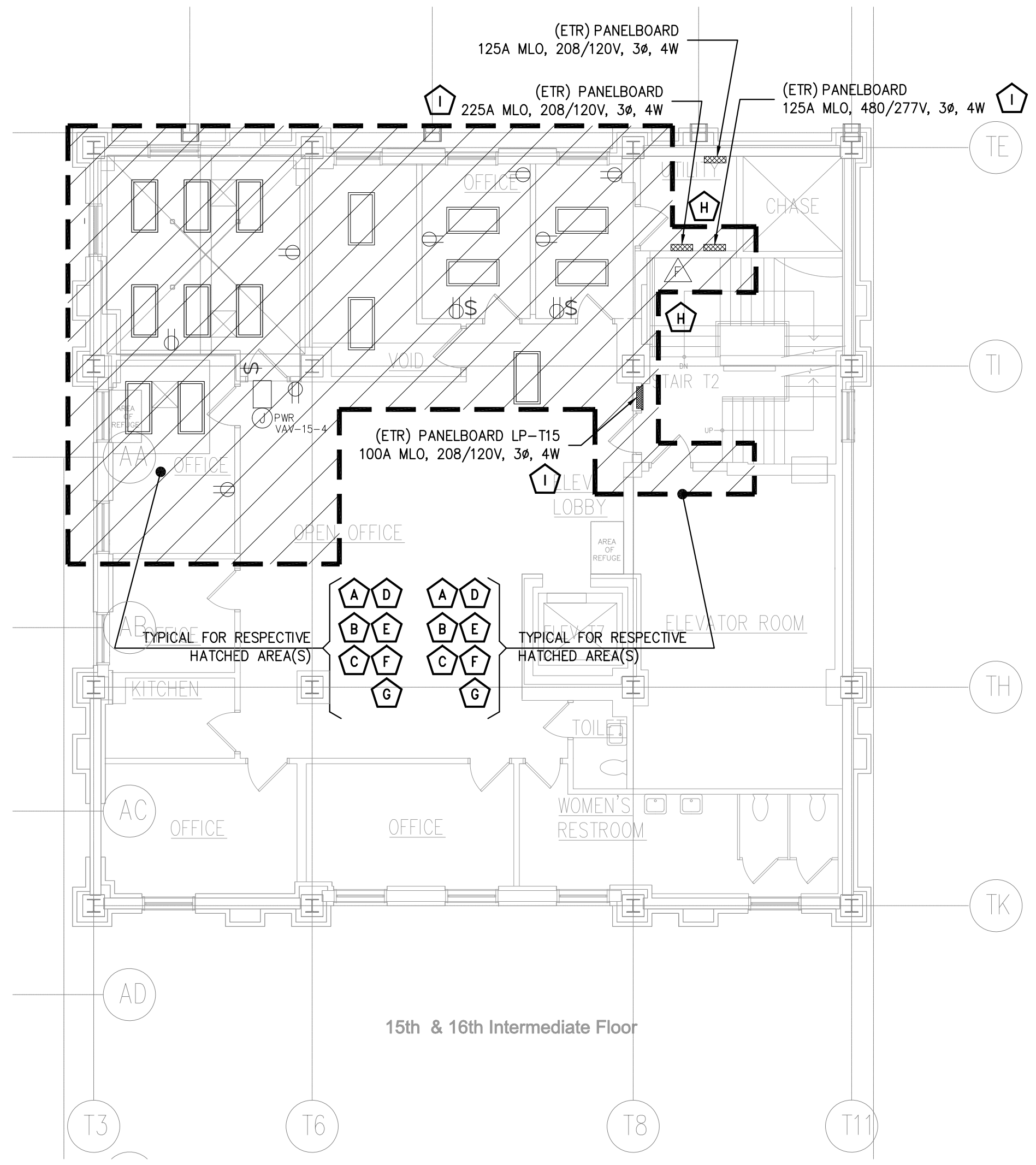
DEMOLITION PLAN - TWELFTH FLOOR
SCALE: 1/8"=1'-0"



DEMOLITION PLAN - THIRTEENTH FLOOR
SCALE: 1/8"=1'-0"



DEMOLITION PLAN - FOURTEENTH FLOOR
SCALE: 1/8"=1'-0"



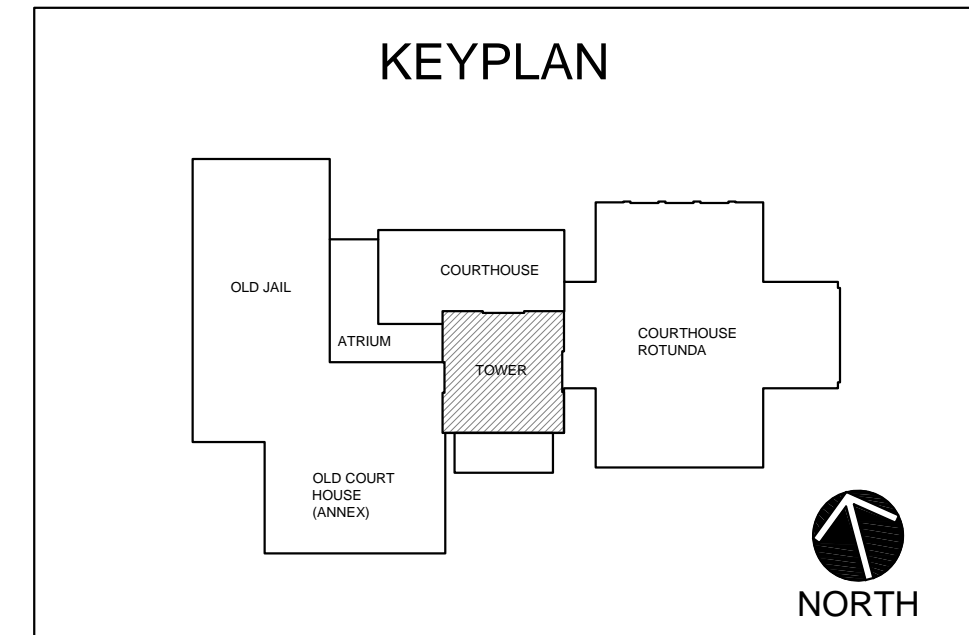
DEMOLITION PLAN - FIFTEENTH FLOOR
SCALE: 1/8"=1'-0"

KEYED DEMOLITION WORK NOTES:

- A IT IS THE OWNER'S INTENT TO REMOVE ALL EXISTING ELECTRICAL FACILITIES IN ORDER TO FACILITATE THE NEW ARCHITECTURAL, MECHANICAL AND PLUMBING DESIGNS AS REQUIRED. THE CONTRACTOR SHALL FIELD-VERIFY THE EXACT LOCATION AND QUANTITIES OF ALL EQUIPMENT TO BE REMOVED, AND BASE HIS BID ACCORDINGLY.
- B DISCONNECT AND REMOVE ALL EXISTING POWER OUTLETS, RECEPTACLES AND ASSOCIATED WIRING, RACEWAY AND CONTROL DEVICES BACK TO SOURCE. EXACT FIXTURES AND EQUIPMENT ARE NOT EXPLICITLY SHOWN. CONTRACTOR SHALL FIELD-VERIFY EXISTING EQUIPMENT LOCATIONS, AND BASE HIS BID ACCORDINGLY.
- C DISCONNECT AND REMOVE ALL EXISTING LIGHTING FIXTURES (INCLUDING EGRESS LIGHTING AND EXIT SIGNS) AND ASSOCIATED WIRING, RACEWAY AND CONTROL DEVICES BACK TO SOURCE. EXACT FIXTURES AND EQUIPMENT ARE NOT EXPLICITLY SHOWN. CONTRACTOR SHALL FIELD-VERIFY EXISTING EQUIPMENT LOCATIONS, AND BASE HIS BID ACCORDINGLY.
- D CONTRACTOR SHALL COORDINATE DEMOLITION WITH THE COUNTY LOW VOLTAGE VENDOR FOR PORTIONS OF WORK WHICH AFFECT ALL LOW-VOLTAGE SYSTEMS, INCLUDING BUT NOT LIMITED TO, TELE/DATA AND SECURITY SYSTEMS, ASSOCIATED WIRING, EQUIPMENT, AND DEVICES.
- E REMOVE EXISTING SMOKE DETECTION AND/OR FIRE ALARM SYSTEM FACILITIES AND WIRING IN THEIR ENTIRETY INCLUDING ANY AND ALL ASSOCIATED EQUIPMENT AND APPURTENANCES. EXACT EQUIPMENT LOCATIONS ARE NOT EXPLICITLY SHOWN. CONTRACTOR SHALL FIELD-VERIFY EXISTING EQUIPMENT LOCATIONS, AND BASE HIS BID ACCORDINGLY.
- F PRIOR TO THE COMMENCEMENT OF WORK, COORDINATE IMPACT OF EXISTING BRANCH CIRCUIT FACILITIES WITH OWNER. COORDINATE ANY AND ALL REQUIRED SHUTDOWN WITH OWNER AT LEAST SEVEN (7) DAYS PRIOR TO IMPACT.
- G TRACE AND MAINTAIN EXISTING LIGHTING BRANCH CIRCUITS SERVING THE EXISTING CORRIDOR THROUGHOUT THE DURATION OF CONSTRUCTION AS REQUIRED. PREPARE EXISTING WIRING FACILITIES FOR RECONNECTION TO NEW PANELBOARD FACILITIES AS REQUIRED.
- H PROTECT EXISTING CONDUIT RISERS AND SUPPORTS FROM DAMAGE DURING WALL CONSTRUCTION. MAINTAIN ACCESSIBILITY TO PULL BOXES AND ENCLOSURES AS REQUIRED. COORDINATE WITH ARCHITECT AND GENERAL CONTRACTOR.
- I PROTECT EXISTING ELECTRICAL EQUIPMENT FROM DAMAGE DURING WALL CONSTRUCTION. COORDINATE WITH ARCHITECT AND GENERAL CONTRACTOR.
- J DISCONNECT AND EXTEND EXISTING BRANCH CIRCUIT WIRING TO MOTORIZED DAMPER TO BE RELOCATED. MATCH WIRING AND CONDUIT SIZE WITH EXISTING. COORDINATE WORK WITH THE MECHANICAL CONTRACTOR.
- K DISCONNECT AND EXTEND EXISTING FEEDER TO AIR HANDLER UNIT AHU-12 TO BE RELOCATED. MATCH WIRING AND CONDUIT SIZE WITH EXISTING. COORDINATE WORK WITH THE MECHANICAL CONTRACTOR.

DRAWING NOTES:

1. THE CONTRACTOR SHALL TRACE ALL EXISTING CIRCUITS IMPACTED BY THE PROJECT WORK AND DETERMINE ALL AREAS AFFECTED BY THE REQUIRED DEMOLITION WORK. THE CONTRACTOR SHALL PROVIDE ALL RECONNECTIONS OF EXISTING REMAINING LIGHTING AND/OR POWER UTILIZATION EQUIPMENT TO NEW ELECTRICAL DISTRIBUTION FACILITIES AS REQUIRED. CONTRACTOR SHALL MAINTAIN SERVICE TO ALL LIGHTING AND POWER UTILIZATION FACILITIES, WHICH ARE INTENDED TO REMAIN IN SERVICE THROUGHOUT THE DURATION OF CONSTRUCTION. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL COORDINATE ALL SHUTDOWNS WITH THE OWNER AND OTHER TRADE CONTRACTORS AS REQUIRED.
2. THE CONTRACTOR SHALL TRACE ALL EXISTING CIRCUITS IMPACTED BY THE PROJECT WORK AND DETERMINE ALL AREAS AFFECTED BY THE REQUIRED DEMOLITION WORK. THE CONTRACTOR SHALL PROVIDE ALL RECONNECTIONS OF EXISTING REMAINING LIGHTING AND/OR POWER UTILIZATION EQUIPMENT TO NEW ELECTRICAL DISTRIBUTION FACILITIES AS REQUIRED. CONTRACTOR SHALL MAINTAIN SERVICE TO ALL LIGHTING AND POWER UTILIZATION FACILITIES, WHICH ARE INTENDED TO REMAIN IN SERVICE THROUGHOUT THE DURATION OF CONSTRUCTION. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL COORDINATE ALL SHUTDOWNS WITH THE OWNER AND OTHER TRADE CONTRACTORS AS REQUIRED.
3. CONTRACTOR SHALL MAINTAIN SERVICE OF THE EXISTING FIRE ALARM SYSTEM TO ALL ADJACENT TENANT SPACES THROUGHOUT THE DURATION OF CONSTRUCTION. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL COORDINATE IMPACT OF THE FIRE ALARM SYSTEM WITH BUILDING MANAGEMENT.
4. IN ORDER TO SERVE NEW LOAD AS REQUIRED, THE CONTRACTOR SHALL BE PERMITTED TO REUTILIZE EXISTING CIRCUIT BREAKER FACILITIES RENDERED SPARE BY THE PROPOSED DEMOLITION WORK. THE CONTRACTOR SHALL IDENTIFY ALL CIRCUIT BREAKERS RENDERED SPARE BY THE DEMOLITION WORK, AND PREPARE SAME FOR REUSE AS INTENDED.
5. THE CONTRACTOR SHALL BE PERMITTED TO REUTILIZE EXISTING FEED WIRING FACILITIES OR PORTIONS THEREOF WHERE A CLEARLY IDENTIFIABLE BENEFIT TO THE OWNER EXISTS. IN ANY AND ALL CASES WHERE EXISTING EQUIPMENT IS REUTILIZED, THE CONTRACTOR SHALL PREPARE AND INCLUDE ANY AND ALL CIRCUIT EXTENSIONS, TRANSITIONS AND/OR TERMINATIONS. THE CONTRACTOR SHALL PROVIDE A FINISHED CONDITION THAT IS NEAT, SAFE, COMPLETE, AND IN STRICT COMPLIANCE WITH NEC REQUIREMENTS.
6. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS.
7. REFER TO ARCHITECTURAL DRAWINGS FOR ROOM NAMES AND NUMBERS.
8. THE CONTRACTOR SHALL COORDINATE THE FINAL PROPOSED MEANS AND METHODS OF CONSTRUCTION, EQUIPMENT LOCATIONS, AND SCOPE OF WORK WITH ALL ARCHITECTURAL, MECHANICAL, PIPING, ELECTRICAL AND VENDOR DRAWINGS.
9. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL COORDINATE ALL ELECTRICAL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND OWNER AS REQUIRED. BASE BID ACCORDINGLY.
10. HATCHING USED TO DENOTE AREAS AND/OR EQUIPMENT IMPACTED BY DEMOLITION WORK.
11. REFER TO DRAWING E.201 FOR THE PROJECT MAIN ONE LINE DIAGRAM.
12. REFER TO DRAWING E.309 FOR NEW WORK POWER AND FIRE ALARM PLANS.
13. REFER TO DRAWING E.409 FOR NEW WORK LIGHTING PLAN.
14. REFER TO DRAWING E.601 FOR THE PROJECT NEW FIRE ALARM RISER.
15. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
16. REFER TO DRAWING E.102 FOR ELECTRICAL SYMBOLS.
17. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - DEMOLITION PLAN
TWELFTH THRU FIFTEENTH FLOORS

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						
10.30.15	95% SUBMISSION	KD	FM						
09.07.17	ISSUED FOR BID	KD	FM						

DRAWN BY: RB
CHKD BY: JH
JOB NO: 2141151
SHEET: _ OF:
DWG NO:

DE.304

KEYED NEW WORK NOTES:

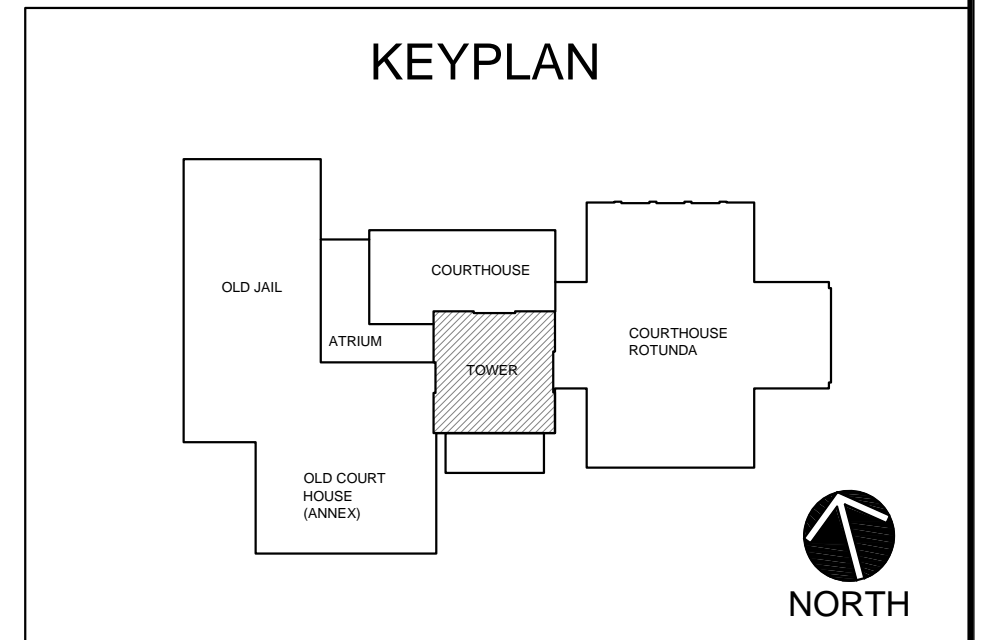
- 1 THE INSTALLATION OF THIS CONDUIT IS PAID UNDER THE CONTRACT FOR THE RADIO ROOM LOCATED AT SIXTEENTH FLOOR IN THE TOWER OF THE COURTHOUSE. THIS CONDUIT IS ALSO USED FOR THE CURRENT PROJECT.
- 2 THE INSTALLATION OF THIS EQUIPMENT IS PAID UNDER THE CONTRACT FOR THE UPGRADE OF THE RADIO ROOM LOCATED AT SIXTEENTH FLOOR IN THE TOWER OF THE COURTHOUSE. THIS EQUIPMENT IS ALSO USED FOR THE CURRENT PROJECT.

CABLE AND CONDUIT:

- 1 4-#4/0 AWG & #4AWG GND IN 2" C

DRAWING NOTES:

1. CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
2. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
3. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
4. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
5. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
6. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
7. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
8. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
10. PROVIDE ALL FIRE ALARM APPLIANCE ROUGH-IN FACILITIES AS REQUIRED.
11. ALL NEW FIRE ALARM APPLIANCES SHALL BE WIRED TO THE EXISTING FIRE ALARM SYSTEM, PROGRAMMED AND COMMISSIONED AS REQUIRED.
12. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS MARKED ACCORDINGLY.
13. PROVIDE INSULATED GROUNDING CONDUCTORS AS REQUIRED FOR ALL EQUIPMENT, LIGHTING FIXTURES, AND RECEPTACLES ETC. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN IN ALL ILLUSTRATED WIRING DESIGNATIONS.
14. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
15. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(3)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9.
16. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
17. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
18. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
19. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
20. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



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NJ License No. AI 16160
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

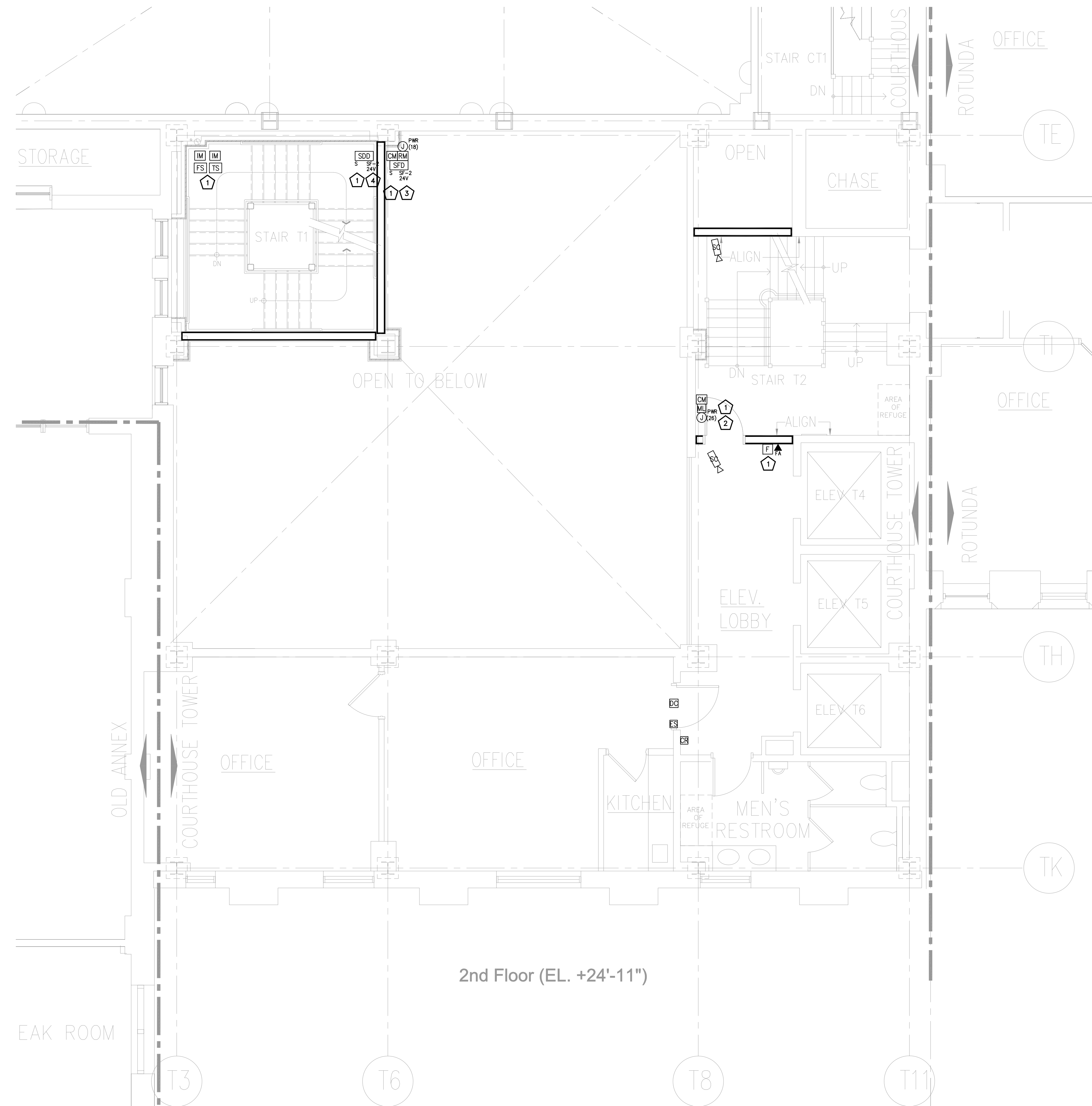
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**ELECTRICAL - POWER AND FIRE ALARM PLAN
BASEMENT FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8" = 1'-0"
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	RB
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	JJH
09.07.17	ISSUED FOR BID	KD	FM					JOB NO	2141151
								SHEET:	_ OF:
								DWG NO	

E.300B



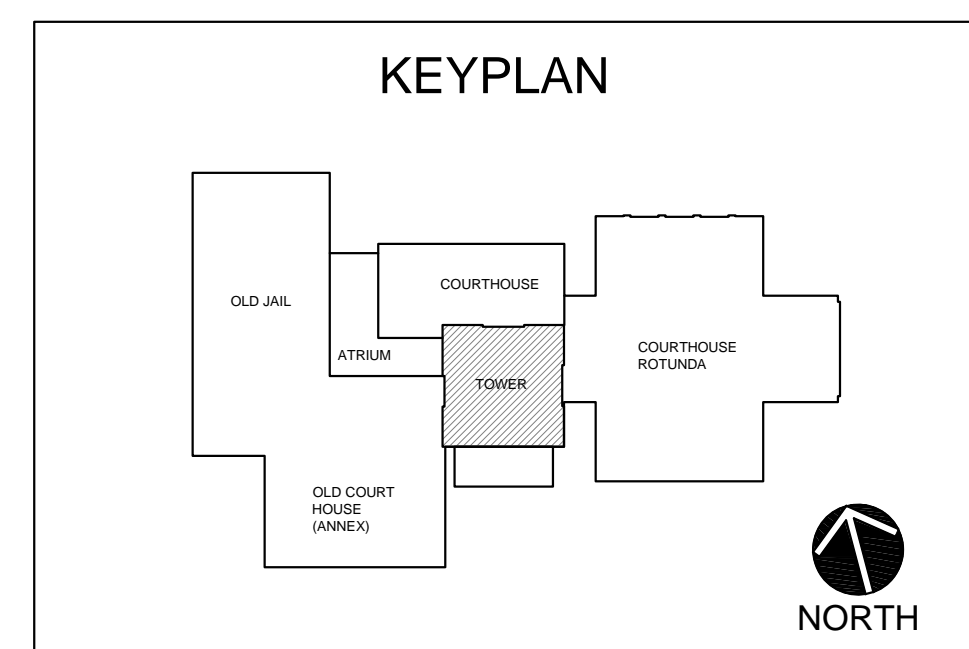
POWER AND FIRE ALARM PLAN – SECOND FLOOR
SCALE: 1/4"=1'-0"

KEYED WORK NOTES:

1. COORDINATE THE EXACT POWER & CONTROL WIRING REQUIREMENTS WITH THE FIRE ALARM VENDOR.
2. ALL FIRE ALARM SYSTEM DOOR LOCK AND HOLDERS UNDER THE SCOPE OF WORK ARE SUPPLIED FROM EMERGENCY PANELBOARD RP-RR LOCATED IN THE NEW RADIO ROOM AT 16TH FLOOR. THE NUMBER ATTACHED TO EACH RESPECTIVE JUNCTION BOX MEANS THE PANELBOARD'S ASSIGNED BRANCH CIRCUIT.
3. ALL FIRE SMOKE DAMPERS UNDER THE SCOPE OF WORK ARE SUPPLIED FROM EMERGENCY PANELBOARD RP-RR LOCATED IN THE RADIO ROOM AT 16TH FLOOR. THE NUMBER ATTACHED TO EACH RESPECTIVE JUNCTION BOX MEANS THE PANELBOARD'S ASSIGNED BRANCH CIRCUIT.
4. NEW DUCT SMOKE DETECTOR(S) PROVIDED BY THE FIRE ALARM CONTRACTOR, AND INSTALLED BY THE MECHANICAL CONTRACTOR. WIRE THE NEW DUCT SMOKE DETECTOR EQUIPMENT AS REQUIRED. REFER TO THE ELECTRICAL DETAILS FOR MORE INFORMATION.

DRAWING NOTES:

1. CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
2. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
3. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
4. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
5. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
6. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
7. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
8. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
10. PROVIDE ALL FIRE ALARM APPLIANCE ROUGH-IN FACILITIES AS REQUIRED.
11. ALL NEW FIRE ALARM APPLIANCES SHALL BE WIRED TO THE EXISTING FIRE ALARM SYSTEM PROGRAMMED AND COMMISSIONED AS REQUIRED.
12. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS MARKED ACCORDINGLY.
13. PROVIDE INSULATED GROUNDING CONDUCTORS AS REQUIRED FOR ALL EQUIPMENT, LIGHTING FIXTURES, AND RECEPTACLES ETC. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN IN ALL ILLUSTRATED WIRING DESIGNATIONS.
14. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
15. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(3)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9.
16. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
17. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
18. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
19. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
20. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



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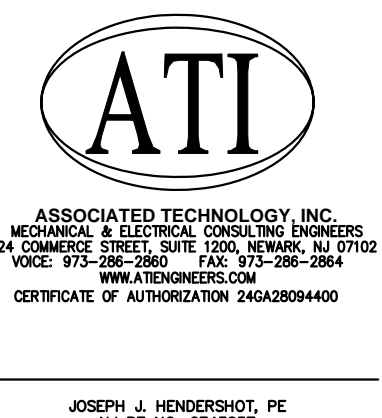
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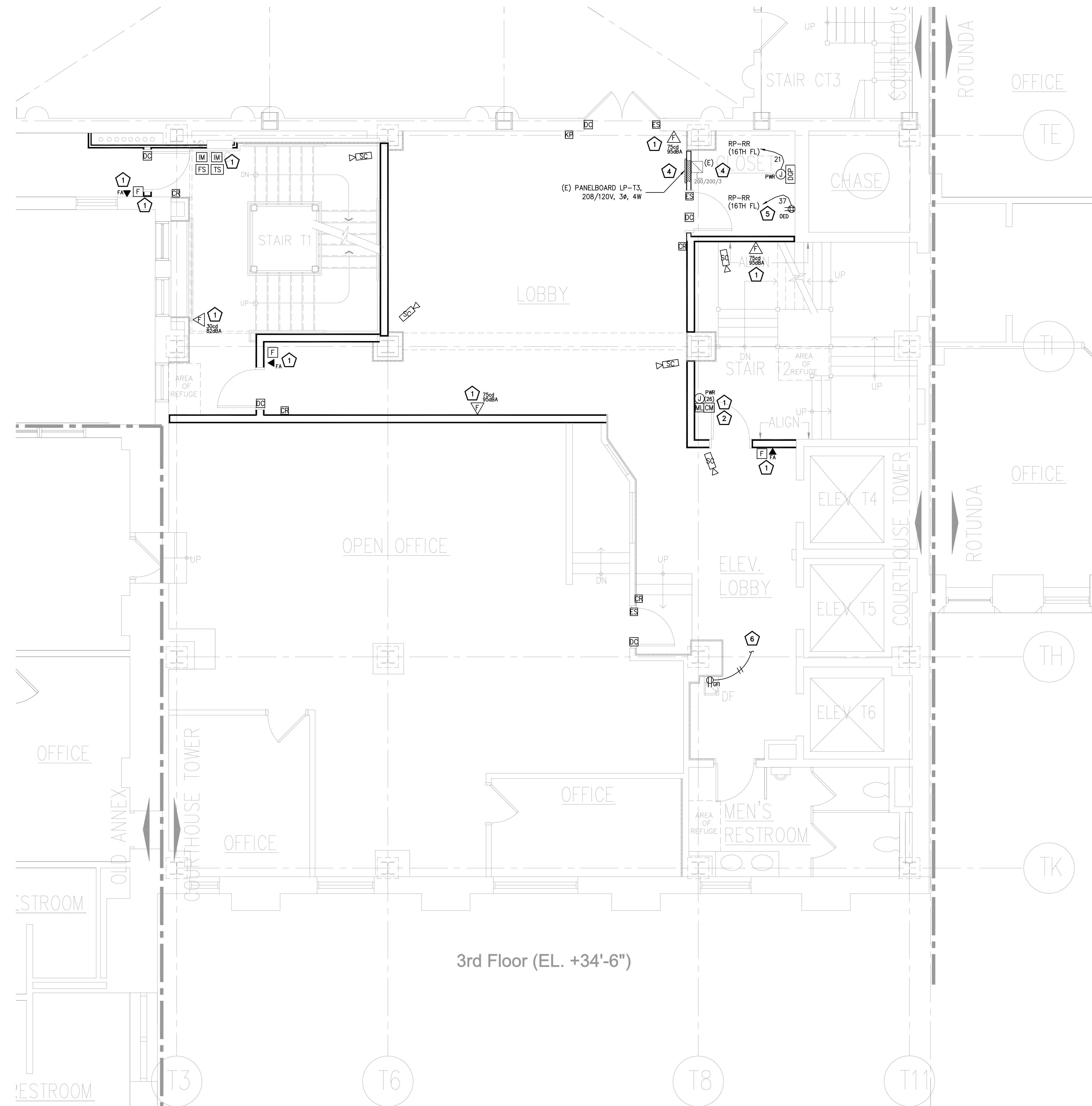


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

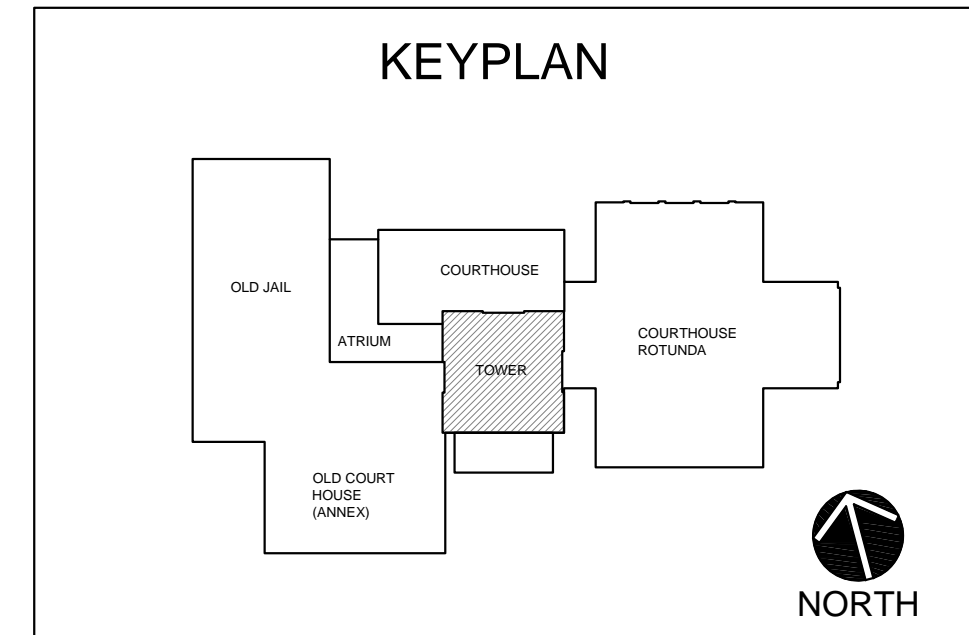
SHEET CONTENTS:
**ELECTRICAL - POWER AND FIRE ALARM PLAN
SECOND FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

E.302



POWER AND FIRE ALARM PLAN - THIRD FLOOR
SCALE: 1/4"=1'-0"



KEYED WORK NOTES:

- 1 COORDINATE THE EXACT POWER & CONTROL WIRING REQUIREMENTS WITH THE FIRE ALARM VENDOR.
- 2 ALL FIRE ALARM SYSTEM DOOR LOCK AND HOLDERS UNDER THE SCOPE OF WORK ARE SUPPLIED FROM EMERGENCY PANELBOARD RP-RR LOCATED IN THE NEW RADIO ROOM AT 16TH FLOOR. THE NUMBER ATTACHED TO EACH RESPECTIVE JUNCTION BOX MEANS THE PANELBOARD'S ASSIGNED BRANCH CIRCUIT.
- 3 FIRE ALARM SYSTEM DIGITAL GATHERING PANEL UNDER THE SCOPE OF WORK IS SUPPLIED FROM EMERGENCY PANELBOARD RP-RR LOCATED IN THE RADIO ROOM AT 16TH FLOOR. THE NUMBER ATTACHED TO EACH RESPECTIVE JUNCTION BOX MEANS THE PANELBOARD'S ASSIGNED BRANCH CIRCUIT.
- 4 PROVIDE SUPPORTS TO EXISTING ELECTRICAL EQUIPMENT IN RE-CONSTRUCTED RATED WALL. MAINTAIN ACCESSIBILITY TO EQUIPMENT, CORRESPONDING ENCLOSURE INTERIOR, AND PULL BOXES. SPLICE AND EXTEND WIRING AND CONDUIT AS REQUIRED. WIRE SIZES TO MATCH EXISTING. COORDINATE WITH THE ARCHITECT AND GENERAL CONTRACTOR.
- 5 PROVIDE DEDICATED EMERGENCY CIRCUIT FOR SECURITY ACCESS CARD PANEL PRIOR TO CIRCUIT INSTALLATION COORDINATE EXACT LOCATION AND POWER REQUIREMENTS WITH THE SECURITY VENDOR.
- 6 CONNECT NEW DRINKING FOUNTAIN (F) RECEPTACLE TO LOCAL FLOOR CONVENIENCE RECEPTACLE CIRCUIT. VIA 2#12 + 1#12S IN 3/4" C. CONTRACTOR TO VERIFY IN THE FIELD THE EXISTING CIRCUIT, TRACE AND DETERMINE EXISTING LOAD TO ACCOMMODATE NEW DRINKING FOUNTAIN. COORDINATE EXACT VA CONSUMPTION AND MOUNTING HEIGHT WITH THE APPROVED FOUNTAIN AND THE ARCHITECT.

DRAWING NOTES:

1. CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
2. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
3. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
4. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
5. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
6. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
7. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
8. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
10. PROVIDE ALL FIRE ALARM APPLIANCE ROUGH-IN FACILITIES AS REQUIRED.
11. ALL NEW FIRE ALARM APPLIANCES SHALL BE WIRED TO THE EXISTING FIRE ALARM SYSTEM, PROGRAMMED AND COMMISSIONED AS REQUIRED.
12. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS MARKED ACCORDINGLY.
13. PROVIDE INSULATED GROUNDING CONDUCTORS AS REQUIRED FOR ALL EQUIPMENT, LIGHTING FIXTURES, AND RECEPTACLES ETC. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN IN ALL ILLUSTRATED WIRING DESIGNATIONS.
14. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT, CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
15. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(3)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9.
16. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
17. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
18. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
19. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
20. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.

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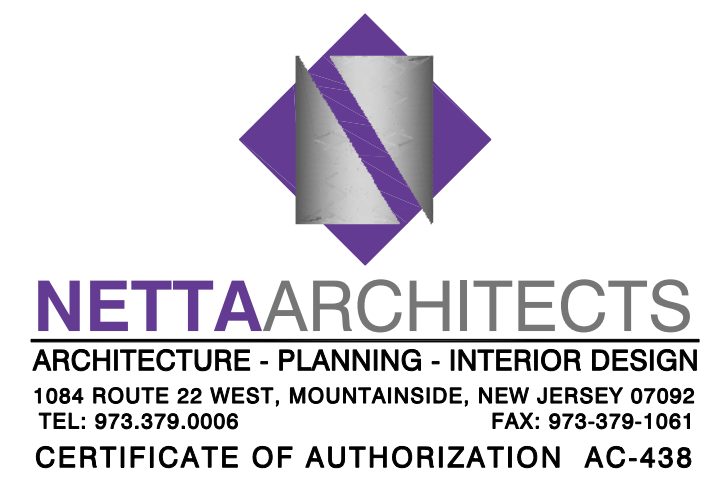
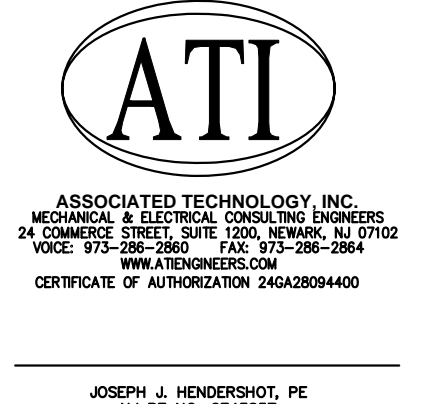
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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**ELECTRICAL - POWER AND FIRE ALARM PLAN
THIRD FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF: _
									DWG NO

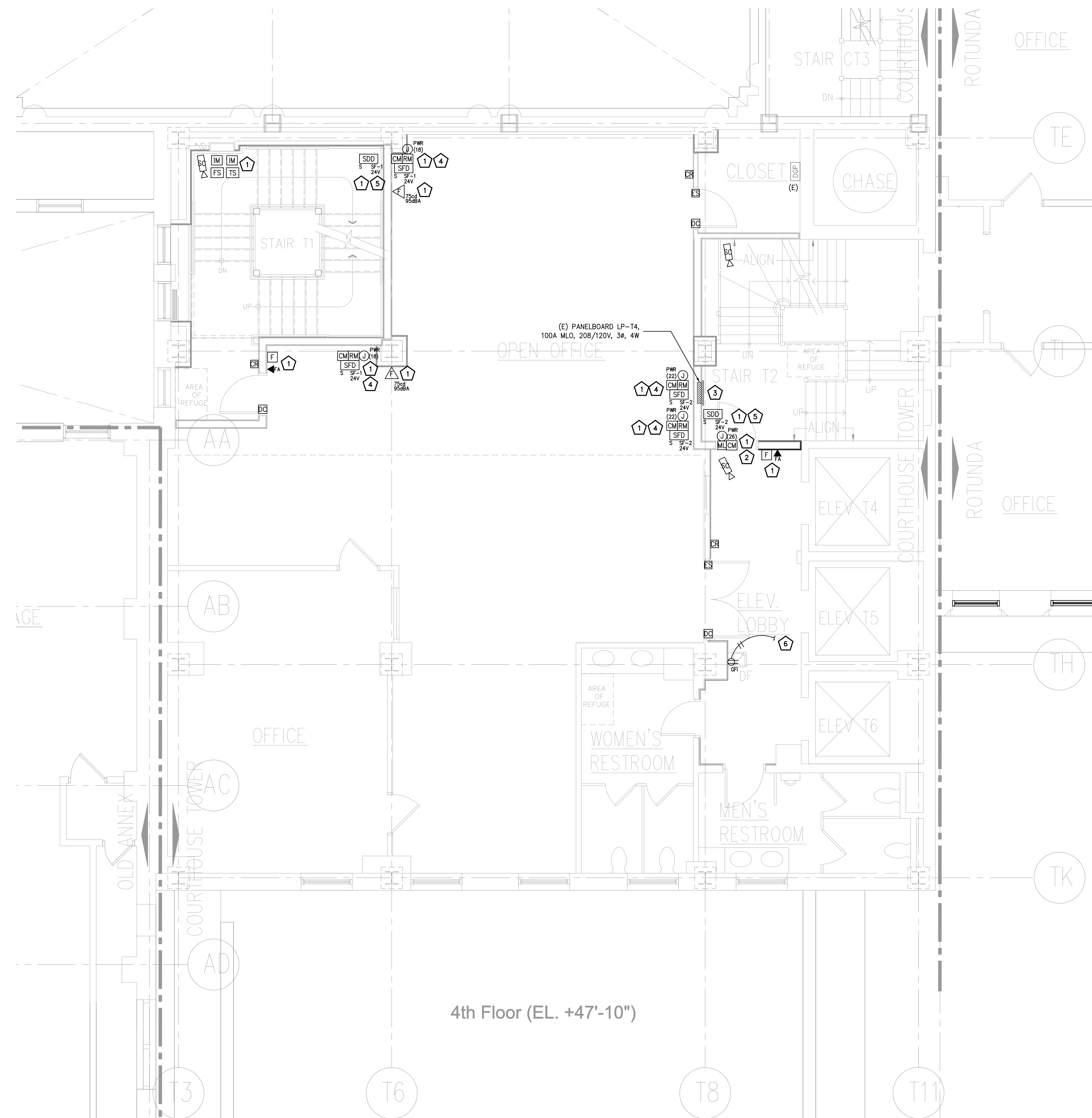
E.303

KEYED WORK NOTES:

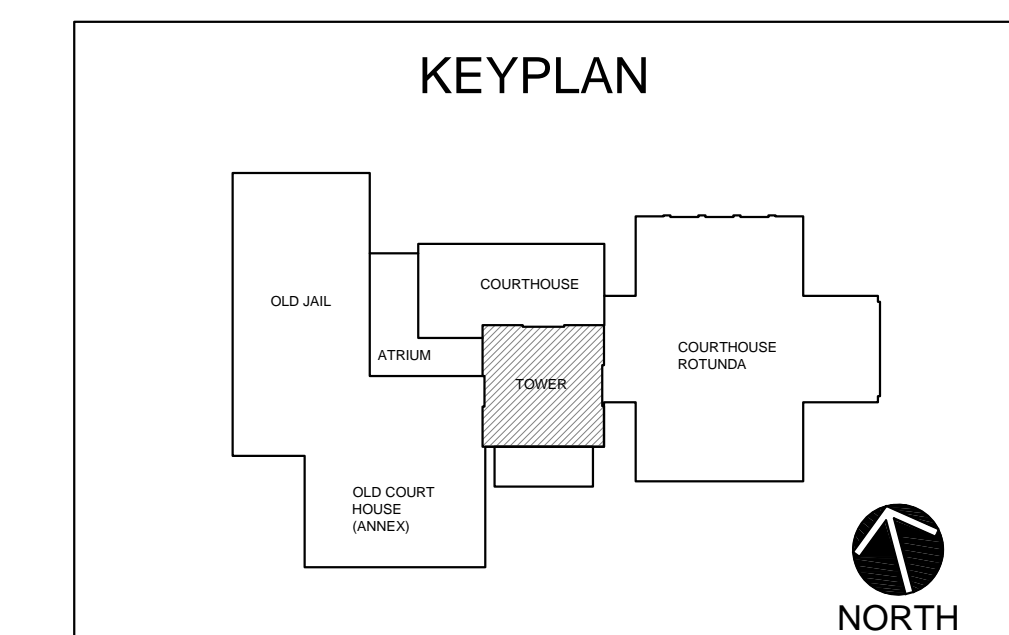
1. COORDINATE THE EXACT POWER & CONTROL WIRING REQUIREMENTS WITH THE FIRE ALARM VENDOR.
2. ALL FIRE ALARM SYSTEM DOOR LOCK AND HOLDERS UNDER THE SCOPE OF WORK ARE SUPPLIED FROM EMERGENCY PANELBOARD RP-RR LOCATED IN THE NEW RADIO ROOM AT 16TH FLOOR. THE NUMBER ATTACHED TO EACH RESPECTIVE JUNCTION BOX MEANS THE PANELBOARD'S ASSIGNED BRANCH CIRCUIT.
3. PROVIDE SUPPORTS TO EXISTING ELECTRICAL EQUIPMENT IN RE-CONSTRUCTED RATED WALL. MAINTAIN ACCESSIBILITY TO EQUIPMENT, CORRESPONDING ENCLOSURE INTERIOR, AND PULL BOXES. SPICE AND EXTEND WIRING AND CONDUIT AS REQUIRED. WIRE SIZES TO MATCH EXISTING. COORDINATE WITH THE ARCHITECT AND GENERAL CONTRACTOR.
4. ALL FIRE SMOKE DAMPERS UNDER THE SCOPE OF WORK ARE SUPPLIED FROM EMERGENCY PANELBOARD RP-RR LOCATED IN THE RADIO ROOM AT 16TH FLOOR. THE NUMBER ATTACHED TO EACH RESPECTIVE JUNCTION BOX MEANS THE PANELBOARD'S ASSIGNED BRANCH CIRCUIT.
5. NEW DUCT SMOKE DETECTOR(S) PROVIDED BY THE FIRE ALARM CONTRACTOR, AND INSTALLED BY THE MECHANICAL CONTRACTOR. WIRE THE NEW DUCT SMOKE DETECTOR EQUIPMENT AS REQUIRED. REFER TO THE ELECTRICAL DETAILS FOR MORE INFORMATION.
6. CONNECT NEW DRINKING FOUNTAIN (F) RECEPTACLE TO LOCAL FLOOR CONVENIENCE RECEPTACLE CIRCUIT, VIA 2#12 + 1#12G IN 3/4". CONTRACTOR TO VERIFY IN THE FIELD THE EXISTING CIRCUIT, TRACE AND DETERMINE EXISTING LOAD TO ACCOMMODATE NEW DRINKING FOUNTAIN. COORDINATE EXACT VA CONSUMPTION AND MOUNTING HEIGHT WITH THE APPROVED FOUNTAIN AND THE ARCHITECT.

DRAWING NOTES:

1. CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
2. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
3. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
4. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
5. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
6. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
7. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
8. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
10. PROVIDE ALL FIRE ALARM APPLIANCE ROUGH-IN FACILITIES AS REQUIRED.
11. ALL NEW FIRE ALARM APPLIANCES SHALL BE WIRED TO THE EXISTING FIRE ALARM SYSTEM, PROGRAMMED AND COMMISSIONED AS REQUIRED.
12. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS MARKED ACCORDINGLY.
13. PROVIDE INSULATED GROUNDING CONDUCTORS AS REQUIRED FOR ALL EQUIPMENT, LIGHTING FIXTURES, AND RECEPTACLES ETC. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN IN ALL ILLUSTRATED WIRING DESIGNATIONS.
14. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT, CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
15. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(3)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9.
16. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
17. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
18. REFER TO DRAWING E-101 FOR ELECTRICAL PROJECT NOTES.
19. REFER TO DRAWING E-102 FOR ELECTRICAL PROJECT SYMBOLS.
20. REFER TO DRAWING E-103 FOR ELECTRICAL ABBREVIATIONS.



POWER AND FIRE ALARM PLAN – FOURTH FLOOR
SCALE: 1/4"=1'-0"



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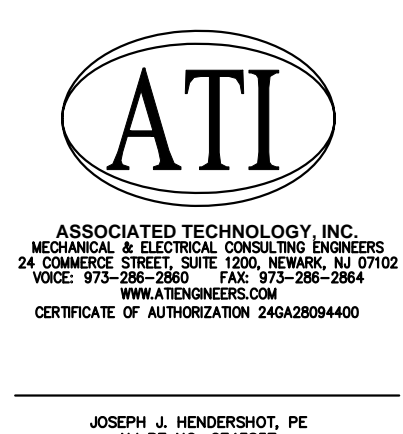
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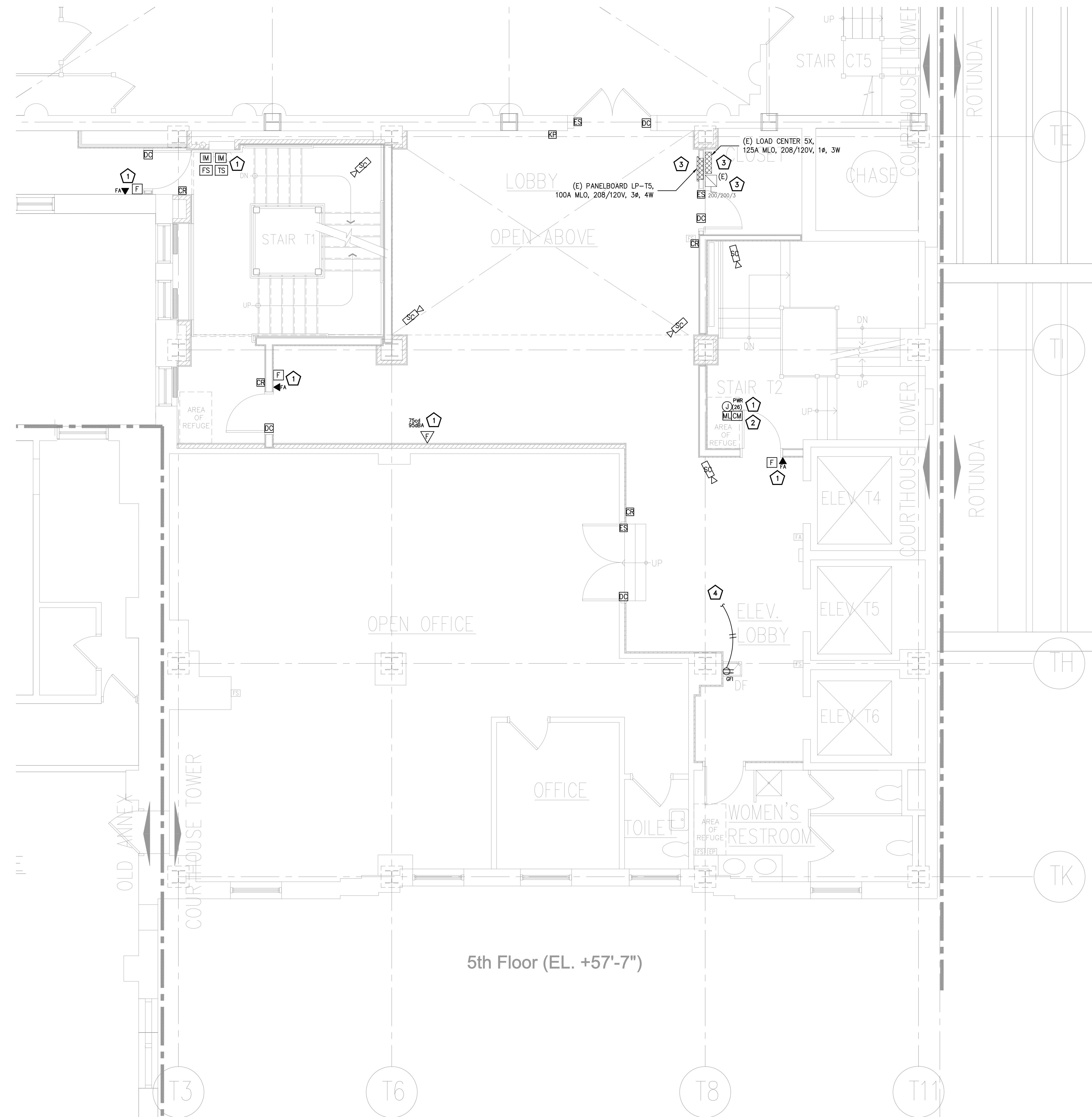


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

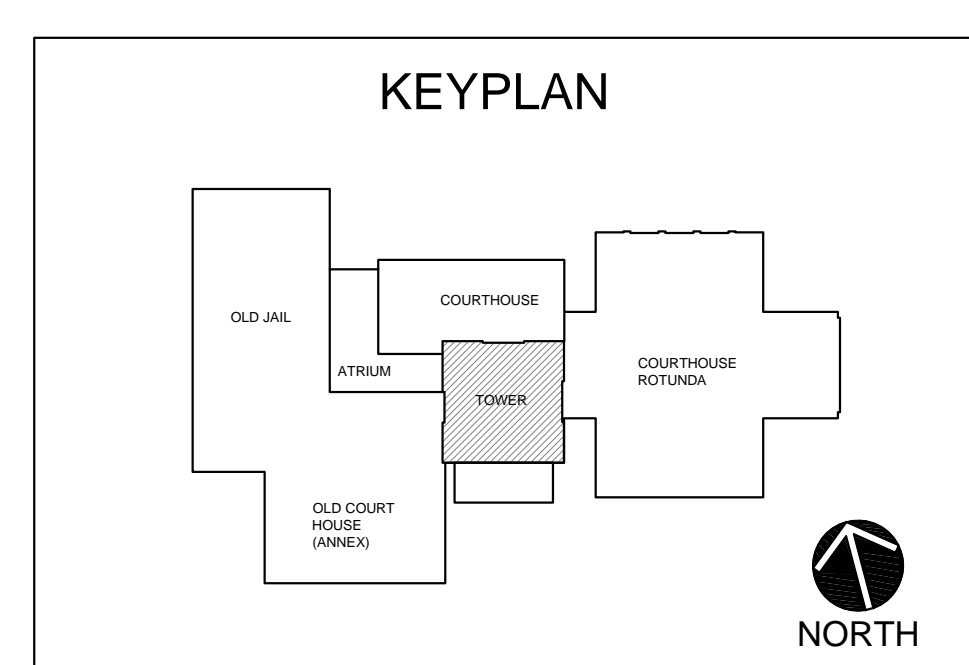
SHEET CONTENTS:
**ELECTRICAL - POWER AND FIRE ALARM PLAN
FOURTH FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

E.304



POWER AND FIRE ALARM PLAN – FIFTH FLOOR
SCALE: 1/4"=1'-0"



KEYED WORK NOTES:

1. COORDINATE THE EXACT POWER & CONTROL WIRING REQUIREMENTS WITH THE FIRE ALARM VENDOR.
2. ALL FIRE ALARM SYSTEM DOOR LOOK AND HOLDERS UNDER THE SCOPE OF WORK ARE SUPPLIED FROM EMERGENCY PANELBOARD RP-FR LOCATED IN THE RADIO ROOM AT 16TH FLOOR. THE NUMBER ATTACHED TO EACH RESPECTIVE JUNCTION BOX MEANS THE PANELBOARD'S ASSIGNED BRANCH CIRCUIT.
3. PROVIDE SUPPORTS TO EXISTING ELECTRICAL EQUIPMENT IN RE-CONSTRUCTED RATED WALL. MAINTAIN ACCESSIBILITY TO EQUIPMENT, CORRESPONDING ENCLOSURE INTERIOR, AND PULL BOXES. SPICE AND EXTEND WIRING AND CONDUIT AS REQUIRED. WIRE SIZES TO MATCH EXISTING. COORDINATE WITH THE ARCHITECT AND GENERAL CONTRACTOR.
4. CONNECT NEW DRINKING FOUNTAIN GF1 RECEPTACLE TO LOCAL FLOOR CONVENIENCE RECEPTACLE CIRCUIT, VIA 2#12 + 1#12G IN 3/4" C. CONTRACTOR TO VERIFY IN THE FIELD THE EXISTING CIRCUIT, TRACE AND DETERMINE EXISTING LOAD TO ACCOMMODATE NEW DRINKING FOUNTAIN. COORDINATE EXACT VIA CONSUMPTION AND MOUNTING HEIGHT WITH THE APPROVED FOUNTAIN AND THE ARCHITECT.

DRAWING NOTES:

1. CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
2. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
3. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
4. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
5. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
6. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
7. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
8. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
10. PROVIDE ALL FIRE ALARM APPLIANCE ROUGH-IN FACILITIES AS REQUIRED.
11. ALL NEW FIRE ALARM APPLIANCES SHALL BE WIRED TO THE EXISTING FIRE ALARM SYSTEM, PROGRAMMED AND COMMISSIONED AS REQUIRED.
12. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS MARKED ACCORDINGLY.
13. PROVIDE INSULATED GROUNDING CONDUCTORS AS REQUIRED FOR ALL EQUIPMENT, LIGHTING FIXTURES, AND RECEPTACLES ETC. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN IN ALL ILLUSTRATED WIRING DESIGNATIONS.
14. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
15. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(3)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9.
16. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
17. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
18. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
19. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
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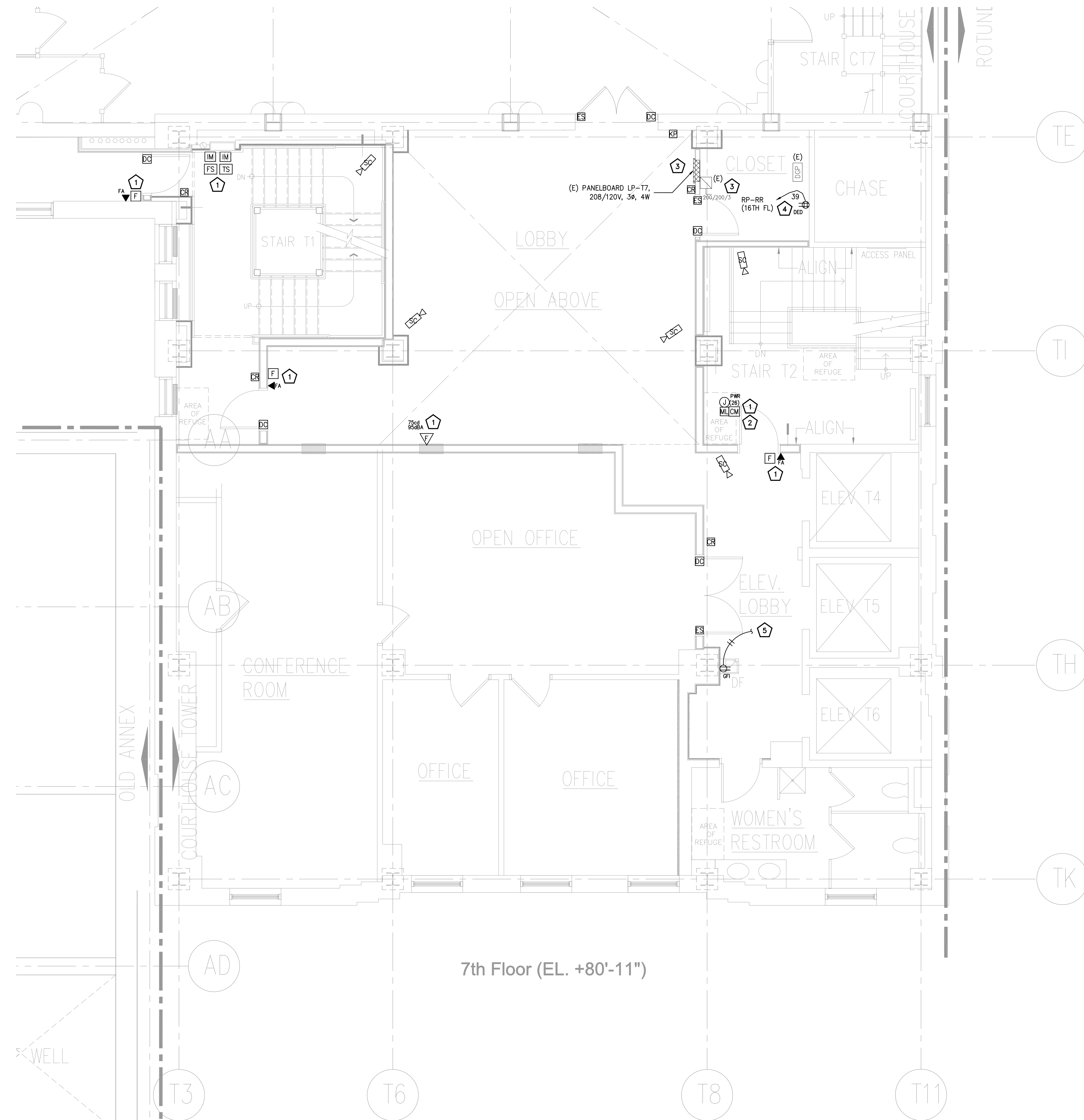


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

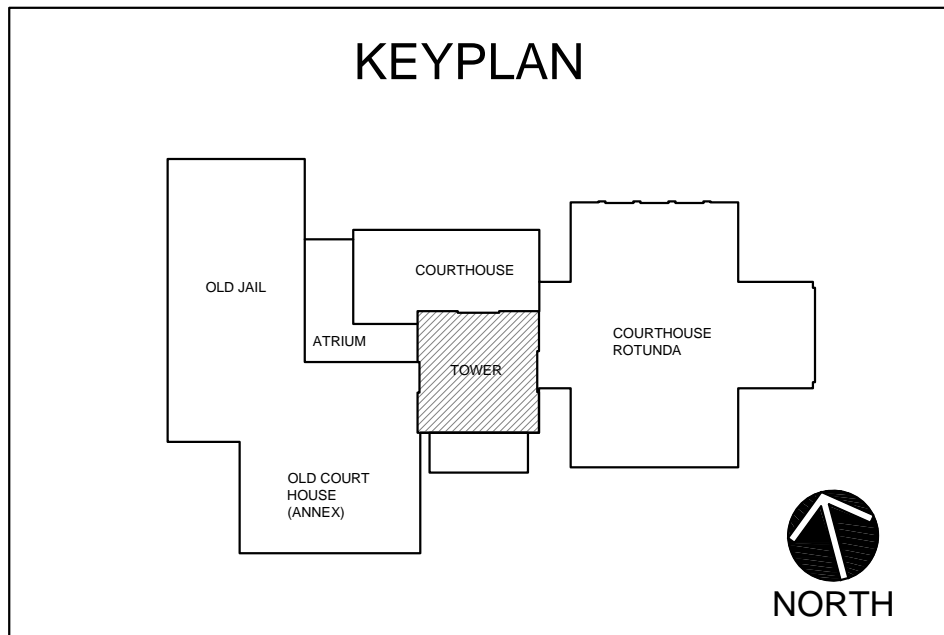
SHEET CONTENTS:
**ELECTRICAL - POWER AND FIRE ALARM PLAN
FIFTH FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

E.305



POWER AND FIRE ALARM PLAN – SEVENTH FLOOR
SCALE: 1/4"=1'-0"



KEYED WORK NOTES:

1. COORDINATE THE EXACT POWER & CONTROL WIRING REQUIREMENTS WITH THE FIRE ALARM VENDOR.
2. ALL FIRE ALARM SYSTEM DOOR LOOK AND HOLDERS UNDER THE SCOPE OF WORK ARE SUPPLIED FROM EMERGENCY PANELBOARD RP-RR LOCATED IN THE RADIO ROOM AT 16TH FLOOR. THE NUMBER ATTACHED TO EACH RESPECTIVE JUNCTION BOX MEANS THE PANELBOARD'S ASSIGNED BRANCH CIRCUIT.
3. PROVIDE SUPPORTS TO EXISTING ELECTRICAL EQUIPMENT IN RE-CONSTRUCTED RATED WALL. MAINTAIN ACCESSIBILITY TO EQUIPMENT, CORRESPONDING ENCLOSURE INTERIOR, AND PULL BOXES. SPLICE AND EXTEND WIRING AND CONDUIT AS REQUIRED. WIRE SIZES TO MATCH EXISTING. COORDINATE WITH THE ARCHITECT AND GENERAL CONTRACTOR.
4. PROVIDE DEDICATED EMERGENCY CIRCUIT FOR SECURITY ACCESS CARD PANEL. PRIOR TO CIRCUIT INSTALLATION COORDINATE EXACT LOCATION AND POWER REQUIREMENTS WITH THE SECURITY VENDOR.
5. CONNECT NEW DRINKING FOUNTAIN GF1 RECEPTACLE TO LOCAL FLOOR CONVENIENCE RECEPTACLE CIRCUIT, VA 2#12 + 1#12G IN 3/4" C. CONTRACTOR TO VERIFY IN THE FIELD THE EXISTING CIRCUIT, TRACE AND DETERMINE EXISTING LOAD TO ACCOMMODATE NEW DRINKING FOUNTAIN. COORDINATE EXACT VA CONSUMPTION AND MOUNTING HEIGHT WITH THE APPROVED FOUNTAIN AND THE ARCHITECT.

DRAWING NOTES:

1. CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
2. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
3. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
4. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
5. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
6. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
7. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
8. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
10. PROVIDE ALL FIRE ALARM APPLIANCE ROUGH-IN FACILITIES AS REQUIRED.
11. ALL NEW FIRE ALARM APPLIANCES SHALL BE WIRED TO THE EXISTING FIRE ALARM SYSTEM, PROGRAMMED AND COMMISSIONED AS REQUIRED.
12. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS MARKED ACCORDINGLY.
13. PROVIDE INSULATED GROUNDING CONDUCTORS AS REQUIRED FOR ALL EQUIPMENT, LIGHTING FIXTURES, AND RECEPTABLES ETC. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN IN ALL ILLUSTRATED WIRING DESIGNATIONS.
14. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
15. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(3)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9.
16. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
17. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
18. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
19. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
20. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.

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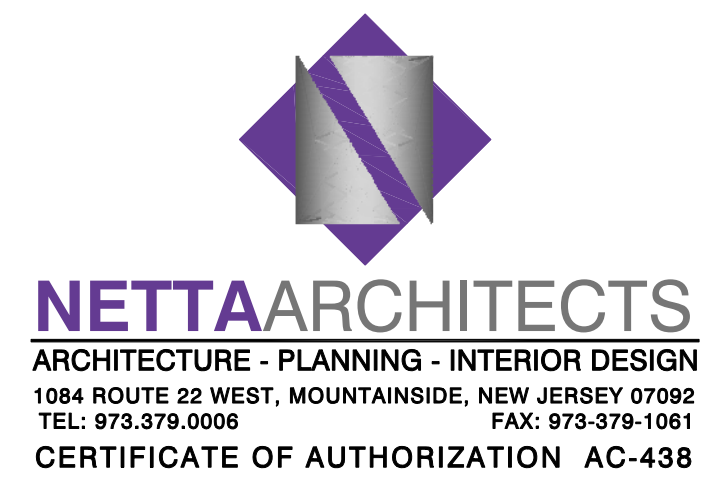
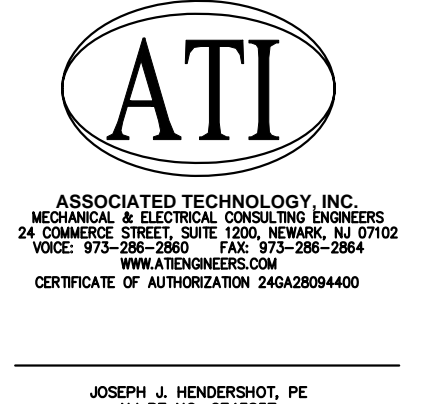
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NJ License No. AI 12118

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NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**ELECTRICAL - POWER AND FIRE ALARM PLAN
SEVENTH FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
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									DWG NO

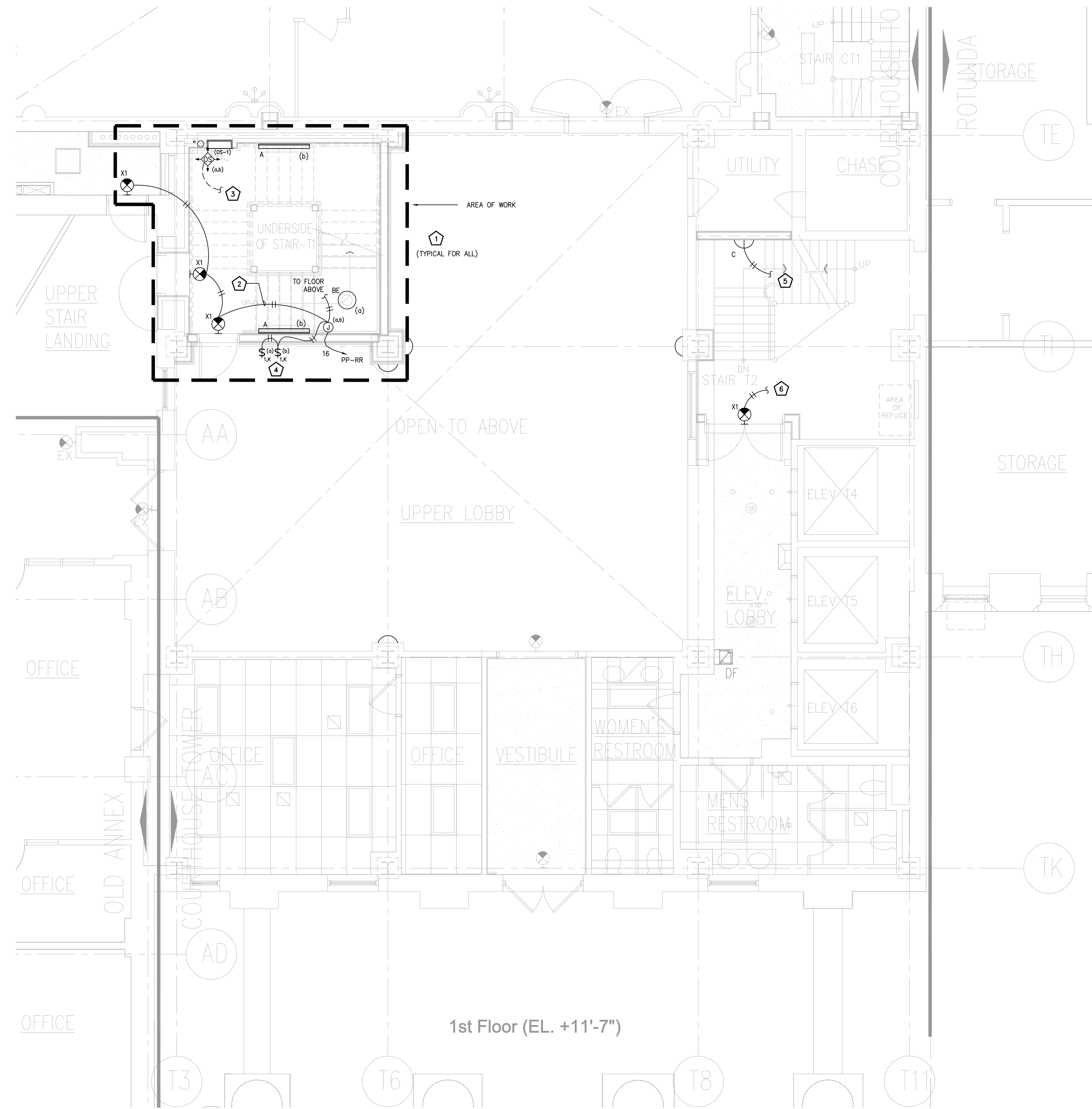
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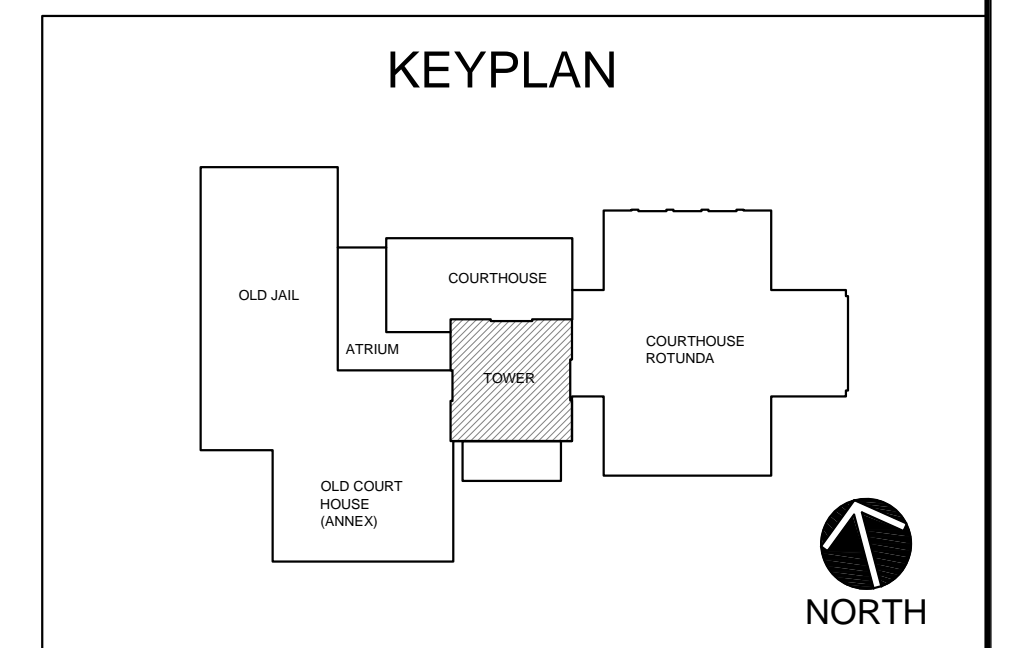
- REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
- ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
- REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS, AND LEGENDS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
- WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9.
- SUBMIT COLOR OPTIONS FOR ALL LIGHTING FIXTURES AND CONTROL DEVICES FOR SELECTION BY ARCHITECT.
- FOR CLARITY, SOME FIXTURE & SWITCH INTERCONNECTING WIRING IS NOT EXPLICITLY SHOWN. CONTRACTOR SHALL USE SWITCHING DESIGNATIONS, HOME RUN REFERENCES, AND APPLICABLE DETAILS TO DERIVE THE COMPLETE SCOPE OF LIGHTING WIRING INTENT.
- FIXTURES CONTAINING EMERGENCY BALLASTS, BATTERY PACKS, AND/OR 24/7 NITE LITE PROVISIONS SHALL BE FED WITH UNSWITCHED POWER AS REQUIRED PER THE FIXTURE/BALLAST MANUFACTURER'S INSTRUCTIONS. IN CERTAIN FIXTURES, THE UNSWITCHED POWER SOURCE FEEDING THE EMERGENCY CIRCUIT MAY BE IN ADDITION TO THE NORMAL SWITCHED POWER SOURCE REQUIRED. THE CONTRACTOR SHALL CONFIRM ALL FIXTURE WIRING REQUIREMENTS AND OPERATIONAL REQUIREMENTS AND BASE HIS BID ACCORDINGLY.
- HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS APPROPRIATELY MARKED.
- REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LUMINAIRES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.
- PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTORS FOR ALL LIGHTING FIXTURES AS REQUIRED. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN ON CERTAIN WIRING DESIGNATIONS.
- COORDINATE FIXTURE STYLE WITH CEILING SYSTEM THE FIXTURE IS TO BE INSTALLED IN OR ON. LAY-IN FIXTURE FRAME STYLE SHALL MATCH THE CEILING GRID / SYSTEM. SURFACE MOUNTED FIXTURES SHALL MAINTAIN THE INTENDED CEILING FIRE RATINGS.
- ALL WIRING TO BE #12AWG WITH #12AWG GND UNLESS OTHERWISE NOTED OR REQUIRED DUE TO CONDUCTOR DERATING FOR MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY OR CABLE ASSEMBLY.
- DASHED LINES USED TO DENOTE OCCUPANCY SENSOR CONTROL WIRING.
- ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT, CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
- CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN). CONTRACTOR SHALL SUBMIT COLOR OPTIONS FOR ANY AND ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
- FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE TENANT.
- REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LIGHTING FIXTURE AND CONTROL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
- REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR FINAL LOCATIONS OF NEW MECHANICAL AND PLUMBING EQUIPMENT.
- ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
- CONTRACTOR SHALL CONDUCT ALL NECESSARY EMERGENCY LIGHTING TEST(S) FOR THE AUTHORITY HAVING JURISDICTION.
- REFER TO DRAWING E.101 FOR ELECTRICAL GENERAL NOTES, DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS AND DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.
- REFER TO DRAWING E.202 FOR ELECTRICAL PANELBOARDS SCHEDULES.
- REFER TO DRAWING E.701 FOR LIGHTING FIXTURES SCHEDULES.

KEYED WORK NOTES:

- ALL LIGHTING FIXTURES AND EXIT SIGNS UNDER THE SCOPE OF WORK ARE SUPPLIED FROM EMERGENCY PANELBOARD PP-RR LOCATED IN THE NEW RADIO ROOM AT 16TH FLOOR. THE NUMBER ATTACHED TO EACH FIXTURE OR TO EACH RESPECTIVE JUNCTION BOX MEANS THE PANELBOARD'S ASSIGNED BRANCH CIRCUIT.
- WIRE NEW EXIT SIGN FROM STAIRWELL EMERGENCY LIGHTING CIRCUIT. FIXTURES SHALL BE FED FROM UPSTREAM OF ANY CONTROL DEVICES.
- WIRE NEW OCCUPANCY SENSOR TO OTHER FLOOR SENSORS AS PER CONTROL ZONE DESIGNATION, VIA CAT 5E CABLE IN 3/4" CONDUIT. LIGHTING CONTROLLED SHALL BE DIMMED TO 50% UPON 20 MINUTES OF OCCUPANTS LEAVING THE SPACE. PROVIDE ALL NECESSARY UL924 EMERGENCY POWER RELAY PACKS, AS REQUIRED.
- FOR ALL KEY-TYPE LIGHTING CONTROL SWITCHES, PROVIDE A PERMANENTLY IDENTIFIED SWITCH COVER PLATE THAT IDENTIFIES LIGHTS SERVED AND IS INDICATIVE OF ON/OFF STATUS.
- WIRE NEW LIGHTING TO THE LOCAL STAIRWELL LIGHTING CIRCUIT. SPLICE AND EXTEND BRANCH CIRCUIT WIRING TO FIXTURE AS REQUIRED, WIRE SIZE TO MATCH EXISTING.
- WIRE NEW EXIT SIGN TO THE LOCAL EXIT SIGN CIRCUIT. SPLICE AND EXTEND BRANCH CIRCUIT WIRING TO SIGN AS REQUIRED, WIRE SIZE TO MATCH EXISTING.



LIGHTING PLAN - FIRST FLOOR
SCALE: 1/4"=1'-0"



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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - LIGHTING PLAN
FIRST FLOOR

SUBMISSIONS				REVISIONS				DATE	10-10-15
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04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JHH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
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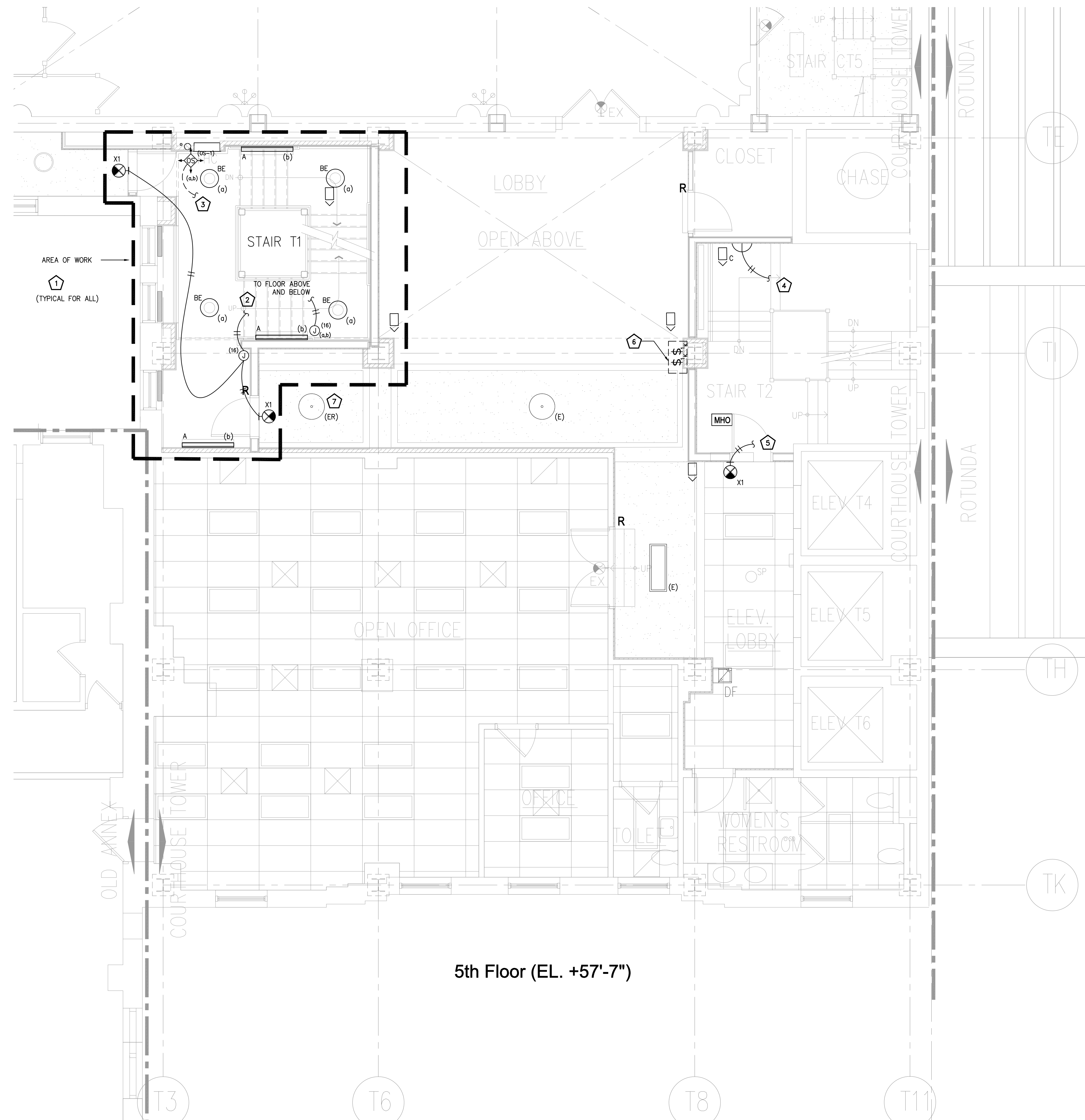
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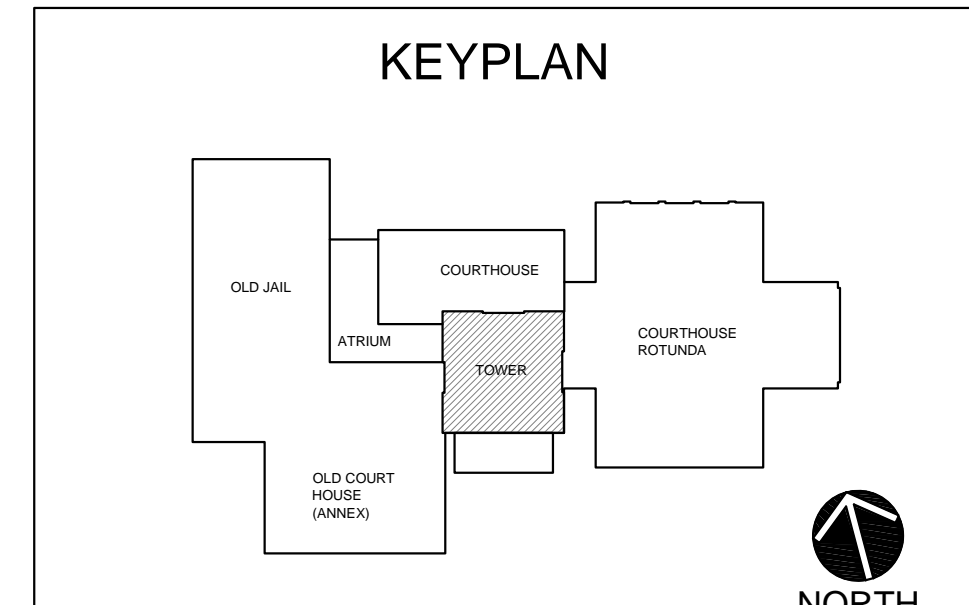
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11. COORDINATE FIXTURE STYLE WITH CEILING SYSTEM THE FIXTURE IS TO BE INSTALLED IN OR ON. LAY-IN FIXTURE FRAME STYLE SHALL MATCH THE CEILING GRID / SYSTEM. SURFACE MOUNTED FIXTURES SHALL MAINTAIN THE INTENDED CEILING FIRE RATINGS.
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22. REFER TO DRAWING E.202 FOR ELECTRICAL PANELBOARDS SCHEDULES.
23. REFER TO DRAWING E.701 FOR LIGHTING FIXTURES SCHEDULES.

KEYED WORK NOTES:

- 1 ALL LIGHTING FIXTURES AND EXIT SIGNS UNDER THE SCOPE OF WORK ARE SUPPLIED FROM EMERGENCY PANELBOARD PP-RR LOCATED IN THE NEW RADIO ROOM AT 16TH FLOOR. THE NUMBER ATTACHED TO EACH FIXTURE OR TO EACH RESPECTIVE JUNCTION BOX MEANS THE PANELBOARD'S ASSIGNED BRANCH CIRCUIT.
- 2 WIRE NEW EXIT SIGN FROM STAIRWELL EMERGENCY LIGHTING CIRCUIT. FIXTURES SHALL BE FED FROM UPSTREAM OF ANY CONTROL DEVICES.
- 3 WIRE NEW OCCUPANCY SENSOR TO OTHER FLOOR SENSORS AS PER CONTROL ZONE DESIGNATION, VIA CAT 5E CABLE IN 3/4" CONDUIT. LIGHTING CONTROLLED SHALL BE DIMMED TO 50% UPON 20 MINUTES OF OCCUPANTS LEAVING THE SPACE. PROVIDE ALL NECESSARY UL924 EMERGENCY POWER RELAY PACKS, AS REQUIRED.
- 4 WIRE NEW LIGHTING TO THE LOCAL STAIRWELL LIGHTING CIRCUIT. SPLICE AND EXTEND BRANCH CIRCUIT WIRING TO FIXTURE AS REQUIRED, WIRE SIZE TO MATCH EXISTING.
- 5 WIRE NEW EXIT SIGN TO THE LOCAL EXIT SIGN CIRCUIT. SPLICE AND EXTEND BRANCH CIRCUIT WIRING TO SIGN AS REQUIRED, WIRE SIZE TO MATCH EXISTING.
- 6 REPLACE REMOVED KEY-SWITCHES WITH NEW. MATCH TYPE SINGLE-WAY OR THREE-WAY AND CONNECT TO LIGHTING FIXTURES TO BE CONTROLLED AS PER EXISTING CONDITIONS. ARRANGE SWITCHES IN GANGS AND COVER WITH A SINGLE FACEPLATE.
- 7 MOUNT RELOCATED EXISTING LIGHTING FIXTURE AS SHOWN. EXTEND WIRING AND CONDUIT TO NEW LOCATION AS REQUIRED, WIRE SIZE TO MATCH EXISTING.



LIGHTING PLAN - FIFTH FLOOR
SCALE: 1/4"=1'-0"



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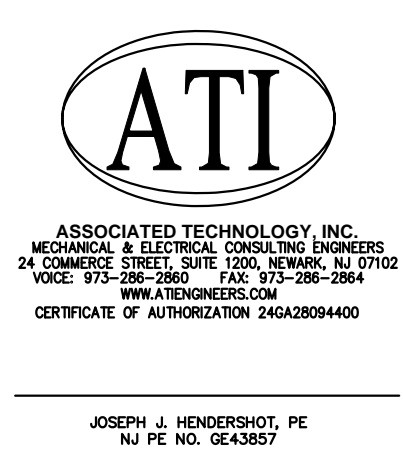
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ELECTRICAL - LIGHTING PLAN
FIFTH FLOOR

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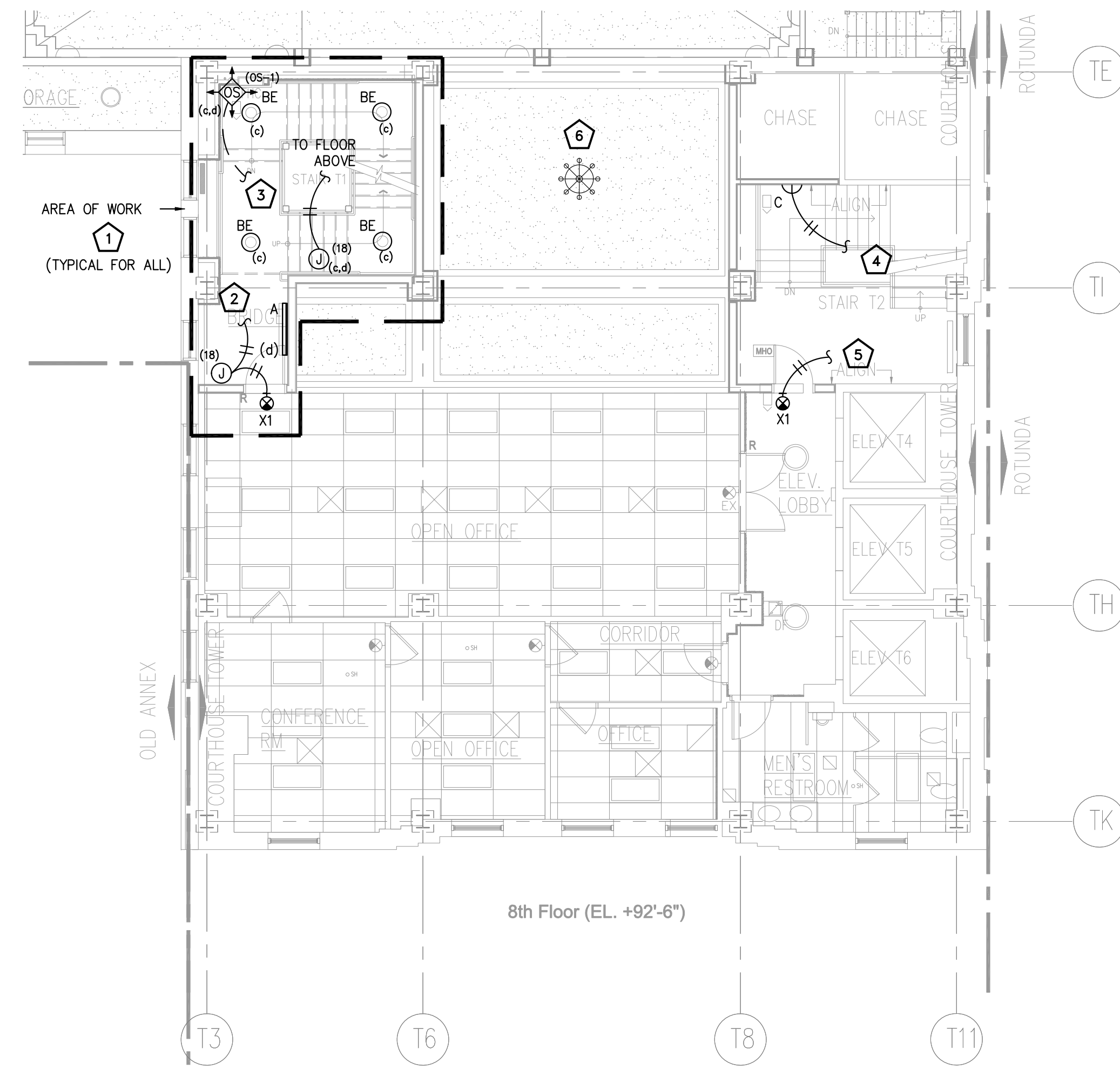
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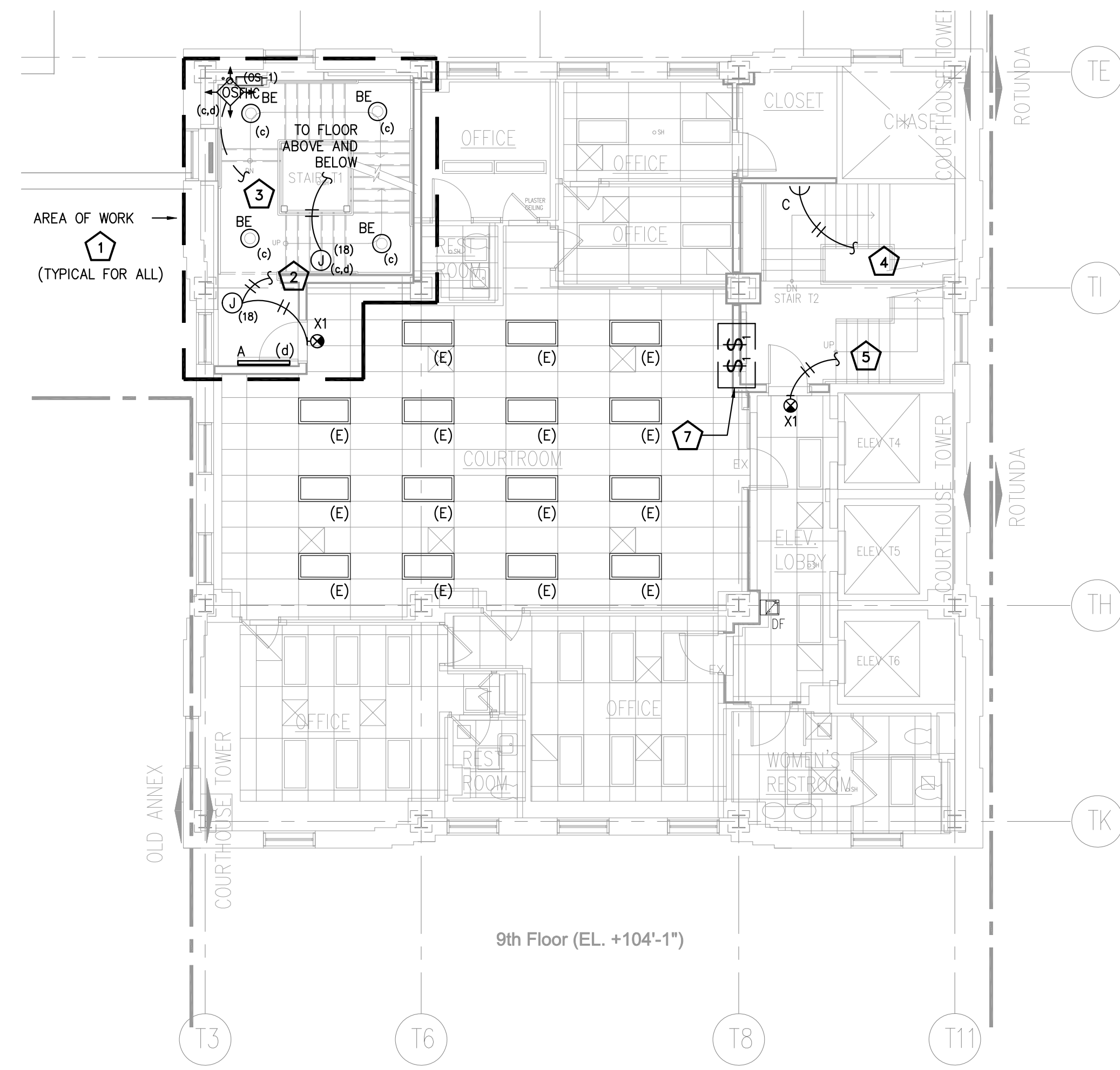
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- REFER TO DRAWING E.701 FOR LIGHTING FIXTURES SCHEDULES.

KEYED WORK NOTES:

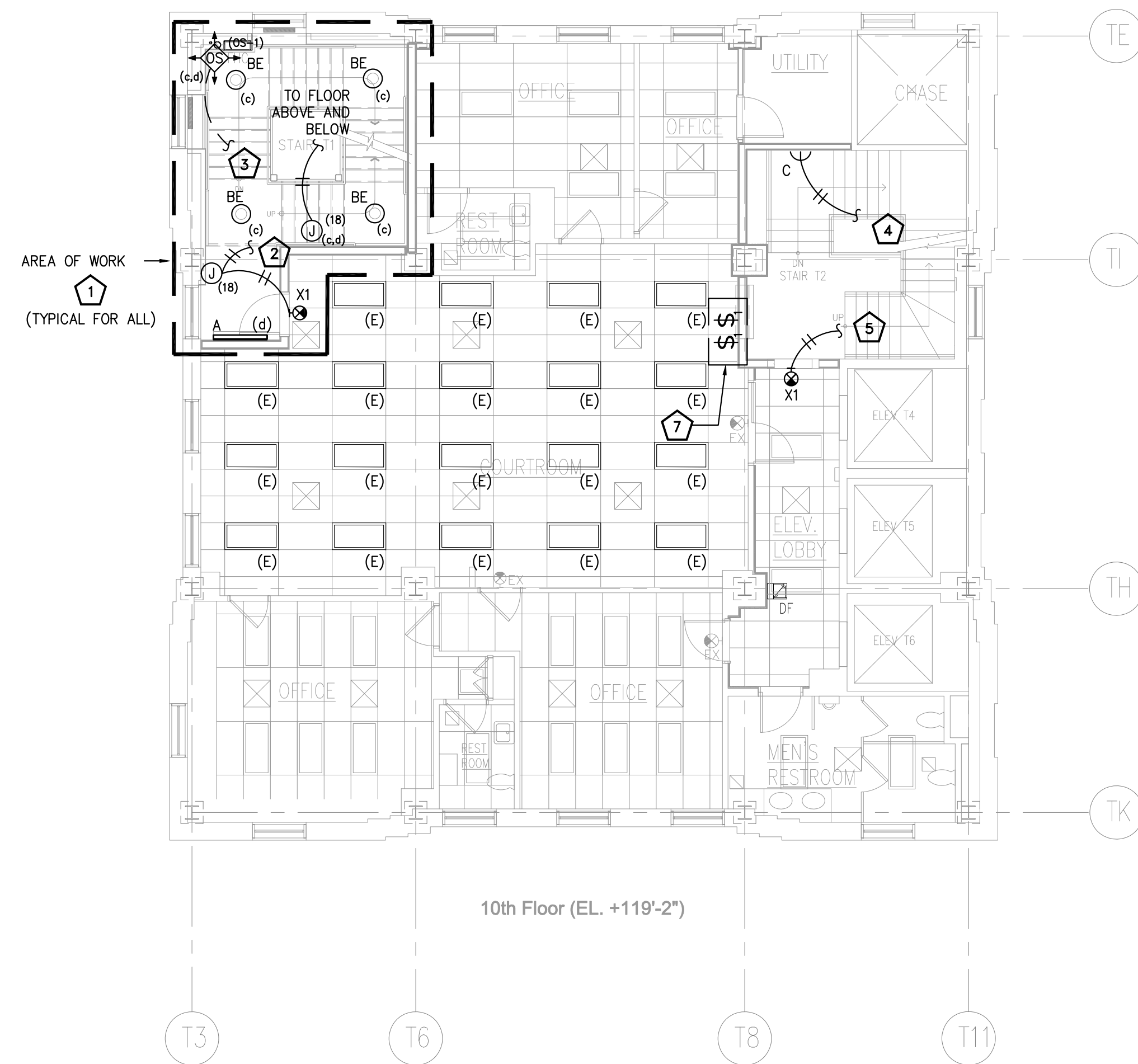
- ALL LIGHTING FIXTURES AND EXIT SIGNS UNDER THE SCOPE OF WORK ARE SUPPLIED FROM EMERGENCY PANELBOARD PP-RR LOCATED IN THE NEW RADIO ROOM AT 16TH FLOOR. THE NUMBER ATTACHED TO EACH FIXTURE OR TO EACH RESPECTIVE JUNCTION BOX MEANS THE PANELBOARD'S ASSIGNED BRANCH CIRCUIT.
- WIRE NEW EXIT SIGN FROM STAIRWELL EMERGENCY LIGHTING CIRCUIT. FIXTURES SHALL BE FED FROM UPSTREAM OF ANY CONTROL DEVICES.
- WIRE NEW OCCUPANCY SENSOR TO OTHER FLOOR SENSORS AS PER CONTROL ZONE DESIGNATION, VIA CAT 5E CABLE IN 3/4" CONDUIT. LIGHTING CONTROLLED SHALL BE DIMMED TO 50% UPON 20 MINUTES OF OCCUPANTS LEAVING THE SPACE. PROVIDE ALL NECESSARY UL924 EMERGENCY POWER RELAY PACKS, AS REQUIRED.
- WIRE NEW LIGHTING TO THE LOCAL STAIRWELL LIGHTING CIRCUIT. SPLICE AND EXTEND BRANCH CIRCUIT WIRING TO FIXTURE AS REQUIRED, WIRE SIZE TO MATCH EXISTING.
- WIRE NEW EXIT SIGN TO THE LOCAL EXIT SIGN CIRCUIT. SPLICE AND EXTEND BRANCH CIRCUIT WIRING TO SIGN AS REQUIRED, WIRE SIZE TO MATCH EXISTING.
- DISCONNECT AND INSTALL EXISTING HIGH-CEILING PENDANT LIGHTING FIXTURE AT A LOWER HEIGHT. EXTEND BRANCH CIRCUIT WIRING AS REQUIRED. COORDINATE WITH THE ARCHITECT.
- REPLACE REMOVED SWITCHES WITH NEW. MATCH TYPE SINGLE-WAY OR THREE-WAY AND CONNECT TO LIGHTING FIXTURES TO BE CONTROLLED AS PER EXISTING CONDITIONS. ARRANGE SWITCHES IN GANGS AND COVER WITH A SINGLE FACEPLATE.



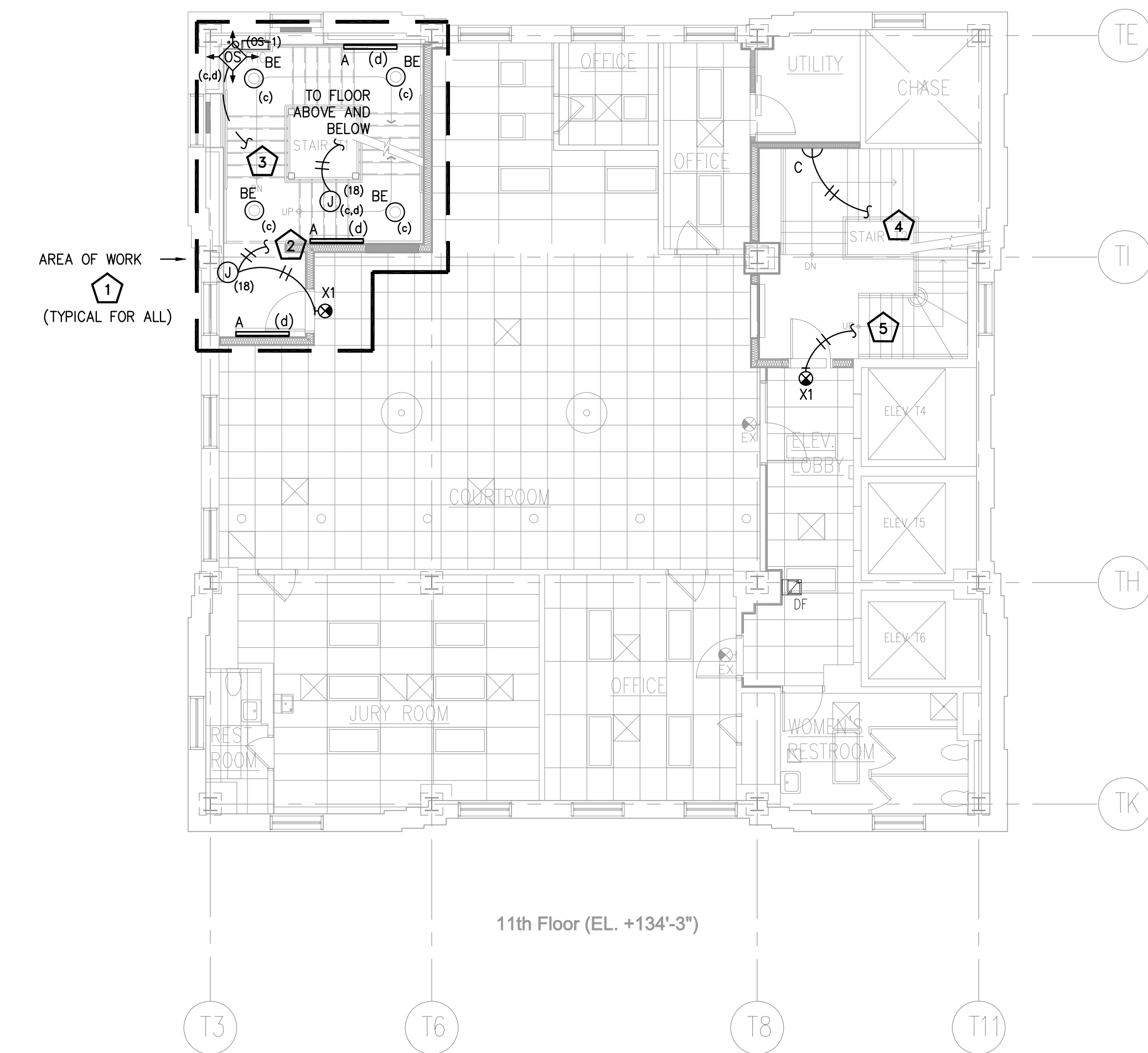
LIGHTING PLAN - EIGHTH FLOOR
SCALE: 1/8"=1'-0"



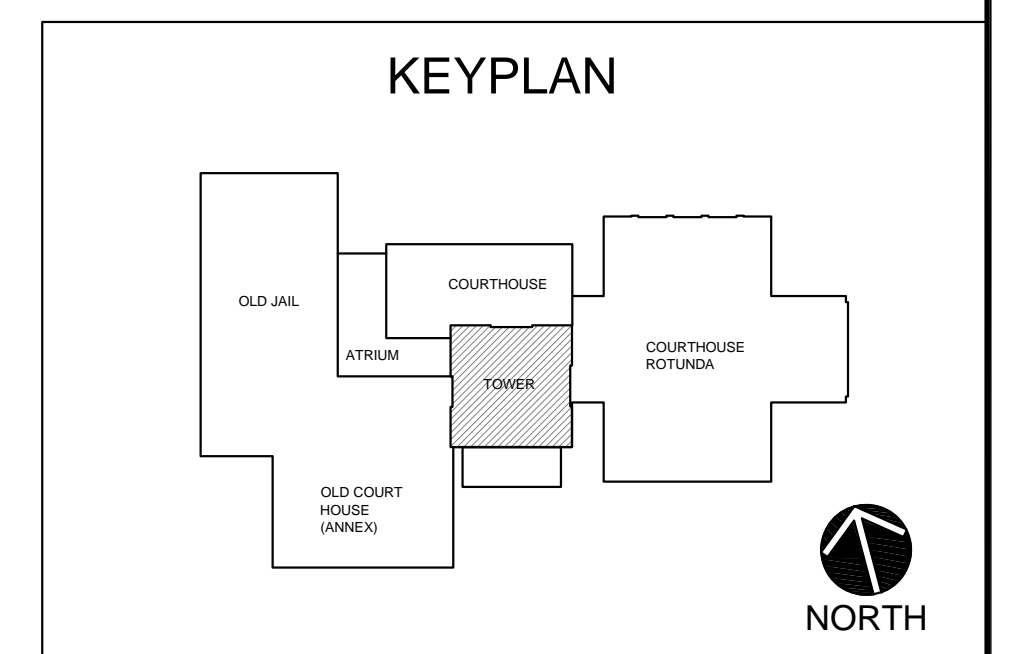
LIGHTING PLAN - NINTH FLOOR
SCALE: 1/8"=1'-0"



LIGHTING PLAN - TENTH FLOOR
SCALE: 1/8"=1'-0"



LIGHTING PLAN - ELEVENTH FLOOR
SCALE: 1/8"=1'-0"



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PROJECT:

UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - LIGHTING PLAN
EIGHTH THRU TWELFTH FLOOR

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY JRB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJB
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

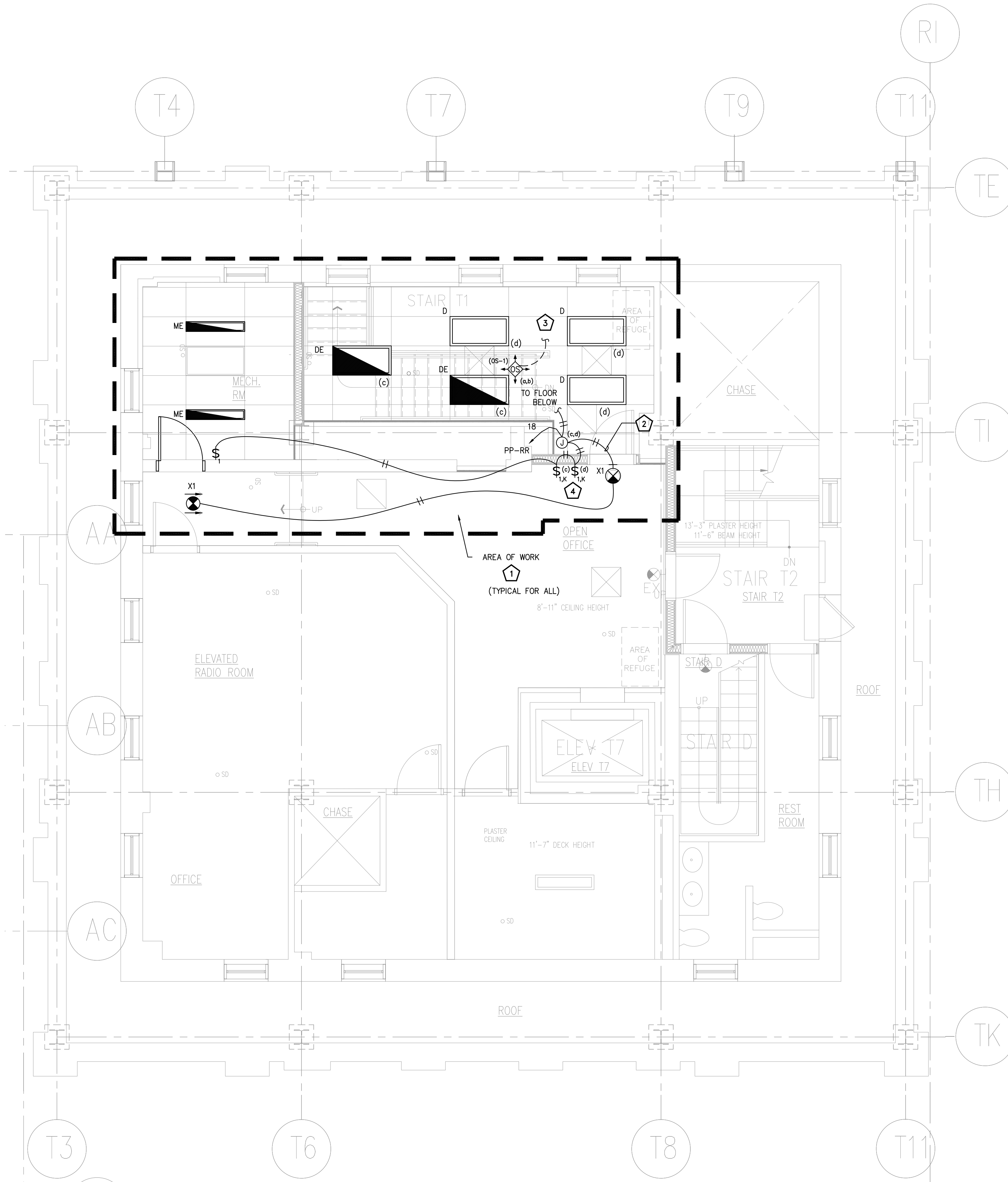
E.408

DRAWING NOTES:

- REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
- ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
- REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS, AND LEGENDS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
- WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9.
- SUBMIT COLOR OPTIONS FOR ALL LIGHTING FIXTURES AND CONTROL DEVICES FOR SELECTION BY ARCHITECT.
- FOR CLARITY, SOME FIXTURE & SWITCH INTERCONNECTING WIRING IS NOT EXPLICITLY SHOWN. CONTRACTOR SHALL USE SWITCHING DESIGNATIONS, HOME RUN REFERENCES, AND APPLICABLE DETAILS TO DERIVE THE COMPLETE SCOPE OF LIGHTING WIRING INTENT.
- FIXTURES CONTAINING EMERGENCY BALLASTS, BATTERY PACKS, AND/OR 24/7 NITE LITE PROVISIONS SHALL BE FED WITH UNSWITCHED POWER AS REQUIRED PER THE FIXTURE/BALLAST MANUFACTURER'S INSTRUCTIONS. IN CERTAIN FIXTURES, THE UNSWITCHED POWER SOURCE FEEDING THE EMERGENCY CIRCUIT MAY BE IN ADDITION TO THE NORMAL SWITCHED POWER SOURCE REQUIRED. THE CONTRACTOR SHALL CONFIRM ALL FIXTURE WIRING REQUIREMENTS AND OPERATIONAL REQUIREMENTS AND BASE HIS BID ACCORDINGLY.
- HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS APPROPRIATELY MARKED.
- REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LUMINAIRES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.
- PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTORS FOR ALL LIGHTING FIXTURES AS REQUIRED. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN ON CERTAIN WIRING DESIGNATIONS.
- COORDINATE FIXTURE STYLE WITH CEILING SYSTEM THE FIXTURE IS TO BE INSTALLED IN OR ON. LAY-IN FIXTURE FRAME STYLE SHALL MATCH THE CEILING GRID / SYSTEM. SURFACE MOUNTED FIXTURES SHALL MAINTAIN THE INTENDED CEILING FIRE RATINGS.
- ALL WIRING TO BE #12AWG WITH #12AWG GND UNLESS OTHERWISE NOTED OR REQUIRED DUE TO CONDUCTOR DERATING FOR MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY OR CABLE ASSEMBLY.
- DASHED LINES USED TO DENOTE OCCUPANCY SENSOR CONTROL WIRING.
- ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT, CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
- CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN). CONTRACTOR SHALL SUBMIT COLOR OPTIONS FOR ANY AND ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
- FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE TENANT.
- REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LIGHTING FIXTURES AND CONTROL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
- REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR FINAL LOCATIONS OF NEW MECHANICAL AND PLUMBING EQUIPMENT.
- ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
- CONTRACTOR SHALL CONDUCT ALL NECESSARY EMERGENCY LIGHTING TEST(S) FOR THE AUTHORITY HAVING JURISDICTION.
- REFER TO DRAWING E.101 FOR ELECTRICAL GENERAL NOTES, DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS AND DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.
- REFER TO DRAWING E.202 FOR ELECTRICAL PANELBOARDS SCHEDULES.
- REFER TO DRAWING E.701 FOR LIGHTING FIXTURES SCHEDULES.

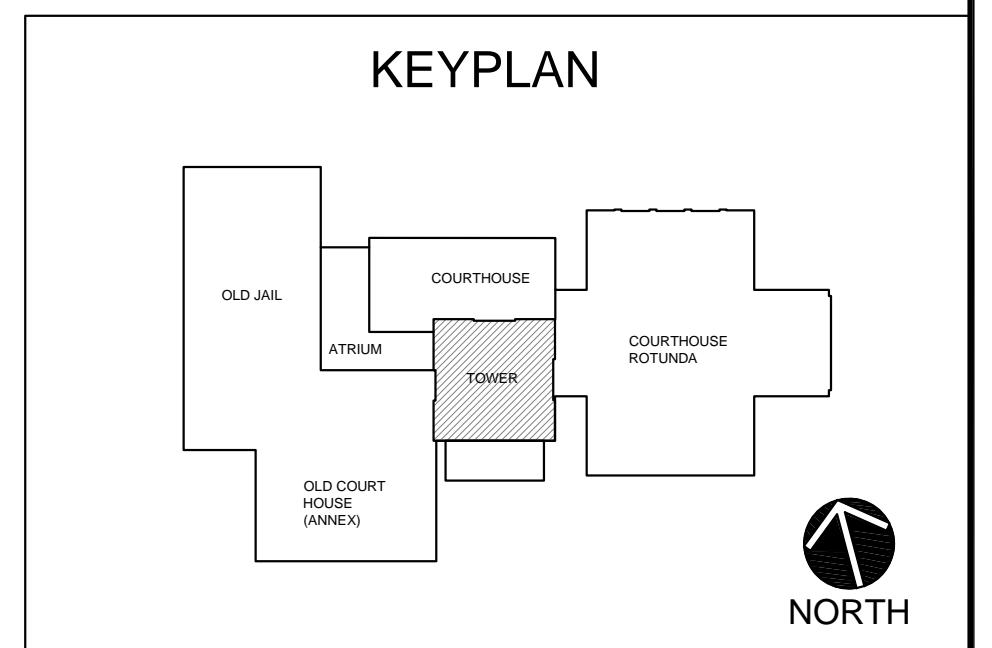
KEYED WORK NOTES:

- ALL LIGHTING FIXTURES AND EXIT SIGNS UNDER THE SCOPE OF WORK ARE SUPPLIED FROM EMERGENCY PANELBOARD PP-RR LOCATED IN THE NEW RADIO ROOM AT 16TH FLOOR. THE NUMBER ATTACHED TO EACH FIXTURE OR TO EACH RESPECTIVE JUNCTION BOX MEANS THE PANELBOARD'S ASSIGNED BRANCH CIRCUIT.
- WIRE NEW EXIT SIGN FROM STAIRWELL EMERGENCY LIGHTING CIRCUIT. FIXTURES SHALL BE FED FROM UPSTREAM OF ANY CONTROL DEVICES.
- WIRE NEW OCCUPANCY SENSOR TO OTHER FLOOR SENSORS AS PER CONTROL ZONE DESIGNATION, VIA CAT 5E CABLE IN 3/4" CONDUIT. LIGHTING CONTROLLED SHALL BE DIMMED TO 50% UPON 20 MINUTES OF OCCUPANTS LEAVING THE SPACE. PROVIDE ALL NECESSARY UL924 EMERGENCY POWER RELAY PACKS, AS REQUIRED.
- FOR ALL KEY-TYPE LIGHTING CONTROL SWITCHES, PROVIDE A PERMANENTLY IDENTIFIED SWITCH COVER PLATE THAT IDENTIFIES LIGHTS SERVED AND IS INDICATIVE OF ON/OFF STATUS.



LIGHTING PLAN - SIXTEENTH FLOOR

SCALE: 1/4"=1'-0"



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PROJECT:

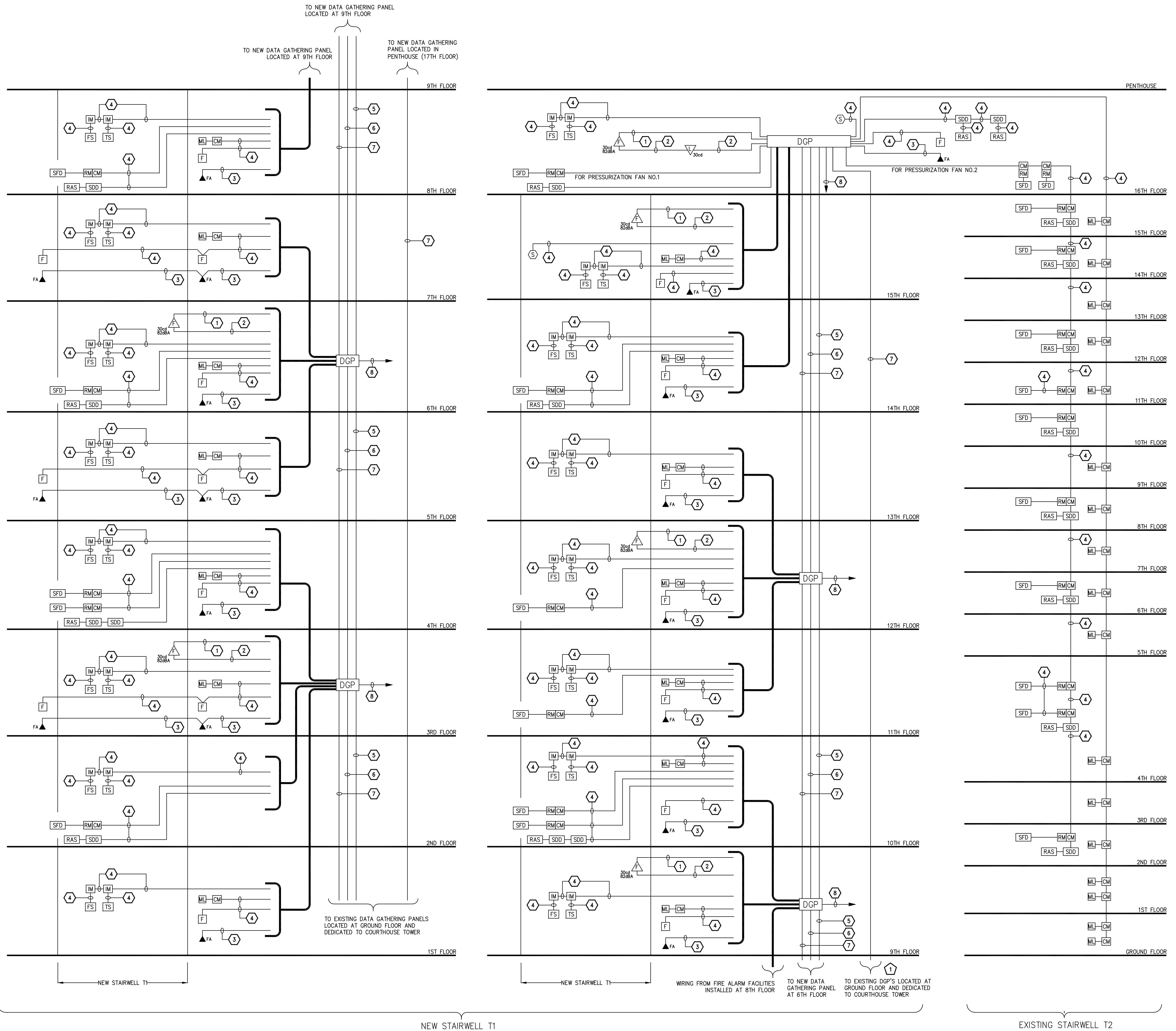
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**ELECTRICAL - LIGHTING PLAN
SIXTEENTH FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JHH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

E.410



KEYED WORK NOTES:

CONNECT TO EXISTING BUILDING FIRE ALARM ADDRESSABLE INTERFACE MODULES AS REQUIRED TO PROVIDE SUPERVISORY & ALARM SIGNALS TO BUILDING FIRE ALARM SYSTEM. FIELD VERIFY EXACT LOCATIONS AND REQUIREMENTS IN THE FIELD AND BASE BID ACCORDINGLY. CONTRACTOR SHALL ALSO INCLUDE PROGRAMMING BY THE BUILDING FIRE ALARM VENDOR OF THE EXISTING BUILDING FIRE ALARM SYSTEM AS REQUIRED TO INTEGRATE THE NEW FIRE ALARM SYSTEM INTO THE BUILDING FIRE ALARM SYSTEM AS REQUIRED.

CABLE AND CONDUIT:

- 1 2#16AWG TWISTED SPEAKER CIRCUIT, 3/4"
- 2 2#14AWG TWISTED STROBE CIRCUIT, 3/4"
- 3 2#16AWG TWISTED, SHIELDED WARDEN CIRCUIT, 3/4"
- 4 2#16AWG TWISTED, SHIELDED, 3/4"
- 5 2#16AWG TWISTED, SHIELDED LOW LEVEL AUDIO RISER, 3/4"
- 6 2#16AWG TWISTED, SHIELDED TELEPHONE AUDIO RISER, 3/4"
- 7 2#16AWG TWISTED, SHIELDED NETWORK DATA (M-NET), 3/4"
- 8 2#12AWG, 1#12AWG GROUND, IN 3/4", TO APPROVED SOURCE AND GROUND.

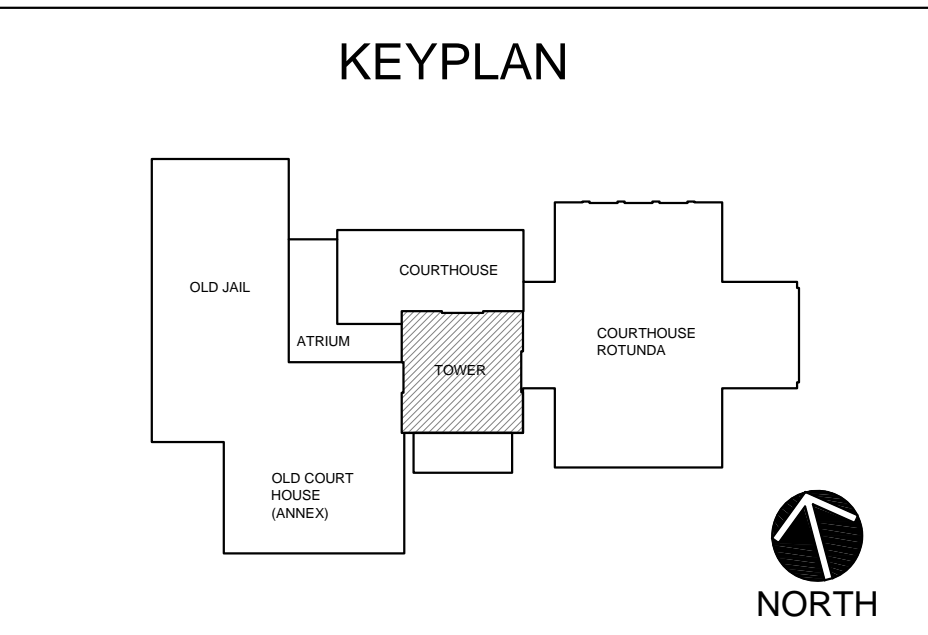
FIRE ALARM NOTES - SCOPE OF WORK:

1. THE CONTRACTOR SHALL REMOVE AND/OR RELOCATE ANY AND ALL EXISTING FIRE DETECTION AND ALARM FACILITIES AS REQUIRED. THE CONTRACTOR SHALL SURVEY ANY AND ALL EXISTING FIRE DETECTION AND ALARM SYSTEM FACILITIES PRIOR TO SUBMITTING HIS BID. COORDINATE THE REMOVAL AND/OR RELOCATION OF EXISTING FIRE ALARM FACILITIES WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE AS REQUIRED.
2. THE DESIGN DEPICTED ON THIS DRAWING IS CONCEPTUAL, AND IS PROVIDED TO ILLUSTRATE A GENERAL BASIS-OF-DESIGN INTENT FOR THE PURPOSE OF RECEIVING A DESIGN/BUILD FIRE ALARM SYSTEM PROPOSAL FROM THE BIDDING CONTRACTOR FOR THE EXPANSION OF THE EXISTING FIRE ALARM AND CONTROL SYSTEM. ALL NEW FACILITIES SHALL BE COMPATIBLE WITH EXISTING FACILITIES.
3. ALL NEW FIRE ALARM DEVICES (INITIATING DEVICES, VISUAL NOTIFICATION APPLIANCES, AUDIBLE NOTIFICATION APPLIANCES, AND/OR AUDIBLE/VISUAL NOTIFICATION APPLIANCES) SHALL BE SUPPLIED, INSTALLED, WIRED, AND INTEGRATED WITH THE EXISTING BUILDING FIRE ALARM AND CONTROL SYSTEM PER MANUFACTURER'S INSTRUCTIONS. THE CONTRACTOR SHALL VISIT THE SITE AND DEVELOP A FINAL, COORDINATED BILL OF MATERIALS AS REQUIRED TO COMPLETE ALL WORK ASSOCIATED WITH UTILIZING AND REWIRING THE EXISTING EXISTING FIRE ALARM SYSTEM AS INTENDED.
4. THE CONTRACTOR SHALL USE THE EXISTING FIRE ALARM CONTROL PANEL (LOCATED IN THE BASEMENT OF THE BUILDING) AS REQUIRED. THE CONTRACTOR SHALL ENGAGE A REPRESENTATIVE OF THE EXISTING FIRE ALARM EQUIPMENT AND COORDINATE AND PROVIDE ALL PROVISIONS AS REQUIRED TO SUPPLY AND INSTALL A FULLY-FUNCTIONAL FIRE ALARM SYSTEM AS INTENDED. THE CONTRACTOR SHALL BASE HIS BID ACCORDINGLY.
5. THE CONTRACTOR SHALL PLACE ALL PROPOSED EQUIPMENT AND FACILITIES IN A FULLY FUNCTIONAL STATE IN ACCORDANCE WITH NFPA 72, AND IN ACCORDANCE WITH EQUIPMENT OEM INSTRUCTIONS. THE CONTRACTOR SHALL RECEIVE ALL APPROVALS AND INSPECTIONS FROM THE LOCAL AUTHORITY OF JURISDICTION.
6. THE CONTRACTOR SHALL SUPPLY AND INSTALL THE FIRE ALARM SYSTEM IN ORDER TO ASSURE PROPER FIRE ALARM COVERAGE AND OPERATION PER NFPA 72 REGARDLESS OF WHAT IS SHOWN ON THE CONTRACT DRAWINGS. THE CONTRACTOR SHALL ADJUST ANY AND ALL DESIGN PARAMETERS TO MEET THE PROPER APPLICATION OF THE PROPOSED EQUIPMENT. THE CONTRACTOR SHALL BASE HIS BID ACCORDINGLY.
7. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL COORDINATE FINAL LOCATIONS OF ALL FIRE ALARM EQUIPMENT WITH ALL ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS.
8. ALL NEW FIRE ALARM NOTIFICATION APPLIANCES SHALL BE WALL MOUNTED WHERE POSSIBLE. ALL DEVICE ROUGH-IN BOXES SHALL BE FLUSH-MOUNTED IN ALL FINISHED SPACES UNLESS OTHERWISE REQUIRED BY THE EQUIPMENT MANUFACTURER.
9. THE CONTRACTOR SHALL EXPAND THE EXISTING FIRE ALARM SYSTEM AS REQUIRED. THIS SHALL INCLUDE, HOWEVER NOT NECESSARILY BE LIMITED TO THE FOLLOWING:
 - a. SURVEY OF EXISTING FACILITIES. LOCATE THE EXISTING MAIN FIRE ALARM CONTROL PANEL AND REMOTE ANNUNCIATOR PANEL. CONFIRMATION OF COVERAGE AND ACCESSORY EQUIPMENT AS REQUIRED FOR A COMPLETE, OPERATIONAL AND COMPLIANT SYSTEM.
 - b. SUPPLY AND INSTALL ALL SYSTEM WIRING DEVICES AND MOUNTING ASSEMBLIES SUCH AS INITIATING MODULES, POWER SUPPLIES, DEVICE CABLE, RACEWAY, AND ROUGH-IN BOXES AS REQUIRED TO PLACE THE SYSTEM IN PROPER WORKING ORDER WITH THE NEW DEVICES SHOWN, PER NFPA 70 (NEC), AND MANUFACTURER'S INSTRUCTIONS. AT MINIMUM, PROVIDE ONE POWER SUPPLY UNIT WITH BATTERY BACKUP FOR EVERY 30 DEVICES ADDED TO EXISTING BUILDING FIRE ALARM CONTROL PANEL, OR AS OTHERWISE RECOMMENDED BY THE FIRE ALARM EQUIPMENT MANUFACTURER (COORDINATE WITH ALL TENANT SPACE ADDITIONS). ALL POWER SUPPLY UNITS SHALL BE INSTALLED IN EXISTING ELECTRICAL EQUIPMENT SPACES. ALL NOTIFICATION APPLIANCE CIRCUITS SHALL BE SYNCHRONIZED TO COMPLY WITH NFPA 72. ALL CABLE/CABLE ASSEMBLY PROVISIONS SHALL BE LISTED FOR PLENUM USE.
 - c. PROVIDE ALL DEVICE AND POWER TERMINATION WORK.
 - d. PROVIDE ALL POWER WIRING, FACILITIES AND APPURTENANCES PER NEC 760, 770 AND 800 WHERE APPLICABLE.
 - e. ENGAGE A REPRESENTATIVE OF THE EXISTING BUILDING FIRE ALARM SYSTEM TO STARTUP AND VALIDATE THE ENTIRE (EXISTING AND EXPANDED) SYSTEM.
 - f. PROVIDE ALL TESTING AND COMMISSIONING REQUIRED FOR RECEIVING FINAL APPROVAL(S) BY THE LOCAL AUTHORITY OF JURISDICTION.
 - g. PROVIDE A FIRE ALARM SYSTEM SUBMITTAL FOR THE PURPOSE OF RECEIVING A CONSTRUCTION PERMIT, AND FOR THE PURPOSE OF COORDINATION WITH THE LOCAL AUTHORITY OF JURISDICTION. THIS SHALL INCLUDE, HOWEVER NOT NECESSARILY BE LIMITED TO THE FOLLOWING: A COMPLETE AND DETAILED BILL OF MATERIALS, A COORDINATED EQUIPMENT LOCATION PLAN, STORAGE BATTERY CALCULATIONS, VOLTAGE DROP CALCULATIONS, AND A COORDINATED DEVICE INTERCONNECTION DIAGRAM.

SHOP DRAWINGS:

1. MANUFACTURER'S DRAWINGS
 - A. SHOP DRAWINGS AND/OR SAMPLES SHALL BE SUBMITTED (MINIMUM 4 SETS) FOR APPROVAL FOR ALL FIRE ALARM SYSTEM EQUIPMENT INCLUDING PANELS, DEVICES, BACKBOXES AND ALL OTHER ASSOCIATED COMPONENTS PRIOR TO ORDERING AND/OR FABRICATION.
 - B. ALL SHOP DWGS. REQUIRING WIRING DIAGRAMS SHALL BE SUBMITTED WITH SPECIFICATIONS FOR ALL DEVICES AND SEQUENCE OF OPERATION OF THE SYSTEM.
 - C. EQUIPMENT MAY NOT BE ORDERED OR FABRICATED UNTIL SUCH SHOP DRAWINGS HAVE BEEN "APPROVED" OR "APPROVED AS NOTED".
 - D. ALL "DISAPPROVED" SHOP DRAWINGS SHALL BE REVISED AND RE-SUBMITTED IN ACCORDANCE WITH THE ABOVE.
2. INSTALLATION DRAWINGS
 - A. COORDINATE SPACE REQUIREMENTS FOR THE NEW FIRE ALARM SYSTEM EQUIPMENT AND SERVICES, INCLUDE ALL CONNECTIONS, CONDUIT, WIRING AND EQUIPMENT. MAKE ALLOWANCES FOR CLEARANCES FOR ACCESS TO AND MAINTENANCE OF EQUIPMENT.

* NOTE *
SUBSCRIPT "FS" INDICATES DEVICE IS A FIRE SUPPRESSION SYSTEM COMPONENT DEVICE



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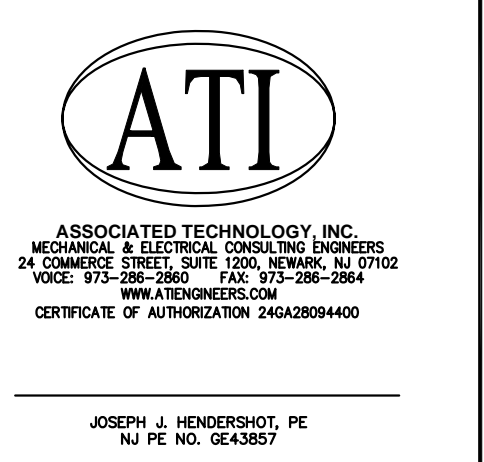
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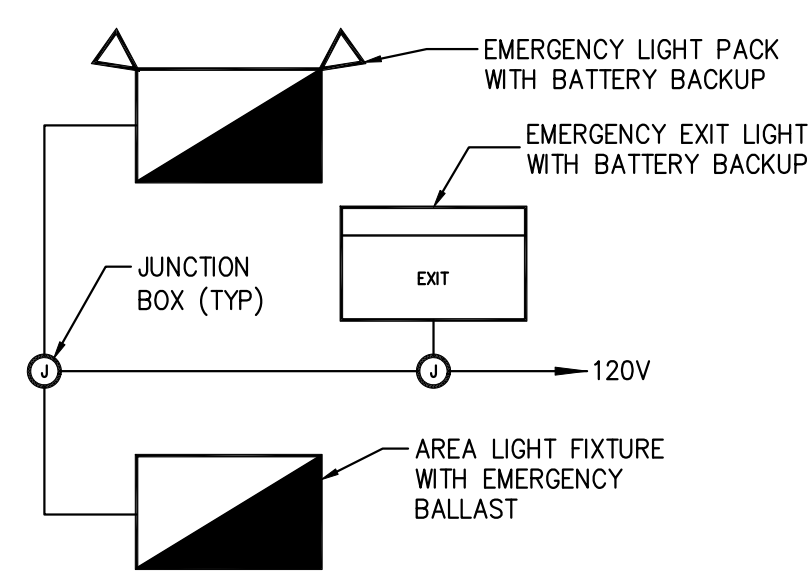


PROJECT: UC COURTHOUSE INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FIRE ALARM RISER DIAGRAMS IN TOWER : NEW STAIRWAY T1 AND EXISTING STAIRWAY T2

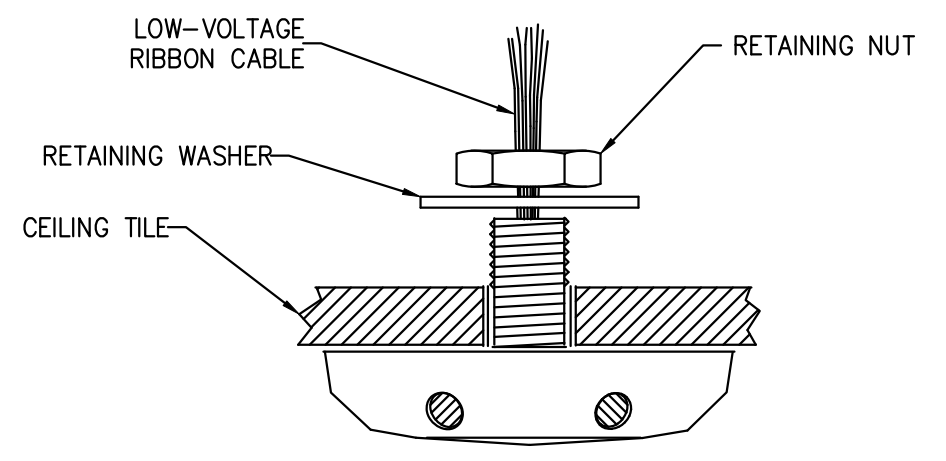
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09.07.17	ISSUED FOR BID	KD	FM					JOB NO	2141151
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								DWG NO	

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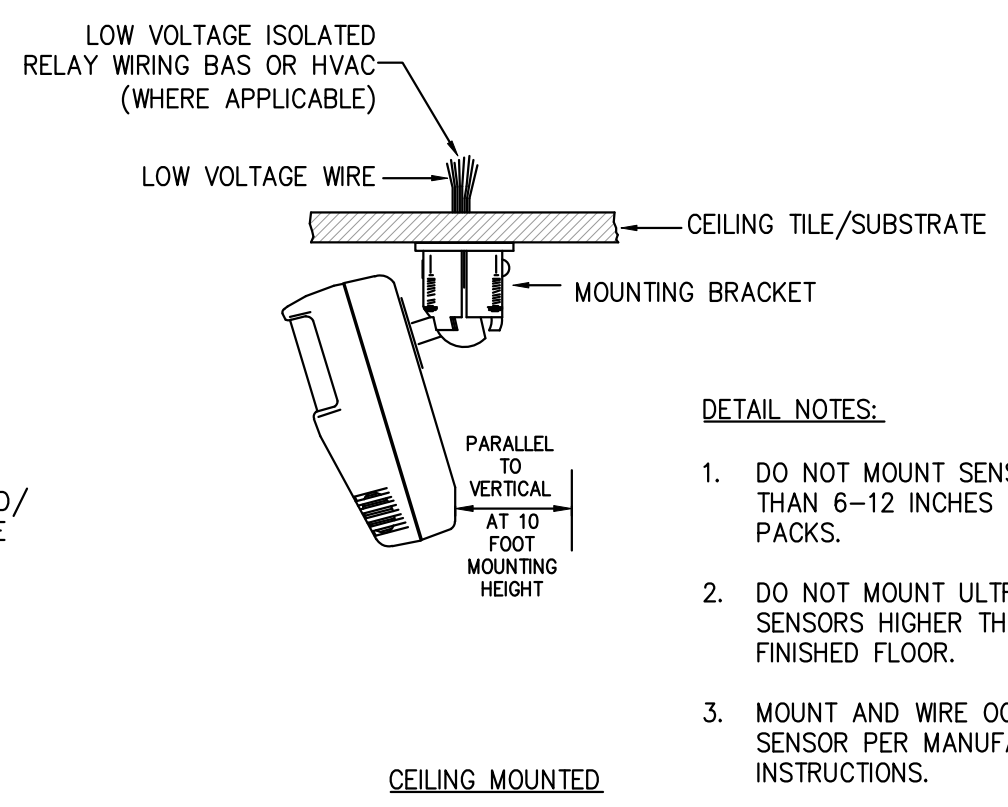
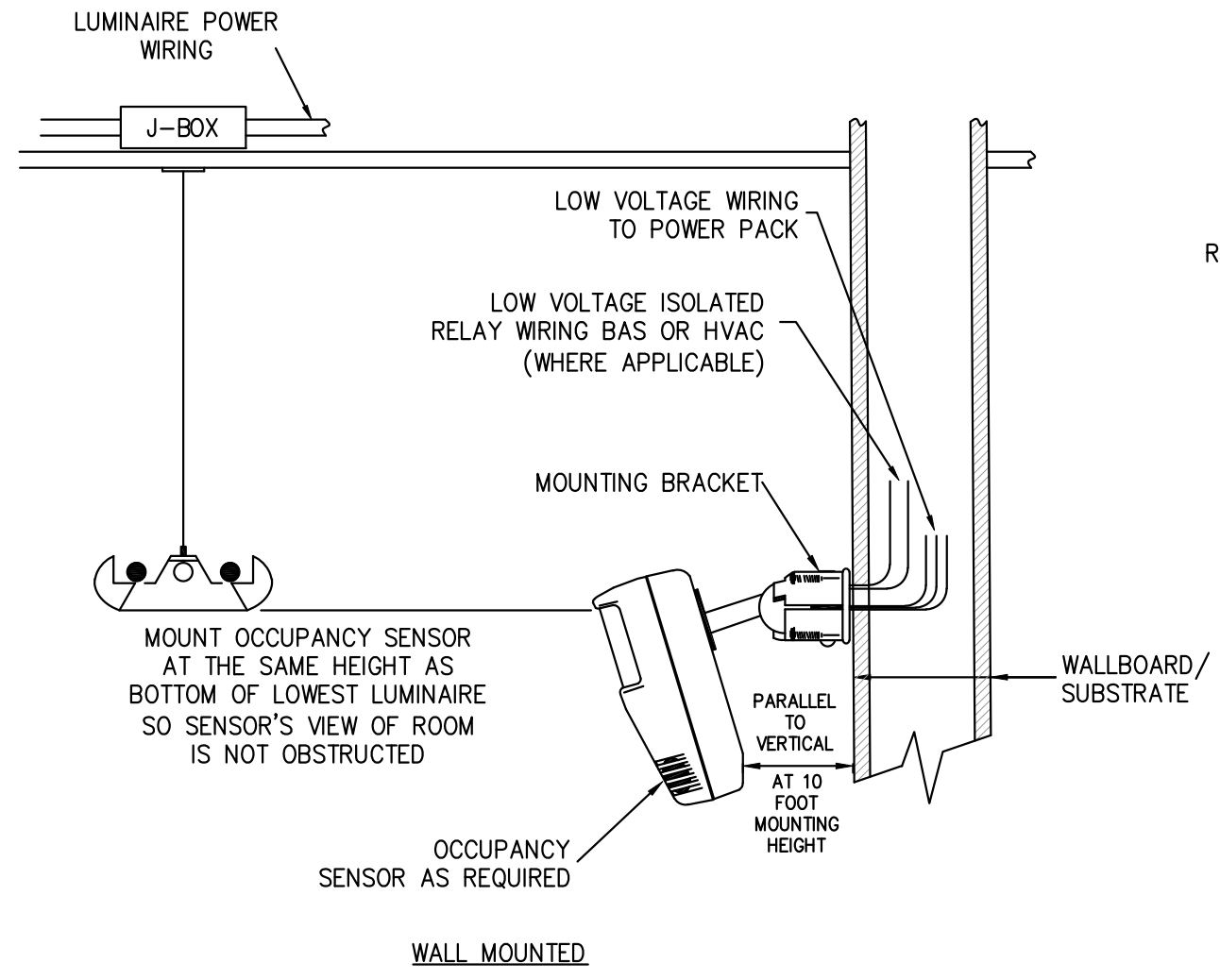
- DETAIL NOTES:**
- CONNECT TO 120/277V LOCAL LIGHTING CIRCUIT (AHEAD OF ANY SWITCHING AND/OR AUTOMATIC CONTROLS) FOR CHARGING AND AREA PROTECTION IN ACCORDANCE WITH NEC 700-12.
 - IN AREAS WHERE (3) OR MORE GENERAL LIGHTING CIRCUITS ARE PROVIDED, PROVIDE A DEDICATED POWER CIRCUIT PER NEC 700-12(F) EXCEPTION 1. IN EXISTING INSTALLATIONS, WHERE DEDICATED POWER CIRCUITS EXIST, INTERCONNECT TO EXISTING POWER CIRCUITS AS REQUIRED.
 - WHERE SEPARATE POWER CIRCUITS ARE EMPLOYED, PROVIDE A LISTED CIRCUIT BREAKER BLOCKING DEVICE THAT PROHIBITS INADVERTENT CIRCUIT BREAKER OPERATION.

TYPICAL DETAIL
EMERGENCY LIGHTING CONNECTIONS
SCALE: NONE

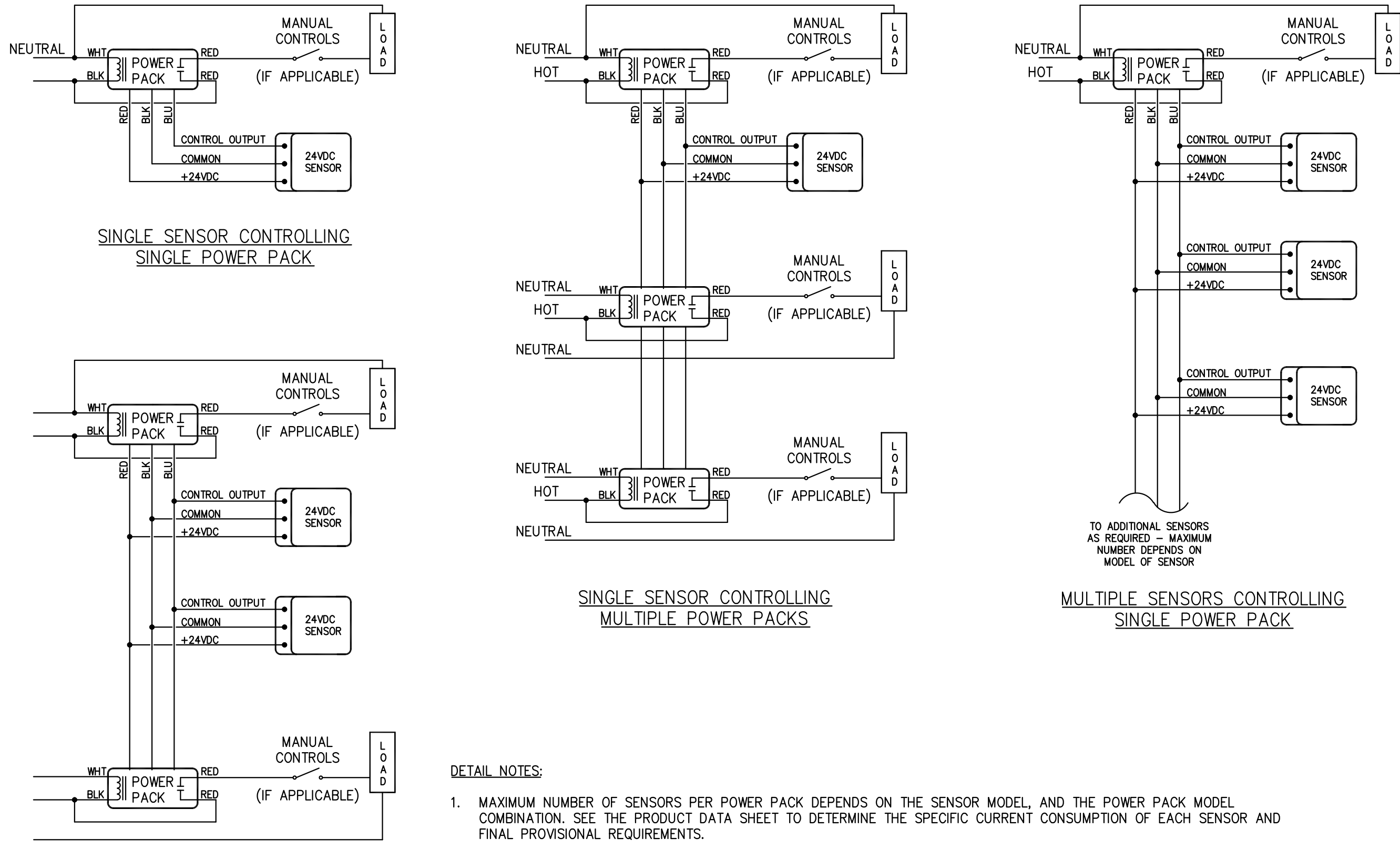


- DETAIL NOTES:**
- DO NOT MOUNT SENSOR(S) CLOSER THAN 6-12 INCHES FROM POWER PACKS.
 - DO NOT MOUNT ULTRASONIC SENSORS HIGHER THAN 14FT ABOVE FINISHED FLOOR.
 - MOUNT AND WIRE OCCUPANCY SENSOR PER MANUFACTURERS INSTRUCTIONS.

TYPICAL DETAIL
CEILING-MOUNTED OCCUPANCY SENSOR
SCALE: NONE

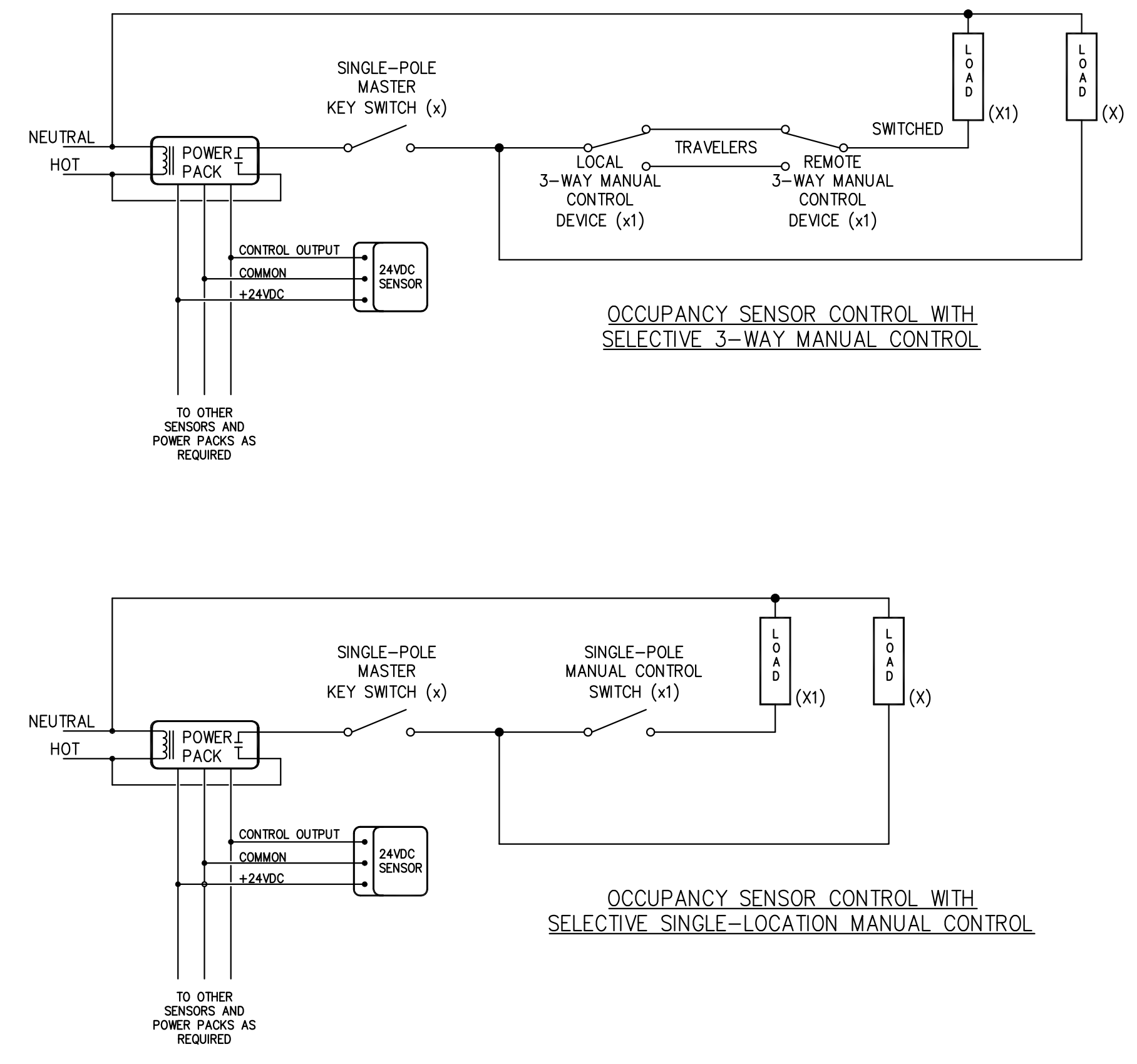


TYPICAL DETAIL
WALL/CEILING-MOUNTED OCCUPANCY SENSOR
SCALE: NONE



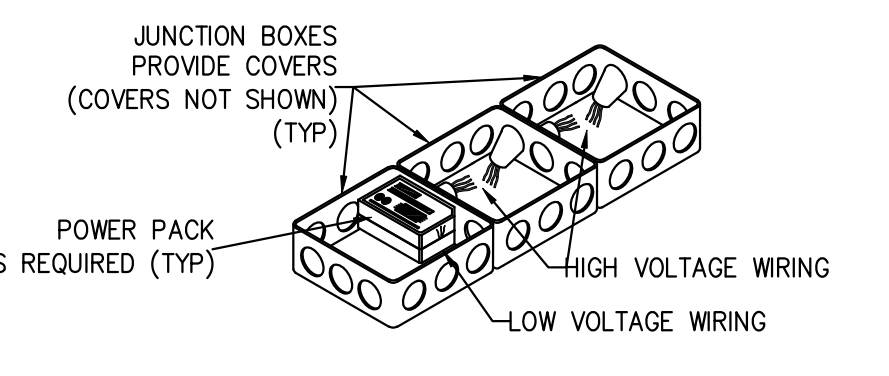
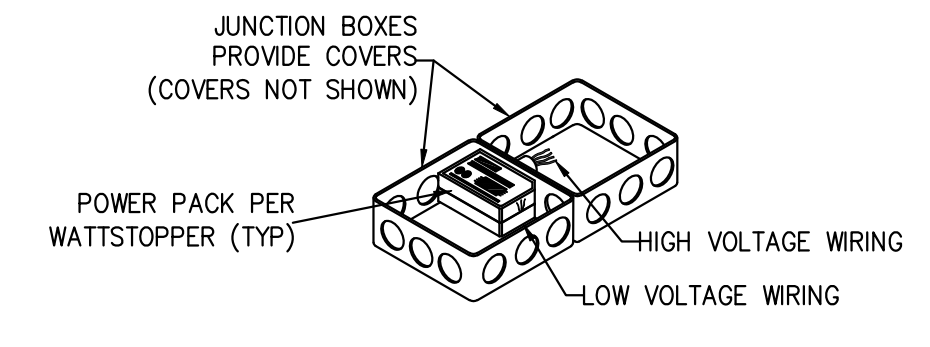
- DETAIL NOTES:**
- MAXIMUM NUMBER OF SENSORS PER POWER PACK DEPENDS ON THE SENSOR MODEL, AND THE POWER PACK MODEL COMBINATION. SEE THE PRODUCT DATA SHEET TO DETERMINE THE SPECIFIC CURRENT CONSUMPTION OF EACH SENSOR AND FINAL PROVISIONAL REQUIREMENTS.
 - PROVIDE WATTSTOPPER B120E-P (120 VAC LIGHTING) OR B277E-P (277V LIGHTING) POWER PACKS, OR APPROVED EQUIVALENT EQUIPMENT, AS REQUIRED.
 - SET OCCUPANCY SENSOR TIME OFF DELAY TO 30 MINUTES. ADJUST AND COMMISSION SENSOR CONTROL EQUIPMENT AS REQUIRED.
 - FOR DUAL TECHNOLOGY DEVICES, SET BOTH ON AND OFF CONTROL TO REQUIRE BOTH TECHNOLOGIES.
 - PROVIDE J-BOX FOR POWER PACK(S) IN VICINITY OF SENSOR LOCATION. WIRE WITH PLENUM RATED #18-3 CONDUCTOR CABLE, OR AS OTHERWISE RECOMMENDED BY THE SENSOR EQUIPMENT MANUFACTURER.
 - WIRE NORMAL BALLAST(S), EMERGENCY BALLAST(S), AND DIMMING CONTROLS IF APPLICABLE, PER MANUFACTURER'S INSTRUCTIONS.
 - SUPPLY AND INSTALL ALL OCCUPANCY SENSORS AND ASSOCIATED APPURTENANCES AND EQUIPMENT PER MANUFACTURERS INSTRUCTIONS AND RECOMMENDATIONS.

TYPICAL DETAIL
OCCUPANCY SENSOR WIRING SCHEMATIC
SCALE: NONE



- DETAIL NOTES:**
- PROVIDE AND INSTALL OCCUPANCY SENSING DEVICES AS SCHEDULED ON THE DRAWINGS AND/OR AS SPECIFIED. INSTALL ALL OCCUPANCY SENSING DEVICES AND POWER PACKS MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
 - WIRE LIGHTING FIXTURE NORMAL BALLAST(S), EMERGENCY BALLAST(S), AND DIMMING CONTROLS (IF APPLICABLE), PER MANUFACTURER'S INSTRUCTIONS.

TYPICAL DETAIL
LIGHTING CONTROLS - AUTOMATIC AND MANUAL CONTROLS
SCALE: NONE



- DETAIL NOTES:**
- INSTALL AND POWER PACKS IN ACCORDANCE WITH ALL STATE AND LOCAL ELECTRICAL CODES, AND PER MANUFACTURER'S INSTRUCTIONS.
 - POWER PACKS ARE DESIGNED TO ATTACH TO EXISTING OR NEW ELECTRICAL ENCLOSURES WITH 1/2" KNOCKOUTS.
 - DO NOT MOUNT POWER PACKS CLOSER THAN 6-12 INCHES FROM SENSOR(S).
 - ACTUAL NUMBER OF JUNCTION BOXES MAY CHANGE DEPENDING ON THE SENSOR/POWER PACK CONFIGURATION USED. CONFIRM FINAL APPLICATION AND CONDITIONS IN-FIELD, AND PROVIDE REQUIRED JUNCTION BOXES AS REQUIRED. VERIFY FINAL EQUIPMENT LOCATIONS IN FIELD. BASE BID ACCORDINGLY.

TYPICAL DETAIL
OCCUPANCY SENSOR POWER PACK INSTALLATION
SCALE: NONE

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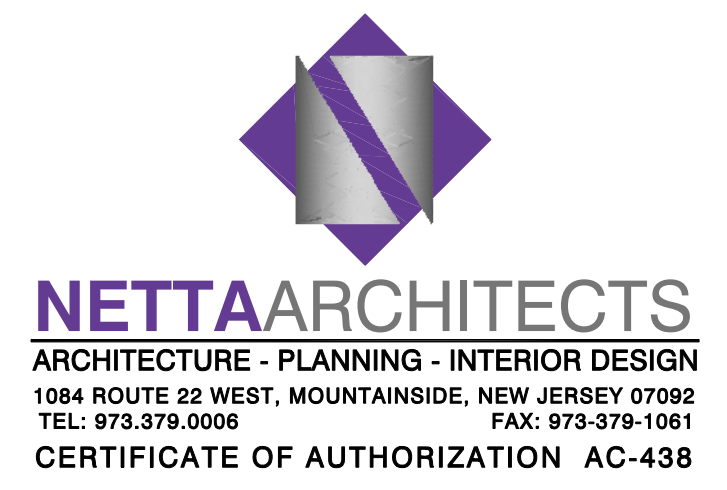
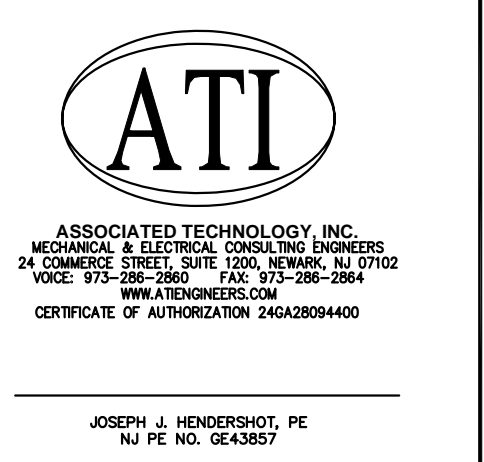
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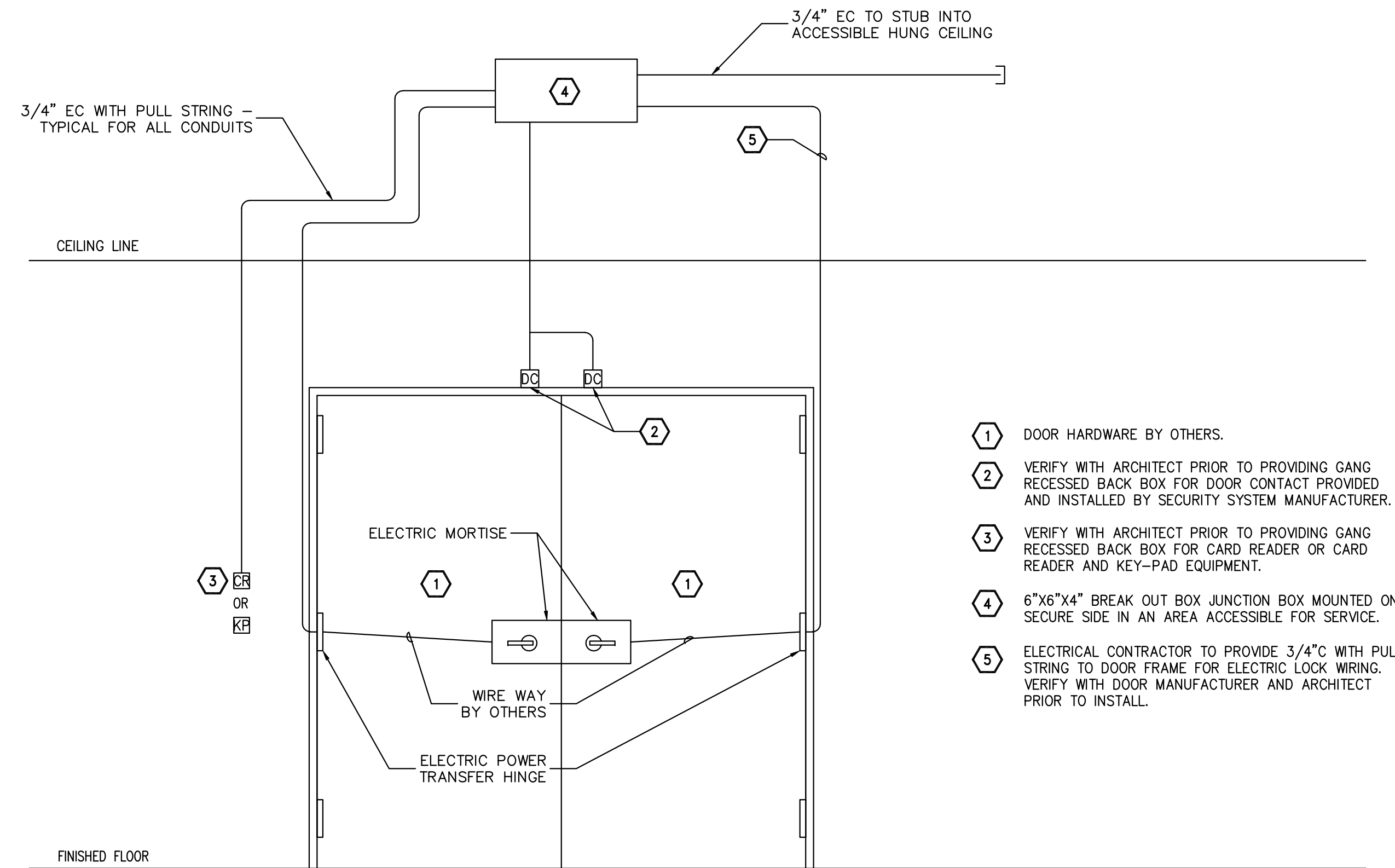


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**ELECTRICAL
DETAILS
(SHEET 3)**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	RB
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	JJH
09.07.17	ISSUED FOR BID	KD	FM					JOB NO	2141151
								SHEET:	_ OF:
								DWG NO	

E.803



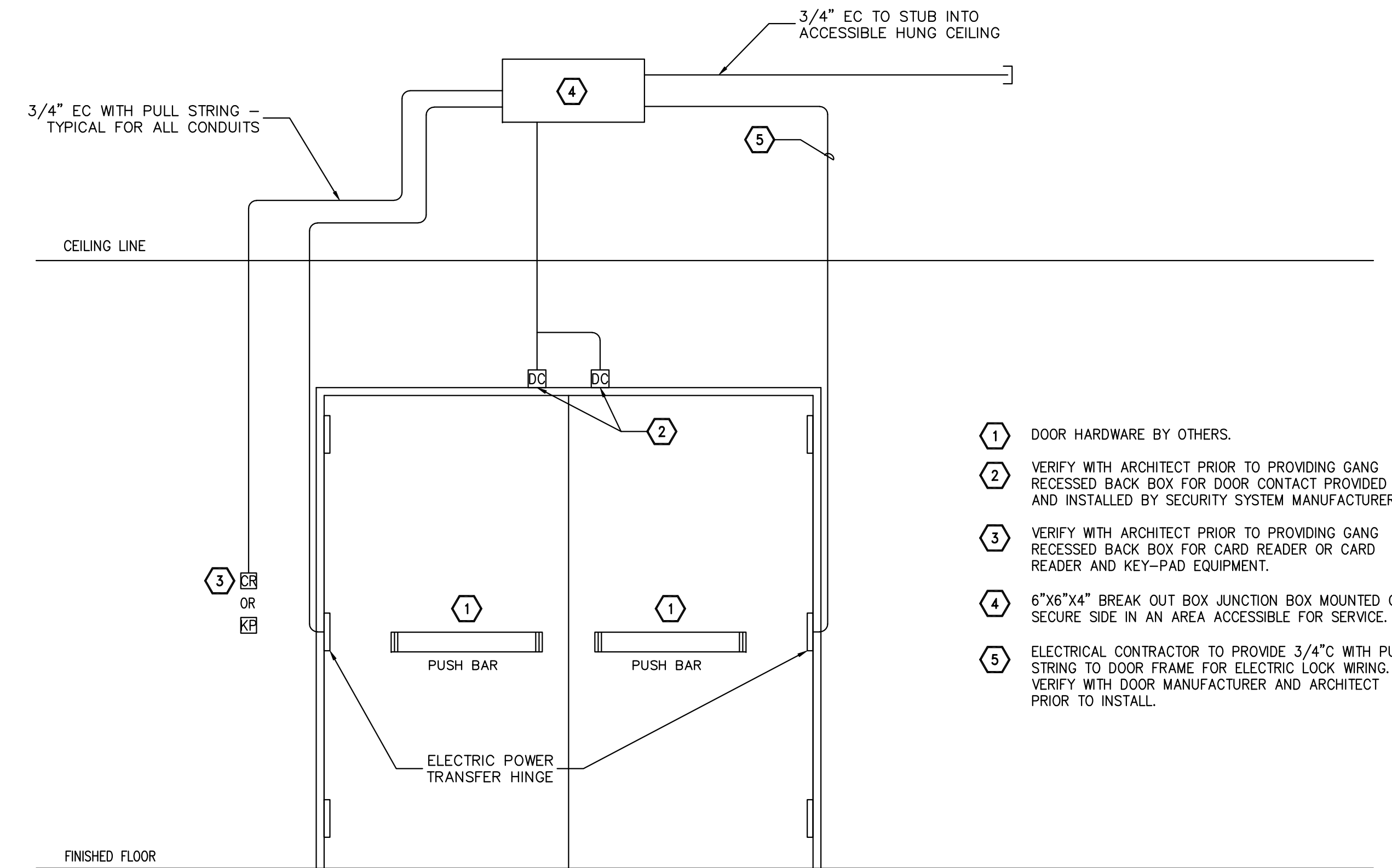
- ① DOOR HARDWARE BY OTHERS.
- ② VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR DOOR CONTACT PROVIDED AND INSTALLED BY SECURITY SYSTEM MANUFACTURER.
- ③ VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR CARD READER OR CARD READER AND KEY-PAD EQUIPMENT.
- ④ 6"x6"x4" BREAK OUT BOX JUNCTION BOX MOUNTED ON SECURE SIDE IN AN AREA ACCESSIBLE FOR SERVICE.
- ⑤ ELECTRICAL CONTRACTOR TO PROVIDE 3/4" EMT WITH PULL STRING TO DOOR FRAME FOR ELECTRIC LOCK WIRING. VERIFY WITH DOOR MANUFACTURER AND ARCHITECT PRIOR TO INSTALL.

DETAIL NOTES:

- 1. REFER TO FLOOR PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES.
- 2. COORDINATE EXACT LOCATION AND QUANTITY OF SECURITY DEVICES WITH SECURITY VENDOR.

**DOUBLE DOOR WITH CARD READER,
OR CARD READER AND KEYPAD**

SCALE: NONE



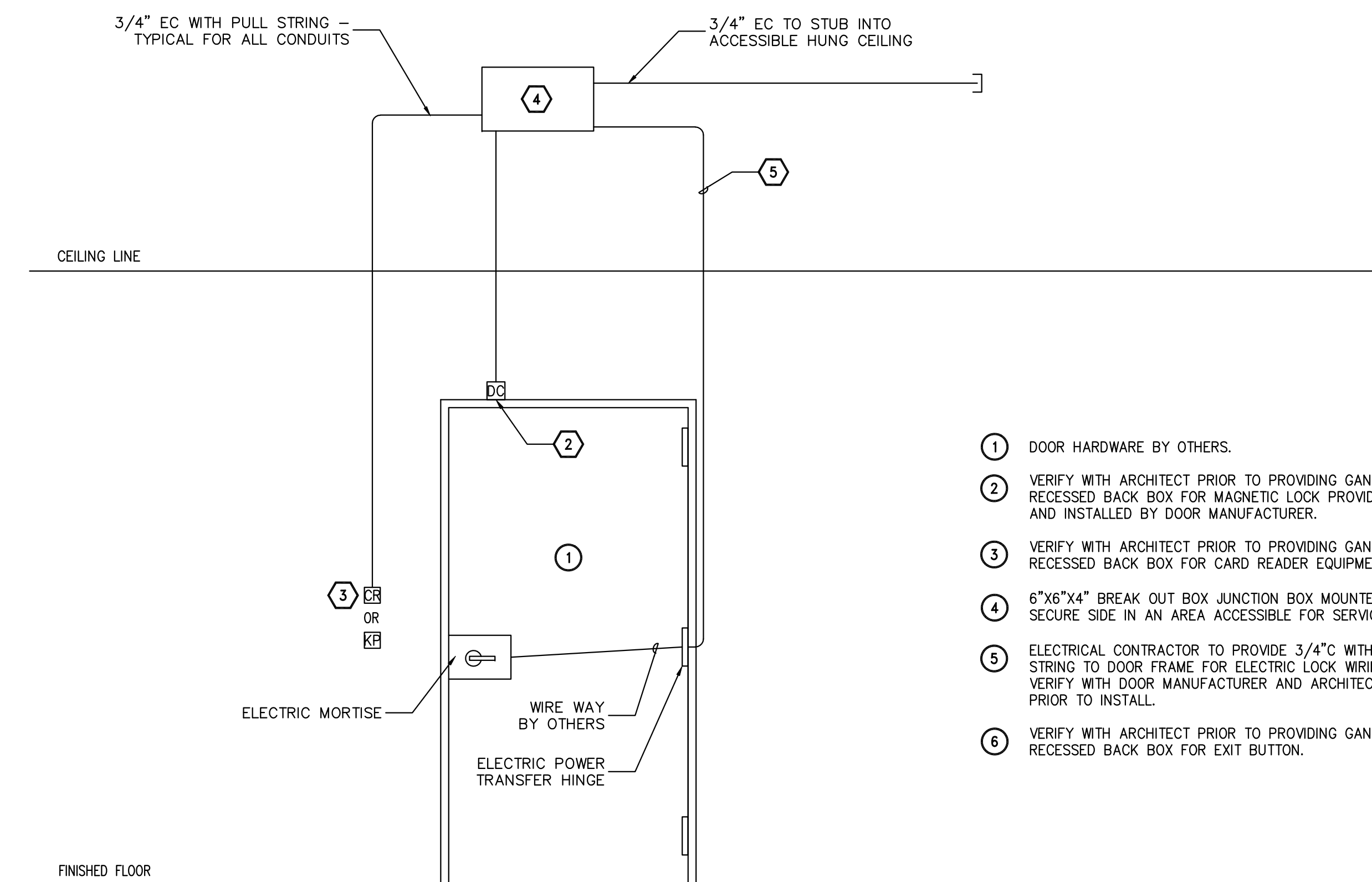
- ① DOOR HARDWARE BY OTHERS.
- ② VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR DOOR CONTACT PROVIDED AND INSTALLED BY SECURITY SYSTEM MANUFACTURER.
- ③ VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR CARD READER OR CARD READER AND KEY-PAD EQUIPMENT.
- ④ 6"x6"x4" BREAK OUT BOX JUNCTION BOX MOUNTED ON SECURE SIDE IN AN AREA ACCESSIBLE FOR SERVICE.
- ⑤ ELECTRICAL CONTRACTOR TO PROVIDE 3/4" EMT WITH PULL STRING TO DOOR FRAME FOR ELECTRIC LOCK WIRING. VERIFY WITH DOOR MANUFACTURER AND ARCHITECT PRIOR TO INSTALL.

DETAIL NOTES:

- 1. REFER TO FLOOR PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES.
- 2. COORDINATE EXACT LOCATION AND QUANTITY OF SECURITY DEVICES WITH SECURITY VENDOR.

**DOUBLE DOOR (PUSH BAR) WITH CARD READER,
OR CARD READER AND KEYPAD**

SCALE: NONE



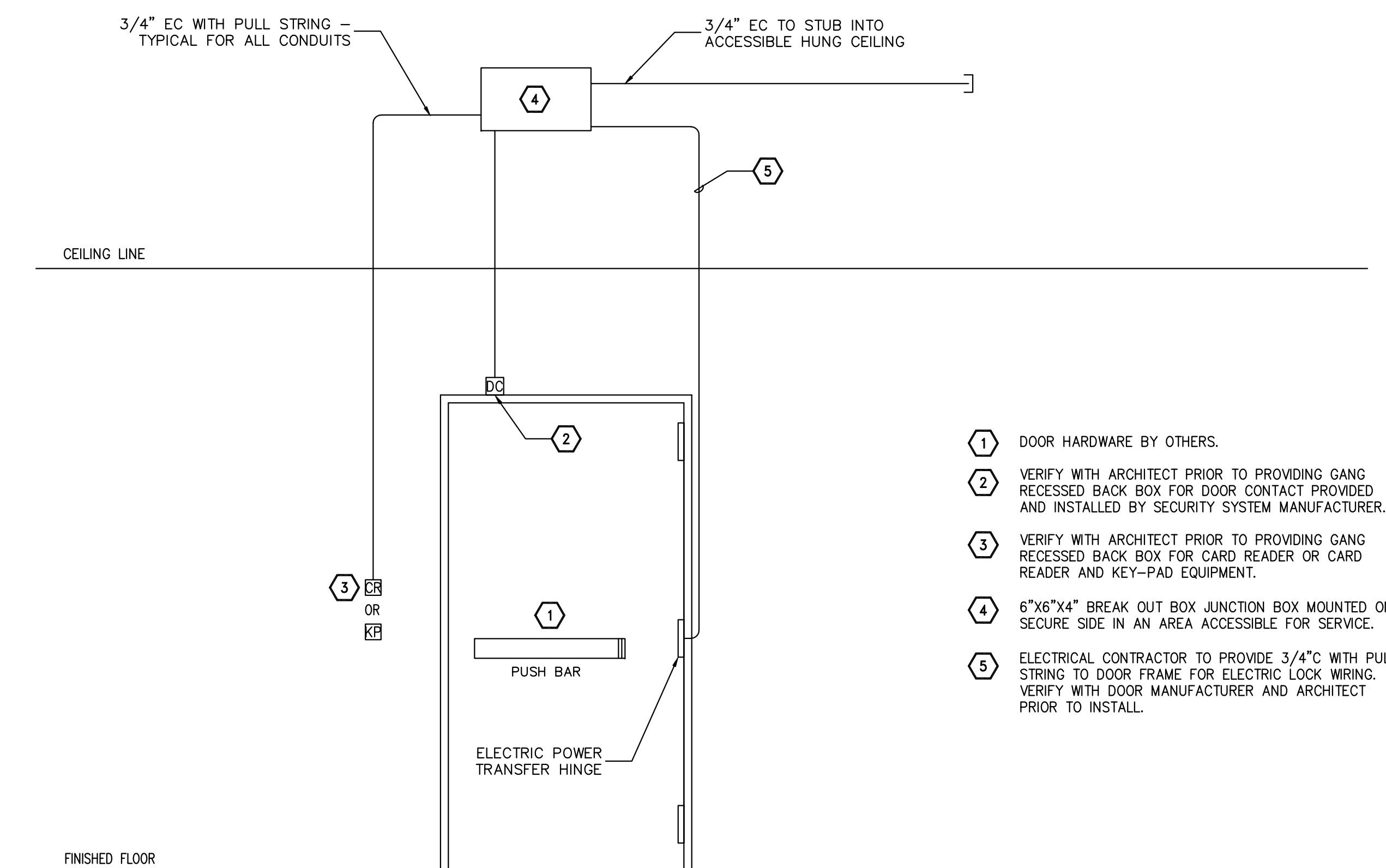
- ① DOOR HARDWARE BY OTHERS.
- ② VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR MAGNETIC LOCK PROVIDED AND INSTALLED BY DOOR MANUFACTURER.
- ③ VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR CARD READER EQUIPMENT.
- ④ 6"x6"x4" BREAK OUT BOX JUNCTION BOX MOUNTED ON SECURE SIDE IN AN AREA ACCESSIBLE FOR SERVICE.
- ⑤ ELECTRICAL CONTRACTOR TO PROVIDE 3/4" EMT WITH PULL STRING TO DOOR FRAME FOR ELECTRIC LOCK WIRING. VERIFY WITH DOOR MANUFACTURER AND ARCHITECT PRIOR TO INSTALL.
- ⑥ VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR EXIT BUTTON.

DETAIL NOTES:

- 1. REFER TO FLOOR PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES.
- 2. COORDINATE EXACT LOCATION AND QUANTITY OF SECURITY DEVICES WITH SECURITY VENDOR.

**SINGLE DOOR WITH CARD READER
OR CARD READER AND KEYPAD**

SCALE: NONE



- ① DOOR HARDWARE BY OTHERS.
- ② VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR DOOR CONTACT PROVIDED AND INSTALLED BY SECURITY SYSTEM MANUFACTURER.
- ③ VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR CARD READER OR CARD READER AND KEY-PAD EQUIPMENT.
- ④ 6"x6"x4" BREAK OUT BOX JUNCTION BOX MOUNTED ON SECURE SIDE IN AN AREA ACCESSIBLE FOR SERVICE.
- ⑤ ELECTRICAL CONTRACTOR TO PROVIDE 3/4" EMT WITH PULL STRING TO DOOR FRAME FOR ELECTRIC LOCK WIRING. VERIFY WITH DOOR MANUFACTURER AND ARCHITECT PRIOR TO INSTALL.

DETAIL NOTES:

- 1. REFER TO FLOOR PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES.
- 2. COORDINATE EXACT LOCATION AND QUANTITY OF SECURITY DEVICES WITH SECURITY VENDOR.

**SINGLE DOOR (PUSH BAR) WITH CARD READER,
OR CARD READER AND KEYPAD**

SCALE: NONE

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NJ License No. AI 16160
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**ELECTRICAL
DETAILS
(SHEET 5)**

SUBMISSIONS				REVISIONS				DATE	10-10-15
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04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
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09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

E.805

SYMBOL LEGEND	
GENERAL	
SYMBOL	DESCRIPTION
	CENTER LINE
	EXISTING CONSTRUCTION & EQUIPMENT
	EXISTING TO BE REMOVED
	NEW WORK
	BREAK
	END CAP
	CONNECT TO EXISTING
	REMOVE FROM EXISTING
	PIPE PITCH
	DIRECTION OF FLOW
	PIPE BREAK DOUBLE LINE
	WORK NOTE
	REVISION CLOUD (AREA OF CHANGE)
	REVISION NUMBER
	SECTION CUT
	SECTION LINE
	DRAWING/DETAIL TITLE
	ROOM NAME/NUMBER
	DIAMETER

PIPING SYMBOL LEGEND		
PLUMBING /GAS		
PIPING	ABBREVIATION	DESCRIPTION
	S	STORM, SOIL OR WASTE PIPING BELOW GRADE
	V	VENT PIPING
	CW	COLD WATER PIPING
	HW	HOT WATER PIPING
	HWR	HOT WATER RETURN PIPING
	SAN/W/S	SANITARY/WASTE/SOIL PIPING
	PD	PUMP DISCHARGE
	IW	INDIRECT WASTE
	ST	STORM PIPING
	TW	TEMPERED WATER
	SA	SUCTION AIR PIPING
	G	GAS PIPING
	HPG	HIGH PRESSURE GAS
	A / CA	ELECTRIC HEAT TRACED PIPING
	A / CA	COMPRESSED AIR PIPING
	WHR / SA	WATER HAMMER ARRESTER / SHOCK ABSORBER
		PIPE CAP
		PIPE UP END
		PIPE DOWN END
		PIPE UP RISE
		CAP TAKE-OFF
		TOP CONNECTION, 45° OR 90°
		BOTTOM CONNECTION, 45° OR 90°
		SIDE CONNECTION
		PIPING CONNECTION TO EQUIP. (UNIT) ON FLR. ABOVE
		SLEEVE
VALVES/GAUGES	ABBREVIATION	DESCRIPTION
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
	CVB	CURB VALVE AND BOX
	BV	BALL VALVE
	GV	GATE VALVE
	CV	CHECK VALVE
		GAS SHUT-OFF VALVE
		MOTOR OPERATED VALVE

PIPING SYMBOL LEGEND	
PLUMBING /GAS CONT.	
SYMBOL	DESCRIPTION
	SOLENOID VALVE
	PRESSURE REDUCING VALVE
	CIRCUIT SETTER
	3-WAY VALVE
	THERMOSTATIC MIXING VALVE
	STRAINER
	STRAINER WITH BLOW DOWN
	BACKFLOW PREVENTER
	UNION
	THERMOMETER
	PRESSURE GAUGE
	AUTOMATIC AIR VENT PIPED TO NEAREST DRAIN
	FLEXIBLE CONNECTION
	VACUUM BREAKER
	BALANCING VALVE
TRAPS/DRAINS	DESCRIPTION
	RD
	FD
	RD/OFD
	FS
	-I-
	FCO/COOP
	OC
	OC
	OC
	OC
	OC
	OC
	OC
	OC
	OC
	OC
	OC
	OC
	OC

ABBREVIATIONS LIST	
ABBREVIATION	DESCRIPTION
ABD	AUTOMATIC BALL DRIP
AFP	ABOVE FINISHED FLOOR
BFP	BACKFLOW PREVENTER
CI	CAST IRON
CFH	CUBIC FEET PER HOUR
CFS	CUBIC FEET PER SECOND
CLG	CLEANING
CO	CLEAN OUT
CONN.	CONNECT
CS	CUP SINK
CVB	CURB VALVE & BOX
DIA	DIAMETER
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY
DIP	DUCTILE IRON PIPE
DN	DOWN
DS	DOWN SPOUT
DW	DISHWASHER
DFU	DRAINAGE FIXTURE UNITS
DWG	DRAWING
ELEV	ELEVATION
EW	ELECTRIC WATER COOLER
EW	EYE WASH
F	FIRE LINE
FAI	FRESH AIR INLET
FCO	FLOOR CLEAN OUT
FS	FLOOR SWITCH
FE	FIRE EXTINGUISHER
FF	FINISHED FLOOR
FH	FIRE HYDRANT
F-R-L	FILTER-REGULATOR-LUBRICATOR
FFD/HUB DR	FUNNEL FLOOR DRAIN/HUB DRAIN
FT	FEET
FU	FIXTURE UNIT
GAL	GALLON
HC	HANDICAP
H&CW	HOT & COLD WATER
INV./E.	INVERT ELEVATION
LAV	LAVATORY
MAX.	MAXIMUM
MIN.	MINIMUM
MC	MECHANICAL CONTRACTOR
MOCV	METER OUTLET CONTROL VALVE
MR	MOP RECEPTOR
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OFD	OVERFLOW DRAIN
PL	PROPERTY LINE
PSI	POUNDS PER SQUARE INCH
RPZ	REDUCED PRESSURE ZONE
RCV	RISER CONTROL VALVE
RD	ROOF DRAIN
SA	SHOCK ARRESTER
SSK	SERVICE SINK
TYP	TYPICAL
UR	URINAL
U/S	UNDER THE FLOOR SLAB
VIR	VENT THRU ROOF
W/	WITH
WC	WATER CLOSET
WCOP	WALL CLEANOUT PLATE

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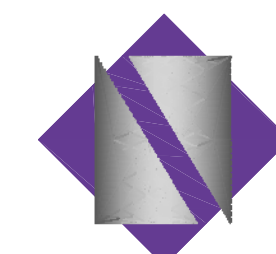
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MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 CHARLES STREET, SUITE 100, NEWARK, NJ 07102
PHONE: 973.278.2800 FAX: 973.278.2804
WWW.ATIARCHITECTS.COM

JOSEPH J. HENDERSON, PE
NJ License No. 36485



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.378.0088 FAX: 973.378.1061
CERTIFICATE OF AUTHORIZATION AC-438

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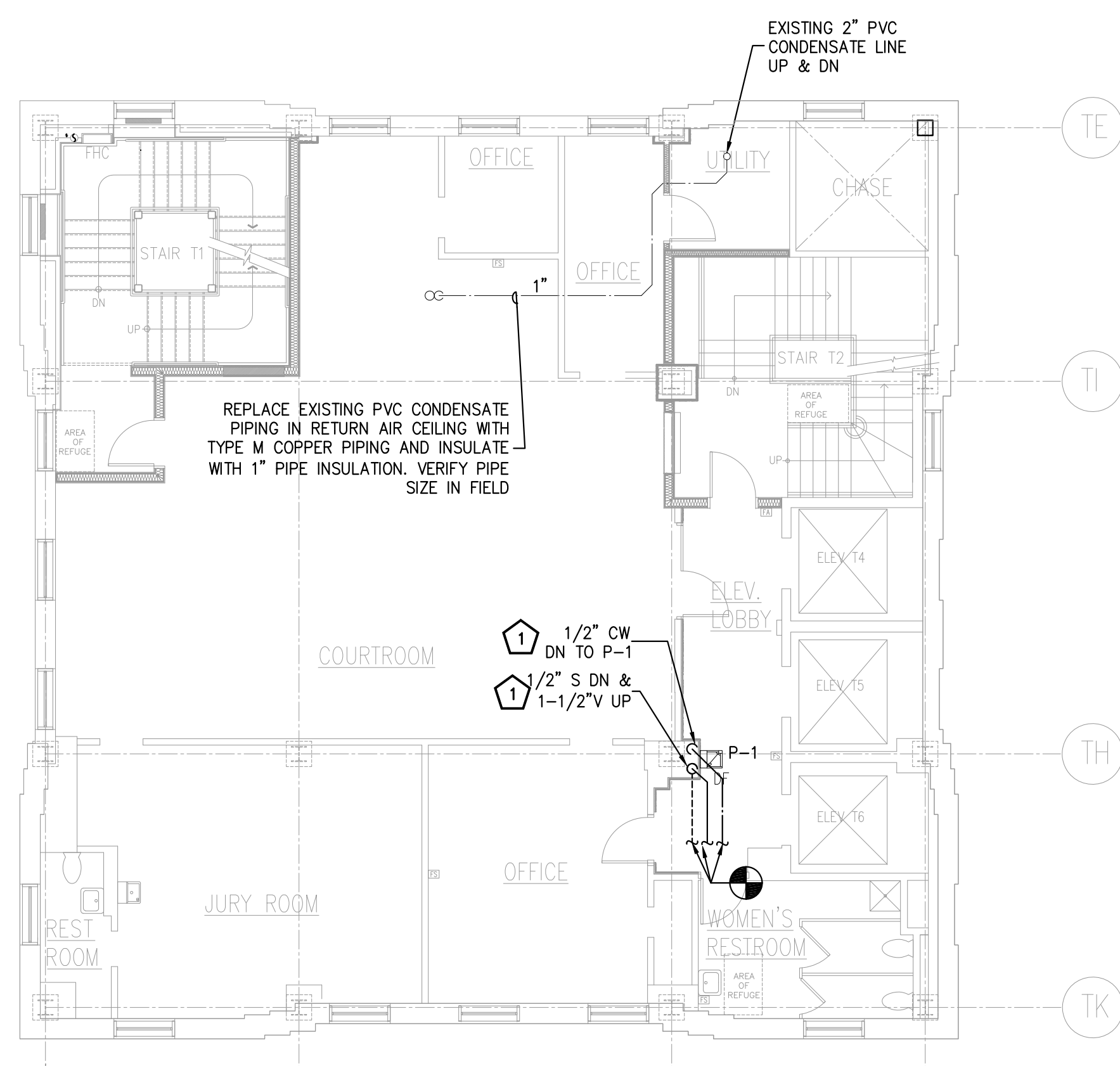
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

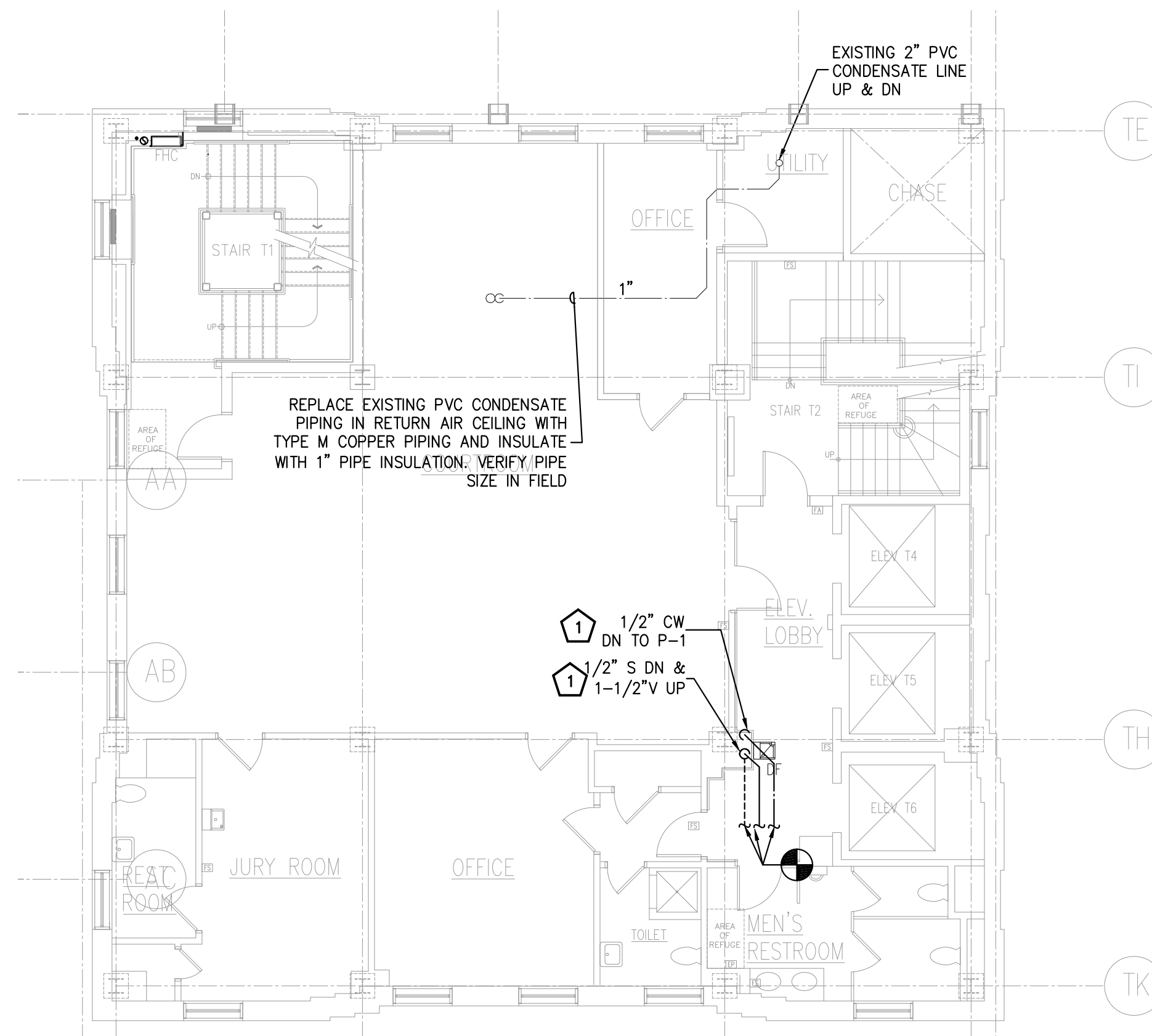
**PLUMBING
SYMBOLS & ABBREVIATIONS**

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DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JHH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

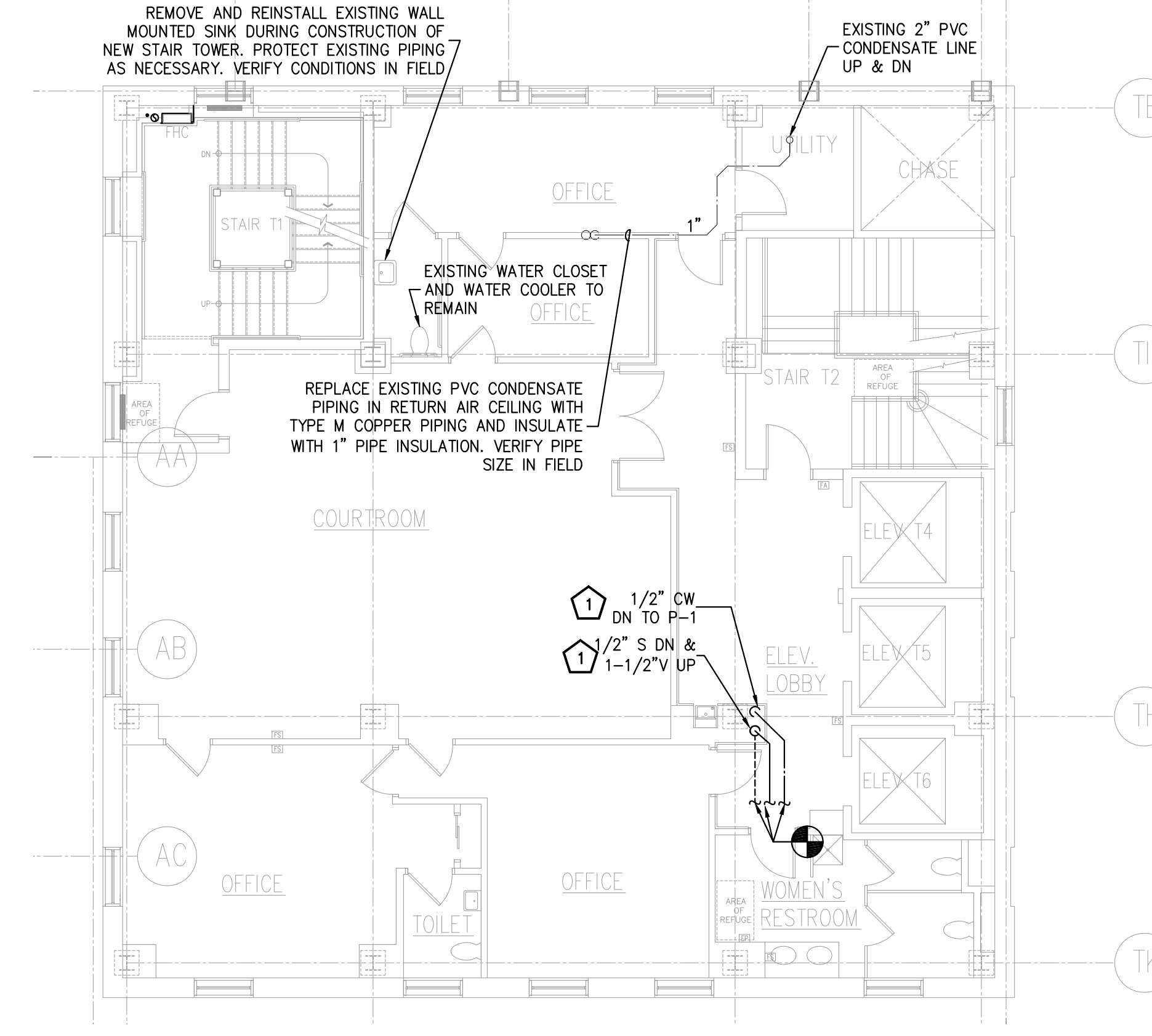
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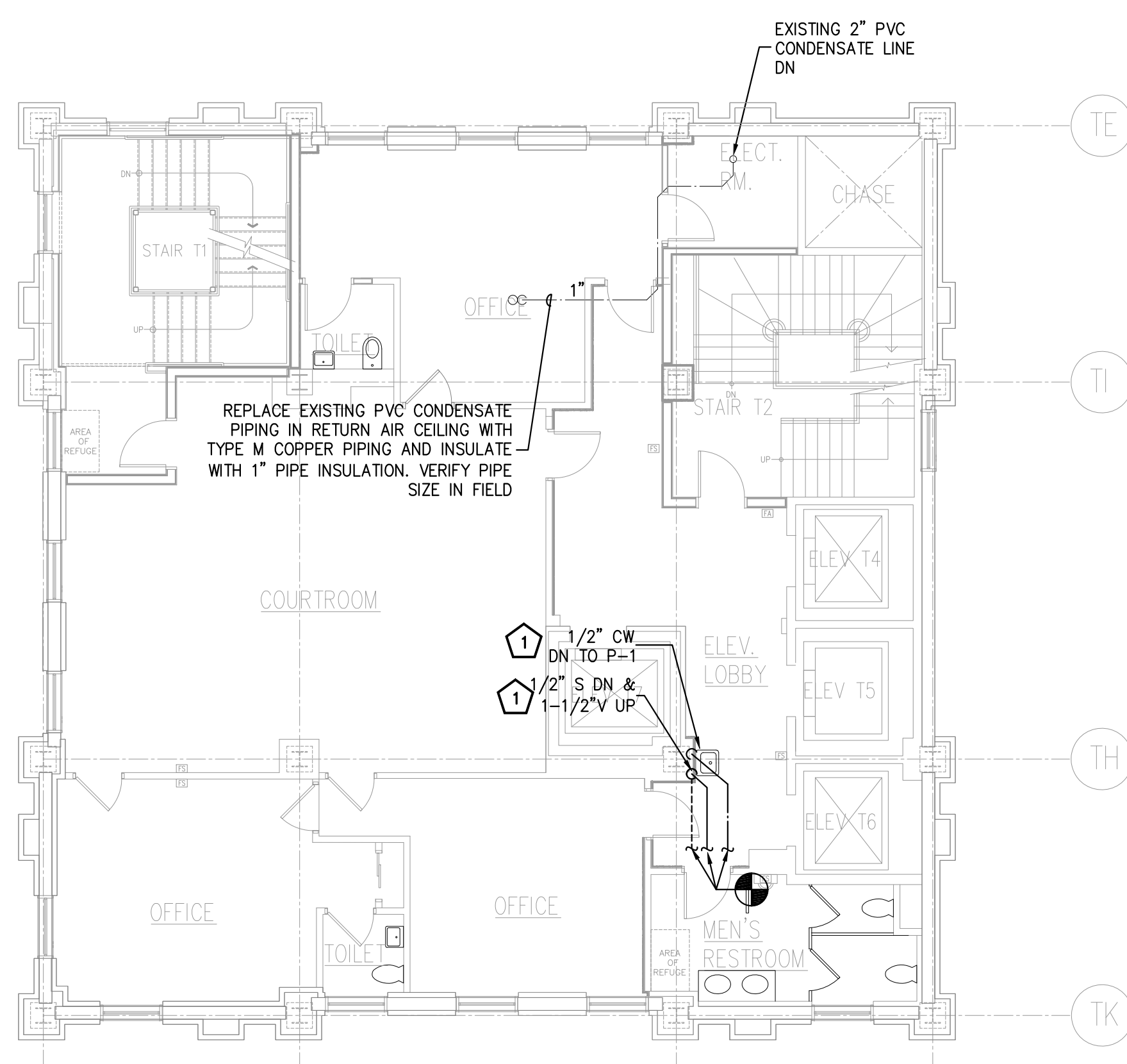
PIPING PLAN – ELEVENTH FLOOR
SCALE: 1/8"=1'-0"



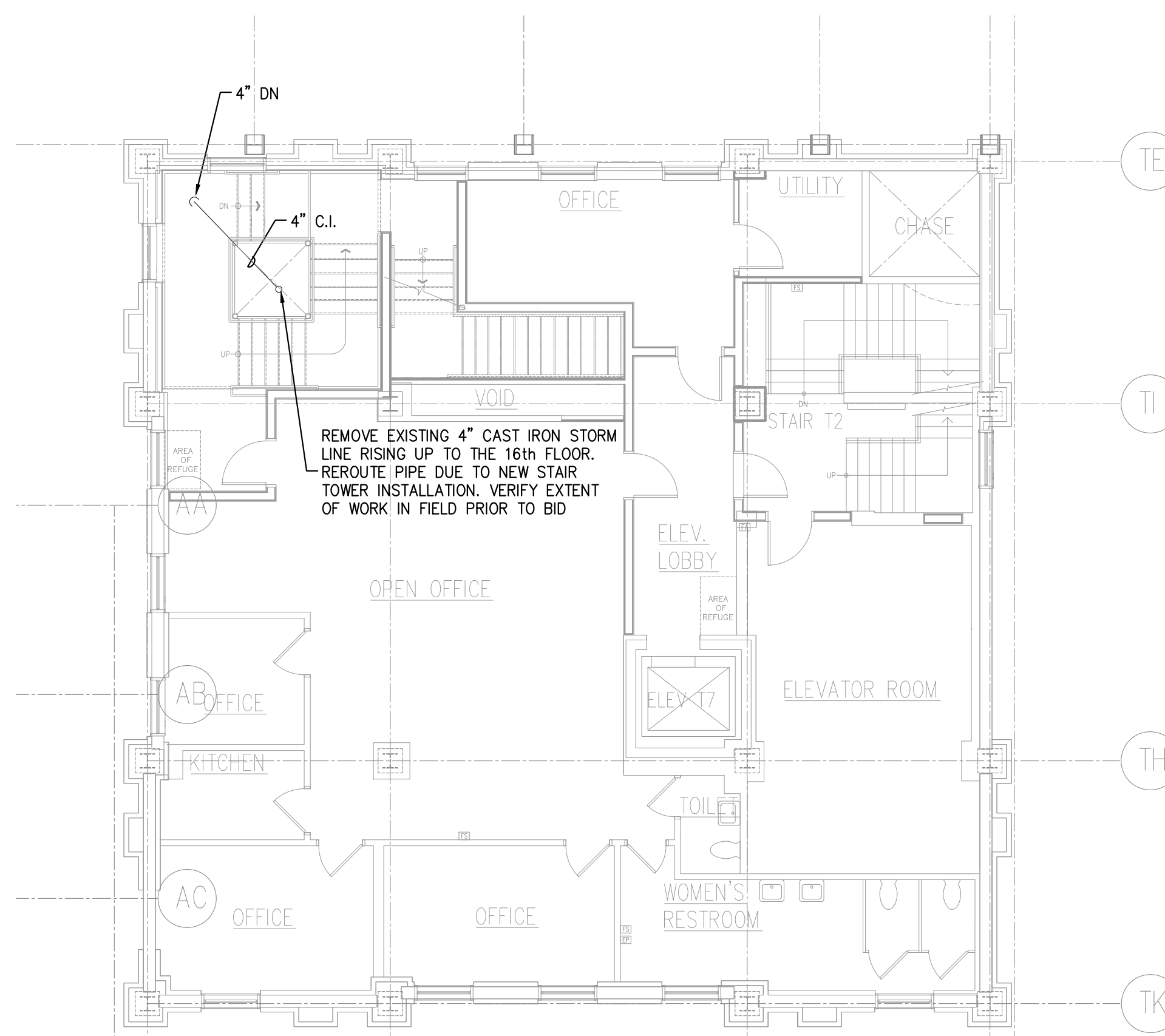
PIPING PLAN – TWELFTH FLOOR
SCALE: 1/8"=1'-0"



PIPING PLAN – THIRTEENTH FLOOR
SCALE: 1/8"=1'-0"



PIPING PLAN – FOURTEENTH FLOOR
SCALE: 1/8"=1'-0"



PIPING PLAN – FIFTEENTH FLOOR
SCALE: 1/8"=1'-0"

KEYED NEW WORK NOTES:

- 1 SANITARY PIPING SHALL CONNECT TO EXISTING PIPING IN CEILING. COLD WATER AND VENT TO CONNECT TO EXISTING PIPING IN CEILING ABOVE. CONTRACTOR TO REVIEW ALL SITE CONDITIONS AND DETERMINE FINAL TIE-IN LOCATIONS. CONTRACTOR TO BASE BID ACCORDINGLY. CONTRACTOR TO CORE DRILL FLOOR AND WALLS AS REQUIRED.

DRAWING NOTES:

- 1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.

KEYED DEMOLITION NOTES:

- A REMOVE EXISTING WC, LAV & EWC REMOVE ASSOCIATED SAN, VENT, CW & HW PIPING AND CAP LINES OUTSIDE OF NEW STAIR TOWER INSTALLATION.
- B REMOVE EXISTING 1" CONDENSATE LINE DUE TO THE RELOCATION OF THE EXISTING HVAC UNIT. REFER TO THE MECHANICAL DRAWINGS FOR THE RELOCATION OF HVAC UNIT AND REPIPE CONDENSATE.
- C REMOVE EXISTING 4" C.I. PIPE RISING UP TO THE 16TH FLOOR. REROUTE PIPE DUE TO NEW STAIR TOWER INSTALLATION. VERIFY EXTENT OF WORK IN FIELD PRIOR TO BID.

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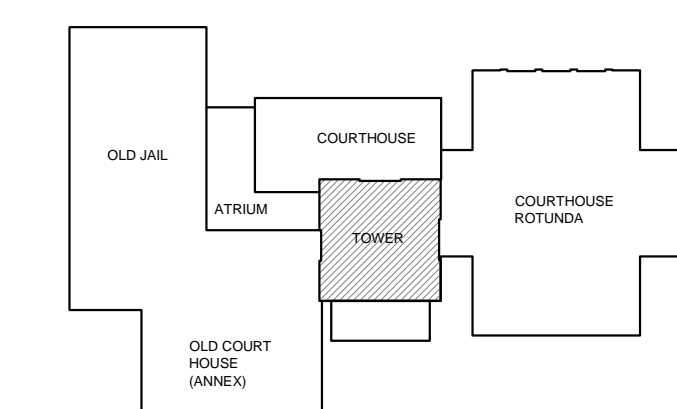
PROJECT:

UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

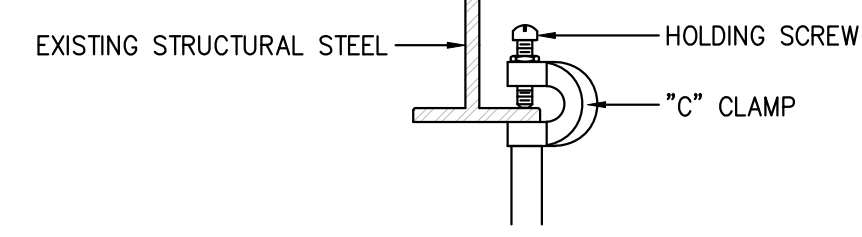
PLUMBING - PIPING PLANS
ELEVENTH THRU FIFTEENTH FLOORS

KEYPLAN

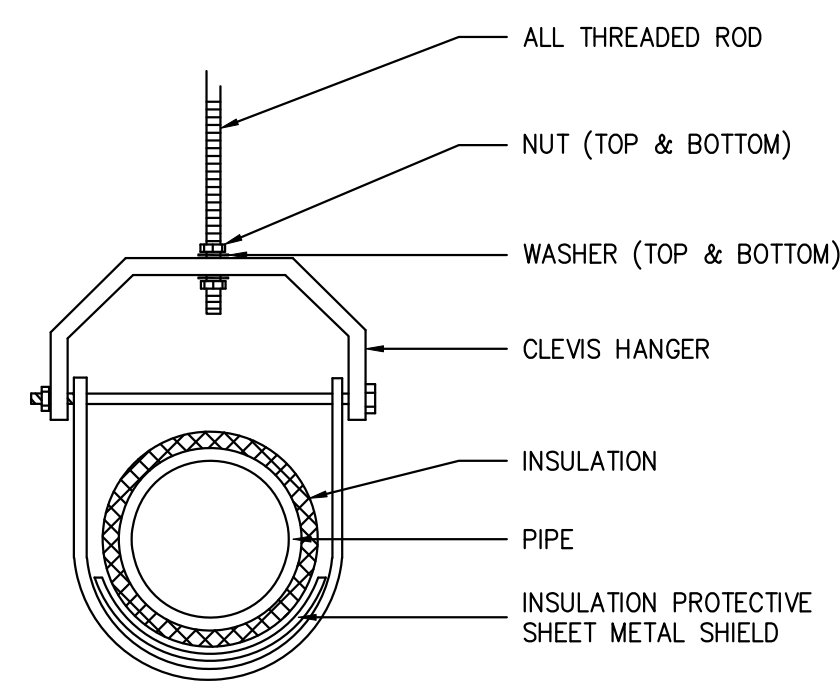


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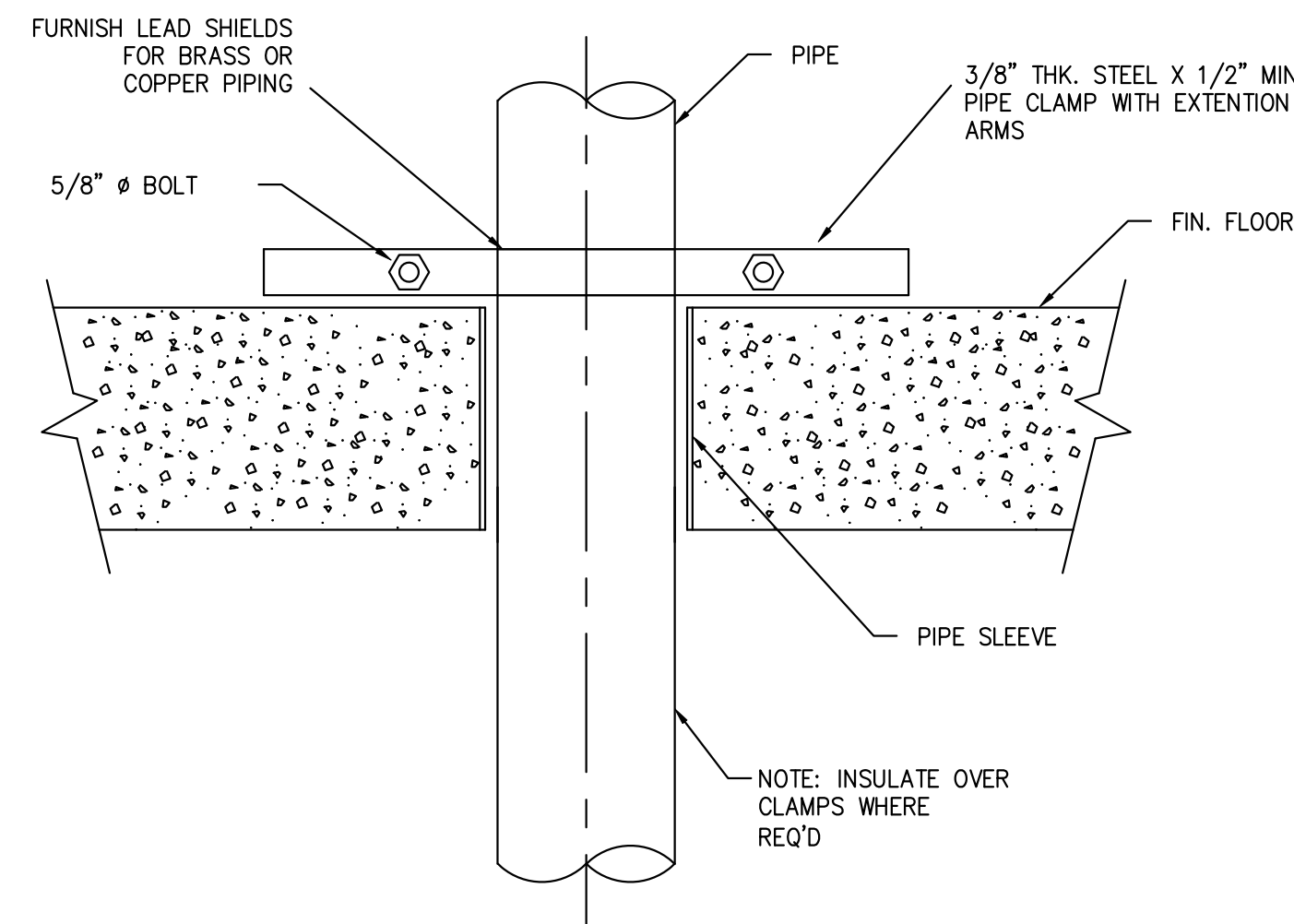
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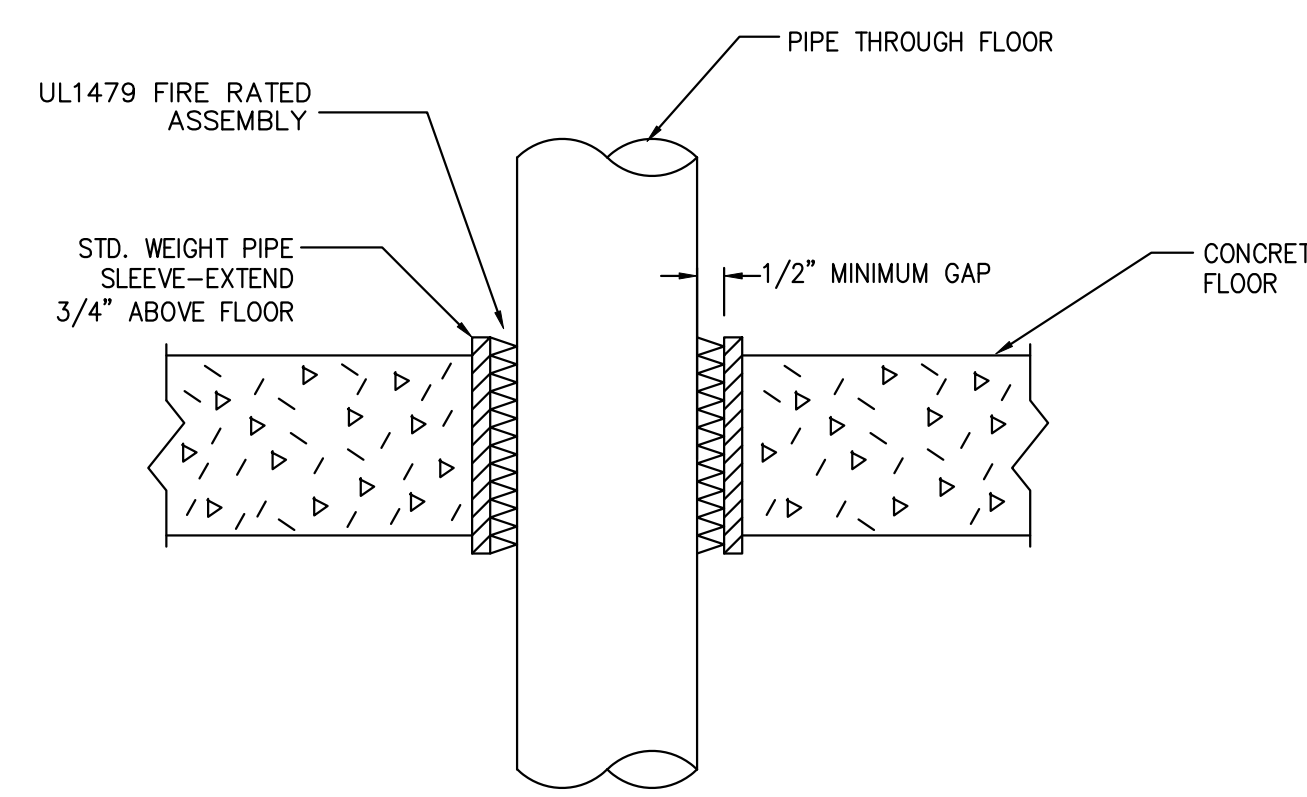
TYPICAL DETAIL CLAMP HANGER
SCALE: NONE



TYPICAL CLEVIS HANGER DETAIL
SCALE: NONE



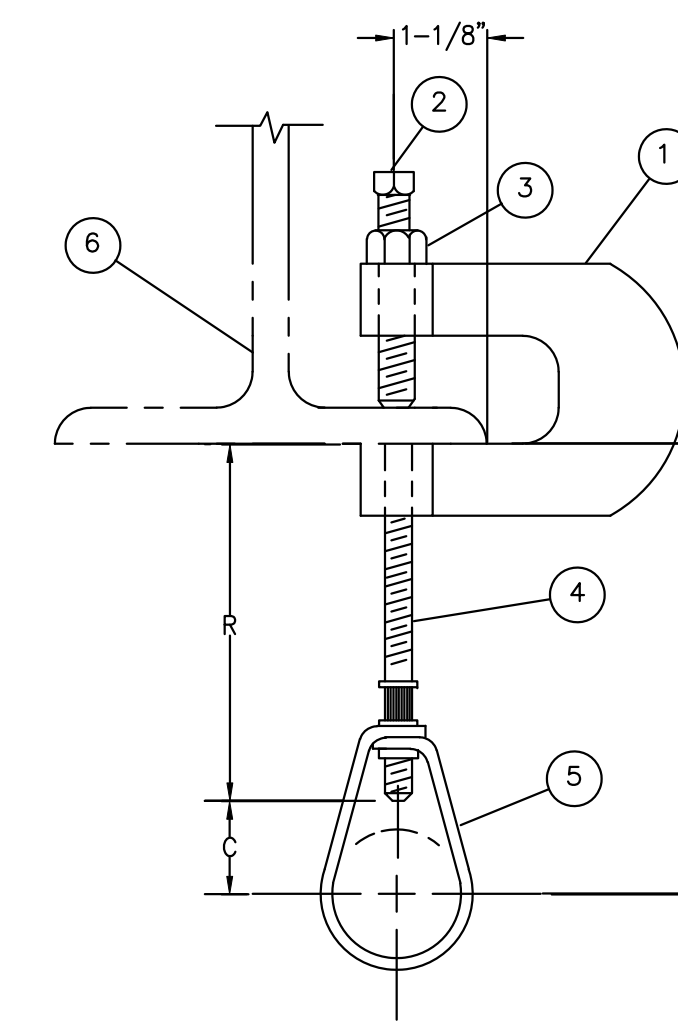
PIPE RISER SUPPORT DETAIL
SCALE: NONE



PIPE SLEEVE THROUGH FLOOR DETAIL
SCALE: NONE

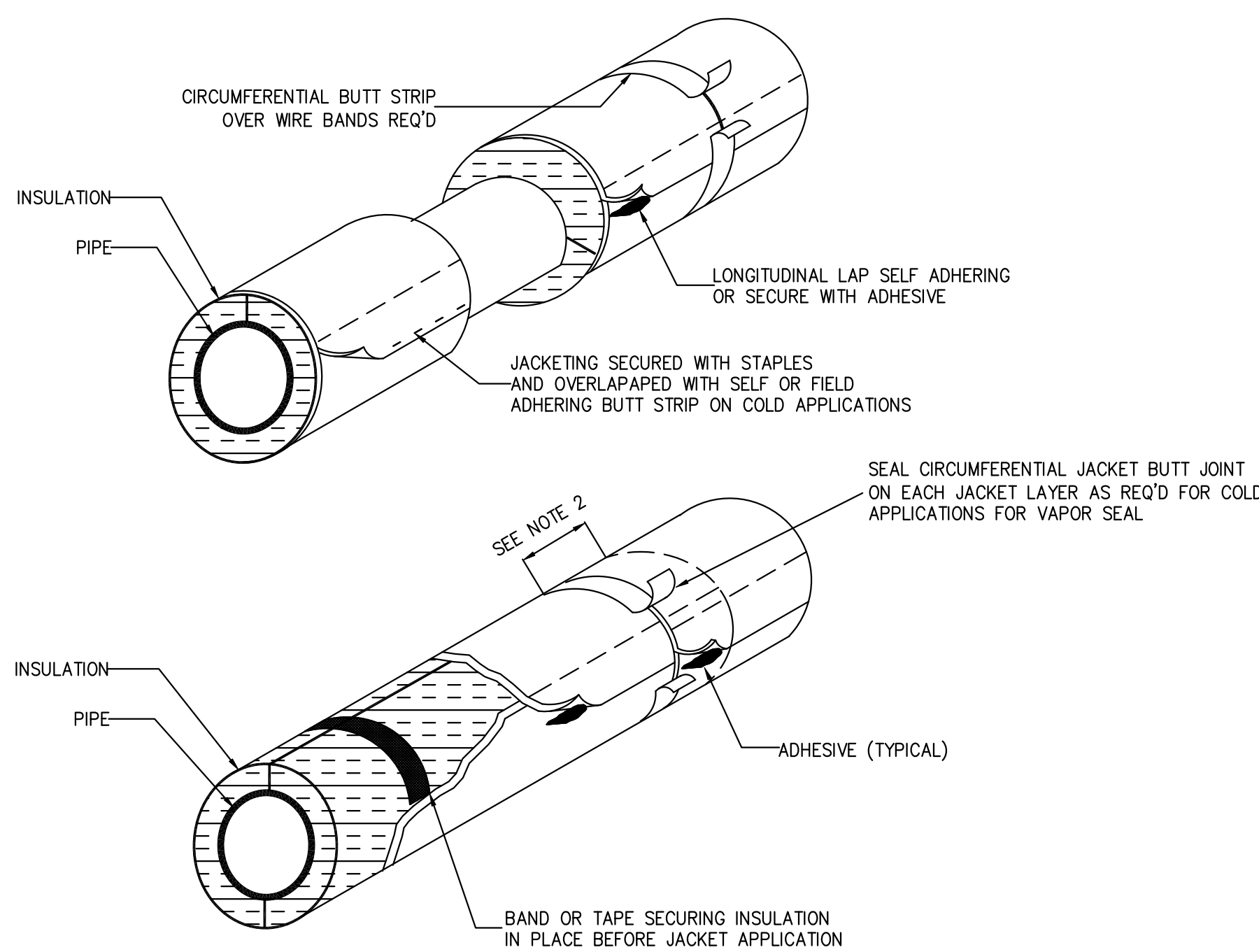
DESIGN DATA FOR C-CLAMP HANGER

Nominal Pipe Size	Minimum A Dimension inches	Hanger Takeout inches	Rod Diameter inches
1/2	3 1/2	-1 1/4	3/8
3/4	3 1/2	-1 1/4	3/8
1	3 1/2	-1 1/4	3/8
1 1/4	3 3/4	-1 1/2	3/8
1 1/2	4	-1 1/2	3/8
2	4 1/4	-1 3/4	3/8
2 1/2	5	-2 1/4	3/8
3	5 1/2	-2 1/2	3/8
4	6	-3	3/8



STANDARD C-CLAMP PIPE HANGER
SCALE: NONE

- Components:
1. C-Clamp
 2. Set Screw
 3. Lock Nut
 4. Hanger Rod
 5. Adjustable Hanger Ring
 6. Steel Beam or Bar Joist



- NOTES:
1. LONGITUDINAL JACKETING SEAMS POSITIONED AT 3 OR 9 O'CLOCK ONLY W/TOP LAP FACING DOWN FOR WEATHER PROOFING
 2. OVERLAP JACKETING A MIN OF 1-1/2"

FACTORY AND FIELD APPLIED NON-METALLIC PIPE JACKETING
SCALE: NONE

PLUMBING FIXTURE CONNECTION SCHEDULE

MARK	FIXTURE	MANUFACTURER	CATALOG NUMBER	MOUNTING	WASTE SIZE	VENT SIZE	ACCESSORIES AND REMARKS
P-1	DRINKING FOUNTAIN	ELKAY	LZS8W5LP	WALL	3"	3"	EZH2O BOTTLE FILLING STATION & SINGLE ADA COOLER, FILTERED, 8GPH, BOTTLE FILLER SENSOR, ELECTRONIC FRONT & REAR MONITOR, LAMINAR FLOW, REAL DRAIN, LIGHT GRAY GRANITE, HANDS FREE, VISUAL FILTER STATUS RESET, ANTIMICROBIAL.

WATER FOUNTAINS ON EACH FLOOR SHALL BE CONNECTED TO EXISTING PLUMBING SYSTEMS AT LOCAL SINK ROOMS.

INSTALLER SHALL INSPECT SITE CONDITIONS AND DETERMINE EXISTING PLUMBING AND BASE BID ACCORDINGLY.

DRAINAGE FIXTURE UNITS (DFU) SHALL BE DETERMINED BY THE CONTRACTOR BASED ON THE DRILL FLOORS AND WALLS AS SHOWN.

SUPPLY FIXTURE UNITS (SFU) 0.5

RISE R D

SCALE: NONE

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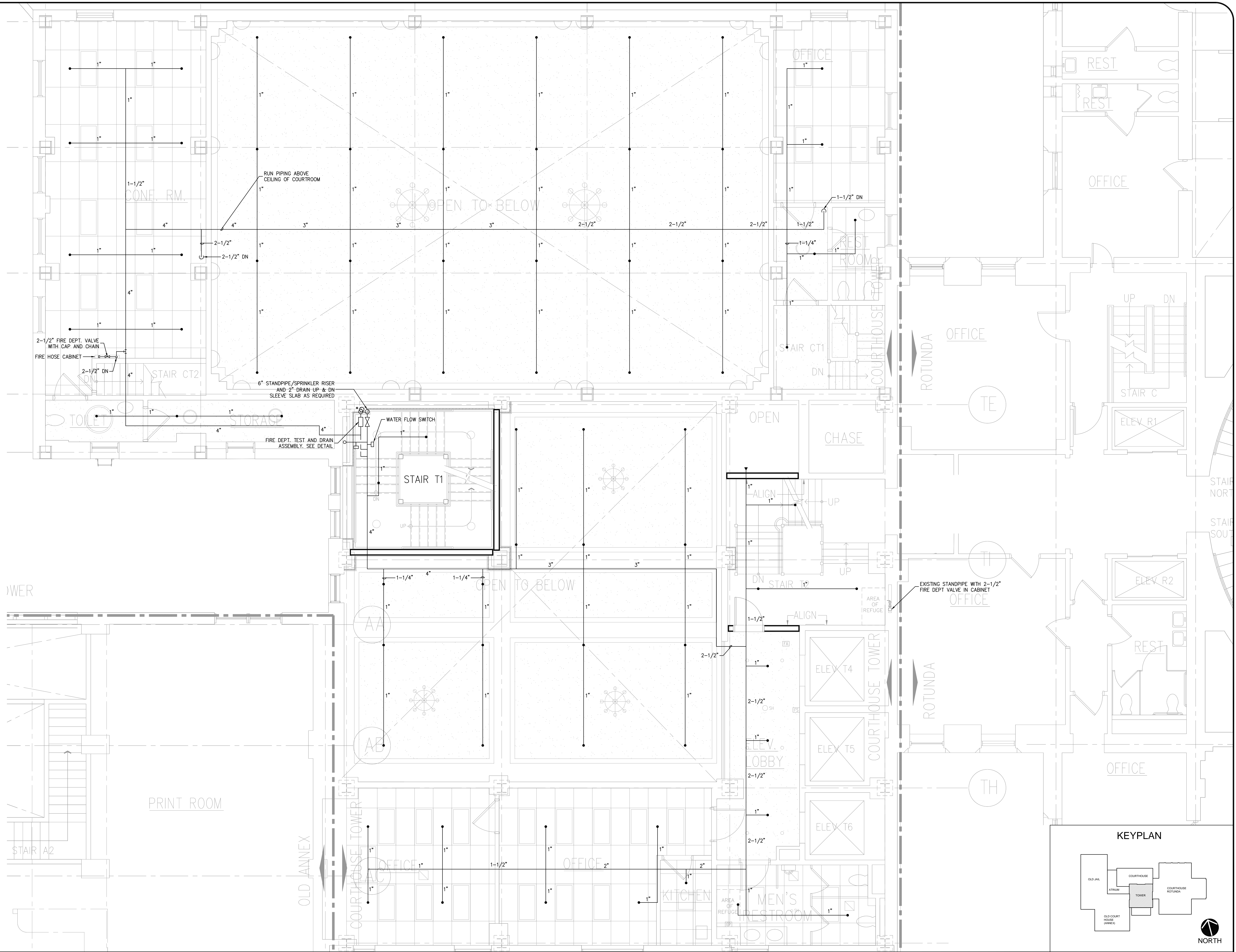
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SHEET CONTENTS:

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									DWG NO

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DRAWING NOTES:
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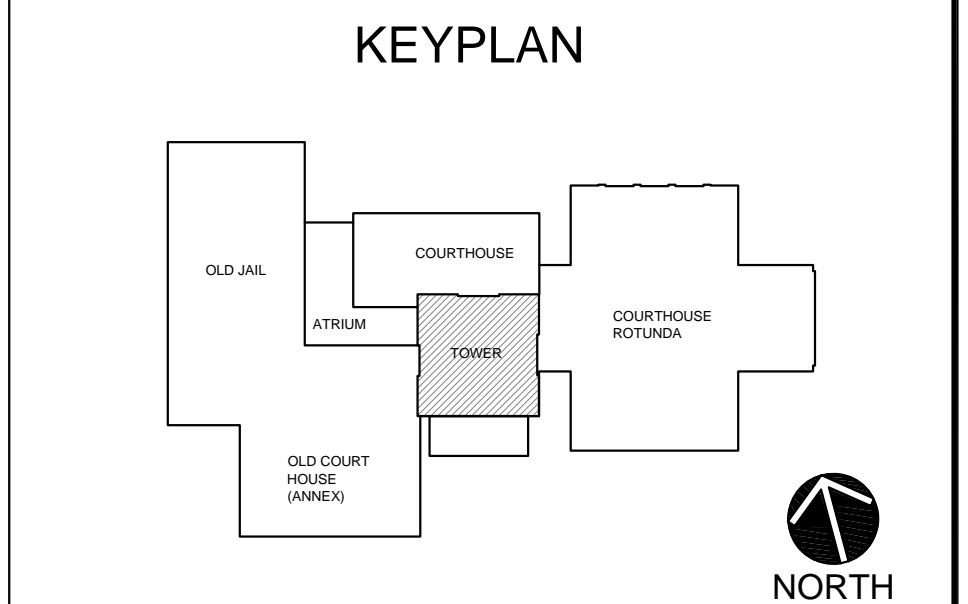
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 NJ License No. AI 14394



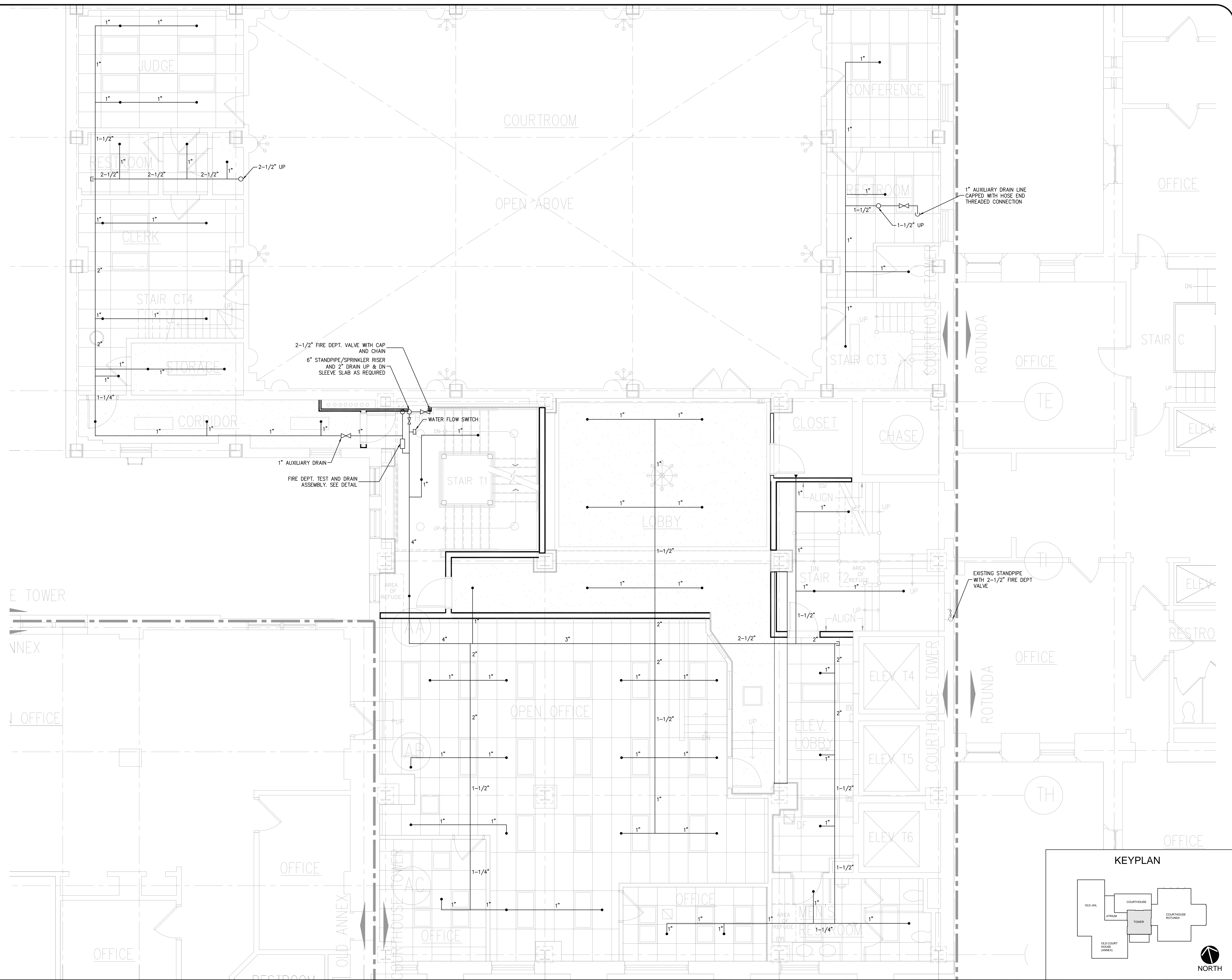
PROJECT:
**UC COURTHOUSE
 INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**FIRE PROTECTION - SPRINKLER PIPING PLAN
 SECOND FLOOR**

SUBMISSIONS				REVISIONS				DATE	SCALE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	10-10-15	1/8" = 1'-0"
04.02.15	DD SUBMISSION	KD	FM					DRAWN BY	RB
10.30.15	95% SUBMISSION	KD	FM					CHKD BY	JJH
09.07.17	ISSUED FOR BID	KD	FM					JOB NO	2141151
								SHEET:	_ OF:
								DWG NO	



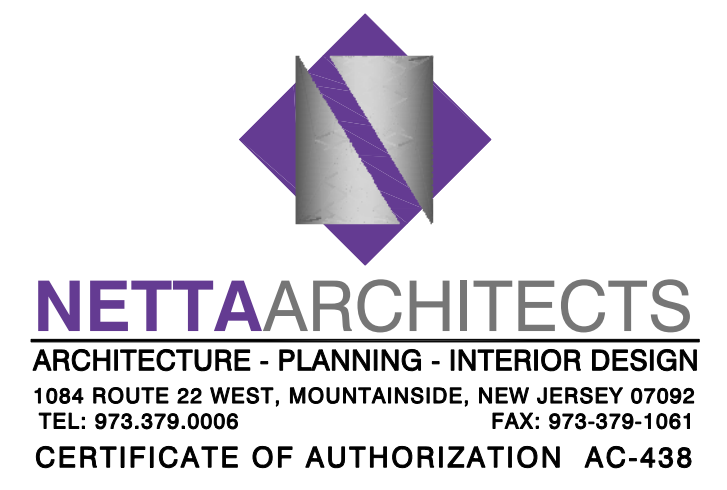
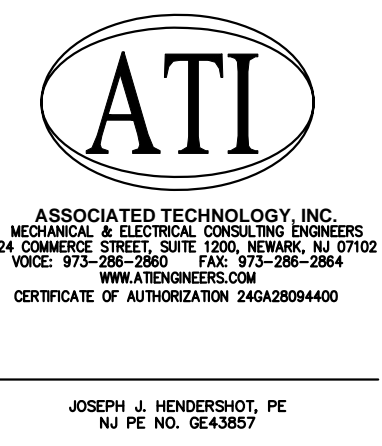
FP.302



DRAWING NOTES:
 1. REFER TO DRAWING FP.101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.

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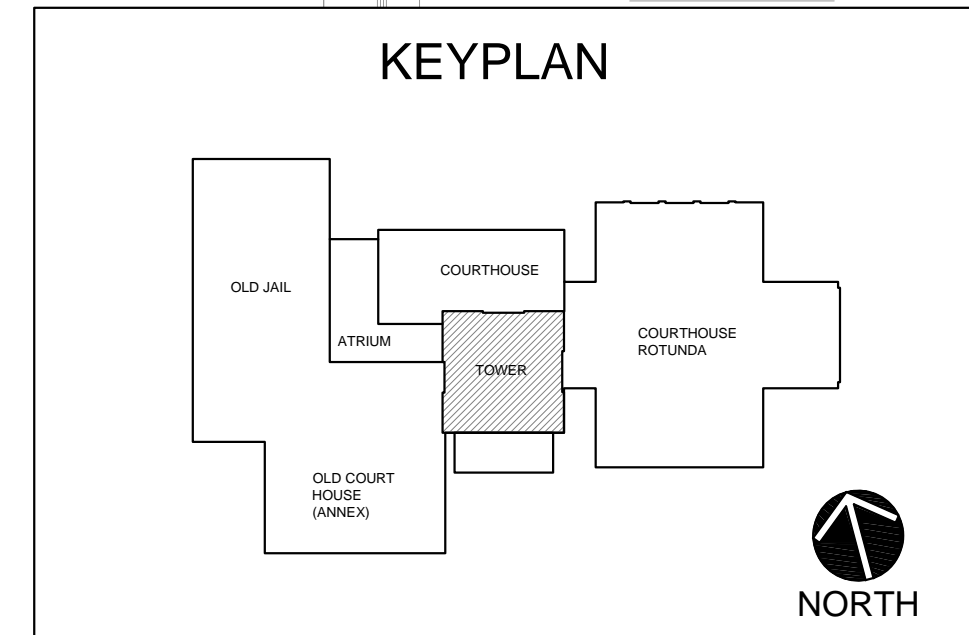
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 MARK E. BESS, AIA, NCARB
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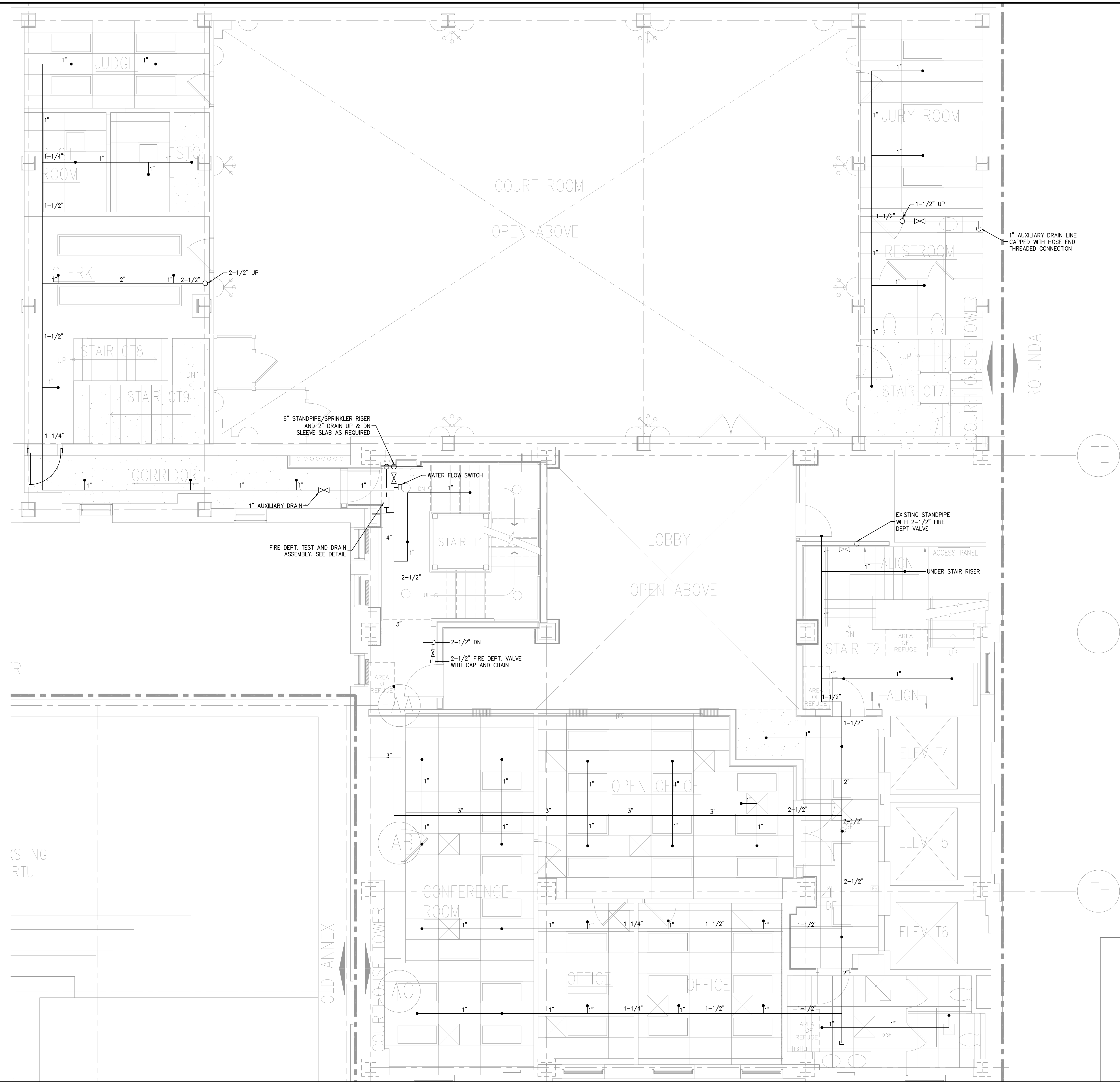
PROJECT:
**UC COURTHOUSE
 INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**FIRE PROTECTION - SPRINKLER PIPING PLAN
 THIRD FLOOR**

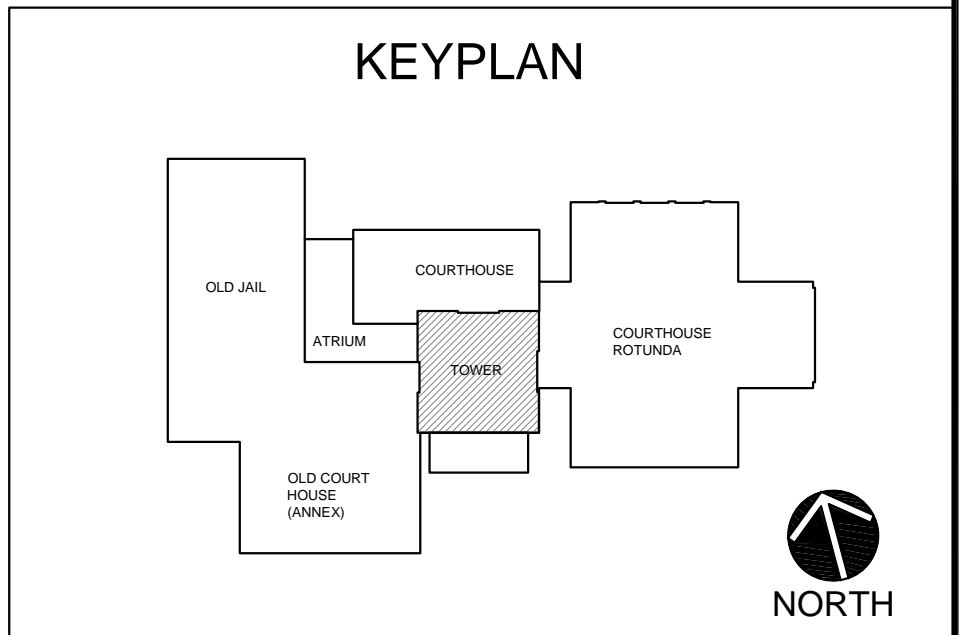
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DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
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10.30.15	95% SUBMISSION	KD	FM					CHKD BY	JJH
09.07.17	ISSUED FOR BID	KD	FM					JOB NO	2141151
								SHEET:	_ OF:
								DWG NO	



FP.303



DRAWING NOTES:
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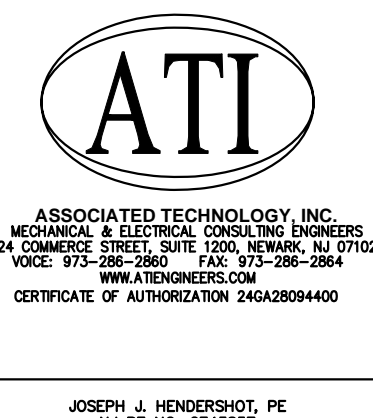
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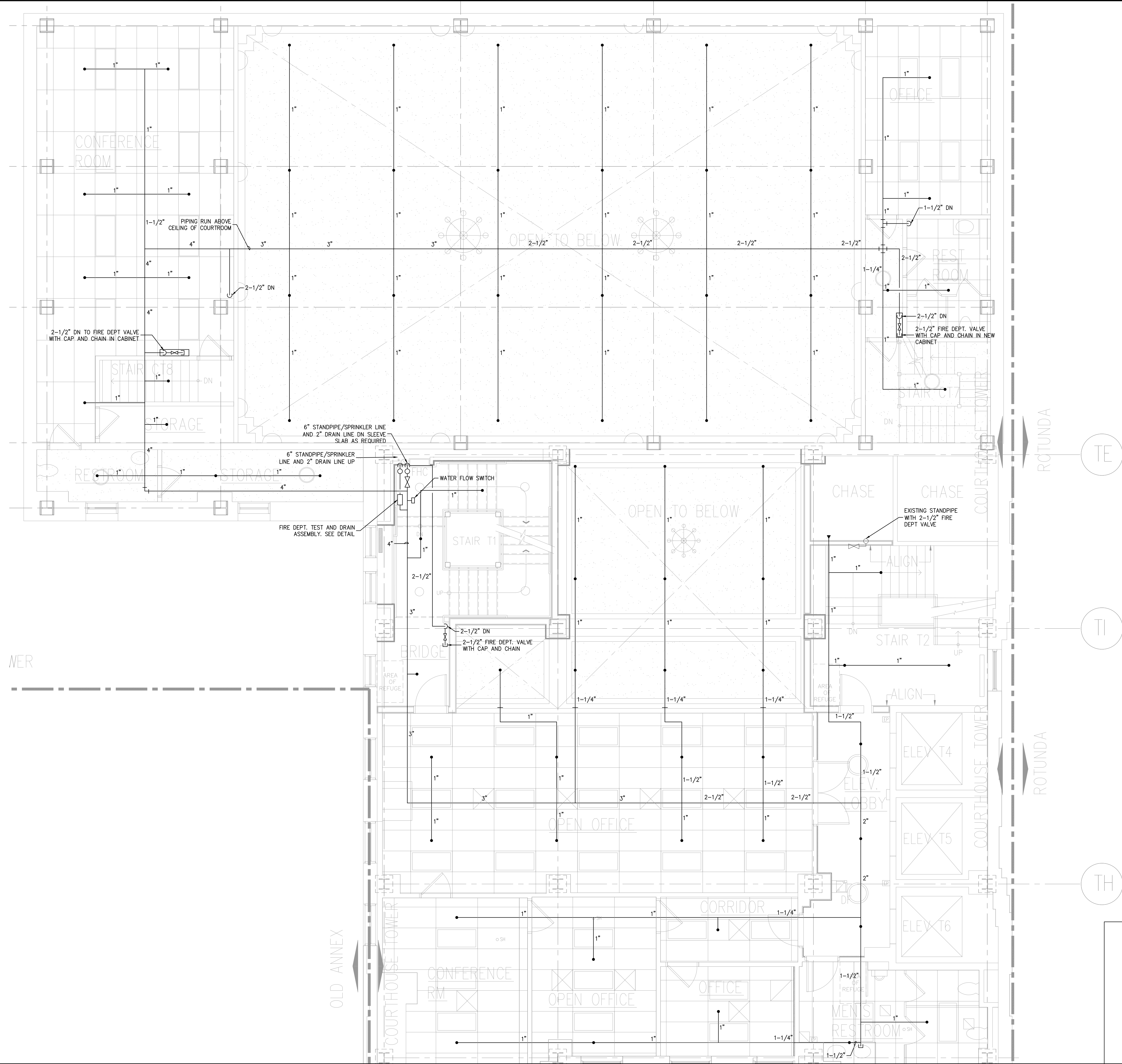


PROJECT:
**UC COURTHOUSE
 INTERNAL STAIR (TOWER)**
 2 Broad Street, Elizabeth New Jersey

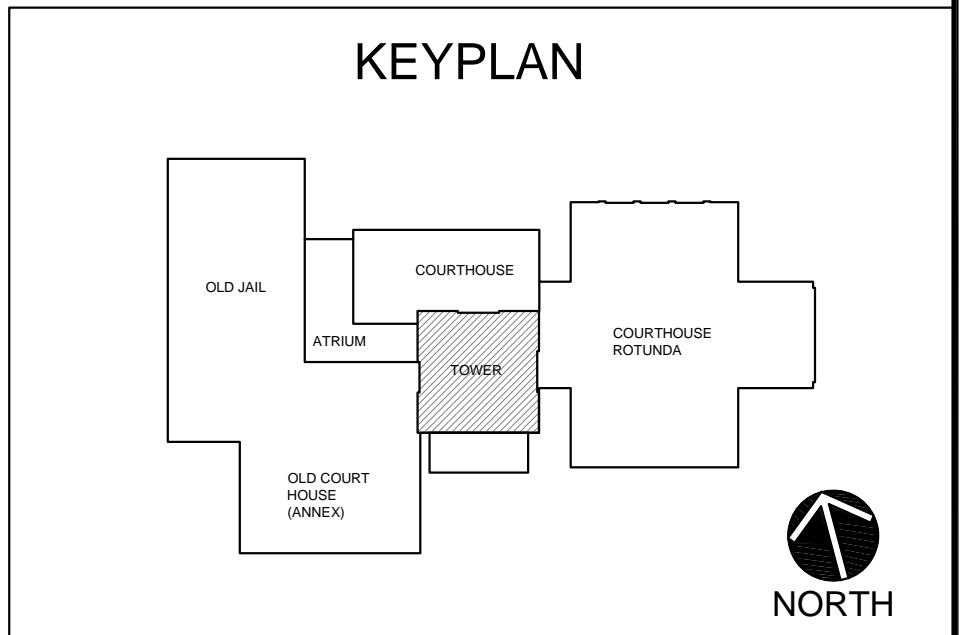
SHEET CONTENTS:
**FIRE PROTECTION - SPRINKLER PIPING PLAN
 SEVENTH FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
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10.30.15	95% SUBMISSION	KD	FM					CHKD BY	JJH
09.07.17	ISSUED FOR BID	KD	FM					JOB NO	2141151
								SHEET:	_ OF:
								DWG NO	

FP.307



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 NJ License No. AI 12541

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 NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
 NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
 NJ License No. AI 14394

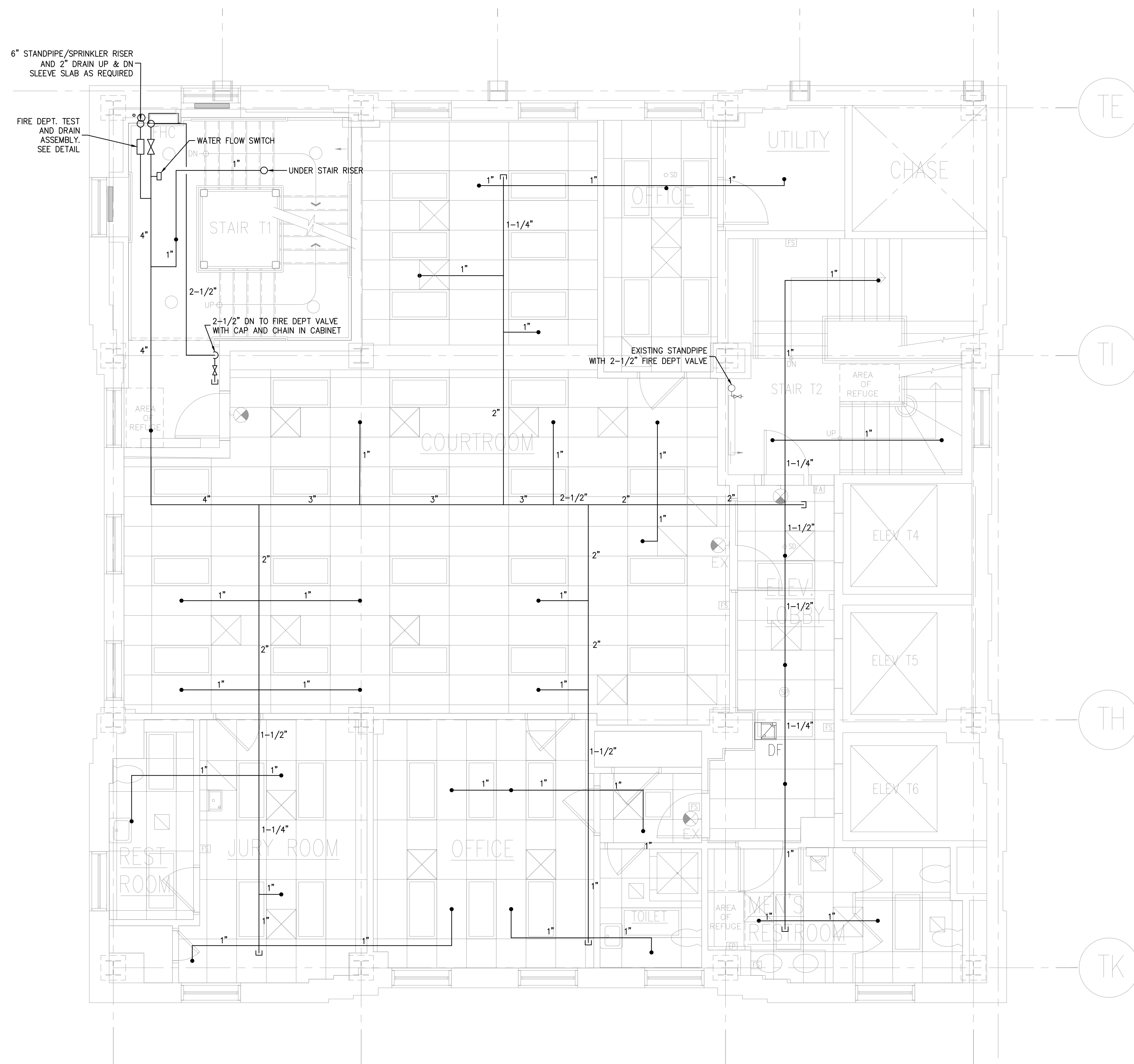


PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
 2 Broad Street, Elizabeth New Jersey

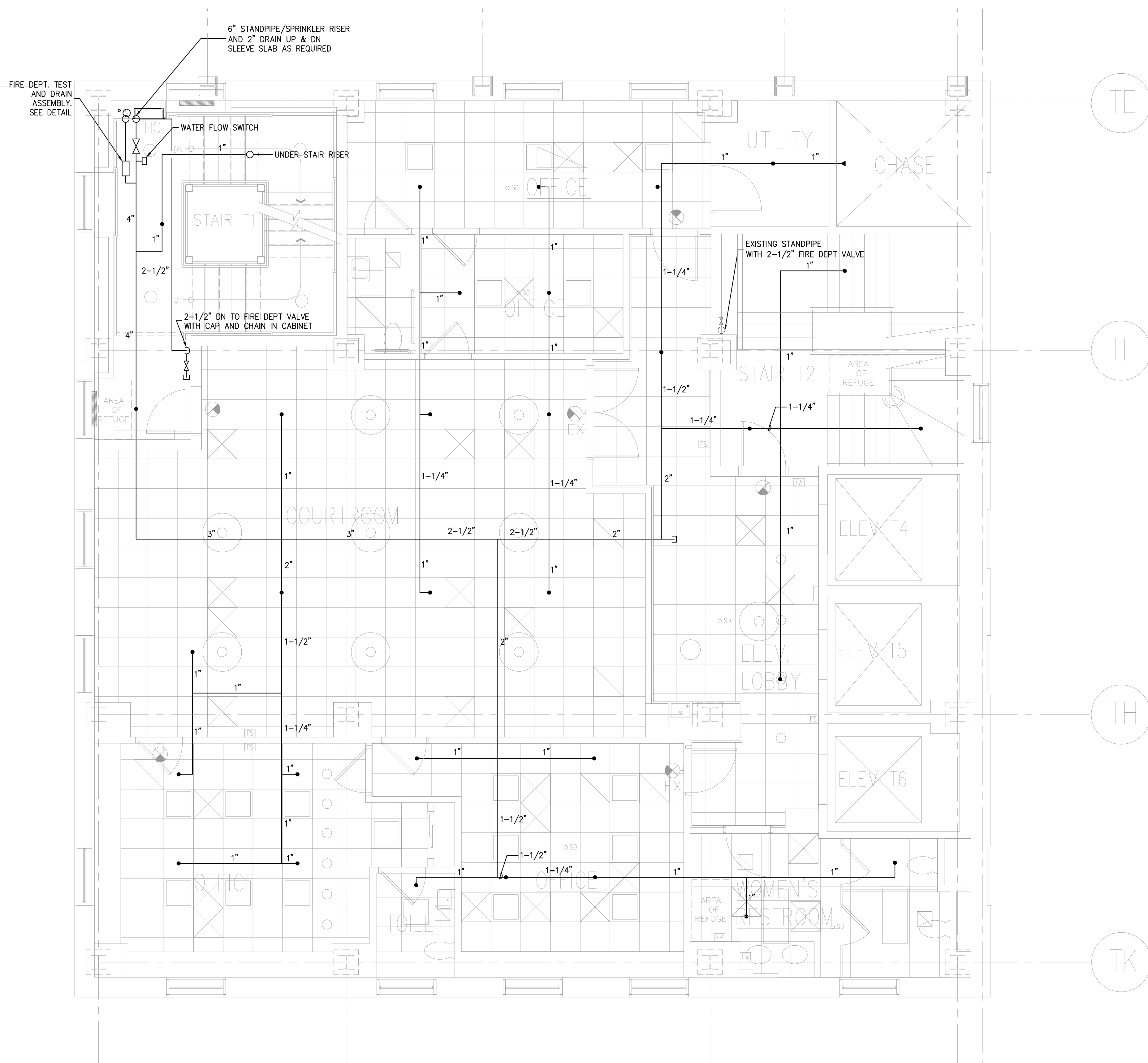
SHEET CONTENTS:
FIRE PROTECTION - SPRINKLER PIPING PLAN
EIGHTH FLOOR

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
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10.30.15	95% SUBMISSION	KD	FM					CHKD BY	JJH
09.07.17	ISSUED FOR BID	KD	FM					JOB NO	2141151
								SHEET:	_ OF:
								DWG NO	

FP.308

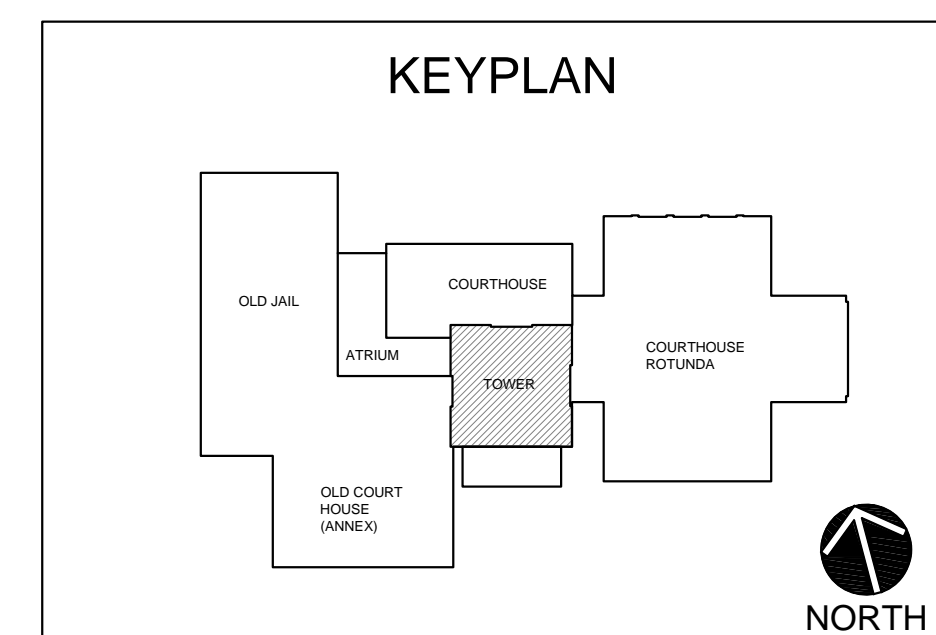


TWELFTH FLOOR - SPRINKLER PIPING PLAN
SCALE: 1/4"=1'-0"



THIRTEENTH FLOOR - SPRINKLER PIPING PLAN
SCALE: 1/4"=1'-0"

DRAWING NOTES:
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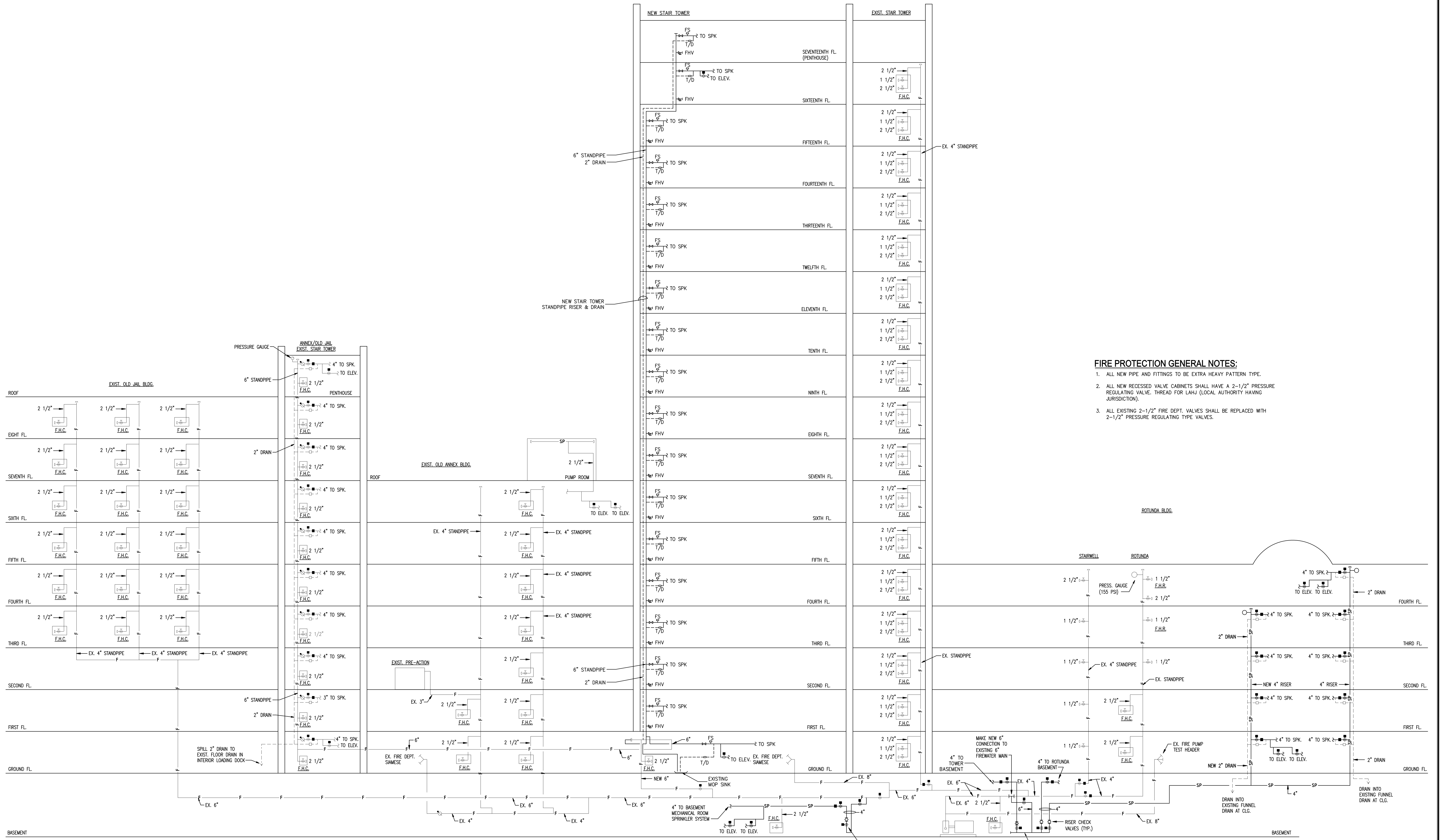


PROJECT:
**UC COURTHOUSE
INTERNAL STAIR (TOWER)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**FIRE PROTECTION - SPRINKLER PIPING PLAN
TWELFTH & THIRTEENTH FLOOR**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						
10.30.15	95% SUBMISSION	KD	FM						
09.07.17	ISSUED FOR BID	KD	FM						
								DRAWN BY	RB
								CHKD BY	JJH
								JOB NO	2141151
								SHEET:	_ OF:
								DWG NO	

FP.311



FIRE PROTECTION GENERAL NOTES:

1. ALL NEW PIPE AND FITTINGS TO BE EXTRA HEAVY PATTERN TYPE.
2. ALL NEW RECESSED VALVE CABINETS SHALL HAVE A 2-1/2" PRESSURE REGULATING VALVE. THREAD FOR LAHJ (LOCAL AUTHORITY HAVING JURISDICTION).
3. ALL EXISTING 2-1/2" FIRE DEPT. VALVES SHALL BE REPLACED WITH 2-1/2" PRESSURE REGULATING TYPE VALVES.

1 RISER DIAGRAM
SCALE: NONE

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NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
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PROJECT: UC COURTHOUSE
INTERNAL STAIR (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**FIRE PROTECTION
RISER DIAGRAM**

SUBMISSIONS				REVISIONS				DATE	10-10-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
04.02.15	DD SUBMISSION	KD	FM						DRAWN BY RB
10.30.15	95% SUBMISSION	KD	FM						CHKD BY JJH
09.07.17	ISSUED FOR BID	KD	FM						JOB NO 2141151
									SHEET: _ OF:
									DWG NO

FP.601



UNION COUNTY COURTHOUSE FIRE SUPPRESSION ROTUNDA BLDG.

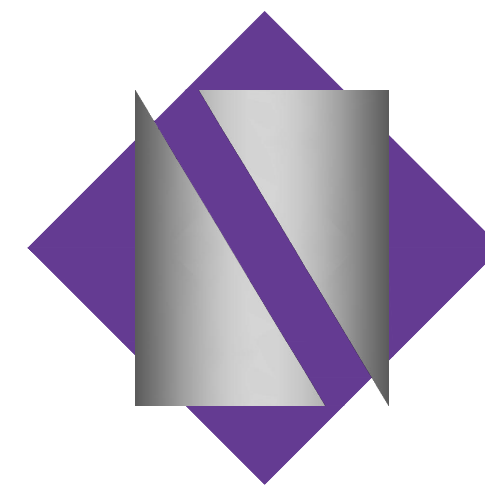
2 BROAD STREET, ELIZABETHTOWN PLAZA
ELIZABETH, NJ 07202



ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365
NEW JERSEY BOARD OF
PROFESSIONAL ENGINEERS AND
LAND SURVEYORS
CERTIFICATE OF AUTHORIZATION
24GA27987500



ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2860 FAX: 973-286-2864
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400



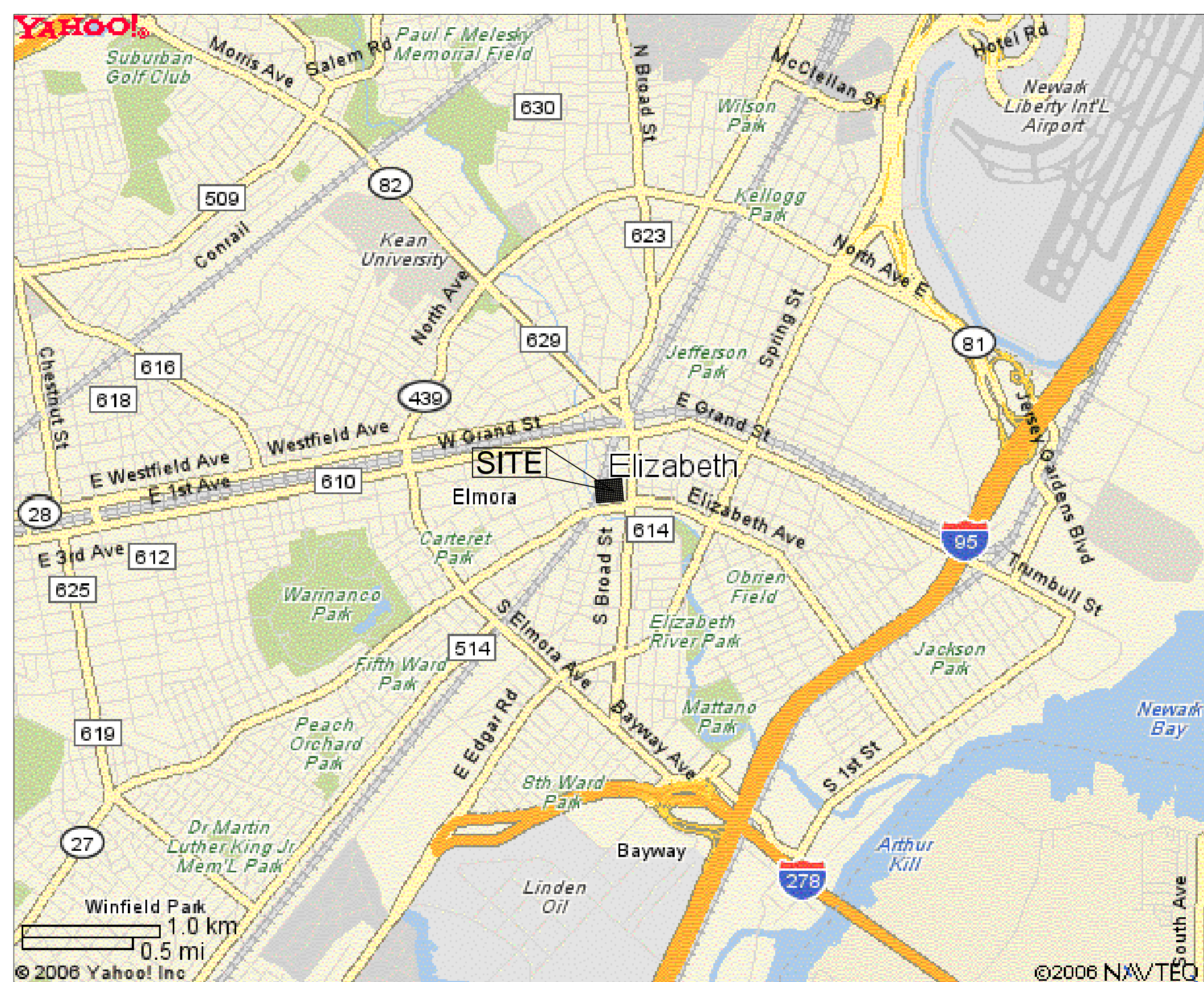
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438



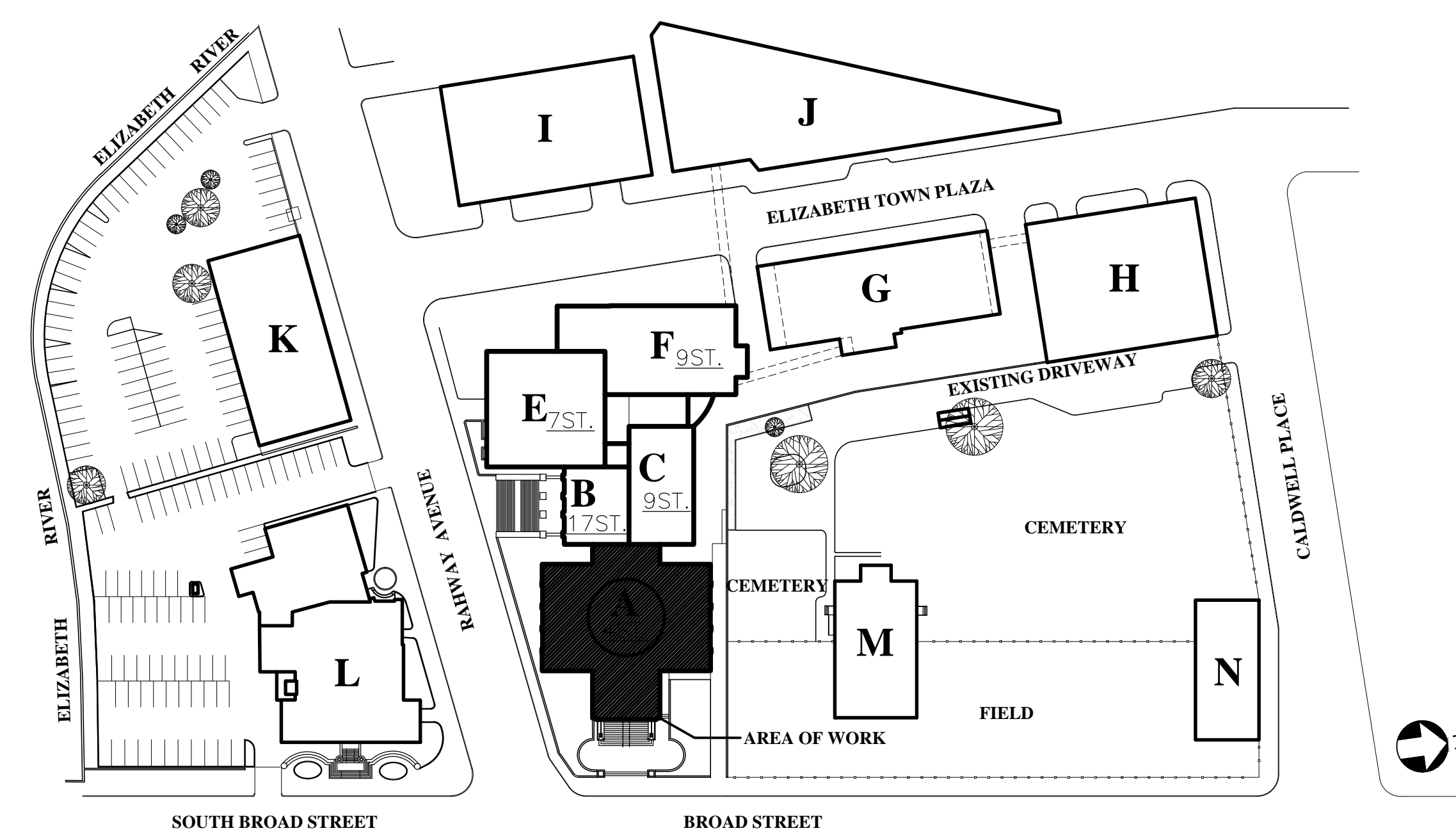
1160 Route 22 West, 2nd Floor, Mountainside, New Jersey 07092
o 908.379.2911 d 908.379.2911 x210 m 908.377.0938
e ppanzarino@o-n.com w o-n.com

ISSUED FOR BID
SEPTEMBER 7, 2017

LOCATION MAP



SITE PLAN



- LEGEND
- A. COURT HOUSE ROTUNDA
 - B. TOWER COURT HOUSE
 - C. OLD COURT HOUSE
 - D. OMITTED
 - E. OLD COURT HOUSE ANNEX
 - F. OLD COURT HOUSE JAIL
 - G. NEW COURT HOUSE ANNEX

- H. PARKING GARAGE / DETENTION CENTER
- I. ADMINISTRATION
- J. RALPH ORISCELLO CORRECTIONAL FACILITY
- K. JUSTICE FACILITY
- L. PUBLIC LIBRARY
- M. FIRST PRESBYN. CHURCH
- N. PARISH HO.

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AA-2	GROUND FLOOR ASBESTOS ABATEMENT PLAN	E.102	ELECTRICAL SYMBOL LEGENDS
AA-3	FIRST FLOOR ASBESTOS ABATEMENT PLAN	E.103	ELECTRICAL ABBREVIATIONS
AA-4	SECOND FLOOR ASBESTOS ABATEMENT PLAN	E.201	ELECTRICAL ONE LINE DIAGRAMS
AA-5	THIRD FLOOR ASBESTOS ABATEMENT PLAN	E.201.1	ELECTRICAL ONE LINE DIAGRAMS
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STRUCTURAL		FP.300G	SPRINKLER PIPING PLAN GROUND FLOOR
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S.201	SECTIONS	FP.304	SPRINKLER PIPING PLAN FOURTH FLOOR
S.301	GENERAL NOTES	FP.601	FIRE PROTECTION RISER DIAGRAM
		FP.801	FIRE PROTECTION DETAILS
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DM.401	MECHANICAL DEMOLITION PLAN FIRST FLOOR	DP.303	PLUMBING DEMOLITION PIPING PLAN THIRD FLOOR
DM.402	MECHANICAL DEMOLITION PLAN SECOND FLOOR	DP.304	PLUMBING DEMOLITION PIPING PLAN FOURTH BASEMENT
DM.403	MECHANICAL DEMOLITION PLAN THIRD FLOOR	P.300B	PLUMBING PIPING PLAN BASEMENT
DM.404	MECHANICAL DEMOLITION PLAN FOURTH FLOOR	P.300G	PLUMBING PIPING PLAN GROUND FLOOR
DM.405	MECHANICAL DEMOLITION PLAN ROOF	P.301	PLUMBING PIPING PLAN FIRST FLOOR
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M.404	MECHANICAL HVAC PLAN FOURTH FLOOR		
M.405	MECHANICAL HVAC PLAN ROOF		
M.500B	MECHANICAL PIPING PLAN BASEMENT FLOOR		
M.500G	MECHANICAL PIPING PLAN GROUND FLOOR		
M.501	MECHANICAL PIPING PLAN FIRST FLOOR		
M.502	MECHANICAL PIPING PLAN SECOND FLOOR		
M.503	MECHANICAL PIPING PLAN THIRD FLOOR		
M.504	MECHANICAL PIPING PLAN FOURTH FLOOR		
M.505	MECHANICAL PIPING PLAN OLD ANNEX--SEVENTH FLOOR		
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M.704	MECHANICAL CONTROL DIAGRAMS SHEET 4		
M.801	MECHANICAL DETAILS SHEET 1		
M.802	MECHANICAL DETAILS SHEET 2		



GENERAL NOTES

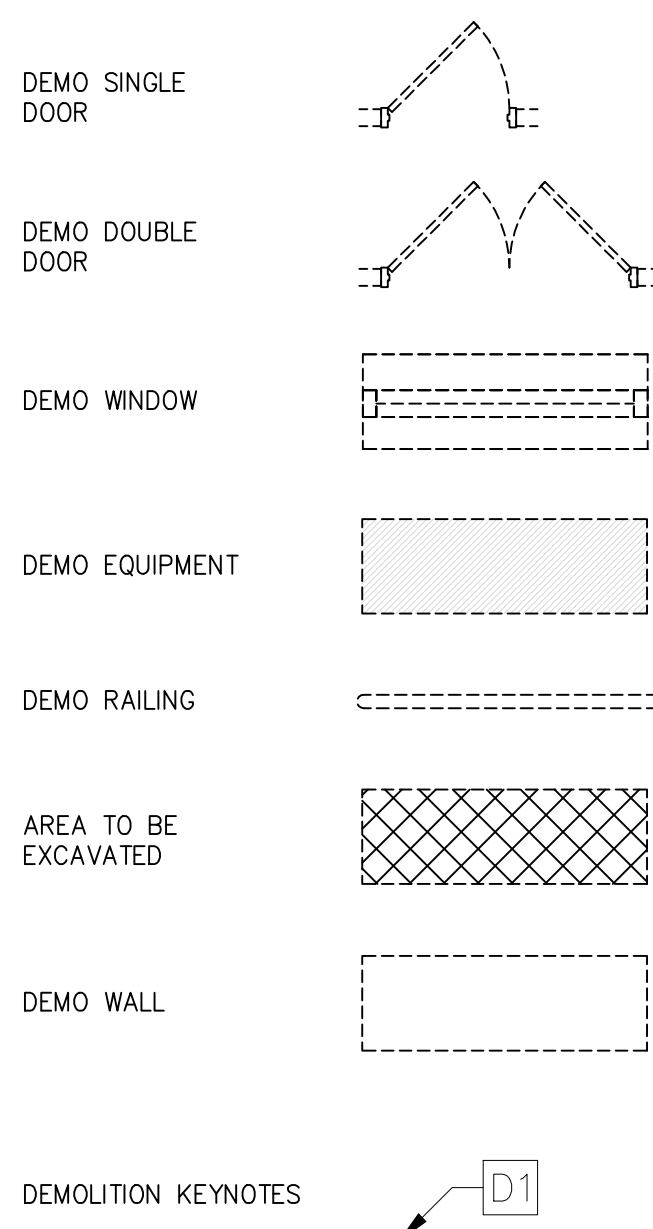
- THE CONTRACTOR SHALL EXAMINE THE EXISTING BUILDING BEFORE BEGINNING DEMOLITION OR CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE OWNER IF ANY MATERIAL(S) SUSPECTED TO BE ASBESTOS IS/ARE ENCOUNTERED DURING DEMOLITION AND WAIT FOR DIRECTION.
- THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS SHALL VISIT THE AREAS INVOLVED IN THE RENOVATION TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS PRIOR TO THE SUBMITTAL OF BIDS.
- ALL PRELIMINARY INVESTIGATION SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR REQUESTING SUCH INVESTIGATION AND SHALL BE COORDINATED WITH THE OWNER, SO AS NOT TO INTERRUPT THE OPERATIONS OF THE FACILITY.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSING OF ALL DEBRIS, HAZARDOUS MATERIALS AND/OR EQUIPMENT FROM ALL TRADES, AND PROVIDING NECESSARY PERMITS AND DISPOSAL CONTAINERS TO REMOVE DEBRIS FROM THE SITE, TRANSPORT ALL DEBRIS AND LEGALLY DISPOSE OF OFF-SITE.
- THE GENERAL CONTRACTOR SHALL NOT PERMIT THE OVER LOADING OF THE EXISTING STRUCTURE WITH DEBRIS FROM THE DEMOLITION AND NEW CONSTRUCTION MATERIALS.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR A MINIMUM OF TWICE DAILY REMOVAL OF ALL DEMOLITION DEBRIS & A DAILY GENERAL BROOM CLEANING.
- DURING CONSTRUCTION/DEMOLITION, THE GENERAL CONTRACTOR SHALL PROVIDE THE NECESSARY BARRIERS TO MINIMIZE DUST, PROTECT THE PUBLIC AND MINIMIZE DAMAGE TO OTHER SERVICES OR ITEMS TO REMAIN. COORDINATE BARRIER LOCATION W/ OWNER AND ARCHITECT SO AS NOT TO INTERRUPT OPERATION OF FACILITY.
- ALL TEMPORARY SERVICES REQUIRED TO MAINTAIN OWNER OPERATIONS DURING & AFTER DEMOLITION SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR INCLUDING BUT NOT LIMITED TO WATER, ELECTRICAL POWER, HYDRAULIC, TELEPHONE, FIRE ALARM/DETECTION, ETC.
- COORDINATE ALL MECHANICAL & ELECTRICAL WORK TO MAINTAIN UTILITY SERVICE TO NON-CONSTRUCTION AREAS DURING NORMAL BUSINESS HOURS. PROVIDE WRITTEN NOTIFICATION TO OWNER, ARCHITECT AND UTILITY COMPANY MIN. ONE (1) WEEK IN ADVANCE OF ANY INTERRUPTIONS TO UTILITY SERVICES.
- THE CONTRACTOR SHALL MAINTAIN WATERTIGHT CONDITIONS AT ROOFING AND EXTERIOR WALLS AT ALL TIMES. THE CONTRACTOR SHALL MAINTAIN THE SECURITY OF THE BUILDING AT ALL TIMES, AND ERECT TEMPORARY FULL HEIGHT FLYWOOD ENCLOSURES AS REQUIRED FOR SAFETY AND SECURITY.
- SHOULD UNFORSEEN CONDITIONS BE ENCOUNTERED THAT AFFECT DESIGN OR FUNCTION OF PROJECT, INVESTIGATE FULLY & CONTACT THE OWNER AND ARCHITECT IMMEDIATELY AWAITING ARCHITECTS RESPONSE, RESCHEDULE OPERATIONS IF NECESSARY TO AVOID DELAY OF OVERALL PROJECT.
- ANY EXISTING WALL TO BE DEMOLISHED AND FOUND TO CONTAIN STRUCTURAL SUPPORTS, PLUMBING OR OTHER SERVICES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT UPON DISCOVERY FOR DIRECTION.
- THE CONTRACTOR SHALL VERIFY ALL JOB CONDITIONS, DIMENSIONS AND DETAILS PRIOR TO START OF CONSTRUCTION/DEMOLITION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL PERMITS AND PAYMENTS FOR ALL REQUIRED PERMIT FEES AS WELL AS ALL REQUIRED INSPECTIONS & CERTIFICATE OF OCCUPANCY.
- ALL WORKS SHALL COMPLY WITH APPLICABLE BUILDING CODES AND REGULATORY AGENCIES.
- EACH TRADE SHALL BE RESPONSIBLE FOR REVIEWING ENTIRE SET OF DOCUMENTS & NOTING HIS WORKS APPLICABLE & SHALL COORDINATE WITH WORK OF OTHER TRADES FOR A COMPLETE INSTALLATION. ALL WORK SHALL BE COORDINATED THROUGH THE G.C.
- CUTTING AND PATCHING, GENERAL EMPLOY SKILLED WORKMAN TO PERFORM CUTTING AND PATCHING. PROCEED WITH CUTTING & PATCHING AT THE EARLIEST FEASIBLE TIME TO COMPLETE WITHOUT DELAY. CUT EXISTING CONSTRUCTION TO PROVIDE FOR INSTALLATION OF OTHER COMPONENTS OR PERFORMANCE OF OTHER CONSTRUCTION ACTIVITIES & THE SUBSEQUENT FITTING AND PATCHING REQUIRED. RETURN SURFACES TO THEIR ORIGINAL CONDITION. PROVIDE SHORING & BRACING AS WELL AS PROTECTIVE BARRIERS BASED ON CONDITIONS.
- CUTTING, CUT EXISTING CONSTRUCTION USING METHODS LEAST LIKELY TO DAMAGE ELEMENTS TO BE RETAINED OR ADJOINING CONSTRUCTION. IN GENERAL, WHERE CUTTING IS REQUIRED USE HAND OR SMALL POWER TOOLS DESIGNED FOR SAWING OR GRINDING. CUT HOLES AND NOTCHES NEATLY TO SIZE REQUIRED WITH MINIMUM DISTURBANCE OF ADJACENT SURFACES. TEMPORARILY COVER OPENINGS WHEN NOT IN USE. TO AVOID MARKING EXISTING SURFACES, CUT HOLES, CUT OR DRILL FROM THE EXPOSED OR FINISHED SIDE INTO CONCEALED SURFACES. CUT CONCRETE, MASONRY OR NATURAL STONE USING A CUTTING MACHINE SUCH AS A CARBORUNDUM SAW OR DIAMOND CORE DRILL. PROVIDE SHORING & BRACING AS WELL AS PROTECTIVE BARRIERS BASED ON CONDITIONS. WET SAWING AND/OR CORING SHALL REQUIRE THE CONTRACTOR TO PROTECT ALL REMAINING SURFACES AND ROOM AREAS FROM WATER DAMAGE AND/OR PENETRATION FROM ANY WATER DAMAGE SHALL BE BORN BY THE CONTRACTOR.
- WHERE SPOT PATCHING IS REQUIRED IT SHALL MATCH THE EXISTING SURROUNDING SURFACES IN TEXTURE, FINISH, AND COLOR. WHERE NEW CONSTRUCTION IS TIED INTO EXISTING, ALL PATCHING SHALL BE FEATHERED IN AS TO PROVIDE INVISIBLE JOINTS.
- ALL PENETRATIONS THROUGH FLOOR SLABS, STAIR WALLS OR RATED PARTITIONS SHALL BE SEALED WITH A FIRE RATED SEALANT, PER SPECIFICATIONS.
- ALL NOTES ON DRAWINGS SHALL APPLY TO ENTIRE SET OF DRAWINGS.
- DRAWINGS ARE NOT TO BE SCALED, DIMENSIONS GOVERN LARGE SCALE DRAWINGS TAKE PRECEDENCE OVER SMALL SCALE DRAWINGS.
- THE TERMS "CONSTRUCTION CONTRACTOR", "GENERAL CONTRACTOR" & "CONTRACTOR" SHALL BE UNDERSTOOD SAME UNLESS SPECIFICALLY NOTED OTHERWISE.
- TYPICAL DIMENSIONS ARE FINISH SURFACE TO FINISH SURFACE, UNLESS NOTED.
- GENERAL CONTRACTOR TO PATCH ALL SCAR JOINTS AS REQUIRED ON EXISTING CONSTRUCTION TO REMAIN WITHIN THE LIMITS OF THE CONTRACT DRAWINGS. ALL SURFACES OR FINISHES TO REMAIN SHALL BE PREPARED BY THE GENERAL CONTRACTOR AT HIS EXPENSE TO "LIKE NEW" CONDITION.
- ALL WORKS IS TO CONFORM TO DRAWINGS AND SPECIFICATIONS, AND SHALL BE NEW & BEST QUALITY OF THE KINDS SPECIFIED.
- ALL MANUFACTURED ARTICLES, MATERIALS & EQUIPMENT SHALL BE SUPPLIED, INSTALLED, COMPLETED, USED, CLEANED & CONDITIONED AS DIRECTED BY THE MANUFACTURERS, UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS.
- THE GENERAL CONTRACTOR SHALL SUBMIT IN WRITING ALL CHANGE ORDER REQUESTS FOR ADDITIONAL WORK TO THE ARCHITECT'S OFFICE FOR REVIEW & APPROVAL. THE ADDITIONAL WORK IS NOT TO PROCEED UNTIL A SIGNED CHANGE ORDER IS RETURNED TO THE GENERAL CONTRACTOR (SEE SPECIFICATION).

- ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE APPLICABLE ZONING AND BUILDING CODES AND THE REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION, AS WELL AS ANY & ALL REGULATORY AGENCIES, INCLUDING BUT NOT LIMITED TO O.S.H.A. ETC. SHOULD ANYTHING CONTAINED IN THE CONTRACT DOCUMENTS BE AT VARIANCE WITH SAID CODES, CONTRACTOR SHALL IMMEDIATELY INFORM OWNER AND ARCHITECT.
- IT IS THE RESPONSIBILITY OF ALL CONTRACTORS WORKING ON THIS PROJECT TO MAINTAIN WORKING ON THIS SITE, HARMONY BETWEEN ALL OTHER CRAFTS & CREWS WORKING ON THIS SITE.
- CONTRACTOR SHALL PROVIDE FULL TIME SUPERVISION FOR THE COMPLETION OF THE WORK.
- ALL WORK WHETHER SHOWN OR IMPLIED, UNLESS SPECIFICALLY QUESTIONED SHALL BE CONSIDERED FULLY UNDERSTOOD IN ALL RESPECTS BY THE GENERAL CONTRACTOR AND HE WILL BE RESPONSIBLE FOR ANY MISINTERPRETATIONS OR CONSEQUENCES THEREOF FOR ALL WORKS ON ALL DRAWINGS.
- QUALITY ASSURANCE: ALL WORK TO BE DONE SHALL BE BY TRAINED & EXPERIENCED PERSONNEL & SUPERVISORS WHO ARE COMPLETELY FAMILIAR WITH THE REQUIREMENTS FOR HIS WORK WITH THE INSTALLATION.
- CONTRACTOR SHALL PROVIDE ALL ITEMS, EQUIPMENT & LABOR NECESSARY FOR THE COMPLETION OF THE WORK SHOWN ON THE CONTRACT DOCUMENTS, INCLUDING TAX, PURCHASE, DELIVERY ARRANGEMENTS AND STORAGE, AS WELL AS ADDITIONAL PREMIUMS TO EXPEDITE DELIVERY OF EQUIPMENT & MATERIAL.
- CONTRACTOR MAY SUBMIT TO THE ARCHITECT FOR CONSIDERATION AND APPROVAL ANY SUGGESTIONS THAT MAY SIMPLIFY THE JOB, IMPROVE THE FINAL RESULT OR REDUCE COST WHILE MAINTAINING FULL COMPLIANCE WITH DESIGN INTENT. OWNER WILL NOT BE LIABLE FOR ANY ASSUMPTIONS MADE BY THE GENERAL CONTRACTOR.
- ALL REQUESTS FOR SUBSTITUTIONS OF MATERIALS OR EQUIPMENTS SHALL BE SUBMITTED TO THE ARCHITECT IN WRITING IN A TIMELY MANNER. THESE REQUESTS SHALL INCLUDE MFR'S, DATA SHEETS AS WELL AS LINE BY LINE COMPARISONS.
- BUILDING IS TO REMAIN OCCUPIED DURING CONSTRUCTION/DEMOLITION. GENERAL CONTRACTOR SHALL COORDINATE WITH THE OWNER TO MINIMIZE DISRUPTIONS TO NORMAL BUILDING ACTIVITIES, AND TO MAINTAIN SAFETY AND SECURITY REQUIREMENTS AT ALL TIMES.
- ALL DIMENSIONS INDICATED AS PLUS/MINUS (+/-) SHALL BE FIELD VERIFIED.
- UNO., ALL EXISTING WINDOWS, DOORS, AIR CONDITIONERS AFFECTED BY THIS PROJECT SHALL BE TURNED OVER TO THE OWNER.
- SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.
- CONTRACTOR SHALL MAINTAIN THE LATEST SET OF DRAWINGS AND CONTRACT DOCUMENTS AT THE JOB SITE AT ALL TIMES.
- THESE DRAWINGS HAVE BEEN PREPARED FOR A PARTICULAR BUILDING IMPROVEMENT ONLY WITH DISTINCT UNDERSTANDING THAT THESE ARE INSTRUMENTS OF SERVICE AND ARE PROTECTED. IF THESE DRAWINGS OR ANY PART THEREOF ARE USED IN ANY MANNER WITHOUT WRITTEN CONSENT OF THE ARCHITECT, THE USER THEREOF BECOMES INDEBTED TO THE ARCHITECT FOR FULL COMMISSION.
- ANY OR ALL REQUIRED FIRE EXTINGUISHERS (SEE PLANS) AND ALARMS SHALL BE LOCATED & CLASSIFIED BY CODE. LOCATIONS SHOWN ON PLANS SHALL BE COORDINATED WITH AND APPROVED BY THE FIRE OFFICIAL.
- GENERAL CONTRACTOR SHALL REPAIR & PATCH PORTIONS OF EXISTING MISSING CONCRETE ON EXPOSED BEAMS, UNDERSIDE OF SLABS AND WALLS PRIOR TO PAINTING.
- WHERE STEEL BARS ARE BEING REMOVED, GENERAL CONTRACTOR SHALL ALSO REMOVE BOTTOM PLATE SET IN SLAB, AND PATCH FLOOR SLAB AS REQUIRED.
- ALL EXISTING STEAM RADIATORS TO BE REMOVE UNLESS NOTED OTHERWISE. COORDINATE WITH MECHANICAL DRAWINGS.
- THE GENERAL CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH THE OWNER FOR REMOVAL OF ALL EXISTING TELEPHONE CABLES, CONNECTIONS, JACKS & PANELS PRIOR TO THE START OF THE WORK.
- EXISTING DOORS, LIGHT FIXTURES, AND GATES REMOVED BUT NOT TO BE RE-USED AT THIS TIME SHALL BE TURNED OVER FOR STORAGE. COORDINATE LOCATION WITH OWNER.
- ANY ACTIVE PIPES, CONDUITS, DUCTS, ETC. TO BE RELOCATED AND WHICH ARE ESSENTIAL TO THE PROPER OPERATIONS OF THE PREMISES SHALL BE PROMPTLY RELOCATED AND MAINTAINED AT ALL TIMES. ALL MECHANICAL & ELECTRICAL SHUTDOWNS AND CONNECTIONS MUST BE MADE AT A TIME CONVENIENT TO THE OWNER BY THE CONTRACTOR WHETHER THESE SHUTDOWNS AND CONNECTIONS ARE MADE AFTER NORMAL WORKING HOURS, SATURDAYS, SUNDAYS, OR HOLIDAYS, OR ON NORMAL WORKING DAYS.
- ANY WALL SWITCHES OR ELECTRICAL OUTLETS IN WAY OF NEW WORK SHALL BE RELOCATED. LOCATION TO BE APPROVED BY ARCHITECT.
- GENERAL CONTRACTOR TO COORDINATE WITH OWNER USE OF CRANES OR HOISTS, IF REQUIRED FOR MECHANICAL EQUIPMENT TO MINIMIZE THE IMPACT ON THE REGULAR OPERATION OF THE BUILDING AND ITS GROUNDS. CONTRACTOR SHALL COORDINATE WITH CITY FOR ANY STREET CLOSINGS, CRANE PLACEMENT, ETC. AND OBTAIN & PAY FOR ANY RELATED PERMITS. ALL COST FOR USE OF CRANES SHALL BE INCLUDED IN BASE BID.
- GENERAL CONTRACTOR SHALL COORDINATE INSTALLATION OF DOORS, HARDWARE, AND FRAMES AND SECURITY CONTROL PANELS, SECURITY HARDWARE AND SECURITY CONTROL SYSTEMS TO BE PROVIDED BY THE SAME MANUFACTURER. DOOR & FRAME MANUFACTURER TO VERIFY LATEST TEMPLATES WITH LOCK MANUFACTURER.
- GENERAL CONTRACTOR TO COORDINATE LOCATION OF POWER AND VIDEO OUTLETS AND PROVIDE BLOCKING AS REQUIRED FOR CAMERAS & BRACKET MOUNTED MONITORS. G.C. SHALL PROVIDE RECESSED ELECTRICAL BOXES WITH CONDUIT & FULL WIRES IN THE NEW CONSTRUCTION. ALL CONDUIT SHALL RUN BACK TO THE SECURITY OFFICE AND SHALL ALLOW FOR A MIN. OF TWO (2) CAMERAS & CONNECTIONS AS WELL AS TWO (2) MONITORS & CONNECTIONS.
- SOME WORK MUST BE DONE IN AREAS THAT ARE OUTSIDE THE CONTRACT LIMIT LINE SHOWN ON DRAWINGS, SUCH AS MECHANICAL AREAS AND OTHER AREAS THROUGH WHICH CONDUITS, PIPING, ETC. MUST PASS. GENERAL CONTRACTOR SHALL COORDINATE WITH OWNER FOR ACCESS TO THESE AREAS WHEN WORKING IN AREAS OUTSIDE CONTRACT LIMIT LINE, AND SHALL TAKE EXTRA CARE TO PROTECT EXISTING FINISHES, FURNISHINGS AND/OR EQUIPMENT INCLUDING REMOVAL OF EXISTING LIGHT FIXTURES & CEILING TILES FOR LATER REPLACEMENT. ANY DAMAGE WHICH IS DIRECTLY OR INDIRECTLY THE RESULT OF AN ERROR OR DEFECT THAT WHICH COULD NOT BE DETERMINED BY REASONABLE INVESTIGATION AND TESTING OR FOR ANY COST OF TESTING AS PERFORMED BY THE AVERAGE DESIGN PROFESSIONAL OFFERING LIKE SERVICES IN THE COMMUNITY.
- PHONES SHALL BE PROVIDED AND INSTALLED BY OWNER. GENERAL CONTRACTOR SHALL PROVIDE CONDUIT WITH FULL WIRE AND OUTLETS. COORDINATE INSTALLATION AS WITH ELECTRICAL PLANS & FURNITURE LAYOUT. ALL CONDUIT & OUTLETS SHALL BE RUN CONCEALED IN THE NEW CONSTRUCTION.

DEMOLITION NOTES

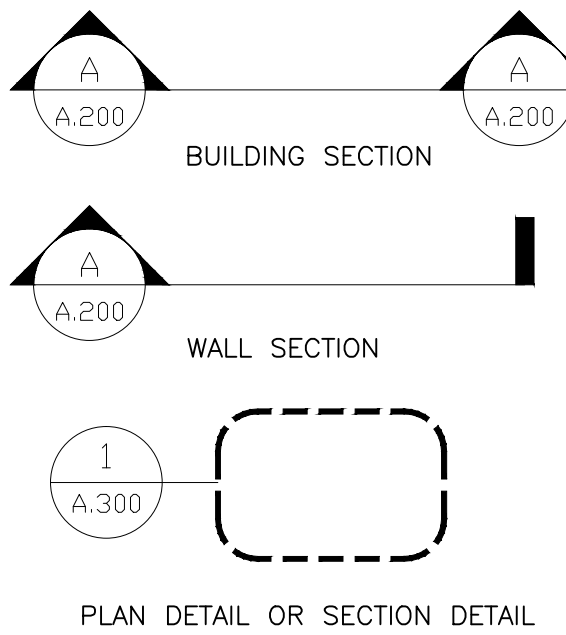
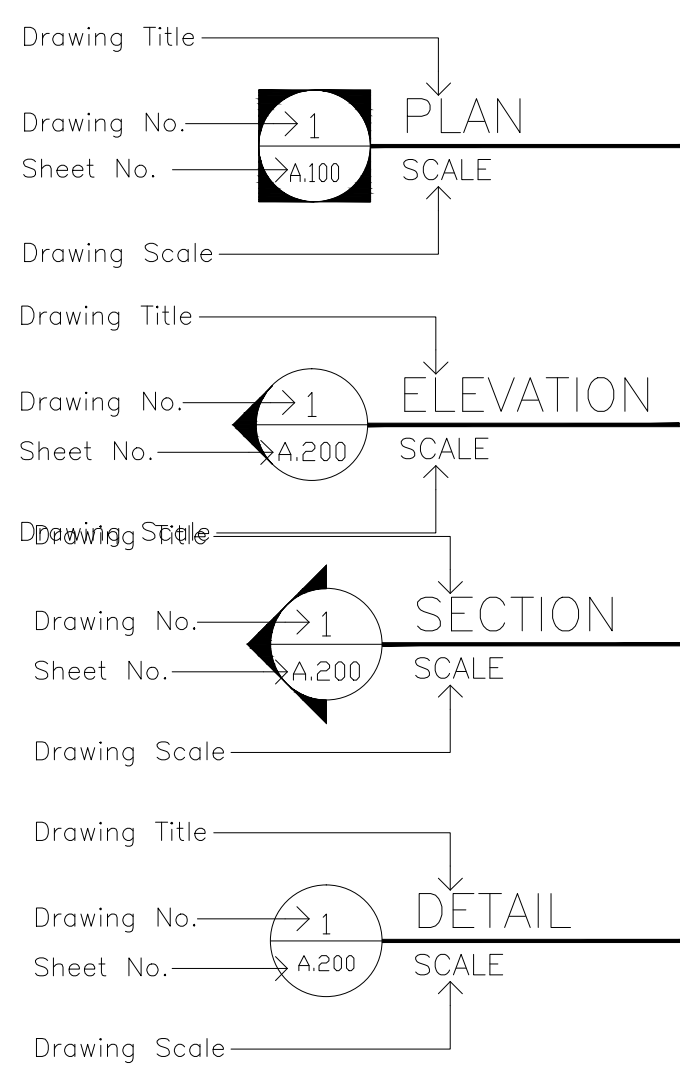
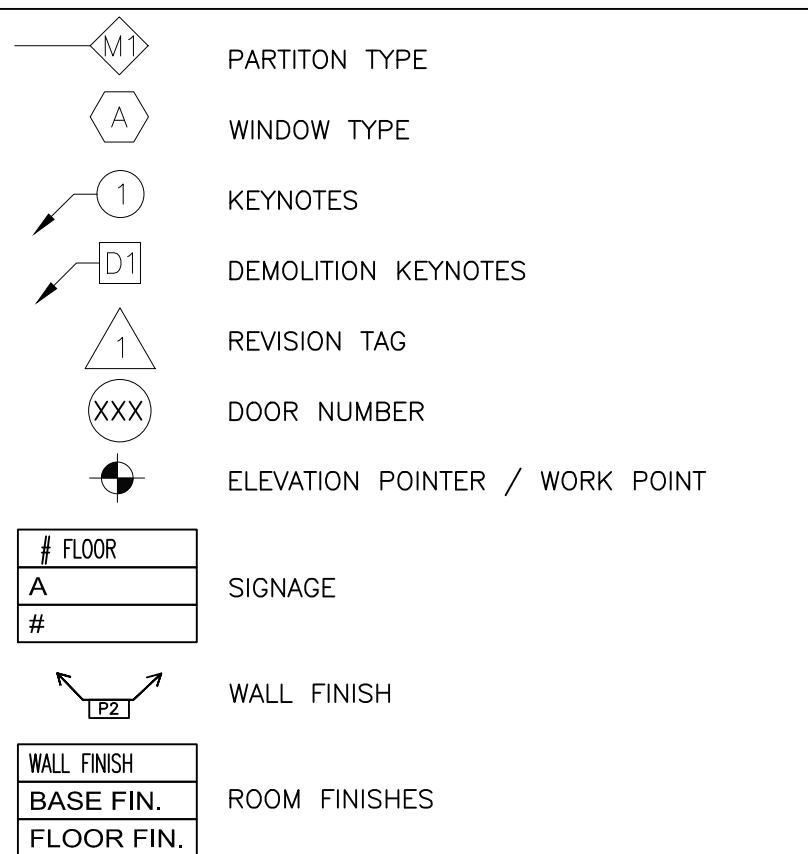
- ALL DAMAGES TO THE EXISTING FACILITY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND ALL DAMAGES TO BE REPAIRED AT HIS OWN EXPENSES.
- BEFORE BEGINNING ANY WORK, THE CONTRACTOR SHALL SET UP A SCHEDULE OF OPERATIONS WITH THE OWNER, COORDINATING PERFORMANCE OF ALL WORK WITHIN THE OPERATION SCHEDULE OF THE FACILITY.
- THERE SHALL BE NO INTERRUPTION OF THE EXISTING PLUMBING, MECHANICAL, ELECTRICAL AND/OR FIRE-PROTECTION SERVICES WITHOUT PRIOR CONSENT OF THE OWNER. SUCH INTERRUPTION SHALL BE KEPT TO A MINIMUM AND SHALL BE CLOSELY SCHEDULED WITH THE OWNER.
- ALL DEMOLITION OPERATIONS SHALL BE COORDINATED WITH APPLICABLE UTILITY COMPANY WHERE REQUIRED.
- DASHED LINES INDICATE ITEMS TO BE REMOVED. LOCATIONS KEYPED IN THIS DRAWINGS FOR THESE ITEMS ARE SCHEMATIC AND REPRESENT AREAS OF SIGNIFICANT WORK. HOWEVER, THEY DO NOT RELIEVE THE CONTRACTOR OF ANY ADDITIONAL WORK OF SIMILAR SCOPE AND NATURE IDENTIFIED THROUGH FIELD INVESTIGATIONS.
- THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED DEMOLITION PERMITS PRIOR TO BEGINNING ANY WORK.
- DEMOLITION PERMITS ARE REQUIRED PRIOR TO BEGINNING OF ANY REMOVAL OR RELOCATION OF EXISTING EQUIPMENT, MATERIALS, APPURTENANCES, ETC. AS INDICATED ON THE DRAWINGS OR AS HEREIN SPECIFIED OR REQUIRED. THESE CONDITIONS MAY OCCUR DURING THE PHASING OF THE EXISTING BUILDING RENOVATION.
- THE CONTRACTOR SHALL KEEP THE SITE FREE ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY THE WORK UPON COMPLETION OF THE CONTRACT, THE CONTRACTOR SHALL BE RESPONSIBLE TO RESTORE THE SITE IN THE SAME CONDITION AS BEFORE COMMENCEMENT OF THE WORK.
- THE CONTRACTOR SHALL CAREFULLY MAKE ALL INVESTIGATIONS IN THE FIELD PRIOR TO SUBMITTING HIS BID. HIS BID SHALL REFLECT ALL WORK NECESSARY FOR THE COMPLETE RENOVATION AND ADDITION TO THE EXISTING FACILITY.
- ANY ITEMS NOT SPECIFICALLY IDENTIFIED BUT REQUIRED TO BE REMOVED OR REPAIRED TO PREPARE THE BUILDING FOR NEW WORK OR TO OTHERWISE PRODUCE THE FINISHED PRODUCT SHOWN IN THE CONTRACT DOCUMENTS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- DEMOLITION PLAN SHOWS APPROXIMATE LAYOUT OF EXISTING PARTITIONS AND ARE NOT INTENDED TO REPRESENT "AS BUILT" CONDITIONS. ALL INFORMATION MUST BE VERIFIED ON SITE. ITEMS TO BE REMOVED SHALL ALSO INCLUDE ALL EXISTING ELECTRICAL AND MECHANICAL COMPONENTS IN ANY AREAS WHERE PARTITION IS NOTED TO BE REMOVED.
- PARTITIONS AND OTHER ITEMS TO BE REMOVED ARE SHOWN DASHED. SERVICES IN THE WALLS SHALL ALSO BE REMOVED OR RELOCATED AS REQUIRED. EDGES OF WALLS TO REMAIN SHALL BE SAW-CUT NEATLY TO ACCEPT NEW CONSTRUCTION. REPAIR AND PATCH EXISTING WALLS TO REMAIN. DEMOLITION SHALL INCLUDE REMOVAL OF CEILING AND FLOOR FINISHES IN ANY AREAS DESIGNATED TO RECEIVE NEW FINISHES. THESE WORK SHALL BE COORDINATED WITH CONTRACT DOCUMENTS.
- SALVAGED MATERIALS (i.e. GUARDRAILS AND GLASS PANELS, KALWALL, SKYLIGHT AND FRAMES, ETC) AS SPECIFIED BY OWNER SHALL BE CLEANED AND STORED IN APPROPRIATE AREAS AWAY FROM THE DEMOLITION UNTIL NEEDED.
- PROVIDE WEATHER PROTECTION DURING ALL PHASES OF CONSTRUCTION TO EXISTING BUILDING.
- ALL EXTERIOR SIGNAGE SHALL BE REMOVED AND RELOCATED AS REQUIRED BY OWNER.
- REFER TO MECHANICAL, ELECTRICAL, AND STRUCTURAL DRAWINGS FOR THE DEMOLITION INFORMATION OF RELATED ITEMS.
- CONTRACTOR IS TO PROVIDE PROTECTION TO EXISTING TUNNEL SYSTEM BETWEEN OLD JAIL BUILDING & NEW ANNEX BUILDING DURING CONSTRUCTION.
- CONTRACTOR TO PROVIDE BARRICADE AROUND ANY AREA DISTURBED BY CONSTRUCTION. BARRIER TO BE CONSTRUCTED TO PREVENT ANY DUST OR PARTICLES ENTERING NON-DISTURBED AREAS.

DEMOLITION LEGEND

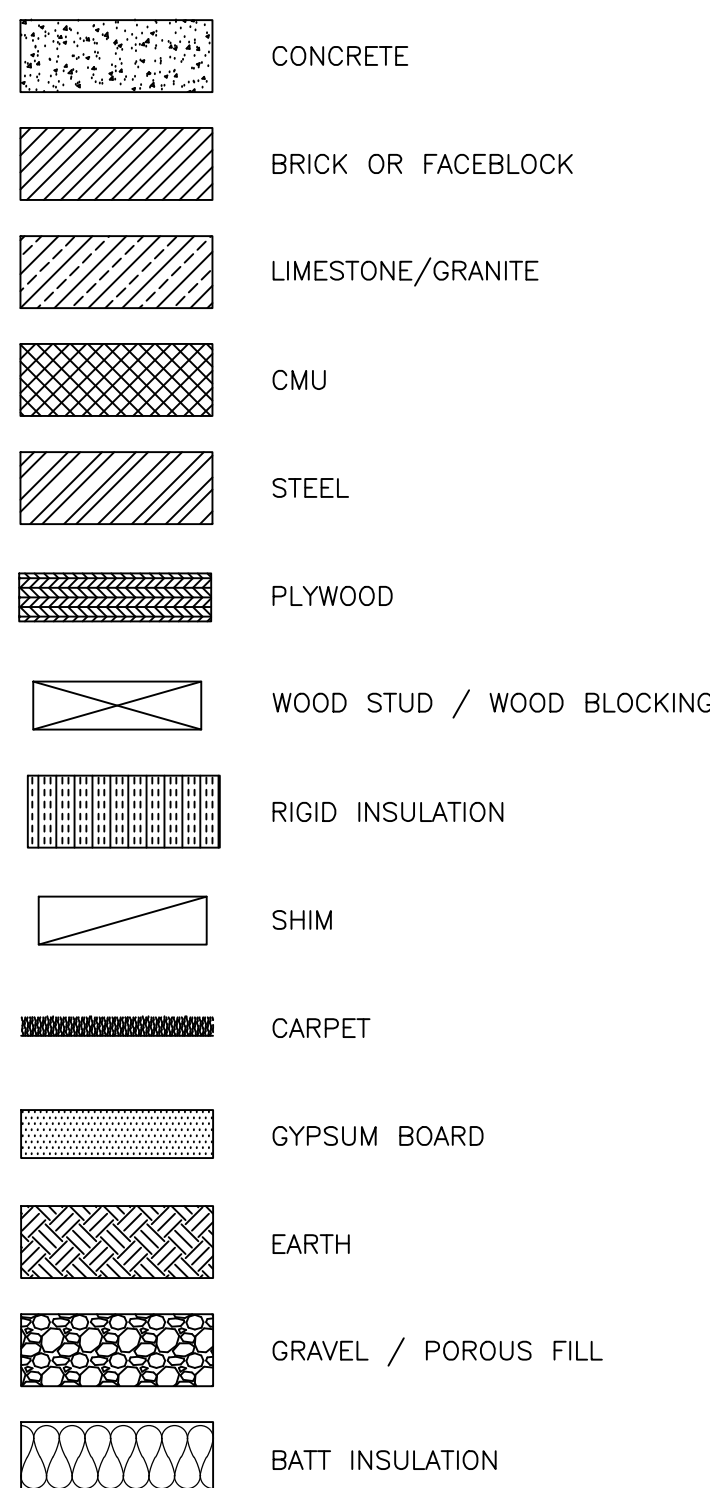


NOTE FOR ALL DRAWINGS:
IN AS MUCH AS THE REMODELING AND / OR REHABILITATION OF AN EXISTING BUILDING REQUIRES THAT CERTAIN ASSUMPTIONS BE MADE REGARDING EXISTING CONDITIONS, AND BECAUSE SOME OF THESE ASSUMPTIONS CAN NOT BE VERIFIED WITHOUT SPENDING GREAT SUMS OF ADDITIONAL MONEY OR DESTROYING OTHERWISE ADEQUATE OR SERVICEABLE PORTIONS OF THE BUILDING, THE DESIGN PROFESSIONAL SHALL NOT BE RESPONSIBLE FOR ANY DAMAGE WHICH IS DIRECTLY OR INDIRECTLY THE RESULT OF AN ERROR OR DEFECT THAT WHICH COULD NOT BE DETERMINED BY REASONABLE INVESTIGATION AND TESTING OR FOR ANY COST OF TESTING AS PERFORMED BY THE AVERAGE DESIGN PROFESSIONAL OFFERING LIKE SERVICES IN THE COMMUNITY.

SYMBOLS



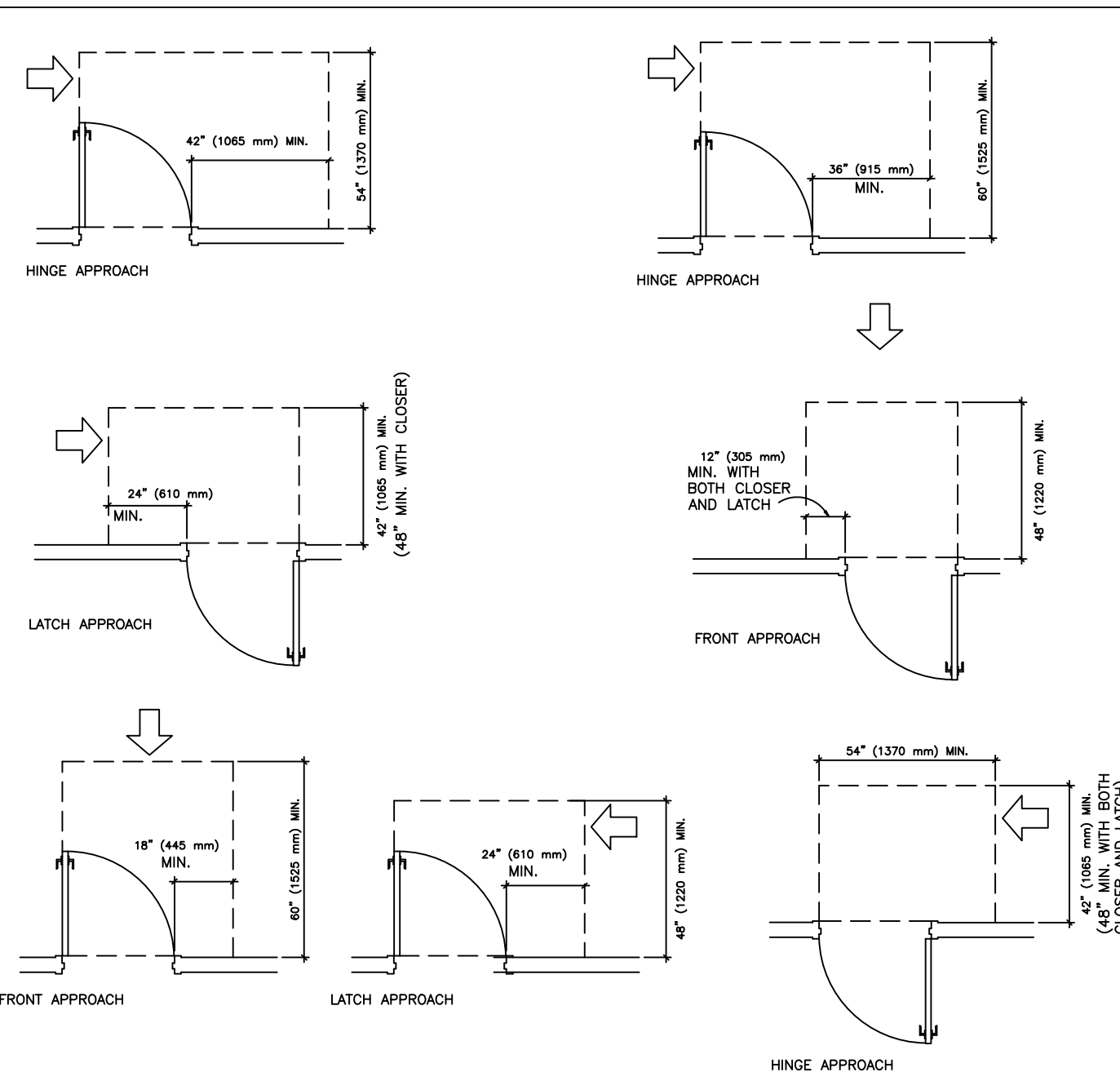
MATERIALS LEGEND



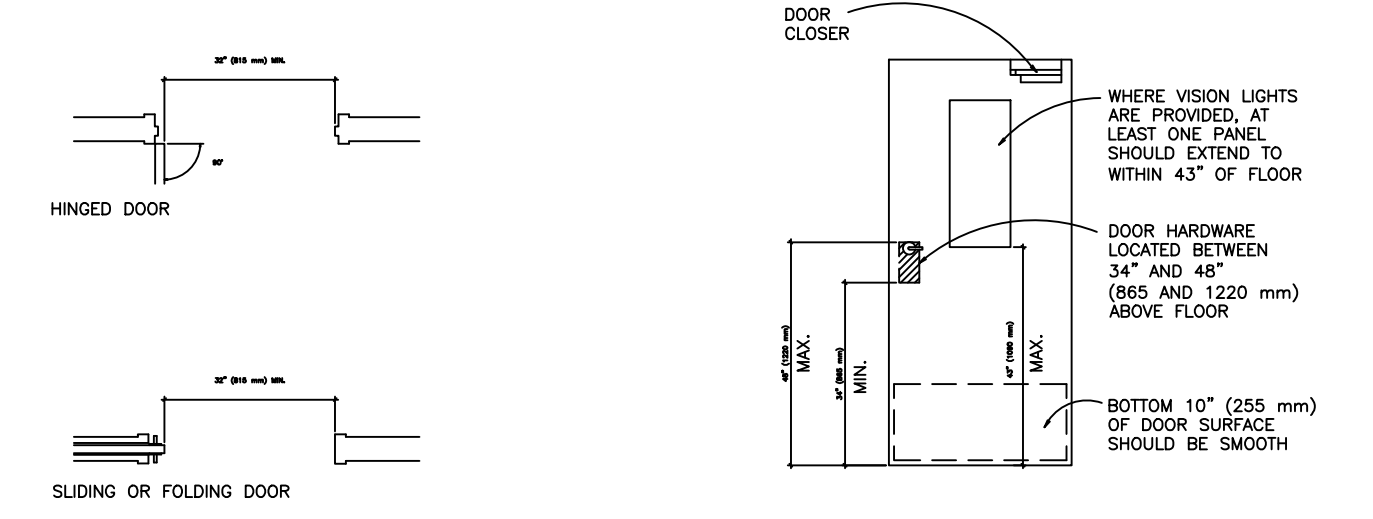
ABBREVIATIONS

ALUM.	ALUMINUM	PLAS.	PLASTIC
A.F.F.	ALTERNATE FINISH FLOOR	LAM.	LAMINATE
ALT.	ALTERNATE	PL.	PLATE
APPROX.	APPROXIMATE	PLYWD.	PLYWOOD
ARCH.	ARCHITECT	PANL.	PANEL
ARCH'L.	ARCHITECTURAL	PR.	PAIR
BD.	BOARD	PTD.	PAINTED
BLDG.	BUILDING	P.V.C.	POLYVINYL CHLORIDE
BOT.	BOTTOM	P.S.I.	POUNDS PER SQUARE INCH
		P.S.F.	POUNDS PER SQUARE FOOT
C.J.	CONTROL JOINT		
CLG.	CEILING	R.	RISER
CU.	CONDENSING UNIT	RAD.	RADIUS
CLO.	CLOSET	RB	RUBBER BASE
C.T.	CERAMIC TILE	RCPC	REFLECTED CEILING PLAN
COL.	COLUMN	R.D.	ROOF DRAIN
C.M.U.	CONCRETE MASONRY UNIT	REF.	REFERENCE
CONC.	CONCRETE	REFL.	REFLECTED
CONST.	CONSTRUCTION	REQ'D.	REQUIRED
CONST.	CONTINUOUS	REINF.	REINFORCING
		REV.	REVISION
DET.	DETAIL	R.H.	RIGHT HAND
DIA.	DIAMETER	R.M.	ROOM
DIM.	DIMENSION	R.O.	ROUGH OPENING
DN.	DOWN	R.O.D.	ROOF OVERFLOW DRAIN
DR.	DOOR		
DWG.	DRAWING		
		SECT.	SECTION
EA.	EACH	SHO.	SHOWER
ELEC.	ELECTRIC	SIM.	SIMILAR
ELECT'L.	ELECTRICAL	SK	SKETCH
ENCL.	ENCLOSURE	SPEC.	SPECIFICATIONS
ENCL.	ENCLOSURE	SQ.	SQUARE
ELEV.	ELEVATOR	S/STL.	STAINLESS STEEL
EQUIP.	EQUIPMENT	STL.	STEEL
EQ.	EQUAL	STD.	STANDARD
E.W.C.	ELECTRIC WATER COOLER	STRUCT.	STRUCTURE
EXIST.	EXISTING	STRUCT'L.	STRUCTURAL
E.T.R.	EXISTING TO REMAIN	SUSP.	SUSPENDED
EXP.	EXPANSION		
EXT.	EXTERIOR	T/	TOP OF
EXPAN.	EXPANSION JOINT	TEL.	TELEPHONE
		TERR.	TERRAZZO
F.D.	FLOOR DRAIN	TRANS.	TRANSFORMER
F.E.	FREIGHT ELEVATOR	TYP.	TYPICAL
FDN.	FOUNDATION	TBD.	TO BE DETERMINED
FIN.	FINISH		
FL.	FLOOR	U.L.	UNDERWRITER'S
FLR.	FLOOR	LABORATORY	LABORATORY
FLUOR.	FLUORESCENT	UNFIN.	UNFINISHED
FT.	FOOT / FEET	U.O.N.	UNLESS OTHERWISE
FTG.	FOOTING	UTIL.	UTILITY
GA.	GALVE	V.B.	VINYL BASE
GALV.	GALVANIZED	V.C.T.	VINYL COMPOSITION
GL.	GLASS		
GWB.	GYPSUM WALL BOARD	VERT.	VERTICAL
GYP. BD.	GYPSUM BOARD	VEST.	VESTIBULE
		V.F.	VERIFY IN FIELD
H.C.	HANDICAPPED	VOL.	VOLUME
HWDR.	HARDWARE	VTR.	VENT THRU ROOF
HWDD.	HARDWOOD		
H.M.	HOLLOW METAL	W/	WITH
H.V.	HIGH POINT	W.C.	WATER CLOSET
HT.	HEIGHT	WDW.	WINDOW
H.V.A.C.	HEATING, VENTILATION, & AIR CONDITIONING	W.F.	WIDE FLANGE
		W.O.	WINDOW OPENING
HORIZ.	HORIZONTAL	W.P.	WORKING POINT
HR.	HOUR	W.W.F.	WELDED FABRIC
I.D.	INSIDE DIAMETER		
IN.	INCH / INCHES		
INCL.	INCLUDING		
INFO.	INFORMATION		
INSUL.	INSULATION		
INV.	INVERT		
JT.	JOINT		
LAM.	LAMINATE		
LAV.	LAVATORY		
L.G.	LONG		
L.P.	LOW POINT		
LT.	LIGHT		
LT. WT.	LIGHT WEIGHT		
MACH.	MACHINE		
M.H.	MANHOLE		
MAT'L.	MATERIAL		
MAX.	MAXIMUM		
MECH.	MECHANICAL		
MEMB.	MEMBRANE		
MIN.	MINIMUM		
MIR.	MIRROR		
MIS.C.	MISCELLANEOUS		
M.O.	MASONRY OPENING		
MOLDG.	MOLDING		
M.O.H.	MIRROR OPPOSITE HAND		
MTD.	MOUNTED		
MTL.	METAL		
MFD.	METAL FLOOR DECK		
MDF.	MEDIUM DENSITY FIBERBOARD		
MFR.	METAL ROOF DECK		
MULL.	MULLION		
N	NORTH		
NAT.	NATURAL		
N.I.C.	NOT IN CONTRACT		
NO.	NUMBER		
N.T.S.	NOT TO SCALE		
O.A.	OVERALL		
O.A.I.	OUTSIDE AIR INTAKE ON CENTER		
OPNG.	OPENING		
OPP.	OPPOSITE		
ORIG.	ORIGINAL		
O.H.	OVERHEAD		
O.D.	OVERFLOW DRAIN		
PART.	PARTITION		
PTN.	PARTITION		
PASS.	PASSENGER		

ACCESSIBLE CLEARANCE AT SWINGING DOORS



CLEAR WIDTH OF ACCESSIBLE DOORWAY



BUILDING CODE INFORMATION

PROJECT NAME:	UNION COUNTY COURTHOUSE FIRE SUPPRESSION (ROTUNDA)
LOCATION:	2 BROAD STREET, ELIZABETH, NEW JERSEY 07202

THE PRIMARY CODE REFERENCE WILL BE THE NEW JERSEY UNIFORM CONSTRUCTION CODE (N.J.A.C. 5:23 ET SEQ.). THE UNIFORM CONSTRUCTION CODE ADOPTS SEVERAL MODEL CODES THAT ARE REFERENCED AS SUBCODES. THESE SUBCODES ARE AN INTEGRAL PART OF THE UNIFORM CONSTRUCTION CODE AND ARE AS FOLLOWS:

SUBCODE	NATIONAL MODEL CODE	UCC REFERENCE
BUILDING	IBC/2009 NEW JERSEY EDITION	N.J.A.C. 5:23-3.14
ACCESSIBILITY	ANSI-A117.1 2003	NJAC 5:23-7
PLUMBING	NATIONAL STANDARD PLUMBING CODE 2009	N.J.A.C. 5:23-3.15
ELECTRICAL	NATIONAL ELECTRICAL CODE 2011	N.J.A.C. 5:23-3.16
ENERGY	ASHRAE 90.1-2007	N.J.A.C. 5:23-3.18
MECHANICAL	INTERNATIONAL MECHANICAL CODE 2009	N.J.A.C. 5:23-3.20

GENERAL BUILDING INFORMATION

USE AND OCCUPANCY CLASSIFICATION	CRITERION / DESIGNATION		IBC REFERENCE
	EXISTING ASSEMBLY A-3	REHABILITATION ASSEMBLY A-3	
OCCUPANCY	NON SEPARATED	NON SEPARATED	SECTION 508.3
CONSTRUCTION CLASSIFICATION	TYPE IB	TYPE IB	TABLE 601
FIRE SUPPRESSION	YES	YES	

FIRE RESISTANT RATING REQUIREMENTS FOR BUILDING ELEMENTS (TABLE 601)

BUILDING ELEMENT	CONSTRUCTION CLASSIFICATION IB		
	CRITERION / DESIGNATION		IBC REFERENCE
	ALLOWABLE	ACTUAL	
STRUCTURAL FRAME INCLUDING GIRDERS, BEAMS, TRUSSES	2-HR	EXISTING 2-HR	TABLE 601
BEARING WALLS EXTERIOR INTERIOR	2-HR	EXISTING 2-HR	TABLE 601
NONBEARING WALLS & PARTITIONS	0-HR	0-HR	TABLE 601
FLOOR CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS	2-HR	EXISTING 2-HR	TABLE 601
ROOF CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS	1-HR	EXISTING 1-HR	TABLE 601

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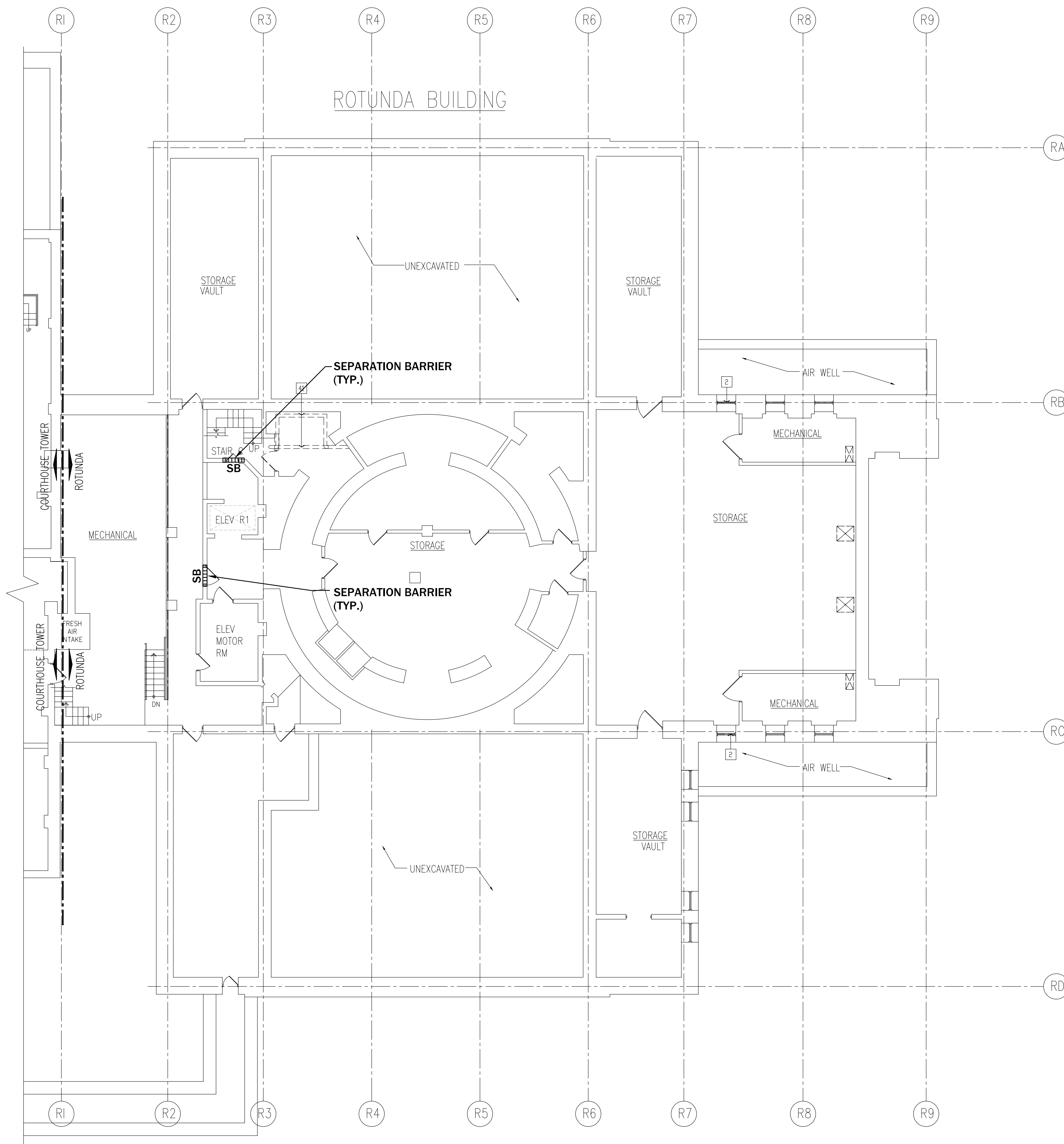
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ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973.379-1161
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS: **GENERAL , DEMOLITION NOTES & CODE**

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
9.25.15	95% CD SUBMIT	KD	FM					AS SHOWN
10.30.15	95% CD UPDATES	KD						

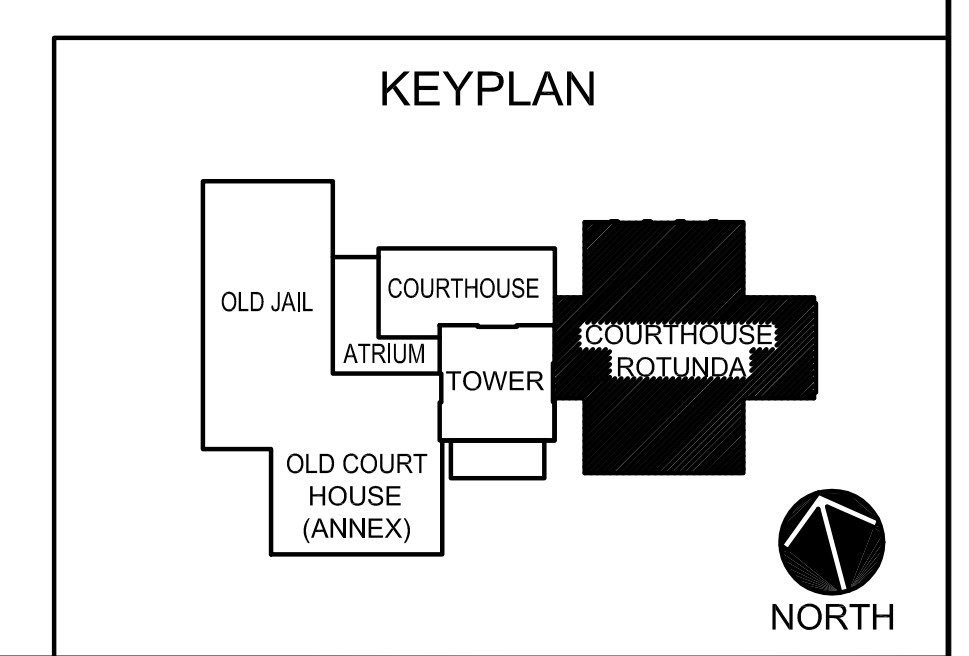


NOTES

1. COMPLETE ALL OF THE ASBESTOS ABATEMENT WORK SPECIFIED IN ACCORDANCE WITH N.J.A.C. 5:23-8.15 "ASBESTOS HAZARD ABATEMENT PROJECTS", N.J.A.C. 5:23-8.19 "ABATEMENT IN OCCUPIED BUILDINGS" AND THE SPECIFICATIONS.
2. COMPLETE THE ASBESTOS ABATEMENT WORK SPECIFIED ON THESE DRAWINGS UTILIZING NO MORE THAN TWENTY-FIVE (25) FULL WORK AREA ENCLOSURES IN ACCORDANCE WITH THE SUB CODE AND THE SPECIFICATIONS.
3. AREAS WHERE NO ACM IS PRESENT MAY BE EXCLUDED FROM THE WORK AREAS.
4. INSTALL AND MAINTAIN THE SEPARATION BARRIERS ON THESE DRAWINGS AS REQUIRED FOR THE DURATION OF THE ASBESTOS ABATEMENT WORK.
5. THE HEPA UNIT AND AIR SAMPLE LOCATIONS INDICATED ARE FOR ILLUSTRATION PURPOSES ONLY. THE ACTUAL NUMBER AND LOCATIONS OF THE HEPA UNITS AND AIR SAMPLES SHALL VARY DEPENDING UPON SITE CONDITIONS AND NEGATIVE AIRFLOW MEASUREMENTS.
6. EXHAUST ALL HEPA UNITS TO THE EXTERIOR OF THE FACILITY.
7. BUILDING TO REMAIN OCCUPIED FOR THE DURATION OF THE WORK.
8. FIRE MARSHALL SHALL HAVE ACCESS TO STANDPIPE AT ALL TIMES IN CASE OF EMERGENCY.

LEGEND

- DECONTAMINATION UNIT.
- NEGATIVE AIR FILTRATION UNIT
- EXHAUST DUCT FROM NEGATIVE AIR FILTRATION UNIT
- FULL WORK AREA ENCLOSURE (TYP.)
- POTENTIAL OVERALL AREAS FOR ASBESTOS ABATEMENT WORK.
- SEPARATION BARRIER (DOORWAY)
- AIR SAMPLE LOCATION
- MANOMETER LOCATION
- CONTRACTOR ENTRANCE/ EXIT AND WASTE TRANSPORTATION ROUTE.
- BUILDING OCCUPANT ENTRANCE/EXIT
- FREE STANDING LUMBER AND POLYETHYLENE WALL.



1 BASEMENT ASBESTOS ABATEMENT PLAN - PHASE 1B
3 1/8" = 1'-0"

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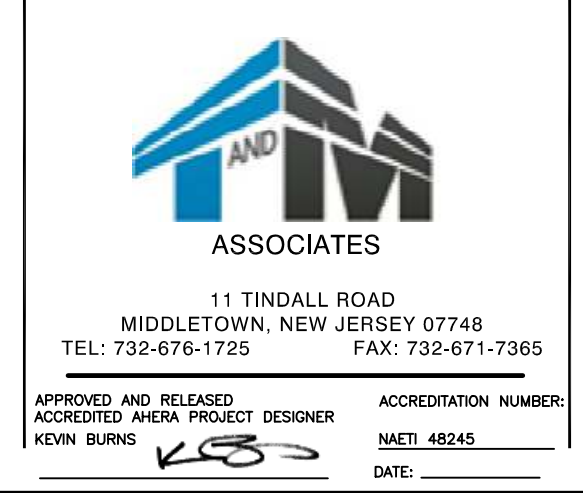
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 NJ License No. AI 12118

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 NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
 NJ License No. AI 14394



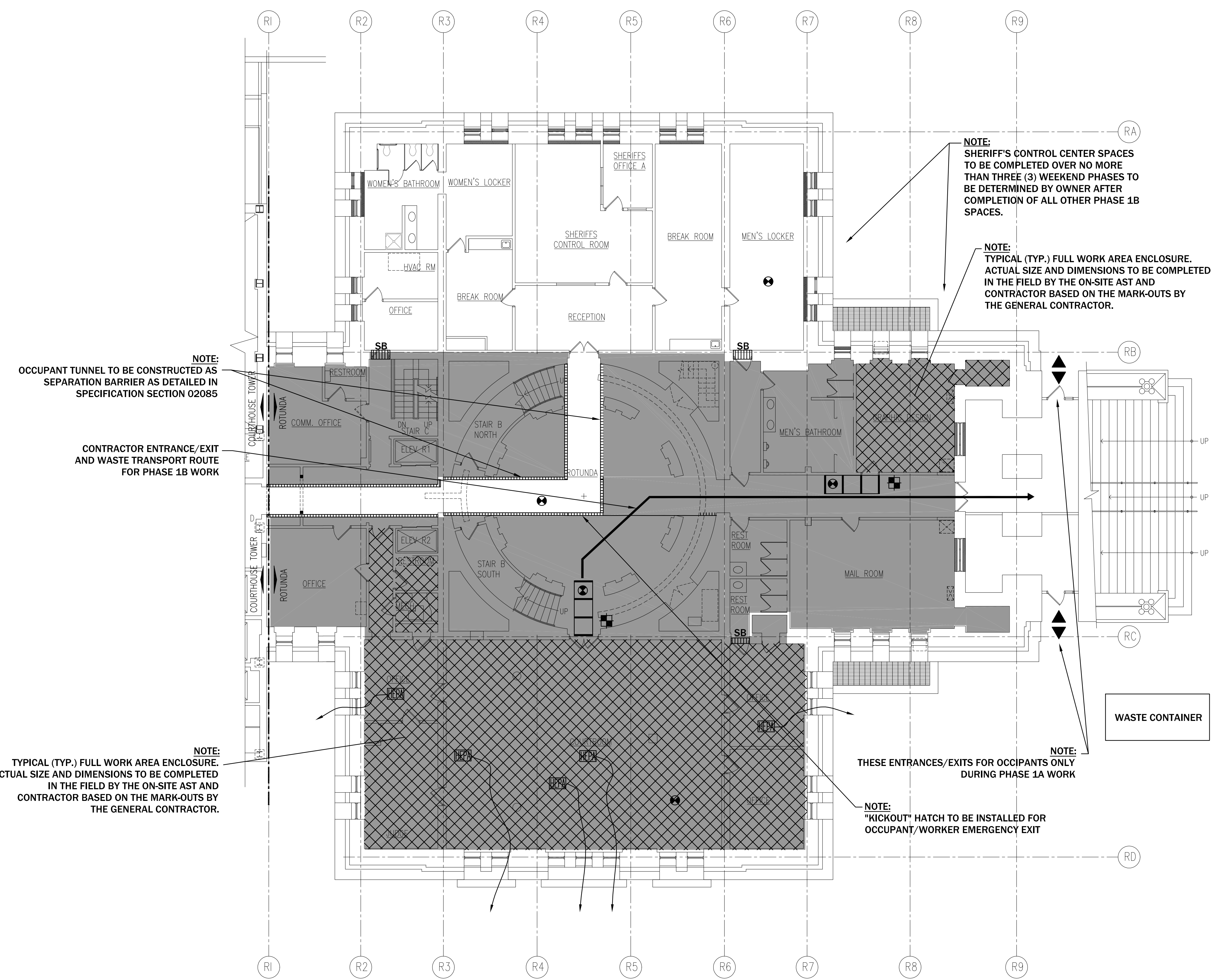
PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
BASEMENT ASBESTOS ABATEMENT PLAN

SUBMISSIONS				REVISIONS				DATE	08-30-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	GH
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00090
								SHEET	3 OF 105
								DWG. NO	

AA-1

100% CD SUBMISSION - PROGRESS PRINT NOT FOR CONSTRUCTION



NOTES

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NOTE:
OCCUPANT TUNNEL TO BE CONSTRUCTED AS SEPARATION BARRIER AS DETAILED IN SPECIFICATION SECTION 02085

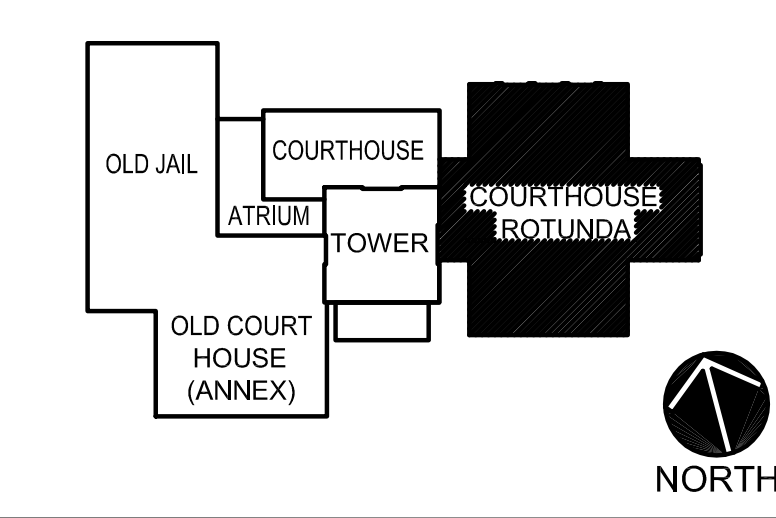
CONTRACTOR ENTRANCE/EXIT AND WASTE TRANSPORT ROUTE FOR PHASE 1B WORK

NOTE:
TYPICAL (TYP.) FULL WORK AREA ENCLOSURE. ACTUAL SIZE AND DIMENSIONS TO BE COMPLETED IN THE FIELD BY THE ON-SITE AST AND CONTRACTOR BASED ON THE MARK-OUTS BY THE GENERAL CONTRACTOR.

NOTE:
THESE ENTRANCES/EXITS FOR OCCIPANTS ONLY DURING PHASE 1A WORK

NOTE:
"KICKOUT" HATCH TO BE INSTALLED FOR OCCUPANT/WORKER EMERGENCY EXIT

KEYPLAN



1 GROUND FLOOR ASBESTOS ABATEMENT PLAN - PHASE 1B
1/8" = 1'-0"

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NJ License No. AI 14394

11 TINDALL ROAD
MIDDLETOWN, NEW JERSEY 07748
TEL: 732-676-1725 FAX: 732-671-7365

APPROVED AND RELEASED
ACREDITED ASBESTOS PROJECT DESIGNER
KEVIN BURNS DATE: 08/24/17

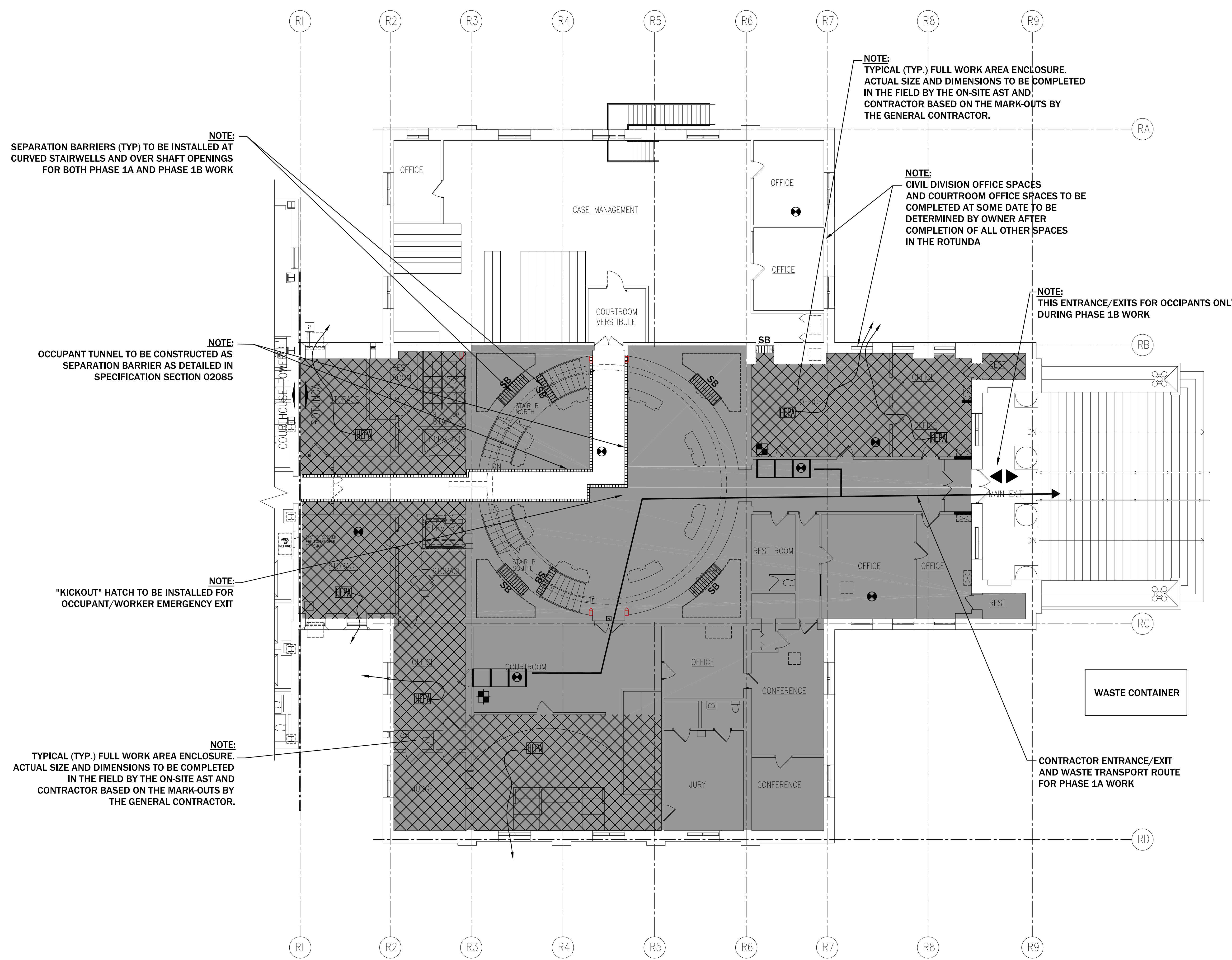
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1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-379-0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
GROUND FLOOR ASBESTOS ABATEMENT PLAN

SUBMISSIONS				REVISIONS				DATE	08-30-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	GH
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00090
								SHEET:	4 OF: 105
								DWG. NO	

AA-2



NOTES

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LEGEND

- DECONTAMINATION UNIT.
- HEPA - NEGATIVE AIR FILTRATION UNIT
- EXHAUST DUCT FROM NEGATIVE AIR FILTRATION UNIT
- FULL WORK AREA ENCLOSURE (TYP.)
- POTENTIAL OVERALL AREAS FOR ASBESTOS ABATEMENT WORK.
- SB - SEPARATION BARRIER (DOORWAY)
- AIR SAMPLE LOCATION
- MANOMETER LOCATION
- CONTRACTOR ENTRANCE/ EXIT AND WASTE TRANSPORTATION ROUTE.
- BUILDING OCCUPANT ENTRANCE/EXIT
- FREE STANDING LUMBER AND POLYETHYLENE WALL.

NOTE:
SEPARATION BARRIERS (TYP) TO BE INSTALLED AT CURVED STAIRWELLS AND OVER SHAFT OPENINGS FOR BOTH PHASE 1A AND PHASE 1B WORK

NOTE:
OCCUPANT TUNNEL TO BE CONSTRUCTED AS SEPARATION BARRIER AS DETAILED IN SPECIFICATION SECTION 02085

NOTE:
"KICKOUT" HATCH TO BE INSTALLED FOR OCCUPANT/WORKER EMERGENCY EXIT

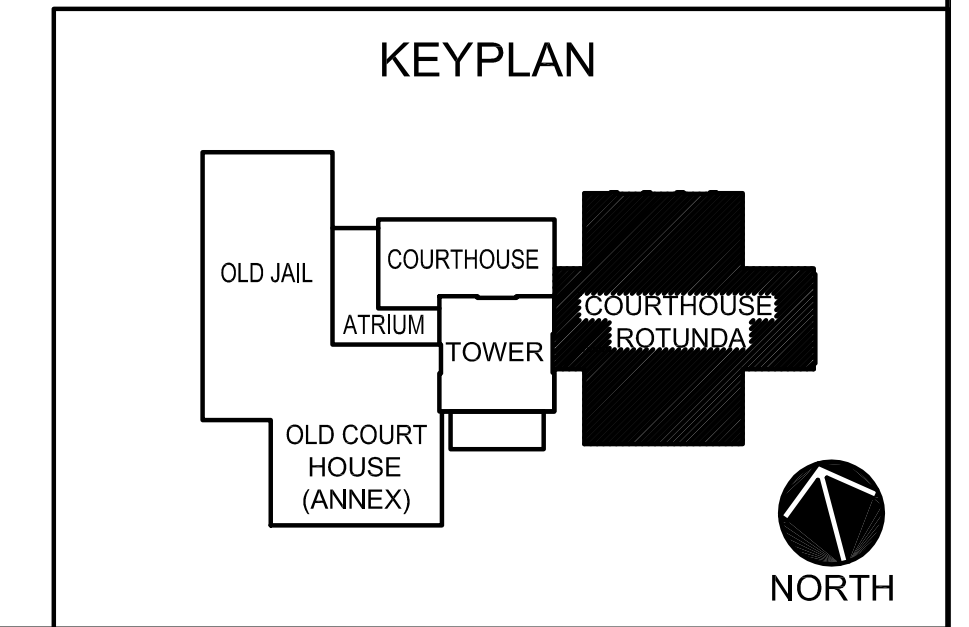
NOTE:
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NOTE:
TYPICAL (TYP.) FULL WORK AREA ENCLOSURE. ACTUAL SIZE AND DIMENSIONS TO BE COMPLETED IN THE FIELD BY THE ON-SITE AST AND CONTRACTOR BASED ON THE MARK-OUTS BY THE GENERAL CONTRACTOR.

NOTE:
CIVIL DIVISION OFFICE SPACES AND COURTROOM OFFICE SPACES TO BE COMPLETED AT SOME DATE TO BE DETERMINED BY OWNER AFTER COMPLETION OF ALL OTHER SPACES IN THE ROTUNDA

NOTE:
THIS ENTRANCE/EXITS FOR OCCUPANTS ONLY DURING PHASE 1B WORK

1 FIRST FLOOR ASBESTOS ABATEMENT PLAN - PHASE 1A
5 1/8" = 1'-0"



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 NJ License No. AI 14394

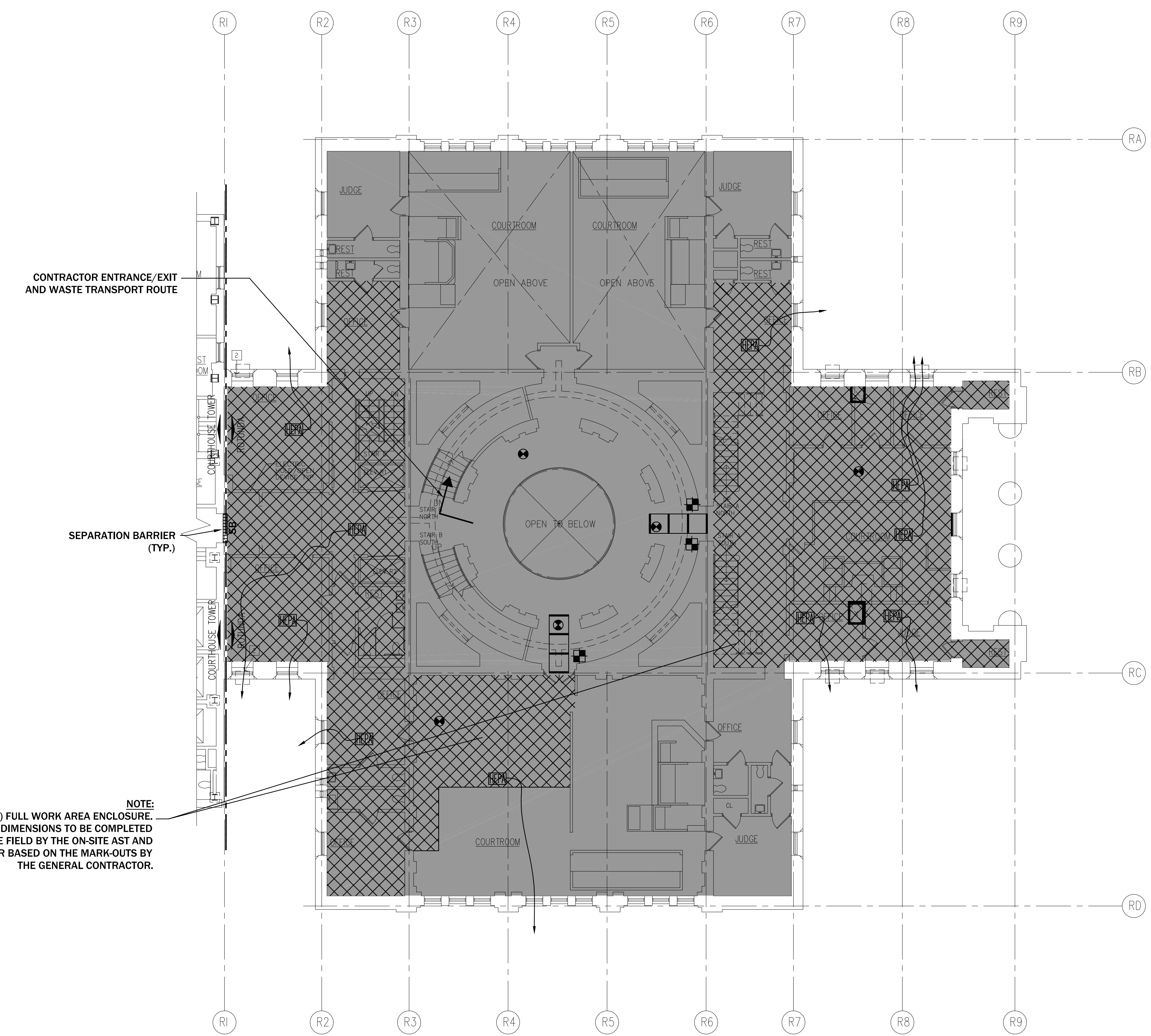


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
 FIRST FLOOR ASBESTOS ABATEMENT PLAN

SUBMISSIONS				REVISIONS				DATE	08-30-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						GH
10.30.15	95% CD UPDATES	KD	FM						KB
05.31.17	100% CD SUBMIT	MMC	FJM						NETA 00090
									5 OF: 105
									DWG. NO

AA-3



CONTRACTOR ENTRANCE/EXIT AND WASTE TRANSPORT ROUTE

SEPARATION BARRIER (TYP.)

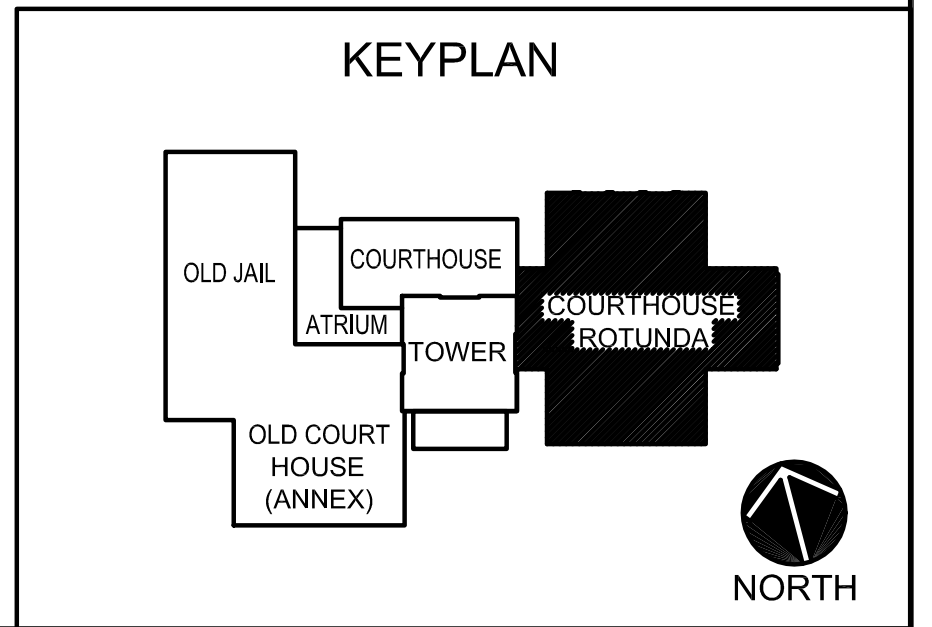
NOTE:
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8. FIRE MARSHALL SHALL HAVE ACCESS TO STANDPIPE AT ALL TIMES IN CASE OF EMERGENCY.

LEGEND

- DECONTAMINATION UNIT.
- HEPA - NEGATIVE AIR FILTRATION UNIT
- EXHAUST DUCT FROM NEGATIVE AIR FILTRATION UNIT
- FULL WORK AREA ENCLOSURE (TYP.)
- POTENTIAL OVERALL AREAS FOR ASBESTOS ABATEMENT WORK.
- SEPARATION BARRIER (DOORWAY)
- AIR SAMPLE LOCATION
- MANOMETER LOCATION
- CONTRACTOR ENTRANCE/ EXIT AND WASTE TRANSPORTATION ROUTE.
- BUILDING OCCUPANT ENTRANCE/EXIT
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1 SECOND FLOOR ASBESTOS ABATEMENT PLAN - PHASE 1A
6 1/8" = 1'-0"

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NJ License No. AI 14394

11 TINDALL ROAD
MIDDLETOWN, NEW JERSEY 07748
TEL: 732-676-1725 FAX: 732-671-7365

APPROVED AND RELEASED
ACREDITED ARCH. PROJECT DESIGNER
KEVIN BURNS

ACREDITATION NUMBER:
NETA 48245
DATE:

ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-379-0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SECOND FLOOR ASBESTOS ABATEMENT PLAN

SUBMISSIONS				REVISIONS				DATE	08-30-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% CD UPDATES	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00090
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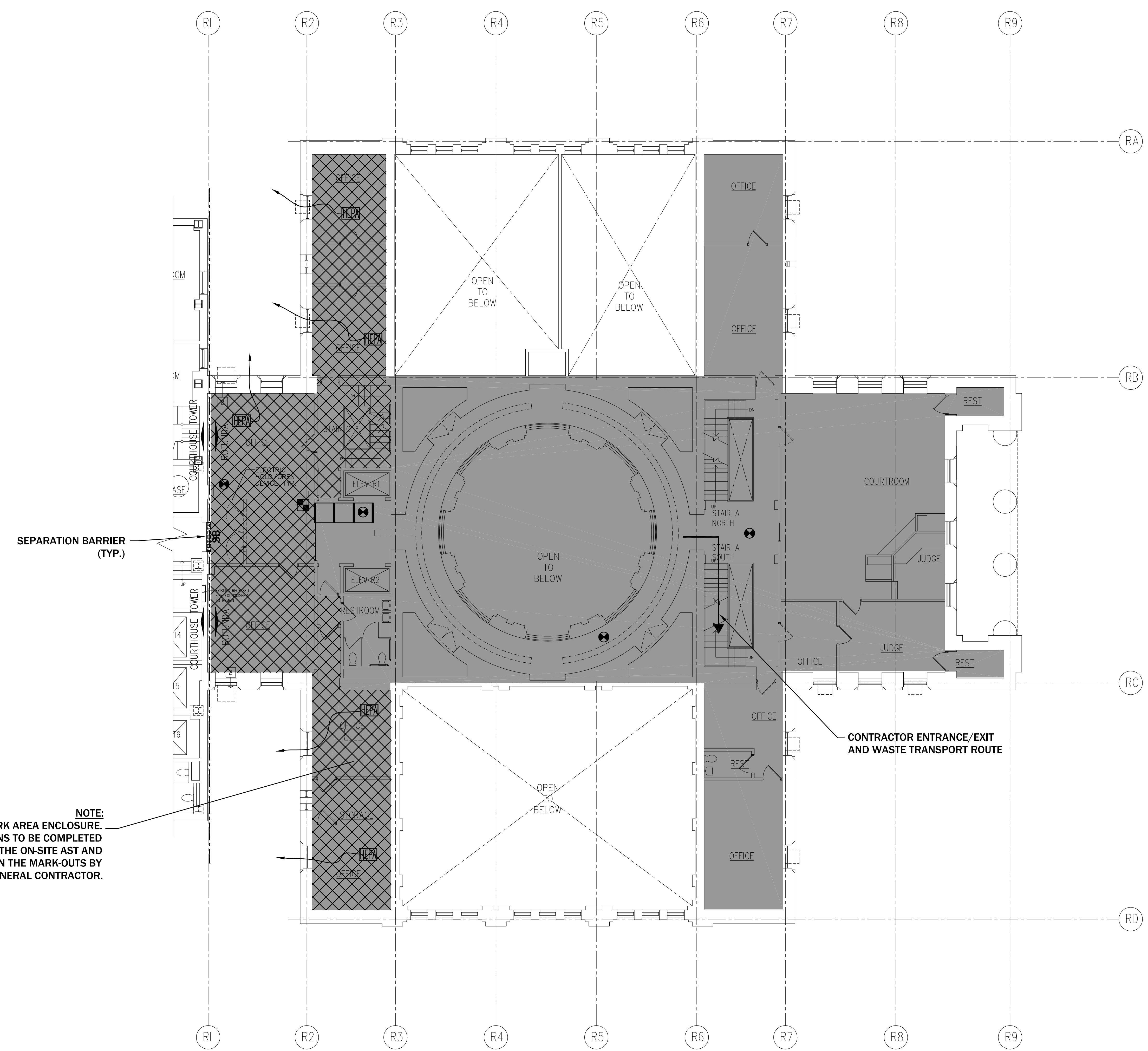
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NOTES

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LEGEND

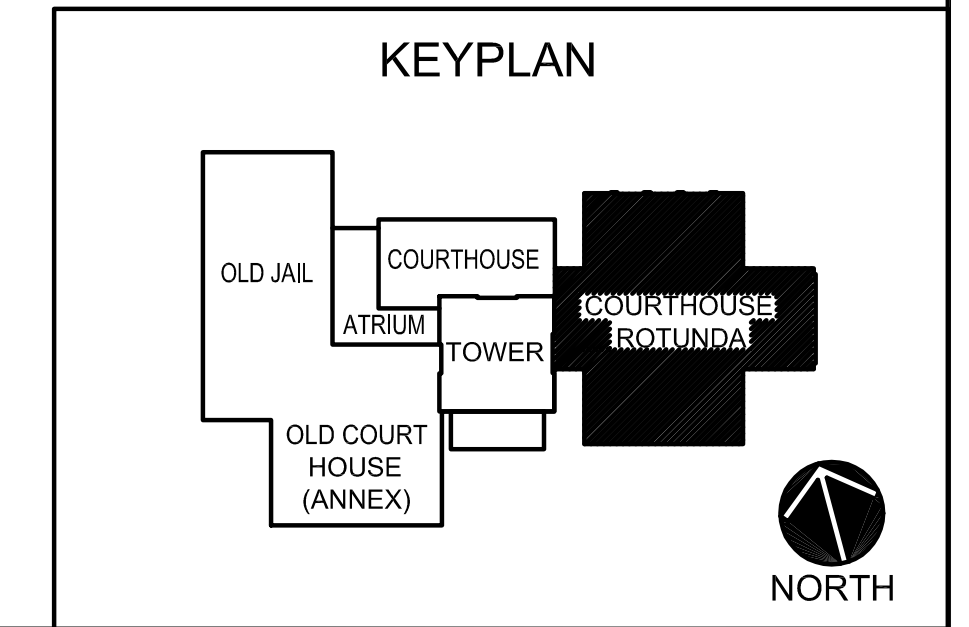
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SEPARATION BARRIER (TYP.)

CONTRACTOR ENTRANCE/EXIT AND WASTE TRANSPORT ROUTE

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1 THIRD FLOOR ASBESTOS ABATEMENT PLAN - PHASE 1A
7 1/8" = 1'-0"

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2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
THIRD FLOOR ASBESTOS ABATEMENT PLAN

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10.30.15	95% CD UPDATES	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00090
								SHEET	7 OF: 105
								DWG. NO	

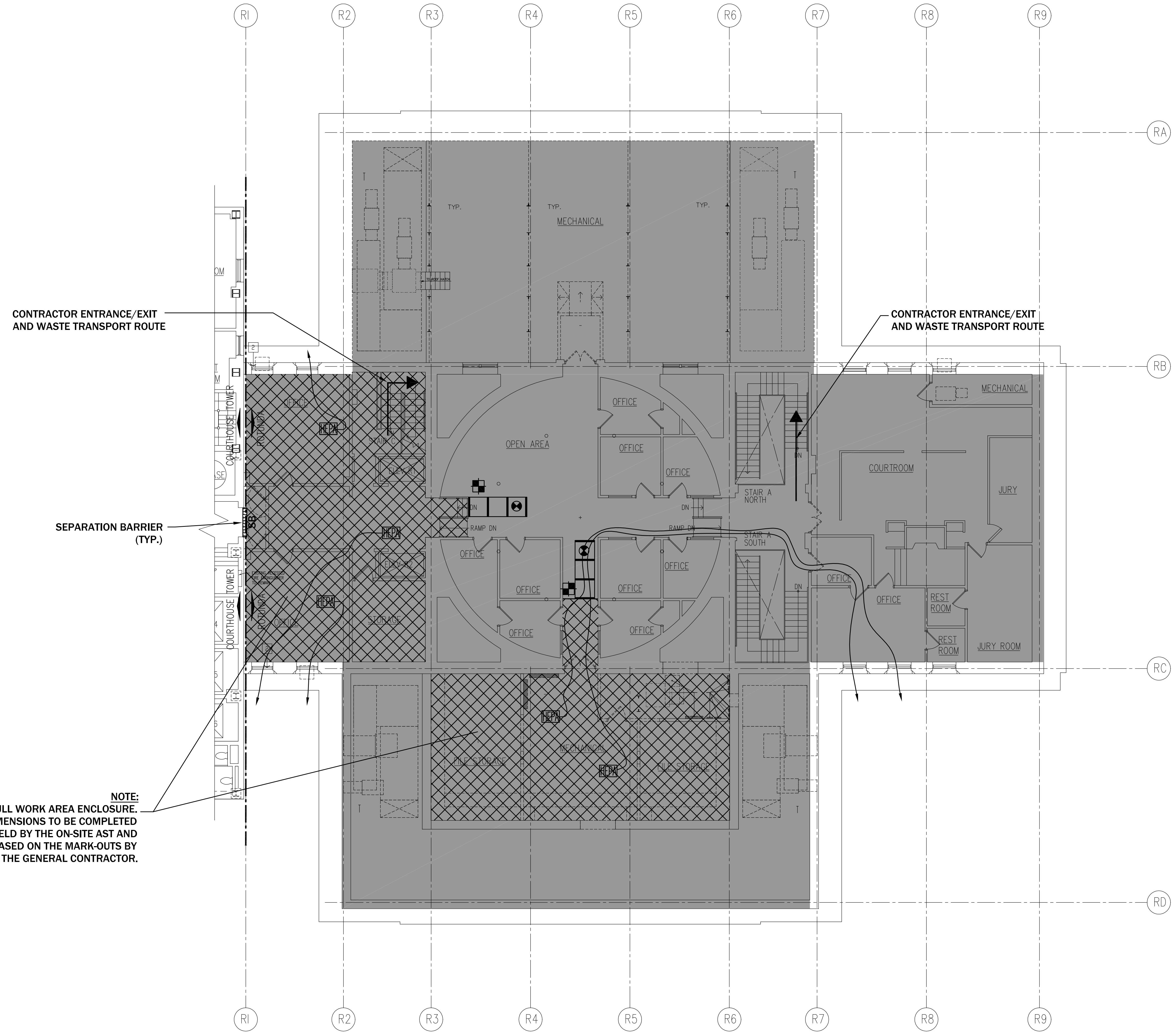
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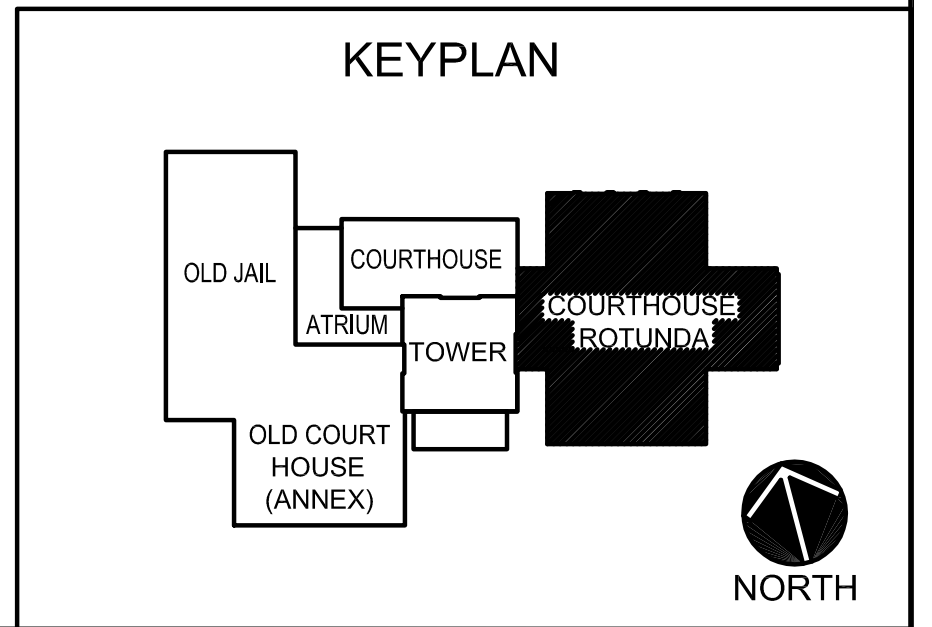
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1 FOURTH FLOOR ASBESTOS ABATEMENT PLAN - PHASE 1A
8 1/8" = 1'-0"

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NJ License No. AI 14394

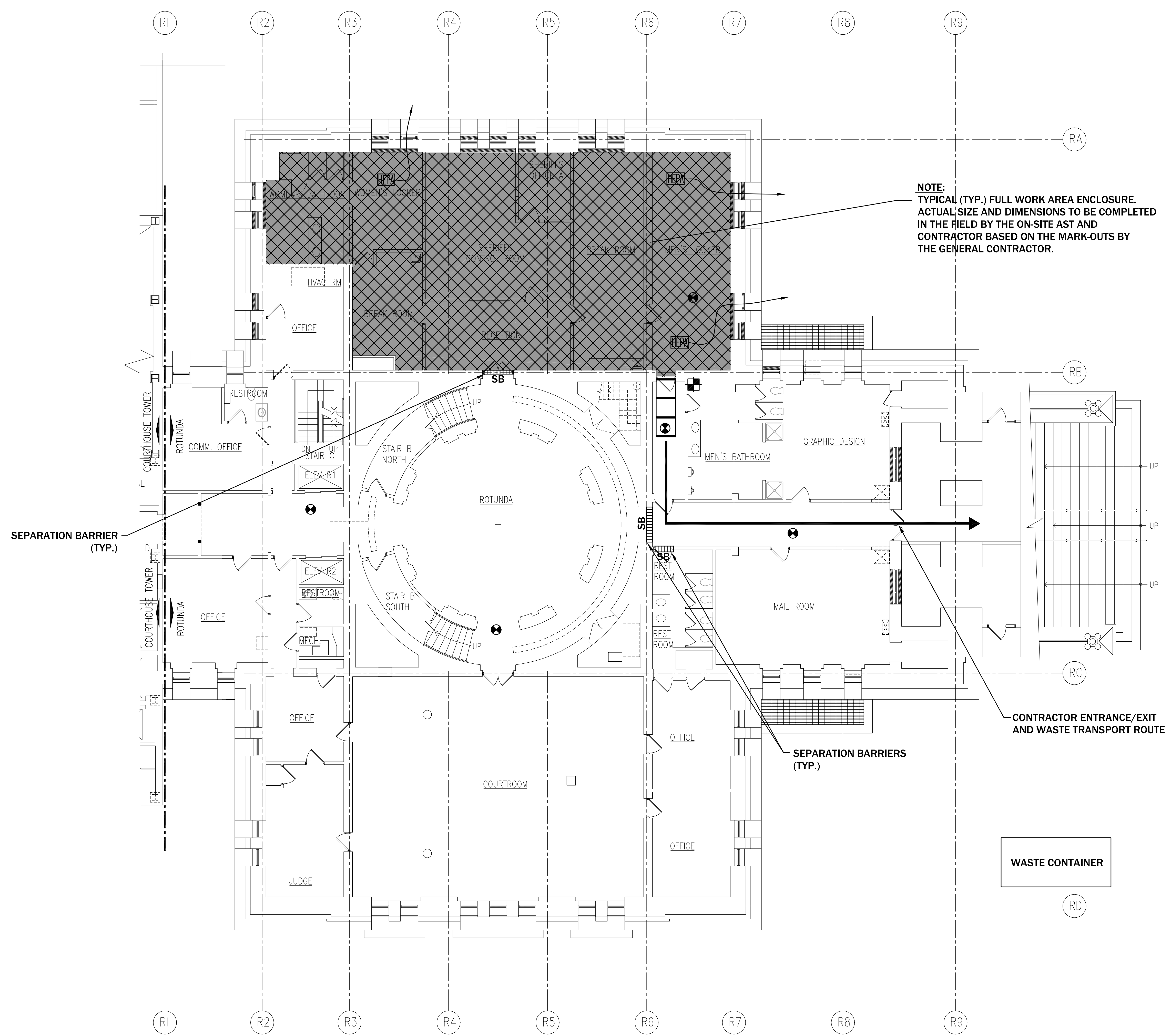
11 TINDALL ROAD
MIDDLETOWN, NEW JERSEY 07748
TEL: 732-676-1725 FAX: 732-671-7365

ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-379-0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey
SHEET CONTENTS:
FOURTH FLOOR ASBESTOS ABATEMENT PLAN

SUBMISSIONS				REVISIONS				DATE	08-30-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	GH
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00090
								SHEET	8 OF 105
								DWG. NO	

AA-6



NOTE:
TYPICAL (TYP.) FULL WORK AREA ENCLOSURE. ACTUAL SIZE AND DIMENSIONS TO BE COMPLETED IN THE FIELD BY THE ON-SITE AST AND CONTRACTOR BASED ON THE MARK-OUTS BY THE GENERAL CONTRACTOR.

NOTES

1. COMPLETE ALL OF THE ASBESTOS ABATEMENT WORK SPECIFIED IN ACCORDANCE WITH N.J.A.C. 5:23-8.15 "ASBESTOS HAZARD ABATEMENT PROJECTS", N.J.A.C. 5:23-8.19 "ABATEMENT IN OCCUPIED BUILDINGS" AND THE SPECIFICATIONS.
2. COMPLETE THE ASBESTOS ABATEMENT WORK SPECIFIED ON THESE DRAWINGS UTILIZING NO MORE THAN TWENTY-FIVE (25) FULL WORK AREA ENCLOSURES IN ACCORDANCE WITH THE SUB CODE AND THE SPECIFICATIONS.
3. AREAS WHERE NO ACM IS PRESENT MAY BE EXCLUDED FROM THE WORK AREAS.
4. INSTALL AND MAINTAIN THE SEPARATION BARRIERS ON THESE DRAWINGS AS REQUIRED FOR THE DURATION OF THE ASBESTOS ABATEMENT WORK.
5. THE HEPA UNIT AND AIR SAMPLE LOCATIONS INDICATED ARE FOR ILLUSTRATION PURPOSES ONLY. THE ACTUAL NUMBER AND LOCATIONS OF THE HEPA UNITS AND AIR SAMPLES SHALL VARY DEPENDING UPON SITE CONDITIONS AND NEGATIVE AIRFLOW MEASUREMENTS.
6. EXHAUST ALL HEPA UNITS TO THE EXTERIOR OF THE FACILITY.
7. BUILDING TO REMAIN OCCUPIED FOR THE DURATION OF THE WORK.
8. FIRE MARSHALL SHALL HAVE ACCESS TO STANDPIPE AT ALL TIMES IN CASE OF EMERGENCY.

LEGEND

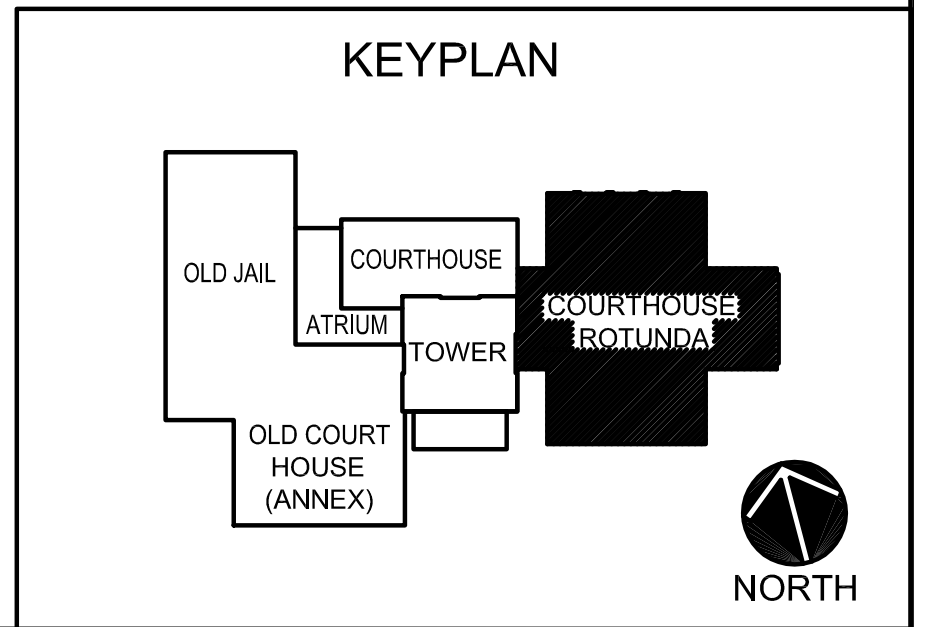
- DECONTAMINATION UNIT.
- HEPA - NEGATIVE AIR FILTRATION UNIT
- EXHAUST DUCT FROM NEGATIVE AIR FILTRATION UNIT
- FULL WORK AREA ENCLOSURE (TYP.)
- POTENTIAL OVERALL AREAS FOR ASBESTOS ABATEMENT WORK.
- SEPARATION BARRIER (DOORWAY)
- AIR SAMPLE LOCATION
- MANOMETER LOCATION
- CONTRACTOR ENTRANCE/EXIT AND WASTE TRANSPORTATION ROUTE.
- BUILDING OCCUPANT ENTRANCE/EXIT
- FREE STANDING LUMBER AND POLYETHYLENE WALL.

SEPARATION BARRIER (TYP.)

SEPARATION BARRIERS (TYP.)

CONTRACTOR ENTRANCE/EXIT AND WASTE TRANSPORT ROUTE

WASTE CONTAINER



1 GROUND FLOOR ASBESTOS ABATEMENT – WEEKEND PHASES
9 1/8" = 1'-0"

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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

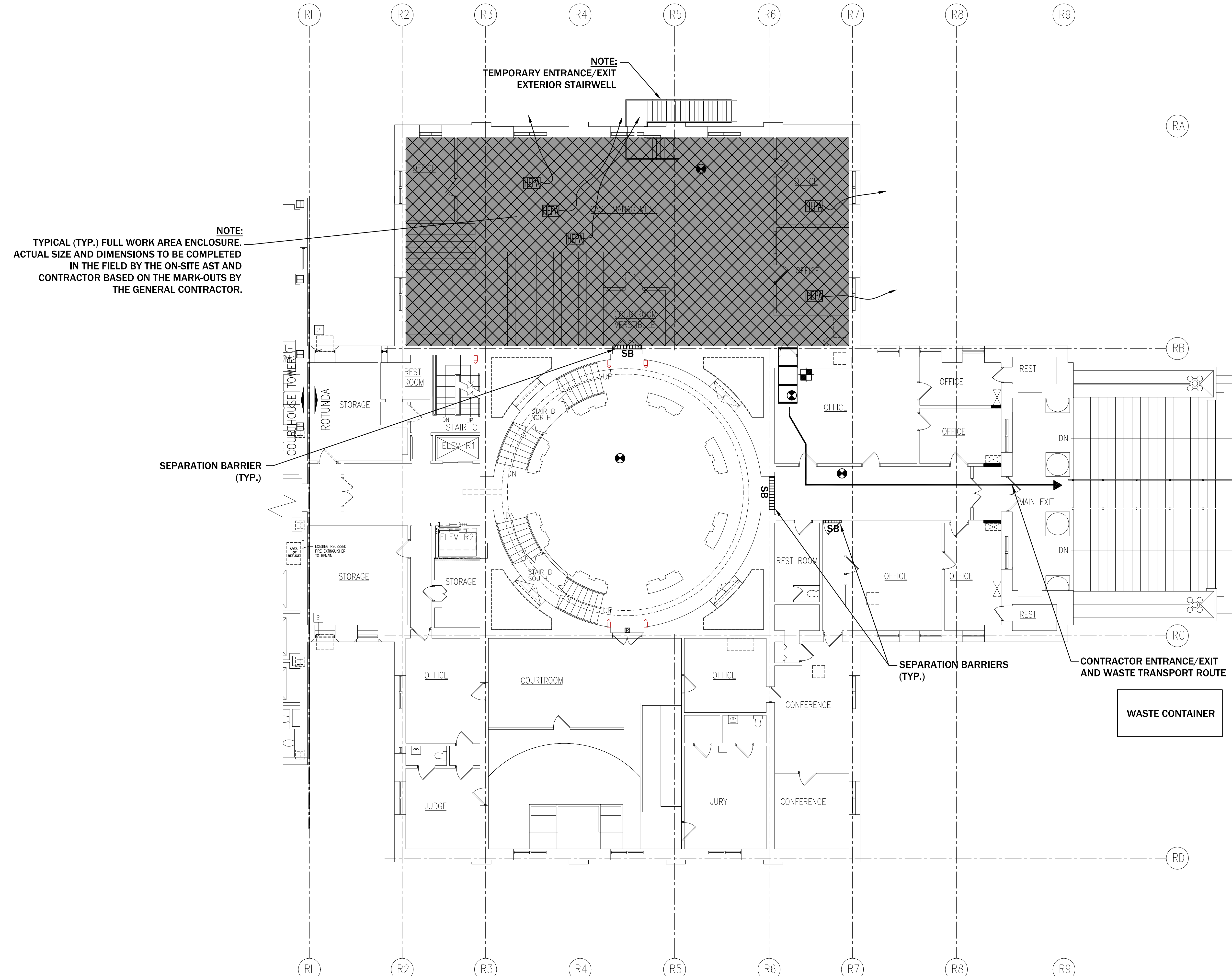


PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
GROUND FLOOR ASBESTOS ABATEMENT PLAN

SUBMISSIONS				REVISIONS				DATE	08-30-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% CD UPDATES	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00090
								SHEET	9 OF 105
								DWG. NO	

AA-7



NOTE:
TYPICAL (TYP.) FULL WORK AREA ENCLOSURE. ACTUAL SIZE AND DIMENSIONS TO BE COMPLETED IN THE FIELD BY THE ON-SITE AST AND CONTRACTOR BASED ON THE MARK-OUTS BY THE GENERAL CONTRACTOR.

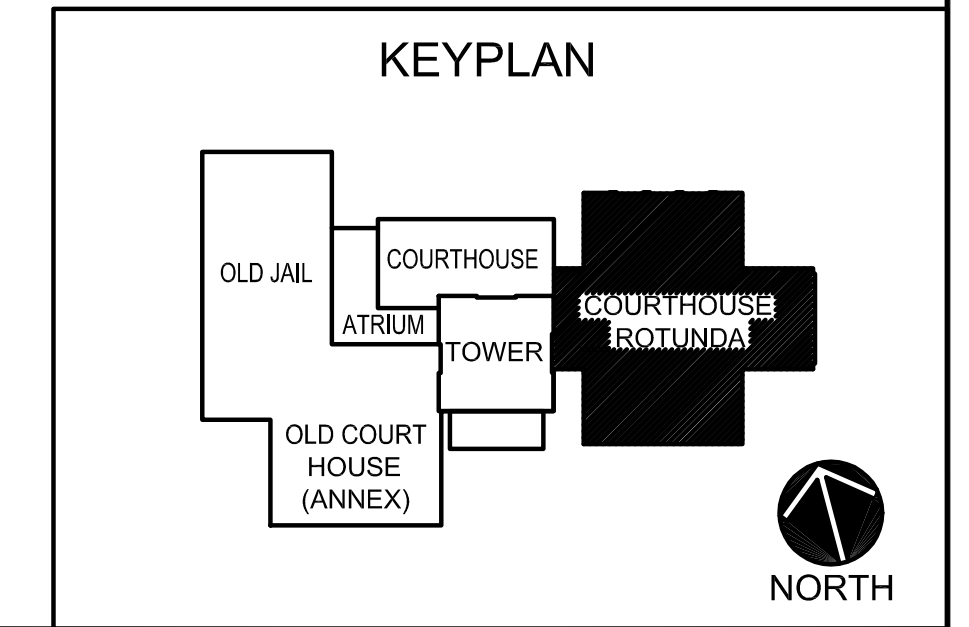
NOTE:
TEMPORARY ENTRANCE/EXIT EXTERIOR STAIRWELL

NOTES

1. COMPLETE ALL OF THE ASBESTOS ABATEMENT WORK SPECIFIED IN ACCORDANCE WITH N.J.A.C. 5:23-8.15 "ASBESTOS HAZARD ABATEMENT PROJECTS", N.J.A.C. 5:23-8.19 "ABATEMENT IN OCCUPIED BUILDINGS" AND THE SPECIFICATIONS.
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6. EXHAUST ALL HEPA UNITS TO THE EXTERIOR OF THE FACILITY.
7. BUILDING TO REMAIN OCCUPIED FOR THE DURATION OF THE WORK.
8. FIRE MARSHALL SHALL HAVE ACCESS TO STANDPIPE AT ALL TIMES IN CASE OF EMERGENCY.

LEGEND

- DECONTAMINATION UNIT.
- NEGATIVE AIR FILTRATION UNIT
- EXHAUST DUCT FROM NEGATIVE AIR FILTRATION UNIT
- FULL WORK AREA ENCLOSURE (TYP.)
- POTENTIAL OVERALL AREAS FOR ASBESTOS ABATEMENT WORK.
- SEPARATION BARRIER (DOORWAY)
- AIR SAMPLE LOCATION
- MANOMETER LOCATION
- CONTRACTOR ENTRANCE/ EXIT AND WASTE TRANSPORTATION ROUTE.
- BUILDING OCCUPANT ENTRANCE/EXIT
- FREE STANDING LUMBER AND POLYETHYLENE WALL.



1 FIRST FLOOR ASBESTOS ABATEMENT – WEEKEND PHASES
10 1/8" = 1'-0"

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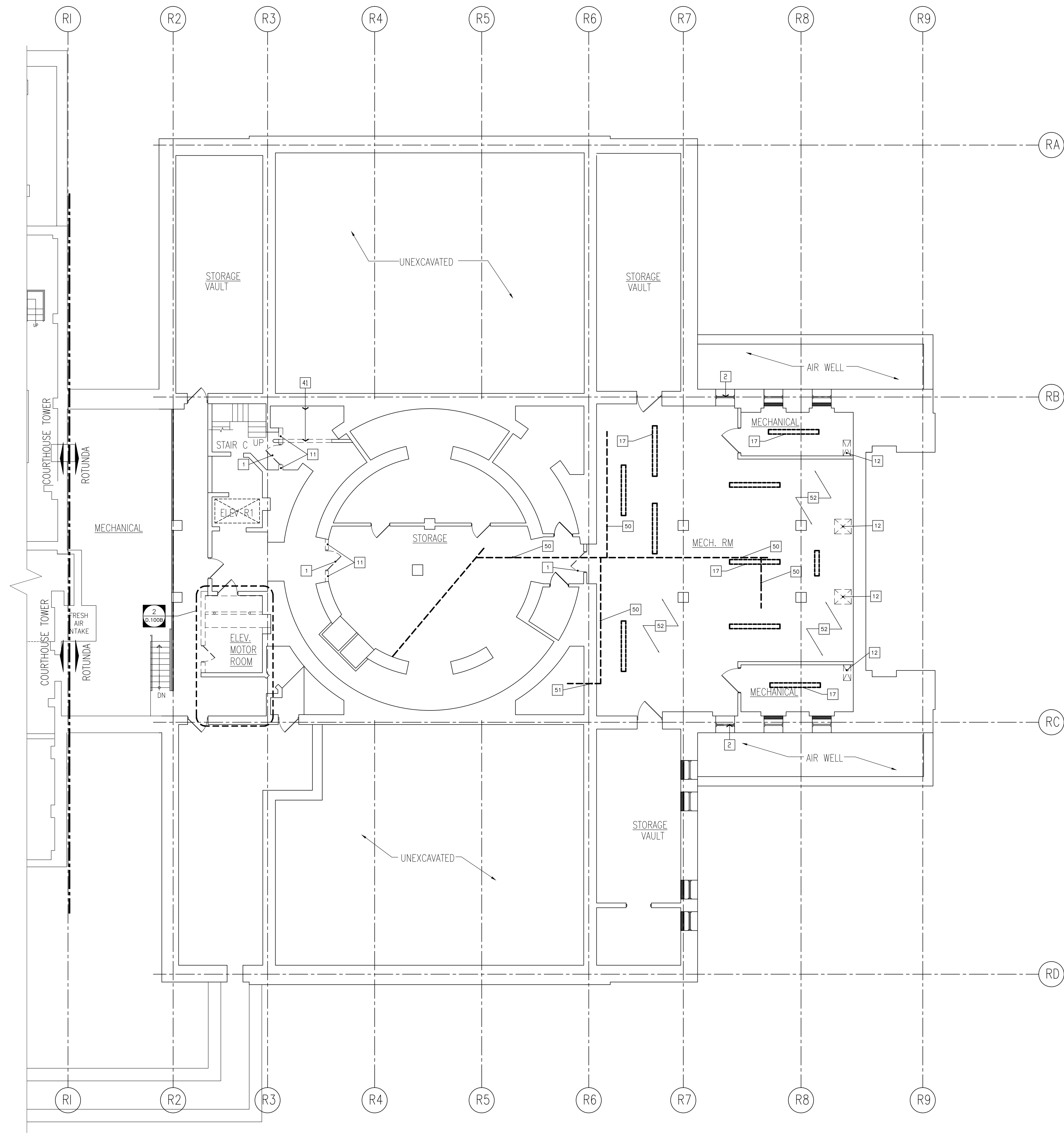
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NJ License No. AI 12541
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NJ License No. AI 14394



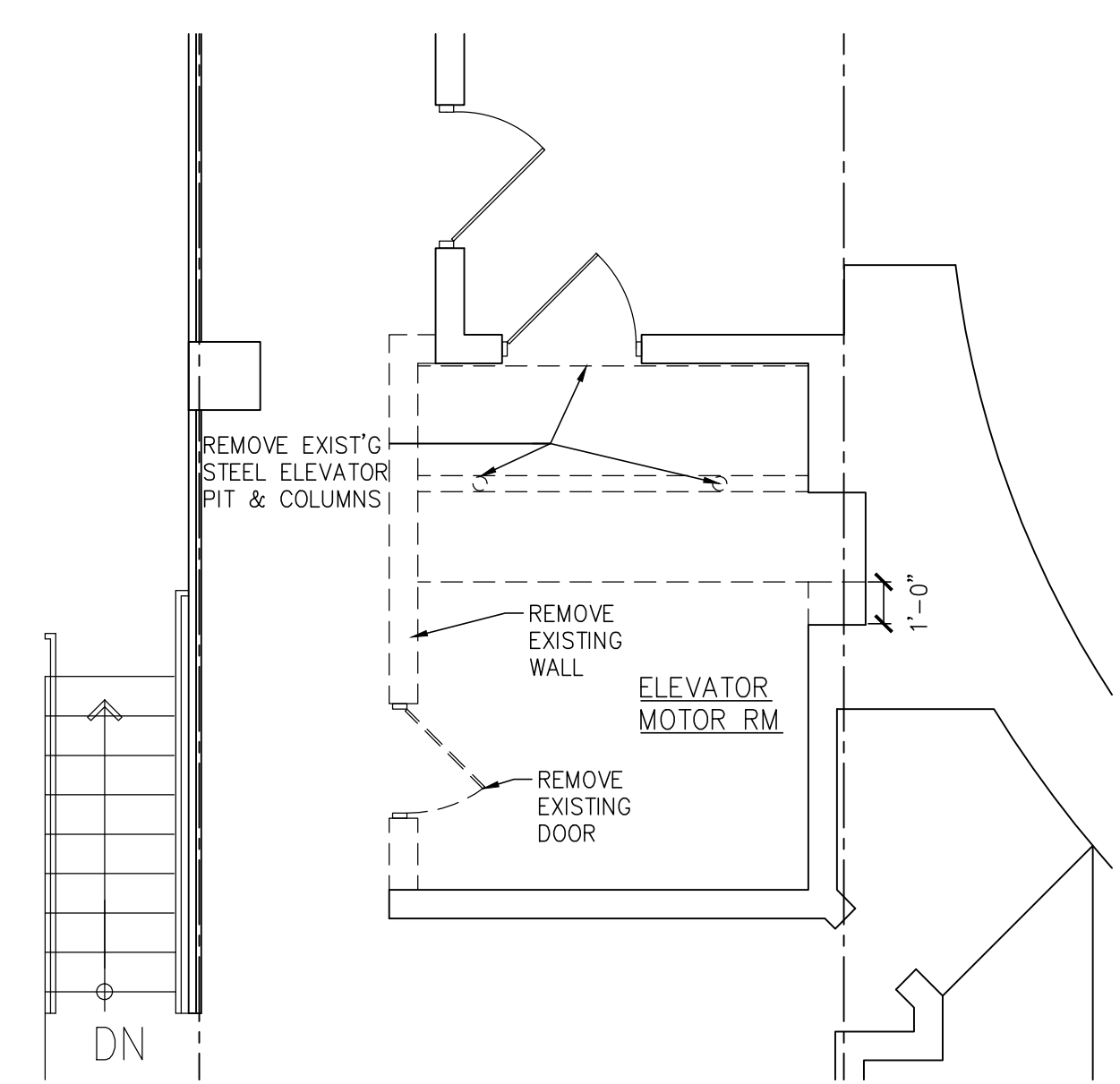
PROJECT: **UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey
SHEET CONTENTS:
FIRST FLOOR ASBESTOS ABATEMENT PLAN

SUBMISSIONS				REVISIONS				DATE	08-30-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% CD UPDATES	KD	FM					CHKD BY	KB
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	NETA 00090
								SHEET:	10 OF: 105
								DWG. NO	

AA-8



1 BASEMENT DEMOLITION PLAN
D.100B 1/8" = 1'-0"

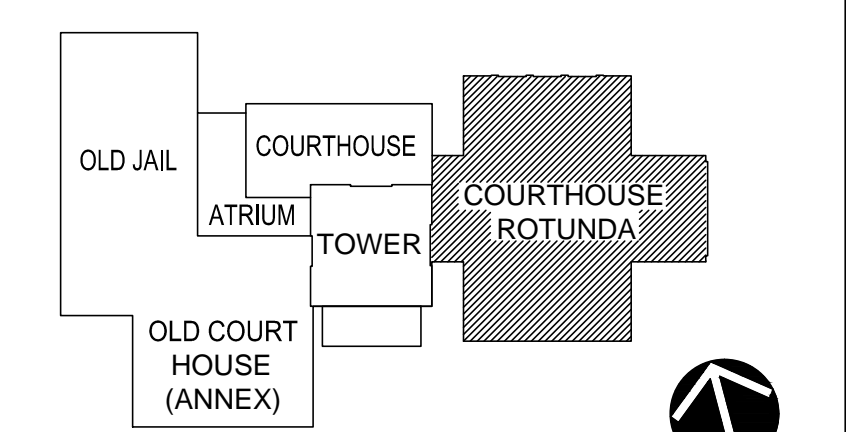


2 ENLARGED FLOOR DEMOLITION PLAN
D.100B 1/4" = 1'-0"

DEMOLITION KEYNOTES

1. REMOVE EXIST. DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
2. REMOVE EXIST. WINDOW SYSTEM. PREPARE OPENING FOR INFULLY NEW INTAKE METAL LOUVER. REFER TO M.400B, 30X42 L-2, & A.100B.
6. REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
10. EXIST. ROOF ACCESS LADDER TO REMAIN
11. REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
12. SAW-CUT EXISTING SLAB FOR NEW DUCT CHASE. REFER TO MECHANICAL DWG.
- 12A. RELOCATE EXISTING PIPING, AND ELECTRICAL WIRING TO NEW LOCATION REFER TO ELECTRICAL DRAWINGS.
15. EXIST. COLUMN TO REMAIN. CONTRACTOR SHALL USE EXTREME CARE NEAR STRUCTURE.
16. EXIST'G STAIR, RAILS AND GUARDS TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
17. REMOVE LIGHTING FIXTURES @ DESIGNATED AREAS, SEE RCP AND ELECTRICAL DWGS.
18. DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
19. EXIST'G FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
20. EXISTING ELECT./MECH./PLUMBING UNIT TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
21. PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
22. EXISTING STRUCTURE TO REMAIN, TYP. UNLESS OTHERWISE NOTED.
25. EXISTING WALL SYSTEM TO REMAIN, TYP.
26. EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWG'S
32. EXISTING DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION, DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
33. PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
34. REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
35. PARTIAL WALL TO BE REMOVED & TO RECEIVE NEW WALL ASSEMBLY.
36. REMOVE EXISTING WOOD RAMP
38. EXISTING MECH./ELECT./PLUMBING EQUIPMENT TO BE REMOVED OR RELOCATED. REFER TO M.E.P. DWG'S. FOR LOCATION.
39. REPLACE EXISTING DOUBLE DOOR AND ITS ASSEMBLY. PREPARE TO RECEIVE NEW DOOR & WALL INFILL.
40. EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF.
41. RELOCATE EXISTING PIPE OBSTRUCTING EGRESS
42. REMOVE EXISTING EXTERIOR WINDOW, PREPARE TO RECEIVE NEW EXIT DOOR.
43. SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS. SEE MECH'L DWGS.
44. REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
45. REMOVE EXISTING STEEL STAIR INSIDE EXISTING CHASE.
46. SAW CUT PLASTER CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE). RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH PLASTER TO MATCH EXISTING.
47. REMOVE PLASTER CEILING TO ALLOW INSTALLATION OF SPRINKLER HEADS FROM ATTIC SPACE ABOVE, TYP.
48. CONTRACTOR TO COORDINATE CORE DRILLING OF FLOORS FOR NEW PIPING WITH GENERAL CONTRACTOR. REFER TO MEP DWGS.
49. OWNER TO REMOVE ALL EXISTING STORAGE AND SHELVING UNITS PRIOR TO THE START OF CONSTRUCTION.
50. SAW CUT FLOOR AS REQUIRED. REFER TO MEP DWGS.
51. CORE DRILL WALL OPENING AS REQUIRED. REFER TO MEP DWGS.
52. CLIENT TO RELOCATE ALL EXISTING STORAGE FILES & SHELVING PRIOR TO START OF CONSTRUCTION.

KEYPLAN



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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

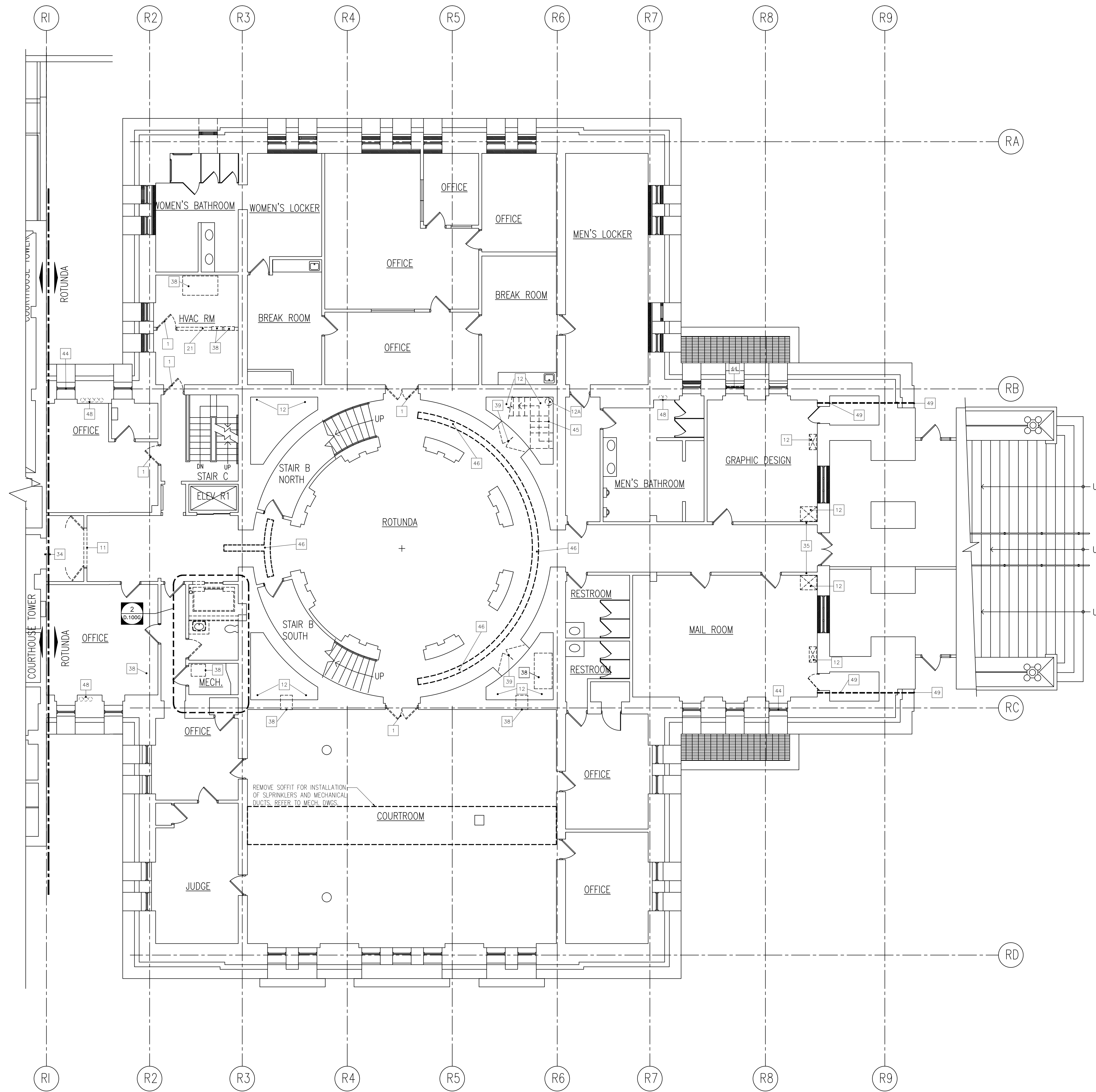
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973.379.1081
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
BASEMENT DEMOLITION PLAN

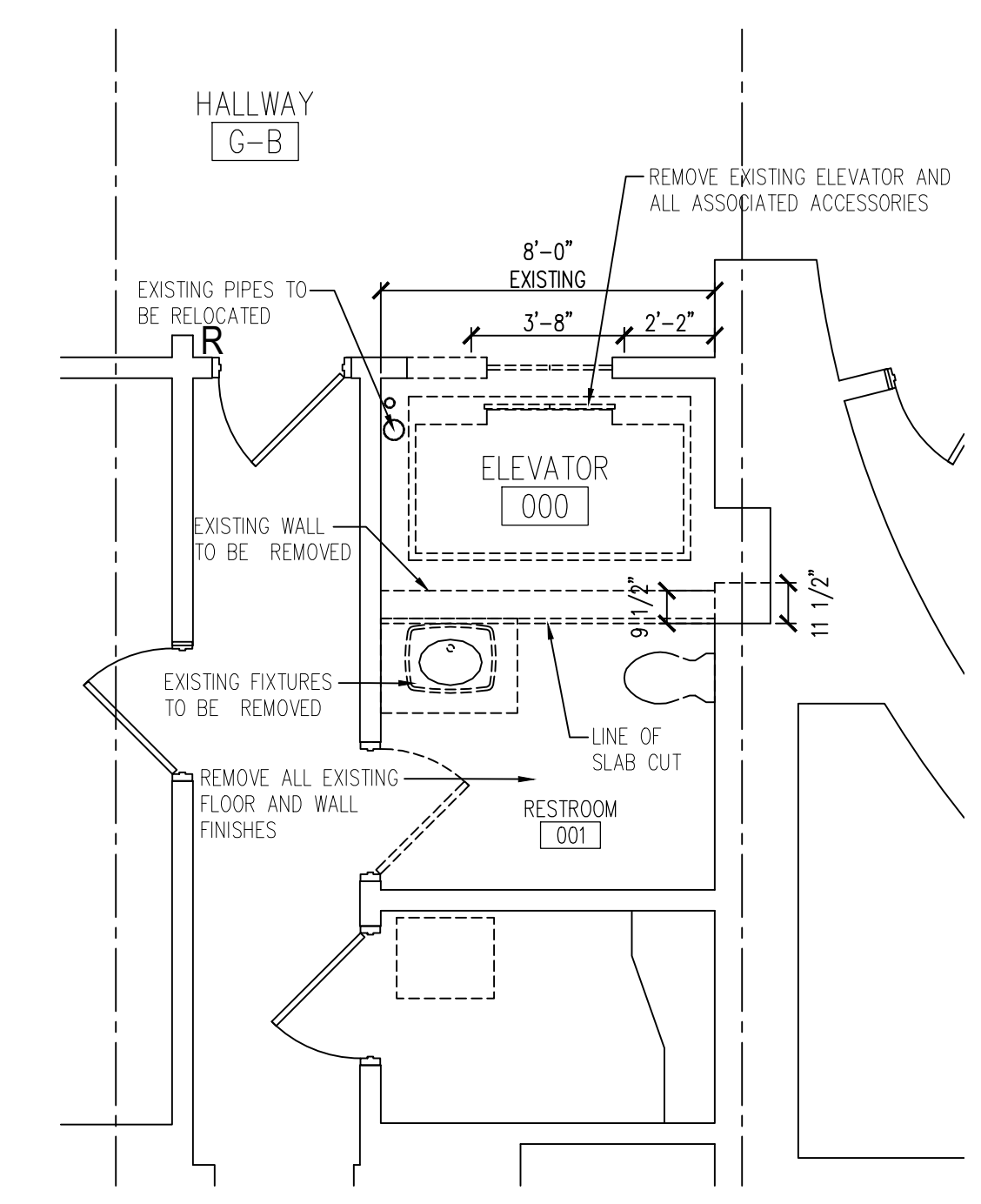
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10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
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								DWG. NO	

D.100B

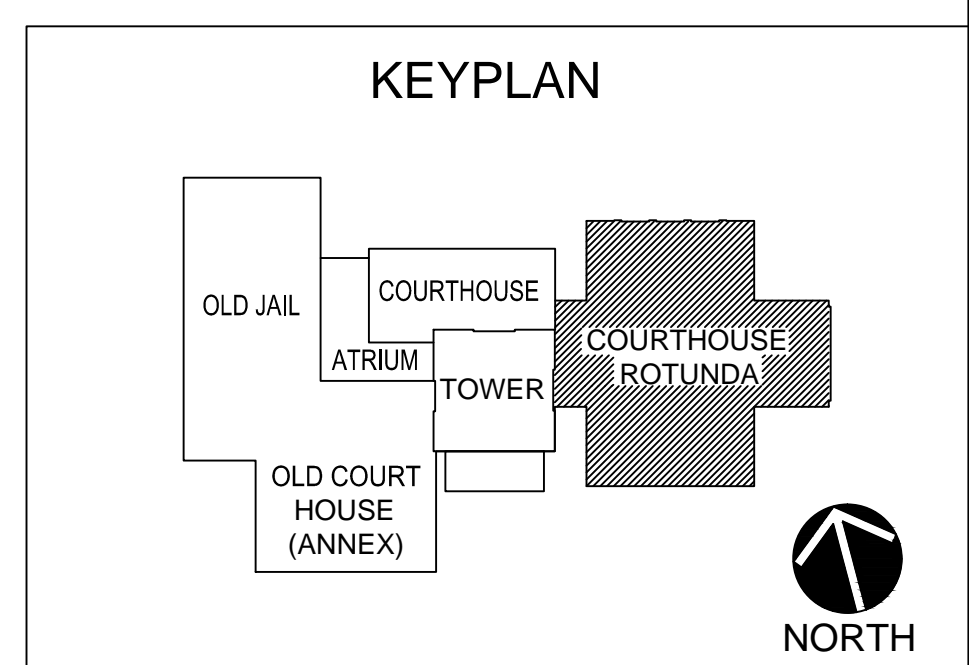


1 GROUND FLOOR DEMOLITION PLAN
D.100G 1/8" = 1'-0"

2 ENLARGED FLOOR DEMOLITION PLAN
D.100G 1/4" = 1'-0"



- ### DEMOLITION KEYNOTES
- 1 REMOVE EXIST. DOOR AND ALL ITS COMPONENTS (I.E. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
 - 2 REMOVE EXIST. WINDOW SYSTEM. PREPARE OPENING FOR INFILL / NEW INTAKE METAL LOUVER (SEE MECH'L PLAN)
 - 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
 - 10 EXIST. ROOF ACCESS LADDER TO REMAIN
 - 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR. SEE DOOR SCHEDULE.
 - 12 SAW-CUT EXISTING SLAB FOR NEW DUCT CHASE, REFER TO MECHANICAL DWG.
 - 12A RELOCATE EXISTING PIPING, AND ELECTRICAL WIRING TO NEW LOCATION REFER TO ELECTRICAL DRAWINGS.
 - 15 EXIST. COLUMN TO REMAIN. CONTRACTOR SHALL USE EXTREME CARE NEAR STRUCTURE.
 - 16 EXIST STAIR RAILS AND GUARDS TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
 - 17 REMOVE LIGHTING FIXTURES @ DESIGNATED AREAS. SEE RCP AND ELECTRICAL DWGS.
 - 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
 - 19 EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
 - 20 EXISTING ELECT./MECH./PLUMBING UNIT TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
 - 21 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
 - 22 EXISTING STRUCTURE TO REMAIN, TYP. UNLESS OTHERWISE NOTED.
 - 23 EXISTING WALL SYSTEM TO REMAIN, TYP.
 - 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWG'S
 - 32 EXISTING DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
 - 33 PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
 - 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
 - 35 PARTIAL WALL TO BE REMOVED & TO RECEIVE NEW WALL ASSEMBLY.
 - 36 REMOVE EXISTING WOOD RAMP
 - 38 EXISTING MECH./ELECT./PLUMBING EQUIPMENT TO BE REMOVED OR RELOCATED. REFER TO M.E.P. DWGS. FOR LOCATION.
 - 39 REPLACE EXISTING DOUBLE DOOR AND ITS ASSEMBLY. PREPARE TO RECEIVE NEW DOOR & WALL INFILL.
 - 40 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL, PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF.
 - 41 RELOCATE EXISTING PIPE OBSTRUCTING EGRESS
 - 42 REMOVE EXISTING EXTERIOR WINDOW, PREPARE TO RECEIVE NEW EXIT DOOR.
 - 43 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
 - 44 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
 - 45 REMOVE EXISTING STEEL STAIR INSIDE EXISTING CHASE.
 - 46 SAW CUT PLASTER CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE). RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH PLASTER TO MATCH EXISTING.
 - 47 REMOVE PLASTER CEILING TO ALLOW INSTALLATION OF SPRINKLER HEADS FROM ATTIC SPACE ABOVE, TYP.
 - 48 CONTRACTOR TO COORDINATE CORE DRILLING OF FLOORS FOR NEW PIPING WITH GENERAL CONTRACTOR. REFER TO MEP DWGS.
 - 49 CORE DRILL WALL AS REQUIRED. REFER TO MECH. M400G. SUPPLY REGISTER- SIDEWALL: SR-1.



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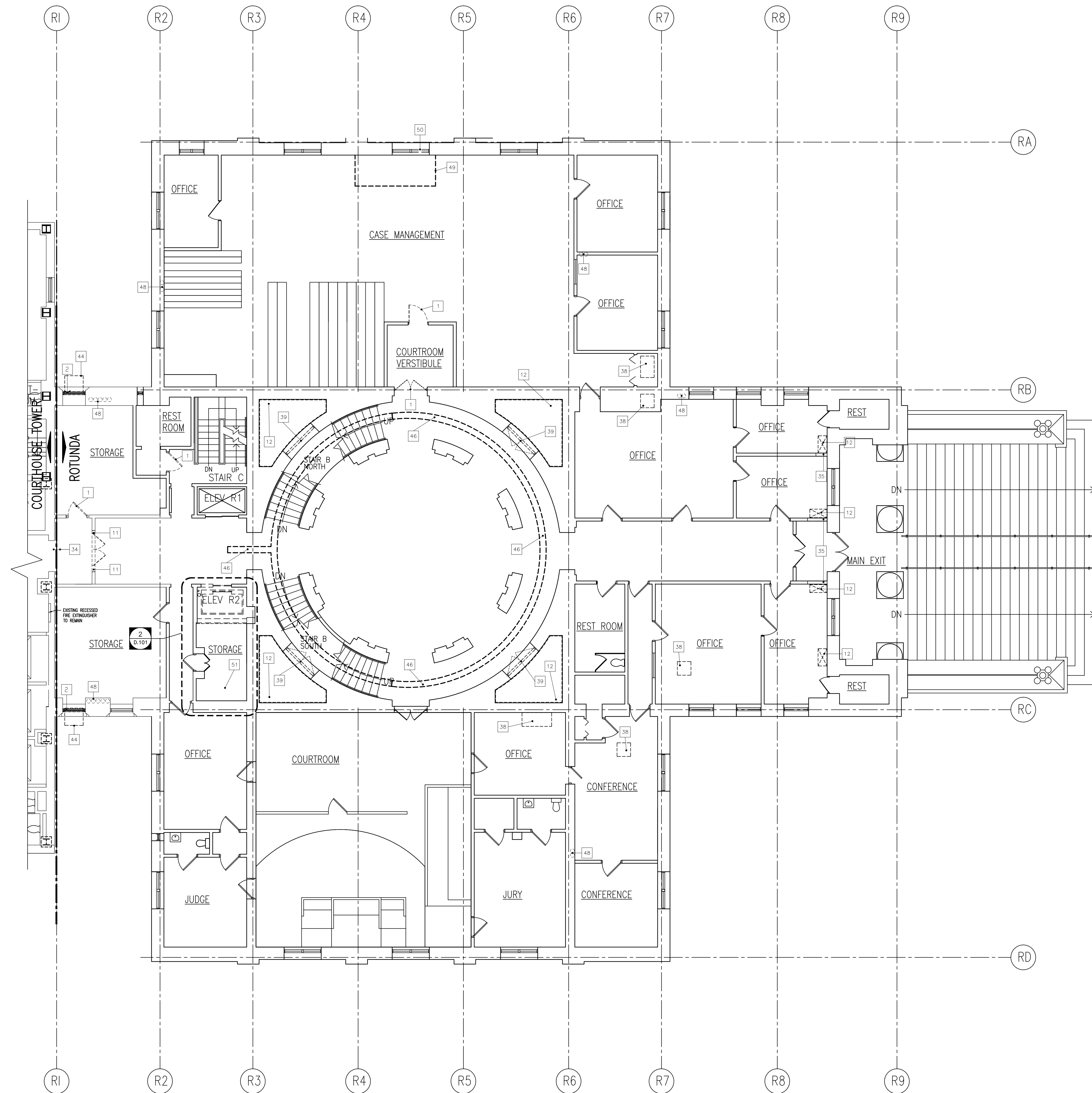
PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
GROUND FLOOR DEMOLITION PLAN

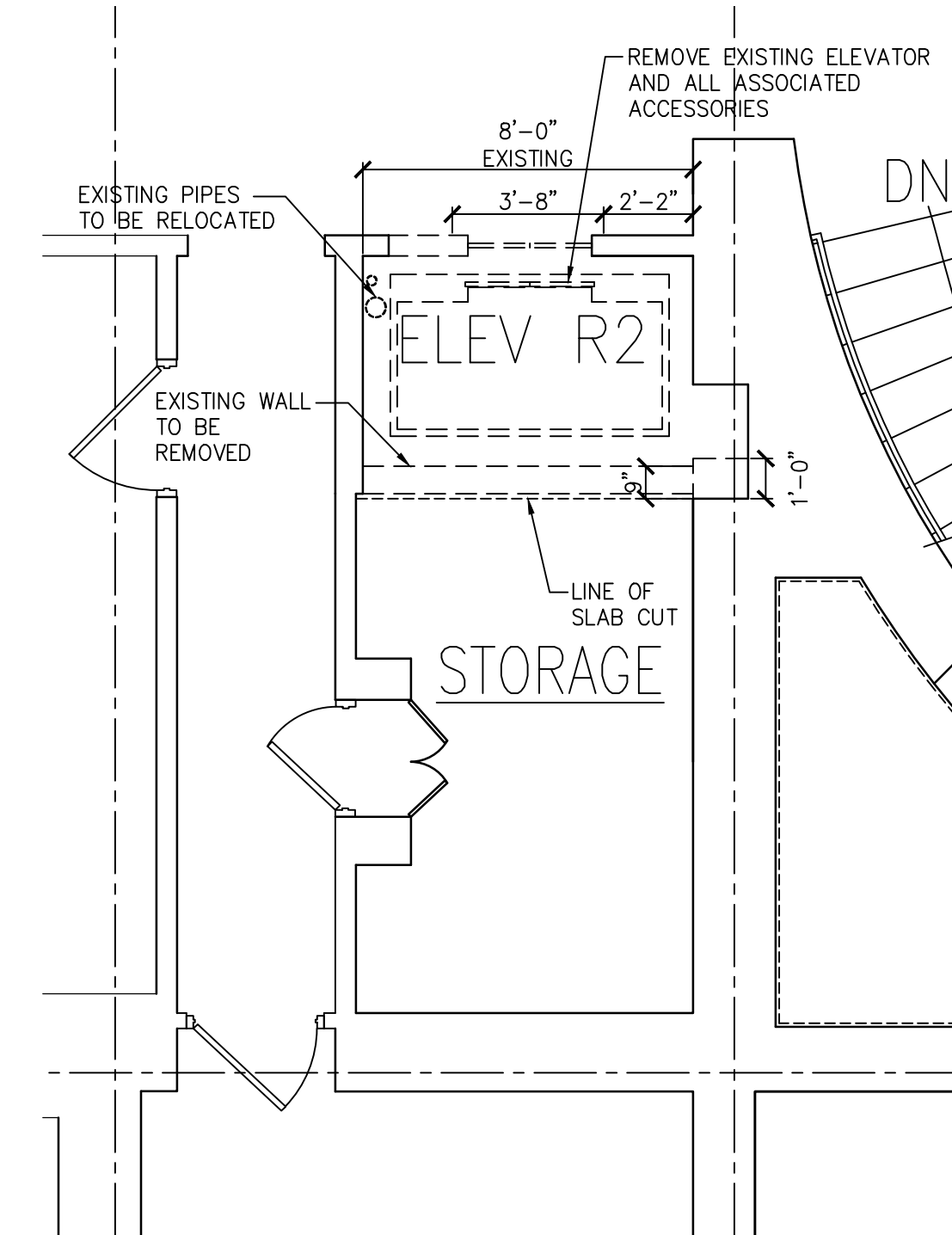
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05.31.17	100% CD SUBMIT	MMC	FJM						
08.30.17	ISSUED FOR BID	MC	FM						

DATE: 05-31-17
SCALE: AS SHOWN
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JOB NO: 2141152
SHEET: 12 OF: 118
DWG. NO:

D.100G

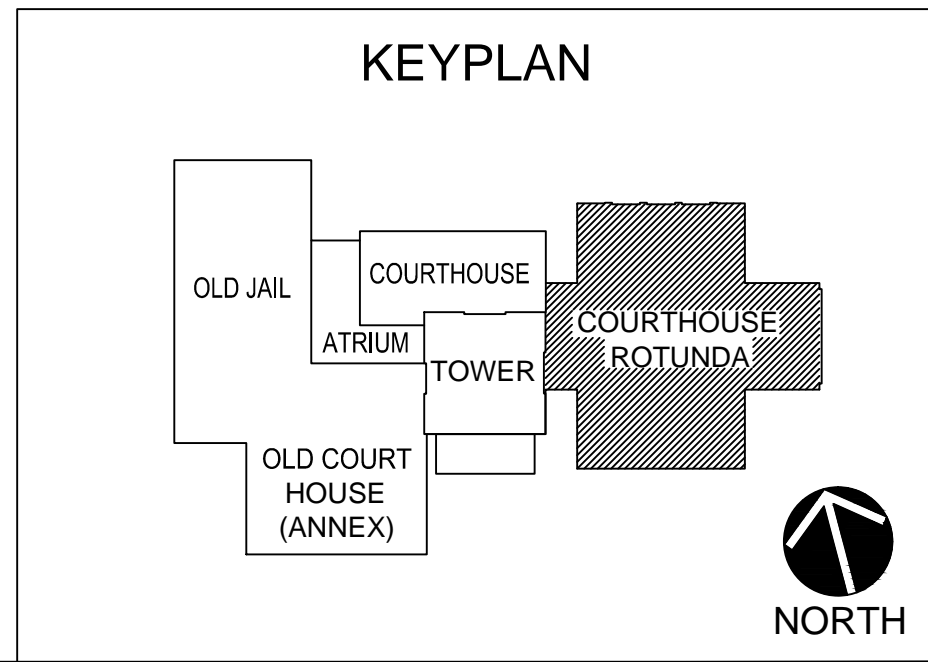


1 FIRST FLOOR DEMOLITION PLAN
D.101 1/8" = 1'-0"



2 ENLARGED FLOOR DEMOLITION PLAN
D.101 1/4" = 1'-0"

- ### DEMOLITION KEYNOTES
1. REMOVE EXIST. DOOR AND ALL ITS COMPONENTS (I.E. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
 2. REMOVE EXIST. WINDOW SYSTEM. PREPARE OPENING FOR INFILL / NEW INTAKE METAL LOUVER (SEE MECH'L PLAN)
 6. REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
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 12. SAW-CUT EXISTING SLAB FOR NEW DUCT CHASE, REFER TO MECHANICAL DWG.
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 23. EXISTING WALL SYSTEM TO REMAIN, TYP.
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 33. PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
 34. REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
 35. PARTIAL WALL TO BE REMOVED & TO RECEIVE NEW WALL ASSEMBLY.
 36. REMOVE EXISTING WOOD RAMP
 38. EXISTING MECH./ELECT./PLUMBING EQUIPMENT TO BE REMOVED OR RELOCATED. REFER TO M.E.P. DWG'S. FOR LOCATION.
 39. REPLACE EXISTING DOUBLE DOOR AND ITS ASSEMBLY. PREPARE TO RECEIVE NEW DOOR & WALL INFILL.
 40. EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF EXISTING.
 41. RELOCATE EXISTING PIPE OBSTRUCTING EGRESS
 42. REMOVE EXISTING EXTERIOR WINDOW, PREPARE TO RECEIVE NEW EXIST DOOR.
 43. SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
 44. REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
 45. REMOVE EXISTING STEEL STAIR INSIDE EXISTING CHASE.
 46. SAW CUT PLASTER CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE), RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH PLASTER TO MATCH EXISTING.
 47. REMOVE PLASTER CEILING TO ALLOW INSTALLATION OF SPRINKLER HEADS FROM ATTIC SPACE ABOVE, TYP.
 48. CONTRACTOR TO COORDINATE CORE DRILLING OF FLOORS FOR NEW PIPING WITH GENERAL CONTRACTOR. REFER TO MEP DWGS.
 49. EXISTING CEILING GRID TO BE REMOVED WHEN TEMPORARY EGRESS STAIR IS PLACED. MIN. HEAD RM. HT. IS 7'-6" AT TOP OF LANDING.
 50. G.C. IS TO CAREFULLY REMOVE EXISTING WINDOW AND PANELS INDICATED AND STORE IN A SAFE AREA. OPENING IS TO BE PREPARED AND RECEIVE TEMPORARY EXIT DOOR. GC IS TO REINSTALL WHEN WORK IS COMPLETE.
 51. GC TO COORDINATE WITH CLIENT THE REMOVAL AND STORAGE OF EXISTING FILES.



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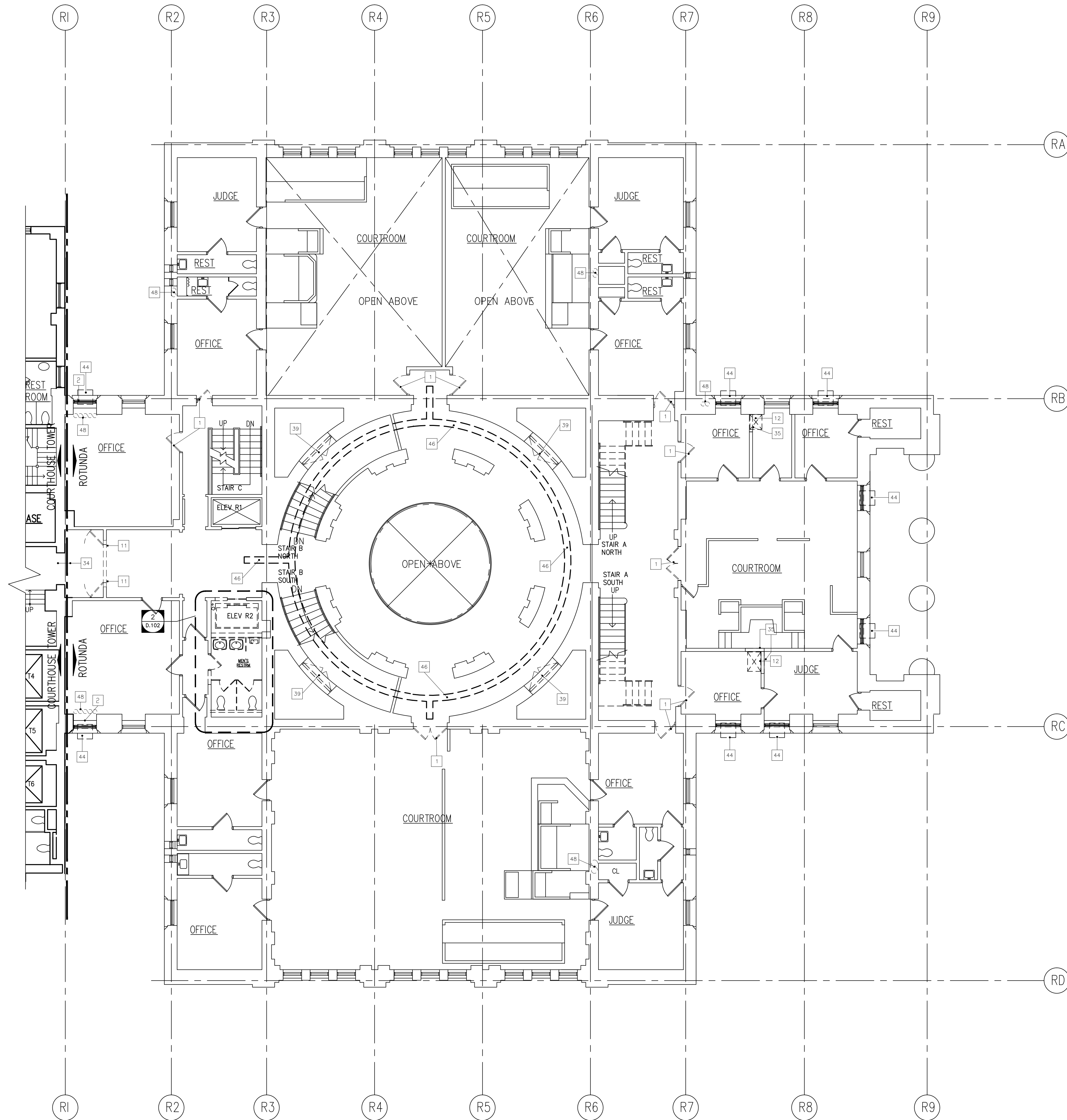


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

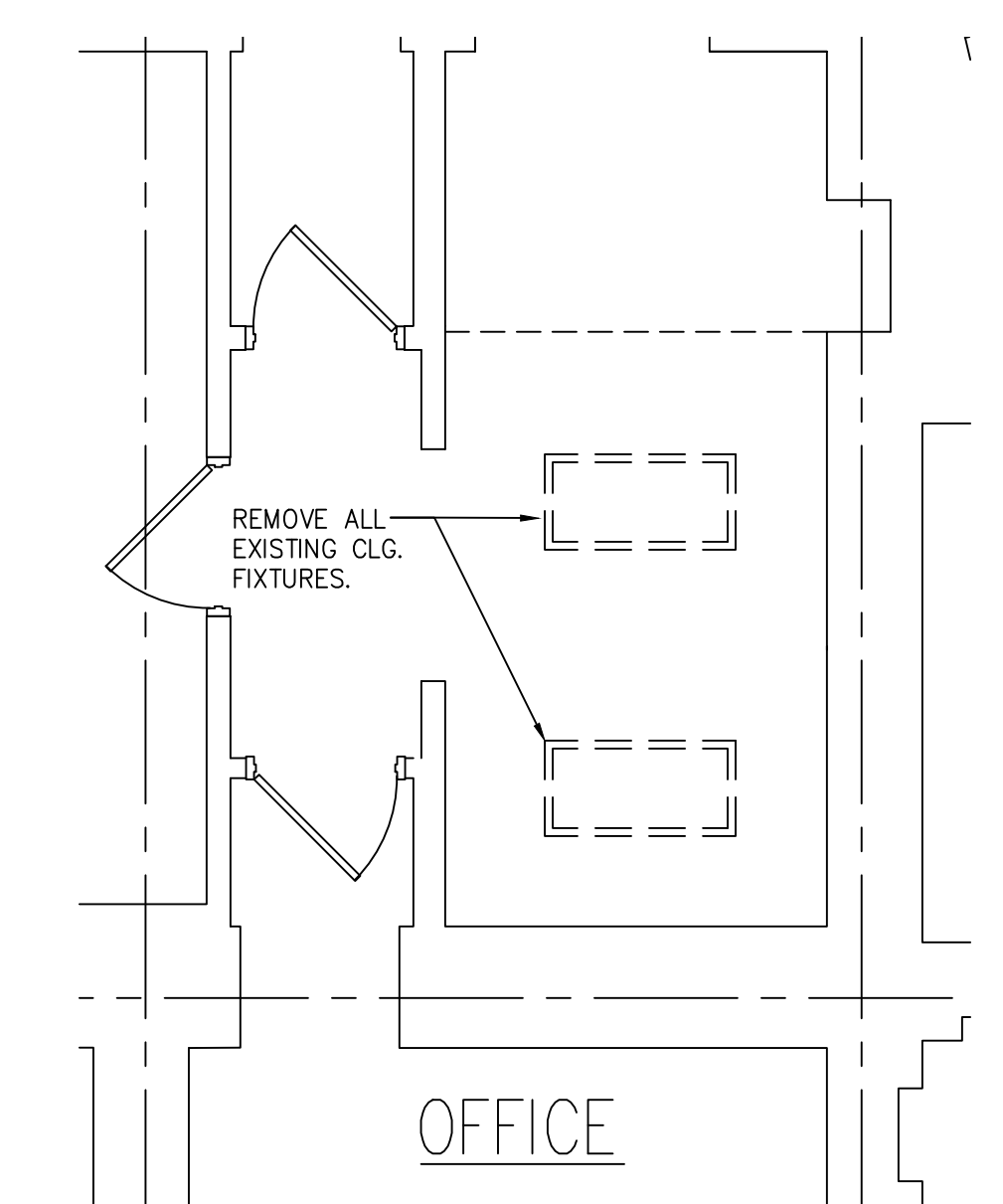
SHEET CONTENTS:
FIRST FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	13 OF: 118
								DWG. NO	

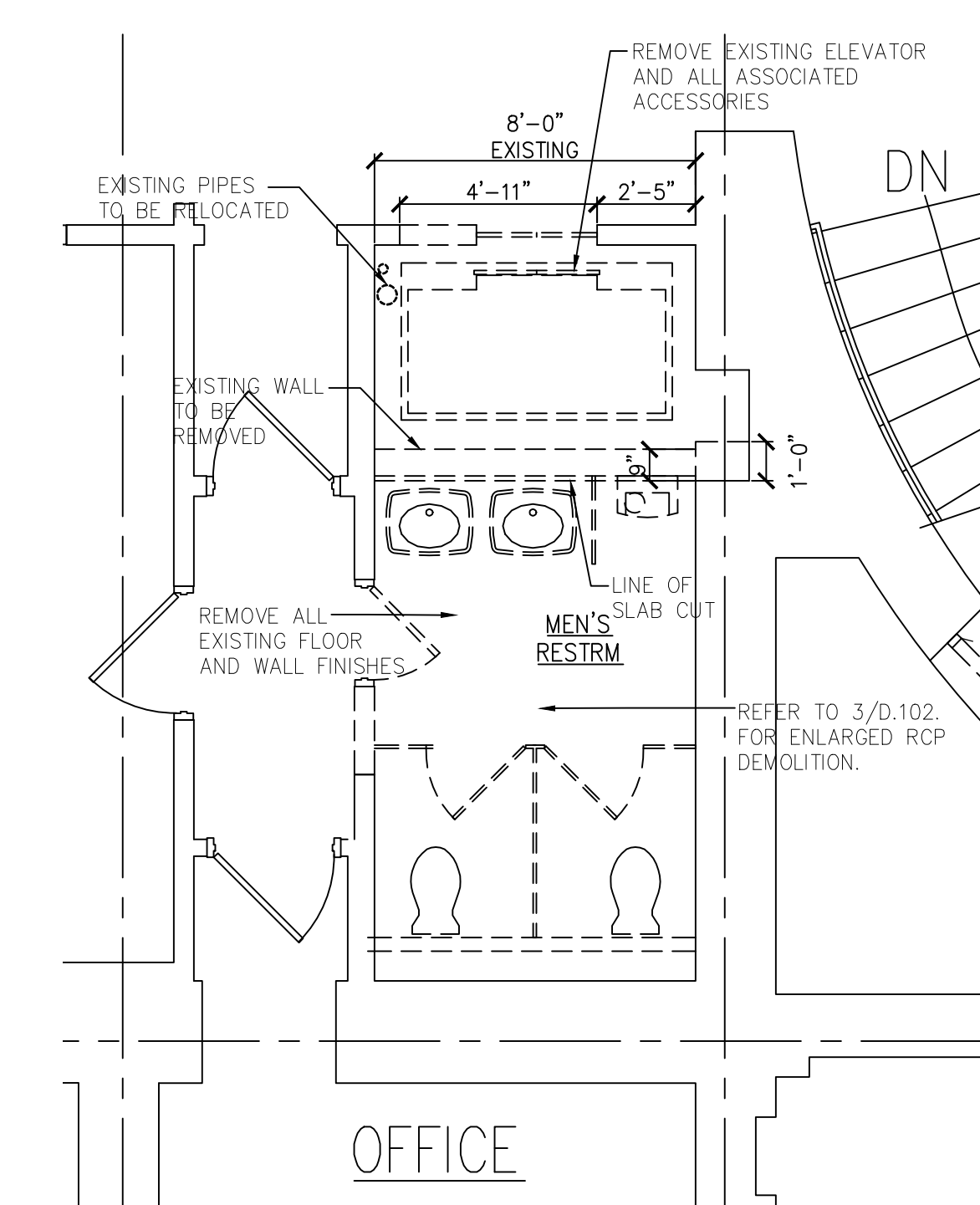
D.101



1 SECOND FLOOR DEMOLITION PLAN
D.102 1/8" = 1'-0"



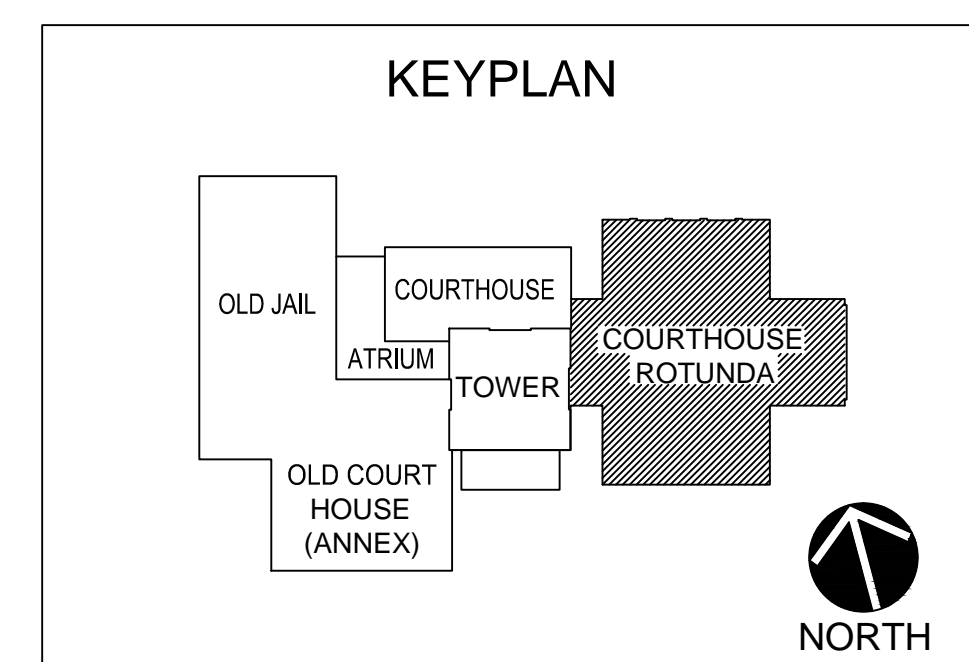
3 ENLARGED RCP DEMOLITION
D.102 1/4" = 1'-0"



46 ENLARGED FLOOR DEMOLITION PLAN
D.102 1/4" = 1'-0"

DEMOLITION KEYNOTES

1. REMOVE EXIST. DOOR AND ALL ITS COMPONENTS (I.E. DOOR JAMBES, SADDLES, HARDWARE, ETC.)
2. REMOVE EXIST. WINDOW SYSTEM. PREPARE OPENING FOR INFILL / NEW INTAKE METAL LOUVER (SEE MECH'L PLAN)
6. REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
10. EXIST. ROOF ACCESS LADDER TO REMAIN
11. REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR. SEE DOOR SCHEDULE.
12. SAW-CUT EXISTING SLAB FOR NEW DUCT CHASE. REFER TO MECHANICAL DWG.
- 12A. RELOCATE EXISTING PIPING, AND ELECTRICAL WIRING TO NEW LOCATION REFER TO ELECTRICAL DRAWINGS.
13. EXIST. COLUMN TO REMAIN. CONTRACTOR SHALL USE EXTREME CARE NEAR STRUCTURE.
16. EXIST STAIR, RAILS AND GUARDS TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
17. REMOVE LIGHTING FIXTURES @ DESIGNATED AREAS. SEE RCP AND ELECTRICAL DWGS.
18. DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
19. EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
20. EXISTING ELECT./MECH./PLUMBING UNIT TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
21. PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
22. EXISTING STRUCTURE TO REMAIN, TYP. UNLESS OTHERWISE NOTED.
23. EXISTING WALL SYSTEM TO REMAIN, TYP.
26. EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWGS
32. EXISTING DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
33. PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
34. REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
35. PARTIAL WALL TO BE REMOVED & TO RECEIVE NEW WALL ASSEMBLY.
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43. SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
44. REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
45. REMOVE EXISTING STEEL STAIR INSIDE EXISTING CHASE.
46. SAW CUT PLASTER CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE). RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH PLASTER TO MATCH EXISTING.
47. REMOVE PLASTER CEILING TO ALLOW INSTALLATION OF SPRINKLER HEADS FROM ATTIC SPACE ABOVE. TYP.
48. CONTRACTOR TO COORDINATE CORE DRILLING OF FLOORS FOR NEW PIPING WITH GENERAL CONTRACTOR. REFER TO MEP DWGS.



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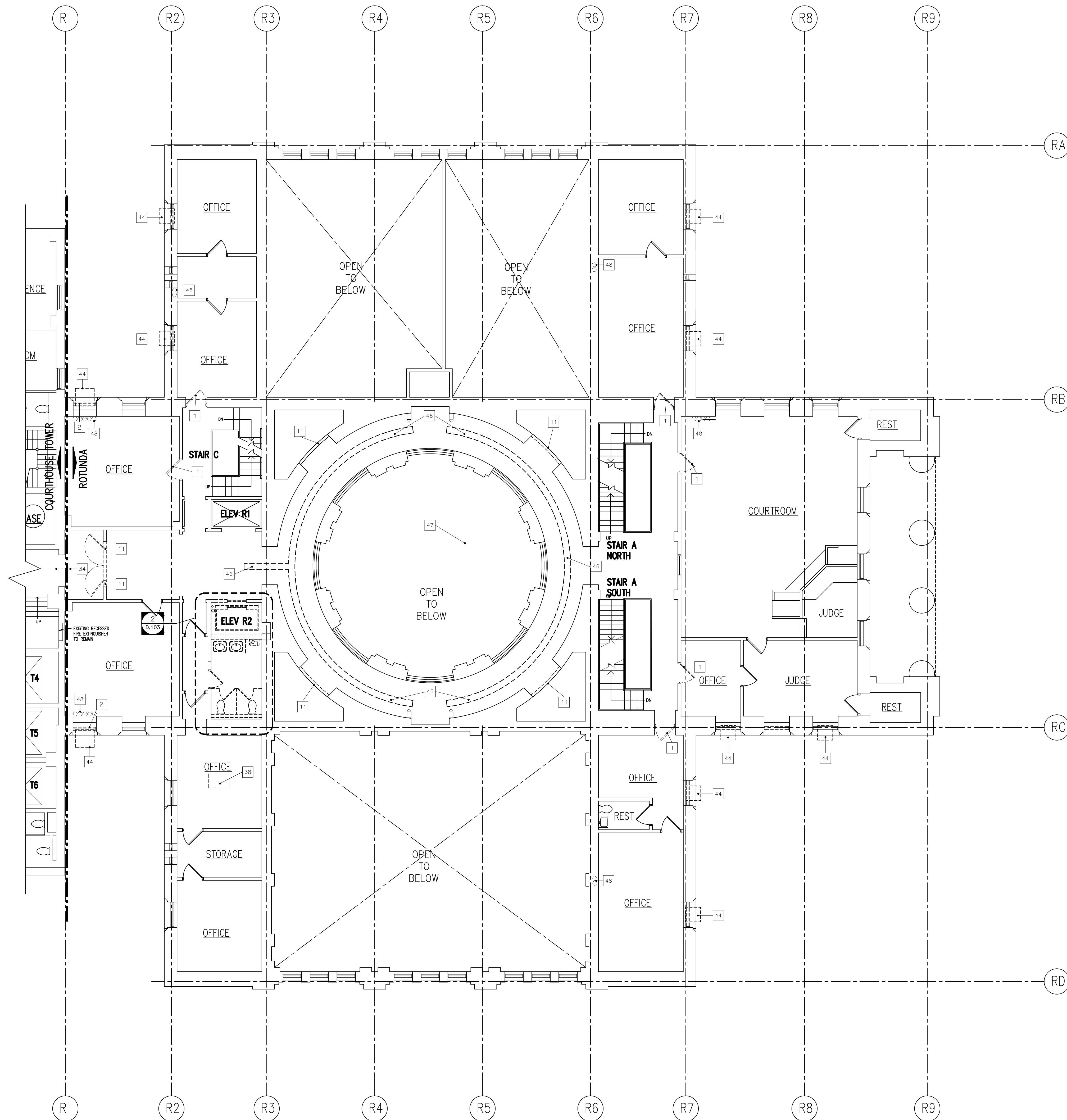


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

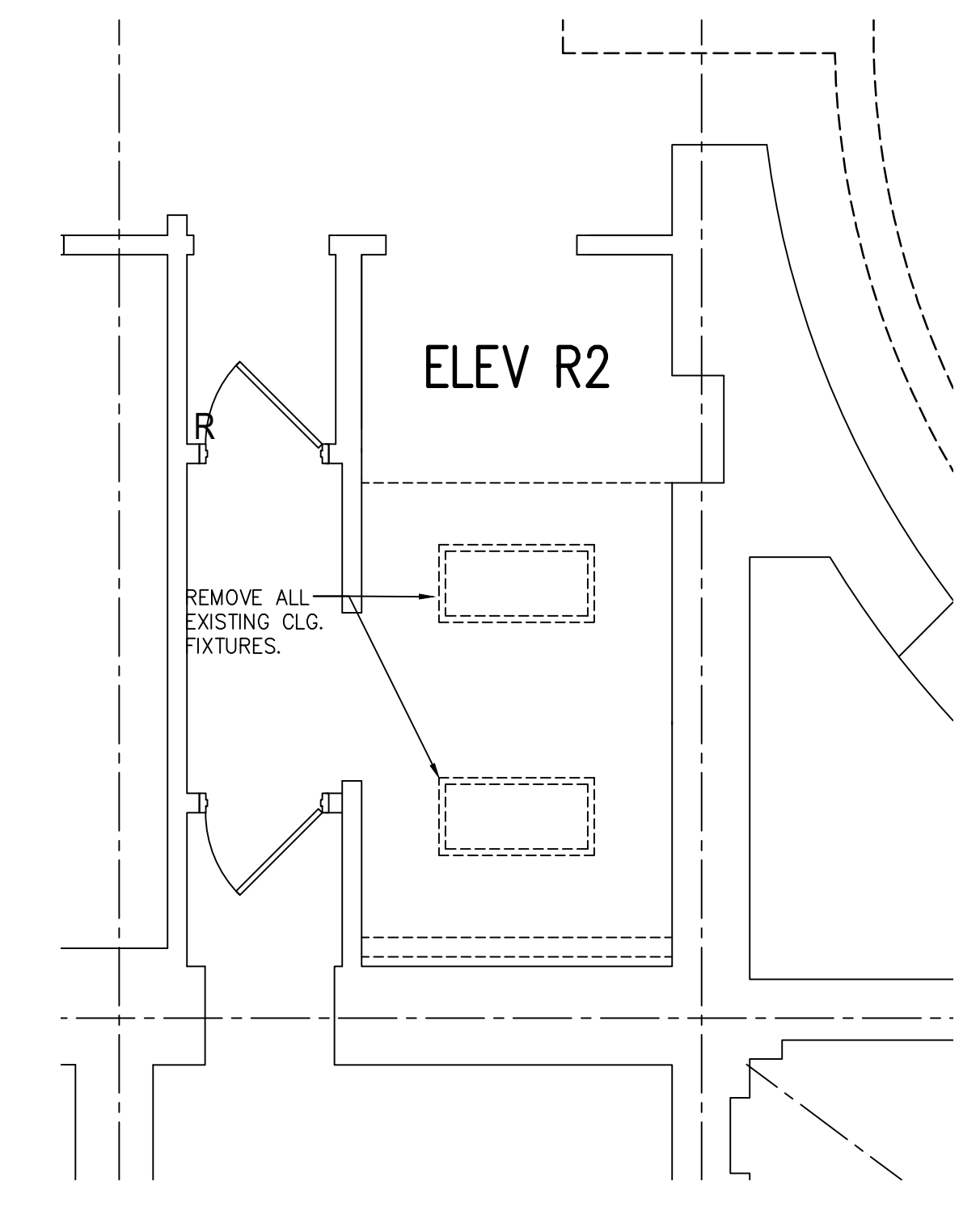
SHEET CONTENTS:
SECOND FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	14 OF: 118
								DWG. NO	

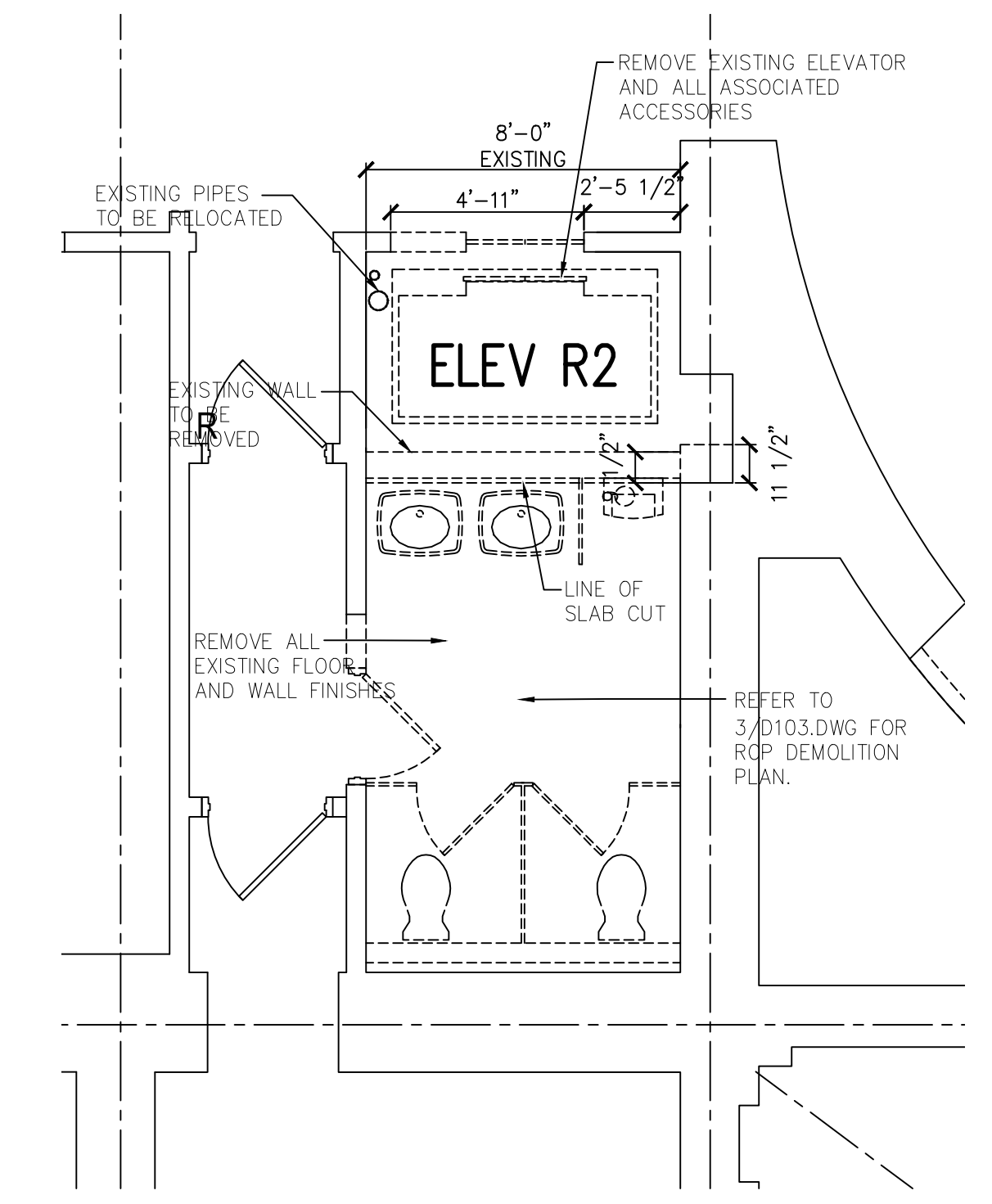
D.102



1 THIRD FLOOR DEMOLITION PLAN
D.103 1/8" = 1'-0"

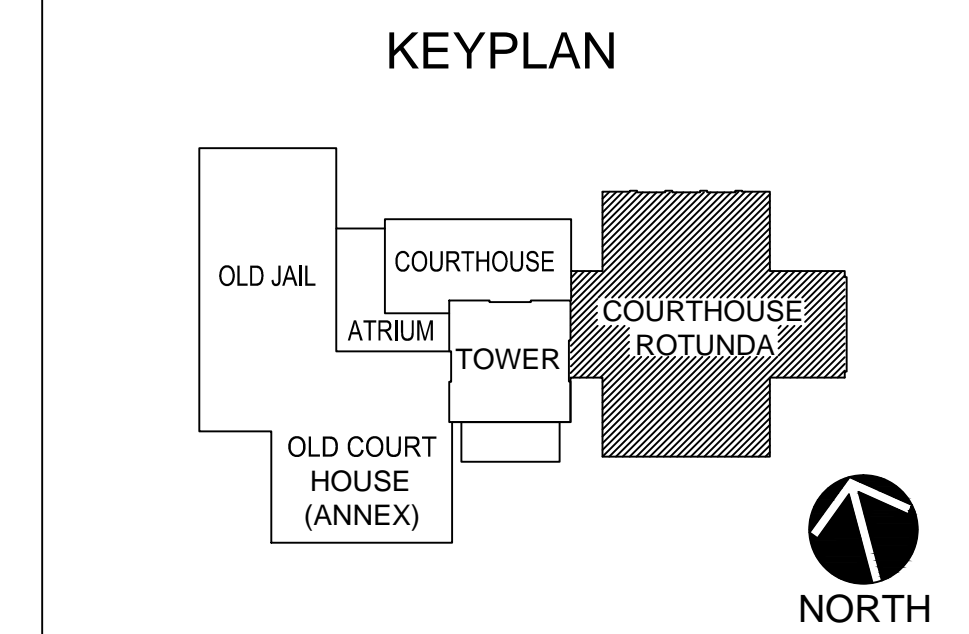


3 ENLARGED RCP DEMO PLAN
D.103 1/4" = 1'-0"



2 ENLARGED FLOOR DEMOLITION PLAN
D.103 1/4" = 1'-0"

- ### DEMOLITION KEYNOTES
1. REMOVE EXIST. DOOR AND ALL ITS COMPONENTS (I.E. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
 2. REMOVE EXIST. WINDOW SYSTEM. PREPARE OPENING FOR INFILL / NEW INTAKE METAL LOUVER (SEE MECH'L PLAN)
 6. REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
 10. EXIST. ROOF ACCESS LADDER TO REMAIN
 11. REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR, SEE DOOR SCHEDULE.
 12. SAW-CUT EXISTING SLAB FOR NEW DUCT CHASE, REFER TO MECHANICAL DWG.
 - 10A. RELOCATE EXISTING PIPING, AND ELECTRICAL WIRING TO NEW LOCATION REFER TO ELECTRICAL DRAWINGS.
 13. EXIST. COLUMN TO REMAIN. CONTRACTOR SHALL USE EXTREME CARE NEAR STRUCTURE.
 16. EXIST STAIR, RAILS AND GUARDS TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
 17. REMOVE LIGHTING FIXTURES @ DESIGNATED AREAS, SEE RCP AND ELECTRICAL DWGS.
 18. DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
 19. EXISTING FIRE EXTINGUISHER CABINET TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGES.
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 21. PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
 22. EXISTING STRUCTURE TO REMAIN, TYP. UNLESS OTHERWISE NOTED.
 23. EXISTING WALL SYSTEM TO REMAIN, TYP.
 26. EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWG'S
 32. EXISTING DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
 33. PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
 34. REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
 35. PARTIAL WALL TO BE REMOVED & TO RECEIVE NEW WALL ASSEMBLY.
 36. REMOVE EXISTING WOOD RAMP
 38. EXISTING MECH./ELECT./PLUMBING EQUIPMENT TO BE REMOVED OR RELOCATED. REFER TO M.E.P. DWG'S. FOR LOCATION.
 39. REPLACE EXISTING DOUBLE DOOR AND ITS ASSEMBLY, PREPARE TO RECEIVE NEW DOOR & WALL INFILL.
 40. EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO Mechanical DWG'S. INFILL PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
 41. RELOCATE EXISTING PIPE OBSTRUCTING EGRESS
 42. REMOVE EXISTING EXTERIOR WINDOW, PREPARE TO RECEIVE NEW EXIT DOOR.
 43. SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
 44. REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
 45. REMOVE EXISTING STEEL STAIR INSIDE EXISTING CHASE.
 46. SAW CUT PLASTER CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE). RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH PLASTER TO MATCH EXISTING.
 47. REMOVE PLASTER CEILING TO ALLOW INSTALLATION OF SPRINKLER HEADS FROM ATTIC SPACE ABOVE, TYP.
 48. CONTRACTOR TO COORDINATE CORE DRILLING OF FLOORS FOR NEW PIPING WITH GENERAL CONTRACTOR. REFER TO MEP DWGS.
 49. EXISTING CEILING GRID TO BE REMOVED WHEN TEMPORARY EGRESS STAIR IS PLACED. MIN. HEAD RM. HT. IS 7'-6" AT TOP OF LANDING.
 50. G.C. IS TO CAREFULLY REMOVE EXISTING WINDOW AND PANELS INDICATED AND STORE IN A SAFE AREA. OPENING IS TO BE PREPARED AND RECEIVE TEMPORARY EXIT DOOR. GC IS TO REINSTALL WHEN WORK IS COMPLETE.
 51. GC TO COORDINATE WITH CLIENT THE REMOVAL AND STORAGE OF EXISTING FILES.



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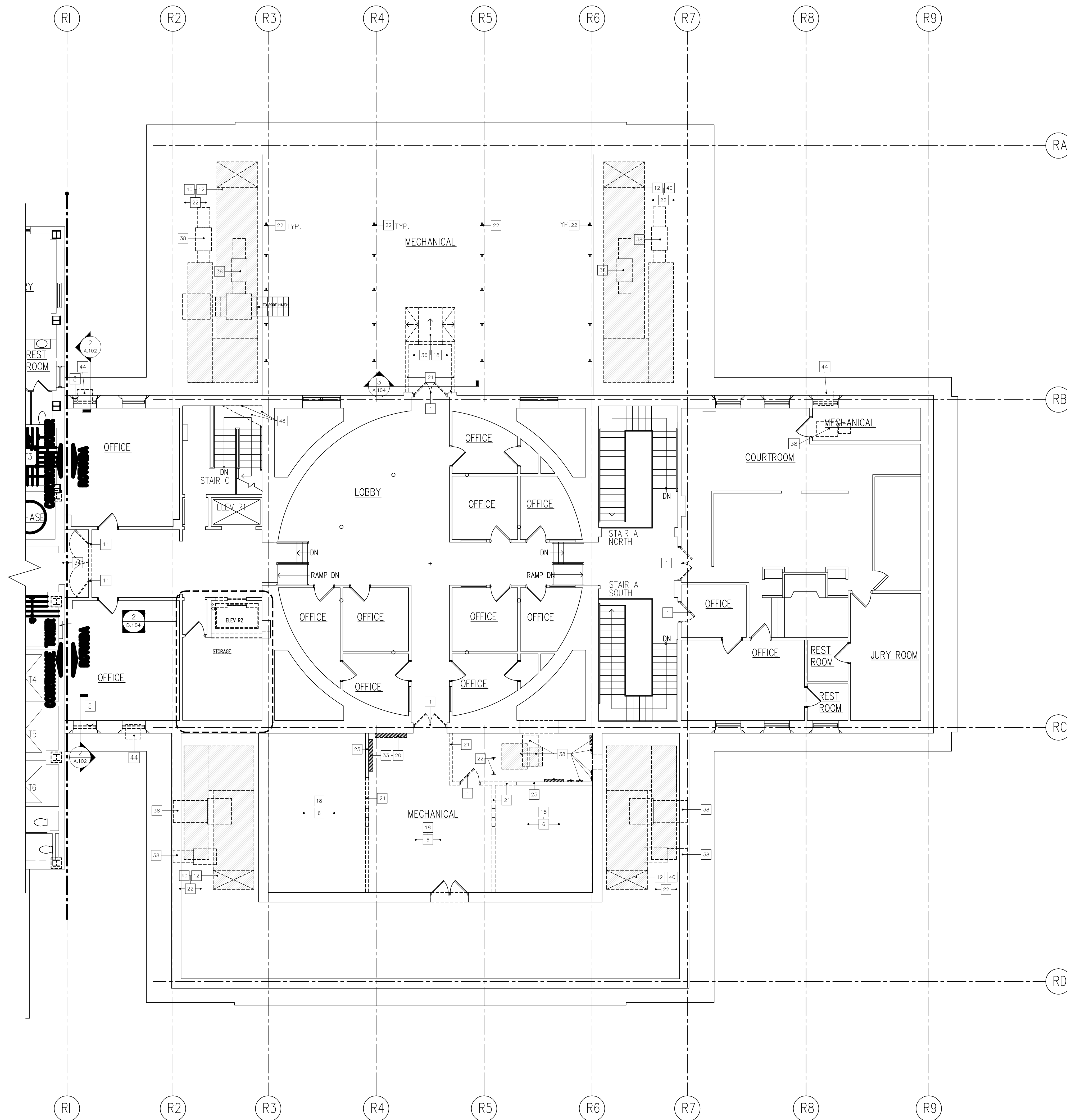


PROJECT:
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

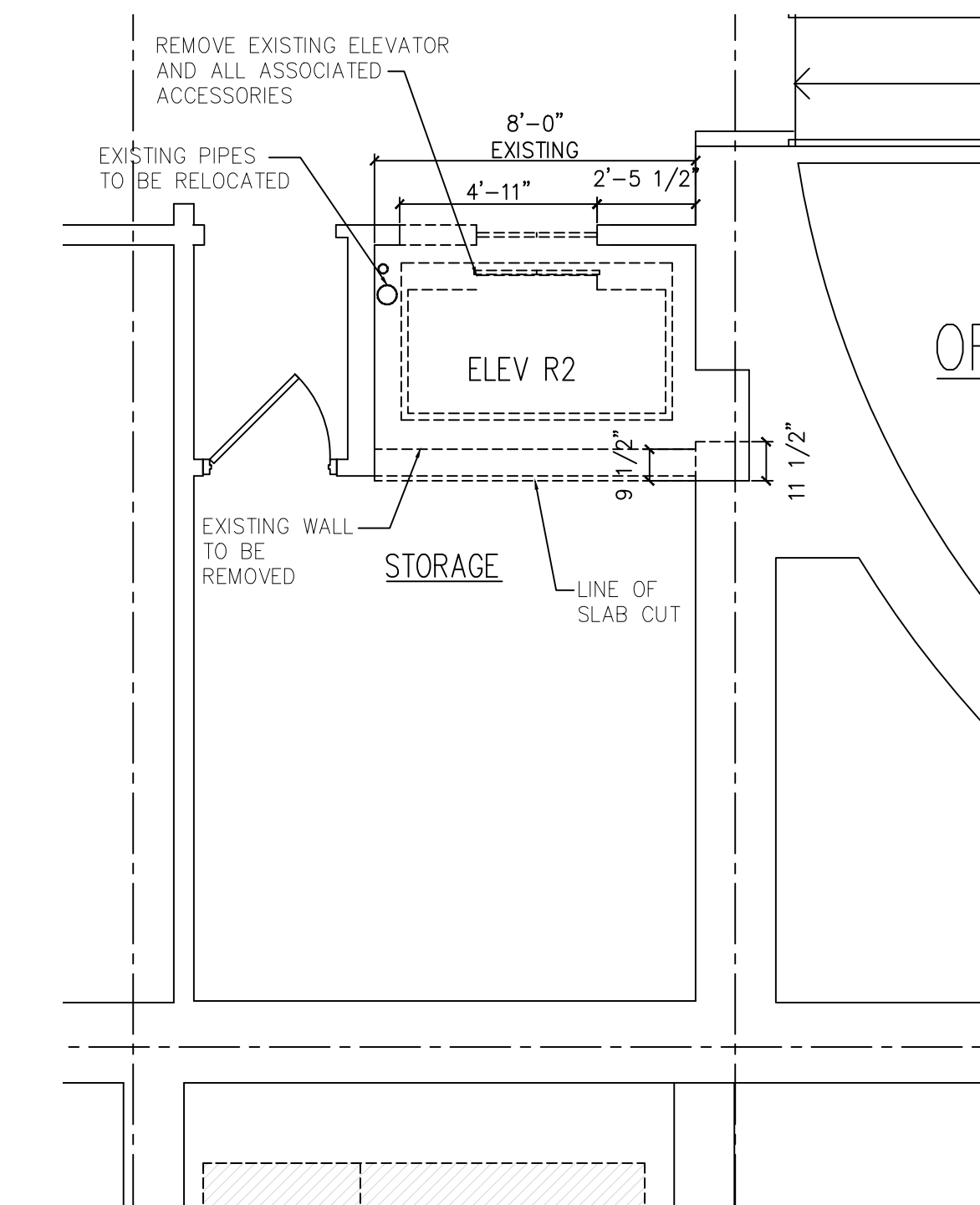
SHEET CONTENTS:
THIRD FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	15 OF: 118
								DWG. NO	

D.103

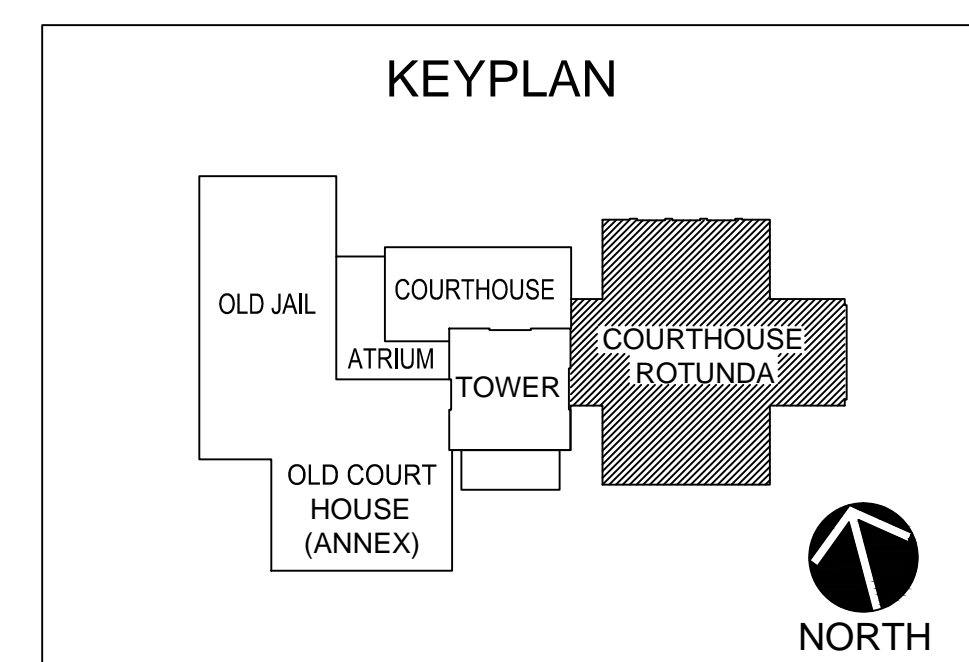


1 FOURTH FLOOR DEMOLITION PLAN
D.104 1/8" = 1'-0"



2 ENLARGED FLOOR DEMOLITION PLAN
D.104 1/4" = 1'-0"

- ### DEMOLITION KEYNOTES
- 1 REMOVE EXIST. DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
 - 2 REMOVE EXIST. WINDOW SYSTEM. PREPARE OPENING FOR INFILL/ NEW INTAKE METAL LOUVER. REFER TO M400B, 30X42 L-2 & A100B.
 - 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
 - 10 EXIST. ROOF ACCESS LADDER TO REMAIN
 - 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR. SEE DOOR SCHEDULE.
 - 12 SAW-CUT EXISTING SLAB FOR NEW DUCT CHASE, REFER TO MECHANICAL DWG.
 - 2A RELOCATE EXISTING PIPING, AND ELECTRICAL WIRING TO NEW LOCATION REFER TO ELECTRICAL DRAWINGS.
 - 15 EXIST. COLUMN TO REMAIN. CONTRACTOR SHALL USE EXTREME CARE NEAR STRUCTURE.
 - 16 EXIST STAIR, RAILS AND GUARDS TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
 - 17 REMOVE LIGHTING FIXTURES @ DESIGNATED AREAS. SEE RCP AND ELECTRICAL DWGS.
 - 18 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING / FLOOR FINISHES @ ANY AREA DESIGNATED TO RECEIVE NEW WORK.
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 - 21 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED) PATCH AND REPAIR OPENING AND PAINT TO MATCH EXISTING ADJACENT WALL.
 - 23 EXISTING STRUCTURE TO REMAIN, TYP. UNLESS OTHERWISE NOTED.
 - 25 EXISTING WALL SYSTEM TO REMAIN, TYP.
 - 26 EXISTING SPRINKLER SYSTEM TO REMAIN. REFER TO MEP DWG'S
 - 32 EXISTING DOOR SHALL BE REMOVED AND REINSTALLED TO SWING IN REVERSE DIRECTION. DOOR COMPONENTS MAY GET DAMAGED DURING REMOVAL AND SHALL GET REPLACED BY SIMILAR AS APPROVED BY ARCHITECT.
 - 33 PROTECT EXIST. MECH., PIPES, CONDUITS, ETC. FROM DAMAGE DURING CONSTRUCTION.
 - 34 REMOVE EXIST. ROLL DOWN GRILLE ENCLOSURE SYSTEM.
 - 35 PARTIAL WALL TO BE REMOVED & TO RECEIVE NEW WALL ASSEMBLY.
 - 36 REMOVE EXISTING WOOD RAMP
 - 38 EXISTING MECH./ELECT./ PLUMBING EQUIPMENT TO BE REMOVED OR RELOCATED. REFER TO MEP DWG'S FOR LOCATION.
 - 39 REPLACE EXISTING DOUBLE DOOR AND ITS ASSEMBLY, PREPARE TO RECEIVE NEW DOOR & WALL INFILL.
 - 40 EXISTING MECHANICAL UNIT TO BE REMOVED FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
 - 41 RELOCATE EXISTING PIPE OBSTRUCTING EGRESS
 - 42 REMOVE EXISTING EXTERIOR WINDOW, PREPARE TO RECEIVE NEW EXIT DOOR.
 - 43 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS. SEE MECH'L DWGS.
 - 44 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
 - 45 REMOVE EXISTING STEEL STAIR INSIDE EXISTING CHASE.
 - 46 SAW CUT PLASTER CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE). RUN SPRINKLER MAIN ABOVE CEILING 1/2" RECESSED & CONCEALED SPRINKLER HEADS. PATCH PLASTER TO MATCH EXISTING.
 - 47 REMOVE PLASTER CEILING TO ALLOW INSTALLATION OF SPRINKLER HEADS FROM ATTIC SPACE ABOVE, TYP.



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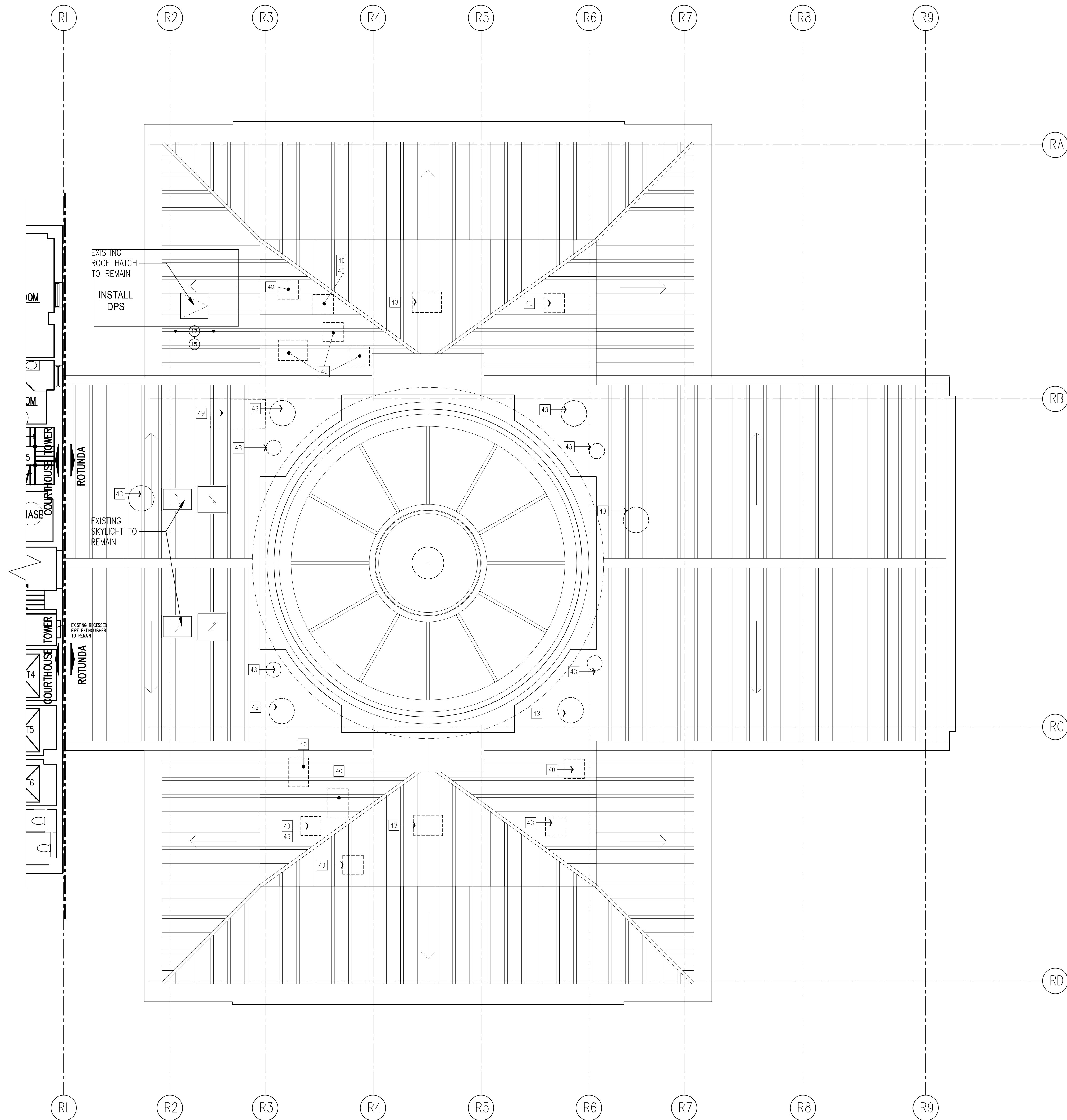


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FOURTH FLOOR DEMOLITION PLAN

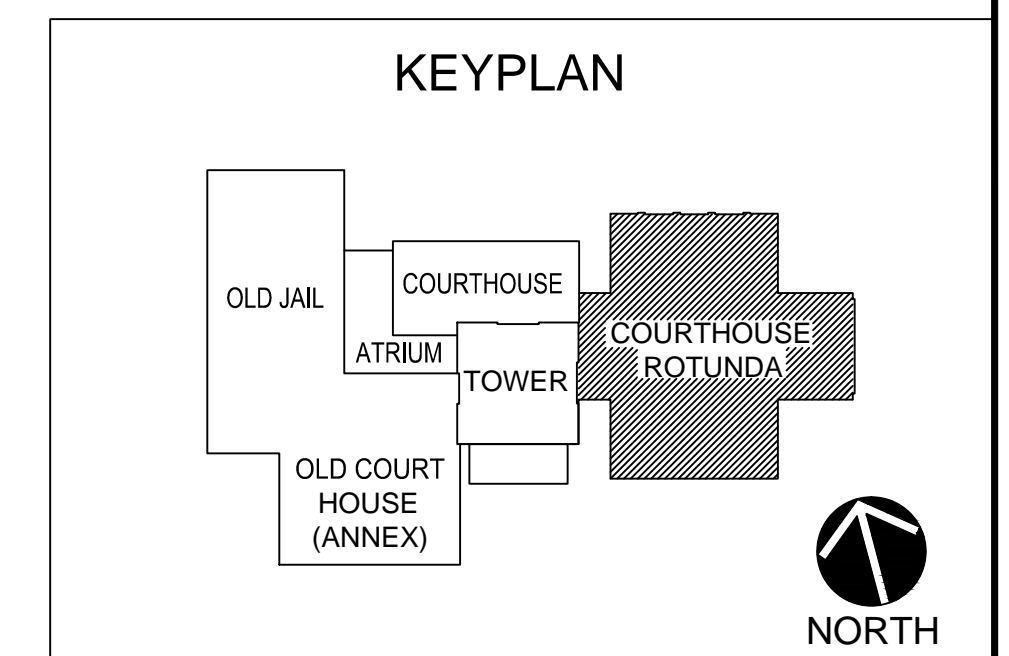
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DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	05-31-17	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						WTJ
10.30.15	95% CD UPDATES	KD	FM						NJN
05.31.17	100% CD SUBMIT	MMC	FJM						2141152
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 16 OF: 118
									DWG. NO

D.104



DEMOLITION KEYNOTES

- 1 REMOVE EXIST. DOOR AND ALL ITS COMPONENTS (i.e. DOOR JAMBS, SADDLES, HARDWARE, ETC.)
- 2 REMOVE EXIST. WINDOW SYSTEM. PREPARE OPENING FOR INFILL / NEW INTAKE METAL LDUVER (SEE MECH'L PLAN)
- 6 REMOVE EXIST. FLOOR TILE FINISH AND GRIND SMOOTH EXIST. CONCRETE SLAB TO RECEIVE NEW FINISHES. FINISHES TO BE SELECTED BY COUNTY.
- 10 EXIST. ROOF ACCESS LADDER TO REMAIN
- 11 REMOVE PORTION OF EXISTING WALL (SHOWN DASHED) AND PREPARE NEW OPENING TO RECEIVE NEW DOOR. SEE DOOR SCHEDULE.
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- 24 RELOCATE EXISTING PIPING, AND ELECTRICAL WIRING TO NEW LOCATION REFER TO ELECTRICAL DRAWINGS.
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- 16 EXIST STAIR, RAILS AND GUARDS TO REMAIN. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO AVOID DAMAGING STAIR SYSTEM.
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- 35 PARTIAL WALL TO BE REMOVED & TO RECEIVE NEW WALL ASSEMBLY.
- 36 REMOVE EXISTING WOOD RAMP
- 38 EXISTING MECH./ ELECT./ PLUMBING EQUIPMENT TO BE REMOVED OR RELOCATED. REFER TO M.E.P. DWG'S. FOR LOCATION.
- 39 REPLACE EXISTING DOUBLE DOOR AND ITS ASSEMBLY. PREPARE TO RECEIVE NEW DOOR & WALL INFILL.
- 40 EXISTING MECHANICAL UNIT TO BE REMOVED. FOR NEW UNITS AND LOCATION REFER TO MECHANICAL DWG'S. INFILL, PATCH EXISTING ROOF OPENINGS TO MATCH EXISTING ROOF
- 41 RELOCATE EXISTING PIPE OBSTRUCTING EGRESS
- 42 REMOVE EXISTING EXTERIOR WINDOW, PREPARE TO RECEIVE NEW EXIT DOOR.
- 43 SAW-CUT EXISTING ROOF & PREPARE FOR MECHANICAL ROOF DUCT PENETRATIONS, SEE MECH'L DWGS.
- 44 REMOVE EXISTING WINDOW A/C UNITS. SEE MECH'L DWGS.
- 45 REMOVE EXISTING STEEL STAIR INSIDE EXISTING CHASE.
- 46 SAW CUT PLASTER CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING (SHOWN DOTTED LINE). RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH PLASTER TO MATCH EXISTING.
- 47 REMOVE PLASTER CEILING TO ALLOW INSTALLATION OF SPRINKLER HEADS FROM ATTIC SPACE ABOVE, TYP.
- 48 REPAIR DAMAGE CEILING & WALL FINISH TO MATCH EXISTING
- 49 REPAIR EXISTING ROOFING SYSTEM WERE LEAKAGE IS COMING FROM ROOFING TO MATCH EXISTING.



1 ROOF DEMOLITION PLAN
D.105 1/8" = 1'-0"

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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14594



PROJECT:

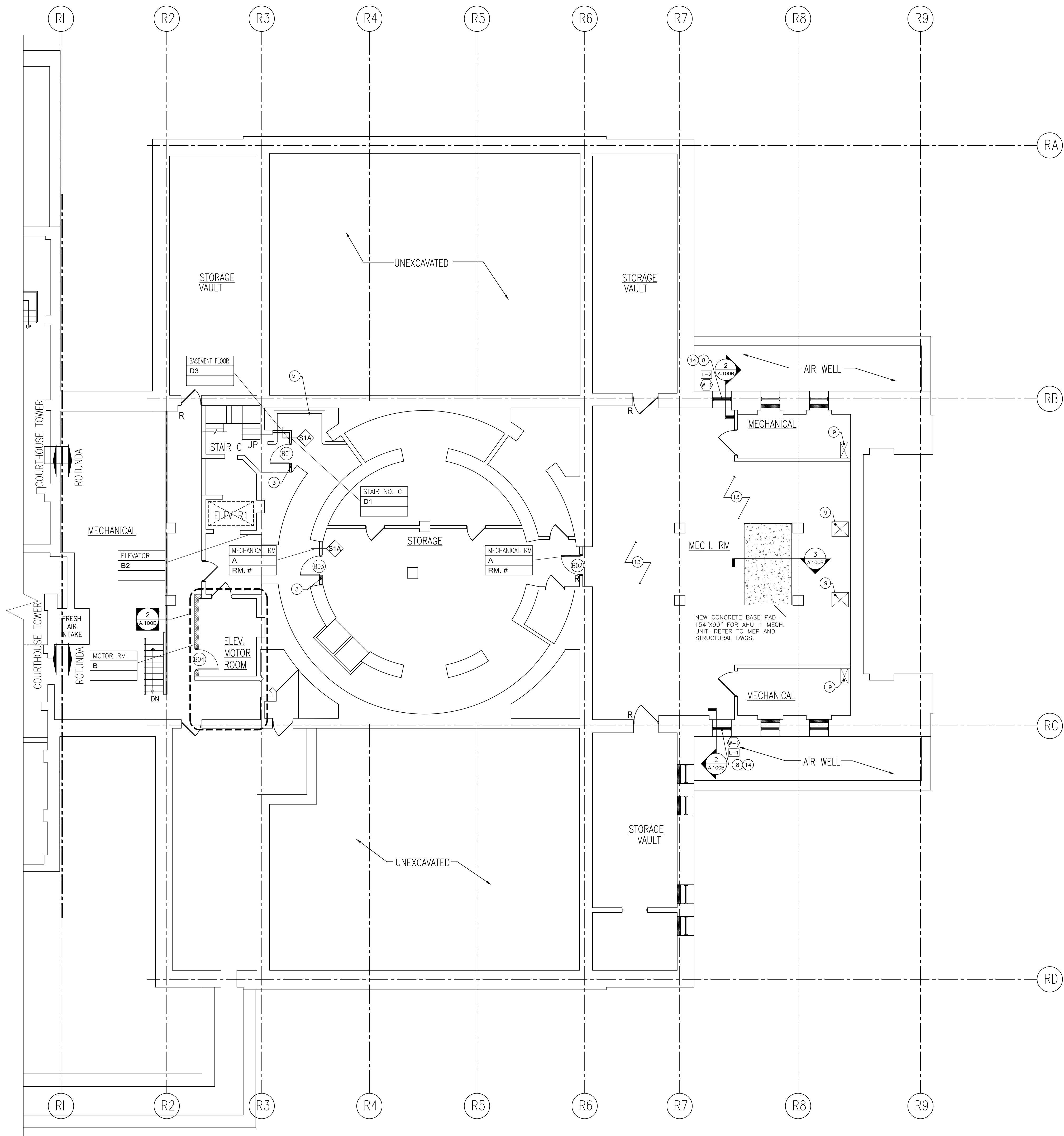
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

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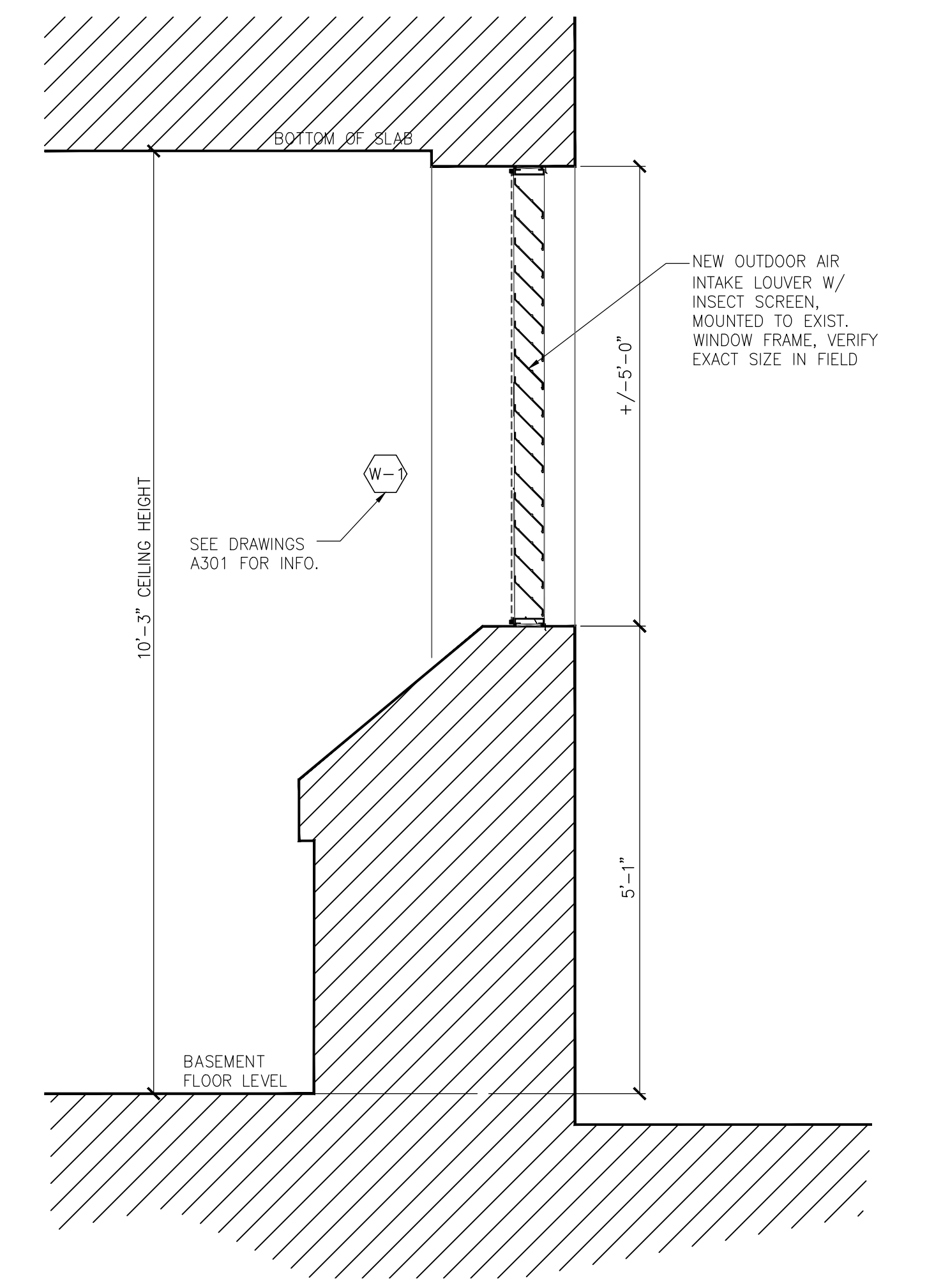
ROOF DEMOLITION PLAN

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DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	17 OF: 118
								DWG. NO	

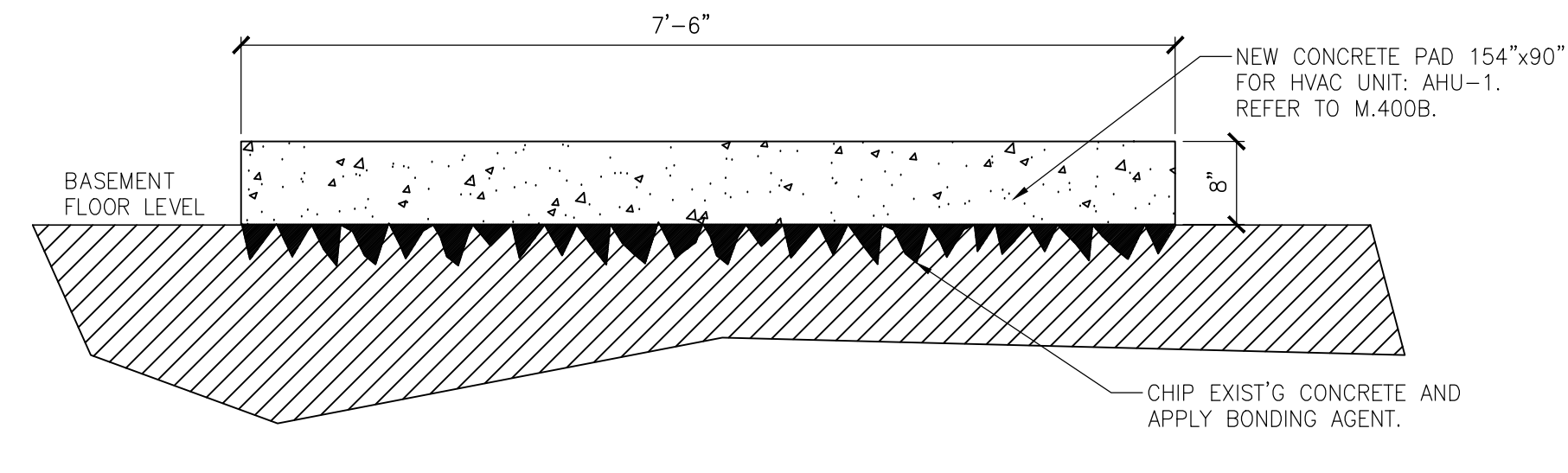
D.105



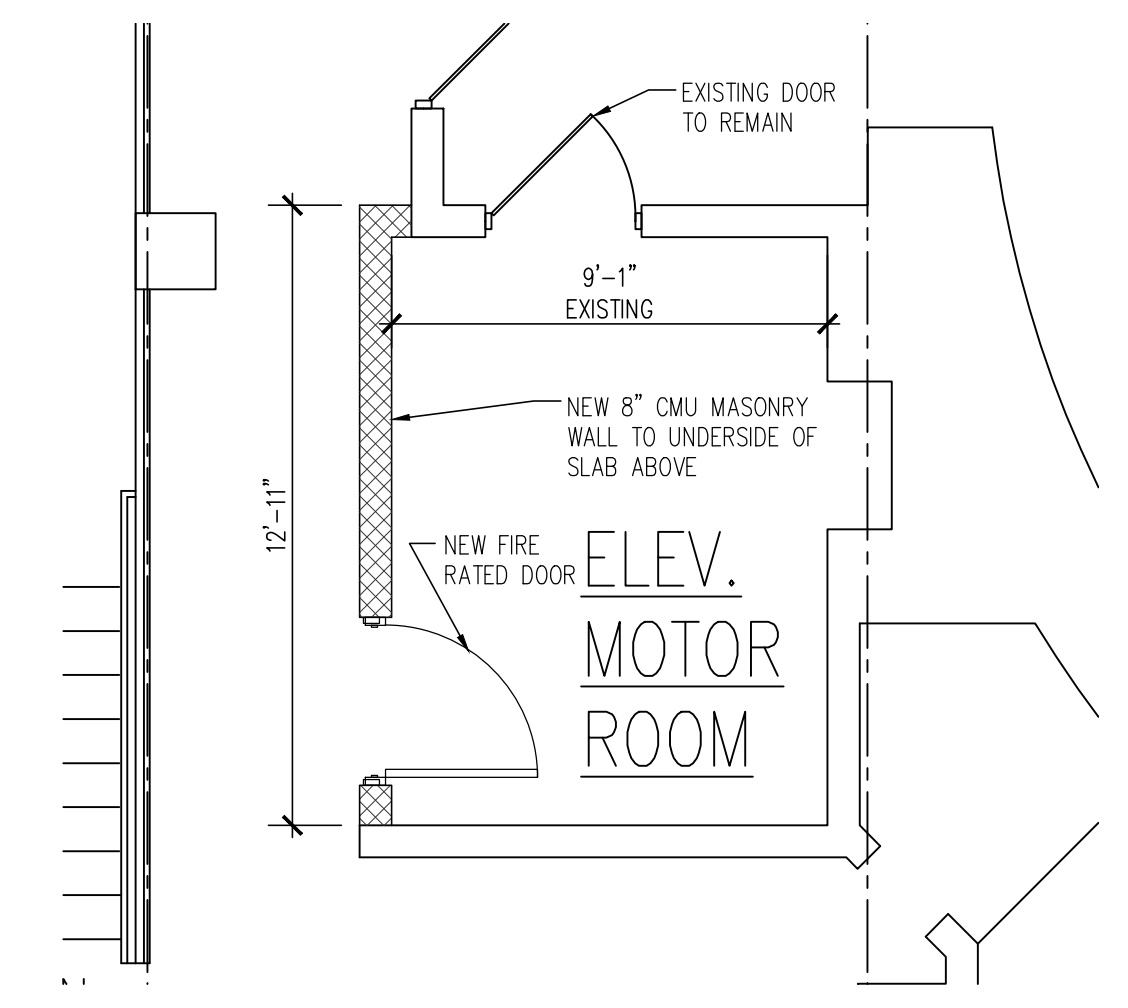
1 BASEMENT FLOOR CONSTRUCTION PLAN
A.100B 1/8" = 1'-0"



2 TYP. @ BASEMENT FLOOR WINDOW SECTION
A.100B SCALE: 3/4"=1'-0"



3 HVAC UNIT CONCRETE PAD SECTION
A.100B SCALE: 3/4"=1'-0"



2 ENLARGED FLOOR CONSTRUCTION PLAN
A.100B 1/4" = 1'-0"

CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES / OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CARPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER A103, A301 & M.400G.
- 9 CONTRACTOR SHALL COORDINATE SAW CUTTING OF THE FLOOR AS REQUIRED FOR NEW MECH'L DUCT OPENING WITH GENERAL CONTRACTOR.
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE WINDOWS.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
- 13 GS TO COORDINATE WITH CLIENT THE RELOCATE OF ALL STORAGE FILES & SHELVING PRIOR TO START OF CONSTRUCTION.
- 14 OVERALL WINDOW SIZE IS 36" X 60". MECHANICAL CLEARANCE FOR L-1 & L-2 IS 30"X40". PROVIDE BLANK PLATE AROUND NEW LOUVER.
- 15 REMOVE SOFFIT FOR INSTALLATION SPRINKLERS & MECHANICAL DUCTS.
- 16 NEW OPENING IN WALL FOR L-1 LOUVER, 36X24. REFER TO M400G.

LEGEND

ROOM ID SIGN	A
ELEVATOR ID SIGN	B
RESTROOM ID SIGN	C
STAIR/EXIT ID SIGN	D
AREA OF REFUGE ID SIGN	E
CHASE ACCESS ID SIGN	F

SYMBOLS

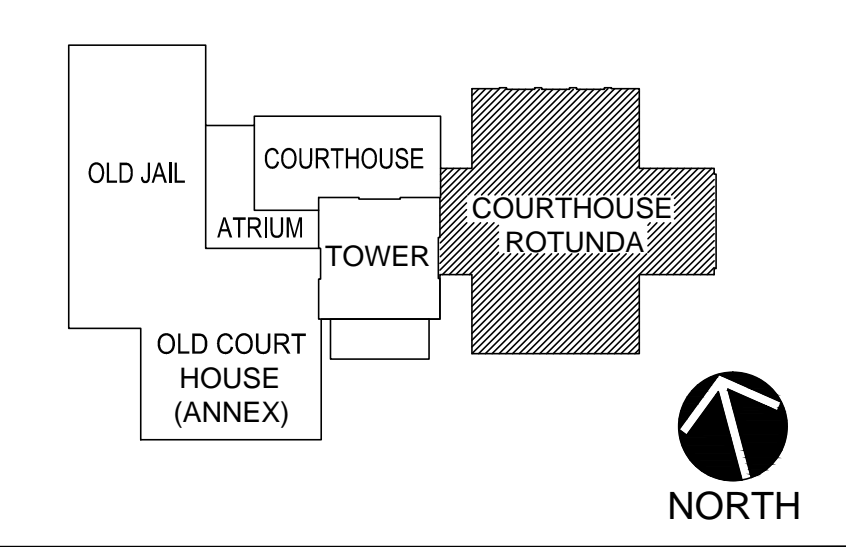
#	CONSTRUCTION KEYNOTES REFER TO DWG.
#	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
#	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
📹	SECURITY VIDEO CAMERA
📄	CARD READER
🔑	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH

SCHEDULE OF STEEL LOUVERS

ITEM	SIZE	LOCATION	NO. OF UNIT
L-1	30" X 40"	BASEMENT - STORAGE	1 UNIT
L-2	30" X 40"	BASEMENT - STORAGE	1 UNIT

NOTE:
COORDINATE SIZE & LOCATION OF LOUVERS FROM MECHANICAL DRAWINGS.

KEYPLAN



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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

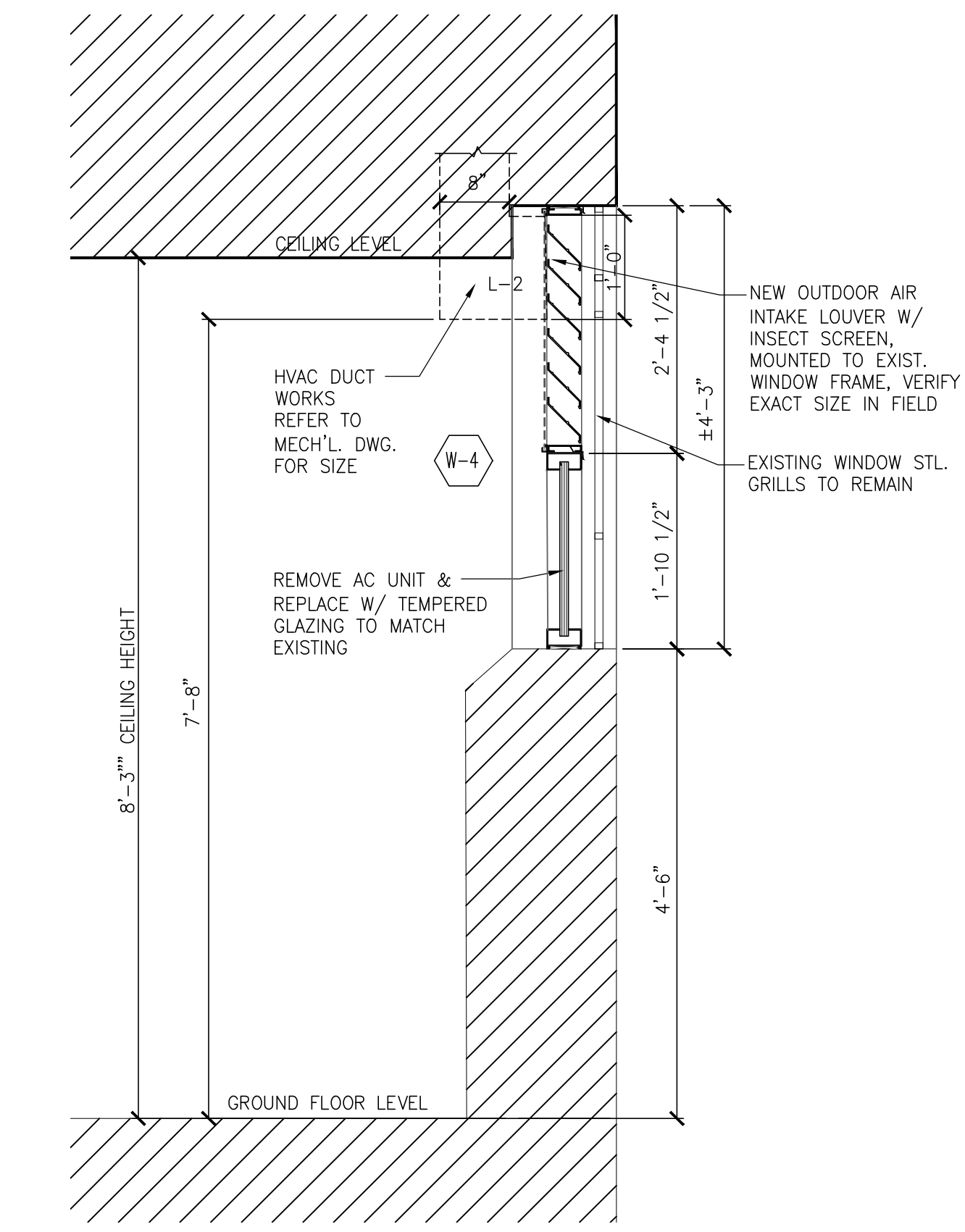
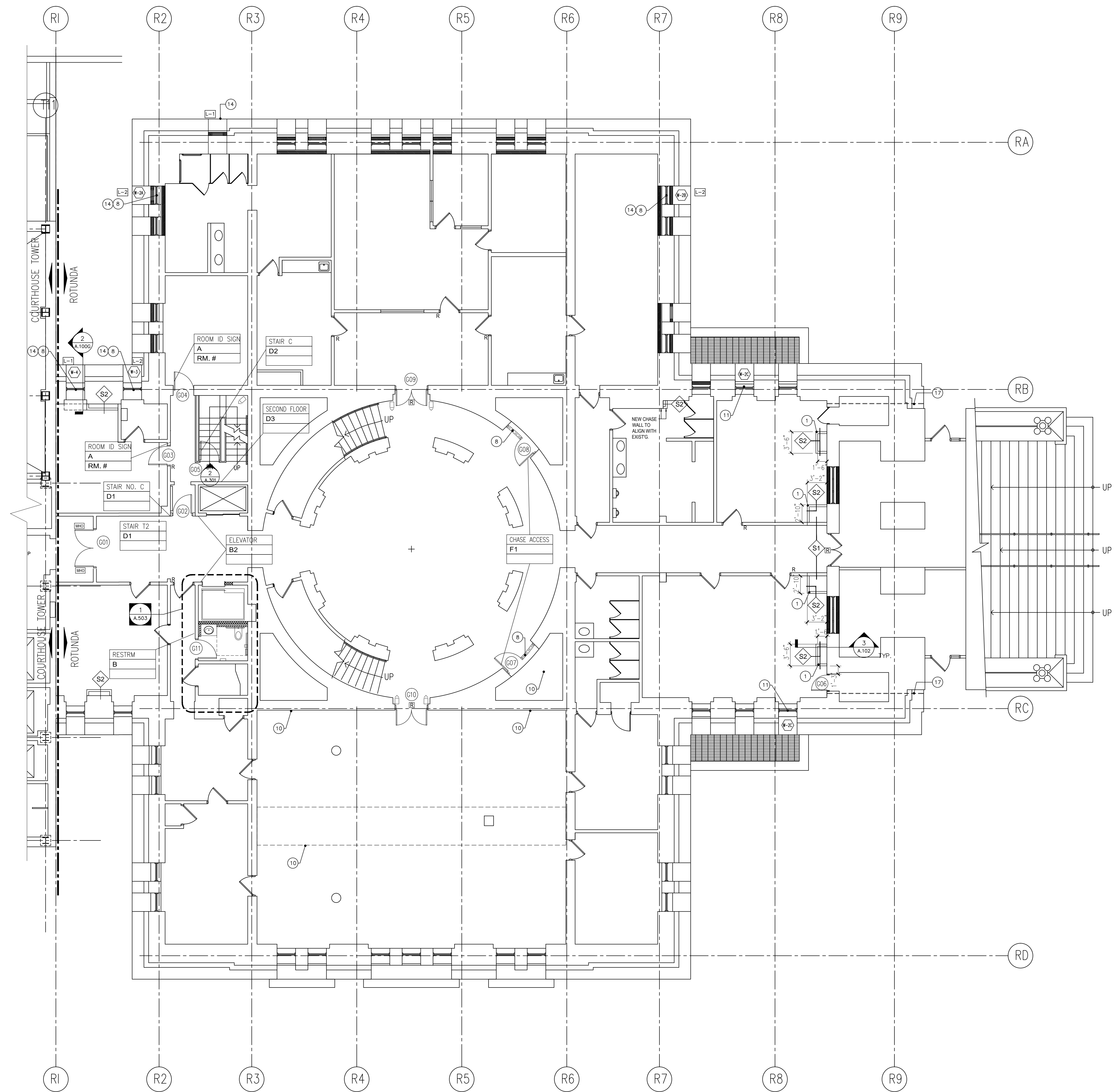
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0008 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
BASEMENT CONSTRUCTION PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
09.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMG	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	18 OF: 118
								DWG. NO	

A.100B



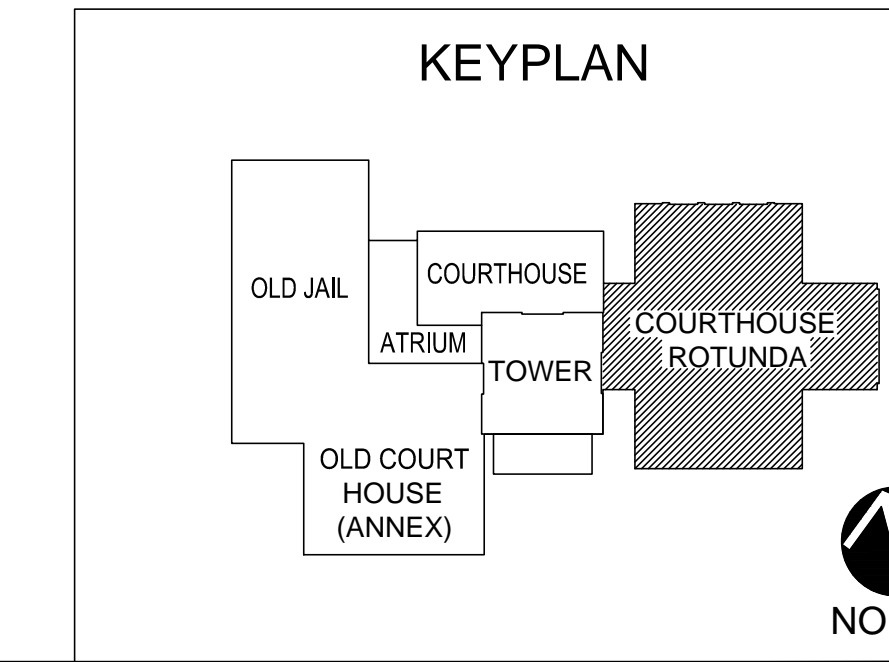
2 TYP. @ GROUND FLOOR WINDOW SECTION
A.100G SCALE: 3/4" = 1'-0"

CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE SCHEDULES.
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHED TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS. REFER TO DWGS. A103, A301 & M400G.
- 9 NEW MECH'L DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.
- 16 CLIENT TO RELOCATE ALL STORAGE FILES & SHELVING PRIOR TO START OF CONSTRUCTION.
- 17 OVERALL WINDOW SIZE IS 36"x60". MECHANICAL CLEARANCE FOR L-1&L-2 IS 30"x40". PROVIDE BLANK PLATE AROUND NEW LOUVER.
- 18 REMOVE SOFFIT FOR INSTALLATION SPRINKLERS & MECHANICAL DUCTS.
- 19 NEW OPENING IN WALL FOR L-1 LOUVER, 36"x24". REFER TO M400G.

LEGEND	
	ROOM ID SIGN
	RM. #
	ROOM ID SIGN
	ELEVATOR ID SIGN
	RESTROOM ID SIGN
	STAIR/EXIT ID SIGN
	AREA OF REFUGE ID SIGN
	CHASE ACCESS ID SIGN

SYMBOLS	
	CONSTRUCTION KEYNOTES REFER TO DWG.
	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
	SECURITY VIDEO CAMERA
	CARD READER
	CARD READER AND KEY PAD
	MAGNETIC CARD HOLDER
	DOOR POSITIONS SWITCH



1 GROUND FLOOR CONSTRUCTION PLAN
A.100G 1/8" = 1'-0"

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NJ License No. AI 12541

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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

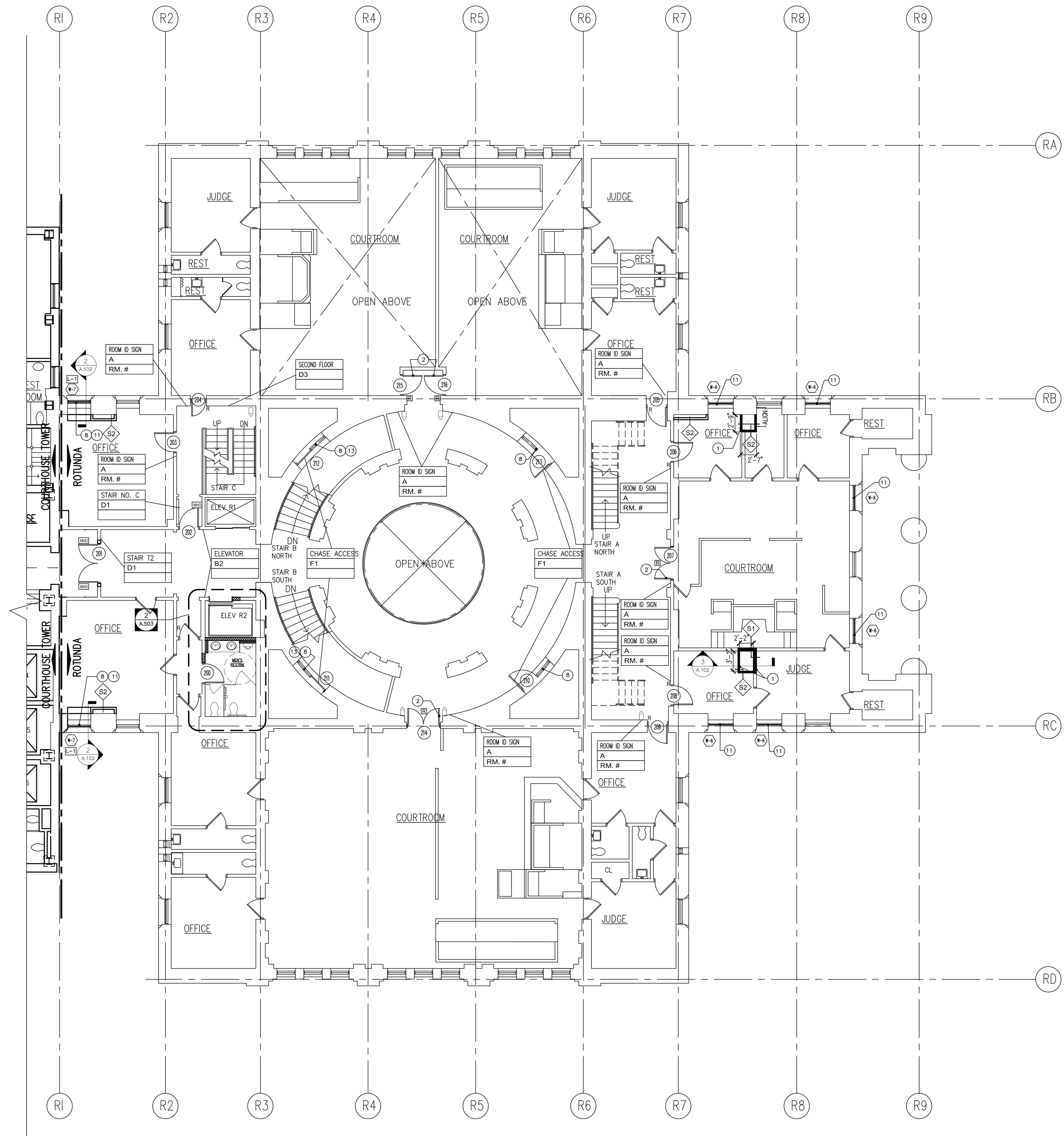


PROJECT: **UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

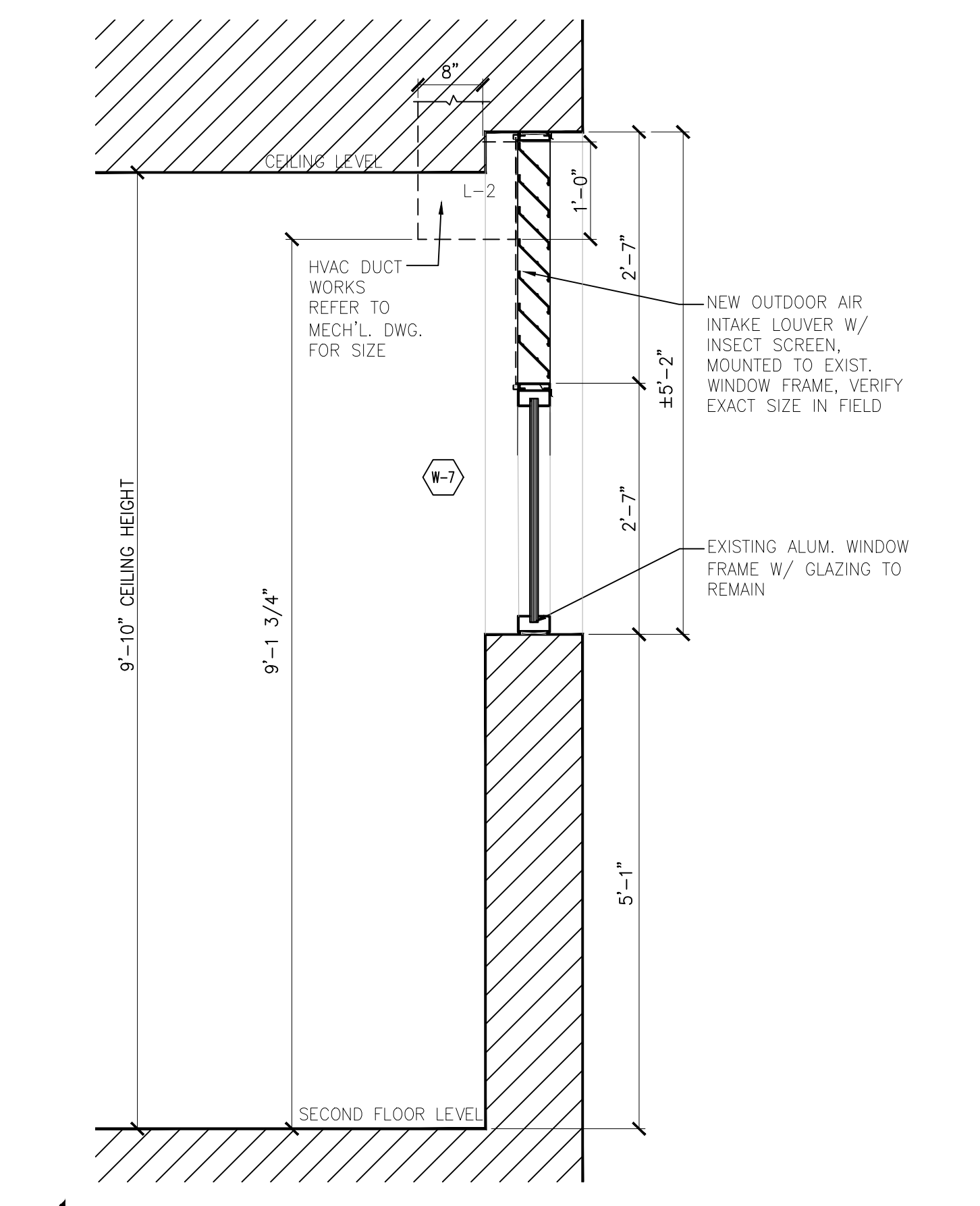
SHEET CONTENTS:
GROUND FLOOR CONSTRUCTION PLAN

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DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMG	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	19 OF: 118
								DWG. NO	

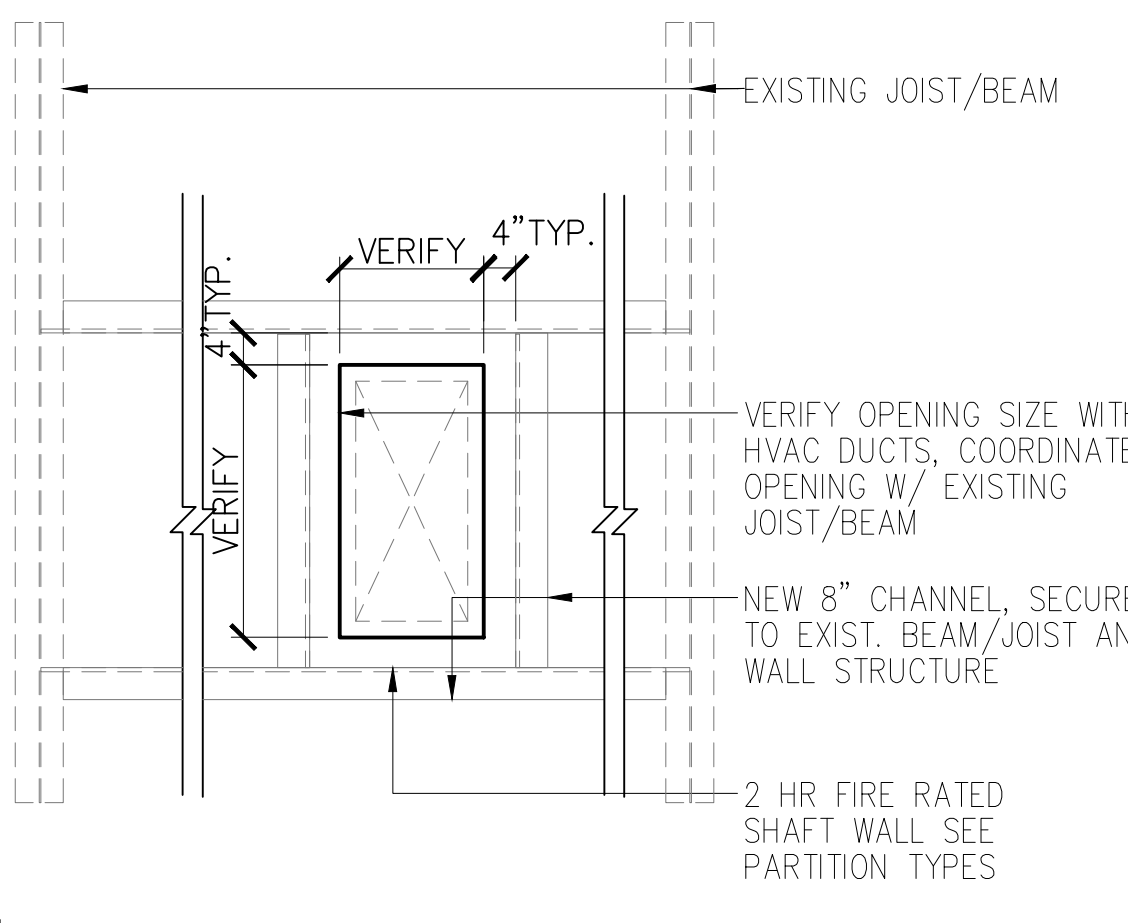
A.100G



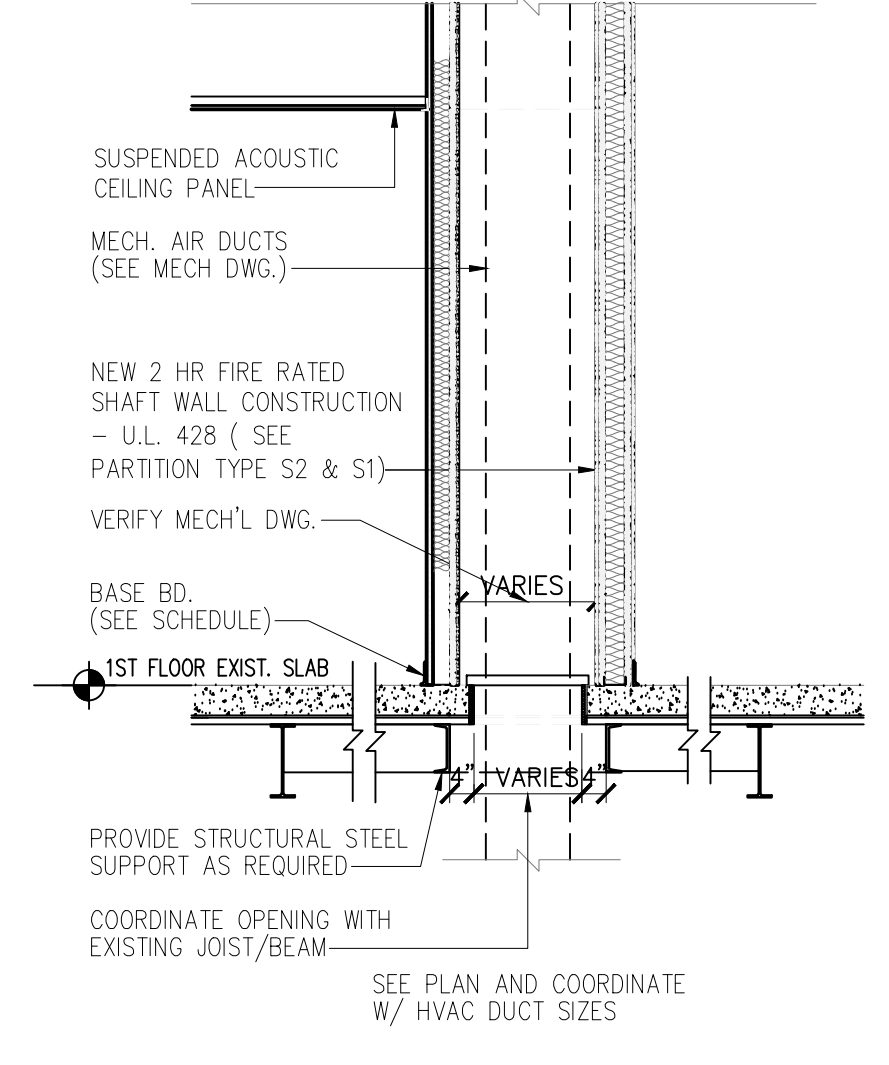
1 SECOND FLOOR CONSTRUCTION PLAN
A.102 1/8" = 1'-0"



2 TYP. @ L-2 SECOND FLOOR WINDOW SECTION
A.102 SCALE: 3/4" = 1'-0"



4 TYP. FLOOR OPENING SUPPORT PLAN
A.102 SCALE: 1 1/2" = 1'-0"



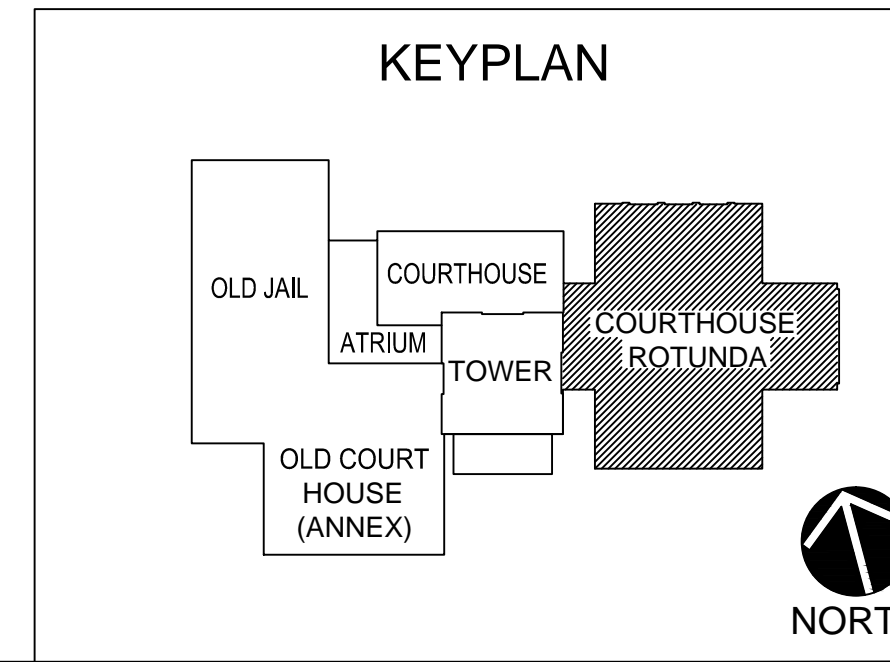
3 TYP. SLAB OPNG. DETAIL
A.102 SCALE: 3/8" = 1'-0"

CONSTRUCTION KEYNOTES

1. NEW 2HR RATED WALL.
2. REPLACE EXISTING DOOR & REVERSE SWING.
3. INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A.
4. ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
5. CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
6. NEW STEEL STAIR, RAILINGS AND PLATFORM.
7. EXIST. ROOFING SYSTEM TO REMAIN.
8. NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS. REFER TO DWGS. A103, A301 & M400G.
9. NEW MECH'L. DUCTS OPENING
10. COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
11. REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
12. PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
13. NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
14. DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
15. GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.
16. CLIENT TO RELOCATE ALL STORAGE FILES & SHELVING PRIOR TO START OF CONSTRUCTION.
17. OVERALL WINDOW SIZE IS 36"x60". MECHANICAL CLEARANCE FOR L-1&L-2 IS 30"x40". PROVIDE BLANK PLATE AROUND NEW LOUVER.
18. REMOVE SOFFIT FOR INSTALLATION SPRINKLERS & MECHANICAL DUCTS.
19. NEW OPENING IN WALL FOR L-1 LOUVER, 36"x24". REFER TO M400G.

LEGEND	
	ROOM ID SIGN
	ELEVATOR ID SIGN
	RESTROOM ID SIGN
	STAIR/EXIT ID SIGN
	AREA OF REFUGE ID SIGN
	CHASE ACCESS ID SIGN

SYMBOLS	
	CONSTRUCTION KEYNOTES REFER TO DWG.
	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
	SECURITY VIDEO CAMERA
	CARD READER
	CARD READER AND KEY PAD
	MAGNETIC CARD HOLDER
	DOOR POSITIONS SWITCH



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NJ License No. AI 14394

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 29 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0098 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

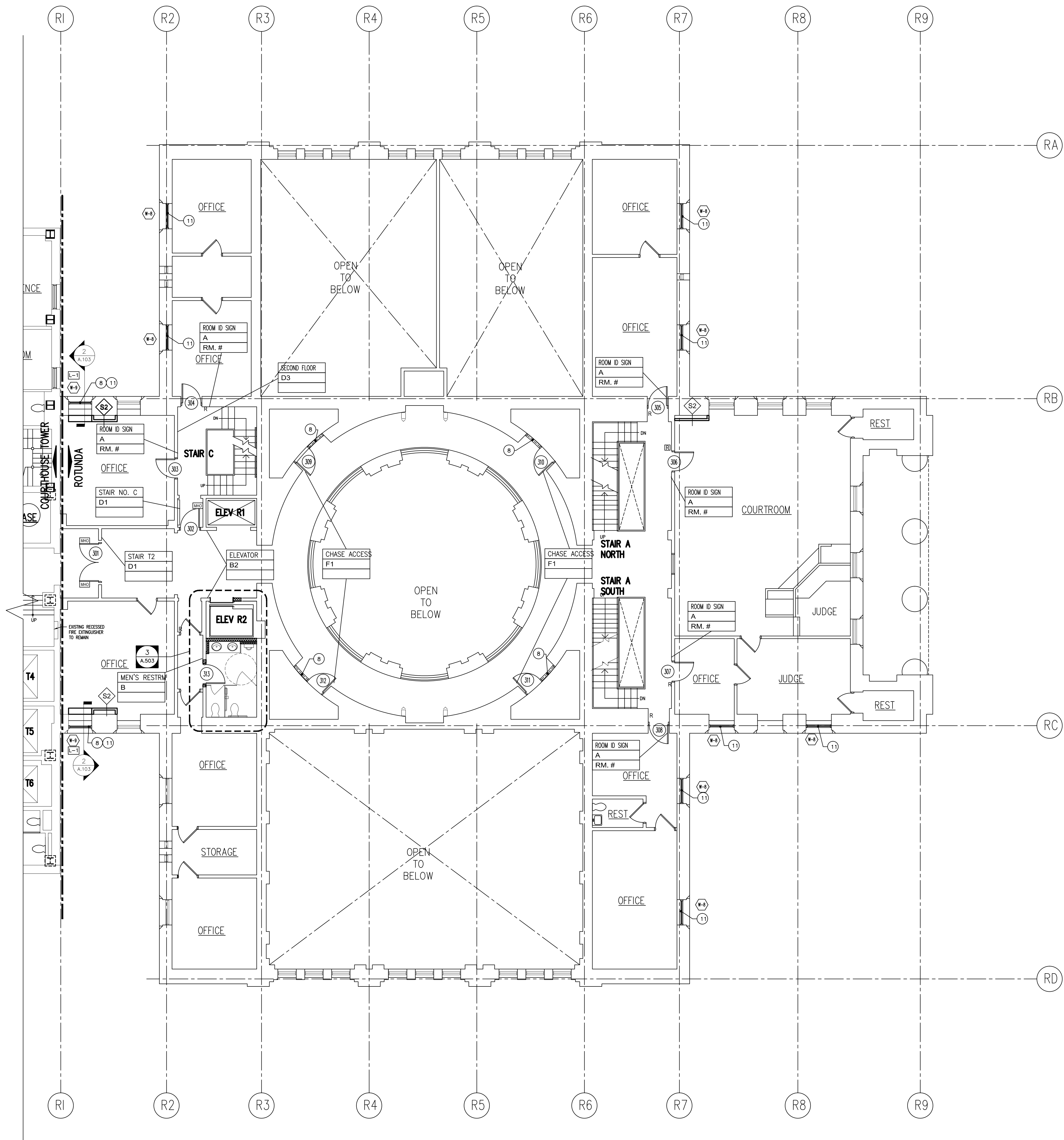
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SECOND FLOOR CONSTRUCTION PLAN

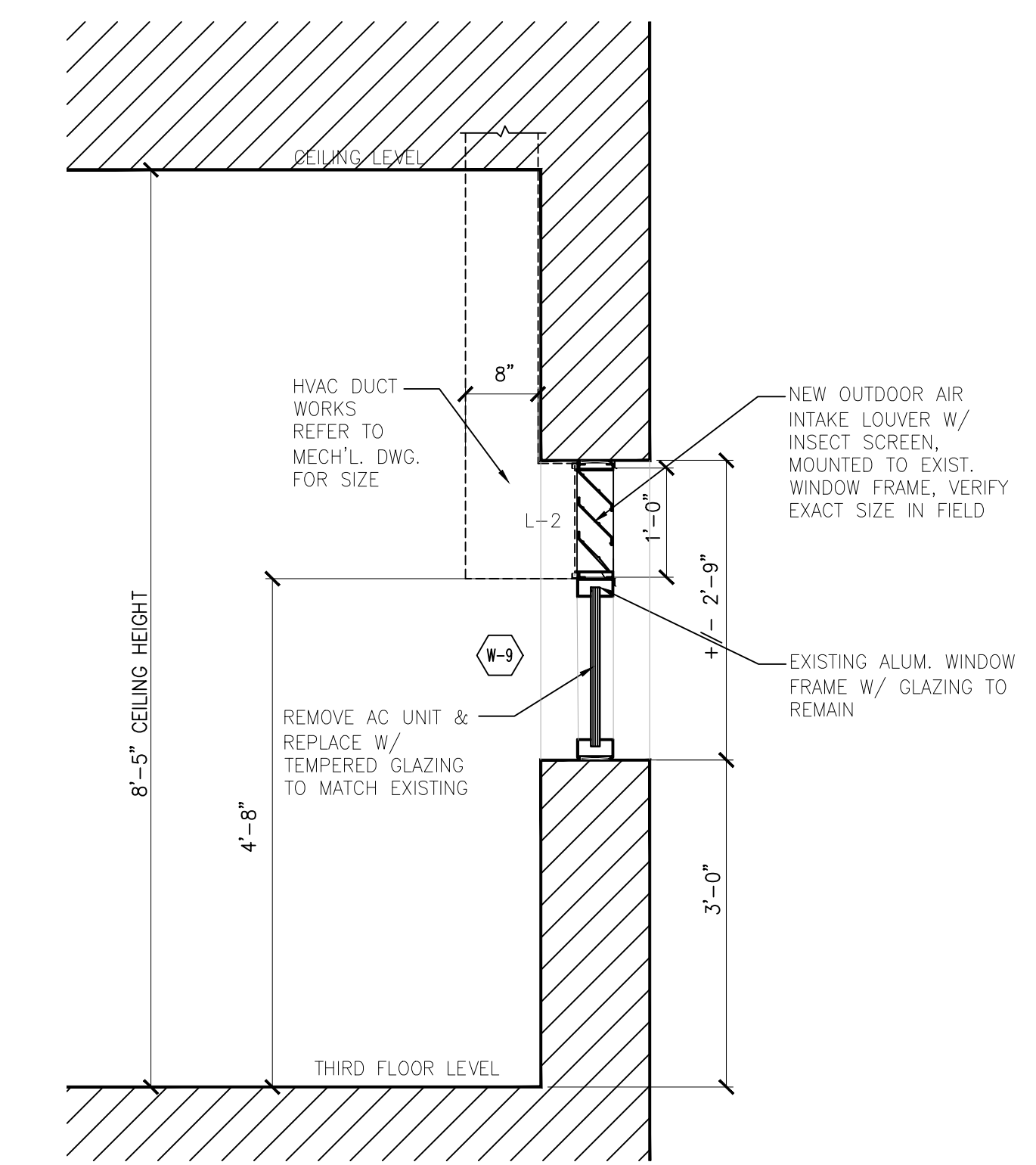
SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						
10.30.15	95% CD UPDATES	KD	FM						
05.31.17	100% CD SUBMIT	MMC	FJM						
08.30.17	ISSUED FOR BID	MC	FM						

JOB NO: 2141152
SHEET: 21 OF: 118
DWG. NO.

A.102



1 THIRD FLOOR CONSTRUCTION PLAN
A.103 1/8" = 1'-0"



2 TYP. @ THIRD FLOOR WINDOW SECTION
A.103 SCALE: 3/4" = 1'-0"

SCHEDULE OF STEEL LOUVERS			
ITEM	SIZE	NO.	OF UNIT
BASEMENT FLOOR			
L-1	30" x 24"	1	UNIT
L-2	30" x 24"	1	UNIT
GROUND FLOOR			
L-1	24" x 12"	2	UNITS
L-2	18" x 12"	3	UNITS
SR-1	36" x 60"	2	UNITS
FIRST FLOOR			
L-1	18" x 12"	2	UNITS
L-2	18" x 12"	1	UNIT
SR-1	36" x 60"	2	UNITS
SECOND FLOOR			
L-1	18" x 12"	2	UNITS
SR-1	20" x 12"	2	UNITS
THIRD FLOOR			
L-1	18" x 12"	2	UNITS
EG-1	36" x 84"	4	UNITS
FOURTH FLOOR			

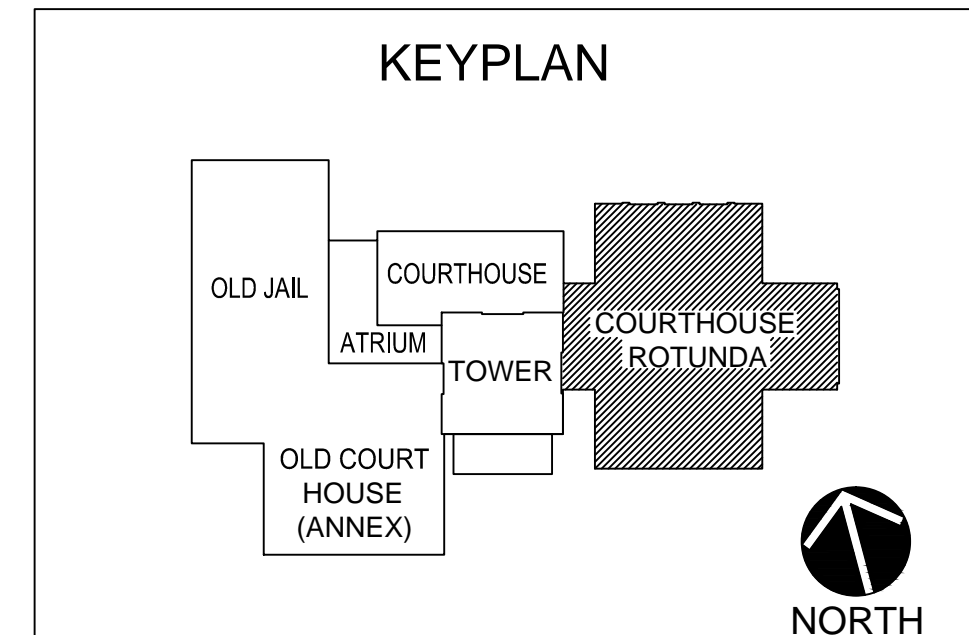
NOTE:
COORDINATE SIZE & LOCATION OF LOUVERS FROM MECHANICAL DRAWINGS.

CONSTRUCTION KEYNOTES

- NEW 2HR RATED WALL.
- REPLACE EXISTING DOOR & REVERSE SWING.
- INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
- ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
- NEW STEEL STAIR, RAILINGS AND PLATFORM.
- EXIST. ROOFING SYSTEM TO REMAIN.
- NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS. REFER TO DWGS. A103, A301 & M400G.
- NEW MECH'L DUCTS OPENING
- COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
- PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
- NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- DIAGRAMATIC EGRESS STAIR REQUIRED BY CODE. GC. TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.
- CLIENT TO RELOCATE ALL STORAGE FILES & SHELVING PRIOR TO START OF CONSTRUCTION.
- OVERALL WINDOW SIZE IS 36"x60". MECHANICAL CLEARANCE FOR L-1&L-2 IS 30"x40". PROVIDE BLANK PLATE AROUND NEW LOUVER.
- REMOVE SOFFIT FOR INSTALLATION SPRINKLERS & MECHANICAL DUCTS.
- NEW OPENING IN WALL FOR L-1 LOUVER, 36"x24". REFER TO M400G.

LEGEND	
	ROOM ID SIGN
	ELEVATOR ID SIGN
	RESTROOM ID SIGN
	STAIR/EXIT ID SIGN
	AREA OF REFUGE ID SIGN
	CHASE ACCESS ID SIGN

SYMBOLS	
	CONSTRUCTION KEYNOTES REFER TO DWG. A102.
	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
	SECURITY VIDEO CAMERA
	CARD READER
	CARD READER AND KEY PAD
	MAGNETIC CARD HOLDER
	DOOR POSITIONS SWITCH



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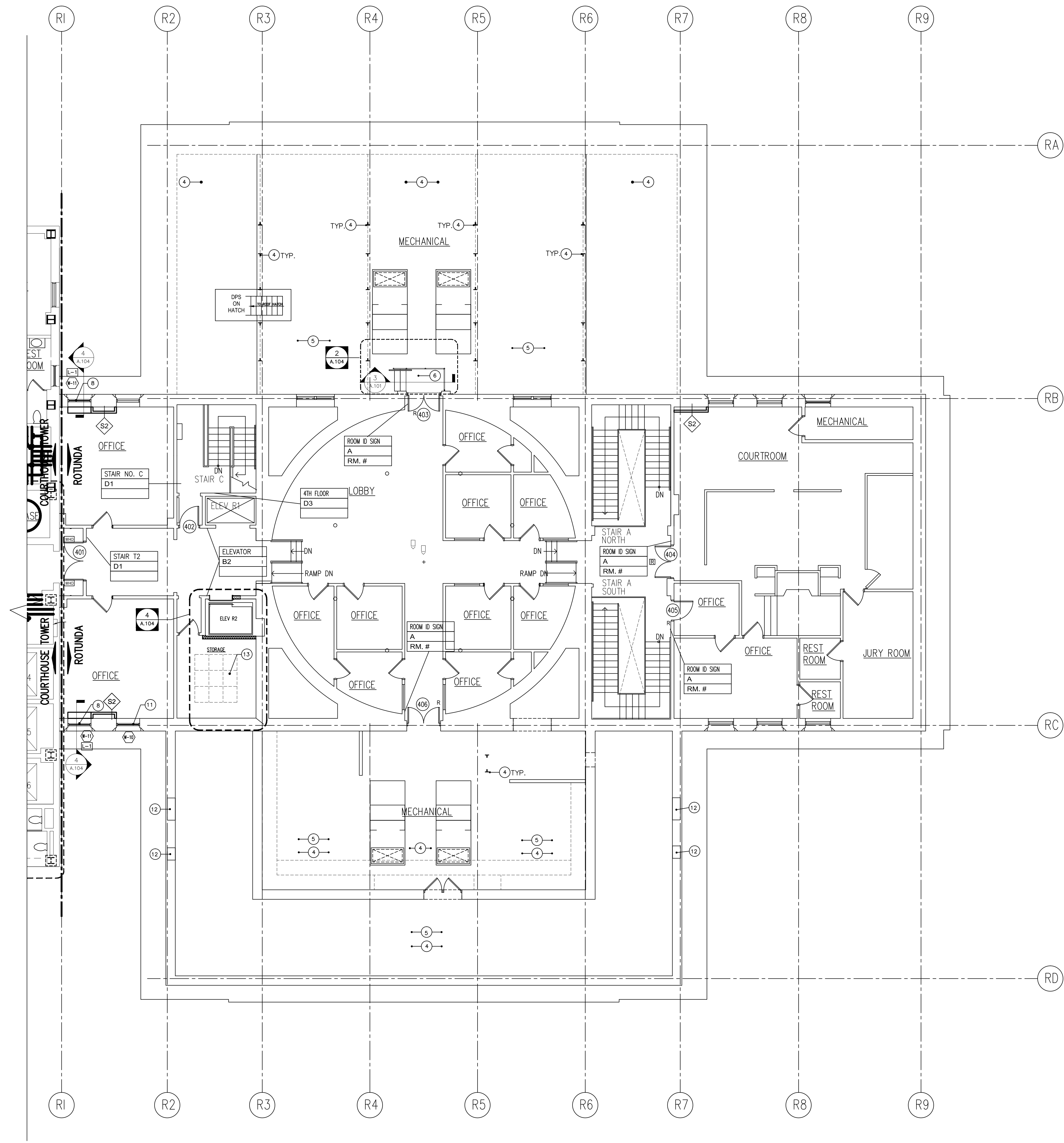


PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

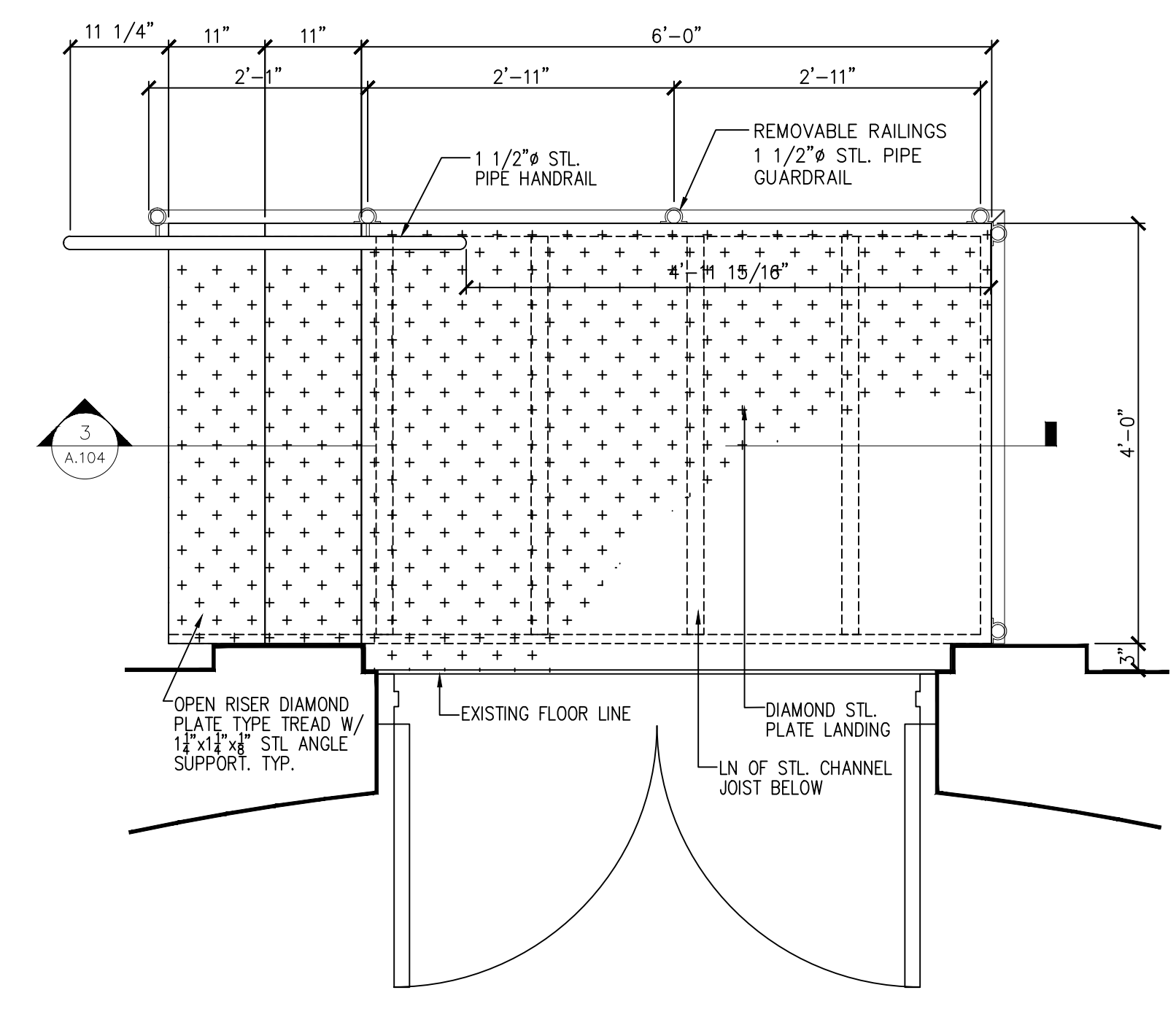
SHEET CONTENTS:
THIRD FLOOR CONSTRUCTION PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	22 OF: 118
								DWG. NO	

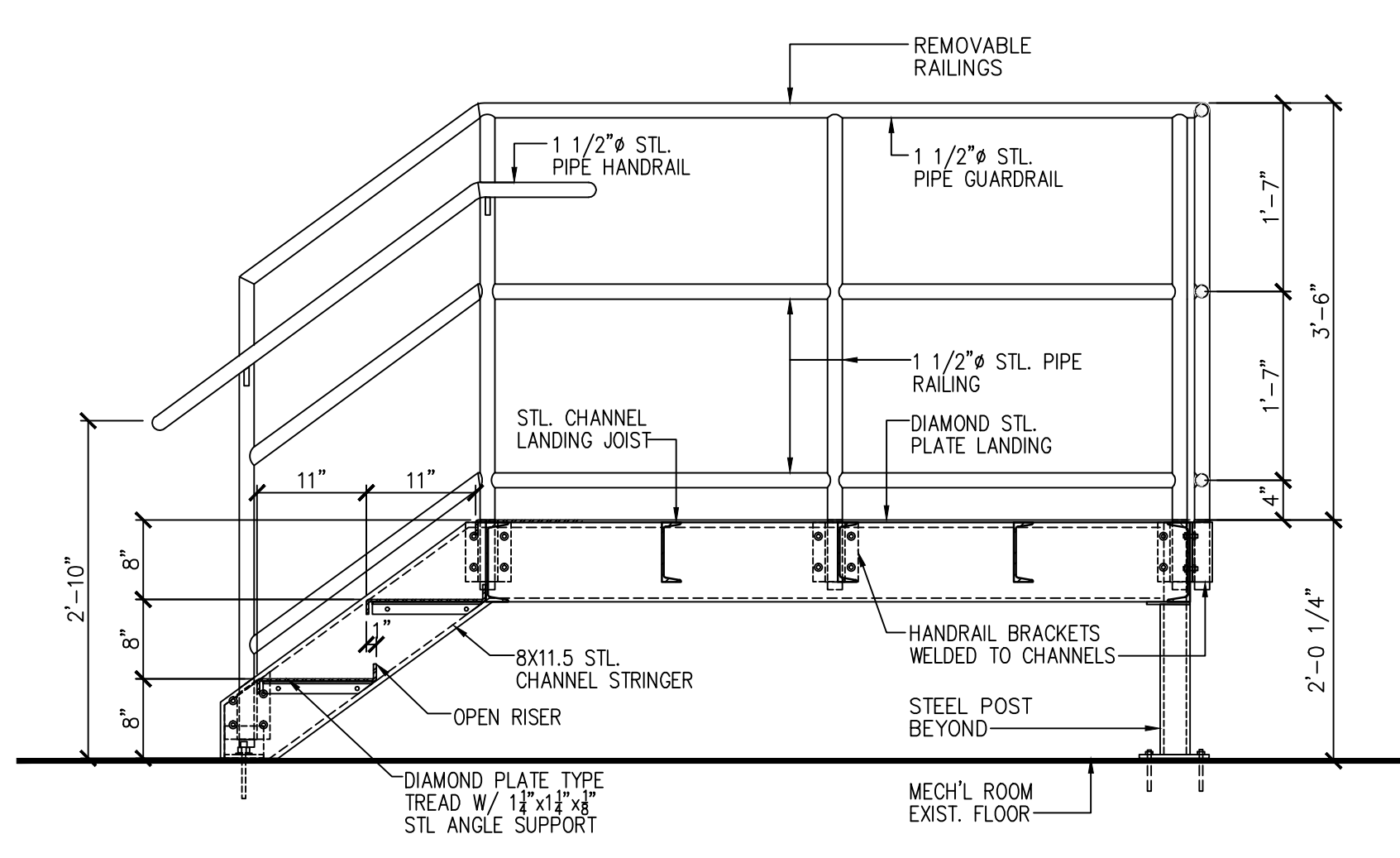
A.103



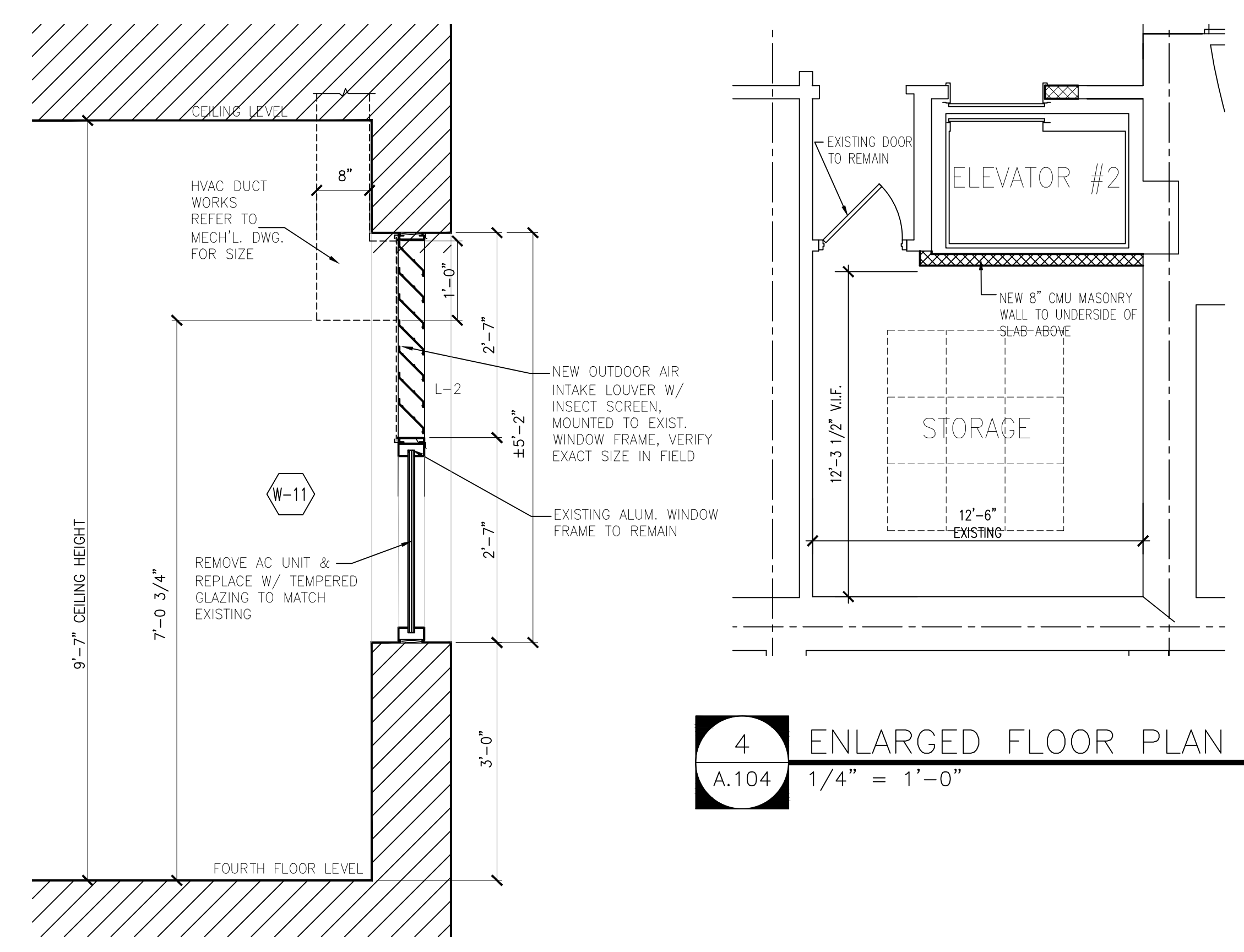
1 FOURTH FLOOR CONSTRUCTION PLAN
A.104 1/8" = 1'-0"



2 STEEL STAIR PLAN
A.104 SCALE: 3/4" = 1'-0"



3 STEEL STAIR SECTION
A.104 SCALE: 3/4" = 1'-0"



4 ENLARGED FLOOR PLAN
A.104 1/4" = 1'-0"

4 TYP. @ 4TH FL WINDOW SECTION
A.104 SCALE: 3/4" = 1'-0"

CONSTRUCTION KEYNOTES

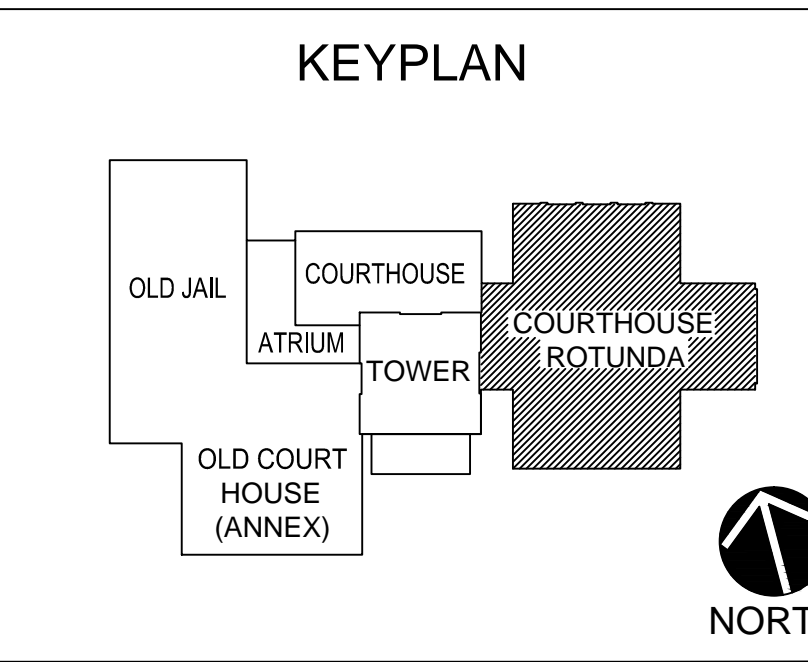
- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS. REFER TO DWGS. A103, A301 & M400C.
- 9 NEW MECH'L. DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMITC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.
- 16 CLIENT TO RELOCATE ALL STORAGE FILES & SHELVING PRIOR TO START OF CONSTRUCTION.
- 17 OVERALL WINDOW SIZE IS 36"x60". MECHANICAL CLEARANCE FOR L-1&L-2 IS 30"x40". PROVIDE BLANK PLATE AROUND NEW LOUVER.
- 18 REMOVE SOFFIT FOR INSTALLATION SPRINKLERS & MECHANICAL DUCTS.
- 19 NEW OPENING IN WALL FOR L-1 LOUVER, 36"x24". REFER TO M400C.

LEGEND

ROOM ID SIGN	A	ROOM ID SIGN
ELEVATOR ID SIGN	B	ELEVATOR ID SIGN
RESTROOM ID SIGN	C	RESTROOM ID SIGN
STAIR/EXIT ID SIGN	D	STAIR/EXIT ID SIGN
AREA OF REFUGE ID SIGN	E	AREA OF REFUGE ID SIGN
CHASE ACCESS ID SIGN	F	CHASE ACCESS ID SIGN

SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W-#	WINDOW TAG, REFER TO DWG. A301 FOR WINDOW SCHEDULE.
D-#	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
SCV	SECURITY VIDEO CAMERA
R	CARD READER
RK	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH



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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0098 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FOURTH FLOOR CONSTRUCTION PLAN

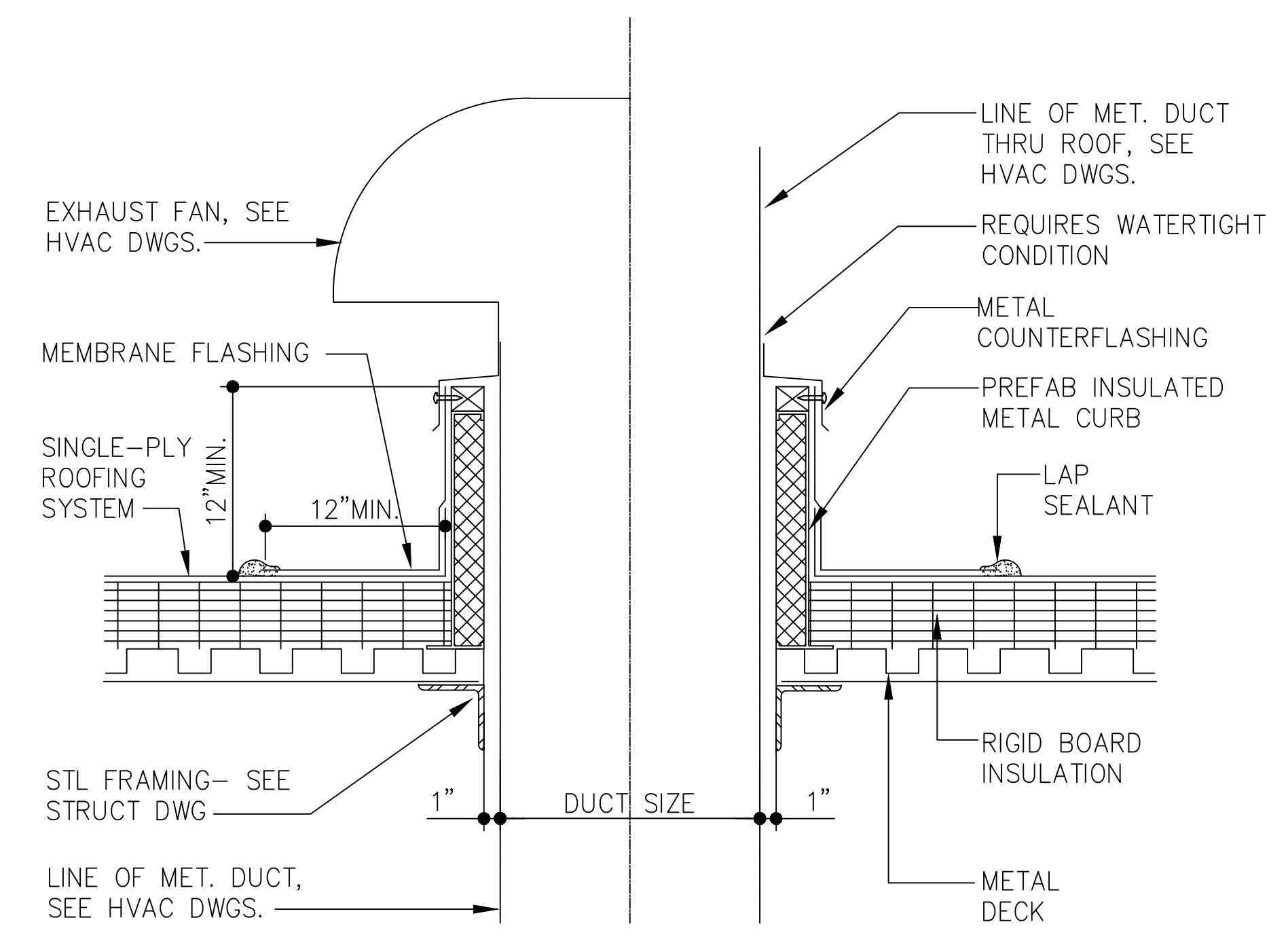
SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	23 OF: 118
								DWG. NO	

A.104

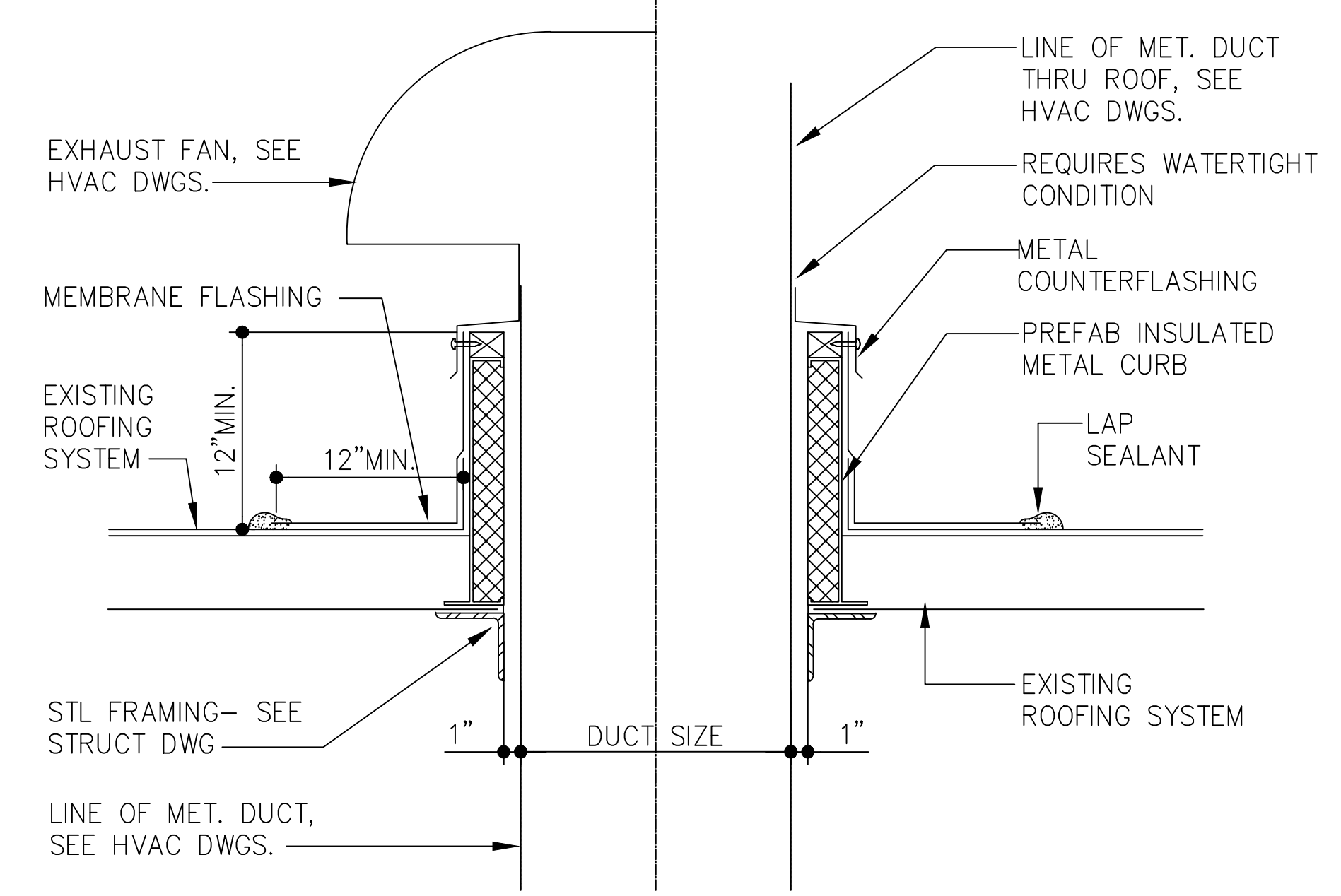
CONSTRUCTION KEYNOTES

- 1 NEW 2HR RATED WALL
- 2 REPLACE EXISTING DOOR & REVERSE SWING.
- 3 INFILL EXISTING OPENING WITH 2 HOUR RATED WALL CONSTRUCTION TO MAINTAIN FIRE RATING REQUIREMENTS. REFER TO PARTITION TYPE S1A
- 4 ALL EXPOSED STEEL SHALL BE SPRAYED WITH FIREPROOFING TO MAINTAIN THE PROPER FIRE RATING REQUIREMENTS.
- 5 CONTRACTOR TO FIELD VERIFY ANY MEP SERVICES/ OPENING'S IN WALL. UTILITIES SHALL BE REMOVED, CAPPED, OR RELOCATED AS REQUIRED. AFTER REMOVAL ALL OPENING'S SHALL BE PATCHED, REPAIRED & FINISHES TO MATCH ADJACENT SURFACE'S TO MAINTAIN FIRE RATING REQUIREMENTS.
- 6 NEW STEEL STAIR, RAILINGS AND PLATFORM.
- 7 EXIST. ROOFING SYSTEM TO REMAIN.
- 8 NEW STEEL LOUVER COORDINATE SIZE OF LOUVER PER MECHANICAL REQUIREMENTS. REFER TO DWGS. A103, A301 & M400G.
- 9 NEW MECH'L DUCTS OPENING
- 10 COORDINATE WITH MECHANICAL FOR REMOVAL OF UNIT
- 11 REMOVE EXISTING AC UNITS FROM WINDOWS AND REPLACE IT W/ TEMPERED GLAZING TO MATCH EXISTING.
- 12 PATCH, COVER & REPAIR TO MATCH EXISTING FINISH & COLOR TO THE EXHAUST VENT REMOVED REFER TO MEP DWGS.
- 13 NEW LOUVER W/ REMOVABLE PANEL. REFER TO A301.
- 14 DIAGRAMIC EGRESS STAIR REQUIRED BY CODE. GC TO SUBMIT SHOP DRAWINGS OF STAIR PRIOR TO INSTALLATION.
- 15 GC TO COORDINATE WITH OCCUPANTS OF ROOM. RECONFIGURING OF STAIR MIGHT BE REQUIRED.
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- 17 OVERALL WINDOW SIZE IS 36"x60". MECHANICAL CLEARANCE FOR L-1&L-2 IS 30"x40". PROVIDE BLANK PLATE AROUND NEW LOUVER.
- 18 REMOVE SOFFIT FOR INSTALLATION SPRINKLERS & MECHANICAL DUCTS.
- 19 NEW OPENING IN WALL FOR L-1 LOUVER, 36"x24". REFER TO M400G.
- 20 REPAIR EXISTING ROOFING SYSTEM WHERE LEAKAGE IS OCCURRING. NEW ROOFING TO MATCH EXISTING.

2 EXHAUST FAN DETAIL @ NEW ROOFING
A.105 SCALE: 1'-0"=1'-0"



3 EXHAUST FAN DETAIL @ EXIST. ROOFING
A.105 SCALE: 1'-0"=1'-0"

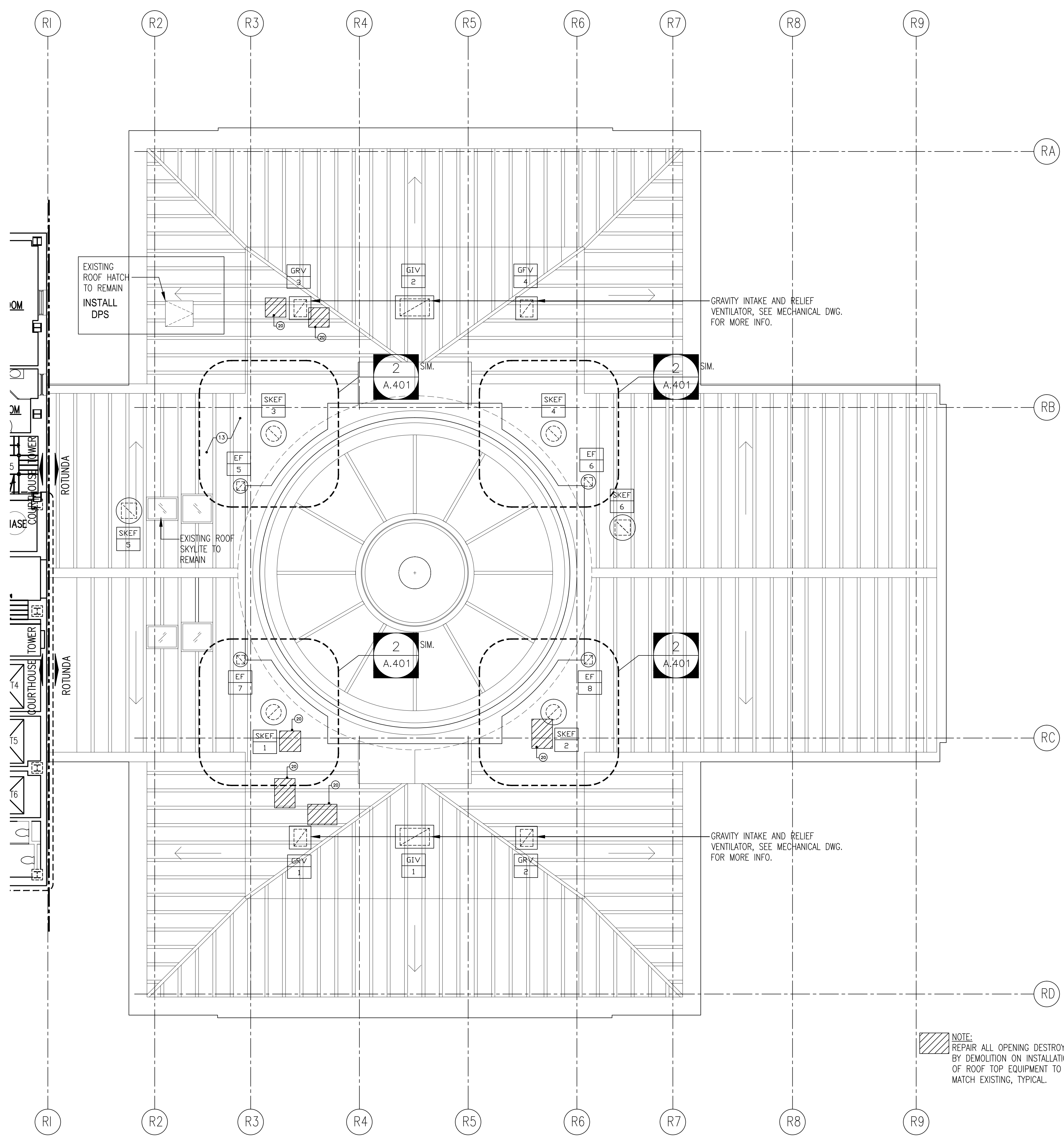
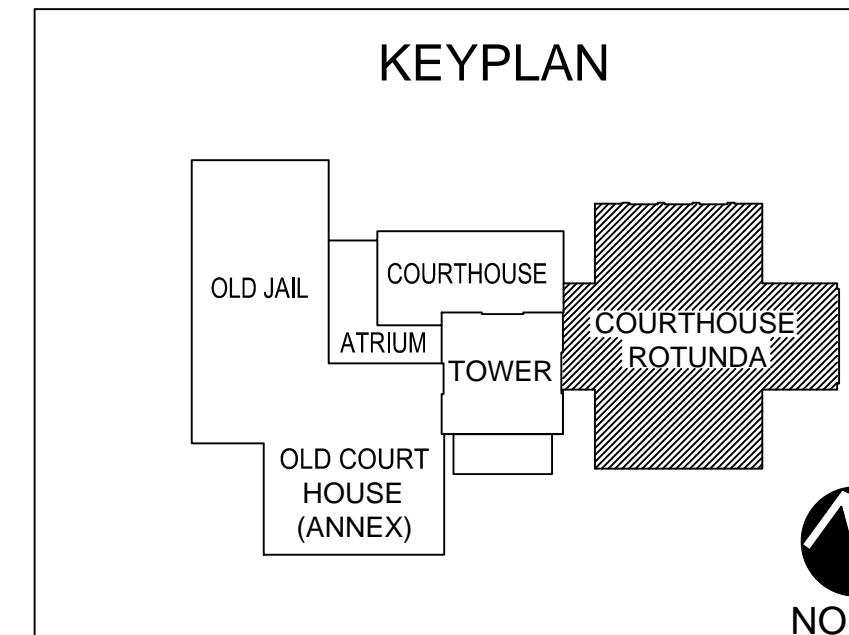


LEGEND

ROOM ID SIGN	RM. #
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

SYMBOLS

#	CONSTRUCTION KEYNOTES REFER TO DWG.
W-1	WINDOW TAG. REFER TO DWG. A301 FOR WINDOW SCHEDULE.
#	DOOR TAG REFER TO DWG. A301 FOR DOOR SCHEDULE.
📹	SECURITY VIDEO CAMERA
R	CARD READER
R	CARD READER AND KEY PAD
MHO	MAGNETIC CARD HOLDER
DPS	DOOR POSITIONS SWITCH



1 ROOF CONSTRUCTION PLAN
A.105 1/8" = 1'-0"

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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
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MARK E. BESS, AIA, NCARB
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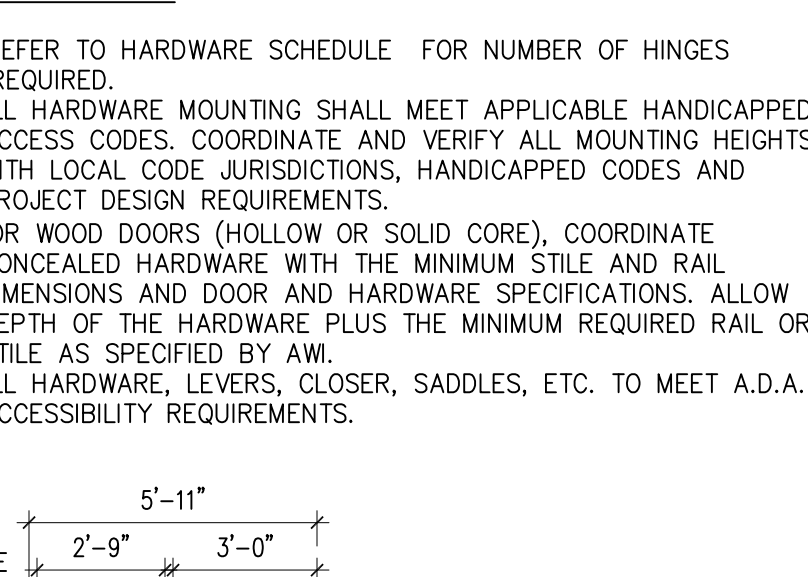
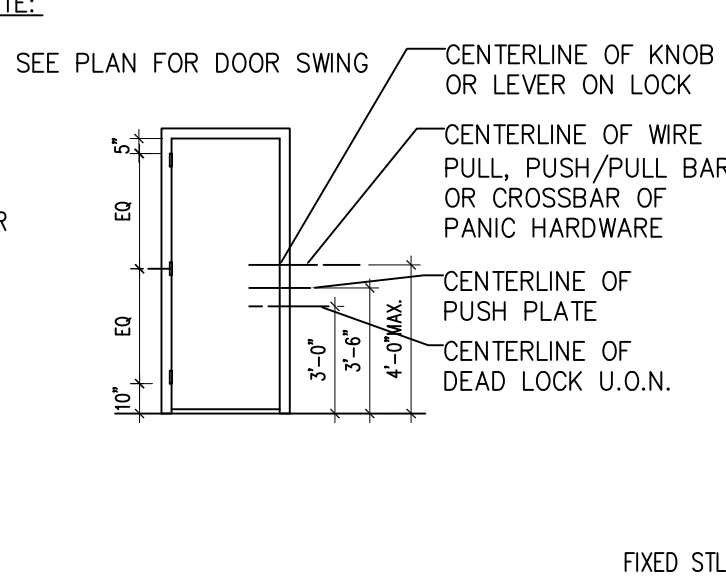
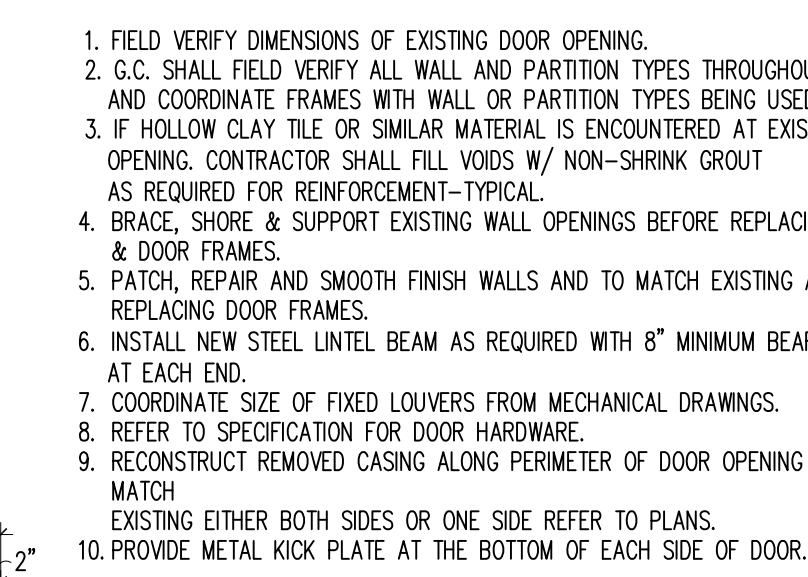
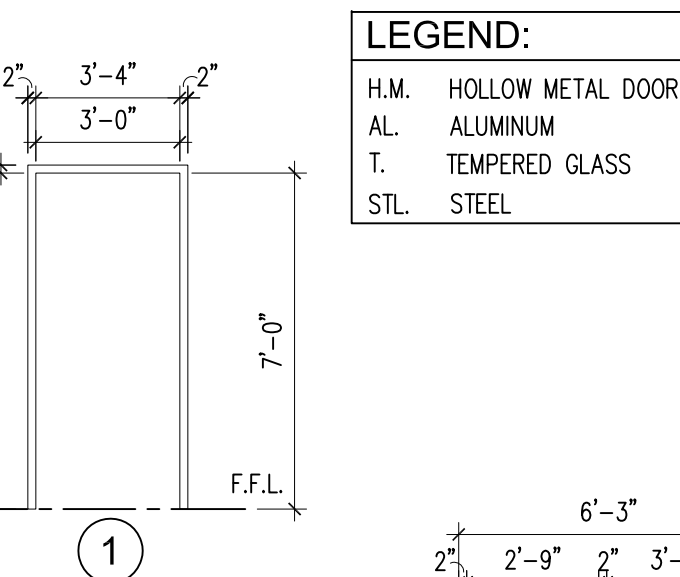
PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ROOF CONSTRUCTION PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	24 OF: 118
								DWG. NO	

A.105

DOOR NO.	DOOR LOCATION		DOOR			FRAME			SILL		FIRE-RATING LABEL	HARDWARE SET	REMARKS					
	FROM	TO	WIDTH	HEIGHT	THICKNESS	MATERIAL	FINISH	TYPE	GLAZING	MATERIAL				FINISH	TYPE	DETAILS	TYPE	MATERIAL
BASEMENT FLOOR																		
B01	CORRIDOR	STAIR C	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J1	H1	-	90 MIN.	01 FSR	
B02	MECHANICAL ROOM	STAIR C	3'-0"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J2	H3	-	45 MIN.	11 FSR	NO CASING, FIELD VERIFY EXIST. CONDITION
B03	STAIR C	CORRIDOR	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J1	H1	-	45 MIN.	11 FSR	
B04	CORRIDOR	ELEVATOR MOTOR RM	3'-2"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J1	H1	-	45 MIN.	16 FSR	*FIRE RATED
GROUND FLOOR																		
G01	CORRIDOR	CORRIDOR	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	2	J2	H3	-	45 MIN.	02 FSR	FIELD VERIFY EXISTING CONDITION/MHO
G02	STAIR C	ROTUNDA CORRIDOR	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J2	H2	-	45 MIN.	03 FSR	FIELD VERIFY EXISTING CONDITION
G03	STAIR C	OFFICE	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J2	H2	-	90 MIN.	08 FSR	FIELD VERIFY EXISTING CONDITION
G04	STAIR C	HVAC RM	2'-9"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J3	H5	-	90 MIN.	15 FSR	FIELD VERIFY EXISTING CONDITION
G05	STAIR C	STAIR C	2'-8"	3'-6"	1 3/4"	STL.	DP1	-	-	STL.	FP1	-	-	-	-	05 FSR	GATE: REFER TO DWG. 2/A301	
G06	MAIL ROOM	STAIR C	3'-0"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J3	H5	-	-	06 FSR	FIELD VERIFY EXISTING CONDITION
G07	CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	A1	-	H.M.	FP1	3	J3	H5	-	90 MIN.	NC	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
G08	CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	A1	-	H.M.	FP1	3	J3	H5	-	90 MIN.	NC	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
G09	OFFICE	ROTUNDA	(2) 3'-0"	7'-4"	1 3/4"	H.M.	DP1	E	T	H.M.	FP1	2	J3	H5	-	90 MIN.	13 FSR	FIELD VERIFY EXISTING CONDITION/ CDR
G10	ROTUNDA CORRIDOR	COURTROOM	(2) 3'-0"	7'-4"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	2	J3	H5	-	90 MIN.	17 FSR	FIELD VERIFY EXISTING CONDITION/CDR
G11	CORRIDOR	RESTROOM	3'-0"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J2	H2	-	90 MIN.	10 FSR	
1ST FLOOR																		
101	CORRIDOR	ROTUNDA	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	2	J2	H3	-	45 MIN.	07 FSR	FIELD VERIFY EXISTING CONDITION
102	CORRIDOR	STAIR C	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J2	H2	-	45 MIN.	09 FSR	FIELD VERIFY EXISTING CONDITION
103	CORRIDOR	ROTUNDA	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J2	H2	-	90 MIN.	03 FSR	FIELD VERIFY EXISTING CONDITION
104	RESTROOM	STAIR C	3'-0"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J2	H2	-	90 MIN.	19 FSR	FIELD VERIFY EXISTING CONDITION
105	COURTROOM VESTIBULE	ROTUNDA CORRIDOR	(2) 3'-0"	7'-4"	1 3/4"	H.M.	DP1	E	T	H.M.	FP1	1	J2	H2	-	90 MIN.	20 FSR	FIELD VERIFY EXISTING CONDITION
106	ROTUNDA CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	D	-	H.M.	FP1	3	J3	H5	-	90 MIN.	21 FSR	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
107	ROTUNDA CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	D	-	H.M.	FP1	3	J3	H5	-	90 MIN.	09 FSR	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
108	ROTUNDA CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	D	-	H.M.	FP1	3	J3	H5	-	90 MIN.	21 FSR	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
109	ROTUNDA CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	D	-	H.M.	FP1	3	J3	H5	-	90 MIN.	09 FSR	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
110	COURTROOM	COURTRM VESTIBULE	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J2	H2	-	90 MIN.	22 FSR	FIELD VERIFY EXISTING CONDITION/ CDR
111	CASE MANAGEMENT	EXTERIOR	3'-0"	7'-0"	1 3/4"	H.M.	DP1	-	-	H.M.	FP1	1	J2	H2	-	90 MIN.	23 FSR	EMERGENCY EXIT DOOR
2ND FLOOR																		
200	CORRIDOR	MENS' RESTROOM	3'-0"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J2	H2	-	90 MIN.	24 FSR	FIELD VERIFY EXISTING CONDITION
201	ROTUNDA CORRIDOR	CORRIDOR	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	2	J2	H3	-	45 MIN.	02 FSR	FIELD VERIFY EXISTING CONDITION/MHO
202	STAIR C	ROTUNDA CORRIDOR	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J2	H2	-	90 MIN.	25 FSR	FIELD VERIFY EXISTING /MHO
203	STAIR C	OFFICE	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J2	H2	-	90 MIN.	15 FSR	FIELD VERIFY EXISTING CONDITION
204	OFFICE	STAIR C	2'-9"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J3	H5	-	90 MIN.	22 FSR	FIELD VERIFY EXISTING CONDITION/CRD
205	OFFICE	STAIR A NORTH	2'-10"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J3	H5	-	45 MIN.	22 FSR	FIELD VERIFY EXISTING CONDITION/CRD
206	STAIR A NORTH	OFFICE	2'-11"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J2	H3	-	45 MIN.	18 FSR	FIELD VERIFY EXISTING CONDITION/CRD
207	COURTROOM	STAIR A CORRIDOR	(2) 2'-6"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	2	J2	H3	-	45 MIN.	13 FSR	FIELD VERIFY EXISTING CONDITION/CRD/KEYPAD
208	STAIR A CORRIDOR	OFFICE	2'-10"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J3	H5	-	45 MIN.	14 FSR	FIELD VERIFY EXISTING CONDITION/CRD
209	STAIR A CORRIDOR	OFFICE	2'-10"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J3	H5	-	45 MIN.	14 FSR	FIELD VERIFY EXISTING CONDITION/CRD
210	ROTUNDA CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	D	-	H.M.	FP1	3	J3	H5	-	90 MIN.	09 FSR	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
211	ROTUNDA CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	D	-	H.M.	FP1	3	J3	H5	-	90 MIN.	21 FSR	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
212	ROTUNDA CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	D	-	H.M.	FP1	3	J3	H5	-	90 MIN.	21 FSR	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
213	ROTUNDA CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	D	-	H.M.	FP1	3	J3	H5	-	90 MIN.	09 FSR	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
214	COURTROOM	ROTUNDA CORRIDOR	(2) 2'-6"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	3	J2	H2	-	90 MIN.	13 FSR	FIELD VERIFY EXISTING CONDITION/CRD/KEYPAD
215	COURTROOM	ROTUNDA CORRIDOR	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J2	H2	-	90 MIN.	22 FSR	FIELD VERIFY EXISTING CONDITION
216	COURTROOM	ROTUNDA CORRIDOR	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J2	H2	-	90 MIN.	22 FSR	FIELD VERIFY EXISTING CONDITION
3RD FLOOR																		
301	ROTUNDA CORRIDOR	CORRIDOR	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	2	J2	H3	-	45 MIN.	02 FSR	FIELD VERIFY EXISTING CONDITION/ MHO
302	STAIR C CORRIDOR	ROTUNDA CORRIDOR	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J2	H2	-	90 MIN.	25 FSR	FIELD VERIFY EXISTING CONDITION
303	STAIR C CORRIDOR	OFFICE	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J2	H3	-	90 MIN.	15 FSR	FIELD VERIFY EXISTING CONDITION
304	STAIR C CORRIDOR	OFFICE	2'-10"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J3	H5	-	90 MIN.	14 FSR	FIELD VERIFY EXISTING CONDITION/CRD
305	STAIR A CORRIDOR	OFFICE	2'-10"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J3	H5	-	45 MIN.	14 FSR	FIELD VERIFY EXISTING CONDITION/CRD
306	STAIR A CORRIDOR	COURTROOM	3'-0"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J2	H3	-	45 MIN.	14 FSR	FIELD VERIFY EXISTING CONDITION/CRD/KEYPAD
307	STAIR A CORRIDOR	OFFICE	3'-0"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J2	H3	-	45 MIN.	14 FSR	FIELD VERIFY EXISTING CONDITION/CRD
308	STAIR A CORRIDOR	OFFICE	2'-8"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J3	H5	-	45 MIN.	14 FSR	FIELD VERIFY EXISTING CONDITION/CRD
309	ROTUNDA CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	D	-	H.M.	FP1	3	J3	H5	-	90 MIN.	09 FSR	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
310	ROTUNDA CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	D	-	H.M.	FP1	3	J3	H5	-	90 MIN.	09 FSR	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
311	ROTUNDA CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	D	-	H.M.	FP1	3	J3	H5	-	90 MIN.	09 FSR	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
312	ROTUNDA CORRIDOR	MECH. CHASE	3'-0"	9'-4"	1 3/4"	H.M.	DP1	D	-	H.M.	FP1	3	J3	H5	-	90 MIN.	09 FSR	FIXED SIDE STL. FRAME W/ STL. LOUVER BLADES
313	ROTUNDA CORRIDOR	RESTROOM	2'-8"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J3	H5	-	45 MIN.	24 FSR	
4TH FLOOR																		
401	CORRIDOR	CORRIDOR	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	2	J2	H3	-	45 MIN.	02 FSR	FIELD VERIFY EXISTING CONDITION/MHO
402	CORRIDOR	STAIR C	3'-0"	7'-0"	1 3/4"	H.M.	DP1	B	T	H.M.	FP1	1	J2	H2	-	90 MIN.	03 FSR	FIELD VERIFY EXISTING CONDITION
403	MECHANICAL RM	LOBBY	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	-	H.M.	FP1	2	J3	H5	-	45 MIN.	12 FSR	FIELD VERIFY EXISTING CONDITION/CRD
404	COURTROOM	STAIR A CORRIDOR	(2) 2'-6"	7'-0"	1 3/4"	H.M.	DP1	A	T	H.M.	FP1	2	J3	H5	-	45 MIN.	13 FSR	FIELD VERIFY EXISTING CONDITION
405	STAIR A CORRIDOR	OFFICE	3'-0"	7'-0"	1 3/4"	H.M.	DP1	C	-	H.M.	FP1	1	J2	H3	-	45 MIN.	14 FSR	FIELD VERIFY EXISTING CONDITION
406	MECH. ROOM	LOBBY	(2) 3'-0"	7'-0"	1 3/4"	H.M.	DP1	A1	-	H.M.	FP1	2	J3	H5	-	45 MIN.	12 FSR	
407	ROOF HATCH	ROOF	-	-	-	-	-	-	-	-	-	-	-	-	-	04 FSR		



FRAME TYPES SCALE: 1/4" = 1'-0"

DOOR TYPES SCALE: 1/4" = 1'-0"

DOOR & FRAME DETAILS SCALE: 3" = 1'-0"

PARTITION TYPES SCALE: 3/4" = 1'-0"

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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

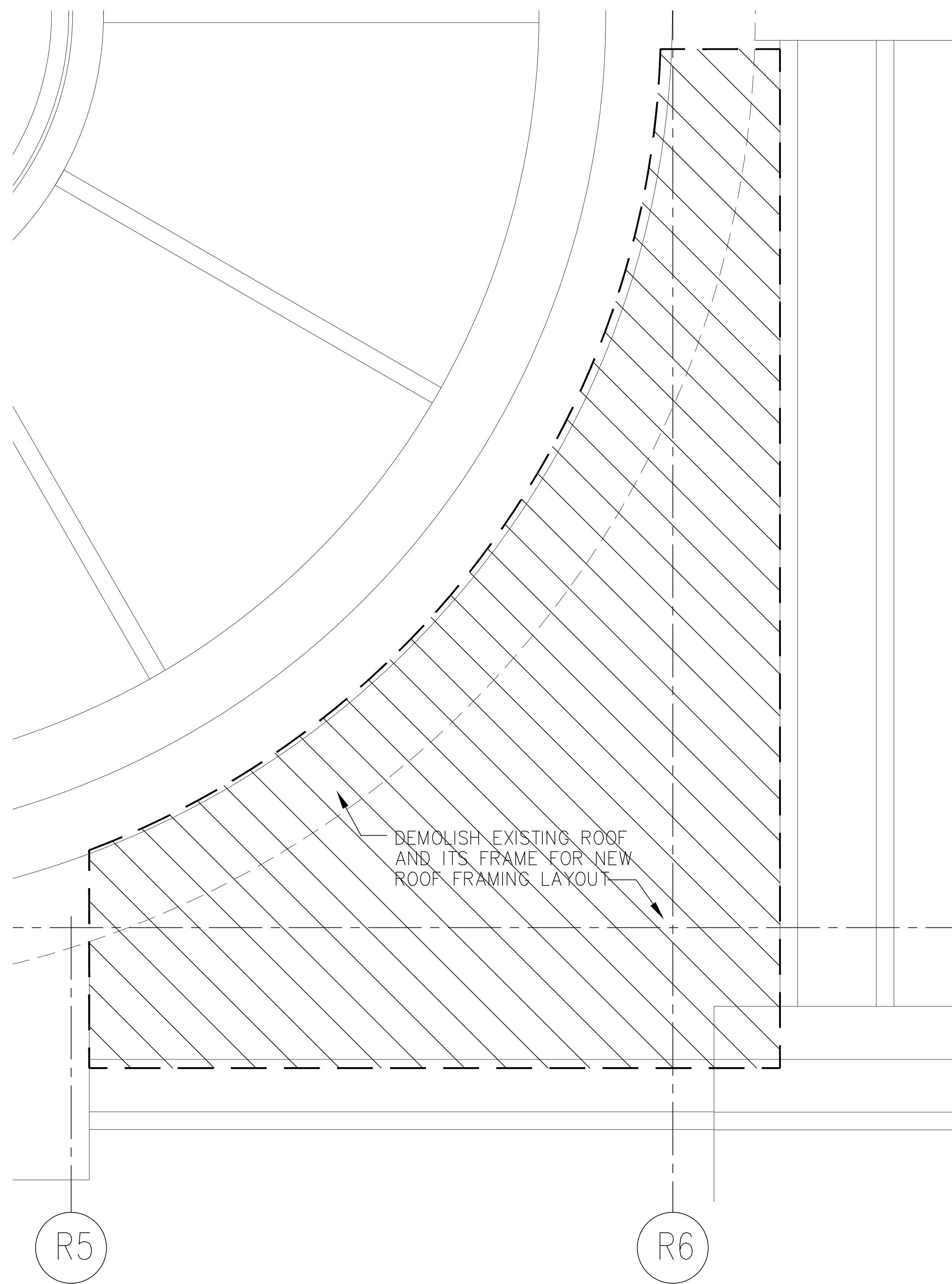
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NJ License No. AI 14394

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1004 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0200 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

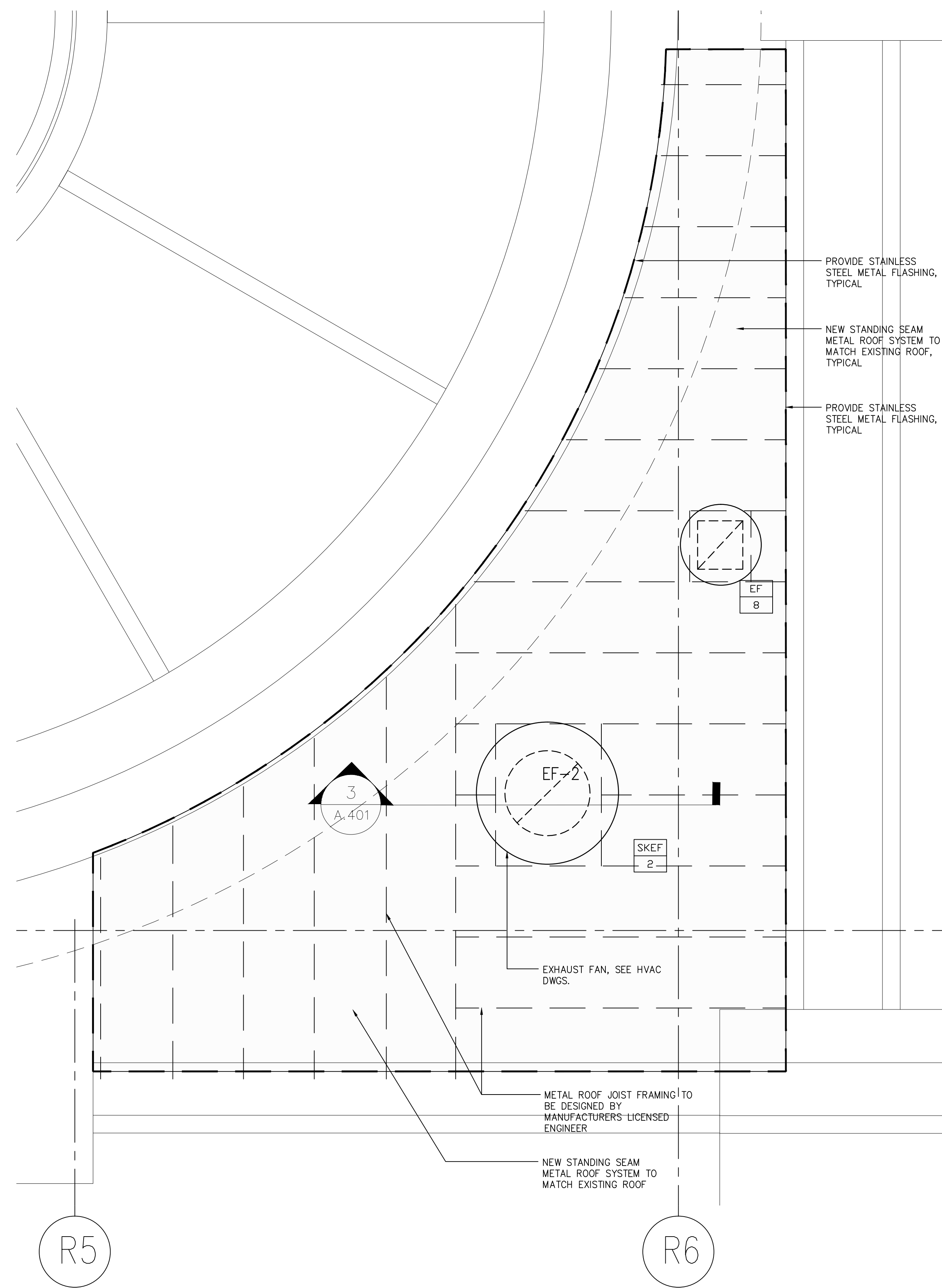
PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
DOOR & WINDOW TYPES, SCHEDULES & PARTITION TYPES

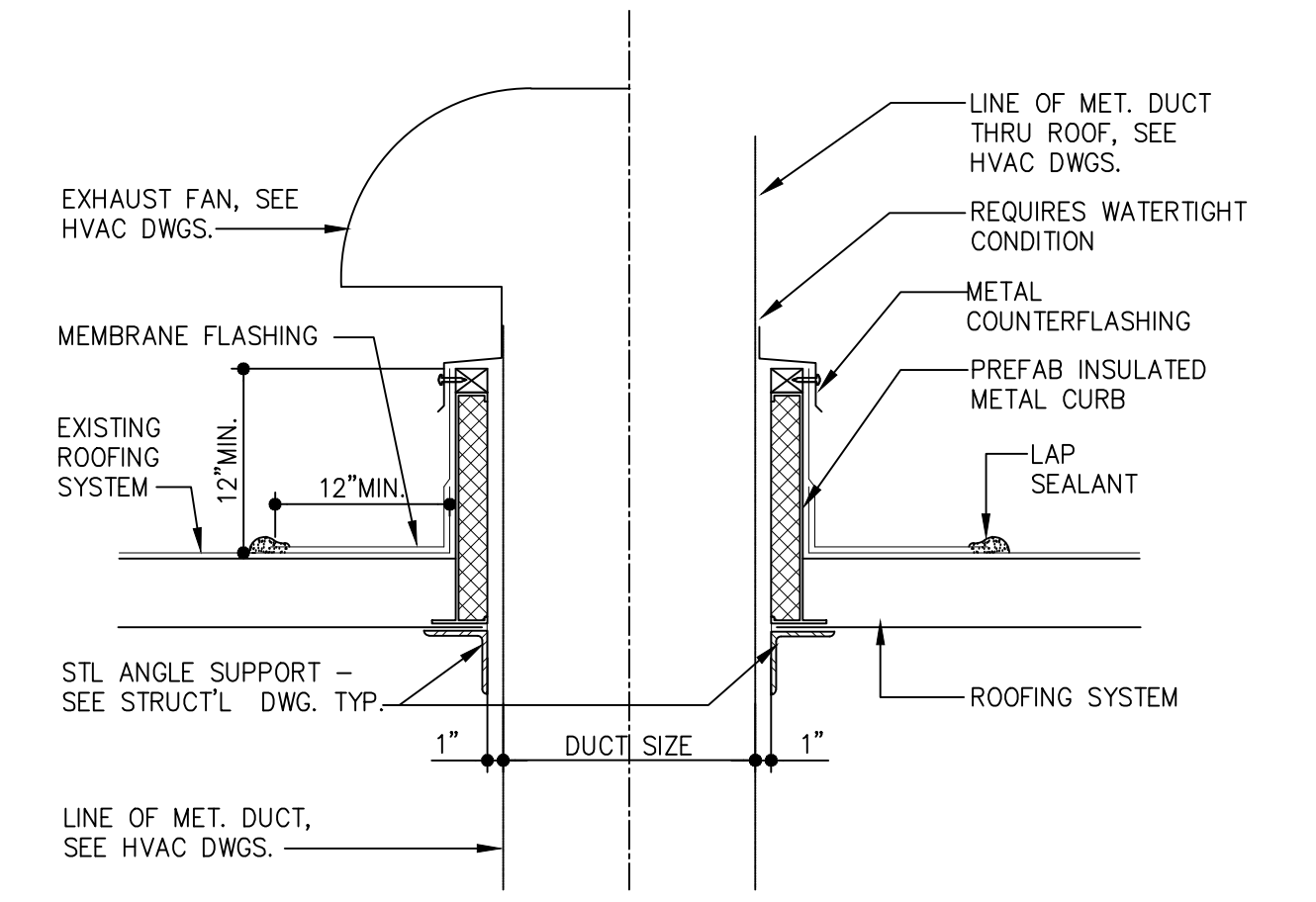
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DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	05-31-17
9.25.15	95% CD SUBMIT	KD	FM					AS SHOWN	
10.30.15	95% CD UPDATES	KD	FM					DRWN BY	WTJ/BT
05.31.17	100% CD SUBMIT	MMC	FJM						



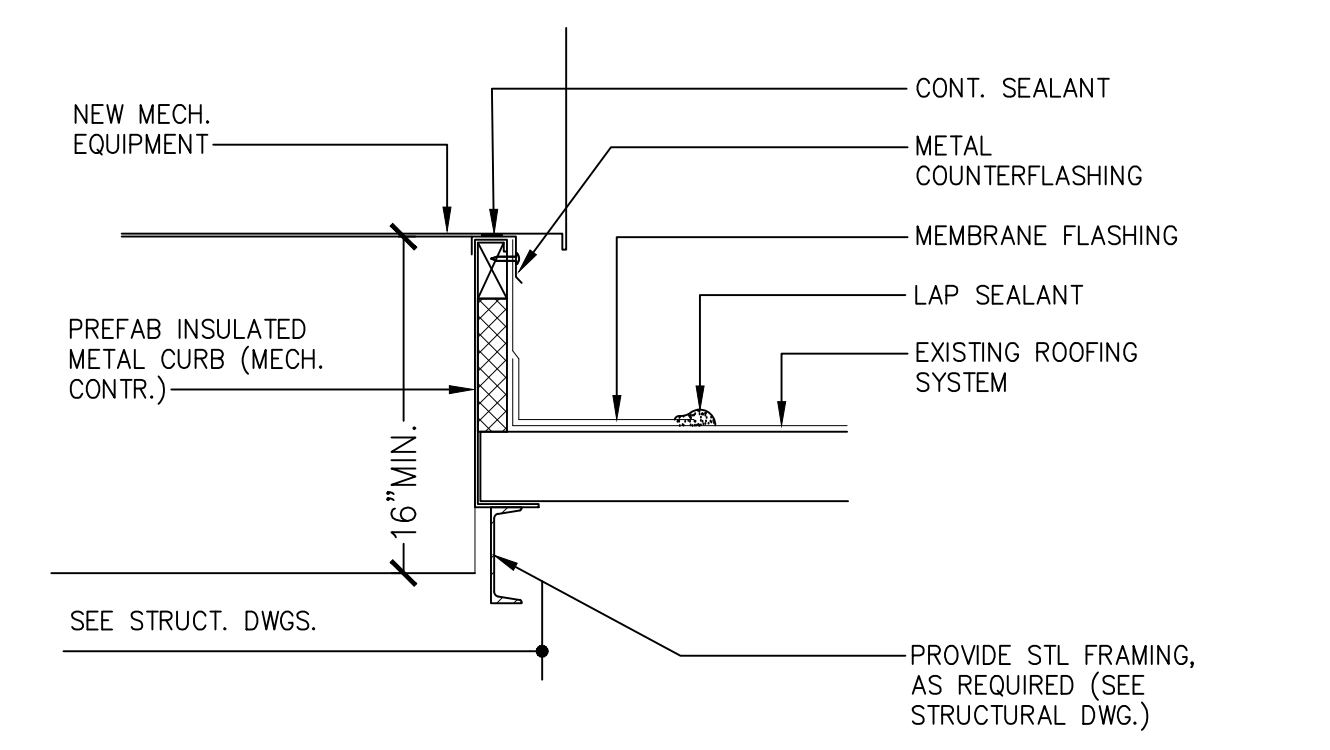
1 PARTIAL ROOF DEMO PLAN
A.401 1/2" = 1'-0"



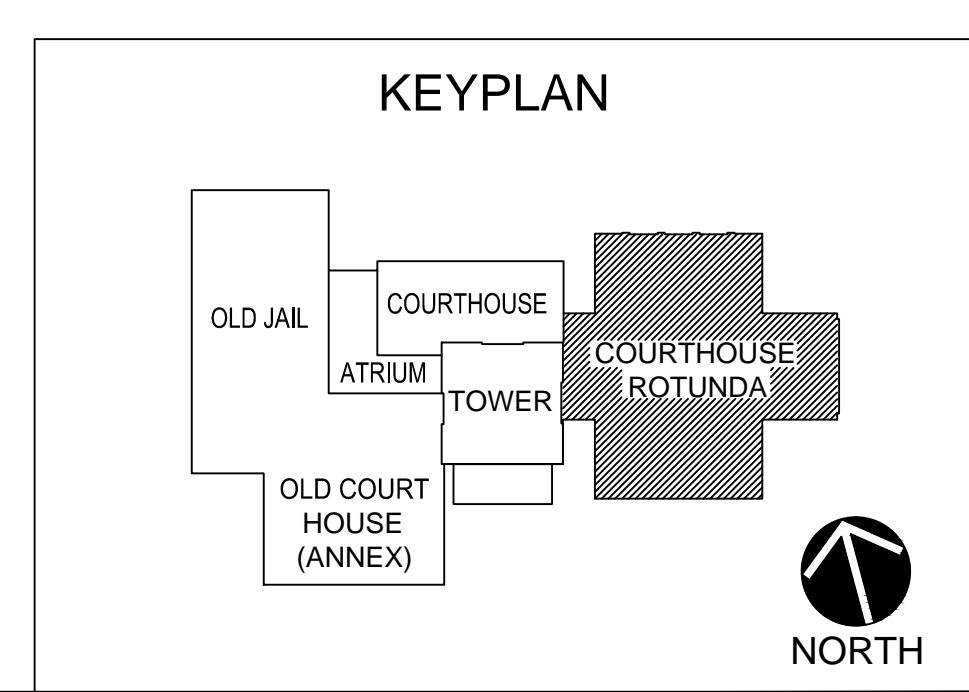
2 PARTIAL ROOF CONSTRUCTION PLAN
A.401 1/2" = 1'-0"



SEE ROOF PLAN FOR LOCATIONS OF EQUIPMENTS
3 TYP. ROOF OPENING DETAIL
A.401 SCALE: 1"=1'-0"



4 ROOF OPENING DETAIL
A.401 SCALE: 1"=1'-0"



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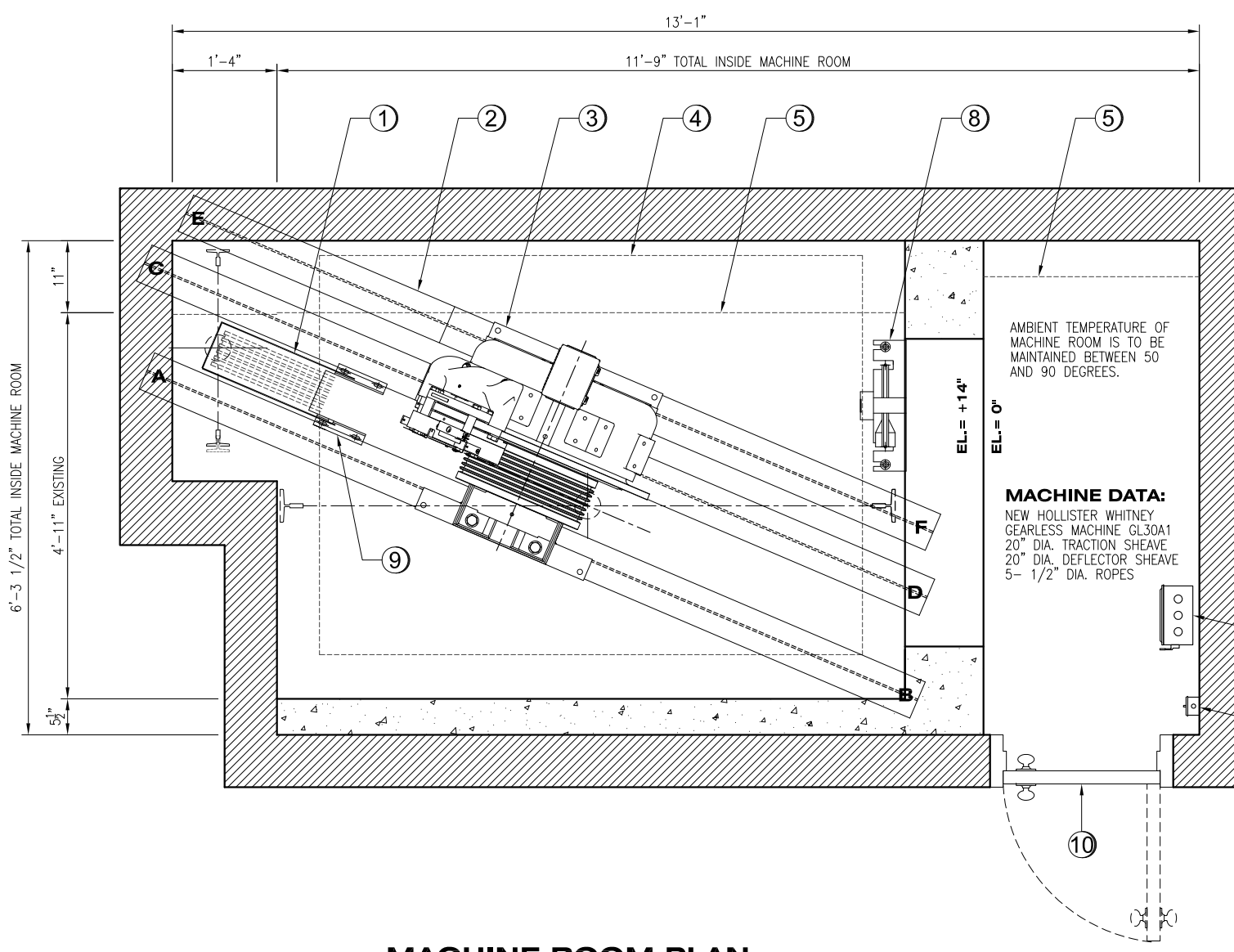


PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
PARTIAL ROOF DETAILS

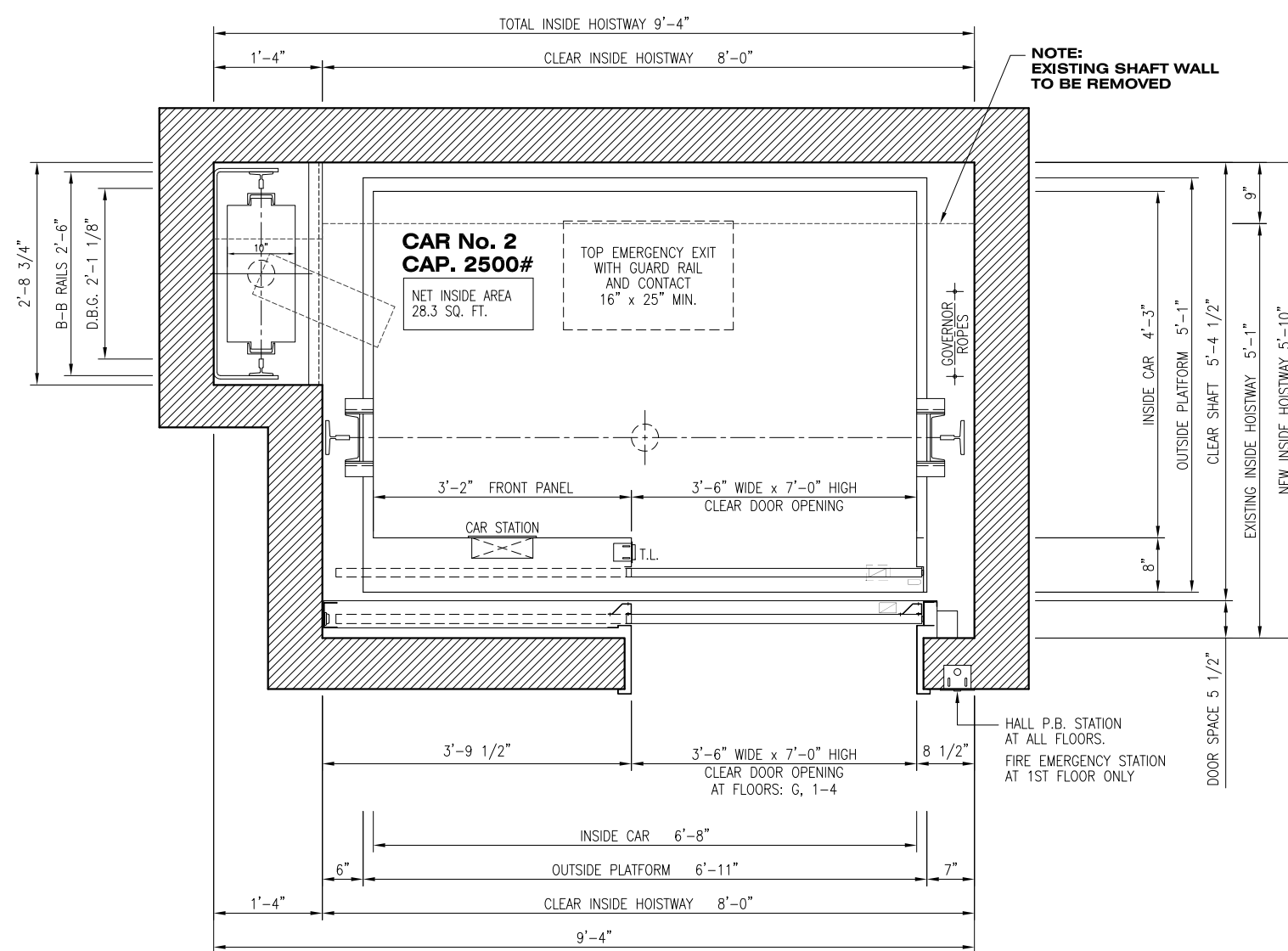
SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY WTJ
10.30.15	95% CD UPDATES	KD	FM						CHKD BY NJN
05.31.17	100% CD SUBMIT	MMC	FJM						JOB NO 2141152
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 26 OF: 118
									DWG. NO

A.401

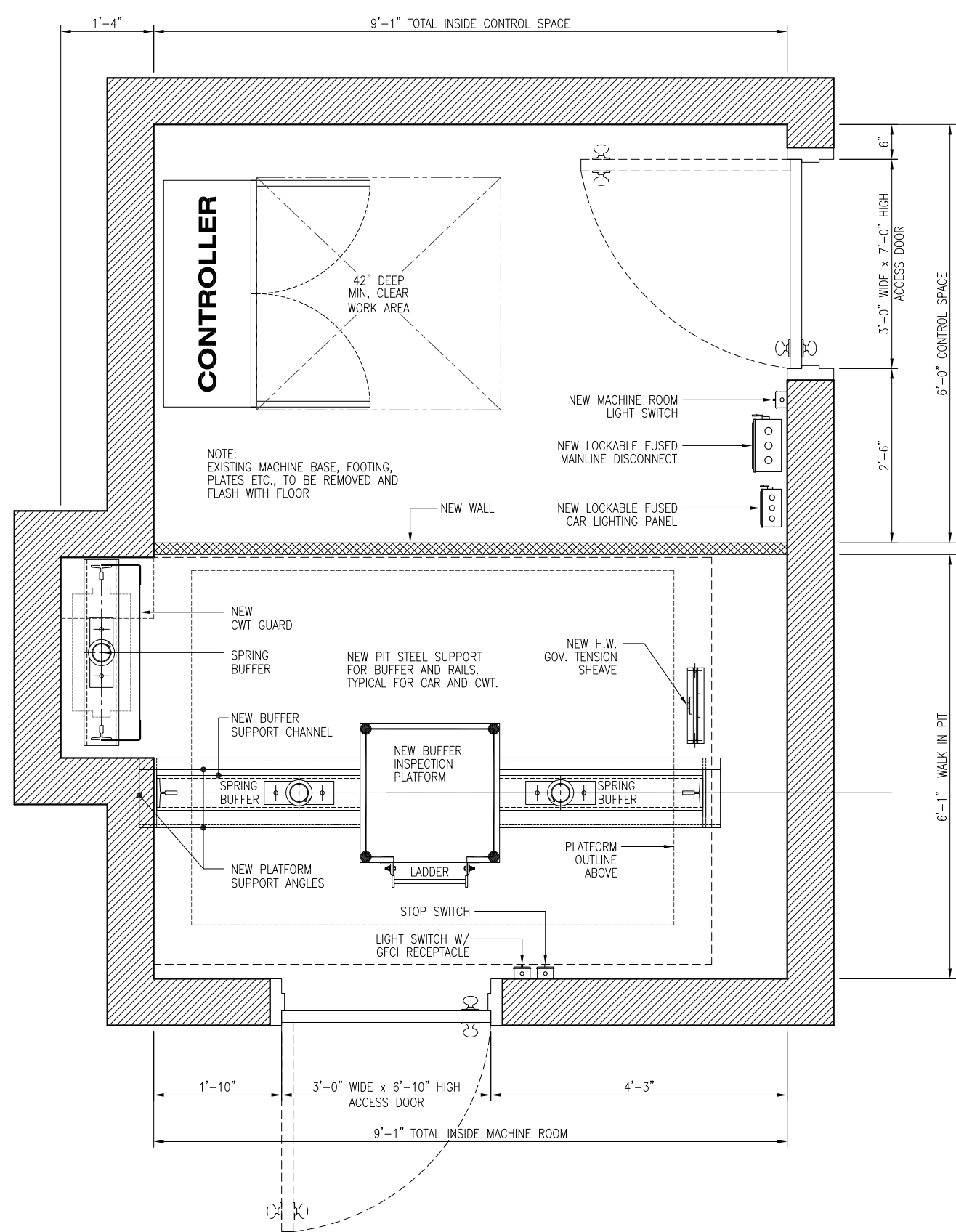


- LEGEND:**
- 1 NEW 20" Ø DEFLECTOR SHEAVE
 - 2 NEW S1200M MACHINE BEAMS
 - 3 NEW HOLLISTER WHITNEY GEARLESS MACHINE GL30A1
 - 4 CAR PLATFORM OUTLINE BELOW
 - 5 EXISTING WALL TO BE REMOVED
 - 6 MACHINE ROOM LIGHT SWITCH
 - 7 NEW LOCKABLE MAINLINE DISCONNECT SWITCH
 - 8 NEW HOLLISTER WHITNEY GOVERNOR
 - 9 NEW HOLLISTER WHITNEY ROPE GRIPPER
 - 10 NEW ACCESS DOOR 30" WIDTH x 80" HEIGHT MIN. 42" WIDTH RECOMMENDED

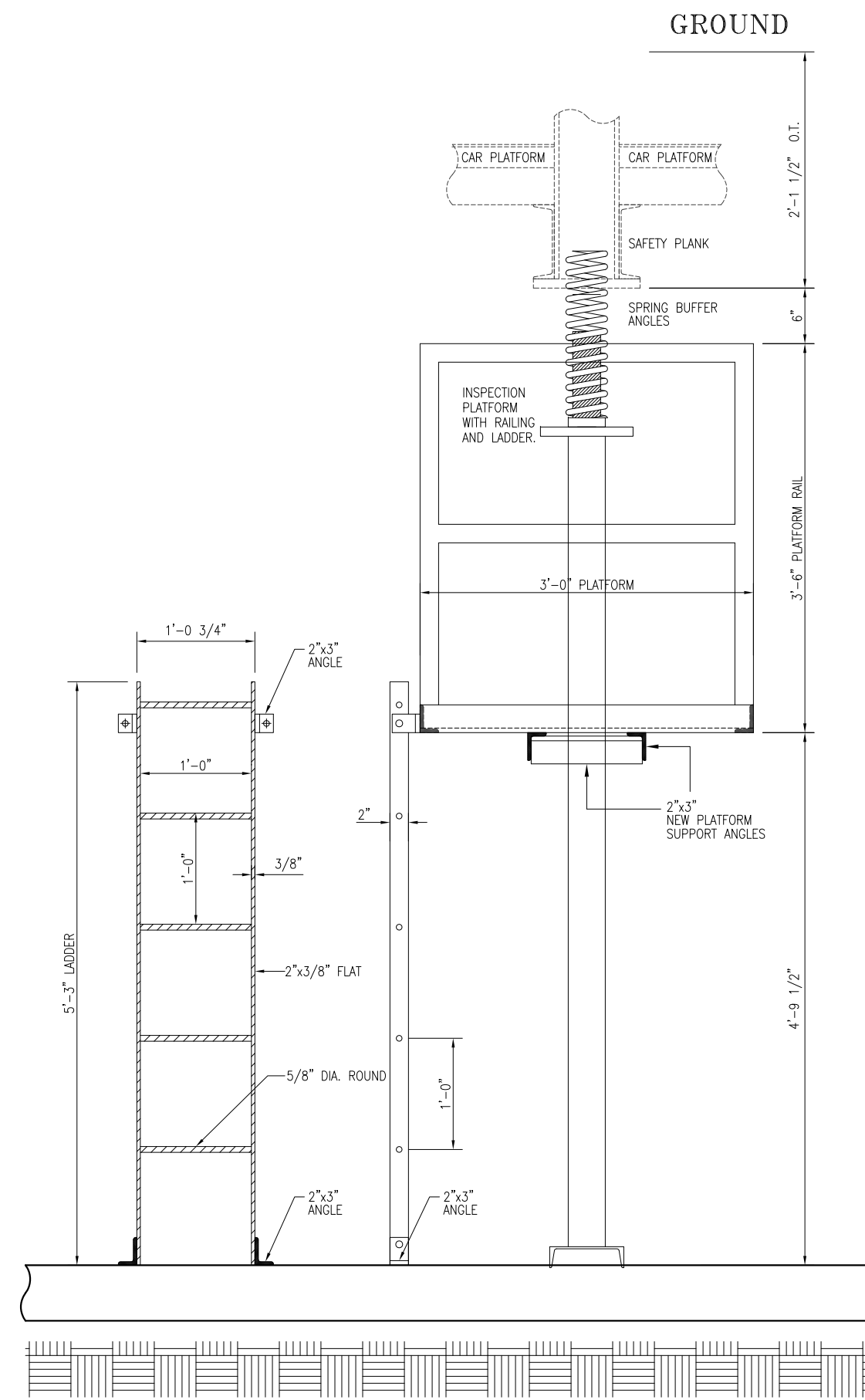
MACHINE ROOM PLAN
SCALE: 1/2" = 1'-0"



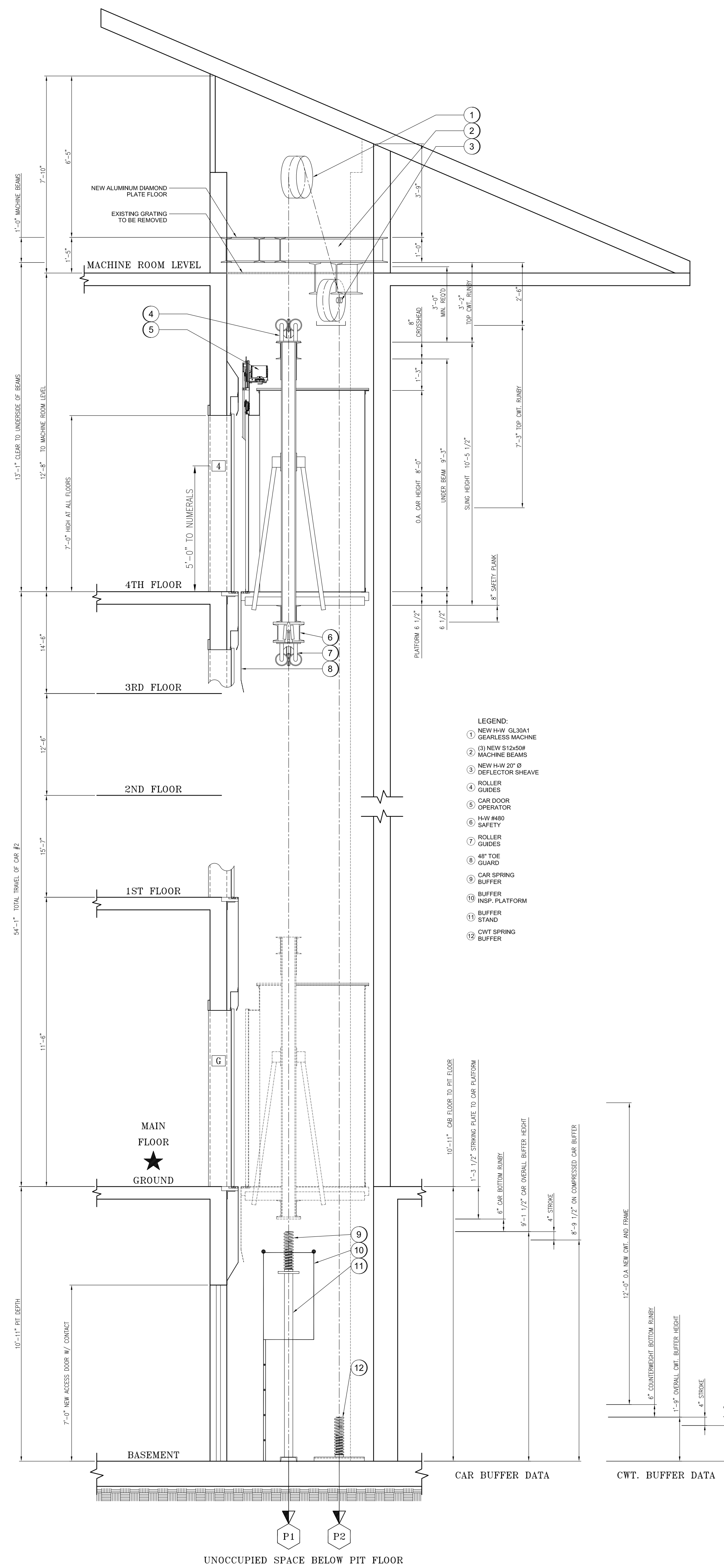
ENLARGED SHAFT PLAN
SCALE: 1/2" = 1'-0"



NEW WALK IN PIT
SCALE: 1/2" = 1'-0"



INSPECTION PLATFORM DETAIL
SCALE: 3/4" = 1'-0"



- LEGEND:**
- 1 NEW 1/4" GL30A1 GEARLESS MACHINE
 - 2 NEW S1200M MACHINE BEAMS
 - 3 NEW 1/4" Ø DEFLECTOR SHEAVE
 - 4 ROLLER GUIDES
 - 5 CAR DOOR OPERATOR
 - 6 NEW WIND SAFETY
 - 7 ROLLER GUIDES
 - 8 4" Ø TOE GUARDS
 - 9 CAR SPRING BUFFER
 - 10 RAMP PLATFORM
 - 11 SAFETY SWAY
 - 12 CWT SPRING BUFFER

ELEVATION / SECTION A-A
SCALE: 3/8" = 1'-0"

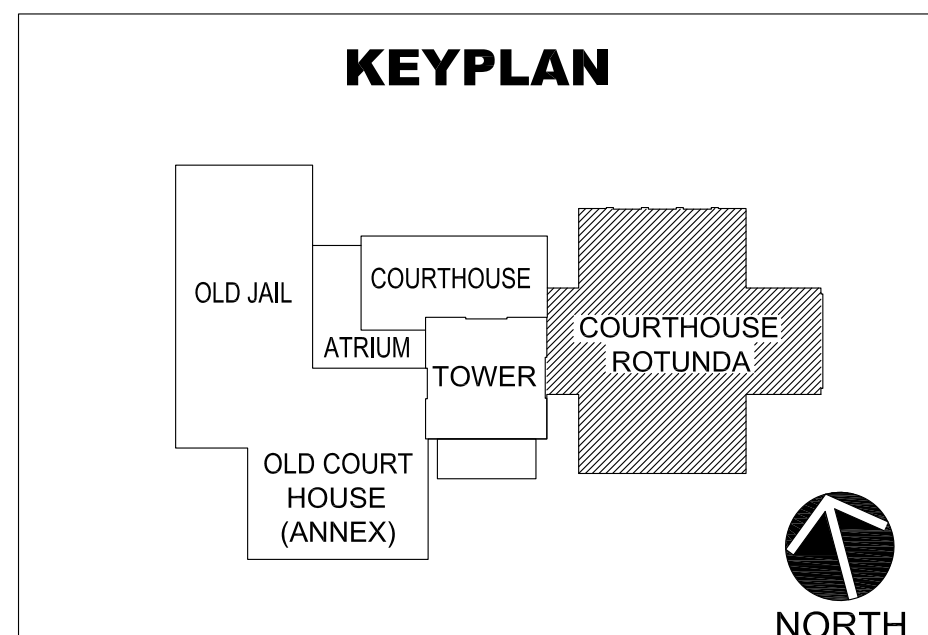
ELEVATOR CONTRACT DATA		
ELEVATOR No.	EXISTING	CAR #2
CITY NO.	EXISTING	NONE
TYPE	EXISTING	PASSENGER
CAPACITY	NEW	2500 LBS.
SPEED	EXISTING	200 FPM
TRAVEL	EXISTING	54'-1"
LANDINGS	EXISTING	4
OPENINGS FRONT	EXISTING	G, 1-4
OPENINGS REAR	EXISTING	NONE
MOTOR CONTROL	NEW	VVVF-AC
OPERATION	NEW	SIMPLEX

MACHINE AND EQUIPMENT		
MACHINE TYPE / ROPING	NEW	HOLLISTER WHITNEY GEARLESS MODEL GL171 / 1:1
MACHINE SHEAVE & PITCH	NEW	20" DIA. / 1"
DEFLECTOR SHEAVE DIA. & PITCH	NEW	20" DIA. / 1"
GOVERNOR TYPE / TRIP FPM (MAX.)	NEW	CENTRIFUGAL / 280 FPM
GOVERNOR CABLE	NEW	(1) 3/8" DIA.
HOIST MOTOR / MANUFACTURER	NEW	A.C. MOTOR / IMPERIAL
HOIST MOTOR HP	NEW	H.P.
ROPE GRIPPER	NEW	H-W
CONTROLLER	NEW	GAL

OVERHEAD REACTIONS						
REACTIONS SHOWN INCLUDE LIVE LOADS WHICH HAVE BEEN DOUBLED FOR IMPACT. WEIGHT OF CONCRETE SLAB OR GRATINGS NOT INCLUDED.						
ELEVATOR No.	A	B	C	D	E	F
CAR #2	5474#	4869#	6569#	6965#	4932#	5240#

RAIL REACTIONS AND FORCES				
RAIL AND BUFFER REACTIONS DO NOT OCCUR SIMULTANEOUSLY.				
REACTIONS ARE PER EACH RAIL.				
F FORCE IS DOWNWARD ON PIT.				
ELEVATOR RAIL FORCES (ZONE 2)	NORMAL LOADING	R1	R2	VF
	NORMAL RUNNING	200#	125#	
	SEISMIC (CAR)			
	SAFETY APPLICATION			16,507#
COUNTERWEIGHT	SEISMIC (CWT.)			N/A
	SAFETY APPLICATION			

BUFFER SUPPORT IMPACTS		
ELEVATOR	CAR BUFFER IMPACT LOAD	27,032#
	CWT BUFFER IMPACT LOAD	20,344#



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NJ License No. AI 14594

NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973.379.1061
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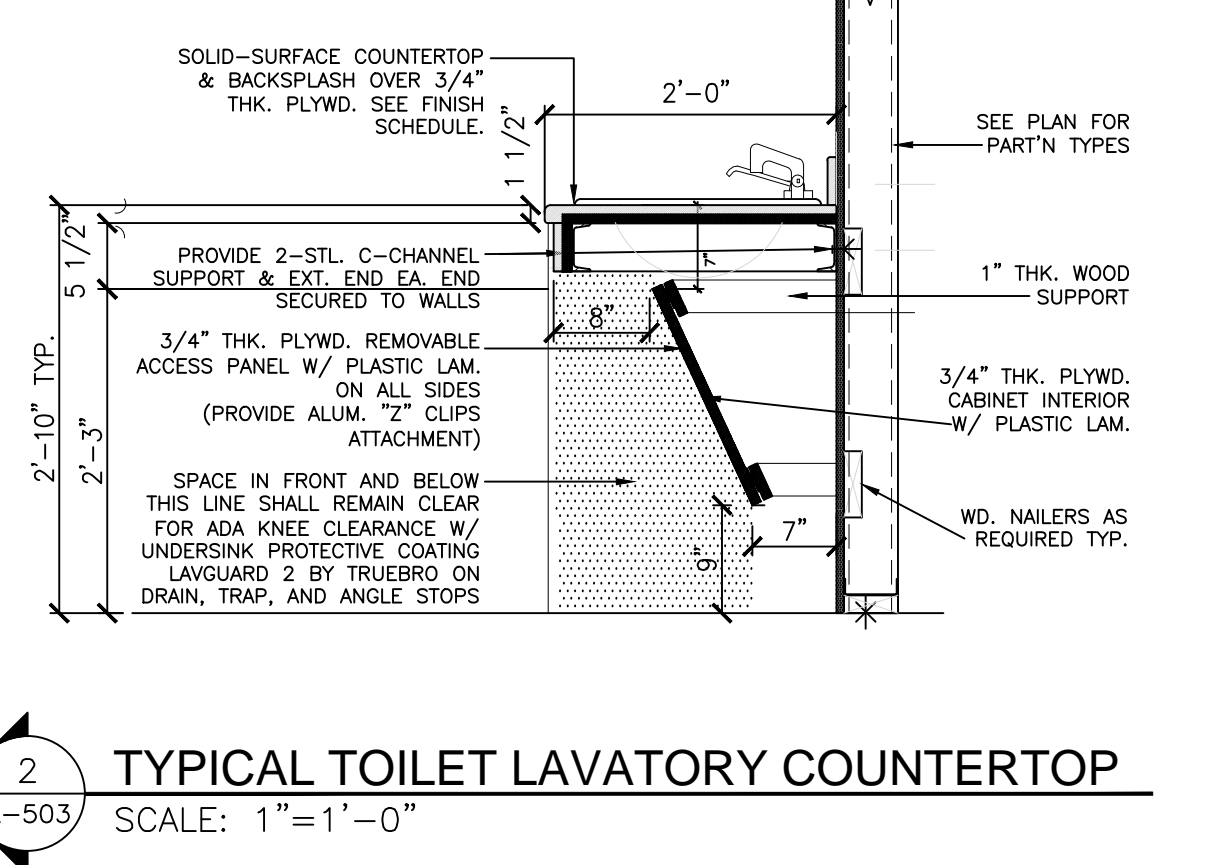
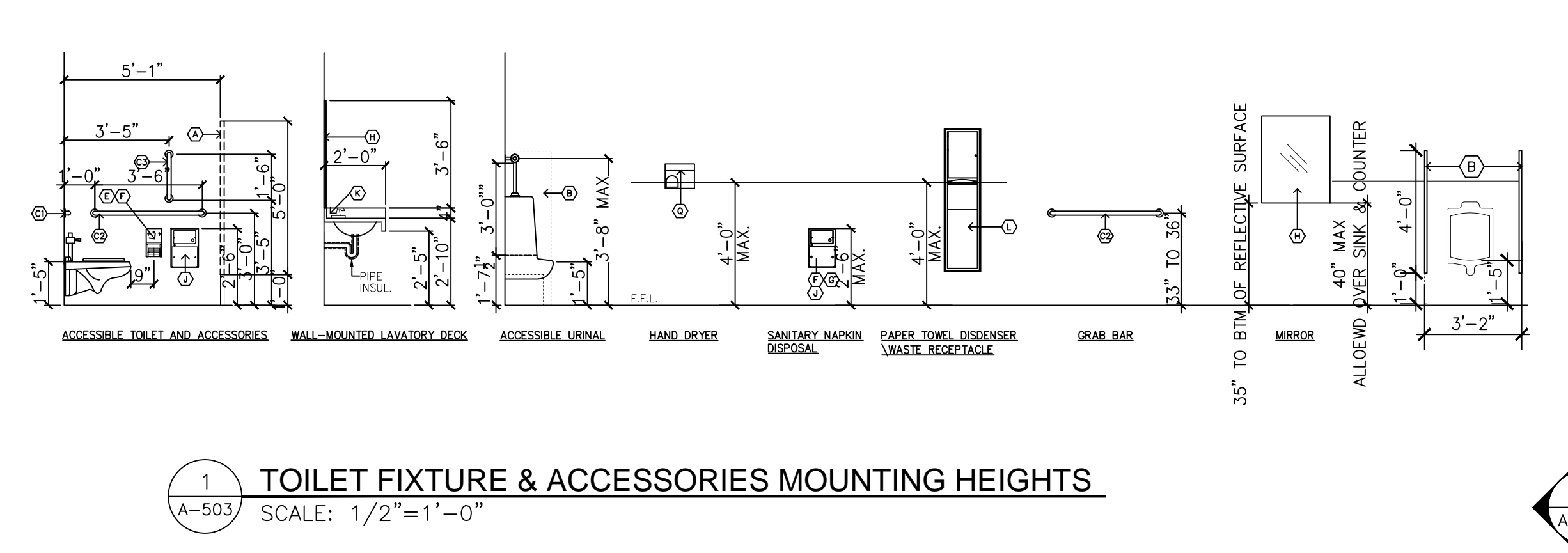
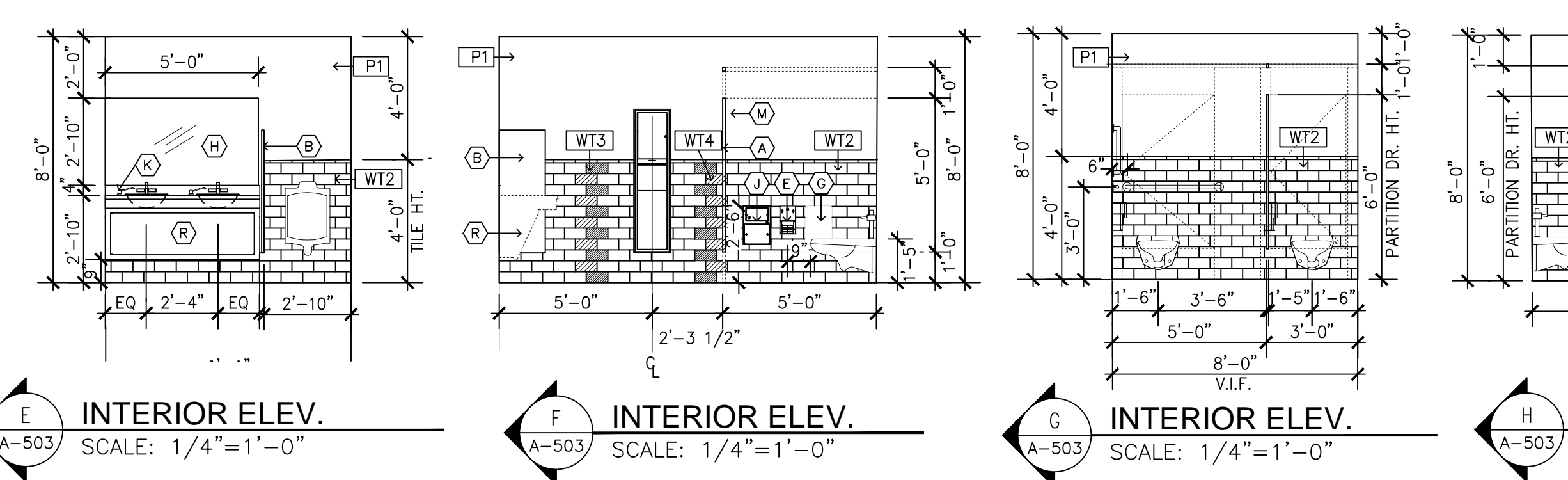
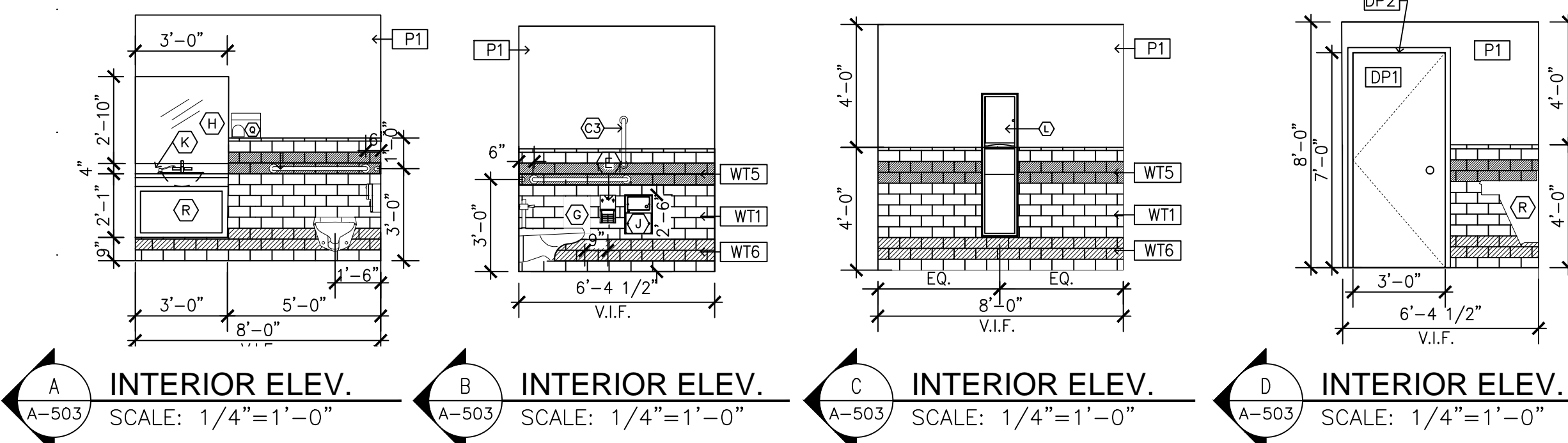
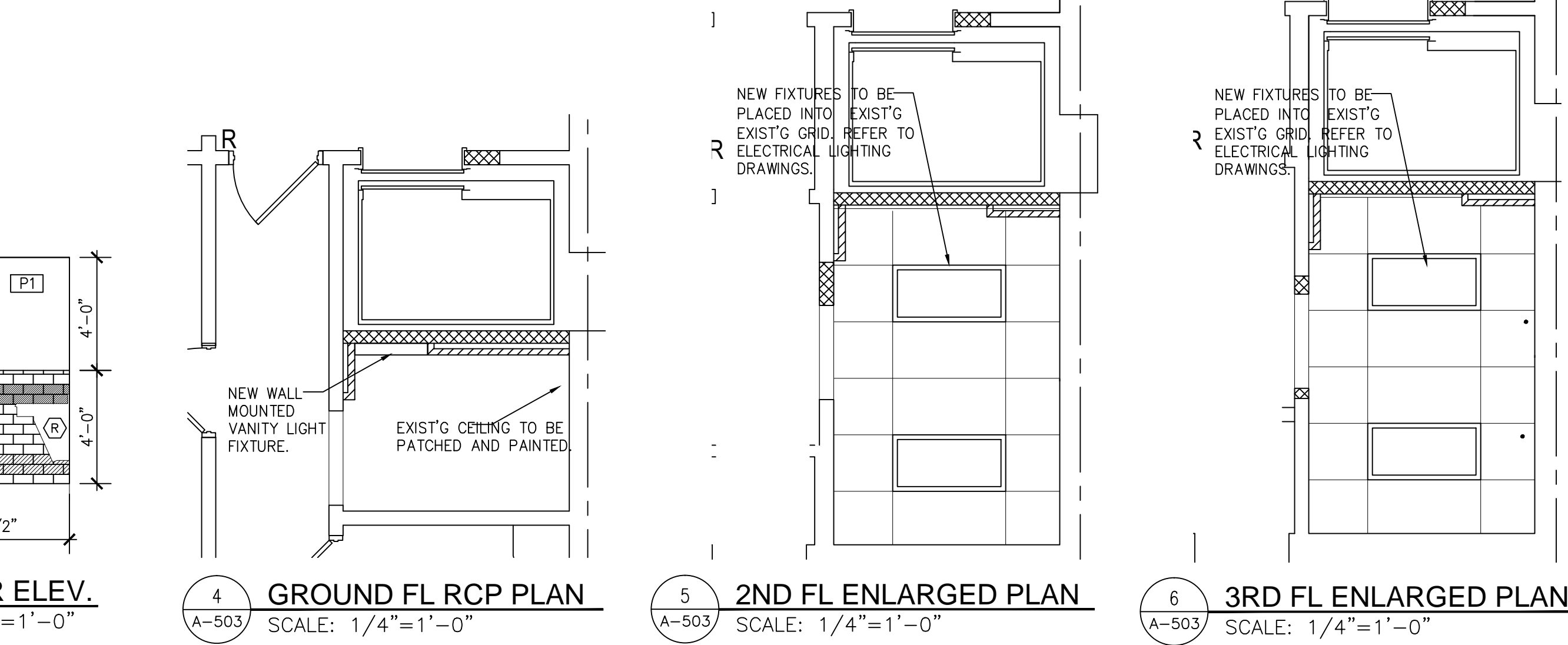
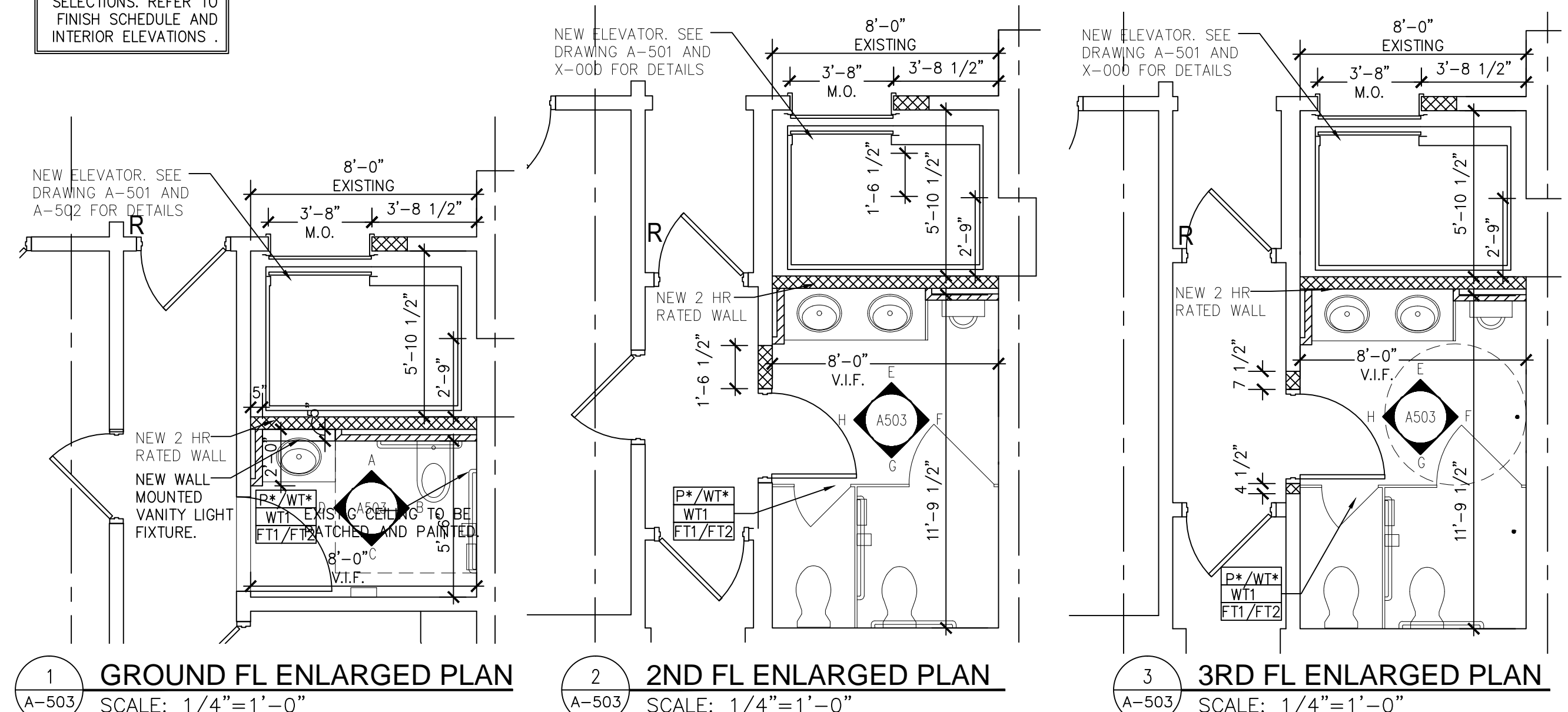
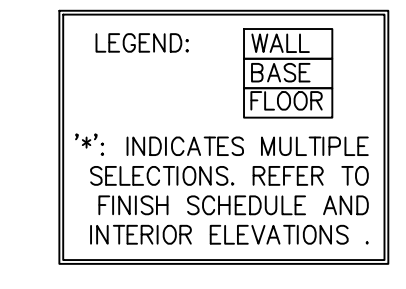
PROJECT:
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELEVATOR DETAILS

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	OF
9.25.15	95% CD SUBMIT	KD	FM					AS SHOWN	
10.30.15	95% CD UPDATES	KD	FM					M.G.	
9.07.17	ISSUED FOR BID	MC	FM					NUN	
								JOB NO	2141152
								SHEET	OF: 118
								DWG. NO	

A502

BASIS OF DESIGN FOR TOILET ACCESSORIES					
ITEM	PRODUCT NAME	DESCRIPTION	MANUFACTURER	MODEL #	REMARKS
(A)	TOILET PARTITIONS	COORDINATE WITH FINISH SCHEDULE	HADRIAN PARTITIONS	POWDER COATED SEE FINISH SCHEDULE	PROVIDE STD. STAINLESS STL. DOOR HARDWARE, HINGES AND BRACKETS
(B)	URINAL SCREENS	WALL HUNG WITH BRACKET	HADRIAN PARTITIONS	POWDER COATED SEE FINISH SCHEDULE	PROVIDE STD. STAINLESS STL. BRACKETS, WALL MOUNTED 48" H SCREEN
(C)	36" GRAB BARS	1 1/2" O.D. STAINLESS STL. WITH CONCEALED MOUNTING	BRADLEY	812-36	PROVIDE STANDARD FINISH
(D)	42" GRAB BARS	1 1/2" O.D. STAINLESS STL. WITH CONCEALED MOUNTING	BRADLEY	812-42	PROVIDE STANDARD FINISH
(E)	18" GRAB BARS	1 1/2" O.D. STAINLESS STL. WITH CONCEALED MOUNTING	BRADLEY	812-18	PROVIDE STANDARD FINISH
(F)	NOT USED	RECESSED MOUNTED	BRITA	MODEL 2000	POWER AND WATER SUPPLY REQUIRED. SEE ELECTRICAL & PLUMBING DWGS.
(G)	TOILET TISSUE DISPENSER	PARTITION-MOUNTED	BRADLEY	5A20	
(H)	TOILET TISSUE DISPENSER	SURFACE-MOUNTED	BRADLEY	5A10	
(I)	SANITARY PRODUCT DISPOSAL UNIT	PARTITION-MOUNTED, DUAL-SIDED NAPKIN/TAMPON DISPOSAL UNIT	BRADLEY	4A11	WOMEN'S TOILET ONLY
(J)	MIRROR	CUSTOM-SIZED FROSTED FRAMELESS MIRROR	X	X	REFER TO INTERIOR ELEVATIONS /A503 AND /A503.
(K)	TOILET SEAT COVER DISPENSER	SURFACE-MOUNTED	BRADLEY	5A40-11	
(L)	LIQUID SOAP DISPENSER	SURFACE-MOUNTED	BOBRICK	B-40	OWNER-SUGGESTED ACCESSORIES
(M)	TOWEL/WASTE RECEPTACLE	SEMI-RECESSED	BRADLEY	MODEL: 234	
(N)	HEAVY-DUTY ROBE HOOK	EXPOSED MOUNTING	BRADLEY	9118	
(O)	SANITARY PRODUCT VENDOR	RECESSED	BRADLEY	MODEL 4A20	
(P)	STAINLESS STL CHANNEL FRAMED MIRROR	CUSTOM-SIZED WALL-MOUNTED	X	X	SEE WALL ELEVATION
(Q)	ELECTRIC HAND DRYER	SURFACE-MOUNTED, AUTOMATIC, BRUSHED STAINLESS STL. COVER	EXCEL DRYER Inc.	MODEL XL-SB	POWER SUPPLY REQUIRED. SEE ELECTRICAL DWGS.
(R)	COUNTERTOP & BACKSPLASH	3/4" THK. SOLID-SURFACE	X	X	PROVIDE STL. C-CHANNEL SUPPORT & WD. NAILERS
(S)	UTILITY SHELF WITH DRYING ROD	SURFACE MOUNTED IN SERVICE SINK.	BRADLEX	MODEL: 9983	

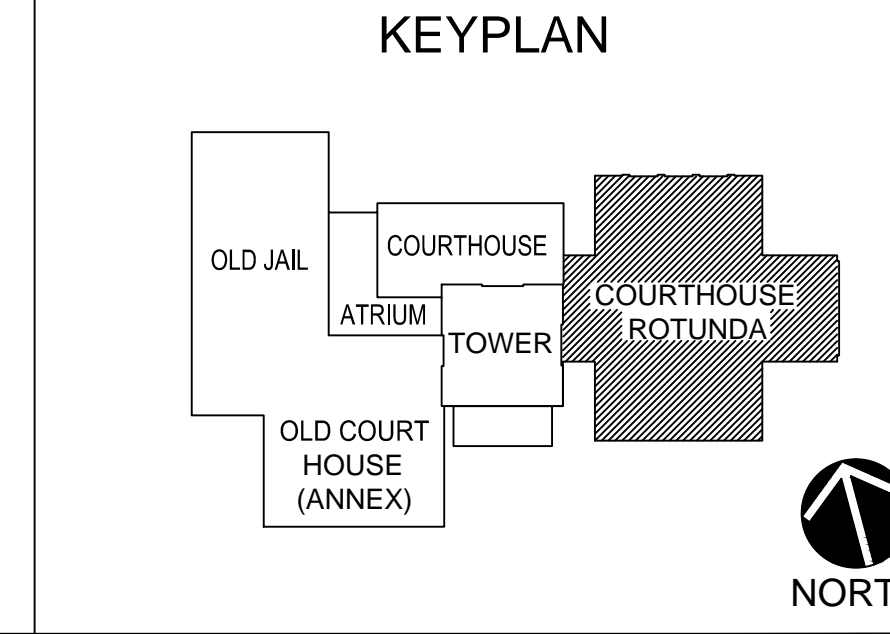


NOTES:

- CONTRACTOR SHALL COORDINATE WITH MANUFACTURER'S RECOMMENDATIONS FOR BLOCKING REQUIREMENTS, WHERE REQUIRED, BLOCKING AND MINIMUM FASTENING REQUIREMENTS SHALL CONFORM TO THE REQUIREMENTS OF ANS/A117.1 AS REFERENCED IN SUBCHAPTER 7 OF THE UNIFORM CONSTRUCTION CODE OF THE STATE OF NEW JERSEY.
- PROVIDE AND INSTALL ACCESS DOORS FOR SPECIFIC EQUIPMENT IN TOILET ROOMS.
- INSTALL 5/8" WATER RESISTANT GYPSUM BOARD AT TOILETS, EXTEND TO UNDERSIDE OF DECK ABOVE ON TOILET ROOM SIDE.
- ALL ROOM DIMENSIONS TAKEN TO FACE OF FINISH WALL U.N.O.
- GENERAL CONTRACTOR TO PROVIDE & INSTALL WOOD NAILERS WITHIN STUD WALL TO SUPPORT GRAB BAR, SHELVING SCREENS & PARTITION INSTALLATION. COORDINATE WOOD NAILERS WITH VERTICAL AND HORIZONTAL MOUNTING HEIGHTS OF PARTITIONS, URINAL SCREENS AND TOILET ACCESSORIES.

FINISH SCHEDULE							
	MATERIAL	TYPE	DESCRIPTION	BASE OF DESIGN MANUFACTURER	CONTACT	REMARKS	
FLOOR	CARPET SHEET	C1	0.16" THICK, 78.74" (200CM) WIDTH SHEET CARPET, COLLECTION: FLOTEX VISION, COLOR: 600434 ENERGY	FORBO	JILL MASTROBA ITISTA TEL: 800.342.0604	GAME ROOM	
	PORCELAIN / CERAMIC / QUARRY TILE	FT1	18"x18" CERAMIC TILE, COLLECTION: HEATHLAND, COLOR: WHITE ROCK HL01	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	RESTROOMS	
		FT2	18"x18" CERAMIC TILE, COLLECTION: HEATHLAND, COLOR: ASHLAND HL05	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	RESTROOMS	
BASE	RUBBER SHEET FLOORING	R1	3.0 MM RUBBER SHEET FLOORING, STYLE: NORAPLAN VALUA, COLOR: ?	NORA	TORY CHURCHILL TEL: 201.661.3514	STAIRWELL	
		R2	3.0 MM RUBBER SHEET FLOORING, STYLE: NORAPLAN VALUA, COLOR: 6721 SANDBAR	NORA	TORY CHURCHILL TEL: 201.661.3514		
	SEALED CONCRETE	SC	ASHFORD FORMULA	CURE CRETE, INC.	TEL: 801.489.5663		
	RUBBER	B1	4" ECOLIBRIUM BIO-BASED TRADITIONAL WALL BASE COLOR: 24 GREY HAZE.	JOHNSONITE			
		B2	4" ECOLIBRIUM BIO-BASED TRADITIONAL WALL BASE COLOR: 24 GREY HAZE.	JOHNSONITE			
	PAINT	P1	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: SATW5566 WESTHIGHLAND WHITE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	ALL RESTROOMS	
		P2	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: LATTE QH26 (1) FINISH: MATTE.	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	LOUVERS AND WALLS ROTUNDA	
		P3	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	FIRST FLOOR OFFICES	
WALL	CERAMIC WALL TILE	WT1	4"x8" CERAMIC WALL TILE FIELD COLLECTION: NATURAL HUES COLOR: MUSHROOM QH18 (1) FINISH: MATTE.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	GROUND FLOOR RESTROOM BRICK-HORIZONTAL PATTERN	
		WT2	4"x8" CERAMIC WALL TILE FIELD COLLECTION: NATURAL HUES COLOR: STEEL QH21 (1) FINISH: MATTE.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN	
		WT3	4"x8" CERAMIC WALL TILE ACCENT COLLECTION: NATURAL HUES COLOR: PERIWINKLE QH31 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN	
		WT4	4"x8" CERAMIC WALL TILE ACCENT COLLECTION: NATURAL HUES COLOR: LATTE QH26 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN	
		WT5	4"x8" CERAMIC WALL TILE COLLECTION: NATURAL HUES COLOR: EGGPLANT QH18 (1) FINISH: GLOSSY	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	GROUND FLOOR RESTROOM BRICK-HORIZONTAL PATTERN	
		WT6	4"x8" CERAMIC WALL TILE COLLECTION: NATURAL HUES COLOR: ROSE BEIGE QH19 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	RESTROOM ACCENT REFER TO INTERIOR ELEV. PATTERN	
	CEILING	ACUSTIC CEILING PANEL	ACT1	24"x24"x7/8" ULTIMA BEVELED REGULAR, COLOR: WHITE	ARMSTRONG		4TH FLOOR LOBBY/ OFFICE AREA
		SUSPENDED SYSTEM	SS1	SUPRAFINE 4" EXPOSED TEE SYSTEM, SHADOW MOLDING, COLOR: WHITE	ARMSTRONG		
		PAINT	CP1	INTERIOR ACRYLIC LATEX PAINT, PROMAR 200 FLAT FINISH, COLOR: CEILING WHITE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	PLASTER CEILING ROTUNDA
	DOORS	VINYL-CLAD DOORS	VD1	VINYL-CLAD FLUSH eIDDOOR WITH 0.040" THICK IPC RIGID VINYL SHEET OPTION, COLOR: APPLEWOOD 0537	EGGERS		REFER TO DWG. A301.
		METAL DOOR	DP1	PAINT SHIELD MICROBICIDAL INTERIOR LATEX PAINT, MEDIUM LUSTER/GLOSS FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	REFER TO DWG. A301.
		METAL DOOR FRAME	DP2	PAINT SHIELD MICROBICIDAL INTERIOR LATEX PAINT, SEMI-GLOSS FINISH, COLOR: TO MATCH ADJACENT DOOR FRAME COLOR	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	REFER TO DWG. A301.
MILL & BULK	PLASTIC LAMINATE	PL1	LAMINATE, COLOR: ?	WILSONART	SANDRA GAVINHO TEL: 800.220.2233	ELEVATOR CAB	
SPECIALTIES	TOILET PARTITIONS/URINAL SCREENS	TP1	1" THICK, POWDER COATED PARTITION, STANDARD SERIES STYLE: HEADRAIL BRACED COLOR: 545 CHARCOAL	HADRIAN PARTITIONS	DENISE ROHMANN : SYLVESTER ASSOCIATES TEL: 732.805.5645	FLOOR MOUNTED W/ HEADRAIL BRACED.	
	URINAL SCREENS	US1	1" THICK, POWDER COATED PARTITION, STANDARD SERIES STYLE: HEADRAIL BRACED COLOR: 545 CHARCOAL	HADRIAN PARTITIONS	DENISE ROHMANN : SYLVESTER ASSOCIATES TEL: 732.805.5645	WALL MOUNTED 48" H SCREEN	
SINK	SOLID SURFACE	S1	ONE-PIECE VANITY TOP AND BOWL, FORMICA SIGNATURES COLOR: BOTTLE GLASS QUARTZ 770	FORMICA	1.800.367.6422	REFER TO DWG. A503, RESTROOM SINK VANITY	
STAIR	STAIR TREAD / RISER / LANDING	RS1	ONE-PIECE NOSING-TREAD-RISER RUBBER STARTTREADS, STYLE: COLOR: ?	JOHNSONITE	TORY CHURCHILL 201.661.3514		
	RAILING, GUARDRAIL & STRINGER	SP1	INTERIOR ACRYLIC LATEX PAINT PROMAR 200 SEMI-GLOSS FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709		
ELEVATOR	CAB PANEL	WP1	PREMIUM LAMINATE, COLOR: WILLIAMSBURG CHERRY 7936K-07, LAMINATE FINISH ON FACE AND FOUR EDGES.	OTIS		SEE ELEVATOR ELEVATION DWG. A-501.	
	CAB PANEL	SS	STAINLESS STEEL WALL PANEL	OTIS		SEE ELEVATOR ELEVATION DWG. A-501	
	CAB BASE	SB1	SATIN STAINLESS STEEL BASE	OTIS		SEE ELEVATOR ELEVATION DWG. A-501	

ROOM FINISH SCHEDULE					
	ROOM NO.	WALL	BASE	FLOOR	REMARKS
RESTROOMS	RESTROOM GROUND FLOOR	P1/W1/W5/W6	WT1	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.
	RESTROOM SECOND FLOOR	P1/W2/W3/W4	WT2	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.
	RESTROOM THIRD FLOOR	P1/W2/W3/W4	WT2	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.



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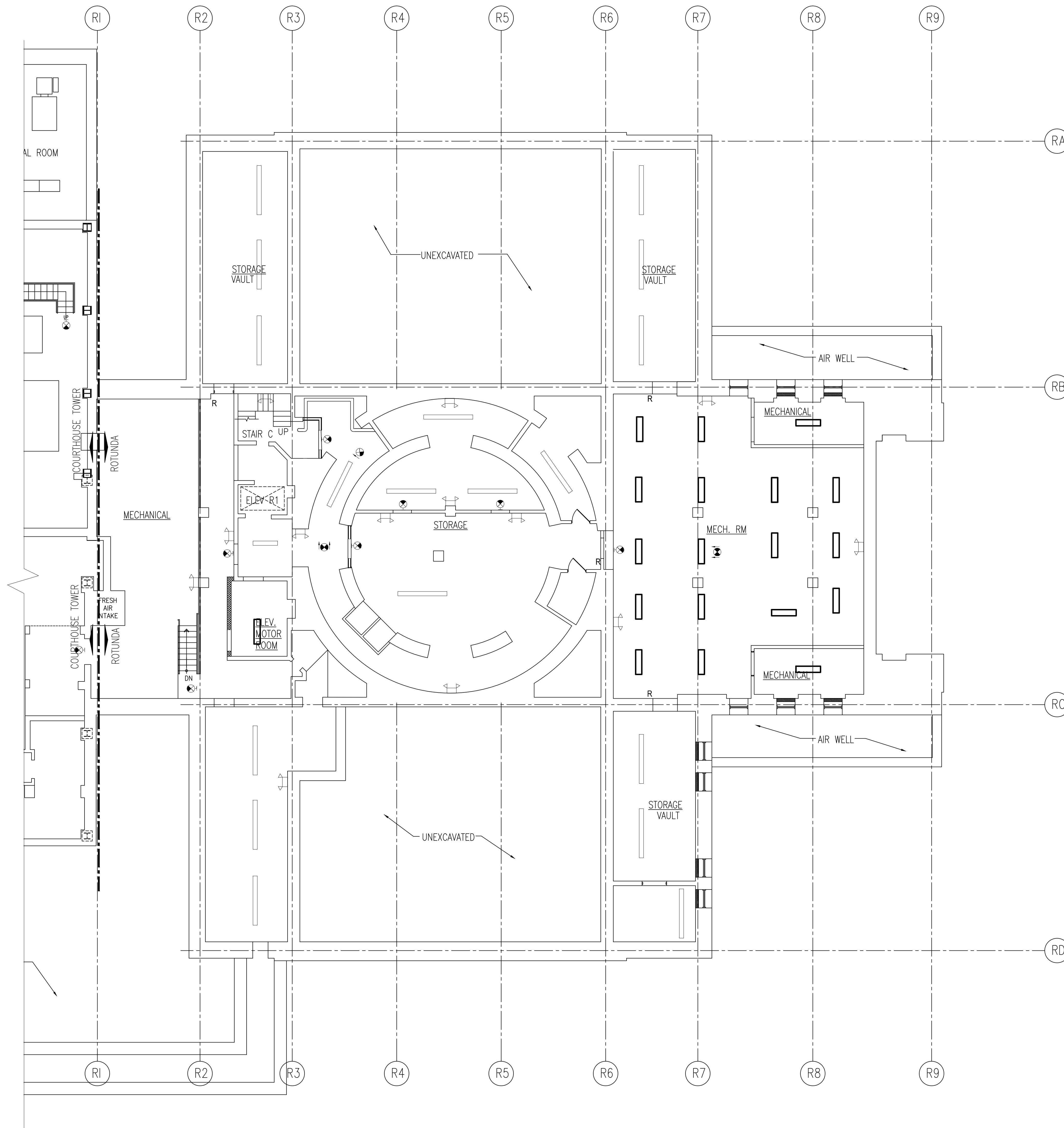
NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 29 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0098 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS: **BATHROOM ENLARGED PLANS AND DETAILS**

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
09.25.15	95% CD SUBMIT	KD	FM					DRWN BY	
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	OF: 118
								DWG. NO	

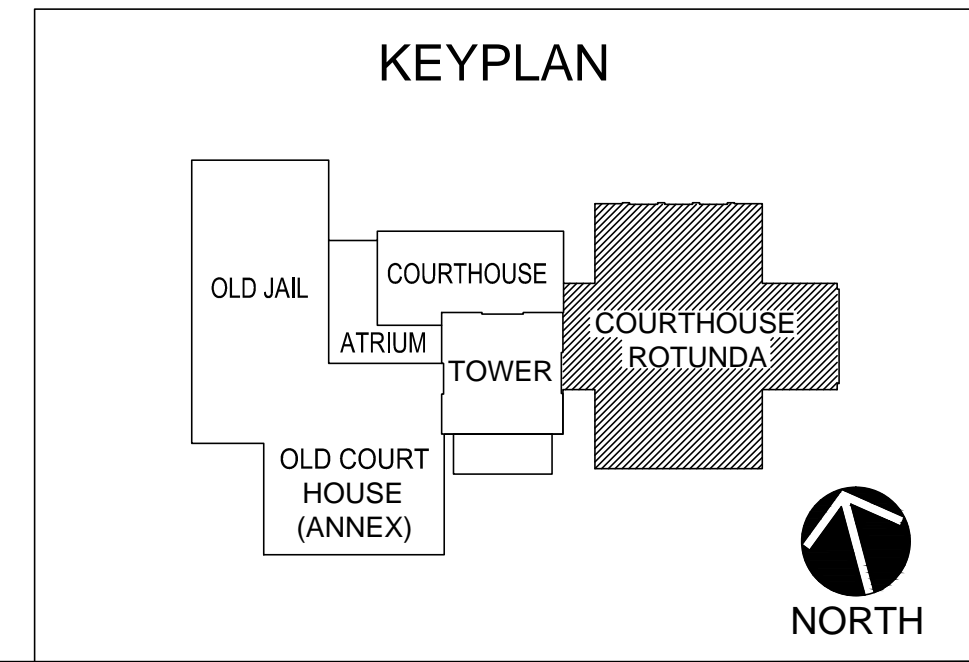
A.503



- LEGEND:**
- EXISTING PLASTER CEILING GRID
 - EXISTING 2'x4' CEILING GRID
 - EXISTING 2'x2' CEILING GRID
 - EXISTING 1'x4' LIGHT FIXTURE
 - EXISTING 1'x8' LIGHT FIXTURE
 - EXISTING 2x2 LIGHT FIXTURE
 - EXISTING 2x4 LIGHT FIXTURE
 - EXISTING LIGHT FIXTURE
 - EXISTING DOWNLIGHT FIXTURE
 - EXISTING CHANDELIER FIXTURE
 - EXISTING SCONCE FIXTURE
 - CEILING MOUNTED LIGHT FIXTURE
 - 1'x4' LIGHT FIXTURE
 - 4' WALL-MOUNTED LIGHT FIXTURE
 - MECH. SUPPLY DIFFUSER
 - MECH. RETURN DIFFUSER
 - WALL-MOUNTED EXIT SIGN
 - EXISTING WALL-MOUNTED EXIT SIGN
 - CEILING-MOUNTED EXIT SIGN
 - EXISTING CEILING-MOUNTED EXIT SIGN
 - EMERGENCY LIGHT
 - EXISTING EMERGENCY LIGHT

- NOTE:**
1. ALL ACOUSTICAL CEILING: CONTRACTOR TO REMOVE AND REPLACE ALL CEILING PANELS
 2. ALL CEILING GRIDS TO REMAIN, CONTRACTOR TO REPLACE DAMAGED GRID & REPAIR ALL GRID TO MATCH EXISTING. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
 3. ALL GYPSUM BD. CEILING: CONTRACTOR TO PATCH AND PAINT TO MATCH EXISTING. REPLACE DAMAGED DURING CONSTRUCTION. SPRINKLER PIPES SHALL BE CONCEALED ABOVE CEILING.
 4. ALL PLASTER CEILING: CONTRACTOR TO PATCH AND PAINT ALL CEILING. SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
 5. ALL OPEN TO STRUCTURE: SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
 6. ALL CEILINGS TO BE FIELD VERIFY BY CONTRACTOR, IMMEDIATELY NOTIFY THE ARCHITECT IF FIELD CONDITION DIFFERS FROM WHAT IS INDICATED ON PLANS

1 BASEMENT FLOOR REFLECTED CEILING PLAN
 A.600B 1/8" = 1'-0"



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 NJ License No. AI 12541

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LAURENCE K. UHER, AIA, LEED, AP
 NJ License No. AI 14394

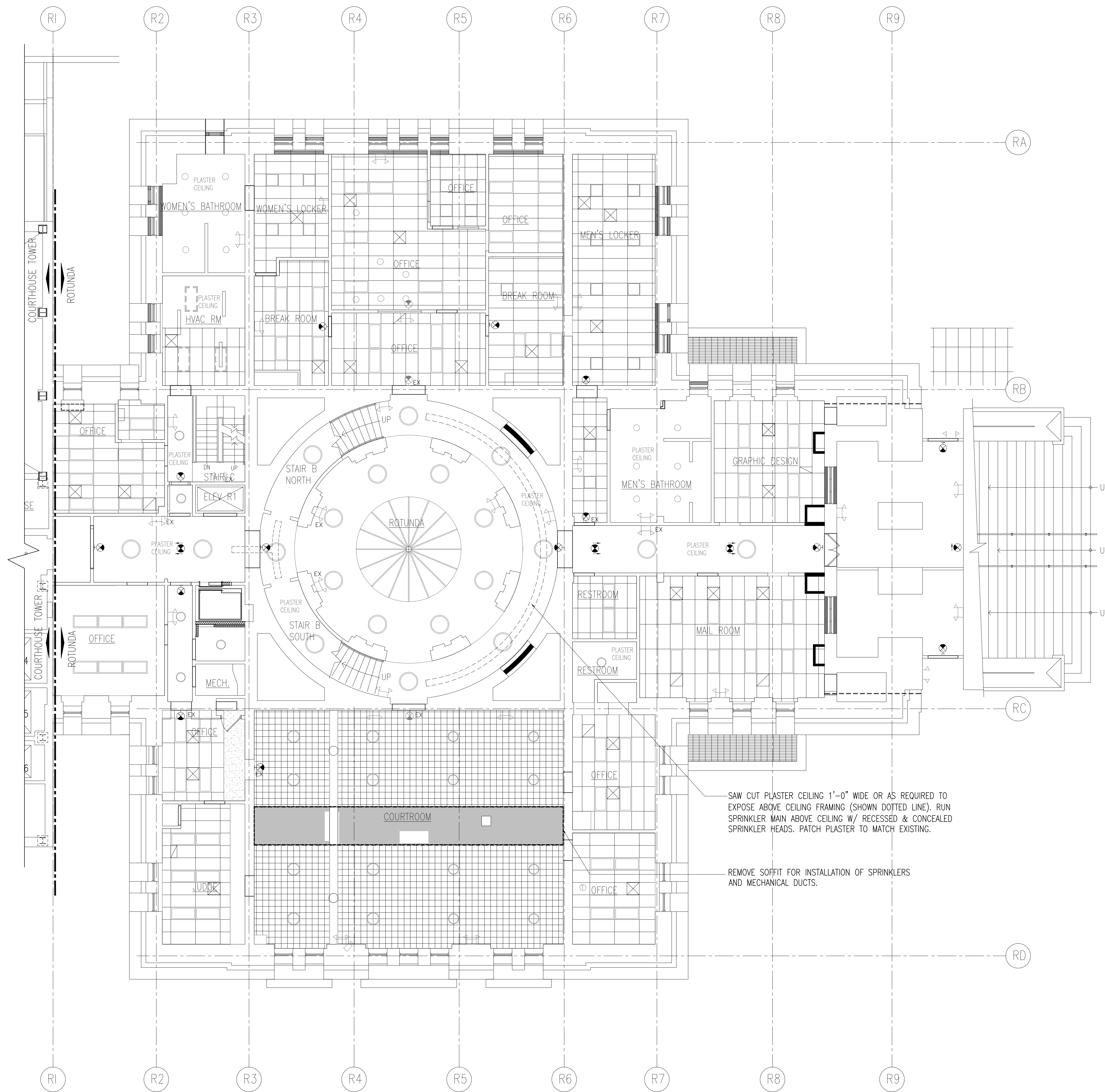


PROJECT: **UC COURTHOUSE
 FIRE SUPPRESSION (ROTUNDA)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
BASEMENT FLOOR REFLECTED CEILING PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
09.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMG	FJM					JOB NO.	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	27 OF: 118
								DWG. NO.	

A.600B



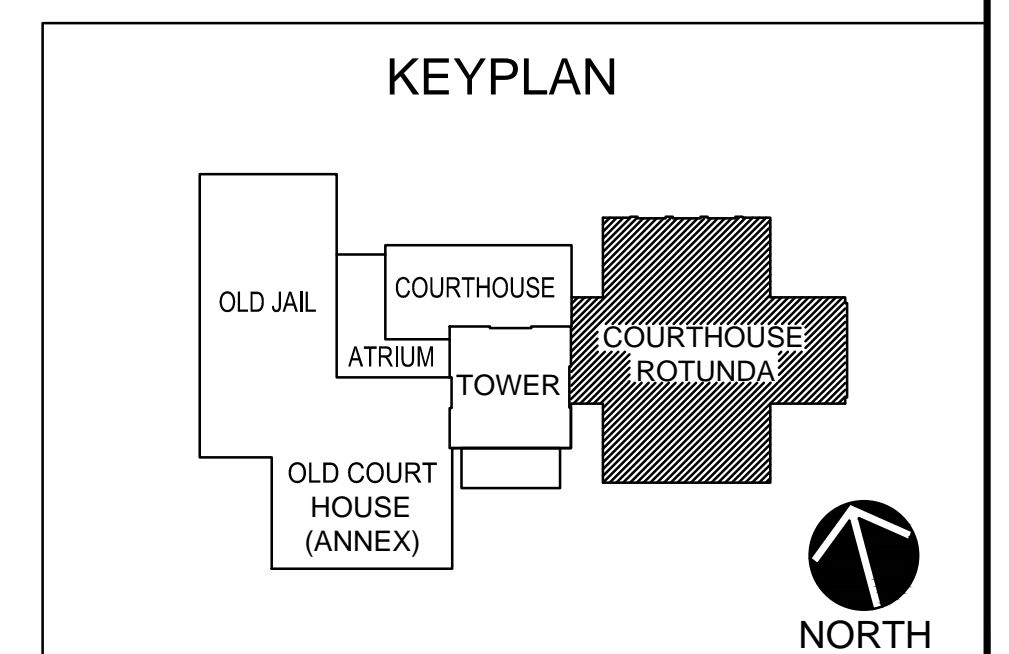
LEGEND:

- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 1'x4' LIGHT FIXTURE
- EXISTING 1'x8' LIGHT FIXTURE
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 1'x4' LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

NOTE:

1. ALL ACOUSTICAL CEILING: CONTRACTOR TO REMOVE AND REPLACE ALL CEILING PANELS.
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4. ALL PLASTER CEILING: CONTRACTOR TO PATCH AND PAINT ALL CEILING. SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
5. ALL OPEN TO STRUCTURE: SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
6. ALL CEILINGS TO BE FIELD VERIFY BY CONTRACTOR, IMMEDIATELY NOTIFY THE ARCHITECT IF FIELD CONDITION DIFFERS FROM WHAT IS INDICATED ON PLANS.

1 GROUND FLOOR REFLECTED CEILING PLAN
 A.600G 1/8" = 1'-0"



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LAURENCE K. UHER, AIA, LEED, AP
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PROJECT:

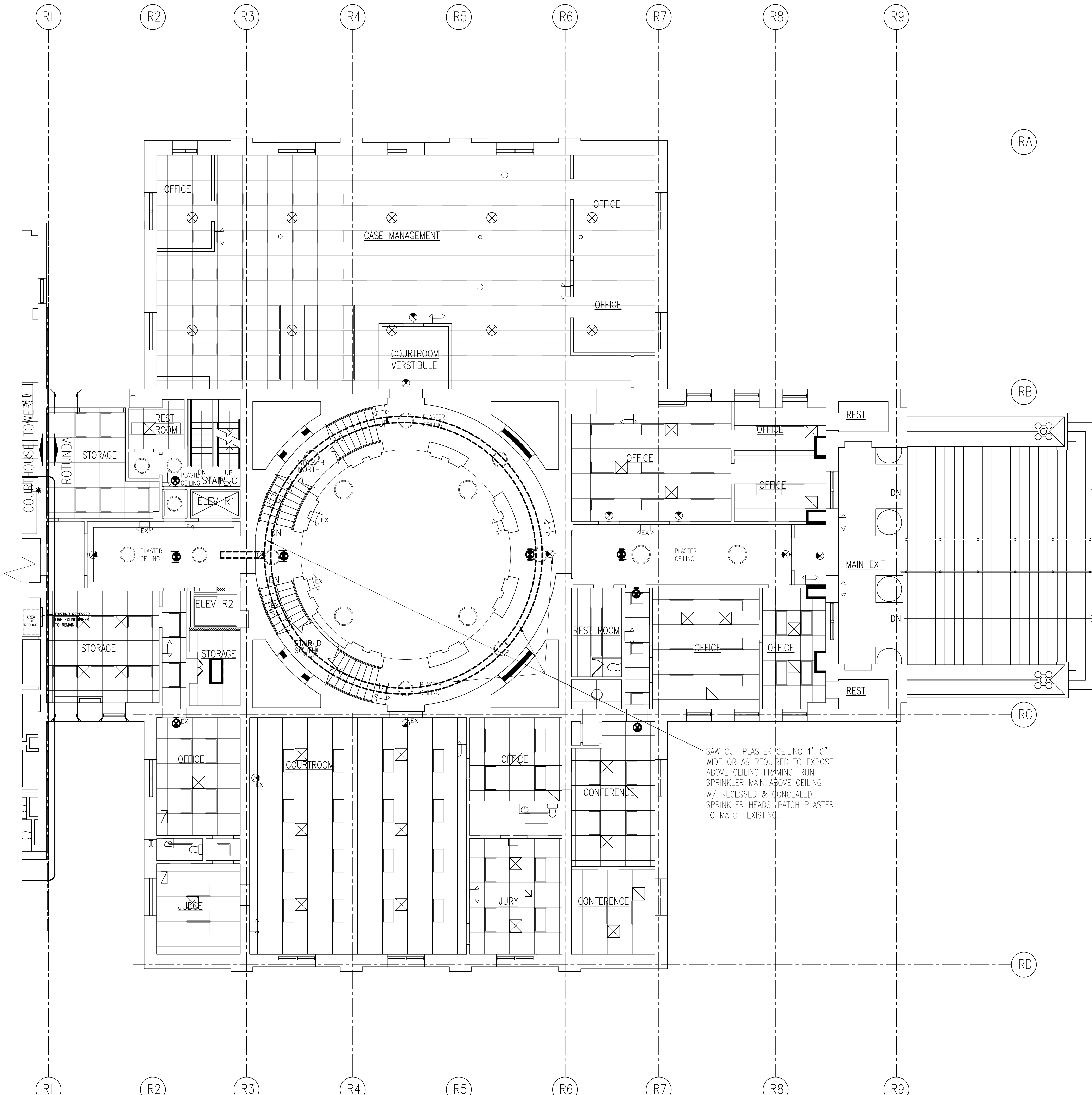
**UC COURTHOUSE
 FIRE SUPPRESSION (ROTUNDA)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

GROUND FLOOR REFLECTED CEILING PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
09.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	28 OF: 118
								DWG. NO	

A.600G



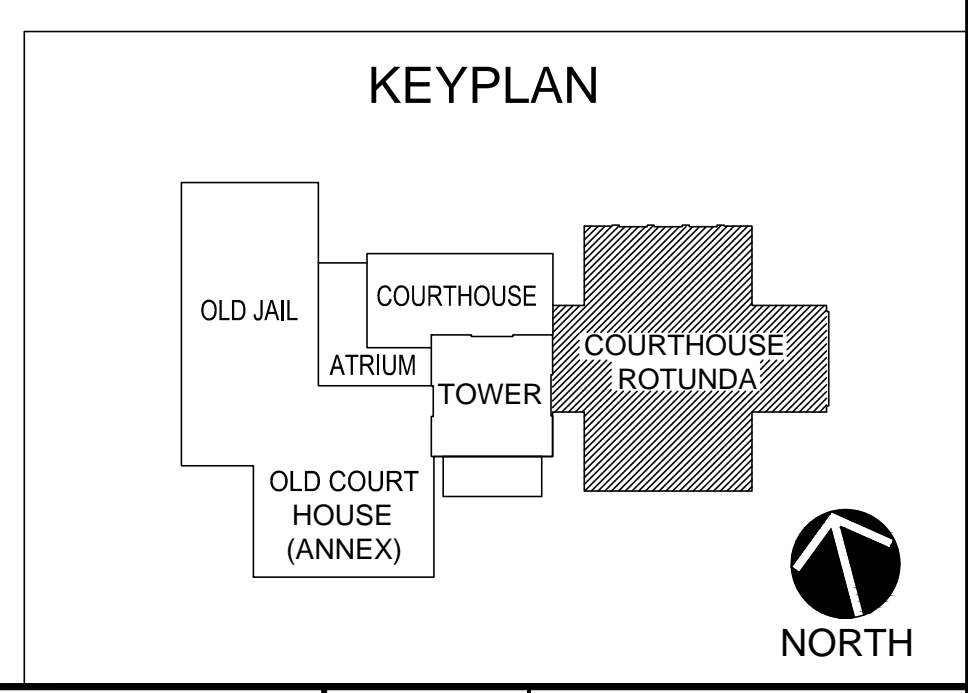
LEGEND:

- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 1'x4' LIGHT FIXTURE
- EXISTING 1'x8' LIGHT FIXTURE
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 1'x4' LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

NOTE:

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5. ALL OPEN TO STRUCTURE; SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
6. ALL CEILINGS TO BE FIELD VERIFY BY CONTRACTOR, IMMEDIATELY NOTIFY THE ARCHITECT IF FIELD CONDITION DIFFERS FROM WHAT IS INDICATED ON PLANS

SAW CUT PLASTER CEILING 1"-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING, RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS, PATCH PLASTER TO MATCH EXISTING.



1 FIRST FLOOR REFLECTED CEILING PLAN

A.601 1/8" = 1'-0"

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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14594



PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

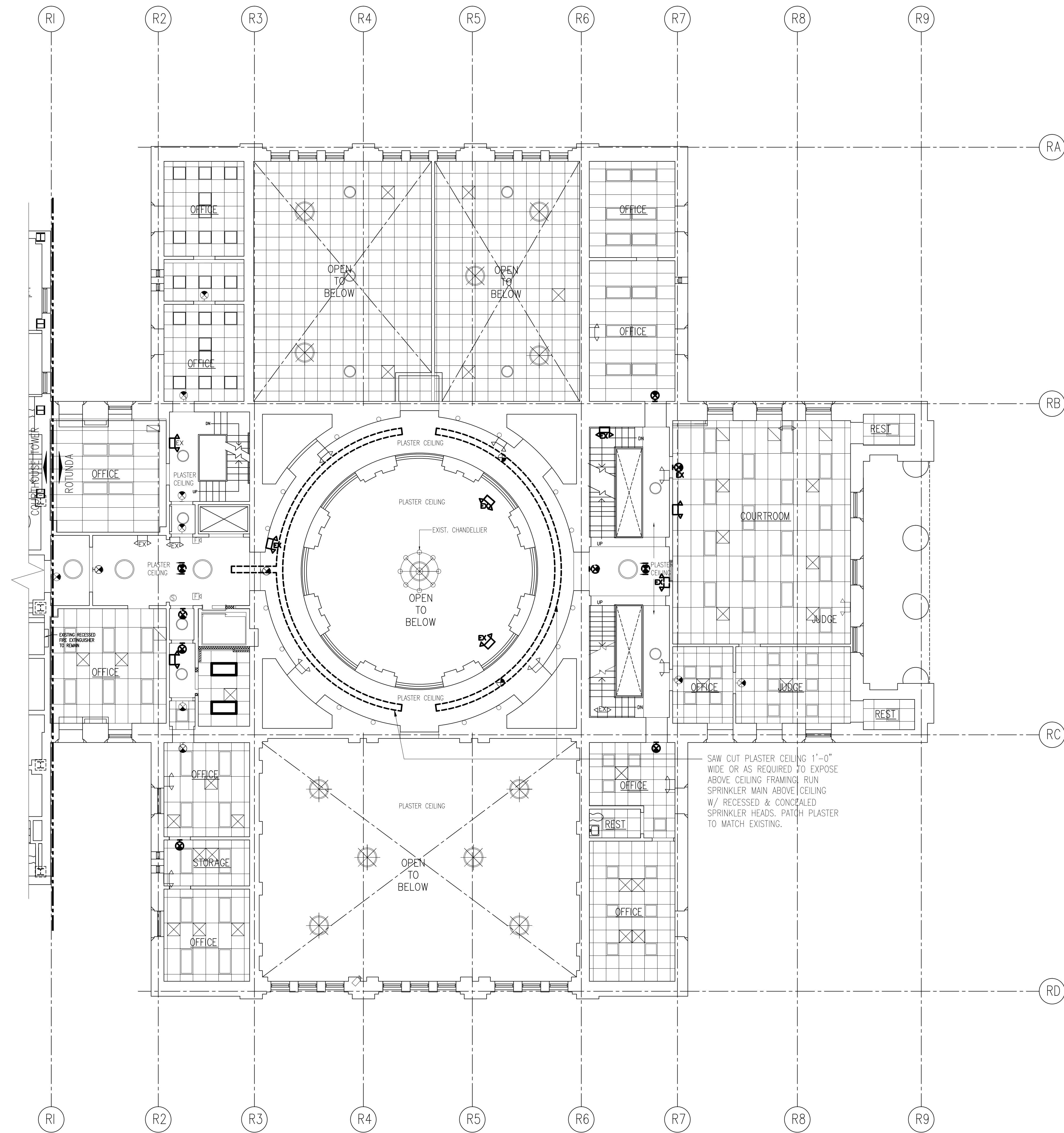
SHEET CONTENTS:

FIRST FLOOR REFLECTED CEILING PLAN

SUBMISSIONS				REVISIONS				DATE	SCALE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	DATE	SCALE
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10.30.15	95% CD UPDATES	KD	FM						
05.31.17	100% CD SUBMIT	MMC	FJM						
08.30.17	ISSUED FOR BID	MC	FM						

DRWN BY: NJN
JOB NO: 2141152
SHEET NO: 118 OF: 118
DWG. NO: 29

A.601



LEGEND:

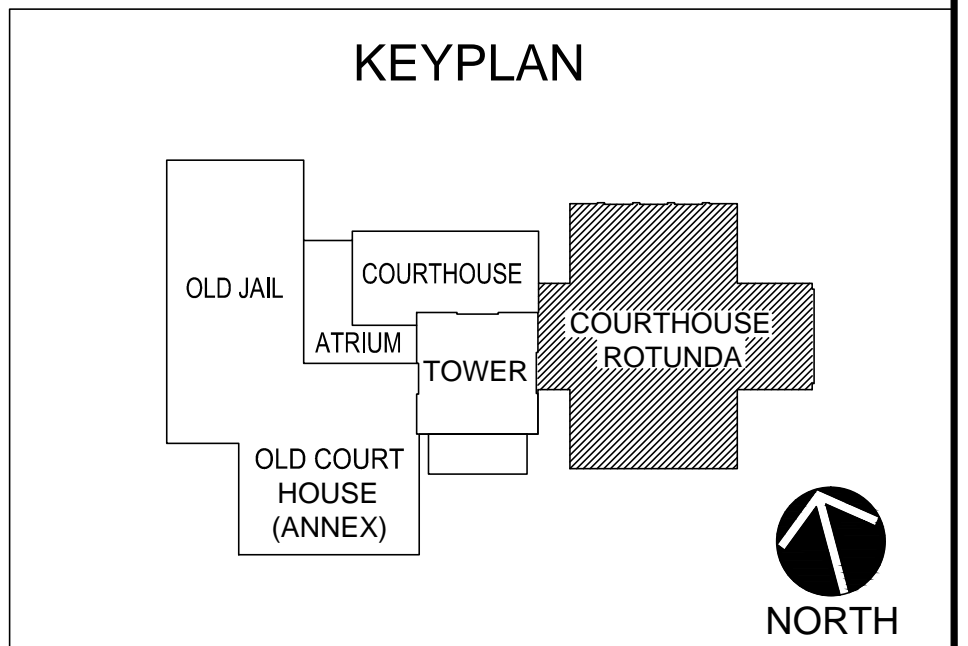
- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 1'x4' LIGHT FIXTURE
- EXISTING 1'x8' LIGHT FIXTURE
- EXISTING 2X2 LIGHT FIXTURE
- EXISTING 2X4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 1'x4' LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

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6. ALL CEILINGS TO BE FIELD VERIFY BY CONTRACTOR, IMMEDIATELY NOTIFY THE ARCHITECT IF FIELD CONDITION DIFFERS FROM WHAT IS INDICATED ON PLANS

SAW CUT PLASTER CEILING 1'-0" WIDE OR AS REQUIRED TO EXPOSE ABOVE CEILING FRAMING RUN SPRINKLER MAIN ABOVE CEILING W/ RECESSED & CONCEALED SPRINKLER HEADS. PATCH PLASTER TO MATCH EXISTING.

1 THIRD FLOOR REFLECTED CEILING PLAN
A.603 1/8" = 1'-0"



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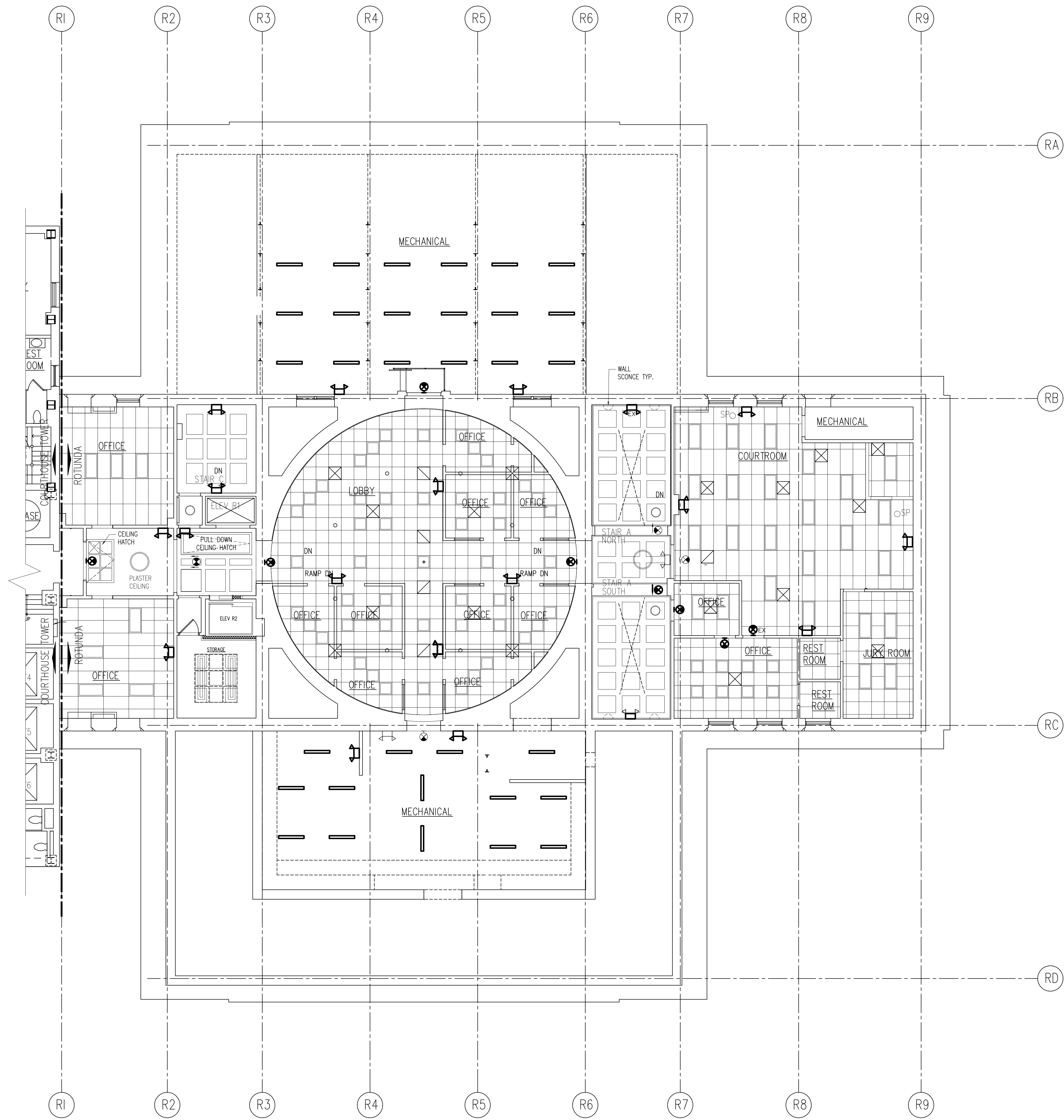


PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
THIRD FLOOR REFLECTED CEILING PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
09.25.15	95% CD SUBMIT	KD	FM						DRWN BY WTJ
10.30.15	95% CD UPDATES	KD	FM						CHKD BY NJN
05.31.17	100% CD SUBMIT	MMG	FJM						JOB NO. 2141152
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 31 OF: 118
									DWG. NO.

A.603

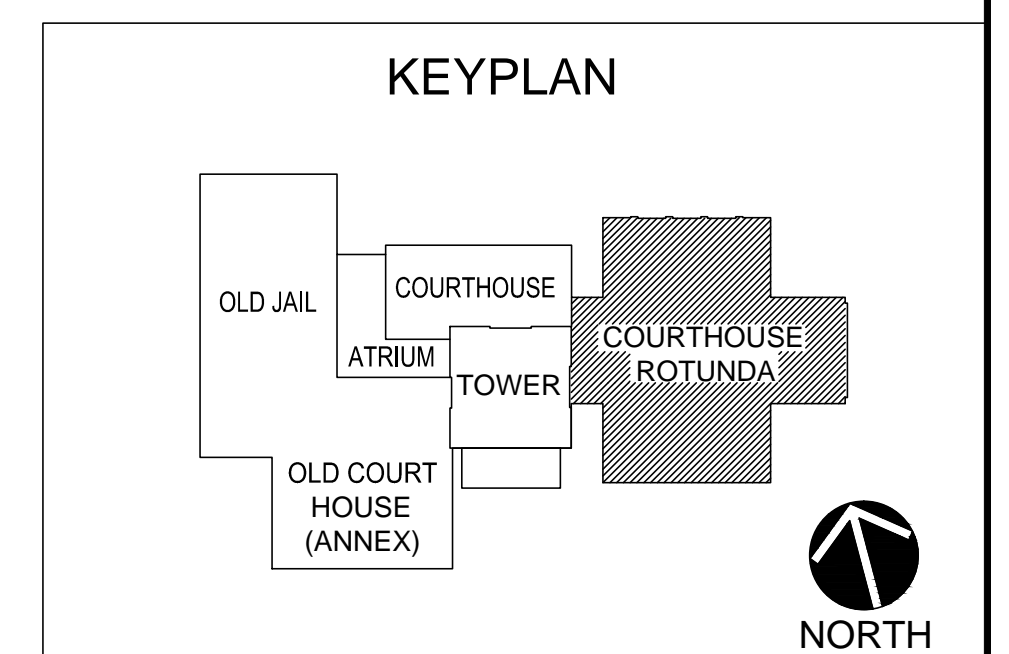


LEGEND:

- EXISTING PLASTER CEILING GRID
- EXISTING 2'x4' CEILING GRID
- EXISTING 2'x2' CEILING GRID
- EXISTING 1'x4' LIGHT FIXTURE
- EXISTING 1'x8' LIGHT FIXTURE
- EXISTING 2x2 LIGHT FIXTURE
- EXISTING 2x4 LIGHT FIXTURE
- EXISTING LIGHT FIXTURE
- EXISTING DOWNLIGHT FIXTURE
- EXISTING CHANDELIER FIXTURE
- EXISTING SCONCE FIXTURE
- CEILING MOUNTED LIGHT FIXTURE
- 1'x4' LIGHT FIXTURE
- 4' WALL-MOUNTED LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL-MOUNTED EXIT SIGN
- EXISTING WALL-MOUNTED EXIT SIGN
- CEILING-MOUNTED EXIT SIGN
- EXISTING CEILING-MOUNTED EXIT SIGN
- EMERGENCY LIGHT
- EXISTING EMERGENCY LIGHT

NOTE:

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4. ALL PLASTER CEILING: CONTRACTOR TO PATCH AND PAINT ALL CEILING. SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
5. ALL OPEN TO STRUCTURE: SPRINKLER PIPES SHALL BE SURFACE MOUNTED.
6. ALL CEILINGS TO BE FIELD VERIFY BY CONTRACTOR, IMMEDIATELY NOTIFY THE ARCHITECT IF FIELD CONDITION DIFFERS FROM WHAT IS INDICATED ON PLANS



1 FOURTH FLOOR REFLECTED CEILING PLAN
A.604 1/8" = 1'-0"

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PROJECT:

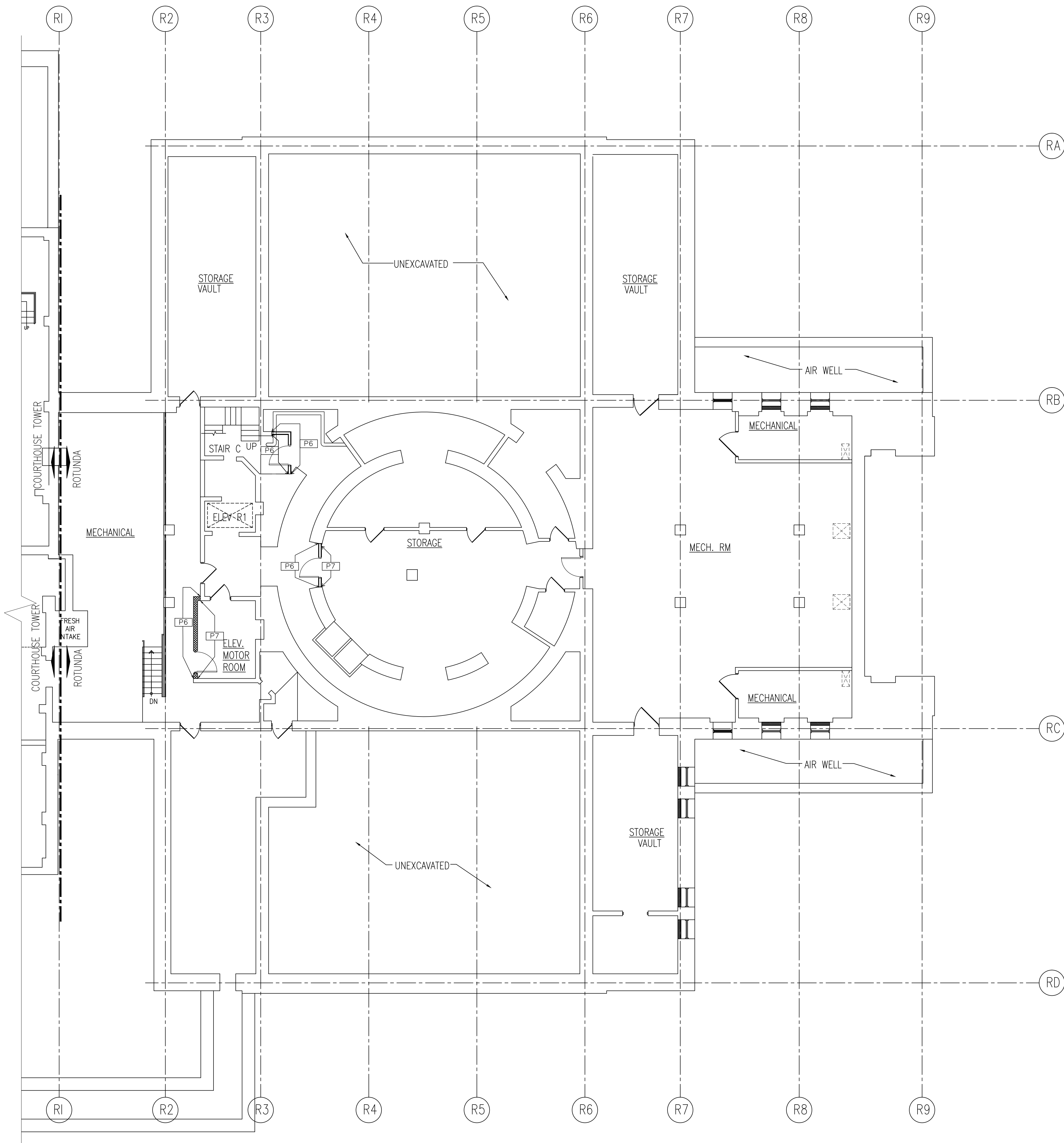
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

FOURTH FLOOR REFLECTED CEILING PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
02.25.15	95% CD SUBMIT	KD	FM						
10.30.15	95% CD UPDATES	KD	FM					DRWN BY	WTJ
05.31.17	100% CD SUBMIT	MMC	FJM					CHKD BY	NJN
08.30.17	ISSUED FOR BID	MC	FM					JOB NO.	2141152
								SHEET:	32 OF: 118
								DWG. NO.	

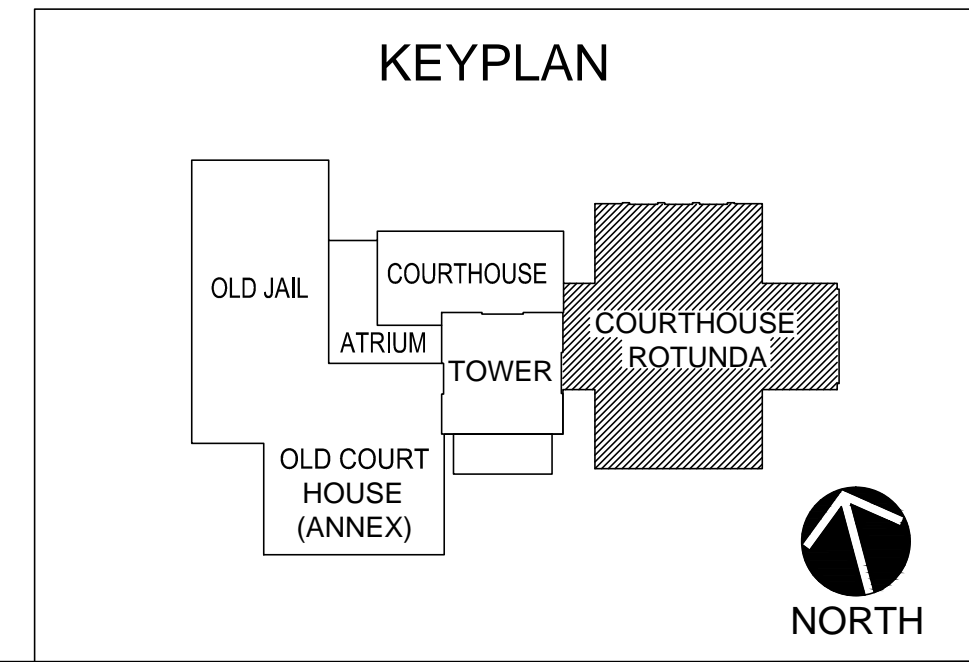
A.604



ROOM FINISH SCHEDULE					
	ROOM NO.	WALL	BASE	FLOOR	REMARKS
RESTROOMS	RESTROOM GROUND FLOOR	P1/WT1/WT5/WT6	WT1	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.
	RESTROOM SECOND FLOOR	P1/WT2/WT3/WT4	WT2	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.
	RESTROOM THIRD FLOOR	P1/WT2/WT3/WT4	WT2	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.

FINISH SCHEDULE						
	MATERIAL	TYPE	DESCRIPTION	MANUFACTURER	CONTACT	REMARKS
FLOOR	CARPET SHEET	C1	0.16" THICK, 78.74" (2000) WIDTH SHEET CARPET. COLLECTION: FLOTEX VISION. COLOR: OCEAN ENERGY.	FORBID	JILL MASTROIA (HISA) TEL: 800.342.0604	HALL ROOM
	PORCELAIN / CERAMIC / QUARRY TILE	F11	18"X18" CERAMIC TILE. COLLECTION: HEATHLAND. COLOR: WHITE ROCK HLD1	DAKILE	RELLY HULLAND-YOUNG TEL: 908.340.8400	RESTROOMS
BASE	RUBBER SHEET FLOORING	R1	3.0 MM RUBBER SHEET FLOORING. STYLE: NORMAN VALLEY. COLOR: 7	NORA	HORY CHURCHILL TEL: 201.661.3514	STAIRWELL
	SEALED CONCRETE	SC	ASHFORD FORMULA	DURE CRETE, INC.	TEL: 801.489.5663	
WALL	RUBBER	B1	4" ECOLEBRUM 80-BASED TRADITIONAL WALL BASE. COLOR: FB-40 BLACK	JOHNSONITE		
	PAINT	P1	INTERIOR LATEX PAINT - EG-SHELL FINISH. COLOR: SW7566 WESTHIGHLAND WHITE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	HALL RESTROOMS
		P2	INTERIOR LATEX PAINT - EG-SHELL FINISH. COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	LOCKERS AND WALLS ROTUNDA
		P3	INTERIOR LATEX PAINT - EG-SHELL FINISH. COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	FIRST FLOOR OFFICES
		P4	INTERIOR LATEX PAINT - EG-SHELL FINISH. COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	OFFICES
		P5	INTERIOR LATEX PAINT - EG-SHELL FINISH. COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	OFFICES
CEILING	CERAMIC WALL TILE	WT1	4"X8" CERAMIC WALL TILE FIELD COLLECTION: NATURAL HUES COLOR: MUSHROOM QH16 (1) FINISH: MATTE.	DAKILE	RELLY HULLAND-YOUNG TEL: 908.340.8400	GROUND FLOOR RESTROOM BRICK-HORIZONTAL PATTERN
		WT2	4"X8" CERAMIC WALL TILE FIELD COLLECTION: NATURAL HUES COLOR: STEEL QH31 (1) FINISH: MATTE.	DAKILE	RELLY HULLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN
		WT3	4"X8" CERAMIC WALL TILE ACCENT COLLECTION: NATURAL HUES COLOR: PERIWINKLE QH31 (1) FINISH: GLOSSY.	DAKILE	RELLY HULLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN
		WT4	4"X8" CERAMIC WALL TILE ACCENT COLLECTION: NATURAL HUES COLOR: LATTE QH26 (1) FINISH: GLOSSY.	DAKILE	RELLY HULLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN
		WT5	4"X8" CERAMIC WALL TILE COLLECTION: NATURAL HUES COLOR: EGGPLANT QH18 (1) FINISH: GLOSSY.	DAKILE	RELLY HULLAND-YOUNG TEL: 908.340.8400	GROUND FLOOR RESTROOM BRICK-HORIZONTAL PATTERN
		WT6	4"X8" CERAMIC WALL TILE COLLECTION: NATURAL HUES COLOR: ROSE BEIGE QH19 (1) FINISH: GLOSSY.	DAKILE	RELLY HULLAND-YOUNG TEL: 908.340.8400	RESTROOM ACCENT REFER TO INTERIOR ELEV. PATTERN
DOORS	ACOUSTIC CEILING PANEL	CA11	24"X24"X7/8" ULTIMA BEVELED REGULAR. COLOR: WHITE	ARMSTRONG		4TH FLOOR LOBBY / OFFICE AREA
	SUSPENDED SYSTEM	SS1	SUSPENDING & EXPOSED TEE SYSTEM. A SHADOW TROUSING. COLOR: WHITE	ARMSTRONG		
WALL & DOOR	PLASTIC LAMINATE	P11	LAMINATE. COLOR:	WILSONART	SANDRA CAVINHO TEL: 800.222.2233	ELEVATOR CAB
	WALL PARTITIONS/URINAL SCREENS	UP1	1 1/2" THICK, POWDER COATED PARTITION. STANDARD SERIES. STYLE: HEADRAL BRACED COLOR: 543 CHAMPION	HADRAM PARTITIONS	HENRIE FORMANN - SYLVESTER ASSOCIATES TEL: 732.805.5645	FLOOR MOUNTED W/ HEADRAL BRACED.
STAIR	URINAL SCREENS	US1	1 1/2" THICK, POWDER COATED PARTITION. STANDARD SERIES. STYLE: HEADRAL BRACED COLOR: 543 CHAMPION	HADRAM PARTITIONS	HENRIE FORMANN - SYLVESTER ASSOCIATES TEL: 732.805.5645	WALL MOUNTED 48" H SCREEN
	SOLID SURFACE	S1	ONE-PIECE VANITY TOP AND BOWL. FORMICA SIGNATURE. COLOR: BOTTLE GLASS QUARTZ 770	FORMICA	1.800.367.6422	REFER TO DWG. A503. RESTROOM SINK VANITY
ELEVATOR	STAIR TREAD / RISER / LANDING & STRINGER	SR1	ONE-PIECE NOSING-TREAD-RISER RUBBER STRIPBACKS. STYLE: COLOR:	JOHNSONITE	HORY CHURCHILL TEL: 201.661.3514	
	CAB PANEL	WP1	PREMIUM LAMINATE. COLOR: WILLAUBURG CHERRY 7936K-07. LAMINATE FINISH ON FACE AND EDGE EDGES	DTIS	DAVID HALL TEL: 908.309.8709	SEE ELEVATOR ELEVATION DWG. A-501.
	CAB PANEL	WS	STAINLESS STEEL WALL PANEL	DTIS		SEE ELEVATOR ELEVATION DWG. A-501.
	CAB BASE	SB1	BATH STAINLESS STEEL BASE	DTIS		SEE ELEVATOR ELEVATION DWG. A-501.

- NOTES:
1. ALL WALL AND CEILING FINISHES SHALL BE CLASS A. FLAME SPREAD INDEX 25 OR UNDER. SMOKE DEVELOPED 450 OR UNDER.
 2. ALL FLOOR FINISH SHALL BE CLASS 1, 0.45 WATTS/SQ. CM OR GREATER.
 3. ALL MODULAR CARPET OVER RAISED FLOOR SHALL HAVE SOIL PROTECTION AND HIGH-FRICTION COATING
 4. REFER TO DIVISION 1 SPECIFICATION SECTION FOR ALTERNATE FINISH ITEMS



1 BASEMENT FLOOR FINISH PLAN
A.700B 1/8" = 1'-0"

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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

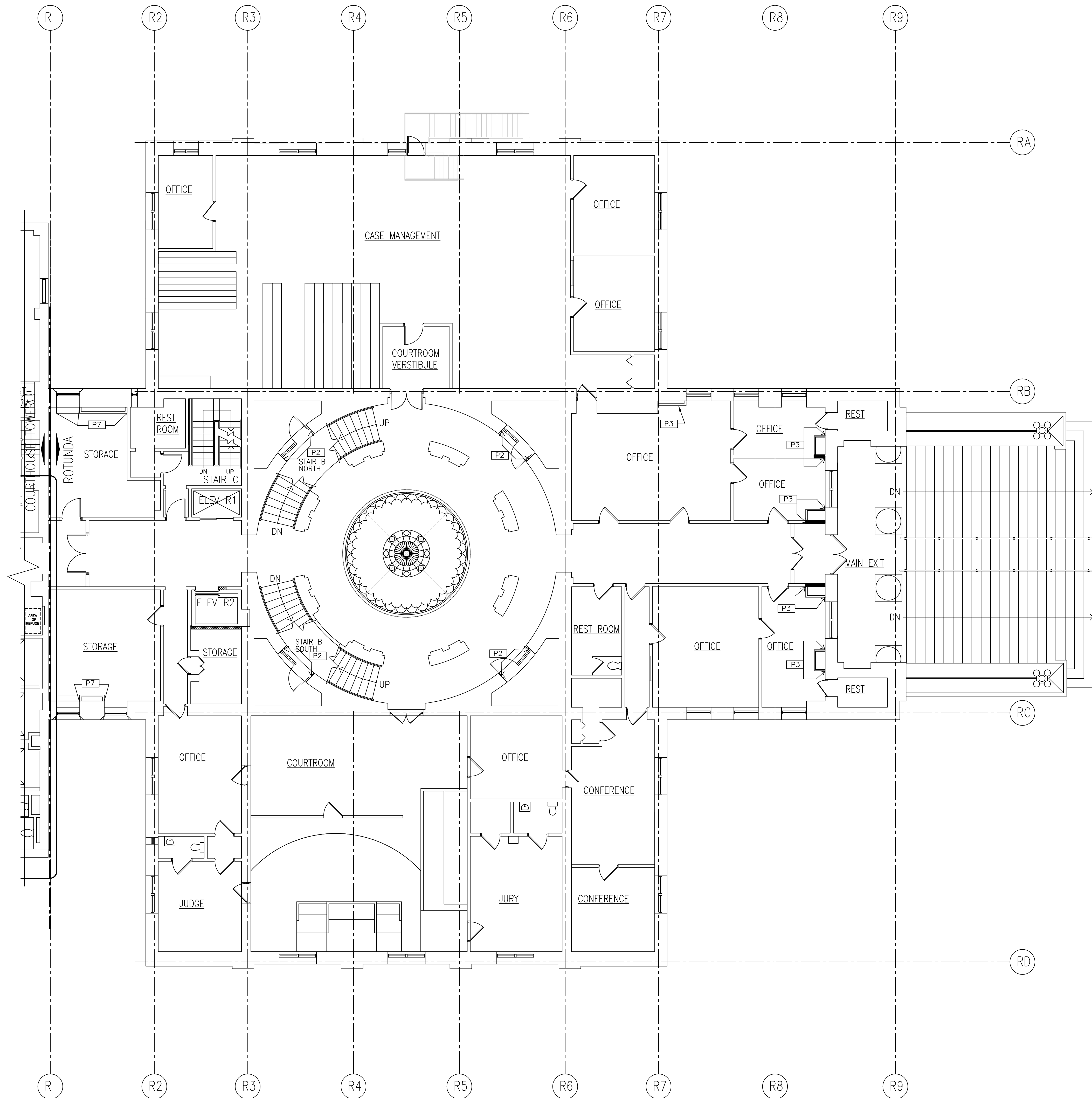


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
BASEMENT FINISH PLAN

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
09.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	33 OF: 118
								DWG. NO	

A.700B

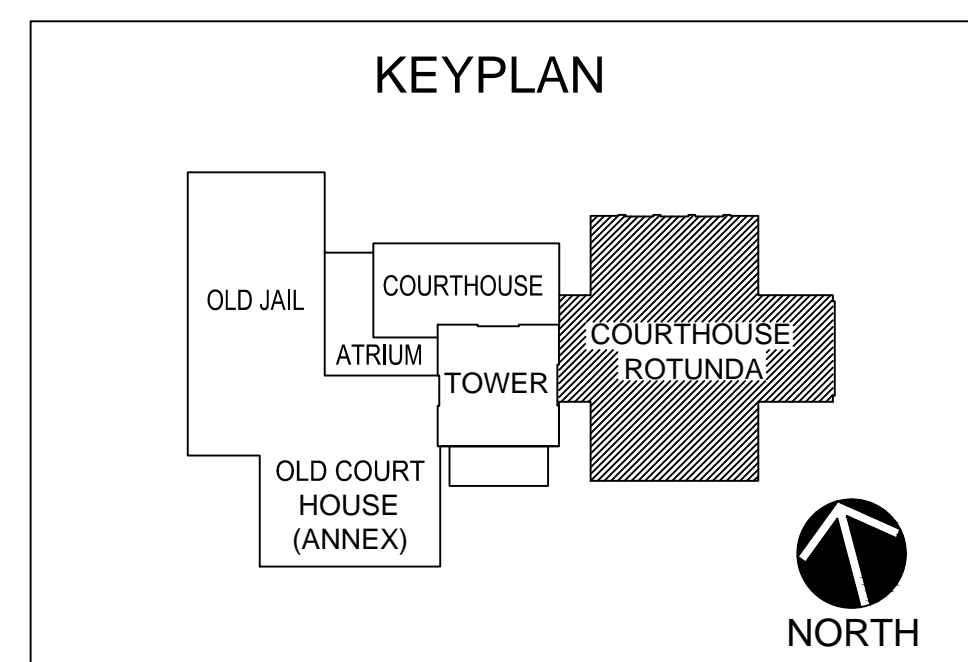


ROOM FINISH SCHEDULE					
ROOM NO.	WALL	BASE	FLOOR	REMARKS	
RESTROOM GROUND FLOOR	P1/WT1/WT5/WT6	WT1	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.	
RESTROOM SECOND FLOOR	P1/WT2/WT3/WT4	WT2	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.	
RESTROOM THIRD FLOOR	P1/WT2/WT3/WT4	WT2	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.	

FINISH SCHEDULE					
MATERIAL	TYPE	DESCRIPTION	BASE OF DESIGN MANUFACTURER	CONTACT	REMARKS
CARPET SHEET	C1	0.16" THICK, 78.74" (2000M) WIDTH SHEET CARPET, COLLECTION: FLOTEX VISION, COLOR: 00044 ENERGY	FORNO	JILL MASTROBA IRITA TEL: 800.342.0604	GAME ROOM
PORCELAN / CERAMIC / QUARRY TILE	FT1	18"x18" CERAMIC TILE, COLLECTION: HEATHLAND, COLOR: WHITE ROCK #101	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	RESTROOMS
	FT2	18"x18" CERAMIC TILE, COLLECTION: HEATHLAND, COLOR: ASHLAND HUES	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	RESTROOMS
RUBBER SHEET FLOORING	R1	3.0 MM RUBBER SHEET FLOORING, STYLE: NORPLAN VALIA, COLOR: ?	NORA	TORY CHURCHILL TEL: 201.661.3514	STAIRWELL
	R2	3.0 MM RUBBER SHEET FLOORING, STYLE: NORPLAN VALIA, COLOR: 6721 SANDBAR	NORA	TORY CHURCHILL TEL: 201.661.3514	
SEALED CONCRETE	SC	ASHFORD FORMULA	CURE CRETE, INC.	TEL: 801.489.5683	
RUBBER	B1	4" ECOLOGURAM BIO-BASED TRADITIONAL WALL BASE, COLOR: 24 GREY HAZE	JOHNSONITE		
	B2	4" ECOLOGURAM BIO-BASED TRADITIONAL WALL BASE, COLOR: EB-40 BLACK	JOHNSONITE		
PAINT	P1	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: DRYTAK WESTHIGHLAND WHITE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	ALL RESTROOMS
	P2	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	LOUVERS AND WALLS ROTUNDA
	P3	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	FIRST FLOOR OFFICES
	P4	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	OFFICES
	P5	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	OFFICES
	P6	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	CORRIDOR
	P7	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	STORAGE/ MECHANICAL
	P8	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	COURTROOM ON 3RD AND 4TH FLOOR
FRP PANEL	FP1	4" HEIGHT GLASSFIBER WITH SURFASKAL PANEL, COLOR: SILVER 86, FINISH: EMBOSSED	CRANE COMPOSITES		HOUSE KEEPING
CERAMIC WALL TILE	WT1	4"x8" CERAMIC WALL TILE FIELD COLLECTION: NATURAL HUES, COLOR: MUSHROOM QH16 (1) FINISH: MATTE	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	GROUND FLOOR RESTROOM BRICK-HORIZONTAL PATTERN
	WT2	4"x8" CERAMIC WALL TILE FIELD COLLECTION: NATURAL HUES, COLOR: STEEL QH21 (1) FINISH: MATTE	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN
	WT3	4"x8" CERAMIC WALL TILE ACCENT COLLECTION: NATURAL HUES, COLOR: PERIWINKLE QH1 (1) FINISH: GLOSSY	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN
	WT4	4"x8" CERAMIC WALL TILE ACCENT COLLECTION: NATURAL HUES, COLOR: LATTE QH26 (1) FINISH: GLOSSY	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN
	WT5	4"x8" CERAMIC WALL TILE COLLECTION: NATURAL HUES, COLOR: EGGPLANT QH18 (1) FINISH: GLOSSY	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	GROUND FLOOR RESTROOM BRICK-HORIZONTAL PATTERN
	WT6	4"x8" CERAMIC WALL TILE COLLECTION: NATURAL HUES, COLOR: ROSE BEIGE QH19 (1) FINISH: GLOSSY	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	RESTROOM ACCENT REFER TO INTERIOR ELEV. PATTERN
ACUSTIC CEILING PANEL	ACT1	24"x24"x7/8" ULTIMA BEVELED REGULAR, COLOR: WHITE	ARMSTRONG		4TH FLOOR LOBBY/ OFFICE AREA
SUSPENDED SYSTEM	SS1	SURFING 4" EXPOSED TEE SYSTEM, SHADOW MOLDING, COLOR: WHITE	ARMSTRONG		
PAINT	CP1	INTERIOR ACRYLIC LATEX PAINT, PROMAR 200 FLAT FINISH, COORCEILING WHITE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	PLASTER CEILING ROTUNDA
VINYL-CLAD DOORS	VD1	VINYL-CLAD FLUSH #DOOR WITH 0.640" THICK RIGID INSULATION SHEET OPTION, COLOR: APPLWOOD 0537	EGGERS		REFER TO DWG. A301.
METAL DOOR	DP1	PAINT SHIELD MICROBICIDAL INTERIOR LATEX PAINT, MEDIUM LUSTER/GLOSS FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	REFER TO DWG. A301.
METAL DOOR FRAME	DP2	PAINT SHIELD MICROBICIDAL INTERIOR LATEX PAINT, SEMI-GLOSS FINISH, COLOR: TO MATCH ADJACENT DOOR FRAME COLOR	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	REFER TO DWG. A301.
WALL FIN	PL1	PLASTIC LAMINATE, COLOR: WILSONART	WILSONART	SANDRA GAVINNO TEL: 800.220.2333	ELEVATOR CAB
TOILET PARTITIONS/URNAL SCREENS	TP1	1" THICK, POWDER COATED PARTITION, STANDARD SERIES, STYLE: HEADRAL, BRACED, COLOR: 545 CHARCOAL	HADRIAN PARTITIONS	DENSE ROHMANN SYLVESTER ASSOCIATES TEL: 732.805.5645	FLOOR MOUNTED W/ HEADRAL BRACED
URNAL SCREENS	US1	1" THICK, POWDER COATED PARTITION, STANDARD SERIES, STYLE: HEADRAL, BRACED, COLOR: 545 CHARCOAL	HADRIAN PARTITIONS	DENSE ROHMANN SYLVESTER ASSOCIATES TEL: 732.805.5645	WALL MOUNTED 48" SCREEN
SOLID SURFACE	S1	ONE-PIECE VANITY TOP AND BOWL, FORMICA SIGNATURES, COLOR: BUTLE GLASS QUARTZ 770	FORMICA	1.800.367.6422	REFER TO DWG. A303, RESTROOM SINK VANITY
STAIR TREAD / RISER / LANDING	RS1	ONE-PIECE NOSING-TREAD-RISER RUBBER STARTTREADS, STYLE: COLOR:	JOHNSONITE	TORY CHURCHILL 201.661.3514	
RAILING, GUARDRAIL & STRINGER	SPT	INTERIOR ACRYLIC LATEX PAINT PROMAR 200 SEMI-GLOSS FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	
CAB PANEL	WP1	PREMIUM LAMINATE, COLOR: WILLIAMSBURG CHERRY 7936K-07, LAMINATE FINISH ON FACE AND FOUR EDGES.	OTIS		SEE ELEVATOR ELEVATION DWG. A-501.
CAB PANEL	SS	STAINLESS STEEL WALL PANEL	OTIS		SEE ELEVATOR ELEVATION DWG. A-501
CAB BASE	SB1	SATIN STAINLESS STEEL BASE	OTIS		SEE ELEVATOR ELEVATION DWG. A-501

- NOTES:
- ALL WALL AND CEILING FINISHES SHALL BE CLASS A, FLAME SPREAD INDEX 25 OR UNDER, SMOKE DEVELOPED 450 OR UNDER.
 - ALL FLOOR FINISH SHALL BE CLASS I, 0.45 WATTS/SQ. CM OR GREATER.
 - ALL MODULAR CARPET OVER RAISED FLOOR SHALL HAVE SOIL PROTECTION AND HIGH-FRICTION COATING
 - REFER TO DIVISION 1 SPECIFICATION SECTION FOR ALTERNATE FINISH ITEMS

1 FIRST FLOOR FINISH PLAN
A.101 1/8" = 1'-0"



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FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

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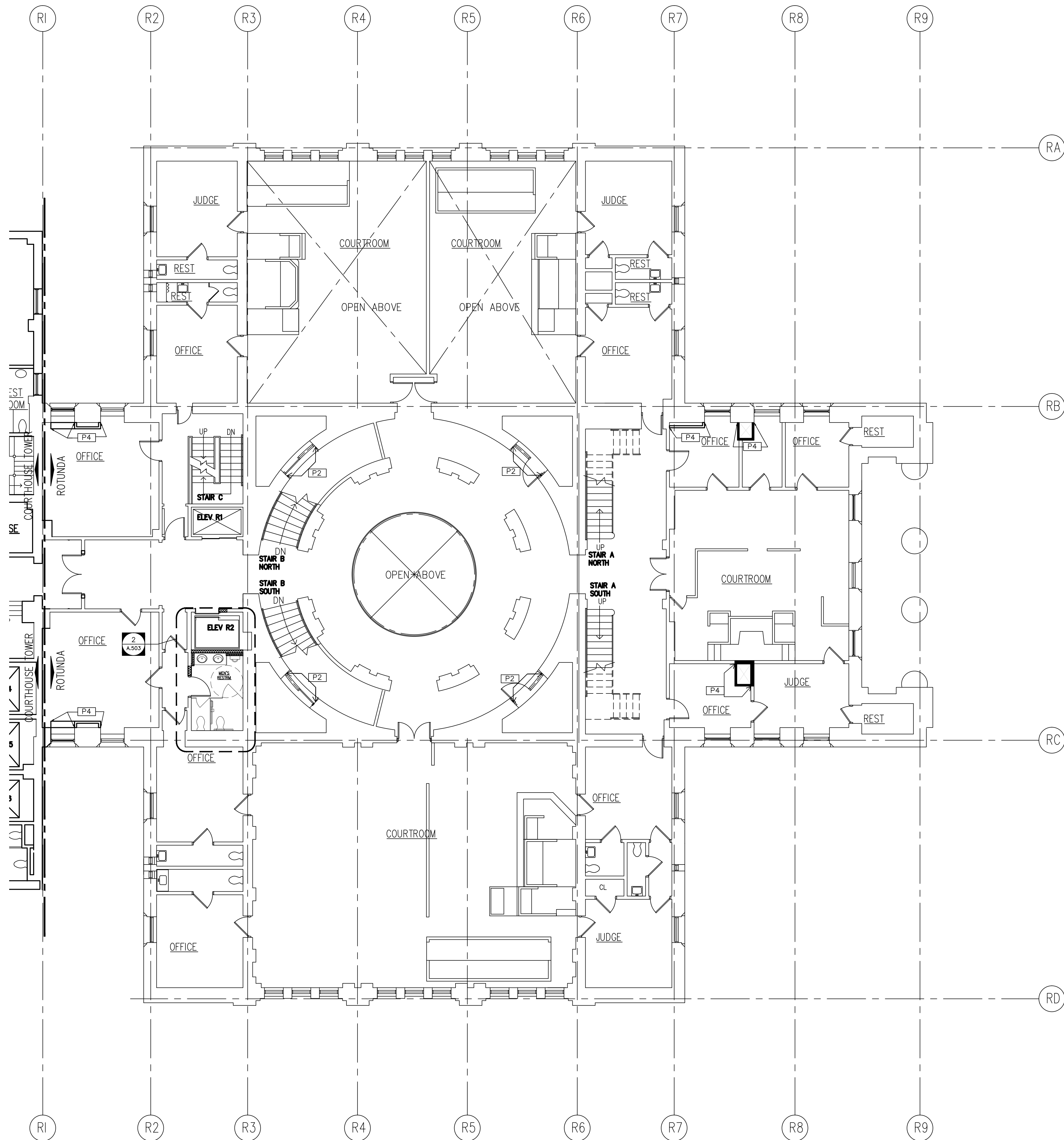


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FIRST FLOOR FINISH PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
06.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	35 OF: 118
								DWG. NO	

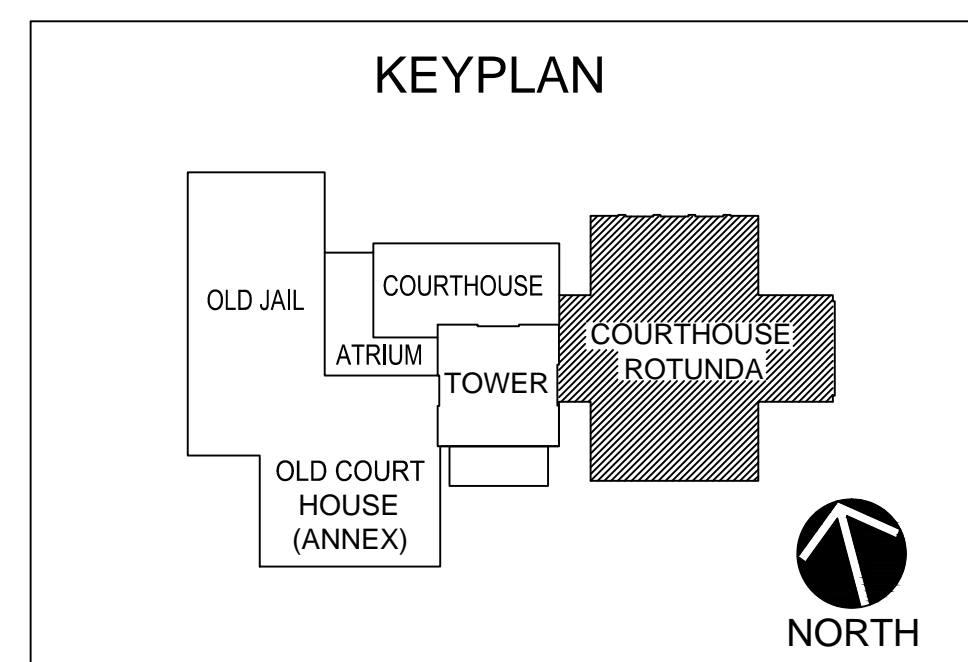
A.701



ROOM FINISH SCHEDULE				
ROOM NO.	WALL	BASE	FLOOR	REMARKS
RESTROOMS				
RESTROOM GROUND FLOOR	P1/WT1/WT5/WT6	WT1	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.
RESTROOM SECOND FLOOR	P1/WT2/WT3/WT4	WT2	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.
RESTROOM THIRD FLOOR	P1/WT2/WT3/WT4	WT2	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.

FINISH SCHEDULE					
MATERIAL	TYPE	DESCRIPTION	BASE OF DESIGN MANUFACTURER	CONTACT	REMARKS
CARPET SHEET	C1	0.16" THICK, 78.74" (200CM) WIDTH SHEET CARPET, COLLECTION: FLOTEX VIGOR, COLOR: 000434 ENERGY.	FORBO	JILL MASTROBA (JISTA) TEL: 908.340.0604	GAME ROOM
PORCELAIN / CERAMIC TILE	FT1	18"x18" CERAMIC TILE, COLLECTION: HEATHLAND, COLOR: WHITE ROCK HL01	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	RESTROOMS
	FT2	18"x18" CERAMIC TILE, COLLECTION: HEATHLAND, COLOR: ASHLAND HL05	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	RESTROOMS
RUBBER SHEET FLOORING	R1	3.0 MM RUBBER SHEET FLOORING, STYLE: NORMAN VALIA, COLOR: 1	NORA	TORY CHURCHILL TEL: 201.661.3514	STAIRWELL
	R2	3.0 MM RUBBER SHEET FLOORING, STYLE: NORMAN VALIA, COLOR: 6721 SANDBAR.	NORA	TORY CHURCHILL TEL: 201.661.3514	
SEALED CONCRETE	SC	ASHFORD FORMULA	CURE CRETE, INC.	TEL: 901.489.5663	
RUBBER	B1	4" EQUILIBRIUM BIO-BASED TRADITIONAL WALL BASE, COLOR: 24 GREY HAZE	JOHNSONITE		
	B2	4" EQUILIBRIUM BIO-BASED TRADITIONAL WALL BASE, COLOR: EB-40 BLACK	JOHNSONITE		
PAINT	P1	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: SW7566 WESTHIGHLAND WHITE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	ALL RESTROOMS
	P2	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	LOVERS AND WALLS ROTUNDA
	P3	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	FIRST FLOOR OFFICES
	P4	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	OFFICES
	P5	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	OFFICES
	P6	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	CORRIDOR
	P7	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	STORAGE/ MECHANICAL
	P8	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED TO MATCH EXISTING	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	COURTROOM ON 3RD AND 4TH FLOOR
FRP PANEL	FP1	4" HEIGHT, GLASSBORO WITH SURFASOL PANEL, COLOR: SILVER 66 FINISH EMBOSSED	CRANE COMPOSITES		HOUSE KEEPING
CERAMIC WALL TILE	WT1	4"x8" CERAMIC WALL TILE FIELD COLLECTION: NATURAL HUES COLOR: MACHROOM QH16 (1) FINISH: MATTE.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	GROUND FLOOR RESTROOM BRICK-HORIZONTAL PATTERN
	WT2	4"x8" CERAMIC WALL TILE FIELD COLLECTION: NATURAL HUES COLOR: STEEL QH21 (1) FINISH: MATTE.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN
	WT3	4"x8" CERAMIC WALL TILE ACCENT COLLECTION: NATURAL HUES COLOR: PERIWINKLE QH31 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN
	WT4	4"x8" CERAMIC WALL TILE ACCENT COLLECTION: NATURAL HUES COLOR: LATE QH09 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN
	WT5	4"x8" CERAMIC WALL TILE COLLECTION: NATURAL HUES COLOR: EGGPLANT QH18 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	GROUND FLOOR RESTROOM BRICK-HORIZONTAL PATTERN
	WT6	4"x8" CERAMIC WALL TILE COLLECTION: NATURAL HUES COLOR: ROSE BEIGE QH19 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	RESTROOM ACCENT REFER TO INTERIOR ELEV. PATTERN
CEILING	AC11	24"x24"x7/8" ULTIMA BEVELED REGULAR, COLOR: WHITE	ARMSTRONG		4TH FLOOR LOBBY/ OFFICE AREA
SUSPENDED SYSTEM	SS1	SUPRAPANE 4" EXPOSED TEE SYSTEM, 4" SHADOW MOLDING, COLOR: WHITE	ARMSTRONG		
PAINT	CP1	INTERIOR ACRYLIC LATEX PAINT, PROMAR 200 FLAT FINISH, COLOR: CEILING WHITE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	PLASTER CEILING ROTUNDA
VINYL-CLAD DOORS	VD1	VINYL-CLAD FLOOR HINGED WITH 6040" THICK IPC HIGD VINYL SHEET OPTION, COLOR: APRILWOOD 0537	EGGERS		REFER TO DWG. A301.
METAL DOOR	DP1	PAINT SHIELD MICROBICIDAL INTERIOR LATEX PAINT, MEDIUM LUSTER/GLOSS FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	REFER TO DWG. A301.
METAL DOOR FRAME	DP2	PAINT SHIELD MICROBICIDAL INTERIOR LATEX PAINT, SEMI-GLOSS FINISH, COLOR: TO MATCH ADJACENT DOOR FRAME COLOR	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	REFER TO DWG. A301.
PLASTIC LAMINATE	PL1	LAMINATE, COLOR:	WILSONART	SANDRA GANNING TEL: 800.220.2233	ELEVATOR CAB
TOILET PARTITIONS/URNAL SCREENS	TP1	1" THICK, POWDER COATED PARTITION, STANDARD SERIES, STYLE: HEADRAL BRACED, COLOR: S40 CHARCOAL	HADRAN PARTITIONS	DENSE ROHMANN / SYLVESTER ASSOCIATES TEL: 732.805.5645	FLOOR MOUNTED W/ HEADRAL BRACED.
URNAL SCREENS	US1	1" THICK, POWDER COATED PARTITION, STANDARD SERIES, STYLE: HEADRAL BRACED, COLOR: S40 CHARCOAL	HADRAN PARTITIONS	DENSE ROHMANN / SYLVESTER ASSOCIATES TEL: 732.805.5645	WALL MOUNTED 48" SCREEN
SINK	S1	ONE-PIECE VANITY TOP AND BOWL, FORMICA SIGNATURES, COLOR: BOTTLE GLASS QUARTZ 770	FORMICA	1.800.367.6422	REFER TO DWG. A503, RESTROOM SINK VANITY
STAIR TREAD / RISER / LANDING RAILING, GUARDRAIL & STRINGER	RS1	ONE-PIECE NOSING-TREAD-RISER RUBBER STRIP/TREAD, STYLE: COLOR:	JOHNSONITE	TORY CHURCHILL TEL: 201.661.3514	
SP1	INTERIOR ACRYLIC LATEX PAINT PROMAR 200 SEMI-GLOSS FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709		
CAB PANEL	WP1	PREMIUM LAMINATE, COLOR: WILLAMSBURG CHERRY 9036-07, LAMINATE FINISH ON FACE AND FOUR EDGES	OTIS		SEE ELEVATOR ELEVATION DWG. A-501
CAB PANEL	SS	STAINLESS STEEL WALL PANEL	OTIS		SEE ELEVATOR ELEVATION DWG. A-501
CAB BASE	SB1	SATIN STAINLESS STEEL BASE	OTIS		SEE ELEVATOR ELEVATION DWG. A-501

- NOTES:
- ALL WALL AND CEILING FINISHES SHALL BE CLASS A, FLAME SPREAD INDEX 25 OR UNDER, SMOKE DEVELOPED 450 OR UNDER.
 - ALL FLOOR FINISH SHALL BE CLASS I, 0.45 WATTS/SQ. CM OR GREATER.
 - ALL MODULAR CARPET OVER RAISED FLOOR SHALL HAVE SOIL PROTECTION AND HIGH-FRICTION COATING
 - REFER TO DIVISION 1 SPECIFICATION SECTION FOR ALTERNATE FINISH ITEMS



1 SECOND FLOOR FINISH PLAN
A.702 1/8" = 1'-0"

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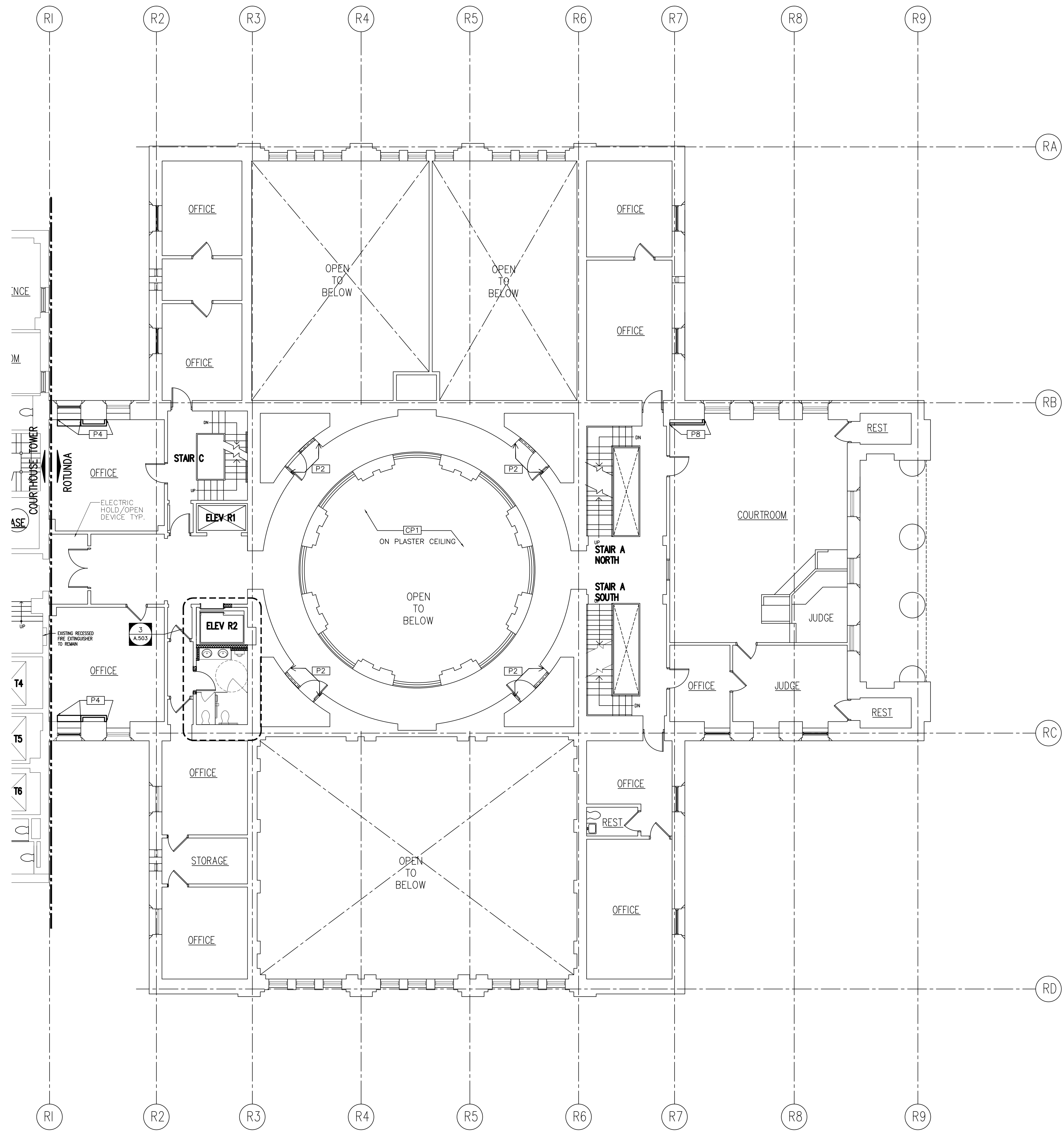
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PROJECT:
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
SECOND FLOOR FINISH PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
06.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	36 OF: 118
								DWG. NO	A.702

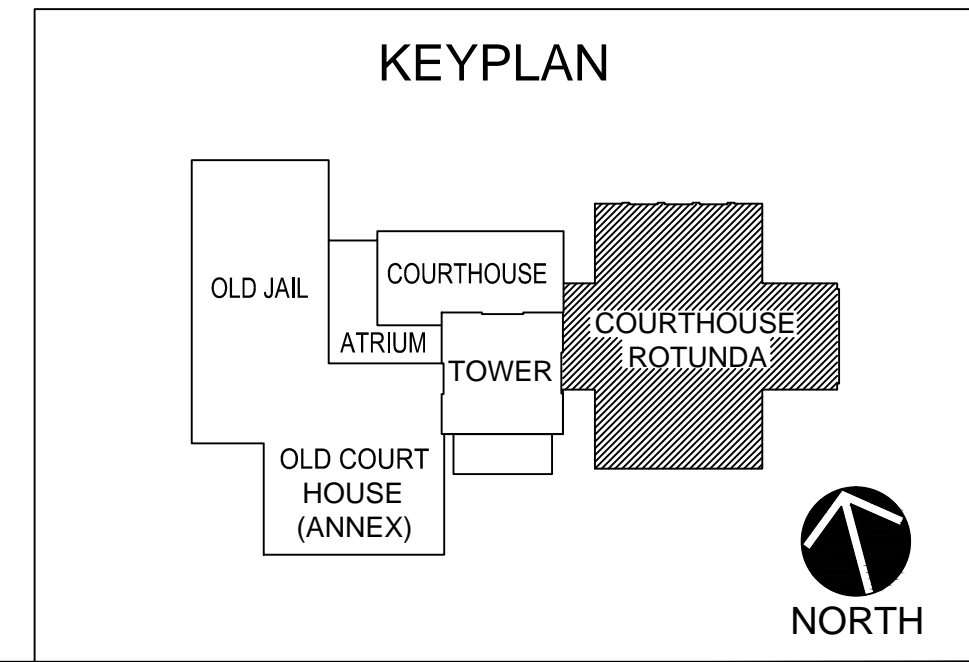


ROOM FINISH SCHEDULE					
	ROOM NO.	WALL	BASE	FLOOR	REMARKS
RESTROOMS	RESTROOM GROUND FLOOR	P1/WT1/WT5/WT6	WT1	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.
	RESTROOM SECOND FLOOR	P1/WT2/WT3/WT4	WT2	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.
	RESTROOM THIRD FLOOR	P1/WT2/WT3/WT4	WT2	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.

FINISH SCHEDULE								
	MATERIAL	TYPE	DESCRIPTION	BASE OF DESIGN MANUFACTURER	CONTACT	REMARKS		
FLOOR	CARPET SHEET	C1	0.16" THICK, 78.74" (200CM) WIDTH SHEET CARPET, COLLECTION: FLOTEX VISION, COLOR: 000434 ENERGE	FORBID	JILL MASTROBA TRISTA TEL: 800.342.0604	GAME ROOM		
	PORCELAIN / CERAMIC / QUARRY TILE	FT1	18"x18" CERAMIC TILE, COLLECTION: HEATHLAND, COLOR: WHITE ROCK H101	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	RESTROOMS		
BASE	RUBBER SHEET FLOORING	R1	3.0 MM RUBBER SHEET FLOORING, STYLE: NORAPLAN VALUA, COLOR: -	NORA	TORY CHURCHILL TEL: 201.681.3514	STARWELL		
	RUBBER	R2	3.0 MM RUBBER SHEET FLOORING, STYLE: NORAPLAN VALUA, COLOR: 6721 SANDBAR.	NORA	TORY CHURCHILL TEL: 201.681.3514			
WALL	SEALED CONCRETE	SC	ASPHFORD FORMULA	CLURE CRETE, INC.	TEL: 801.489.5063			
	RUBBER	B1	4" EQUILIBRIUM BIO-BASED TRADITIONAL WALL BASE, COLOR: 24 GREY HAZE.	JOHNSONITE				
	PAINT	B2	4" EQUILIBRIUM BIO-BASED TRADITIONAL WALL BASE, COLOR: EB-40 BLACK	JOHNSONITE				
	CEILING	FRP PANEL	FP1	4" INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	ALL RESTROOMS	
		CEILING	FRP PANEL	FP2	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	LOUVERS AND WALLS ROTUNDA
			FRP PANEL	FP3	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	FIRST FLOOR OFFICES
			FRP PANEL	FP4	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	OFFICES
			FRP PANEL	FP5	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	OFFICES
			FRP PANEL	FP6	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	CORRIDOR
			FRP PANEL	FP7	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	STORAGE/ MECHANICAL
			FRP PANEL	FP8	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED TO MATCH EXISTING	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	COURTROOM ON 3RD AND 4TH FLOOR
	FRP PANEL		FP9	INTERIOR LATEX PAINT EG-SHEL FINISH, COLOR: TO BE SELECTED TO MATCH EXISTING	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	HOUSE KEEPING	
WALL	CERAMIC WALL TILE	WT1	4"x8" CERAMIC WALL TILE FIELD COLLECTION: NATURAL HUES COLOR: MUSHROOM QH10 (1) FINISH: MATTE.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	GROUND FLOOR RESTROOM BRICK-HORIZONTAL PATTERN		
	CERAMIC WALL TILE	WT2	4"x8" CERAMIC WALL TILE FIELD COLLECTION: NATURAL HUES COLOR: STEEL QH21 (1) FINISH: MATTE.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN		
	CERAMIC WALL TILE	WT3	4"x8" CERAMIC WALL TILE ACCENT COLLECTION: NATURAL HUES COLOR: FERWINKLE QH31 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN		
	CERAMIC WALL TILE	WT4	4"x8" CERAMIC WALL TILE ACCENT COLLECTION: NATURAL HUES COLOR: LATE QH08 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN		
	CERAMIC WALL TILE	WT5	4"x8" CERAMIC WALL TILE COLLECTION: NATURAL HUES COLOR: EGGLANT QH18 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	GROUND FLOOR RESTROOM BRICK-HORIZONTAL PATTERN		
	CERAMIC WALL TILE	WT6	4"x8" CERAMIC WALL TILE COLLECTION: NATURAL HUES COLOR: ROSE BEIGE QH19 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	RESTROOM ACCENT REFER TO INTERIOR ELEV. PATTERN		
DOORS	VINYL-CLAD DOORS	VD1	VINYL-CLAD FLUSH #DOOR WITH 0.040" THICK IPS RIGID VINYL SHEET OPTION, COLOR: APPLEWOOD 0537.	EGGERS		REFER TO DWG. A301.		
	METAL DOOR	DP1	PAINT SHIELD MICROBICIDAL INTERIOR LATEX PAINT, MEDIUM LUSTER/GLOSS FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	REFER TO DWG. A301.		
DOORS	METAL DOOR FRAME	DP2	PAINT SHIELD MICROBICIDAL INTERIOR LATEX PAINT, SEMI-GLOSS FINISH, COLOR: TO MATCH ADJACENT DOOR FRAME COLOR	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	REFER TO DWG. A301.		
	PLASTER	PL1	LAMINATE, COLOR: -	WILSONART	SANDRA SAVINHO TEL: 800.220.2233	ELEVATOR CAB		
SPECIALTIES	TOILET PARTITIONS/URINAL SCREENS	TP1	1" THICK, POWDER COATED PARTITION, STANDARD SERIES, STYLE: HEADRAL BRACED	HADRAN PARTITIONS	DENSE ROMANNI SYLVESTER ASSOCIATES TEL: 732.805.5645	FLOOR MOUNTED W/ HEADRAL BRACED		
	URINAL SCREENS	US1	1" THICK, POWDER COATED PARTITION, STANDARD SERIES, STYLE: HEADRAL BRACED COLOR: 545 CHARCOAL.	HADRAN PARTITIONS	DENSE ROMANNI SYLVESTER ASSOCIATES TEL: 732.805.5645	WALL MOUNTED 48" SCREEN		
SINK	SOLID SURFACE	S1	ONE-PIECE VANITY TOP AND BOWL, FORMICA SIGNATURES COLOR: BOTTLE GLASS QUARTZ 770	FORMICA	1.800.367.6422	REFER TO DWG. A503, RESTROOM SINK VANITY		
	STAR TREAD / RISER / LANDING	RS1	ONE-PIECE NOSING-TREAD-RISER RUBBER STRIPTRACS, STYLE: COLOR: -	JOHNSONITE	TORY CHURCHILL 201.681.3514			
STAIR	RAILING, GUARDRAIL & STRINGER	SP1	INTERIOR ACRYLIC LATEX PAINT PROMAR 200 SEMI-GLOSS FINISH, COLOR: TO BE SELECTED	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709			
	CAB PANEL	WP1	PREMIUM LAMINATE, COLOR: WILLIAMSBURG CHERRY ASKA-DJ, LAMINATE FINISH ON FACE AND FOUR EDGES.	OTIS		SEE ELEVATOR ELEVATION DWG. A-501.		
	CAB PANEL	SS	STAINLESS STEEL WALL PANEL	OTIS		SEE ELEVATOR ELEVATION DWG. A-501		
ELEVATOR	CAB BASE	SB1	SATIN STAINLESS STEEL BASE	OTIS		SEE ELEVATOR ELEVATION DWG. A-501		

- NOTES:
1. ALL WALL AND CEILING FINISHES SHALL BE CLASS A, FLAME SPREAD INDEX 25 OR UNDER, SMOKE DEVELOPED 450 OR UNDER.
 2. ALL FLOOR FINISH SHALL BE CLASS 1, 0.45 WATTS/SQ. CM OR GREATER.
 3. ALL MODULAR CARPET OVER RAISED FLOOR SHALL HAVE SOIL PROTECTION AND HIGH-FRICTION COATING
 4. REFER TO DIVISION 1 SPECIFICATION SECTION FOR ALTERNATE FINISH ITEMS

1 THIRD FLOOR FINISH PLAN
A.703 1/8" = 1'-0"



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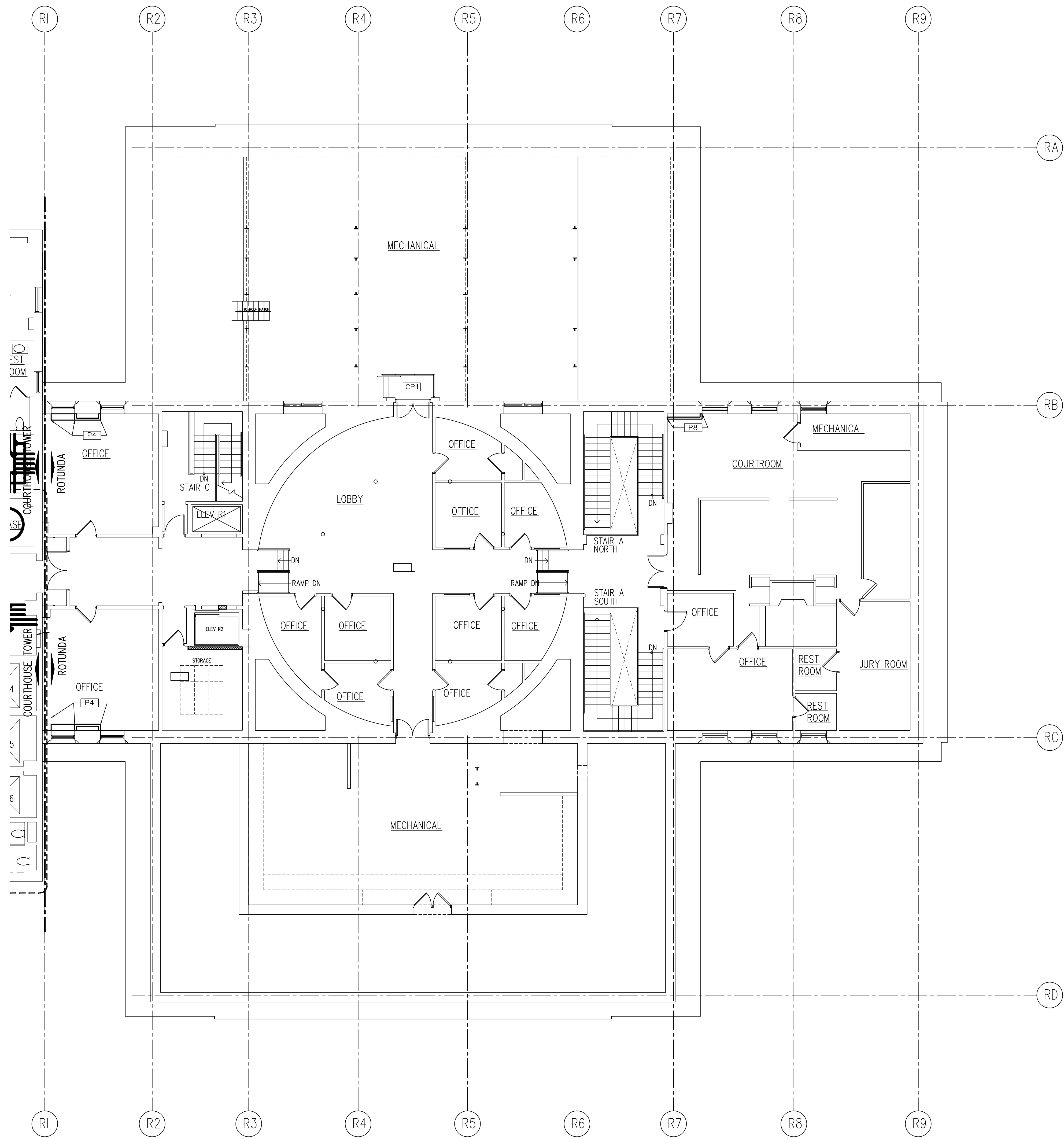
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PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
THIRD FLOOR FINISH PLAN

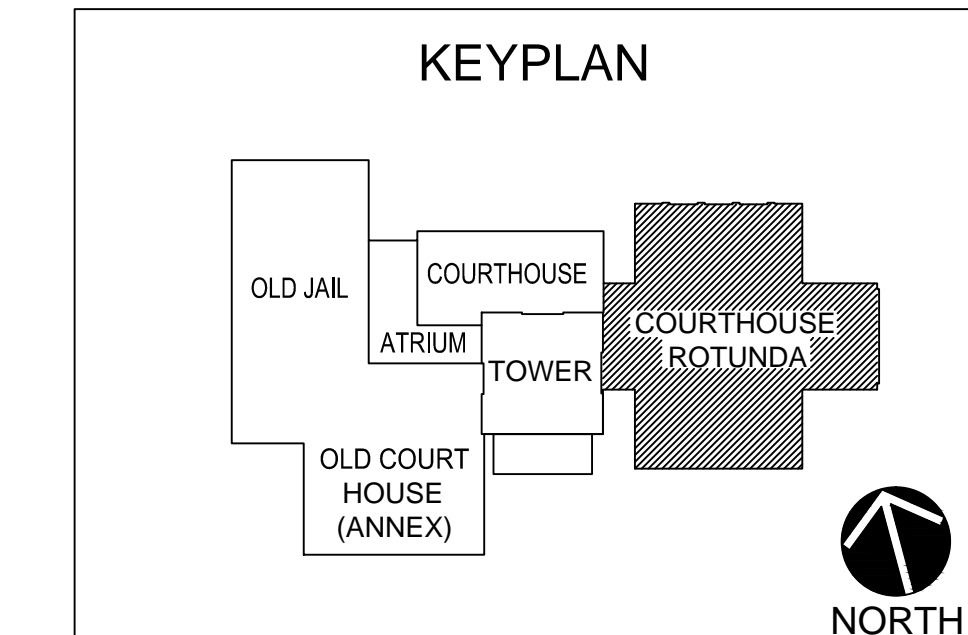
SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	37 OF: 118
								DWG. NO	A.703



ROOM FINISH SCHEDULE					
	ROOM NO.	WALL	BASE	FLOOR	REMARKS
RESTROOMS	RESTROOM GROUND FLOOR	P1/WT1/WT5/WT6	WT1	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.
	RESTROOM SECOND FLOOR	P1/WT2/WT3/WT4	WT2	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.
	RESTROOM THIRD FLOOR	P1/WT2/WT3/WT4	WT2	FT1/FT2	REFER TO ELEV. & PLANS FOR PATTERNS.

FINISH SCHEDULE						
	MATERIAL	TYPE	DESCRIPTION	BASE OF DESIGN MANUFACTURER	CONTACT	REMARKS
FLOOR	CARPET SHEET	C1	0.16" THICK, 78.74" (200CM) WIDTH SHEET CARPET. COLLECTION: FLOTEX VISION. COLOR: DOKKA ENERGY.	FORBER	JILL MASTROBA TRISTA TEL: 800.342.0604	GAME ROOM
	PORCELAIN CERAMIC / QUARRY TILE	FT1	18"x18" CERAMIC TILE. COLLECTION: HEATHLAND. COLOR: WHITE ROCK HLD1	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	RESTROOMS
FLOOR	RUBBER SHEET FLOORING	R1	3.0 MM RUBBER SHEET FLOORING. STYLE: NORPLAN VALLIA. COLOR: 7	NORA	TORY CHURCHILL TEL: 201.661.3514	STARWELL
	SEALED CONCRETE	SC	ASHFORD FORMULA	CURE CRETE, INC.	TEL: 801.489.5663	
BASE	RUBBER	B1	4" EQUILIBRIUM BIO-BASED TRADITIONAL WALL BASE. COLOR: 24 GREY HAZE.	JOHNSONITE		
	RUBBER	B2	4" EQUILIBRIUM BIO-BASED TRADITIONAL WALL BASE. COLOR: 0140 BLACK.	JOHNSONITE		
PAINT	INTERIOR LATEX PAINT	P1	EG-SHEL FINISH. COLOR: TO BE SELECTED.	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	ALL RESTROOMS
	INTERIOR LATEX PAINT	P2	EG-SHEL FINISH. COLOR: TO BE SELECTED.	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	LOUVERS AND WALLS ROTUNDA
	INTERIOR LATEX PAINT	P3	EG-SHEL FINISH. COLOR: TO BE SELECTED.	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	FIRST FLOOR OFFICES
	INTERIOR LATEX PAINT	P4	EG-SHEL FINISH. COLOR: TO BE SELECTED.	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	OFFICES
	INTERIOR LATEX PAINT	P5	EG-SHEL FINISH. COLOR: TO BE SELECTED.	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	OFFICES
	INTERIOR LATEX PAINT	P6	EG-SHEL FINISH. COLOR: TO BE SELECTED.	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	CORRIDOR
	INTERIOR LATEX PAINT	P7	EG-SHEL FINISH. COLOR: TO BE SELECTED.	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	STORAGE/ MECHANICAL
	INTERIOR LATEX PAINT	P8	EG-SHEL FINISH. COLOR: TO BE SELECTED TO MATCH EXISTING.	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	COURTROOM ON 3RD AND 4TH FLOOR
WALL	FRP PANEL	FP1	4" HEIGHT. GLASS/FRP WITH SURFACIAL PANEL. COLOR: SILVER 66. FINISH: EMBOSSED.	CRANE COMPOSITES		HOUSE KEEPING
	CERAMIC WALL TILE	WT1	4 1/2" x 8" CERAMIC WALL TILE. FIELD COLLECTION: NATURAL HUES. COLOR: MUSHROOM QH16 (1) FINISH: MATTE.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	GROUND FLOOR RESTROOM BRICK-HORIZONTAL PATTERN
	CERAMIC WALL TILE	WT2	4 1/2" x 8" CERAMIC WALL TILE. FIELD COLLECTION: NATURAL HUES. COLOR: STEEL QH21 (1) FINISH: MATTE.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN
	CERAMIC WALL TILE	WT3	4 1/2" x 8" CERAMIC WALL TILE. ACCENT COLLECTION: NATURAL HUES. COLOR: FEWINKLE QH31 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN
	CERAMIC WALL TILE	WT4	4 1/2" x 8" CERAMIC WALL TILE. ACCENT COLLECTION: NATURAL HUES. COLOR: LATTE QH26 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	2ND & 3RD FL RESTROOM BRICK-HORIZONTAL PATTERN
	CERAMIC WALL TILE	WT5	4 1/2" x 8" CERAMIC WALL TILE. COLLECTION: NATURAL HUES. COLOR: EGGPLANT QH18 (1) FINISH: GLOSSY.	DALTILE	KELLY HOLLAND-YOUNG TEL: 908.340.8400	GROUND FLOOR RESTROOM BRICK-HORIZONTAL PATTERN
CEILING	ACOUSTIC CEILING PANEL	ACT1	24"x24"x7/8" ULTIMA BEVELED REGULAR. COLOR: WHITE.	ARMSTRONG		4TH FLOOR LOBBY/ OFFICE AREA
	SUSPENDED SYSTEM	SS1	SURFING 4" EXPOSED TEE SYSTEM. 4" SHADOW MOLDING. COLOR: WHITE.	ARMSTRONG		
DOORS	VINYL-GLAZED DOORS	VD1	INTERIOR VINYL-GLAZED FLUSH DOOR WITH 0.040" THICK 1/2" RIGID VINYL SHEET OPTION. COLOR: APFLEWOOD 0537.	EGGERS	DAVID HALL TEL: 908.309.8709	PLASTER CEILING ROTUNDA
	METAL DOOR	DP1	PAINT SHIELD MICROBIOGICAL INTERIOR LATEX PAINT. MEDIUM LUSTER/GLOSS FINISH. COLOR: TO BE SELECTED.	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	REFER TO DWG. A301.
WALL	METAL DOOR FRAME	DF2	PAINT SHIELD MICROBIOGICAL INTERIOR LATEX PAINT. SEMI-GLOSS FINISH. COLOR: TO MATCH ADJACENT DOOR FRAME. COLOR: TO BE SELECTED.	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	REFER TO DWG. A301.
	PLASTIC LAMINATE	PL1	LAMINATE. COLOR: TO BE SELECTED.	WILSONART	SANDRA GAVINHO TEL: 800.220.2233	ELEVATOR CAB
SPECIALTIES	TOILET PARTITIONS/URINAL SCREENS	TP1	1" THICK, POWDER COATED PARTITION. STANDARD SERIES. STYLE: HEARMAL BRACED. COLOR: 545 CHARCOAL.	HADRAN PARTITIONS	DENSE ROHMANN SILVESTER ASSOCIATES TEL: 732.805.5645	FLOOR MOUNTED W/ HEADRAL BRACED.
	URINAL SCREENS	US1	1" THICK, POWDER COATED PARTITION. STANDARD SERIES. STYLE: HEARMAL BRACED. COLOR: 545 CHARCOAL.	HADRAN PARTITIONS	DENSE ROHMANN SILVESTER ASSOCIATES TEL: 732.805.5645	WALL MOUNTED 48" SCREEN
SINK	SOLID SURFACE	S1	ONE-PIECE VANITY TOP AND BOWL. FORMICA SIGNATURES. COLOR: BOTTLE GLASS QUARTZ 770.	FORMICA	1.800.367.8422	REFER TO DWG. A503. RESTROOM SINK VANITY
	STAR TREAD / RISER / LANDING	RS1	ONE-PIECE NOSING-TREAD-RISER RUBBER STAIRHEADS. STYLE: COLOR: TO BE SELECTED.	JOHNSONITE	TORY CHURCHILL 201.661.3514	
ELEVATOR	RAILING, GUARDRAIL & STRINGER	SP1	INTERIOR ACRYLIC LATEX PAINT. PROMAR 200 SEMI-GLOSS FINISH. COLOR: TO BE SELECTED.	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	SEE ELEVATOR ELEVATION DWG. A-501.
	CAB PANEL	WP1	PREMIUM LAMINATE. COLOR: WILLIAMSBURG CHERRY 7936K-07. LAMINATE FINISH ON FACE AND FOUR EDGES.	OTIS		SEE ELEVATOR ELEVATION DWG. A-501.
	CAB PANEL	SS	STAINLESS STEEL WALL PANEL	OTIS		SEE ELEVATOR ELEVATION DWG. A-501.
	CAB BASE	SB1	SATIN STAINLESS STEEL BASE	OTIS		SEE ELEVATOR ELEVATION DWG. A-501.

- NOTES:
- ALL WALL AND CEILING FINISHES SHALL BE CLASS A. FLAME SPREAD INDEX 25 OR UNDER. SMOKE DEVELOPED 450 OR UNDER.
 - ALL FLOOR FINISH SHALL BE CLASS 1, 0.45 WATTS/SQ. CM OR GREATER.
 - ALL MODULAR CARPET OVER RAISED FLOOR SHALL HAVE SOIL PROTECTION AND HIGH-FRICTION COATING.
 - REFER TO DIVISION 1 SPECIFICATION SECTION FOR ALTERNATE FINISH ITEMS.



1 FOURTH FLOOR FINISH PLAN
A.704 1/8" = 1'-0"

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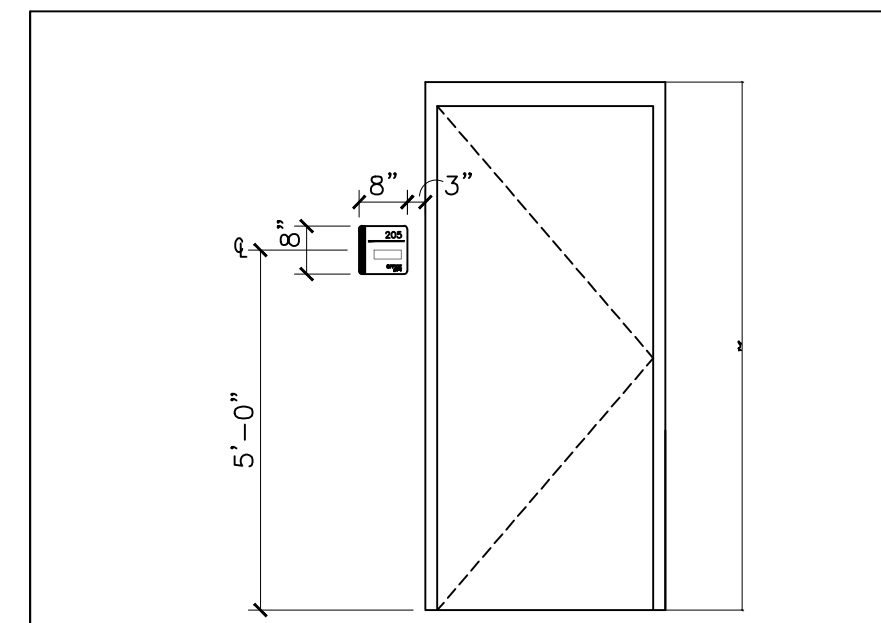


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

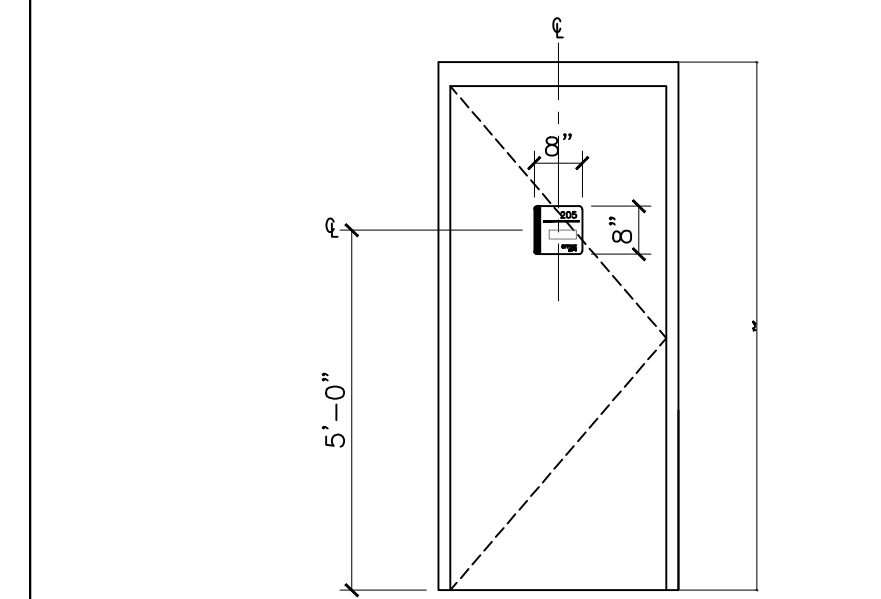
SHEET CONTENTS:
FOURTH FLOOR FINISH PLAN

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	WTJ
10.30.15	95% CD UPDATES	KD	FM					CHKD BY	NJN
05.31.17	100% CD SUBMIT	MMC	FJM					JOB NO	2141152
08.30.17	ISSUED FOR BID	MC	FM					SHEET:	38 OF: 118
								DWG. NO	

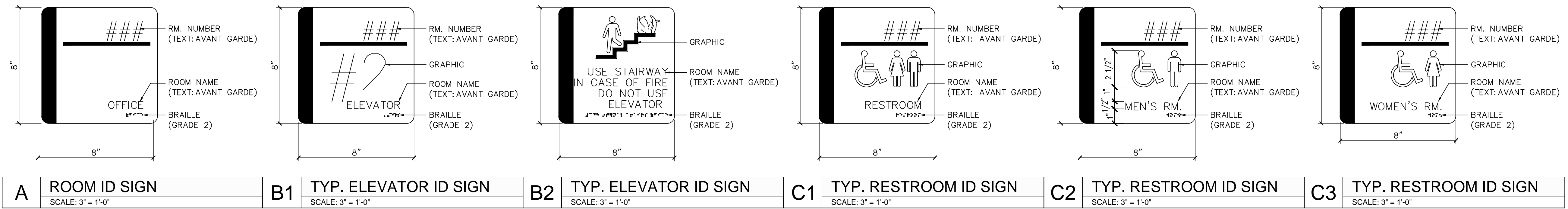
A.704



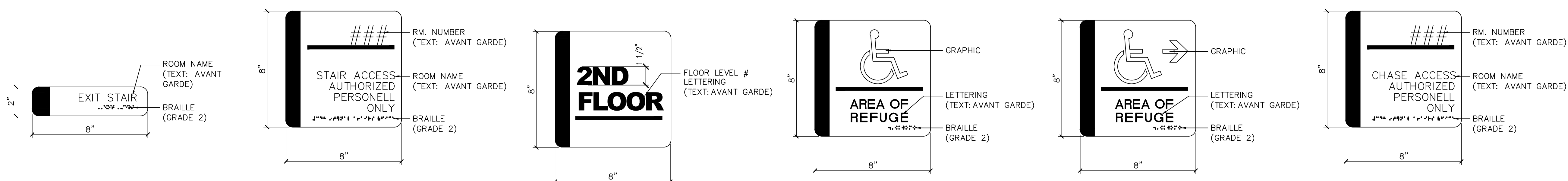
1 TYP. SIGN MTD. TO WALL
WITH OR WITHOUT WINDOW SCALE: 3/8" = 1'-0"



2 TYP. SIGN MTD. TO DOOR
WITH OR WITHOUT WINDOW SCALE: 3/8" = 1'-0"



A ROOM ID SIGN SCALE: 3" = 1'-0"
B1 TYP. ELEVATOR ID SIGN SCALE: 3" = 1'-0"
B2 TYP. ELEVATOR ID SIGN SCALE: 3" = 1'-0"
C1 TYP. RESTROOM ID SIGN SCALE: 3" = 1'-0"
C2 TYP. RESTROOM ID SIGN SCALE: 3" = 1'-0"
C3 TYP. RESTROOM ID SIGN SCALE: 3" = 1'-0"



D1 TYP. STAIR ID SIGN SCALE: 3" = 1'-0"
D2 STAIR ID SIGN SCALE: 3" = 1'-0"
D3 TYP. INSIDE STAIR ID SIGN SCALE: 3" = 1'-0"
E1 TYP. AREA OF REFUGE ID SIGN NTS
E2 TYP. AREA OF REFUGE DIRECTIONAL ID SIGN NTS
F1 CHASE ACCESS ID SIGN NTS

LEGEND	
A	ROOM ID SIGN
B	ELEVATOR ID SIGN
C	RESTROOM ID SIGN
D	STAIR/EXIT ID SIGN
E	AREA OF REFUGE ID SIGN
F	CHASE ACCESS ID SIGN

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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

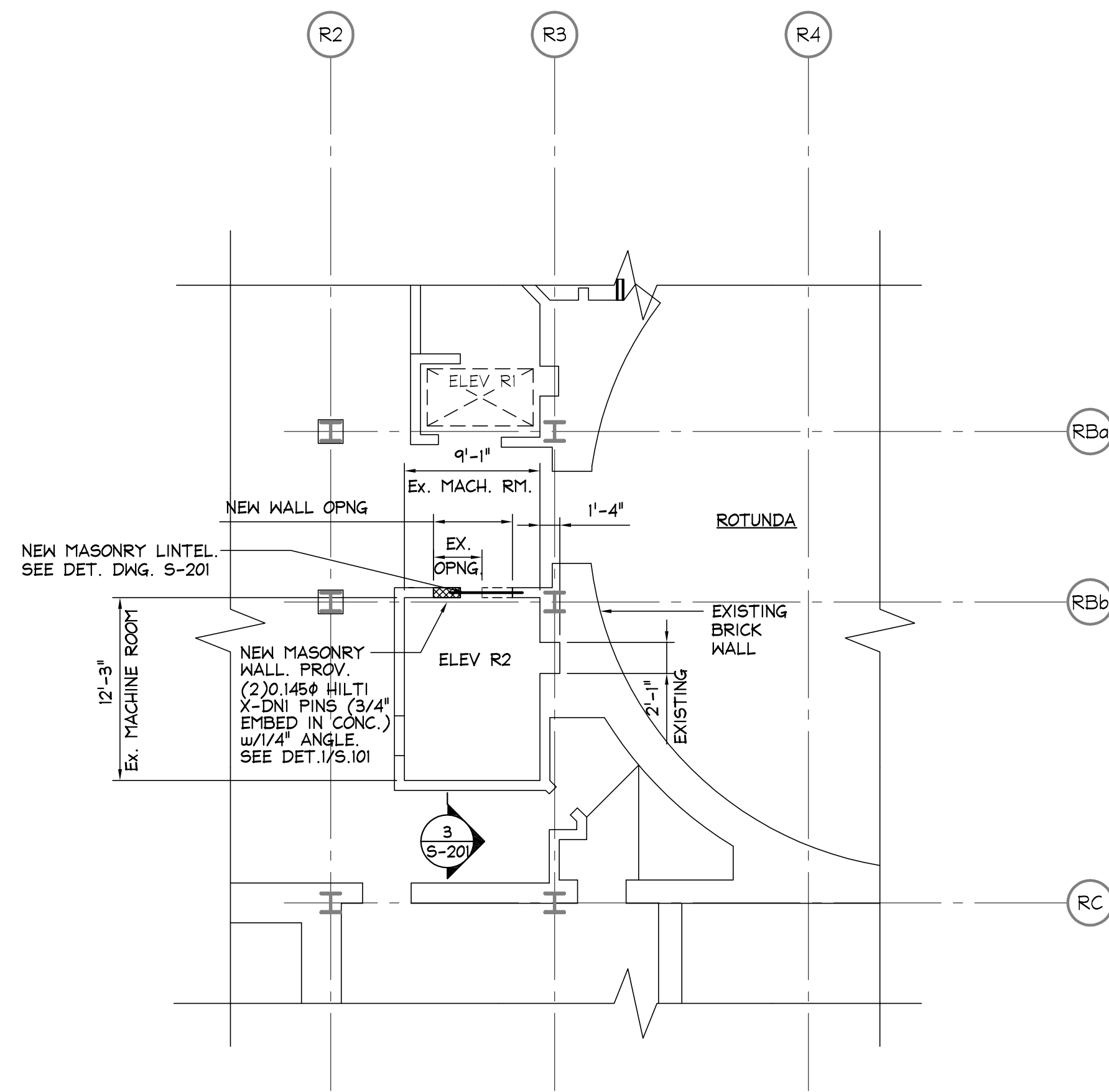


PROJECT: **UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

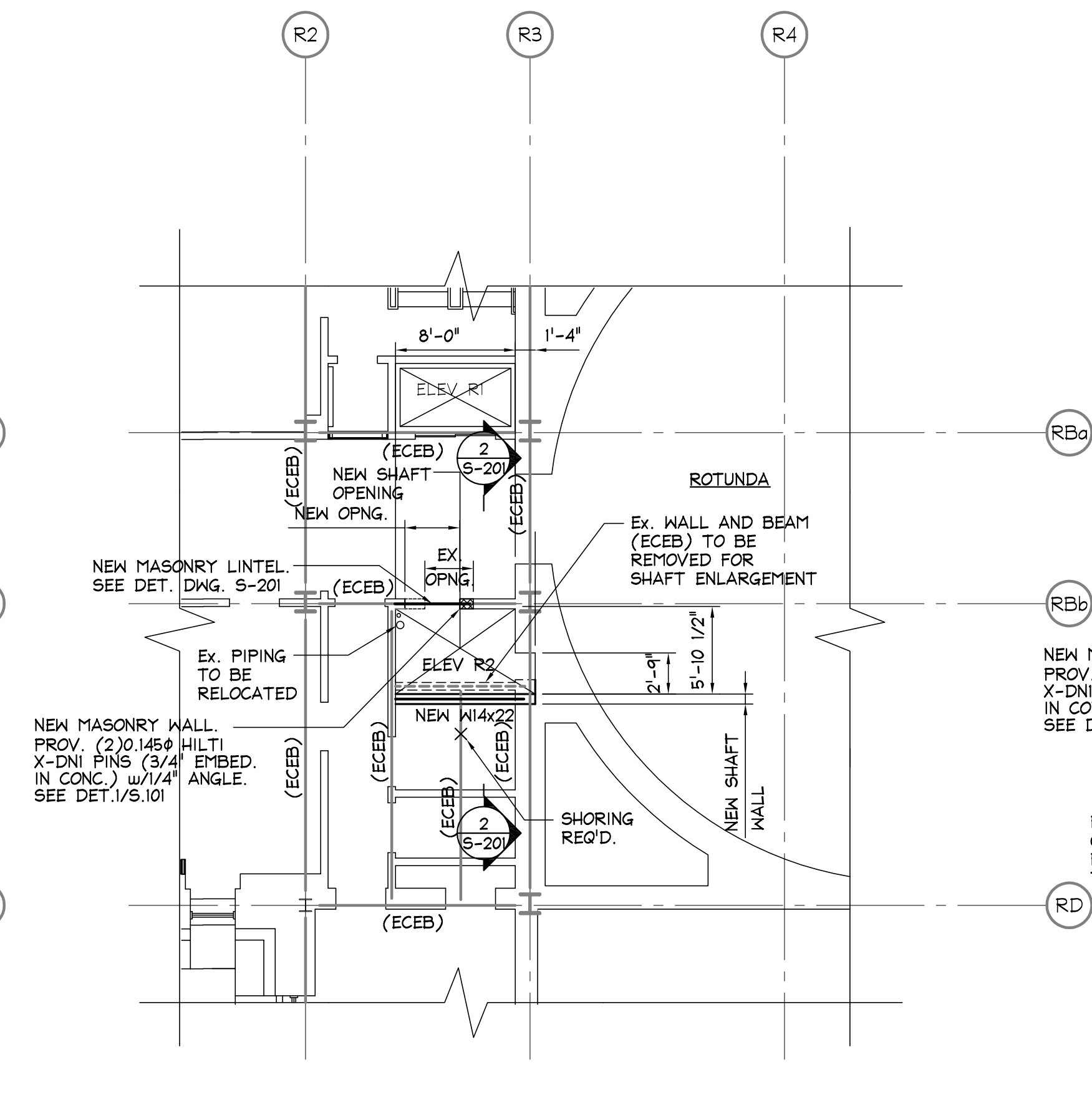
SHEET CONTENTS:
SIGNAGE DETAIL

SUBMISSIONS				REVISIONS				DATE	05-31-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
09.25.15	95% CD SUBMIT	KD	FM						DRWN BY BT
10.30.15	95% CD UPDATES	KD	FM						CHKD BY NJN
05.31.17	100% CD SUBMIT	MMC	FJM						JOB NO 2141152
08.30.17	ISSUED FOR BID	MC	FM						SHEET: 39 OF: 118
									DWG. NO

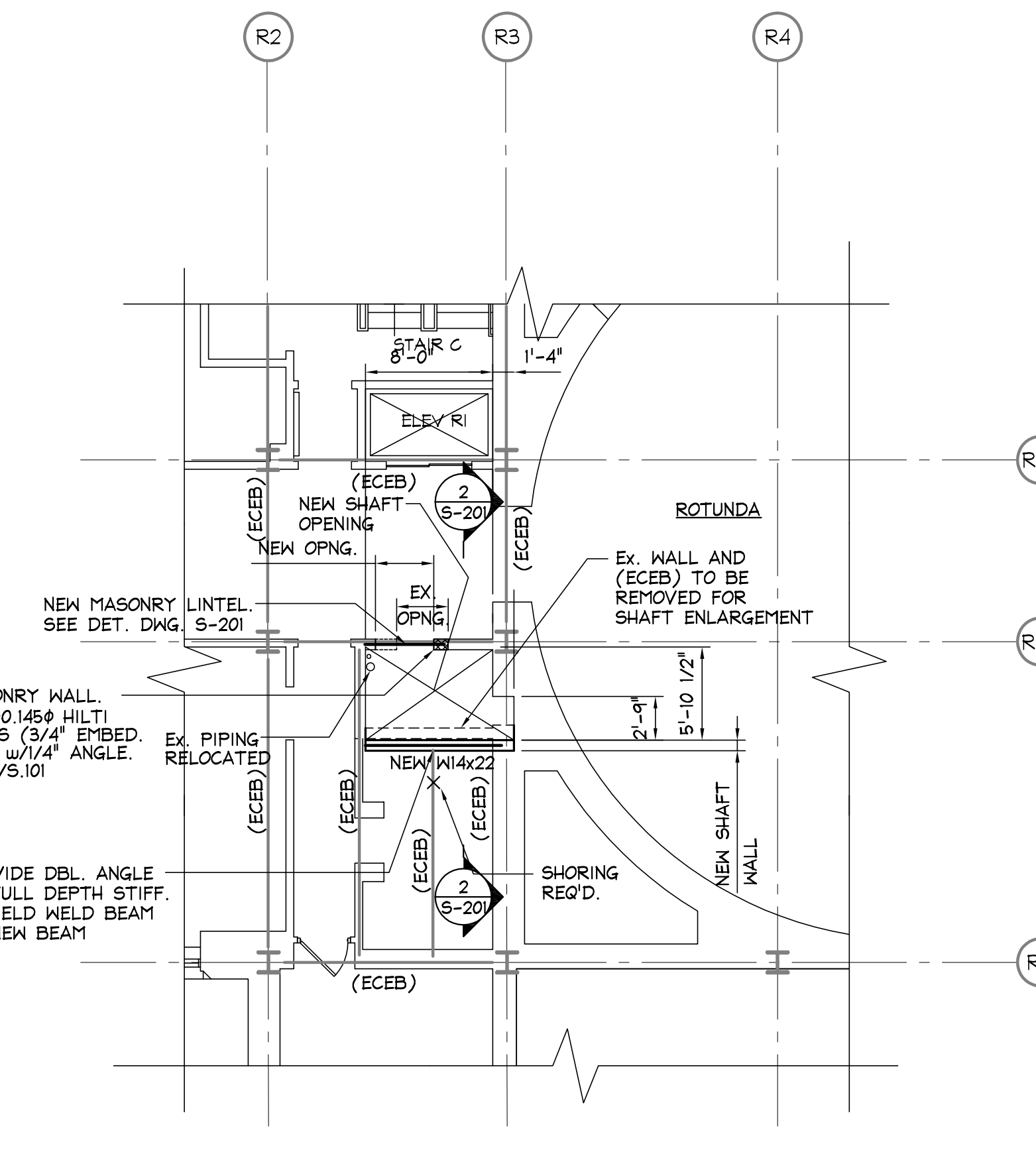
A.801



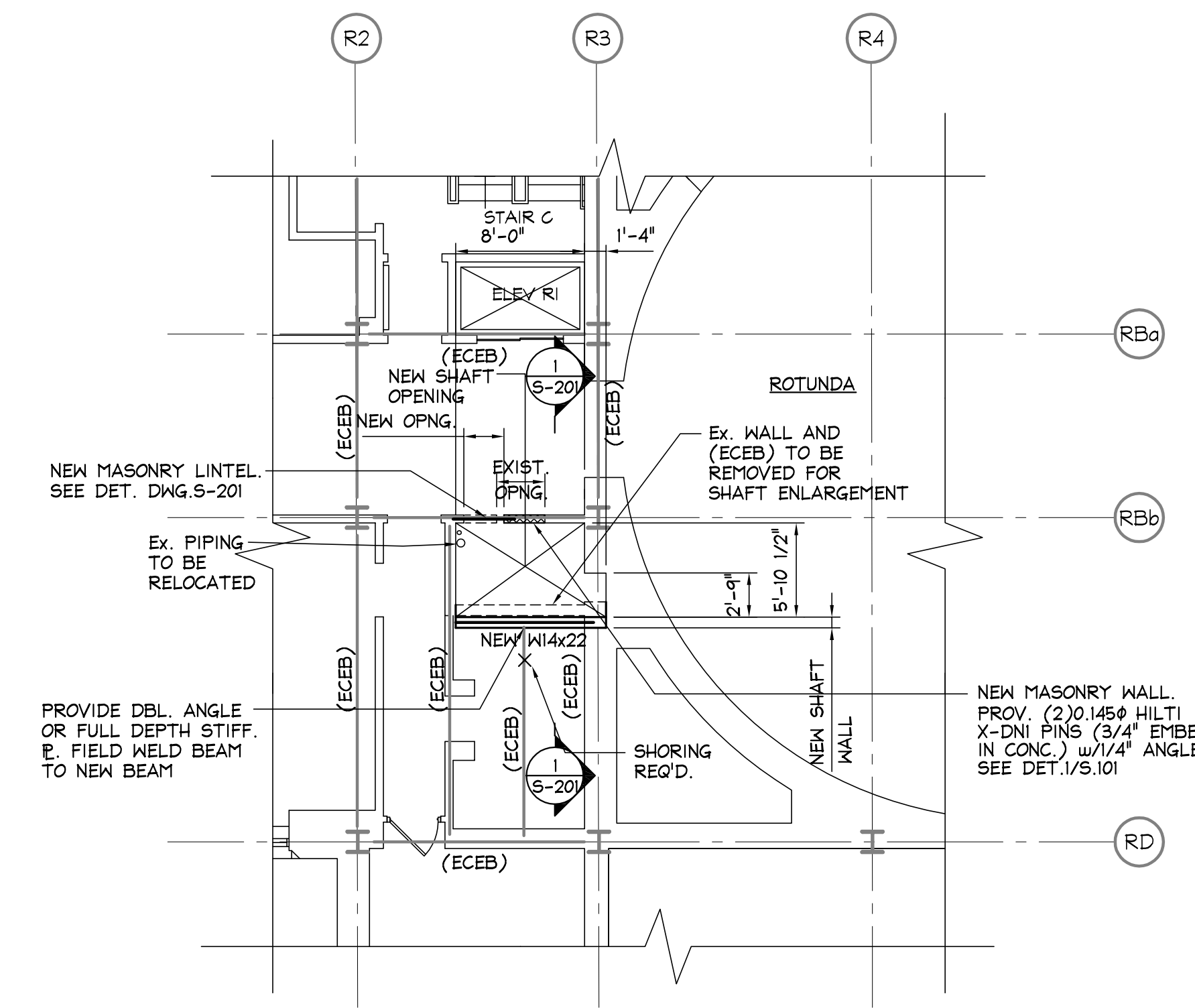
PARTIAL BASEMENT PLAN-EXISTING CONDITION
SCALE: 1/8"=1'-0"



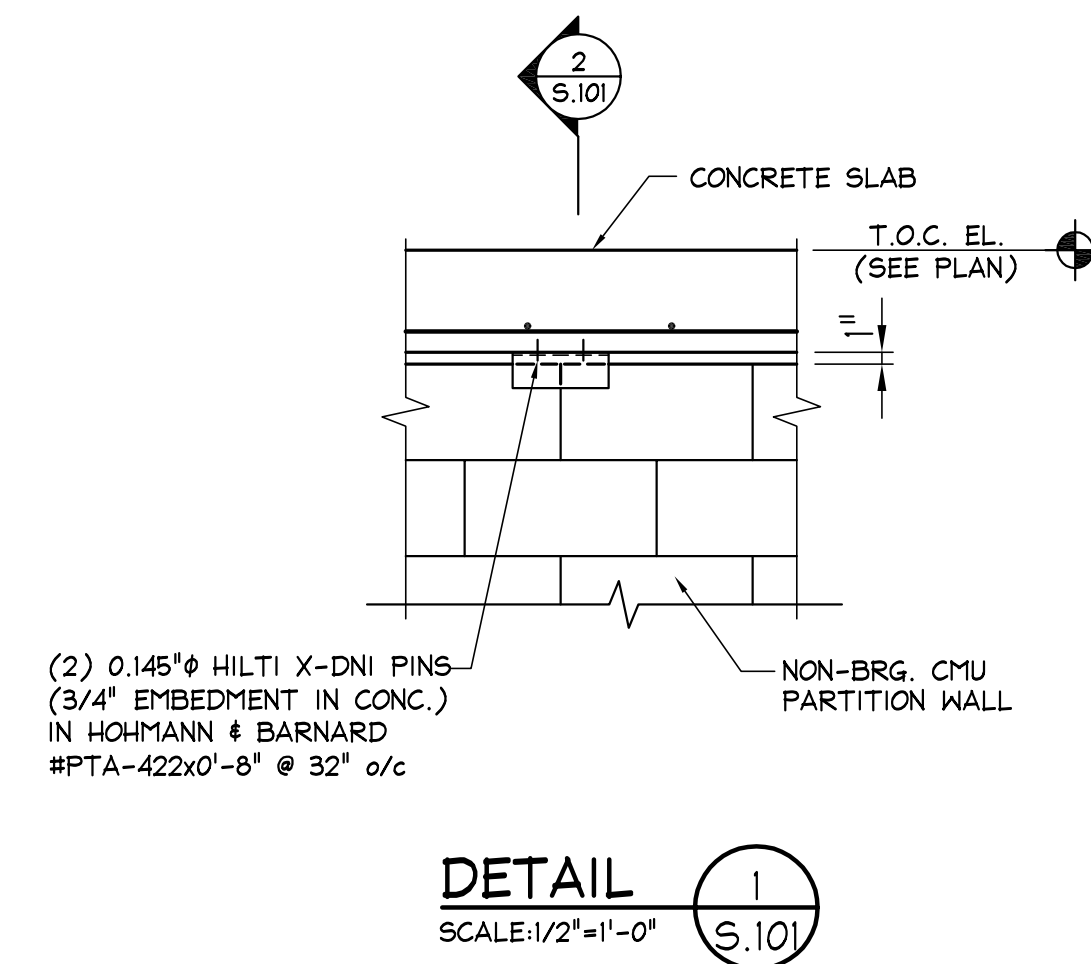
PARTIAL GROUND FLOOR PLAN
SCALE: 1/8"=1'-0"
1) (ECEB) ... INDICATES AN EXISTING STEEL BEAM ENCASED IN CONCRETE.
2) X ... INDICATES POINT OF SHORING REQUIRED FOR EXISTING CONCRETE ENCASED BEAM.



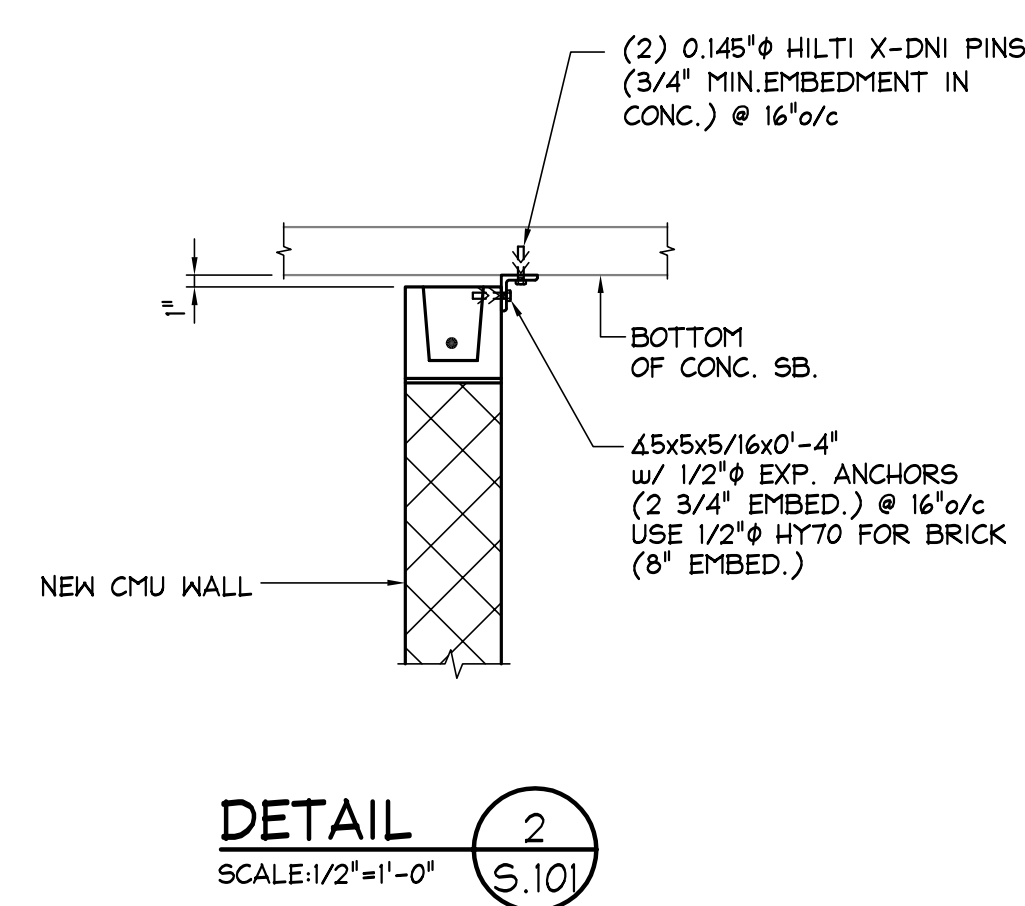
PARTIAL TYPICAL FLOOR PLAN (1ST - 3RD FL'S)
SCALE: 1/8"=1'-0"
1) (ECEB) ... INDICATES AN EXISTING STEEL BEAM ENCASED IN CONCRETE.
2) X ... INDICATES POINT OF SHORING REQUIRED FOR EXISTING CONCRETE ENCASED BEAM.



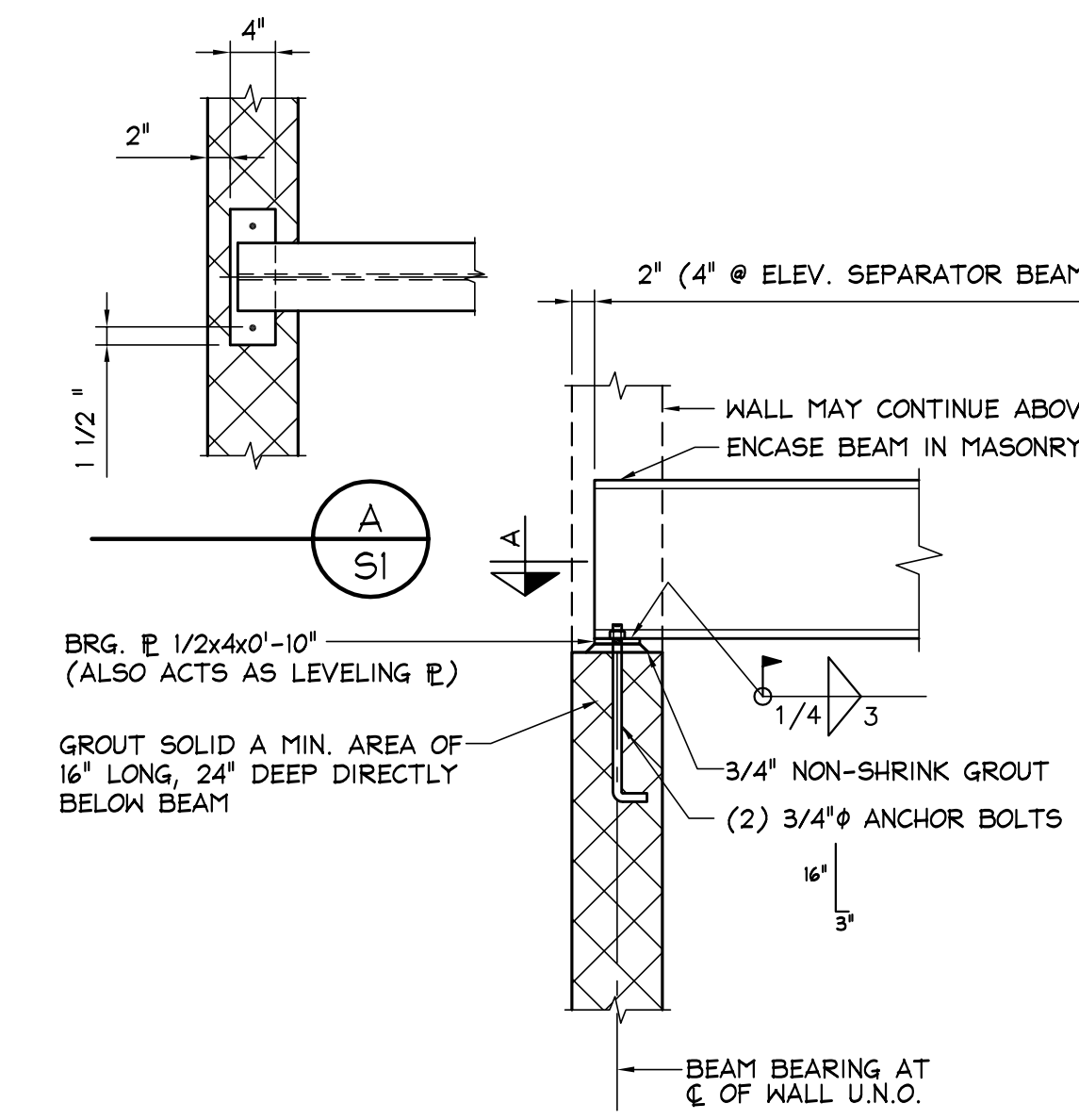
PARTIAL ATTIC FRAMING PLAN
SCALE: 1/8"=1'-0"



DETAIL 1
SCALE: 1/2"=1'-0"
S.101

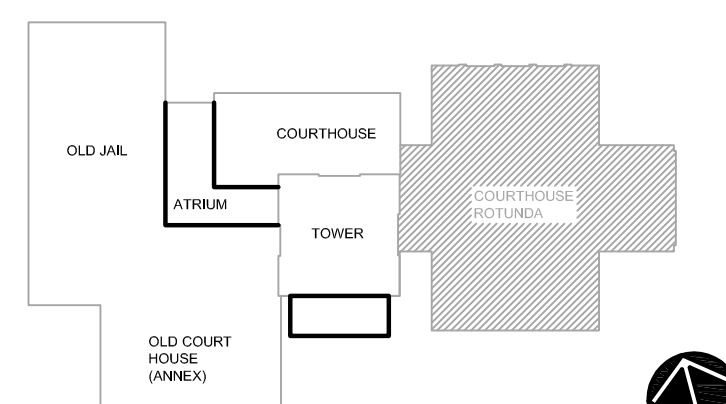


DETAIL 2
SCALE: 1/2"=1'-0"
S.101



TYPICAL BEARING PLATE DETAIL
SCALE: 3/4"=1'-0"

KEYPLAN



ODONNELL & NACCARATO, INC.
STRUCTURAL ENGINEERS
160 ROUTE 22 WEST
2ND FLOOR
MOUNTAINSIDE, NJ 07092
TELEPHONE: (908) 379-2911
FAX: (201) 627-0251
Project No. 3823.0010.00
Paul Peter Panzarino, P.E.
N.J. Cert. No. 42798
Date:

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NJ License No. AI 12541

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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

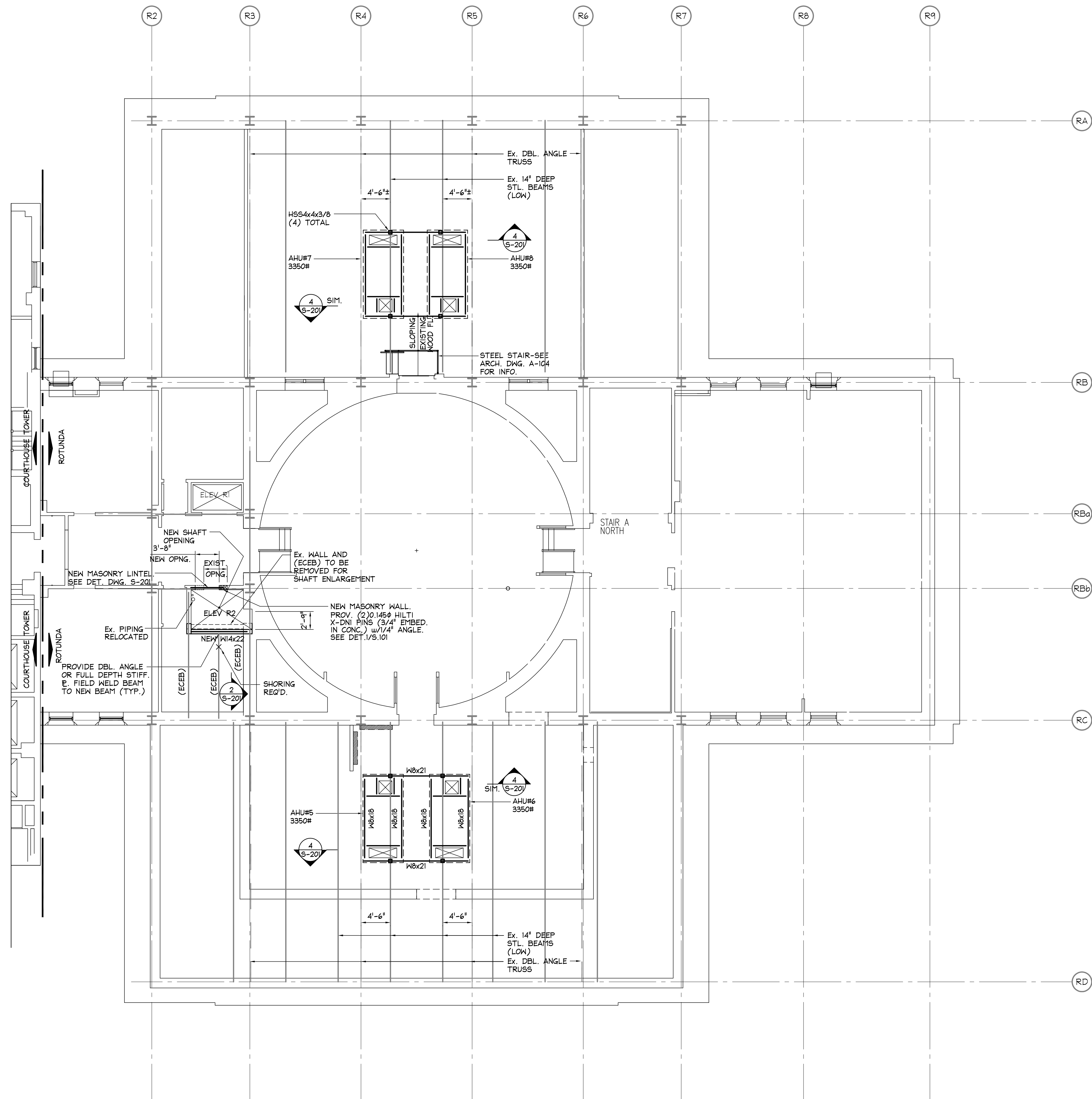
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1094 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0008 FAX: 973.379.1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:
UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

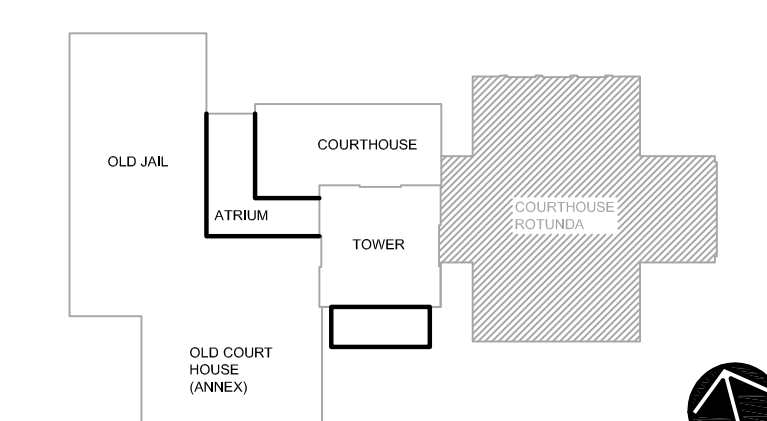
SHEET CONTENTS:
PARTIAL BASEMENT, GROUND FLOOR,
TYPICAL FLOORS (1 THRU 3) AND ATTIC
FRAMING PLANS

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
9-25-15	15% CD SUBMIT	JD	M1					AS SHOWN
05-31-17	100% CD REVIEW	JD	M1					
08-07-17	ISSUED FOR BID	JD	M1					
DRWG NO								OF: XX
								S.101



PARTIAL FOURTH FLOOR PLAN
SCALE: 1/8"=1'-0"

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ODONNELL & NACCARATO, INC.
STRUCTURAL ENGINEERS
160 ROUTE 22 WEST
2ND FLOOR
MOUNTAINSIDE, NJ 07092
TELEPHONE: (908) 379-2911
FAX: (201) 627-0261
Project No. 3823.0010.00
Paul Peter Panzolino, P.E.
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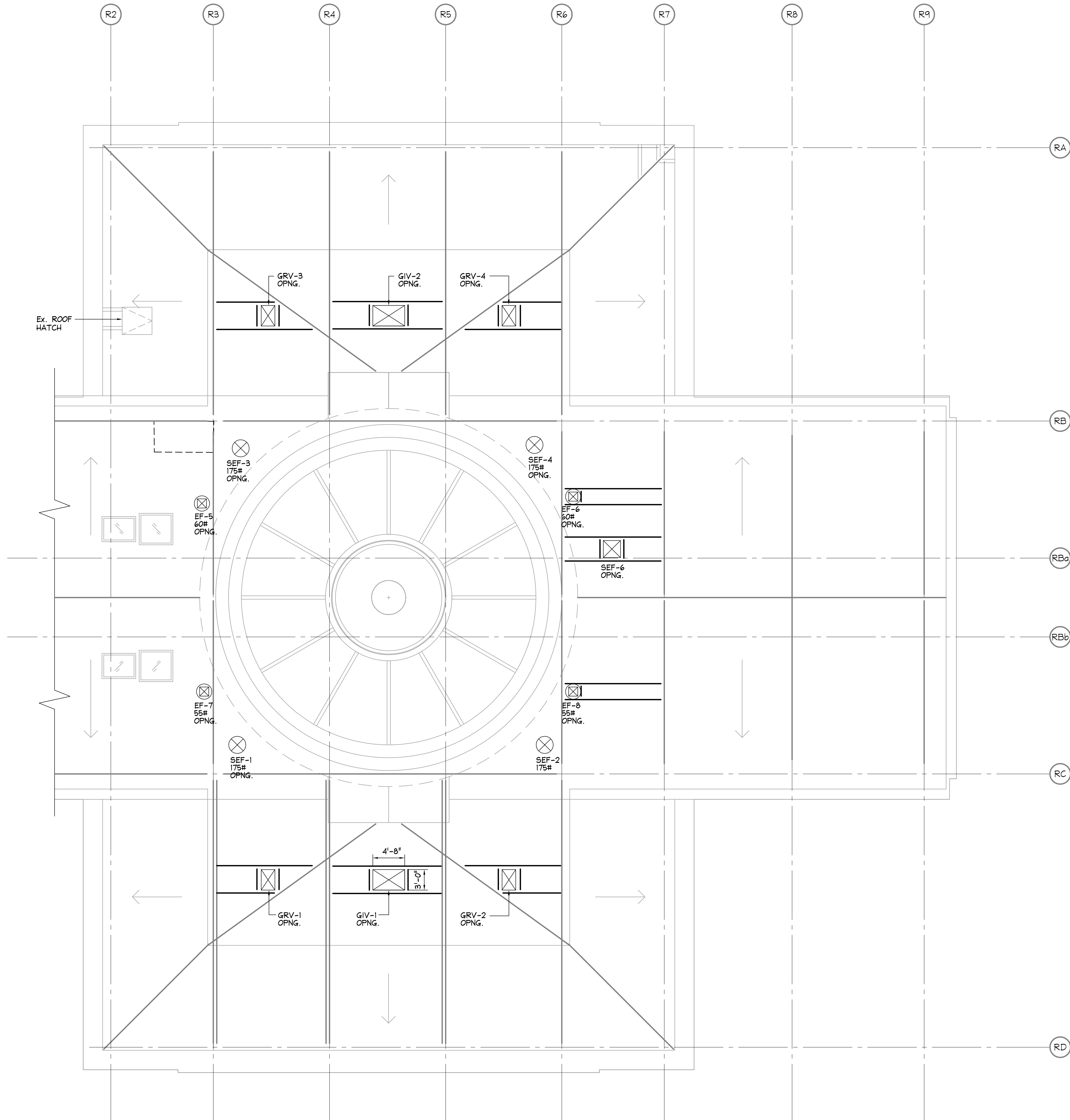
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ARCHITECTURE - PLANNING - INTERIOR DESIGN
1094 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-379-8008 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT: **UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
PARTIAL FOURTH FLOOR FRAMING PLAN

SUBMISSIONS				REVISIONS				DATE	09-25-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9-25-15	15% CD SUBMIT	JD	MM					DRWN BY	JPD
06-31-17	100% CD REVIEW	JD	MM					CHKD BY	BJ
09-07-17	ISSUED FOR BID	JD	MM					JOB NO	214152
								SHEET:	OF: XX
								DRWG NO	

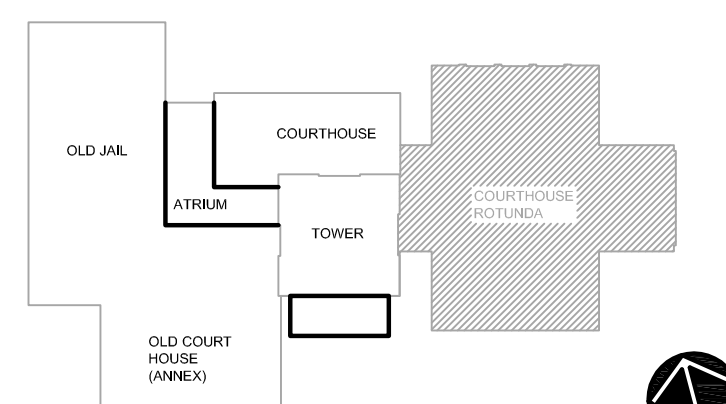
S.102



PARTIAL ROOF PLAN
SCALE: 1/8"=1'-0"

- 1) FOR ROOF OPENING SIZES AND EXACT LOCATIONS SEE ARCHITECTURAL AND MECHANICAL DRAWINGS.
- 2) SEE SECTION 5/5-201 FOR DETAIL AT ROOF OPENINGS. CONTRACTOR TO NOTIFY ENGINEER OF FIELD CONDITIONS THAT DIFFER.

KEYPLAN



ODONNELL & NACCARATO, INC.
STRUCTURAL ENGINEERS
160 ROUTE 22 WEST
2ND FLOOR
MOUNTAINSIDE, NJ 07092
TELEPHONE: (908) 379-2911
FAX: (201) 627-0261
Project No. 3823.0010.00
Paul Peter Panzolino, P.E.
N.J. Cert. No. 42798
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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1094 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.6008 FAX: 973.379.1061
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PROJECT:

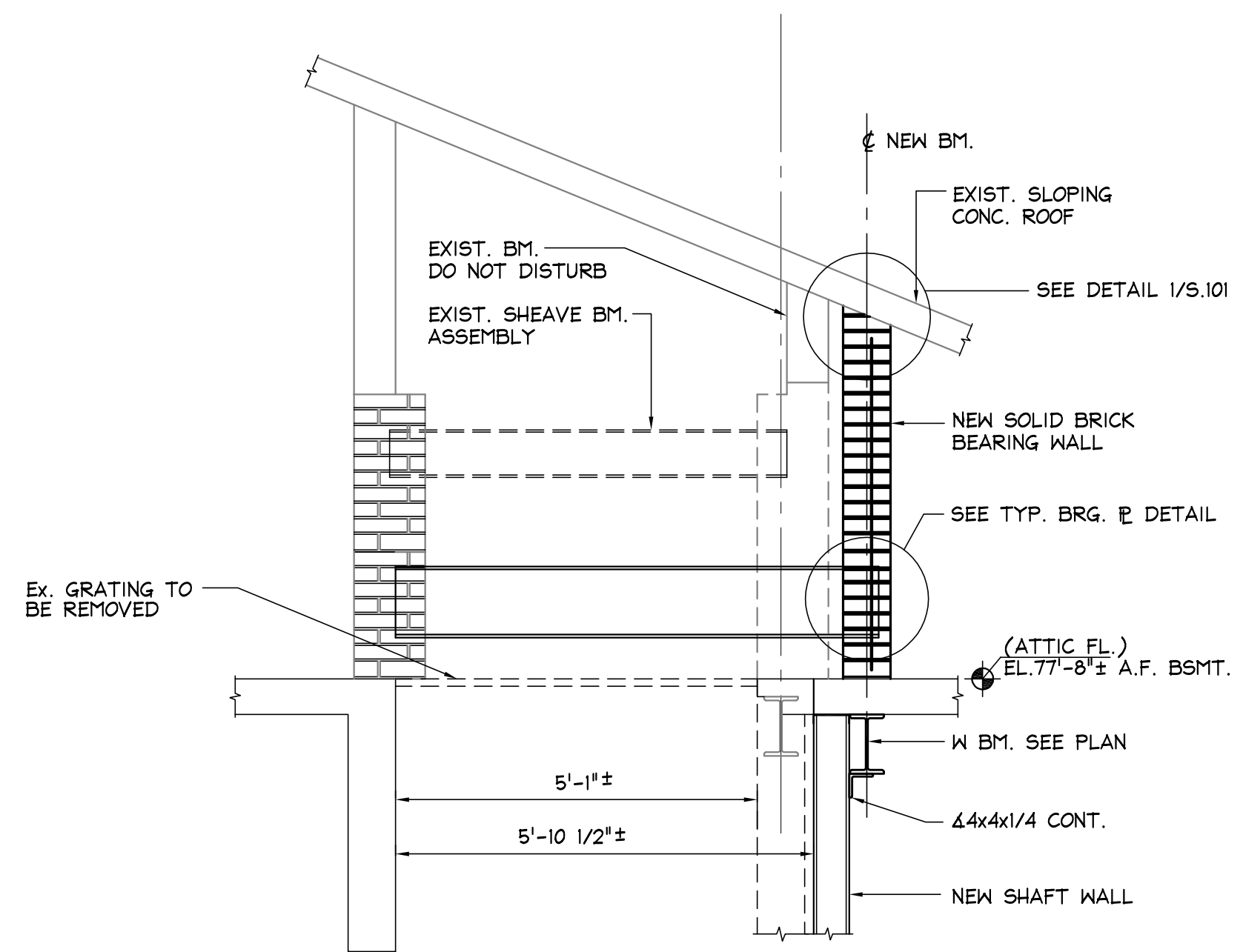
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

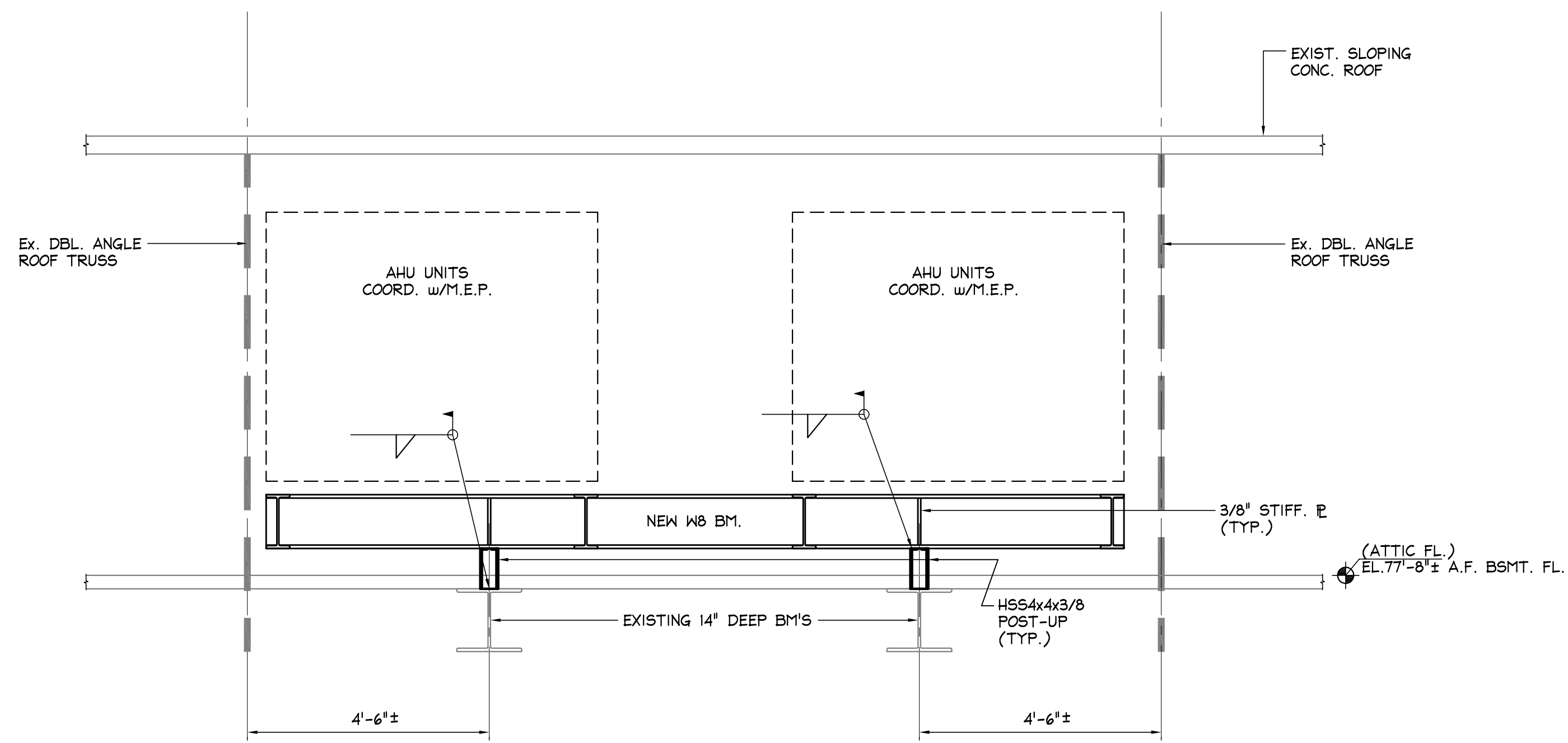
PARTIAL ROOF FRAMING PLAN

SUBMISSIONS				REVISIONS				DATE	09-25-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9-25-15	15% CD SUBMIT	JD	MM					DRWN BY	JPD
06-31-17	100% CD REVIEW	JD	MM					CHKD BY	BJ
09-07-17	"ISSUED FOR BID"	JD	MM					JOB NO	2141152
								SHEET:	OF: XX
								DRWG NO	

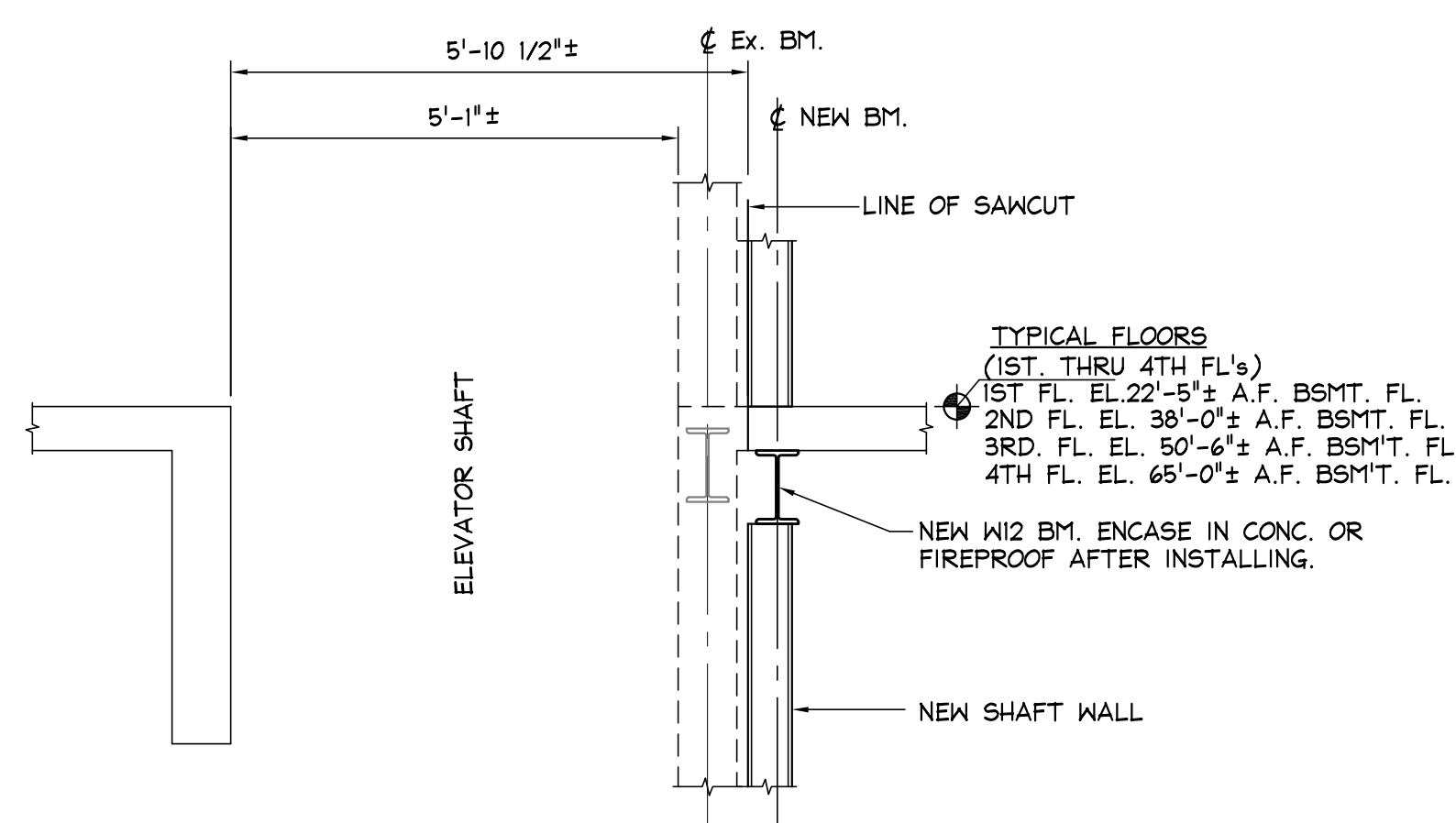
S.103



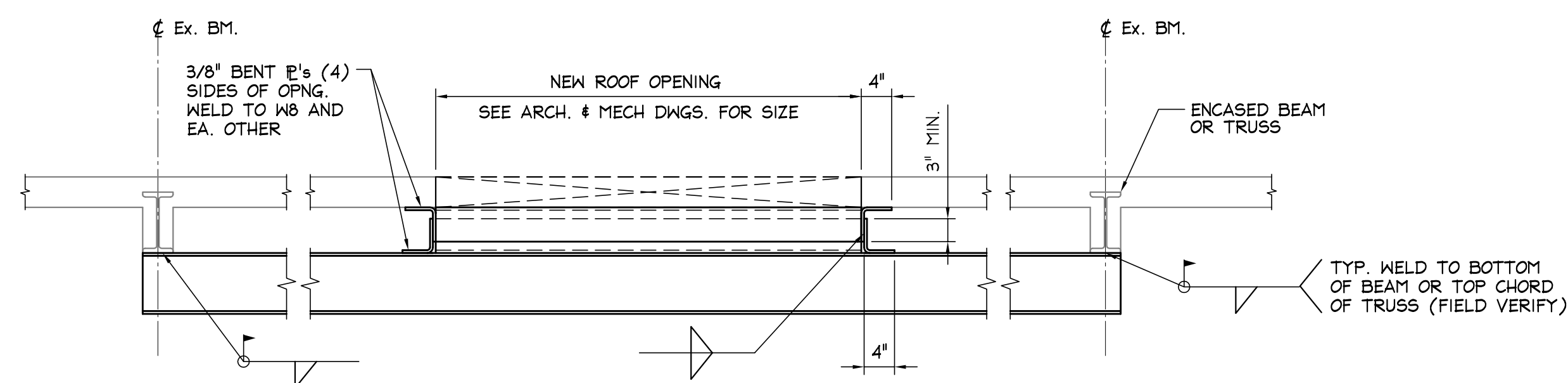
SECTION 1
SCALE: 3/4"=1'-0"
S-1



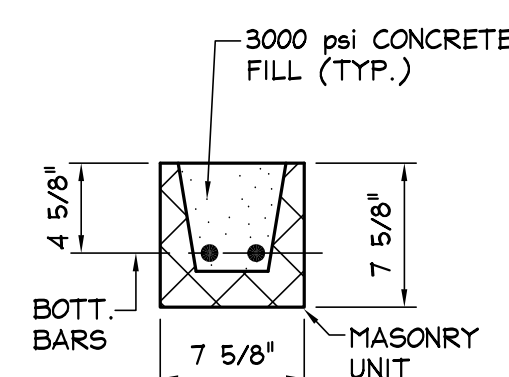
SECTION 4
SCALE: 1/2"=1'-0"
S-1



SECTION 2
SCALE: 3/4"=1'-0"
S-1

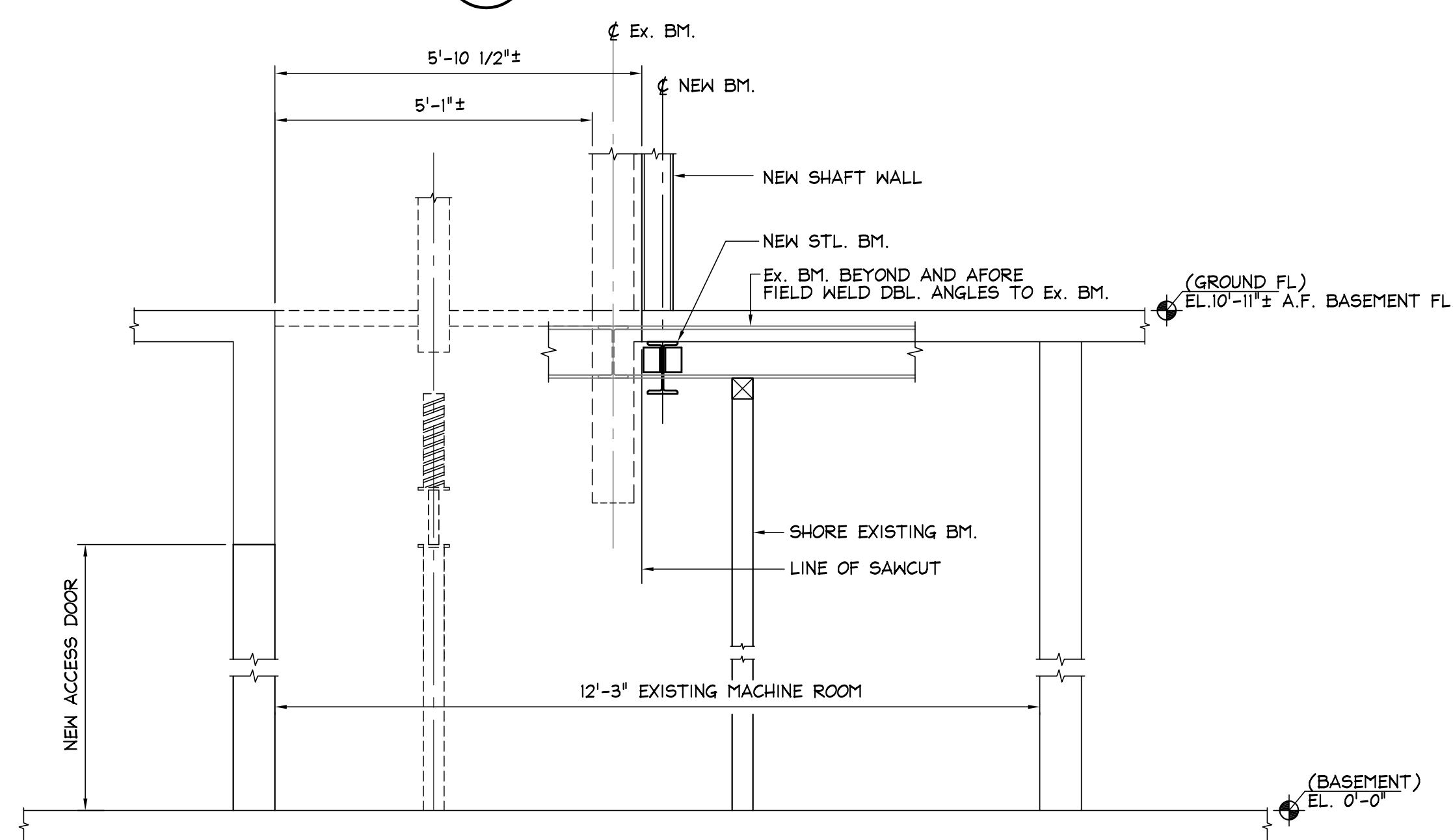


SECTION 5
SCALE: 1/2"=1'-0"
S-1



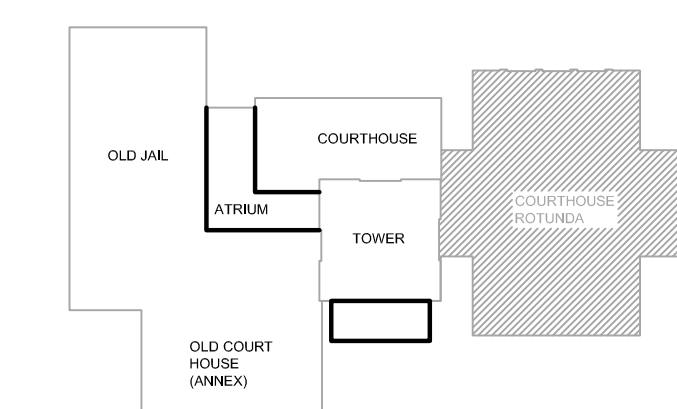
TYPICAL MASONRY LINTEL

- NOTES:
 1) FILL CMU VOIDS SOLID (2) COURSES BELOW LINTEL BEARING.
 2) ALL LINTELS SHALL HAVE 8" MINIMUM BEARING U.N.O.
 3) ALL CONCRETE LINTELS SHALL BE 8" DEEP, U.N.O.



SECTION 3
SCALE: 3/4"=1'-0"
S-1

KEYPLAN



ODONNELL & NACCARATO, INC.
 STRUCTURAL ENGINEERS
 160 ROUTE 22 WEST
 2ND FLOOR
 MOUNTAINSIDE, NJ 07092
 TELEPHONE: (908) 379-2911
 FAX: (201) 627-1051
 Project No. 3823.0010.00
 Paul Peter Panzolino, P.E.
 N.J. Cert. No. 42798
 Date:

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 NJ License No. AI 16160
 LAURENCE K. UHER, AIA, LEED, AP
 NJ License No. AI 14394

NETTA ARCHITECTS
 ARCHITECTURE - PLANNING - INTERIOR DESIGN
 1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
 TEL: 973-379-0008 FAX: 973-379-1061
 CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

**UC COURTHOUSE
 FIRE SUPPRESSION (ROTUNDA)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

SECTIONS

SUBMISSIONS				REVISIONS				DATE	09-25-17
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9-25-15	15% CD SUBMIT	JD	MM					DRWN BY	JPD
05-31-17	100% CD REVIEW	JD	MM					CHKD BY	BJ
08-07-17	ISSUED FOR BID	JD	MM					JOB NO	2141152
								SHEET:	OF: XX
								DRWG NO	

S.201

GENERAL HVAC NOTES:

- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE INTERNATIONAL MECHANICAL CODE (IMC), NEW JERSEY UNIFORM CONSTRUCTION CODE, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
- PROVIDE A COMPLETE OPERABLE SYSTEM INSTALLED IN A WORKMANLIKE MANNER. OUTLINE DESCRIPTION AND EQUIPMENT DOES NOT LIMIT CONTRACTOR'S LIABILITY FOR THE INSTALLATION OF A COMPLETE OPERABLE SYSTEM.
- CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
- CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
- CONTRACTOR SHALL NOT FASTEN ANY EQUIPMENT AND MATERIAL FROM ROOF DECKING. CONTRACTOR SHALL SUPPORT EQUIPMENT AND MATERIAL FROM BEAMS. IF NECESSARY, CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT STEEL ON METAL TO ATTACH TO BEAMS.
- FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
- THE WORK INDICATED ON THESE DRAWINGS IS DIAGRAMMATIC AND IS INTENDED TO SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND DESIGN INTENT. CONTRACTOR MAY MAKE FIELD CHANGES TO THE DESIGN DOCUMENTS ONLY WHEN REQUESTING AND RECEIVING APPROVAL FROM THE ENGINEER. CONTRACTOR FIELD CHANGES SHALL NOT RESULT IN ANY ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL WARRANT ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
- CONTRACTOR SHALL PROVIDE PROTECTION FOR THE OWNER AND CONSTRUCTION WORKERS IN AND AROUND THE CONSTRUCTION AREA. ADEQUATE BARRIERS SHALL BE PROVIDED TO EXPOSE CONTROL OF SAFE NEGATIVE EGRESS OF PREMISES. FIRE EXITS SHALL AT NO TIME BE BLOCKED.
- ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
- CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
- WHERE INFORMATION IN DIFFERENT PARTS OF THE CONTRACT DOCUMENTS ARE INTERPRETED BY THE CONTRACTOR TO BE DUPLICATED, THE CONTRACTOR SHALL OBTAIN A WRITTEN APPROVAL OF HIS INTERPRETATION FROM THE OWNER BEFORE DELETING THE SCOPE OR WORK HE INTERPRETS AS BEING A DUPLICATION. IN THE ABSENCE OF SUCH WRITTEN APPROVAL, THE CONTRACTOR SHALL NOT EXCLUDE ANY ITEM SHOWN IN DIFFERENT PARTS OF THE CONTRACT. FOR EITHER CONTRACTOR'S INTERPRETATION OF DUPLICATION OR CONTRADICTION AS INDICATED ABOVE, THE OWNER'S DETERMINATION SHALL BE FINAL AND SHALL NOT ENTITLE THE CONTRACTOR TO ANY ADDITIONAL COMPENSATION.
- DUCTS AND PIPES SHALL BE RUN AS HIGH AS POSSIBLE AND AS CLOSE AS POSSIBLE TO ALIGN FLOOR STRUCTURE TO MAINTAIN CEILING HEIGHTS SHOWN ON ARCHITECTURAL. EQUIPMENT SIZE IS BASED ON INFORMATION FROM THE SCHEDULE. CONTRACTOR SHALL VERIFY ACTUAL EQUIPMENT SIZES BASED ON APPROVED SHOP DRAWINGS BEFORE COORDINATING PENETRATIONS AND CONCRETE EQUIPMENT PADS.
- PROVIDE DUCT TRANSITION TO MATCH HVAC EQUIPMENT ACTUAL OPENINGS. DUCT TRANSITIONS SHALL BE FABRICATED WITH FLAT BOTTOMS UNLESS OTHERWISE NOTED.
- WHERE TRANSFER DUCTS ARE INDICATED ON THE DRAWINGS, GRILLES SHALL BE PROVIDED ON BOTH SIDES OF THE WALL.
- LOCATIONS OF ROOM THERMOSTATS/TEMPERATURE SENSOR ARE APPROXIMATE AND FINAL LOCATIONS SHALL BE COORDINATED WITH ENGINEER.
- ALL DUCTWORK, PIPING, CONDUITS, AND TUBING SHALL BE RUN CONCEALED IN FINISHED AREAS. COORDINATE LOCATIONS WITH GENERAL CONSTRUCTION. ALL RUNS SHALL BE APPROVED BY ENGINEER. ANY MODIFICATION REQUIRED BY ENGINEER DUE TO FIELD CONFLICTS SHALL BE DONE AT NO ADDITIONAL COST.
- PROVIDE VALVED AND CAPPED CONNECTIONS AT ALL LOW POINTS IN PIPING SYSTEMS REQUIRED FOR DRAINING SYSTEM.
- PROVIDE ALL AUTOMATIC OR MANUAL AIR VENTS AT ALL HIGH POINTS OF PIPING SYSTEM.
- CONTRACTOR SHALL PROVIDE ALL NECESSARY PIPING TO CONNECT ALL EQUIPMENT TO COMPLETE THE SYSTEM AS PER PLANS AND SPECIFICATIONS WITHOUT ANY ADDITIONAL COST TO THE OWNER.
- HVAC CONTRACTOR SHALL PROVIDE ALL CEILING DIFFUSERS, REGISTERS, AND GRILLES. FRAME TYPE TO MATCH CEILING CONSTRUCTION IN WHICH UNITS ARE TO BE INSTALLED.
- HVAC AND MECHANICAL SYSTEMS/SERVICES SHALL BE MAINTAINED FULLY OPERATIONAL IN AREAS/SPACES OF AREA OF WORK DURING CONSTRUCTION.
- DUCTWORK SHALL BE FABRICATED IN ACCORDANCE WITH SMACNA AND ASHRAE'S LATEST EDITION AS NECESSARY TO MEET THE PERFORMANCE REQUIREMENTS OF THE DESIGN. ALL DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS. WHERE INTERNAL LINING OCCURS, INCREASE DUCT SIZES ACCORDINGLY BY THE LINING THICKNESS. ALL DUCTS SHALL BE ASSEMBLED WITH A GASKETED FLANGED SYSTEM SUCH AS DUCT MATE.
- WHEN HVAC SYSTEMS ARE COMPLETELY INSTALLED AND OPERATIONAL, CONTRACTOR SHALL PROVIDE AIR AND WATER SIDE BALANCING IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. CONTRACTOR SHALL SUBMIT A REPORT TO THE ENGINEER FOR APPROVAL. ADJUSTMENTS AND MODIFICATIONS TO EQUIPMENT TO ACHIEVE DESIGN QUANTITIES SHALL BE MADE AT NO COST TO THE OWNER.
- FOR EXACT LOCATION AND MOUNTING HEIGHT OF CEILING DIFFUSERS REFER TO ARCHITECTURAL REFLECTED CEILING PLANS.

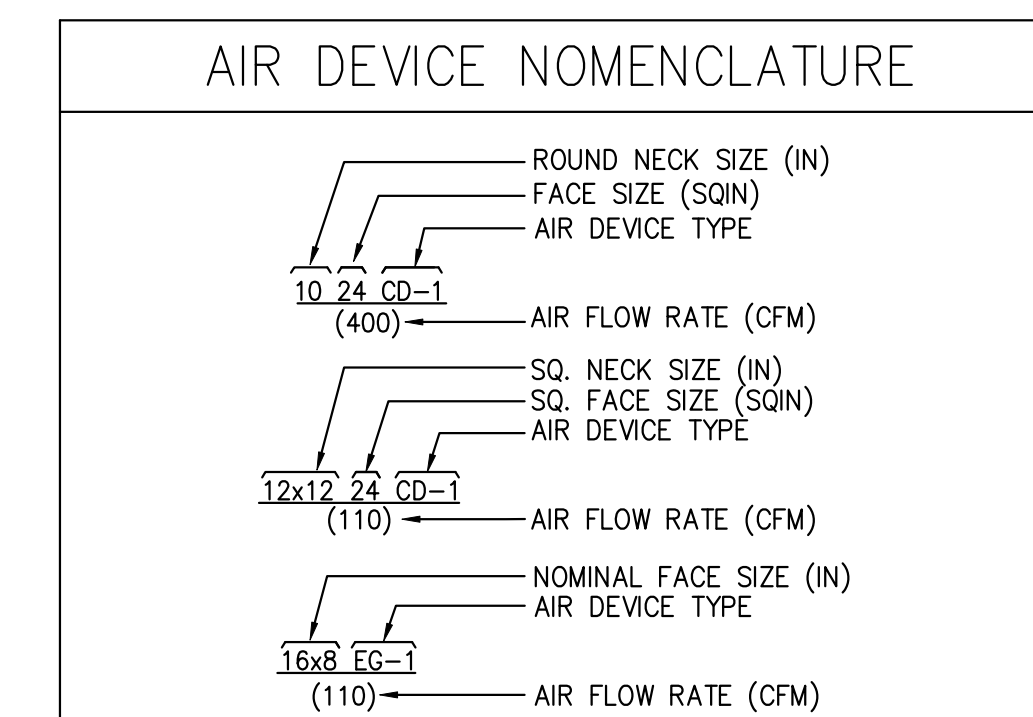
HVAC DEMOLITION GENERAL NOTES:

- CONTRACTOR SHALL REMOVE ALL EXISTING HVAC SYSTEMS, DUCTWORK, DIFFUSERS, PIPING, CONTROL SYSTEMS, AND SUPPORTS ON THE PROJECT AS INDICATED. ALL DEMOLISHED EQUIPMENT SHALL BE REMOVED OFFSITE AND DISPOSED OF IN A SAFE AND LAWFUL MANNER.
- CONTRACTOR SHALL VISIT THE SITE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AS WELL AS THE MEANS AND METHODS OF THE WORK. FAILURE TO DO SO WILL NOT QUALIFY FOR LATER CLAIMS DUE TO THE SCOPE OF WORK REQUIRED.
- PROTECT ALL EXISTING SPACES AND SURFACES WHILE PERFORMING THE CONTRACT SCOPE OF WORK. CONTRACTOR SHALL PATCH, PAINT, AND REPAIR ANY EXISTING OR NEW SURFACES DAMAGED DURING THE COURSE OF WORK TO THE EXISTING CONDITIONS OR BETTER.
- CONTRACTOR SHALL CAP EXISTING PIPES AND DUCTS NOT TO BE DEMOLISHED FLUSH WITH EXISTING SURFACES. SEAL OPENING AIR TIGHT.
- COORDINATE ALL DEMOLITION WORK WITH THE GENERAL CONTRACTOR OR OWNER'S REPRESENTATIVE BEFORE PROCEEDING WITH WORK.

MECHANICAL DUCT SYMBOLS		
SINGLE LINE DUCTWORK	DOUBLE LINE DUCTWORK	DESCRIPTION
		SUPPLY AIR
		SUPPLY AIR DUCT OR FRESH AIR DUCT
		RETURN AIR DUCT OR EXHAUST AIR DUCT
		SUPPLY DUCT UP
		RETURN DUCT UP
		RETURN DUCT UP
		RETURN DUCT UP
		LINEAR DIFFUSER
		CEILING DIFFUSER
		CEILING GRILLE
		CEILING DIFFUSERS MOUNTED ON BOTTOM OF DUCT
		SUPPLY TOP REGISTER OR GRILLE
		EXHAUST OR RETURN TOP REGISTER OR GRILLE
		EXHAUST CEILING REGISTER OR GRILLE
		EXHAUST FAN
		NEW DUCT - WIDTH x DEPTH
		FLEXIBLE CONNECTION
		INCLINED RISE, IN DIRECTION OF AIR FLOW
		INCLINED DROP, IN DIRECTION OF AIR FLOW
		FLEXIBLE DUCTWORK
		FLEXIBLE CONNECTION
		VOLUME DAMPER
		FIRE DAMPER
		MOTORIZED DAMPER
		VANED ELBOW, PROVIDE ALL ELBOWS WITH VANES EVEN IF SYMBOL MISSING
		VANED ELBOW (SHORT RADIUS)
		STANDARD RADIUS ELBOW
		SPLITTER DAMPER
		TAKE OFF COLLAR
		LOUVERED DOOR
		REDUCER
		DUCT SMOKE DETECTOR
		TEMPERATURE SENSOR (STRAP ON)
		TEMPERATURE SENSOR (WELL)
		FLOW SWITCH
		AQUASTAT
		SPACE TEMPERATURE SENSOR
		SPACE THERMOSTAT

PIPING SYMBOLS	
PIPING/VALVES	DESCRIPTION
	TOP CONNECTION, 45° OR 90°
	BOTTOM CONNECTION, 45° OR 90°
	SIDE CONNECTION
	TOP CONNECTION CAPPED
	PIPE UP RISE
	PIPE UP @ END
	PIPE DOWN @ END
	PIPE CAP
	NAME INDICATES PIPE'S SERVICE
	DIRECTION OF FLOW
	STRAINER
	STRAINER WITH BLOW DOWN
	ISOLATION VALVE
	BALL VALVE
	BUTTERFLY VALVE
	DRAIN VALVE
	BACKFLOW PREVENTER
	STRAINER WITH SHUT OFF VALVE & HOSE COUPLING
	GATE VALVE
	GLOBE VALVE
	CHECK VALVE
	CONTROL VALVE
	ANGLE VALVE
	AUTOMATIC AIR VENT PIPED TO NEAREST DRAIN
	MOTOR OPERATED VALVE
	SOLENOID VALVE
	PRESSURE REDUCING VALVE
	CIRCUIT SETTER
	BALANCING VALVE
	TRIPLE DUTY VALVE
	VALVE WITH PNEUMATIC OPERATOR
	THERMOMETER
	PRESSURE GAUGE
	GAUGE WITH PETCOCK
	RELIEF VALVE WITH DISCHARGE TO NEAREST FLR DR
	SCREWED UNION
	FLANGED UNION
	FLEXIBLE CONNECTOR
	SENSOR OR SWITCH FOR MONITOR OR CONTROL
	FINNED-TUBE RADIATION
	FINNED-TUBE RADIATION- TYPE A
	EFFECTIVE HEATING ELEMENT LENGTH LINEAR FEET
	BREAK
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	HOSE BIBB
	FLOW METER
	VACUUM BREAKER
	AUTO AIR VENT
	BACK FLOW PREVENTER
	SIGHT GLASS
	STEAM TRAP
	STEAM, WATER OR REFRIGERANT COIL
	PIPE ANCHOR

GENERAL SYMBOLS	
	DESCRIPTION
	CENTER LINE
	EXISTING CONSTRUCTION & EQUIPMENT
	EXISTING TO BE REMOVED
	NEW WORK
	CONTINUED
	END CAP
	CONNECT TO EXISTING
	DISCONNECT FROM EXISTING
	PIPE PITCH
	DIRECTION OF FLOW
	PIPE BREAK DOUBLE LINE
	WORK NOTE
	REVISION CLOUD (AREA OF CHANGE)
	REVISION NUMBER
	SECTION CUT
	SECTION LINE
	DRAWING/DETAIL TITLE
	ROOM NAME/NUMBER
	BREAK LINE



GENERAL ABBREVIATIONS	
SYMBOLS	DESCRIPTION
AC	AIR CONDITIONING
AD	ACCESS DOOR
AF	AIR FILTER
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AL	ACOUSTICAL LINING
BD	BLOWN DOWN
BI	BLACK IRON
BS	BIRD SCREEN
BSA	BOARD OF STANDARDS AND APPEAL
BG	BOTTOM GRILLE
BHP	BRAKE HORSE POWER
BWF	BOILER WATER FEED
BR	BOTTOM REGISTER
CA	COMPRESSED AIR
CC	COOLING COIL
CD	CEILING DIFFUSER
CF	CHEMICAL FEED
CG	CEILING GRILLE
CHWP/CWS	STANDBY
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CR	CEILING REGISTER
CO	CLEAN OUT
COND	CONDENSATE DRAIN LINE (GRAVITY)
CUH	CABINET UNIT HEATER
CV	CONVECTOR
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
D	DRAIN
DD	DRUM DIFFUSER
DX	DIRECT EXPANSION
DB	DRY BULB TEMPERATURE, °F
EA	EXHAUST AIR
EDH	ELECTRIC COIL DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
ESP	EXTERNAL STATIC PRESSURE
EXIST	EXISTING
FL	FLOOR
FACP	FIRE ALARM CONTROL PANEL
FC	FLEXIBLE CONNECTION
FD	FIRE DAMPER AND ACCESS DOOR
FAI OR OAI	FRESH AIR INTAKE OR OUTSIDE AIR INTAKE
FA	FREE AREA SQUARE FEET
FLA	FULL LOAD AMPS
FBM	FEET PER MINUTE
FRP	FIBERGLASS REINFORCED PLASTIC
FTR	FIN TUBE RADIATION
GPM	GALLONS PER MINUTE
HC	HEATING COIL
HQA	HAND/OFF/AUTO SWITCH
HP	HORSE POWER
HPS	HIGH PRESSURE STEAM (81+PSI)
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HZ	HERTZ
KX	KITCHEN EXHAUST FAN
LD	LINEAR DIFFUSER
LID	LOUVER IN DOOR
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM (0-20 PSI)
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MFS	MAXIMUM FUSE SIZE
MIN	MINIMUM
MER	MECHANICAL EQUIPMENT ROOM
MPS	MEDIUM PRESSURE STEAM (21-80 PSI)
MUA	MAKE UP AIR
NOM	NOMINAL
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
NK	NECK
OA	OUTSIDE AIR
OAD	OUTSIDE AIR DAMPER
OV	OUTLET VELOCITY
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SP	STATIC PRESSURE
SD	SPLITTER DAMPER
ST/ST	STAINLESS STEEL
TG	TOP GRILLE
TR	TOP REGISTER
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
TX	TOILET EXHAUST
UH	UNIT HEATER
VD	VOLUME DAMPER
V	VENT
WB	WET BULB TEMPERATURE, °F
WC	WATER COLUMN GAUGE (INCH)
WMS	WIRE MESH SCREEN
W/	WITH

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MARK E. BESS, AIA, NCARB
NJ License No. AI 16160
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**MECHANICAL
GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY R/N
									JOB NO 2141152
									SHEET: _ OF:
									DWG. NO M.101

AIR HANDLING UNIT SCHEDULE

EQUIPMENT NO.	LOCATION	MANUFACTURER & MODEL	SUPPLY FAN					HOT WATER HEATING COIL										CHILLED WATER COIL										WEIGHT (LBS.)	NOTES			
			SUPPLY AIRFLOW (CFM)	OUTDOOR AIRFLOW (CFM)	E.S.P. (IN)	MOTOR RPM	FAN RPM	MOTOR HP	MOTOR VOLT/PH/Hz	TOTAL CAP. (MBH)	COIL VELOCITY (FPM)	EDB (°F)	LDB (°F)	AIR PD (IN. WC)	FLUID TYPE	EWT (°F)	LWT (°F)	GPM	WATER PD (FT)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	COIL VELOCITY (FPM)	EDB/EWB (°F)	LDB/LWB (°F)	AIR PD (IN. WC)	FLUID TYPE	EWT (°F)			LWT (°F)	GPM	FLUID PD (FT)
AHU-1	BASEMENT	DAIKIN CAH014GDAC	6500	1000	2	1750	1751	7.5	460/3/60	136	489	40	59	0.2	35% GLYCOL	180	151	10	5	262	183	465	80/67	54.1/53.9	0.9	40% GLYCOL	45	55	58.5	6	2523	1
AHU-2	GROUND FL	DAIKIN CAH008GDAC	3300	1400	1.5	1750	2194	3.0	460/3/60	146	471	15	56	0.2	35% GLYCOL	180	157	14	3	157	100	440	82/69	54.1/53.9	0.8	40% GLYCOL	45	55	34.9	9	2100	1
AHU-3	THIRD FL	ENVIRO-TEC VR-25	2600	525	1	1750	918	1.5	460/3/60	82	500	55	85	0.1	35% GLYCOL	180	160	8.4	2	88	63	457	80/67	58.3/56.3	0.3	40% GLYCOL	45	55	17.4	7	1352	2
AHU-4	FOURTH FL	ENVIRO-TEC VR-30	3200	675	0.8	1750	979	3.0	460/3/60	114	457	55	88	0.1	35% GLYCOL	180	160	11.6	2	120	83	469	80/67	56.6/54.9	0.4	40% GLYCOL	45	55	23.8	5	1497	2
AHU-5	FOURTH FL	DAIKIN CAH019GDAM	8000	2000	2.5	1750	1219	15.0	460/3/60	219	550	30	55	0.2	35% GLYCOL	180	158	22	5	342	234	518	80/67	53.2/53.0	1.2	40% GLYCOL	45	55	76	8	3350	1
AHU-6	FOURTH FL	DAIKIN CAH019GDAM	8000	2000	2.5	1750	1219	15.0	460/3/60	219	550	30	55	0.2	35% GLYCOL	180	158	22	5	342	234	518	80/67	53.2/53.0	1.2	40% GLYCOL	45	55	76	8	3350	1
AHU-7	FOURTH FL	DAIKIN CAH019GDAM	8000	2000	2.5	1750	1219	15.0	460/3/60	219	550	30	55	0.2	35% GLYCOL	180	158	22	5	342	234	518	80/67	53.2/53.0	1.2	40% GLYCOL	45	55	76	8	3350	1
AHU-8	FOURTH FL	DAIKIN CAH019GDAM	8000	2000	2.5	1750	1219	15.0	460/3/60	219	550	30	55	0.2	35% GLYCOL	180	158	22	5	342	234	518	80/67	53.2/53.0	1.2	40% GLYCOL	45	55	76	8	3350	1

- NOTES:
 1. PROVIDE NON-FUSED DISCONNECT, VARIABLE FREQUENCY DRIVES (VFD) FOR MOTORS, 0-100% ECONOMIZER, MIXING BOX WITH DAMPERS, 2" THROWAWAY FILTERS, DUCT SMOKE DETECTOR, HOT WATER 2-WAY CONTROL VALVE, CHILLED WATER 2-WAY CONTROL VALVE, BMS CONTROLLER (BACNET COMPATIBLE)
 2. PROVIDE NON-FUSED DISCONNECT, MIXING BOX WITH DAMPERS, 2" THROWAWAY FILTERS, DUCT SMOKE DETECTOR, HOT WATER 2-WAY CONTROL VALVE, CHILLED WATER 2-WAY CONTROL VALVE, BMS CONTROLLER (BACNET COMPATIBLE)

FAN COIL UNIT SCHEDULE

EQUIPMENT NO.	LOCATION	MANUFACTURER & MODEL	SUPPLY FAN					HOT WATER HEATING COIL										CHILLED WATER COIL										WEIGHT (LBS.)	NOTES
			SUPPLY AIRFLOW (CFM)	OUTDOOR AIRFLOW (CFM)	E.S.P. (IN)	MOTOR RPM	MOTOR HP	MOTOR VOLT/PH/Hz	TOTAL CAP. (MBH)	EDB (°F)	LDB (°F)	AIR PD (IN. WC)	FLUID TYPE	EWT (°F)	LWT (°F)	GPM	WATER PD (FT)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	EDB/EWB (°F)	LDB/LWB (°F)	AIR PD (IN. WC)	FLUID TYPE	EWT (°F)	LWT (°F)	GPM	FLUID PD (FT)		
FCU-1,2,3,4,5,6,7,8,9	VARIOUS	DAIKEN FCHH208	550	150	0.25	1350	1/4	277/1/60	25.0	55	96.7	0.2	35% GLYCOL	180	160	2.7	2	16.2	12.8	80/67	58.6	57.7	40% GLYCOL	45	54	3.7	9.3	115	1

- NOTES:
 1. PROVIDE NON-FUSED DISCONNECT, ECM MOTOR, 2" THROWAWAY FILTERS, HOT WATER 2-WAY CONTROL VALVE, CHILLED WATER 2-WAY CONTROL VALVE, BMS CONTROLLER (BACNET COMPATIBLE)

RETURN FAN SCHEDULE

UNIT NO.	MANUFACTURER	MODEL	LOCATION	UNIT SERVED	TYPE	CFM	SP (IN. WG)	FAN RPM	ELECTRICAL				WEIGHT (LBS)	NOTES
									VOLTS	PHASE	HERTZ	MOTOR HP		
RF-1	GREENHECK	QEI-20	BASEMENT	AHU-1	INLINE	5800	1.5	1317	460	3	60	3	310	1
RF-2	GREENHECK	QEI-20	4TH FLOOR	AHU-5	INLINE	7200	1.5	1520	460	3	60	5	310	1
RF-3	GREENHECK	QEI-20	4TH FLOOR	AHU-6	INLINE	7200	1.5	1520	460	3	60	5	310	1
RF-4	GREENHECK	QEI-20	4TH FLOOR	AHU-7	INLINE	7200	1.5	1520	460	3	60	5	310	1
RF-5	GREENHECK	QEI-20	4TH FLOOR	AHU-8	INLINE	7200	1.5	1520	460	3	60	5	310	1

- NOTES:
 1. PROVIDE NON-FUSED DISCONNECT, VARIABLE FREQUENCY DRIVES (VFD) FOR MOTORS, THREADED HANGING RODS WITH RAILS AND ISOLATORS, INLET AND OUTLET GUARDS.

EXHAUST FAN SCHEDULE

UNIT NO.	MANUFACTURER	MODEL	LOCATION	AREA SERVED	TYPE	CFM	SP (IN. WG)	FAN RPM	ELECTRICAL				WEIGHT (LBS)	NOTES
									VOLTS	PHASE	HERTZ	MOTOR HP		
EF-1	GREENHECK	SP-A70	GROUND	TOILET	INLINE	50	0.125	718	115	60	1	20 WATTS	15	1
EF-2	GREENHECK	CSP-A710	GROUND	WOMEN'S LOCKER	INLINE	500	0.25	922	115	60	1	325 WATTS	40	1
EF-3	GREENHECK	CSP-A1410	GROUND	MEN'S LOCKER	INLINE	950	0.25	995	115	60	1	822 WATTS	60	1
EF-4	GREENHECK	SP-A70	FIRST	TOILET	INLINE	50	0.125	718	115	60	1	20 WATTS	15	1
EF-5	GREENHECK	SQ-97-VG	4TH FL	TOILET	INLINE	150	0.75	1624	115	60	1	1/4	49	1
EF-6	GREENHECK	SQ-97-VG	4TH FL	TOILET	INLINE	150	0.75	1624	115	60	1	1/4	49	1
EF-7	GREENHECK	BCF-110-4	4TH FL	TOILET	BELT	900	0.75	896	115	60	1	1/4	253	2
EF-8	GREENHECK	BCF-108-4	4TH FL	TOILET	BELT	750	0.75	1059	115	60	1	1/4	112	2

- NOTES:
 1. PROVIDE WITH UNIT MOUNTED DISCONNECT SWITCH, SPEED CONTROLLER, SPRING VIBRATION HANGERS, GALVANIZED WHEEL CONSTRUCTION.
 2. PROVIDE WITH UNIT MOUNTED DISCONNECT SWITCH, MOTOR STARTERS, BACKDRAFT DAMPER, SPRING VIBRATION HANGERS.

SMOKE EXHAUST FAN SCHEDULE

UNIT NO.	MANUFACTURER	MODEL	LOCATION	AREA SERVED	TYPE	CFM	SP (IN. WG)	FAN RPM	ELECTRICAL				WEIGHT (LBS)	NOTES
									VOLTS	PHASE	HERTZ	MOTOR HP		
SEF-1	GREENHECK	S-CUBE-240	ROOF	ROTUNDA	BELT	6000	0.5	790	460	3	60	1.5	175	1
SEF-2	GREENHECK	S-CUBE-240	ROOF	ROTUNDA	BELT	6000	0.5	790	460	3	60	1.5	175	1
SEF-3	GREENHECK	S-CUBE-240	ROOF	ROTUNDA	BELT	6000	0.5	790	460	3	60	1.5	175	1
SEF-4	GREENHECK	S-CUBE-240	ROOF	ROTUNDA	BELT	6000	0.5	790	460	3	60	1.5	175	1
SEF-5	GREENHECK	S-CUBE-240	ROOF	COMMON CORRIDORS	BELT	4000	0.5	628	460	3	60	0.75	175	1
SEF-6	GREENHECK	S-CUBE-240	ROOF	COMMON CORRIDORS	BELT	4000	0.5	628	460	3	60	0.75	175	1

- NOTES:
 1. PROVIDE WITH UNIT MOUNTED DISCONNECT SWITCH, MOTOR STARTERS, BACKDRAFT DAMPER, ROOF CURB, UL LISTED FOR SMOKE CONTROL SYSTEMS.

PUMP SCHEDULE

EQUIPMENT NUMBER	SERVICE	LOCATION	GPM	SOLUTION	TDH (FT)	SIZE	MOTOR			MANUFACTURER	MODEL	NOTES
							RPM	HP	VOLT/PH/Hz			
HWP-1	HOT WATER	BASEMENT	275	35% P.G.	60	3x3x8	1750	7.5	460-3-60	ARMSTRONG	SERIES 4300	1
HWP-2	STANDBY	BASEMENT	275	35% P.G.	60	3x3x8	1750	7.5	460-3-60	ARMSTRONG	SERIES 4300	1
CHWP-1	CHILLED WATER	ANNEX	430	40% P.G.	80	4x4x11.5	1750	15	460-3-60	ARMSTRONG	SERIES 4360	1
CHWP-2	STANDBY	ANNEX	430	40% P.G.	80	4x4x11.5	1750	15	460-3-60	ARMSTRONG	SERIES 4360	1

- NOTES:
 1. PROVIDE CONTROL PANEL WITH VFD DRIVES FOR BOTH PUMPS, TRIPLE DUTY VALVE, INLET STRAINER, SHUTOFF VALVES, VIBRATION ISOLATORS, AND NON OVERLOADING MOTORS

AIR DEVICE SCHEDULE

DESIGNATION	TYPE	MANUFACTURER	MODEL	FINISH	MOUNTING	MATERIAL	NOTES
CD-1	CEILING DIFFUSEER	TITUS	TMS	WHITE	LAY-IN	STEEL	1
RG-1	RETURN GRILLE	TITUS	355RL	WHITE	LAY-IN	STEEL	2
EG-1	EXHAUST GRILLE	TITUS	355FL	WHITE	LAY-IN	ALUMINUM	2
SR-1	SUPPLY REGISTER	TITUS	272FL	WHITE	SIDEWALL	ALUMINUM	3
L-1	INTAKE LOUVER	GREENHECK	ESD-435	MILL	IN WALL	ALUMINUM	4
L-2	EXHAUST LOUVER	GREENHECK	ESD-435	MILL	IN WALL	ALUMINUM	4

- NOTES:
 1. R-6 INSULATION BLANKET.
 2. 3/8" DEFLECTION, 1/2" BLADE SPACING.
 3. PROVIDE OPPOSED BLADE DAMPER, DOUBLE DEFLECTION.
 4. LOUVER SHALL BE SIZED FOR THE TOP HALF OF WINDOW, FULL WIDTH. PROVIDE WITH BIRDSCREEN.

AIR SEPARATOR SCHEDULE

EQUIPMENT NUMBER	SERVICE	FLOW (GPM)	INLET AND OUTLET (IN)	CONNECTION	HEIGHT (IN)	DIAMETER (IN)	SHIP WT. (LBS.)	MOUNTING	MANUFACTURER	MODEL	NOTES
AS-1	HOT WATER	300	4	THREADED	31	13	165	VERTICAL	BELL AND GOSSETT	R-4	-

DUCTLESS SPLIT HEAT PUMP SYSTEM SCHEDULE

EQUIPMENT NO.	SERVICE	COOLING CAPACITY (BTU/HR)	HEATING CAPACITY (BTU/HR)	CFM	SEER (EFFICIENCY)	REFRIGERANT LIQUID LINE (IN.)	REFRIGERANT GAS LINE (IN.)	ELECTRICAL				WEIGHT (lbs)	MANUFACTURER & MODEL	NOTES
								MCA	FLA	MOCP	V/PHZ			
HP-1	ELEVATOR MACHINE ROOM	8,000-18,000	8,000-20,000	425	-	1/4	1/2	1	0.33	-	208/1/60	29	MITSUBISHI PKA-A12H46	1,2
ACCU-1	HP-1	-	-	-	15.3	1/4	1/2	13	0.35	20	208/1/60	91	MITSUBISHI PUY-A12NH46	3

- NOTES:
 1. PROVIDE WITH WIRED CONDENSER AND DISCONNECT SWITCH.
 2. PROVIDE SAUERMAN CONDENSATE PUMP MODEL S13100 WIRED TO HP-1 UNIT PER MITSUBISHI RECOMMENDATIONS AND INSTALLATION DRAWINGS.
 3. PROVIDE EQUIPMENT RAILS.

GRAVITY INTAKE VENT SCHEDULE

UNIT NO.	MANUFACTURER	MODEL	LOCATION	UNIT SERVED	CFM	SP (IN. WG)	FREE AREA (SF)	FPM	NOTES
GIV-1	GREENHECK	WRH-3672	ROOF	AHU-5, 6	16000	0.1	18	900	1
GIV-2	GREENHECK	WRH-3672	ROOF	AHU-7, 8	16000	0.1	18	900	1

- NOTES:
 1. PROVIDE WITH 12" HIGH ROOF CURB, BIRDSCREEN

GRAVITY RELIEF VENT SCHEDULE

UNIT NO.	MANUFACTURER	MODEL	LOCATION	UNIT SERVED	CFM	SP (IN. WG)	FREE AREA (SF)	FPM	NOTES
GRV-1	GREENHECK	WRH-3636	ROOF	AHU-5	8000	0.1	9	900	1
GRV-2	GREENHECK	WRH-3636	ROOF	AHU-6	8000	0.1	9	900	1
GRV-3	GREENHECK	WRH-3636	ROOF	AHU-7	8000	0.1	9	900	1
GRV-4	GREENHECK	WRH-3636	ROOF	AHU-8	8000	0.1	9	900	1

- NOTES:
 1. PROVIDE WITH 12" HIGH ROOF CURB, BIRDSCREEN

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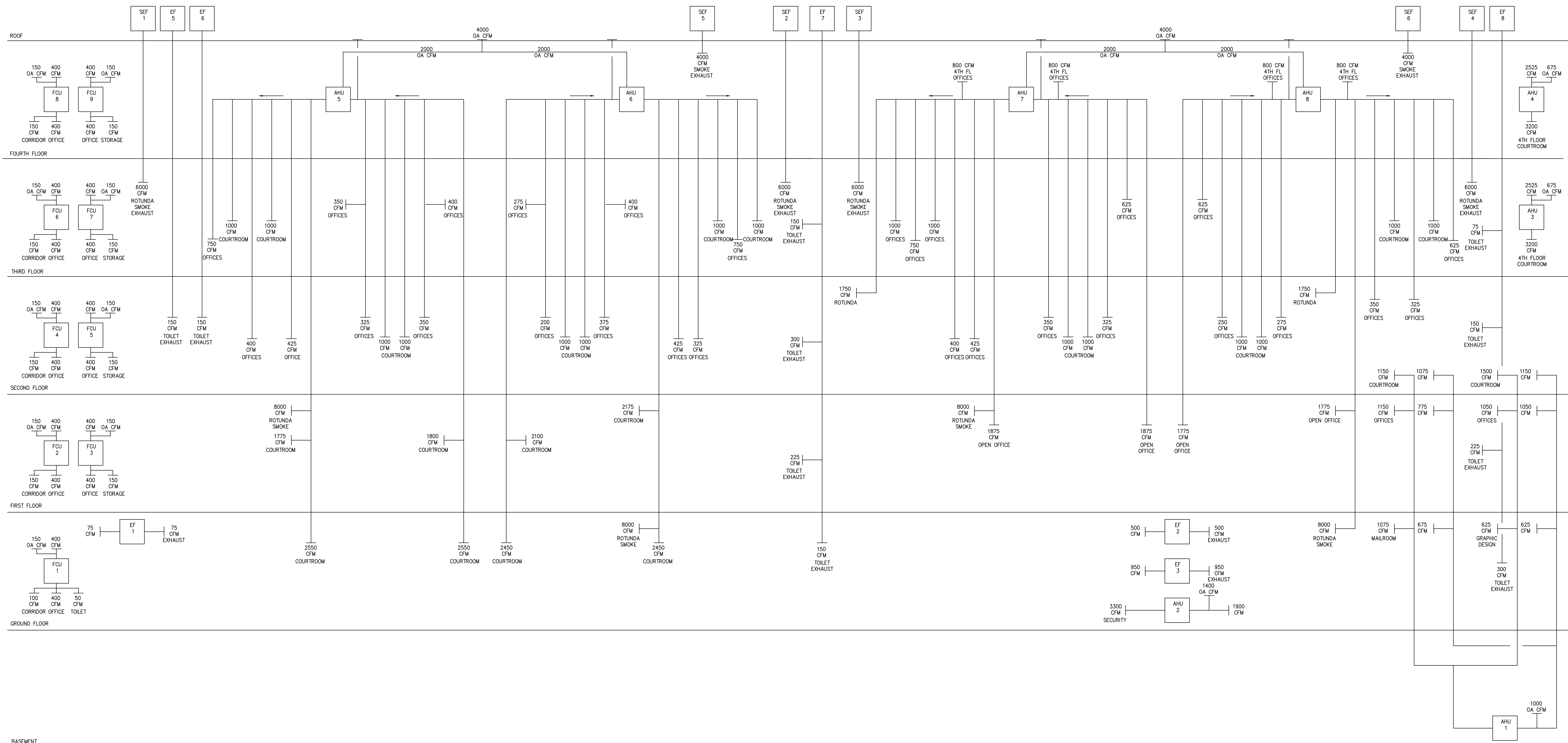
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ASSOCIATED TECHNOLOGY INC.
 MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
 100 CAMP

VENTILATION INDEX SCHEDULE								
ROOM NAME	FLOOR	TOTAL SQUARE FEET	NO. OF OCCUPANTS	REQUIRED CFM PER SQUARE FOOT	REQUIRED CFM PER PERSON	TOTAL AMOUNT OF OUTDOOR AIR REQUIRED (CFM)	AMOUNT OF OUTSIDE AIR PROVIDED (CFM)	REFERENCE STANDARD
MAIL ROOM	GROUND	580	4	0.06	5	55	90	ASHRAE 62.1
GRAPHIC DESIGN	GROUND	360	2	0.06	5	32	83	ASHRAE 62.1
OFFICE	GROUND	260	1	0.06	5	21	53	ASHRAE 62.1
OFFICE	GROUND	240	1	0.06	5	19	60	ASHRAE 62.1
COURTROOM	GROUND	1890	40	0.06	5	313	880	ASHRAE 62.1
JUDGE	GROUND	290	1	0.06	5	22	90	ASHRAE 62.1
OFFICE	GROUND	200	1	0.06	5	17	80	ASHRAE 62.1
OFFICE	GROUND	270	3	0.06	5	31	100	ASHRAE 62.1
SECURITY OFFICE	GROUND	960	5	0.06	5	83	548	ASHRAE 62.1
WOMEN'S BREAK	GROUND	230	3	0.18	7.5	84	74	ASHRAE 62.1
MENS BREAK	GROUND	455	5	0.18	7.5	119	231	ASHRAE 62.1
OFFICE	FIRST	465	3	0.06	5	43	75	ASHRAE 62.1
OFFICE	FIRST	125	1	0.06	5	13	42	ASHRAE 62.1
OFFICE	FIRST	150	1	0.06	5	14	30	ASHRAE 62.1
OFFICE	FIRST	190	1	0.06	5	16	35	ASHRAE 62.1
OFFICE	FIRST	330	2	0.06	5	30	68	ASHRAE 62.1
CONFERENCE	FIRST	290	12	0.06	5	77	80	ASHRAE 62.1
CONFERENCE	FIRST	180	8	0.06	5	51	70	ASHRAE 62.1
JURY	FIRST	265	12	0.06	5	76	80	ASHRAE 62.1
COURTROOM	FIRST	1300	80	0.06	5	478	400	ASHRAE 62.1
JUDGE	FIRST	190	1	0.06	5	16	40	ASHRAE 62.1
OFFICE	FIRST	250	1	0.06	5	20	80	ASHRAE 62.1
STORAGE	FIRST	322	0	0.06	5	19	108	ASHRAE 62.1
STORAGE	FIRST	255	0	0.06	5	15	108	ASHRAE 62.1
OPEN OFFICE	FIRST	3000	20	0.06	5	280	735	ASHRAE 62.1
OFFICE	SECOND	103	1	0.06	5	11	34	ASHRAE 62.1
OFFICE	SECOND	55	1	0.06	5	8	15	ASHRAE 62.1
OFFICE	SECOND	95	1	0.06	5	11	34	ASHRAE 62.1
COURTROOM	SECOND	690	25	0.06	5	166	180	ASHRAE 62.1
JUDGE	SECOND	145	1	0.06	5	14	42	ASHRAE 62.1
OFFICE	SECOND	112	1	0.06	5	12	30	ASHRAE 62.1
OFFICE	SECOND	190	1	0.06	5	16	65	ASHRAE 62.1
JUDGE	SECOND	180	1	0.06	5	16	70	ASHRAE 62.1
COURTROOM	SECOND	1760	100	0.06	5	606	800	ASHRAE 62.1
OFFICE	SECOND	192	1	0.06	5	17	75	ASHRAE 62.1
OFFICE	SECOND	192	1	0.06	5	17	45	ASHRAE 62.1
OFFICE	SECOND	300	2	0.06	5	28	108	ASHRAE 62.1
OFFICE	SECOND	310	2	0.06	5	29	108	ASHRAE 62.1
OFFICE	SECOND	189	1	0.06	5	16	65	ASHRAE 62.1
JUDGE	SECOND	185	1	0.06	5	16	70	ASHRAE 62.1
COURTROOM	SECOND	986	50	0.06	5	309	400	ASHRAE 62.1
COURTROOM	SECOND	842	50	0.06	5	301	400	ASHRAE 62.1
JUDGE	SECOND	193	1	0.06	5	17	55	ASHRAE 62.1
OFFICE	SECOND	198	1	0.06	5	17	60	ASHRAE 62.1
COURTROOM	THIRD	978	50	0.06	5	309	330	ASHRAE 62.1
JUDGE	THIRD	214	1	0.06	5	18	60	ASHRAE 62.1
OFFICE	THIRD	112	1	0.06	5	12	45	ASHRAE 62.1
OFFICE	THIRD	153	1	0.06	5	14	60	ASHRAE 62.1
OFFICE	THIRD	292	2	0.06	5	28	70	ASHRAE 62.1
OFFICE	THIRD	192	1	0.06	5	17	60	ASHRAE 62.1
STORAGE	THIRD	96	0	0.06	5	6	20	ASHRAE 62.1
OFFICE	THIRD	196	1	0.06	5	17	70	ASHRAE 62.1
OFFICE	THIRD	300	2	0.06	5	28	70	ASHRAE 62.1
OFFICE	THIRD	317	2	0.06	5	29	70	ASHRAE 62.1
OFFICE	THIRD	189	1	0.06	5	16	108	ASHRAE 62.1
OFFICE	THIRD	185	1	0.06	5	16	108	ASHRAE 62.1
OFFICE	THIRD	200	1	0.06	5	17	60	ASHRAE 62.1
OFFICE	THIRD	293	2	0.06	5	28	80	ASHRAE 62.1
COURTROOM	FOURTH	1075	50	0.06	5	315	350	ASHRAE 62.1
JURY	FOURTH	220	12	0.06	5	73	80	ASHRAE 62.1
OFFICE	FOURTH	245	2	0.06	5	25	90	ASHRAE 62.1
OFFICE	FOURTH	85	1	0.06	5	10	25	ASHRAE 62.1
OPEN OFFICE	FOURTH	1200	9	0.06	5	117	170	ASHRAE 62.1
OPEN AREA	FOURTH	400	5	0.06	5	49	105	ASHRAE 62.1
STORAGE	FOURTH	173	0	0.06	5	10	41	ASHRAE 62.1
OFFICE	FOURTH	344	2	0.06	5	31	108	ASHRAE 62.1
OFFICE	FOURTH	335	2	0.06	5	30	108	ASHRAE 62.1

VAV TERMINAL BOX SCHEDULE																		
UNIT NO.	MANUFACTURER	MODEL	PRIMARY INLET SIZE (IN.)	MIN COOLING (CFM)	MAX COOLING (CFM)	STATIC PRESSURE			HOT WATER HEAT COIL							ROWS	NOTES	
						MAX ΔP	CFM	MBH	EAT	LAT	APD (in)	GPM	EWT	LWT	WPD (FT)			
VAV-1-1	ENVIRO-TEC	SDR-8	8	220	625	0.70	220	8.5	55.0	90.8	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-1-2	ENVIRO-TEC	SDR-8	8	140	400	0.70	140	8.5	55.0	111.2	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-1-3	ENVIRO-TEC	SDR-8	8	240	675	0.70	240	8.5	55.0	87.8	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-1-4	ENVIRO-TEC	SDR-8	8	175	500	0.70	175	8.5	55.0	100.0	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-1-5	ENVIRO-TEC	SDR-6	6	125	350	0.70	125	4.3	55.0	86.5	0.7	0.5	180.0	160.0	5.0	1	1	
VAV-1-6	ENVIRO-TEC	SDR-5	5	70	200	0.70	70	4.3	55.0	111.2	0.7	0.5	180.0	160.0	5.0	1	1	
VAV-1-7	ENVIRO-TEC	SDR-6	6	135	375	0.70	135	4.3	55.0	84.1	0.7	0.5	180.0	160.0	5.0	1	1	
VAV-1-8	ENVIRO-TEC	SDR-6	6	120	325	0.70	120	4.3	55.0	87.8	0.7	0.5	180.0	160.0	5.0	1	1	
VAV-1-9	ENVIRO-TEC	SDR-8	8	160	450	0.70	160	8.5	55.0	104.2	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-1-10	ENVIRO-TEC	SDR-8	8	210	600	0.70	210	8.5	55.0	92.5	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-1-11	ENVIRO-TEC	SDR-6	6	105	300	0.70	105	4.3	55.0	92.5	0.7	0.5	180.0	160.0	5.0	1	1	
VAV-1-12	ENVIRO-TEC	SDR-8	8	210	600	0.70	210	8.5	55.0	92.5	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-1-13	ENVIRO-TEC	SDR-8	8	210	600	0.70	210	8.5	55.0	92.5	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-1-14	ENVIRO-TEC	SDR-8	8	200	550	0.70	200	8.5	55.0	94.4	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-2-1	ENVIRO-TEC	SDR-8	8	500	500	0.70	500	8.5	55.0	70.7	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-2-2	ENVIRO-TEC	SDR-5	5	90	250	0.70	90	4.3	55.0	98.7	0.7	0.5	180.0	160.0	5.0	1	1	
VAV-2-3	ENVIRO-TEC	SDR-10	10	350	1000	0.70	350	12.8	55.0	88.7	0.7	1.5	180.0	160.0	5.0	1	1	
VAV-2-4	ENVIRO-TEC	SDR-6	6	105	300	0.70	105	4.3	55.0	92.5	0.7	0.5	180.0	160.0	5.0	1	1	
VAV-2-5	ENVIRO-TEC	SDR-8	8	200	550	0.70	200	8.5	55.0	94.4	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-2-6	ENVIRO-TEC	SDR-8	8	550	550	0.70	550	8.5	55.0	69.3	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-2-7	ENVIRO-TEC	SDR-6	6	350	350	0.70	350	4.3	55.0	66.2	0.7	0.5	180.0	160.0	5.0	1	1	
VAV-3-1	ENVIRO-TEC	SDR-12	12	560	1650	0.70	560	21.3	55.0	90.1	0.7	2.5	180.0	160.0	5.0	1	1	
VAV-3-2	ENVIRO-TEC	SDR-6	6	105	300	0.70	105	4.3	55.0	92.5	0.7	0.5	180.0	160.0	5.0	1	1	
VAV-3-3	ENVIRO-TEC	SDR-8	8	210	600	0.70	210	8.5	55.0	92.5	0.7	1.0	180.0	160.0	5.0	1	1	
BPD-3-1	ENVIRO-TEC	SDR-12	12	0	1660	0.70	-	-	-	-	-	-	-	-	-	-	1	
VAV-4-1	ENVIRO-TEC	SDR-8	8	165	475	0.70	165	8.5	55.0	102.7	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-4-2	ENVIRO-TEC	SDR-12	12	615	1750	0.70	615	25.5	55.0	93.4	0.7	3.0	180.0	160.0	5.0	1	1	
VAV-4-3	ENVIRO-TEC	SDR-8	8	185	525	0.70	185	8.5	55.0	97.5	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-4-4	ENVIRO-TEC	SDR-8	8	150	425	0.70	150	8.5	55.0	107.5	0.7	1.0	180.0	160.0	5.0	1	1	
BPD-4-1	ENVIRO-TEC	SDR-14	14	0	2060	0.70	-	-	-	-	-	-	-	-	-	-	1	
VAV-5-1	ENVIRO-TEC	SDR-8	8	160	450	0.70	160	8.5	55.0	104.2	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-5-2	ENVIRO-TEC	SDR-8	8	140	400	0.70	140	8.5	55.0	111.2	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-5-3	ENVIRO-TEC	SDR-12	12	595	1700	0.70	595	25.5	55.0	94.7	0.7	3.0	180.0	160.0	5.0	1	1	
VAV-5-4	ENVIRO-TEC	SDR-10	10	350	1000	0.70	350	17.0	55.0	100.0	0.7	2.0	180.0	160.0	5.0	1	1	
VAV-5-5	ENVIRO-TEC	SDR-8	8	140	400	0.70	140	8.5	55.0	111.2	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-5-6	ENVIRO-TEC	SDR-8	8	165	475	0.70	165	8.5	55.0	102.7	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-5-7	ENVIRO-TEC	SDR-8	8	140	400	0.70	140	8.5	55.0	111.2	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-5-8	ENVIRO-TEC	SDR-8	8	150	425	0.70	150	8.5	55.0	107.5	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-5-9	ENVIRO-TEC	SDR-8	8	140	400	0.70	140	8.5	55.0	111.2	0.7	1.0	180.0	160.0	5.0	1	1	
VAV-5-10	ENVIRO-TEC	SDR-6	6	125	350	0.70	125	4.3	55.0	86.5	0.7	0.5	180.0	160.0	5.0	1	1	
VAV-5-11	ENVIRO-TEC	SDR-10	10	350	1000	0.70	350	17.0	55.0	100.0	0.7	2.0	180.0	160.0	5.0	1	1	
VAV-5-12	ENVIRO-TEC	SDR-10	10	350	1000	0.70	350	17.0	55.0	100.0	0.7	2.0	180.0	160.0	5.0	1	1	
VAV-6-1	ENVIRO-TEC	SDR-6	6	125	350	0.70	125	4.3	55.0	86.5	0.7	0.5	180.0	160.0	5.0	1	1	
VAV-6-2	ENVIRO-TEC	SDR-12	12	595	1700	0.70	595	25.5	55.0	94.7	0.7	3.0	180.0	160.0	5.0	1	1	
VAV-6-3																		



AIR FLOW DIAGRAM
NOT TO SCALE

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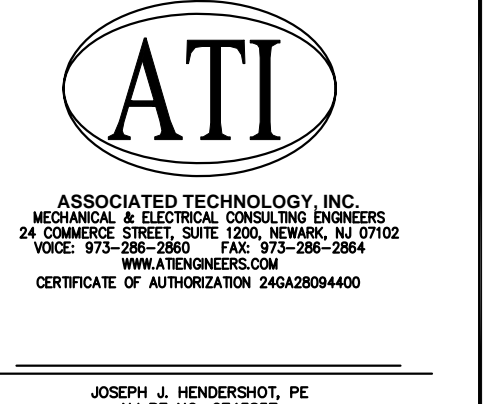
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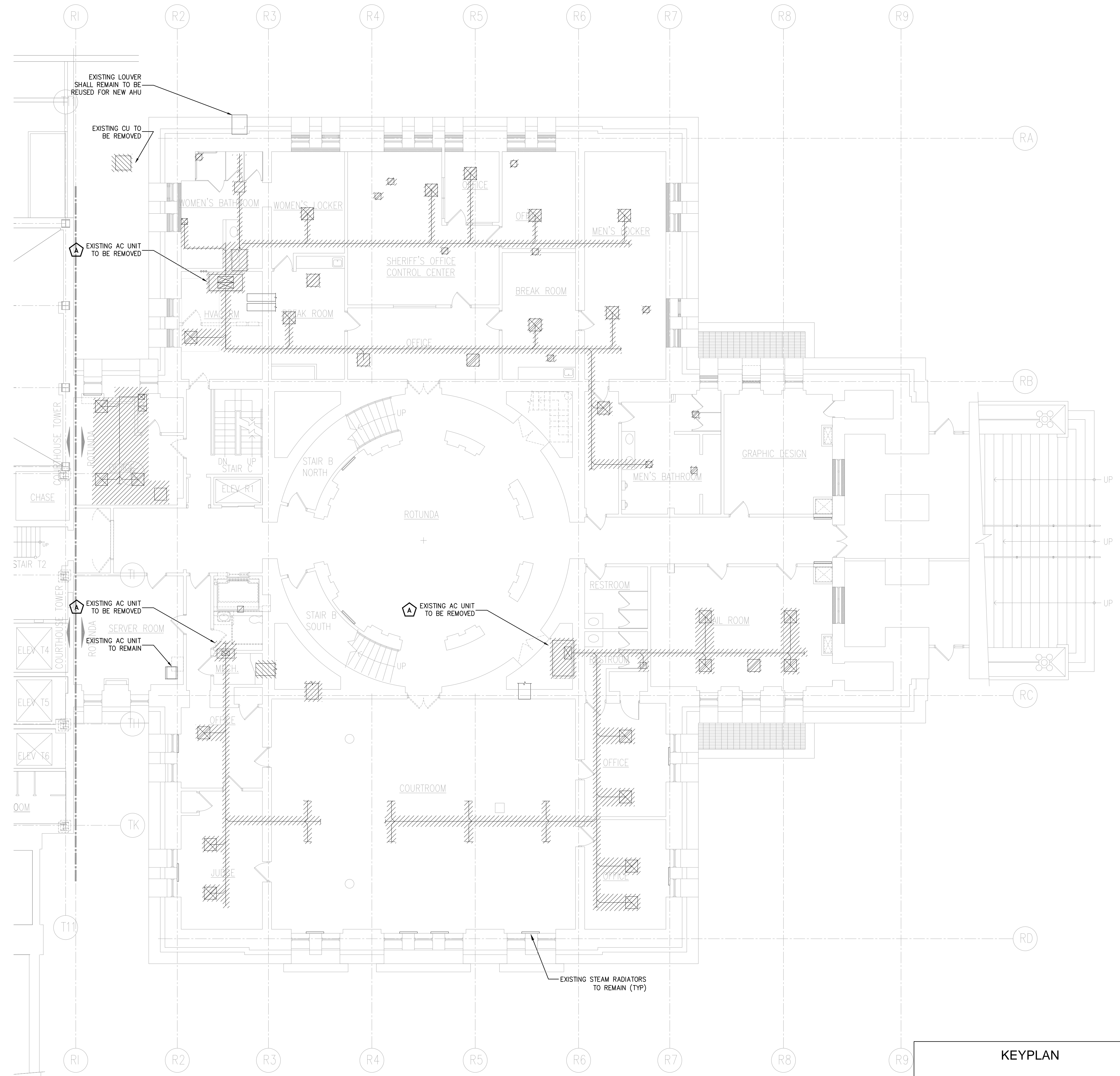
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PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL
AIR FLOW DIAGRAM**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	M.301

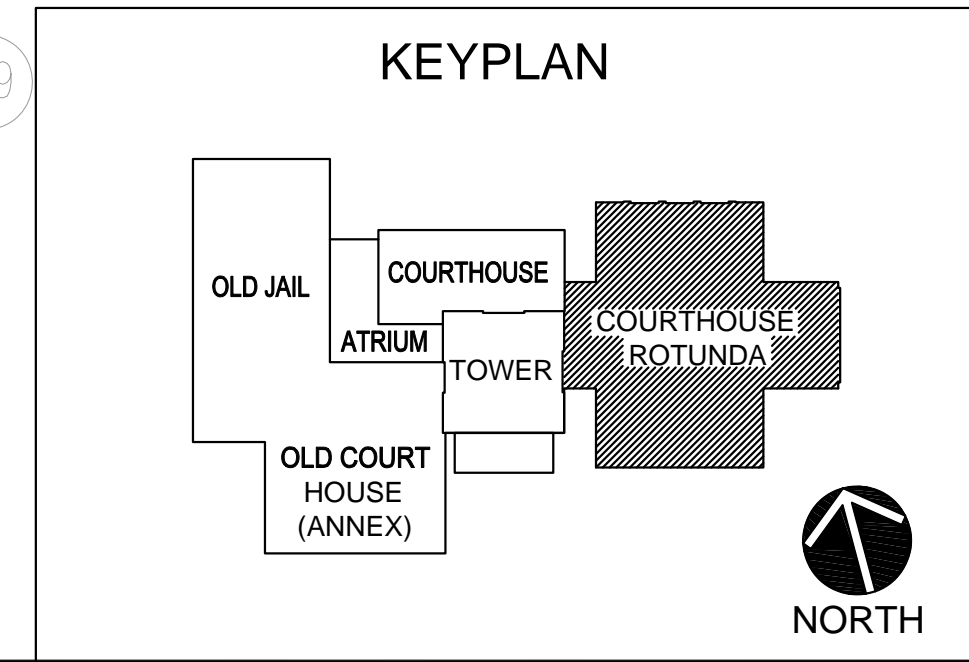


KEYED DEMOLITION WORK NOTES:

△ REMOVE EXISTING HVAC UNIT ALONG WITH REMOTE OUTDOOR CONDENSING UNIT, PIPING, CONTROLS, SUPPLY/RETURN DUCTWORK, ETC. COORDINATE WITH ELECTRICAL CONTRACTOR FOR REMOVAL OF POWER WIRING, DISCONNECTS, ETC.

DRAWING NOTES:

1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.



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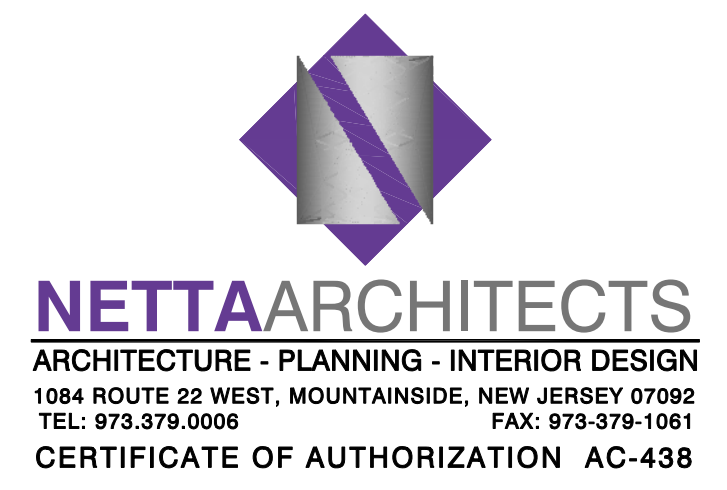
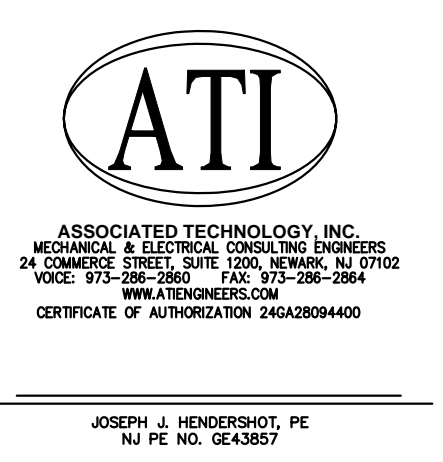
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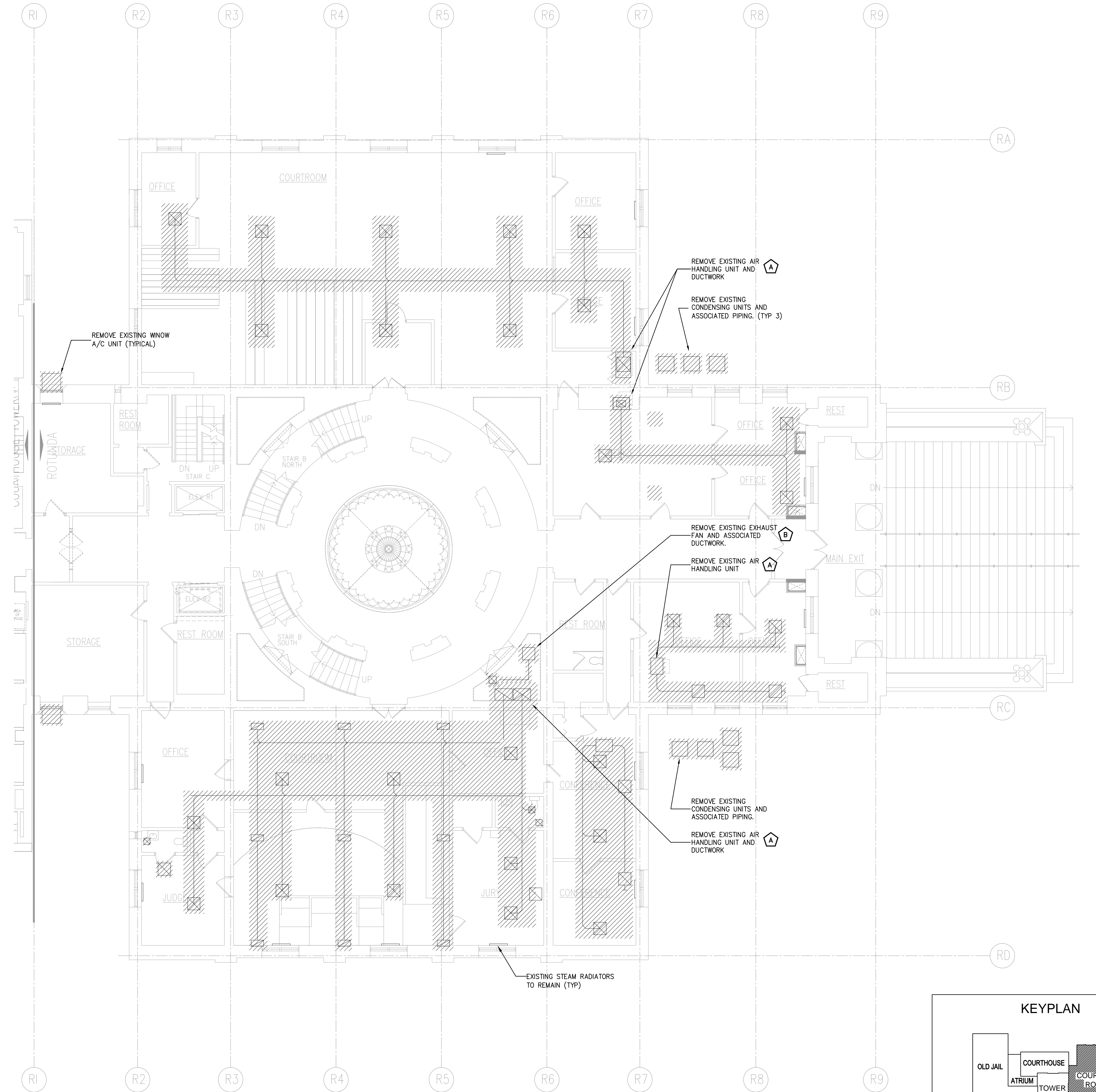


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
MECHANICAL - DEMOLITION PLAN
GROUND FLOOR

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
9.25.15	95% CD SUBMIT	KD	FM					09-25-15
09.07.17	ISSUED FOR BID	KD	FM					1/8"=1'-0"
								DRWN BY RB
								CHKD BY NJN
								JOB NO 2141152
								SHEET: _ OF:
								DWG. NO

DM.400G

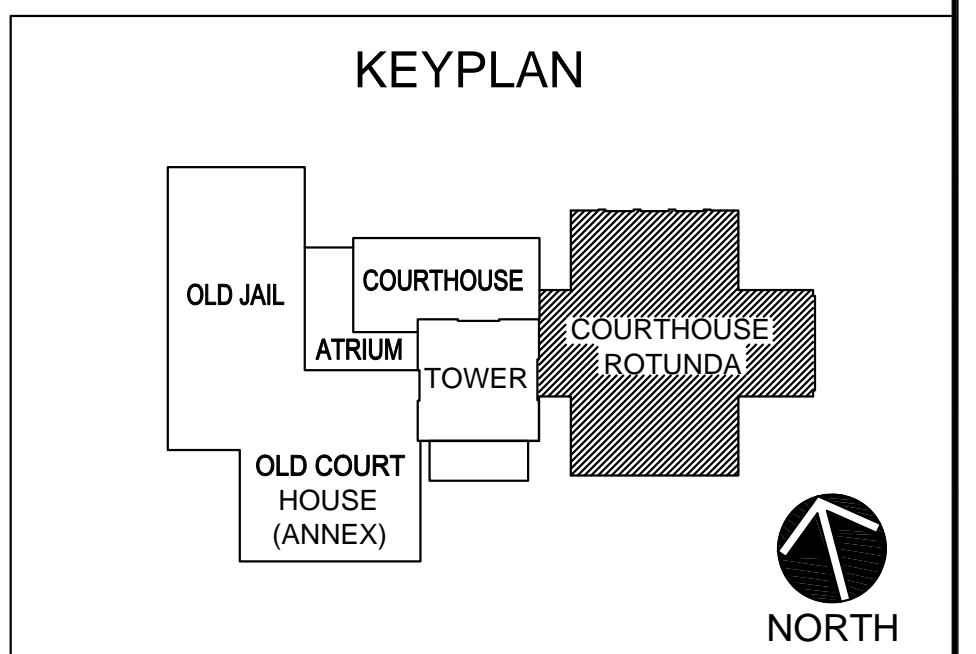


KEYED DEMOLITION WORK NOTES:

- A** REMOVE EXISTING HVAC UNIT ALONG WITH REMOTE OUTDOOR CONDENSING UNIT, PIPING, CONTROLS, SUPPLY/RETURN DUCTWORK, ETC. COORDINATE WITH ELECTRICAL CONTRACTOR FOR REMOVAL OF POWER WIRING, DISCONNECTS, ETC.
- B** REMOVE EXHAUST EXHAUST FAN AND DUCTWORK. ROOF OPENING SHALL BE REPAIRED.

DRAWING NOTES:

1. REFER TO DRAWING M101 & M102 FOR NOTES, SYMBOLS & ABBREVIATIONS.



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PROJECT:

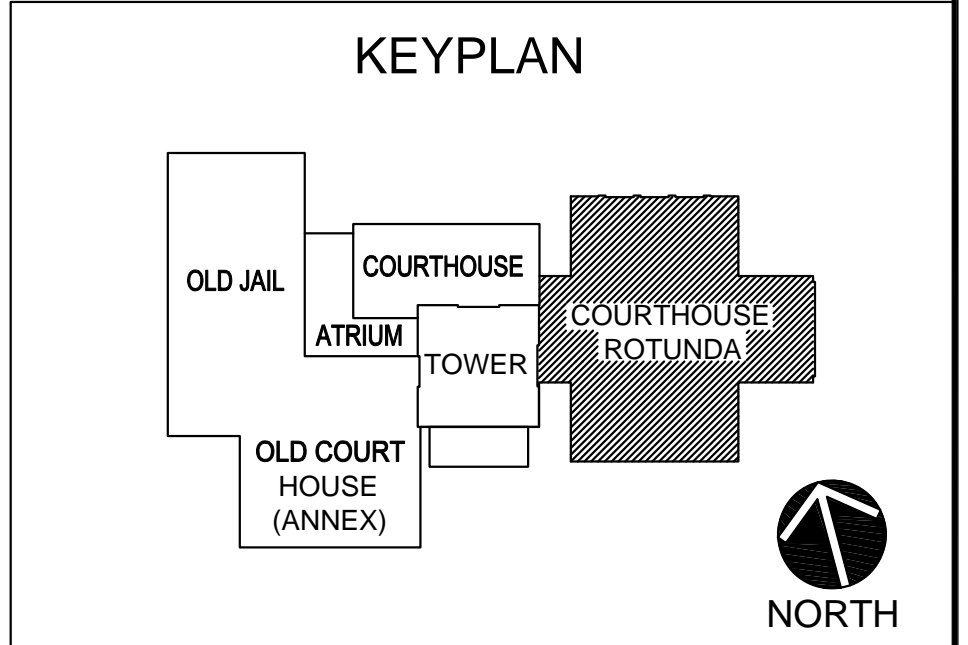
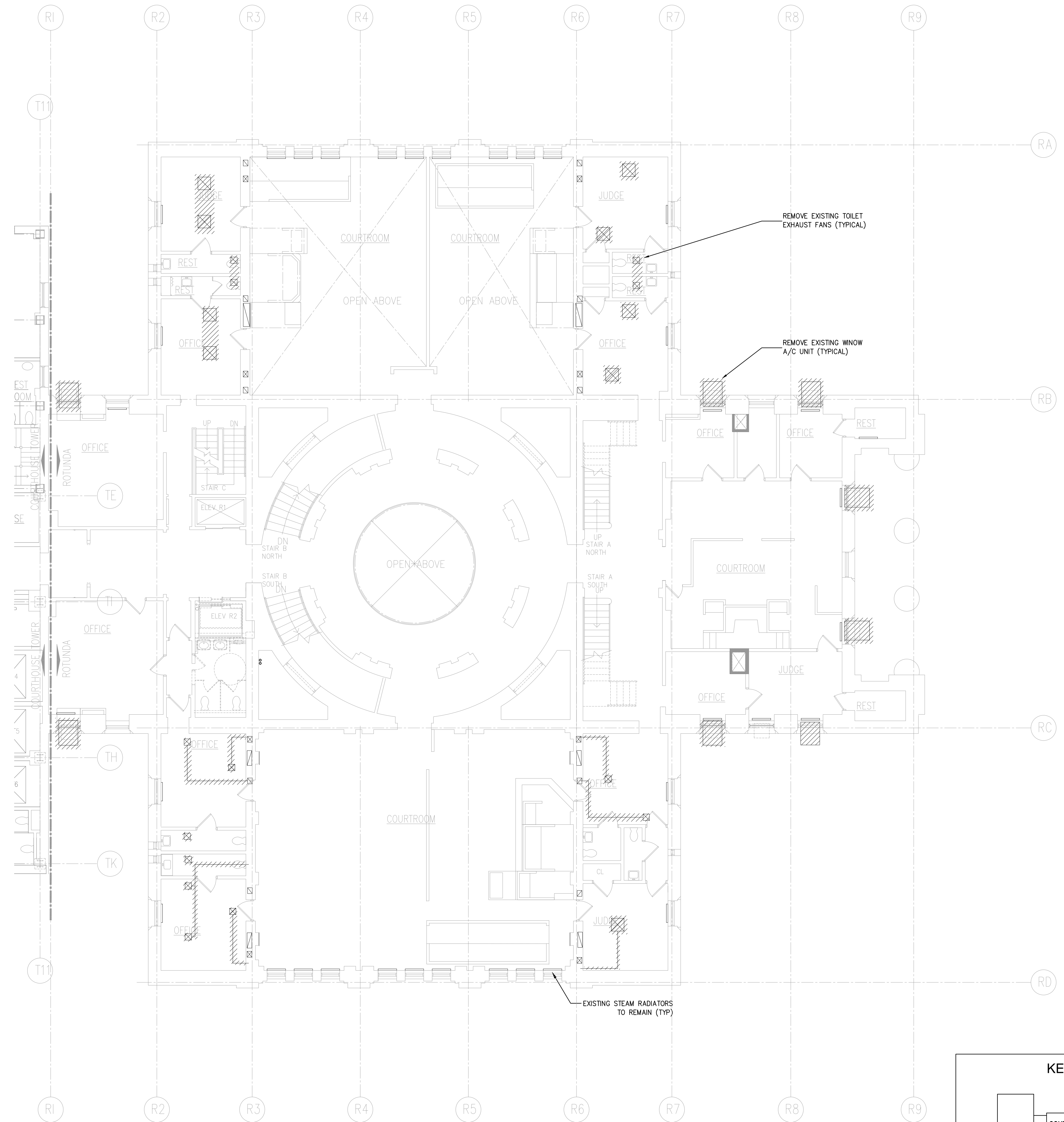
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**MECHANICAL - DEMOLITION PLAN
FIRST FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

DM.401



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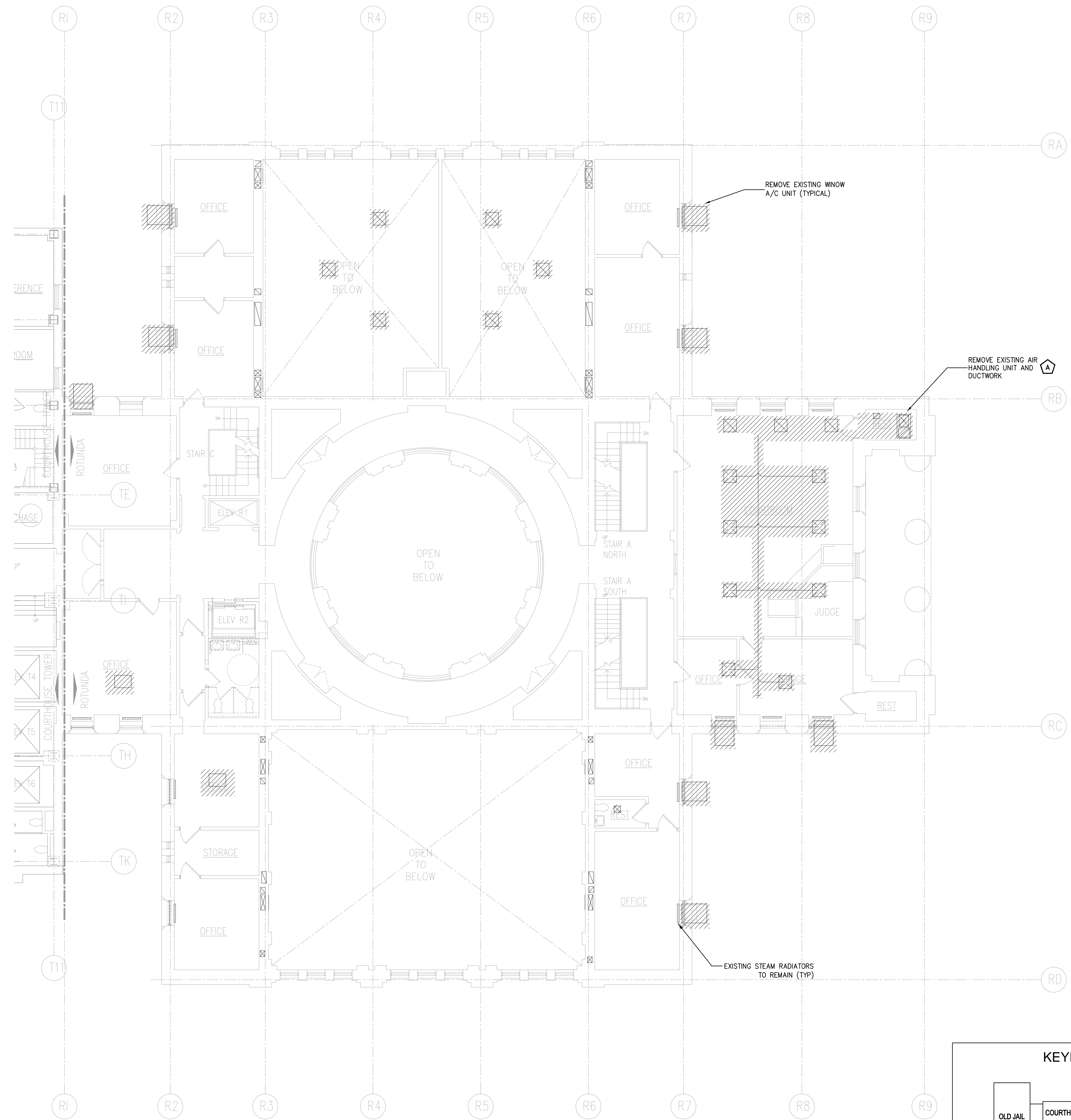


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
MECHANICAL - DEMOLITION PLAN
SECOND FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
09.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

DM.402

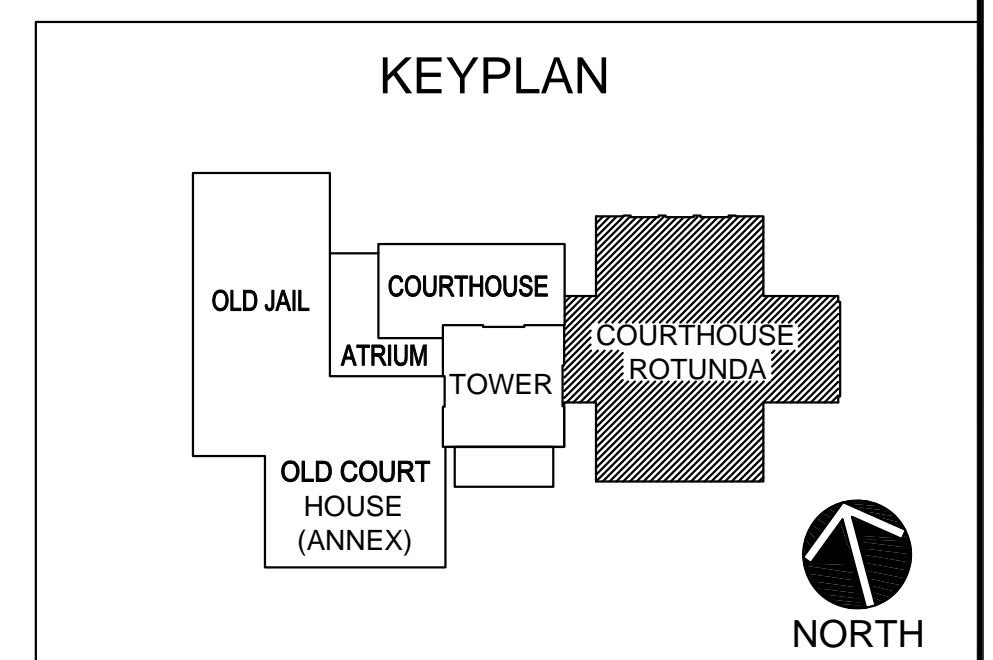


KEYED DEMOLITION WORK NOTES:

- A** REMOVE EXISTING HVAC UNIT ALONG WITH REMOTE OUTDOOR CONDENSING UNIT, PIPING, CONTROLS, SUPPLY/RETURN DUCTWORK, ETC. COORDINATE WITH ELECTRICAL CONTRACTOR FOR REMOVAL OF POWER WIRING, DISCONNECTS, ETC.

DRAWING NOTES:

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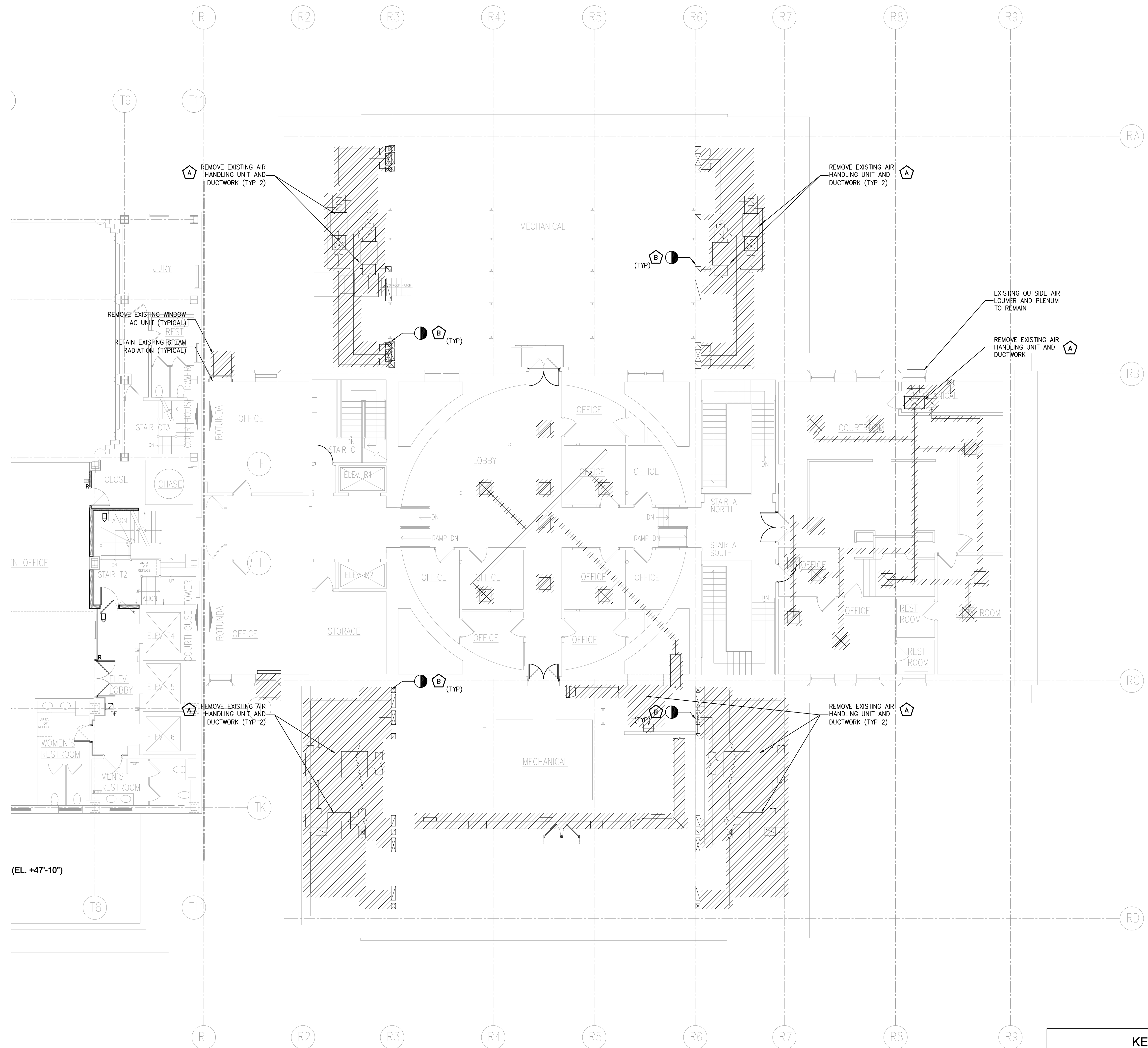


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
MECHANICAL - DEMOLITION PLAN
THIRD FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8" = 1'-0"
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

DM.403

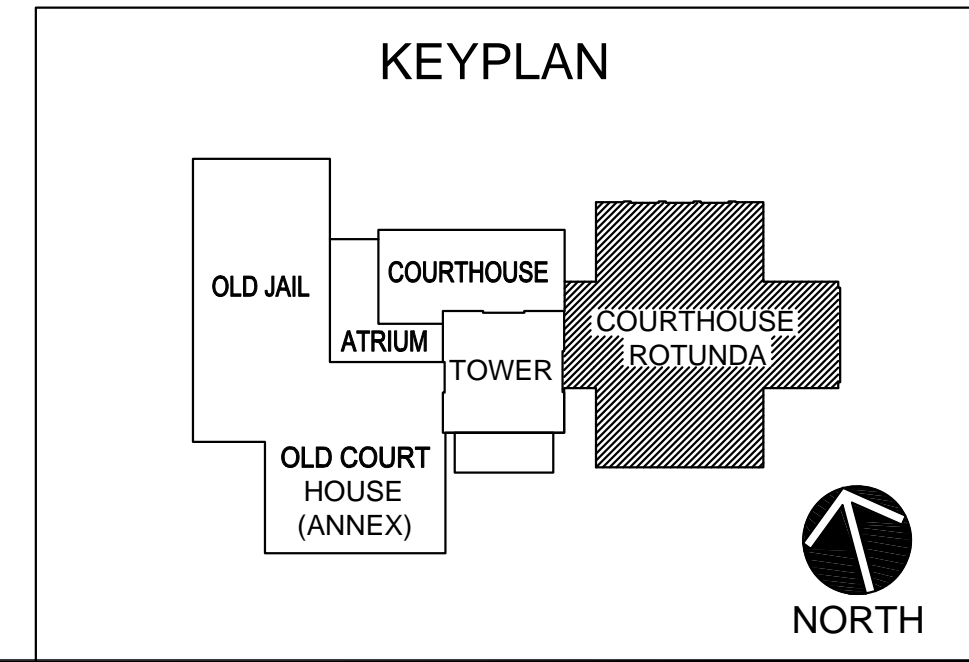


KEYED DEMOLITION WORK NOTES:

- A** REMOVE EXISTING HVAC UNIT ALONG WITH REMOTE OUTDOOR CONDENSING UNIT, PIPING, CONTROLS, SUPPLY/RETURN DUCTWORK, ETC. COORDINATE WITH ELECTRICAL CONTRACTOR FOR REMOVAL OF POWER WIRING, DISCONNECTS, ETC.
- B** DISCONNECT EXISTING DUCTWORK AT DUCT RISER. EXISTING DUCT RISER TO BE REUSED WITH NEW CONNECTIONS.

DRAWING NOTES:

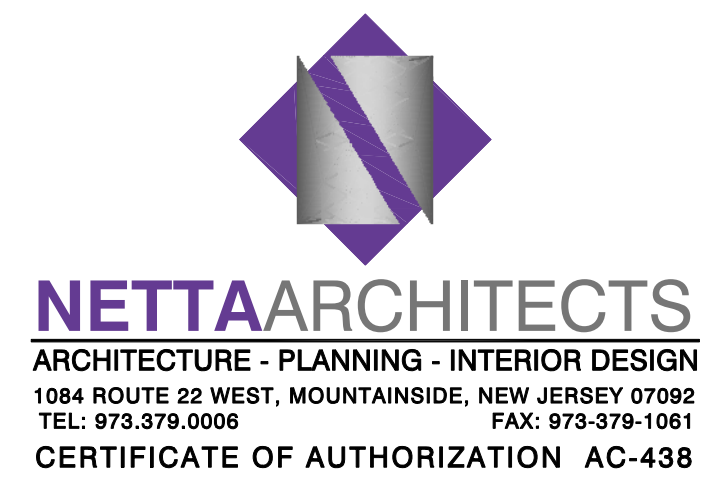
1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.



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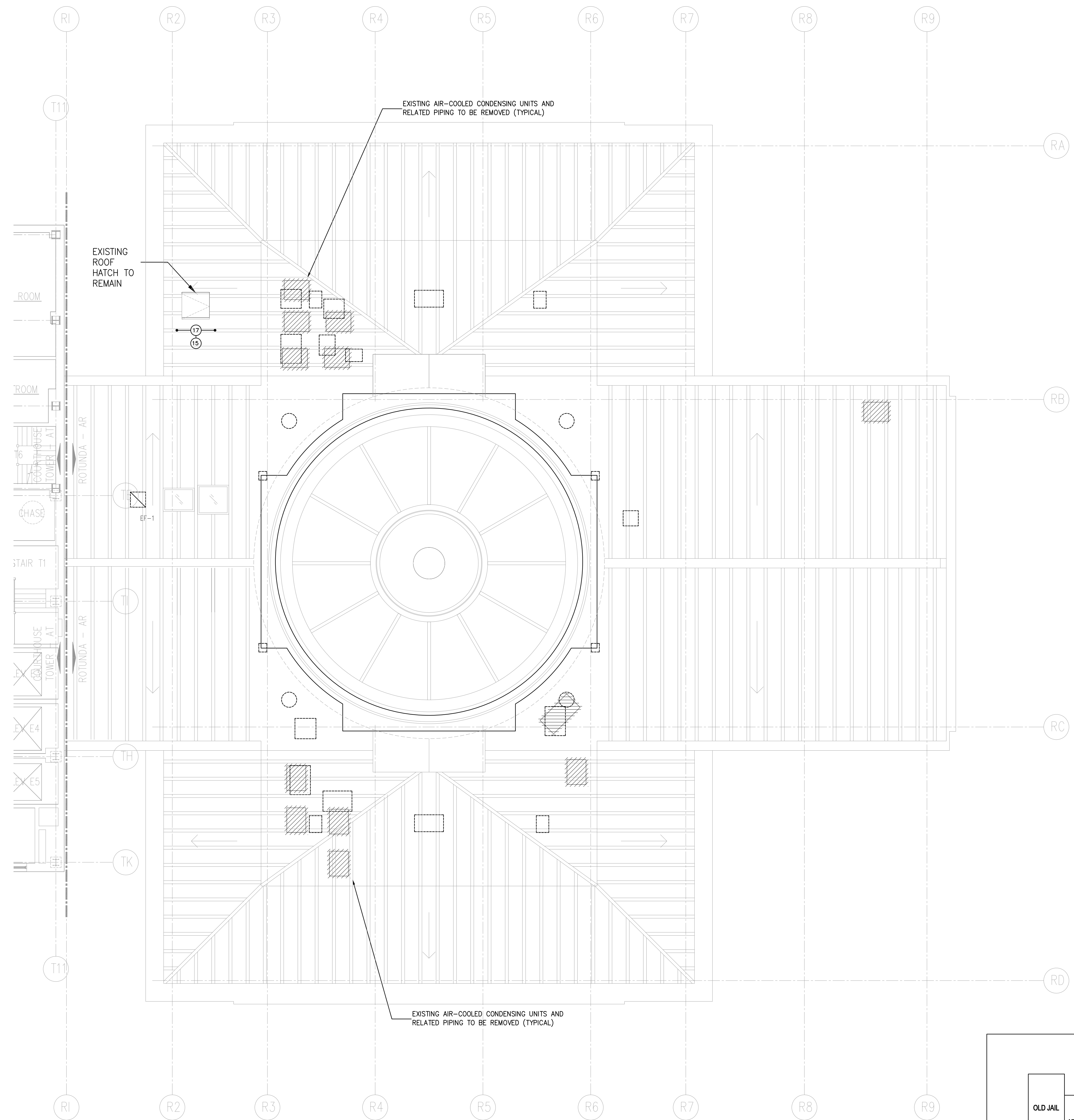


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
MECHANICAL - DEMOLITION PLAN
FOURTH FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
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09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

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DRAWING NOTES:
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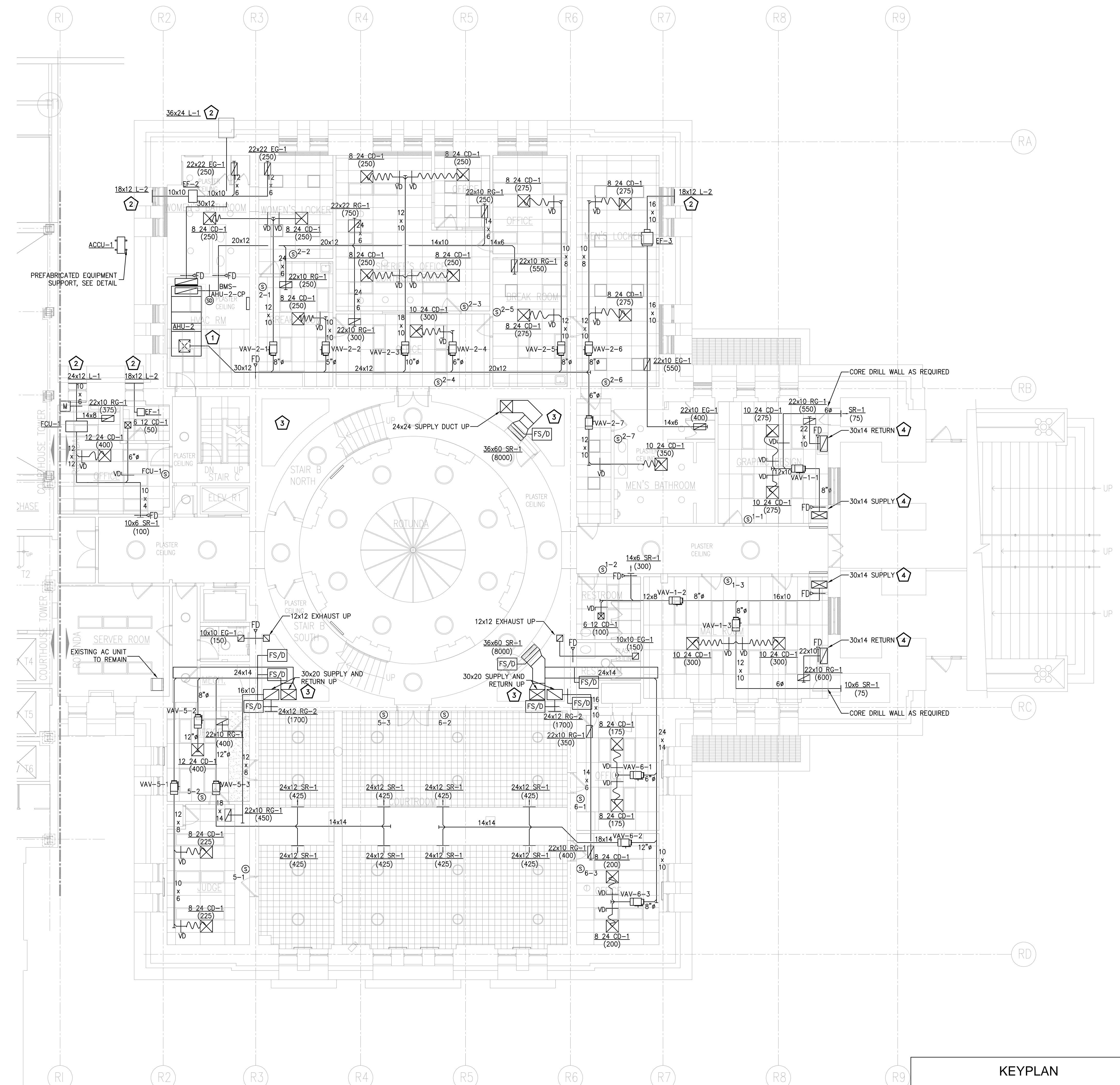


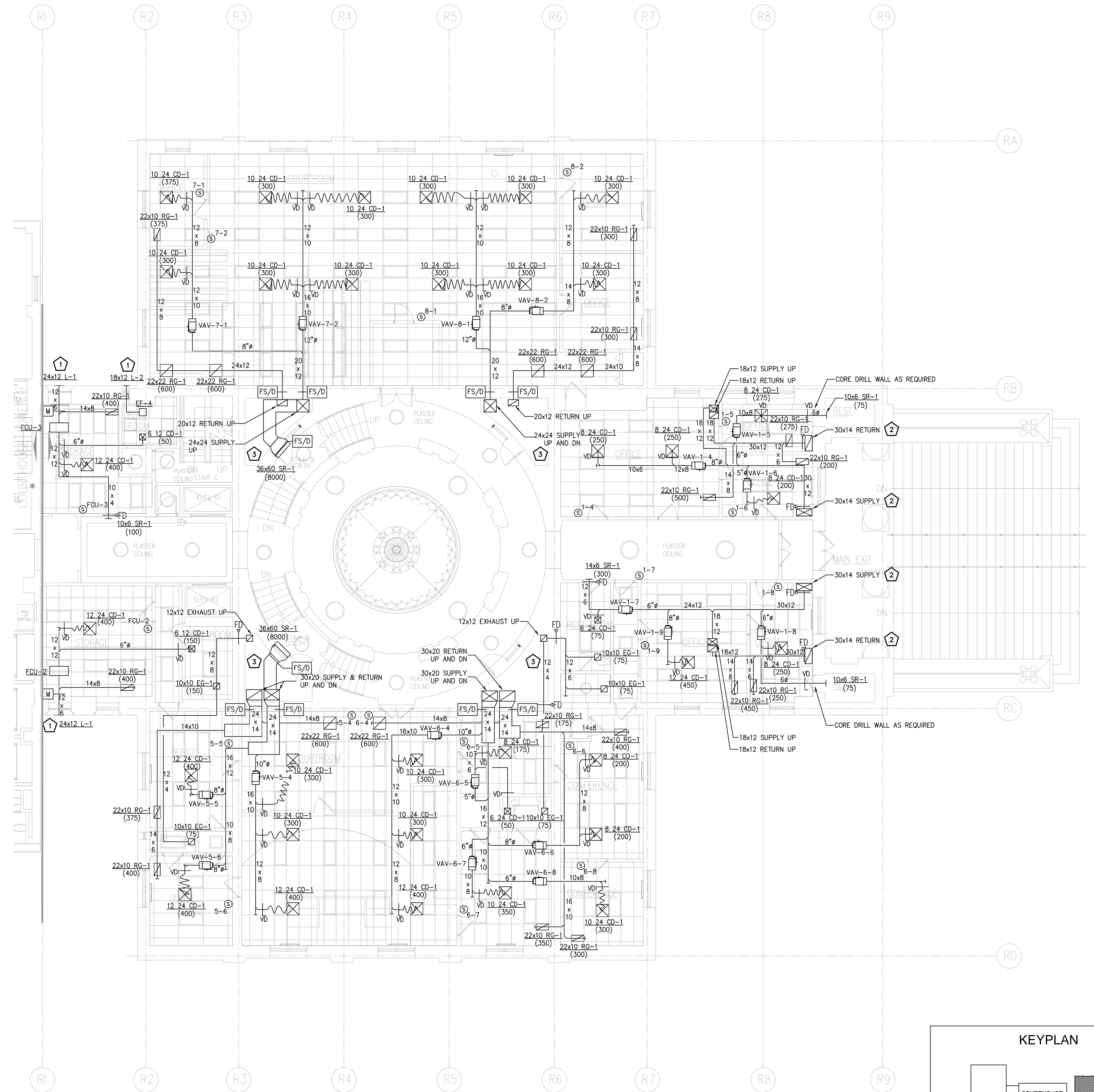
PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
 MECHANICAL - DEMOLITION PLAN
 ROOF

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
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								JOB NO	2141152
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DM.405



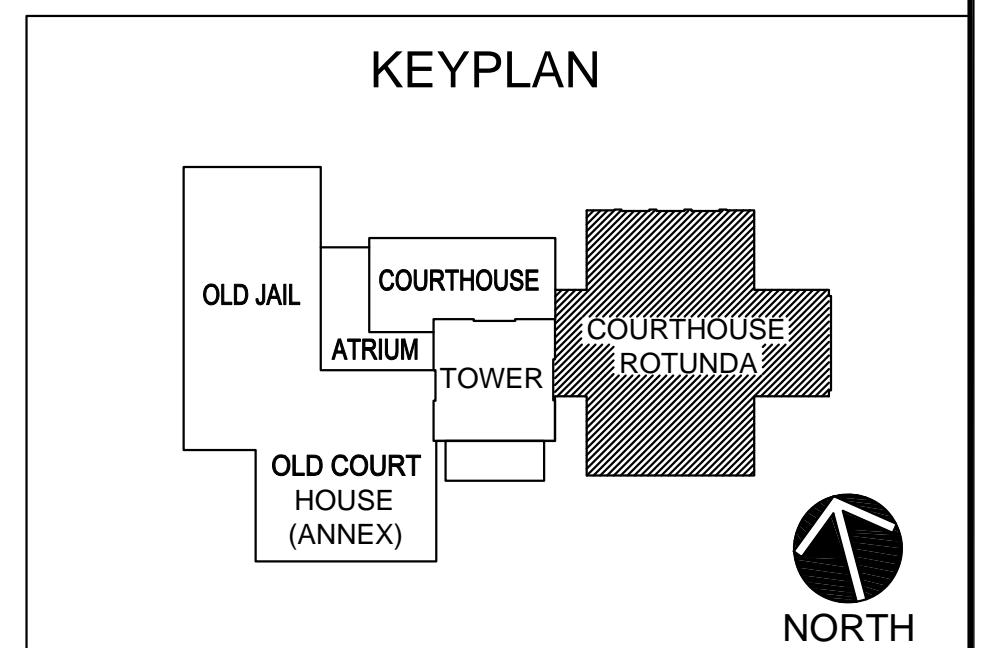


KEYED NEW WORK NOTES:

- 1 NEW LOUVER SHALL BE INSTALLED IN EXISTING WINDOW FRAME, COORDINATE WITH ARCHITECT.
- 2 CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR FOR SAW CUTTING OF FLOOR AS REQUIRED.
- 3 ALL WORK IN SHAFT AREAS SHALL BE COORDINATED WITH ALL EXISTING UTILITIES AND CONDITIONS. COORDINATE ALL SAW CUTTING AND CORE DRILLING OF SHAFT WALLS/FLOORS WITH GENERAL CONTRACTOR. GENERAL CONTRACTOR SHALL PROVIDE SCAFFOLDING IN SHAFT AREAS AS REQUIRED TO PERFORM WORK SAFELY.

DRAWING NOTES:

- 1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
- 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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NJ License No. AI 14394



PROJECT:

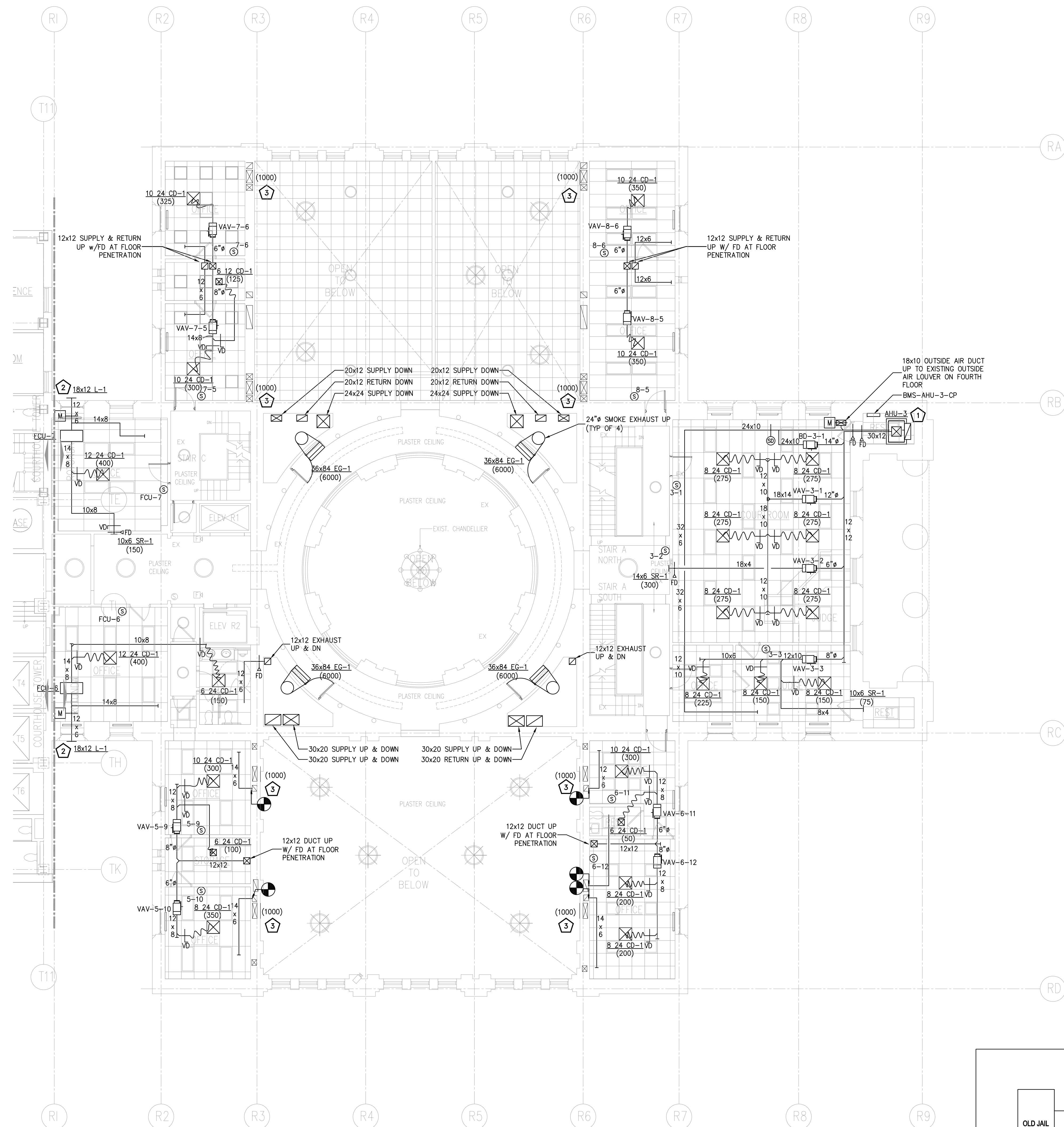
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**MECHANICAL - HVAC PLAN
FIRST FLOOR**

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
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09.07.17	ISSUED FOR BID	KD	FM					1/8"=1'-0"
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								JOB NO 2141152
								SHEET: _ OF: _
								DWG. NO

M.401

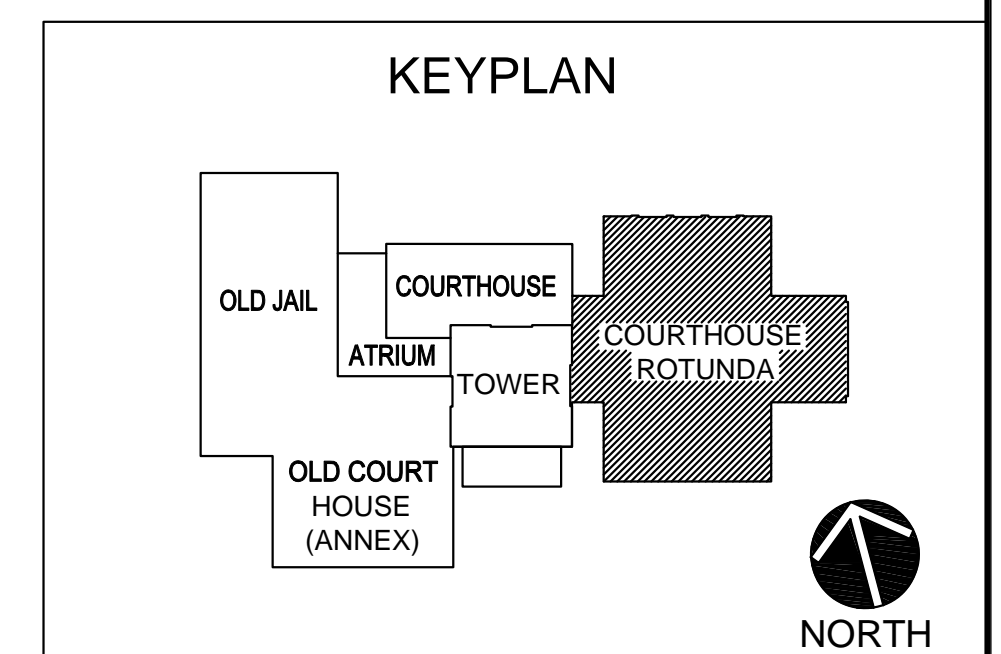


KEYED NEW WORK NOTES:

- 1 MOUNT NEW HVAC UNIT ON 4" HIGH CONCRETE PAD
- 2 NEW LOUVER SHALL BE INSTALLED IN EXISTING WINDOW FRAME. COORDINATE WITH ARCHITECT.
- 3 REBALANCE EXISTING AIR DEVICE TO CFM VALUE SHOWN.

DRAWING NOTES:

- 1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
- 4. ALL EQUIPMENT INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



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MECHANICAL & ELECTRICAL CONSULTING BUSINESS
24 COMPTON STREET, SUITE 100, NEWARK, NJ 07102
TEL: 973-278-2881 FAX: 973-278-2884
WWW.ATIMECHANICAL.COM

JOSEPH J. HENDERSON, PE
NJ License No. 36048



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-378-0088 FAX: 973-378-1081
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**MECHANICAL - HVAC PLAN
THIRD FLOOR**

SUBMISSIONS

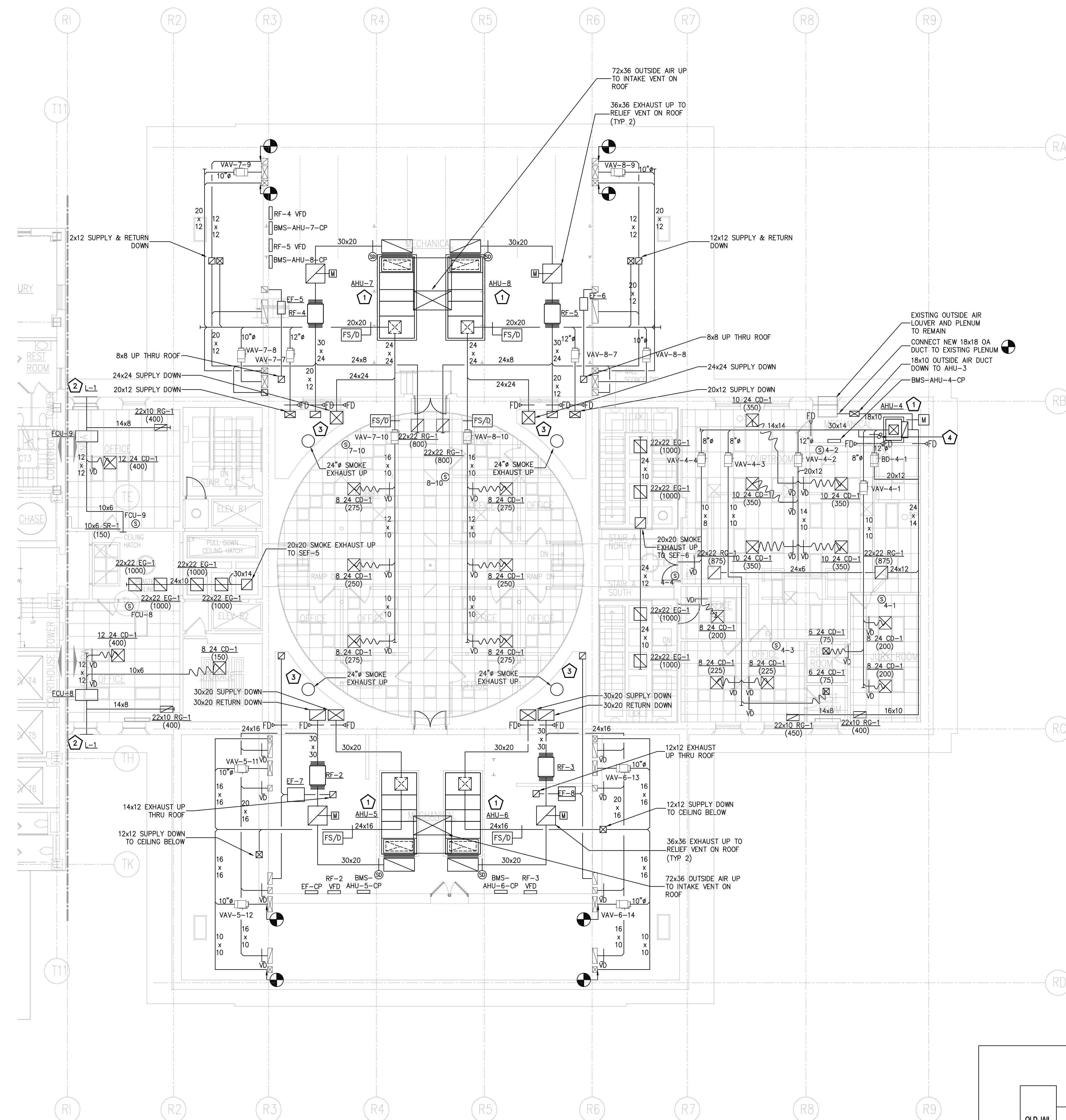
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09.07.17	ISSUED FOR BID	KD	FM				

REVISIONS

DATE

DATE	DESCRIPTION
09-25-15	SCALE 1/8"=1'-0"
	DRWN BY RB
	CHKD BY NJN
	JOB NO 2141152
	SHEET: _ OF:
	DWG. NO

M.403

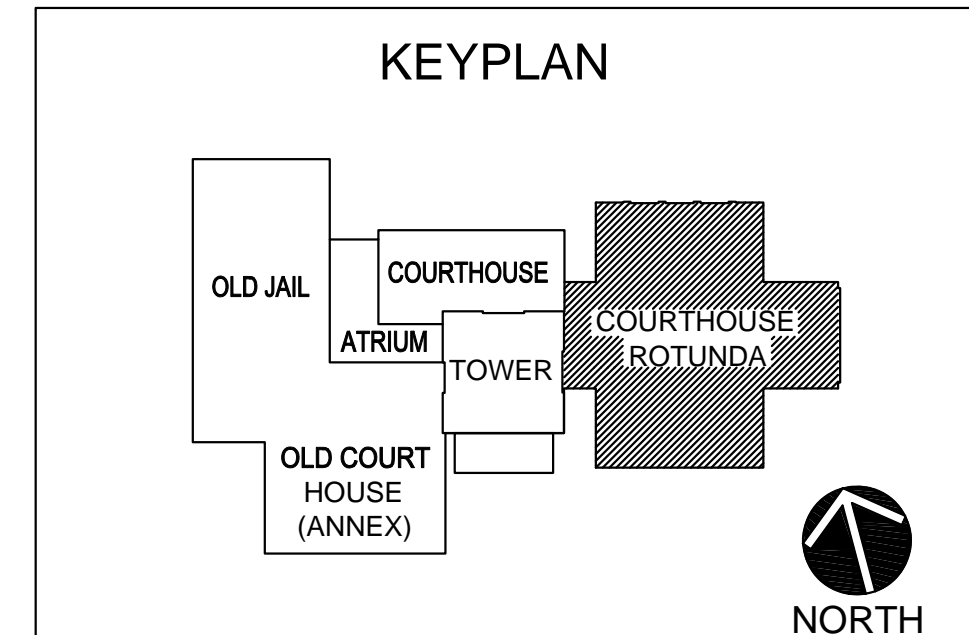


KEYED NEW WORK NOTES:

- 1 MOUNT NEW HVAC UNIT ON 4" HIGH CONCRETE PAD, TO BE PROVIDED BY GENERAL CONTRACTOR.
- 2 NEW LOUVER SHALL BE INSTALLED IN EXISTING WINDOW FRAME. COORDINATE WITH ARCHITECT.
- 3 COORDINATE NEW DUCTWORK WITH EXISTING PIPING LOCATED AT WALLS OF SHAFT. RELOCATE AND ADJUST PIPING AS REQUIRED TO ACCOMMODATE NEW DUCTWORK.
- 4 3/4" PIPE TO EXISTING FLOOR DRAIN FROM AHU-4, 1/2" PUMPED CONDENSATE DN TO CP-2 ON 3rd FLOOR SERVING AHU-3.

DRAWING NOTES:

- 1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
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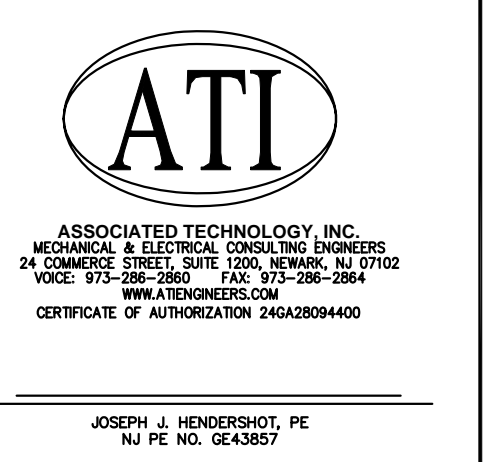
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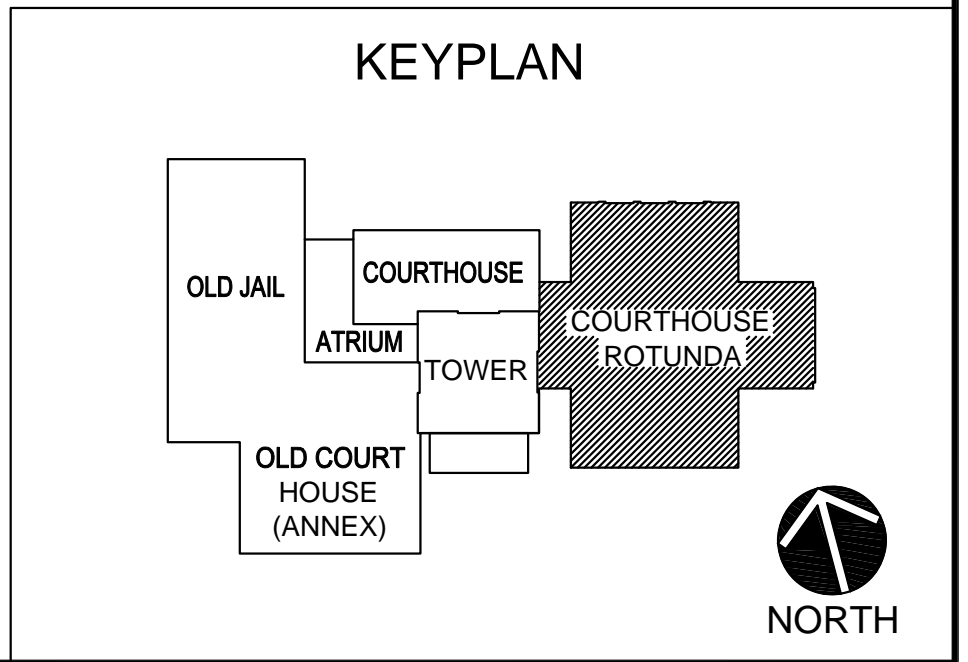
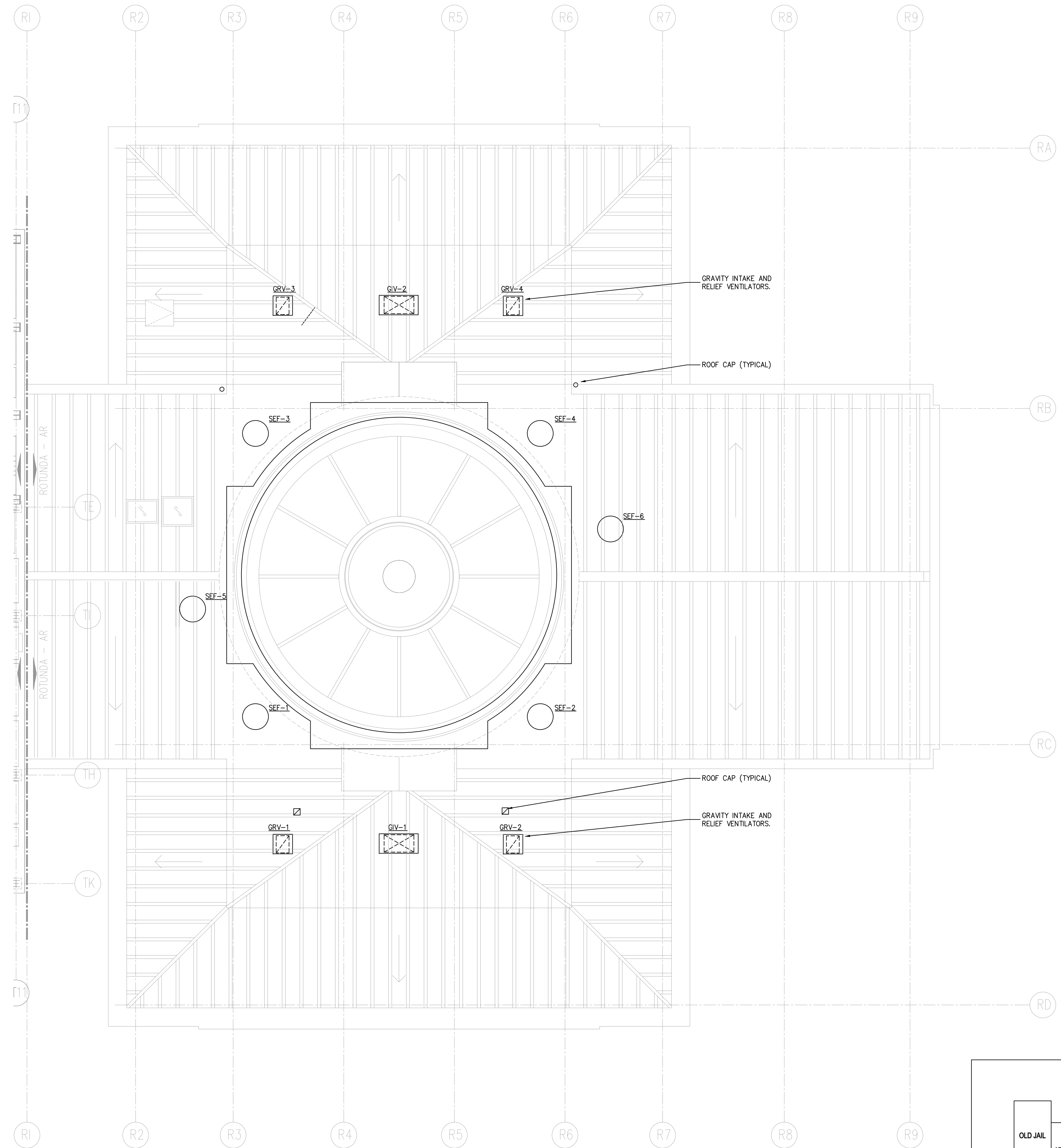


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
MECHANICAL - HVAC PLAN
FOURTH FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RJ
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

M.404



DRAWING NOTES:

1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
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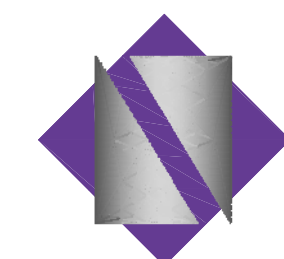
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24 CAMDEN DRIVE, SUITE 100, MOUNTAIN VIEW, NJ 07096
TEL: 973-278-2883 FAX: 973-278-2884
WWW.ATITECHNOLOGY.COM
CERTIFICATE OF AUTHORIZATION 2848984840

JOSEPH J. HENDERSON, PE
NJ License No. 364887



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINVIEW, NEW JERSEY 07092
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CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

**UC COURTHOUSE
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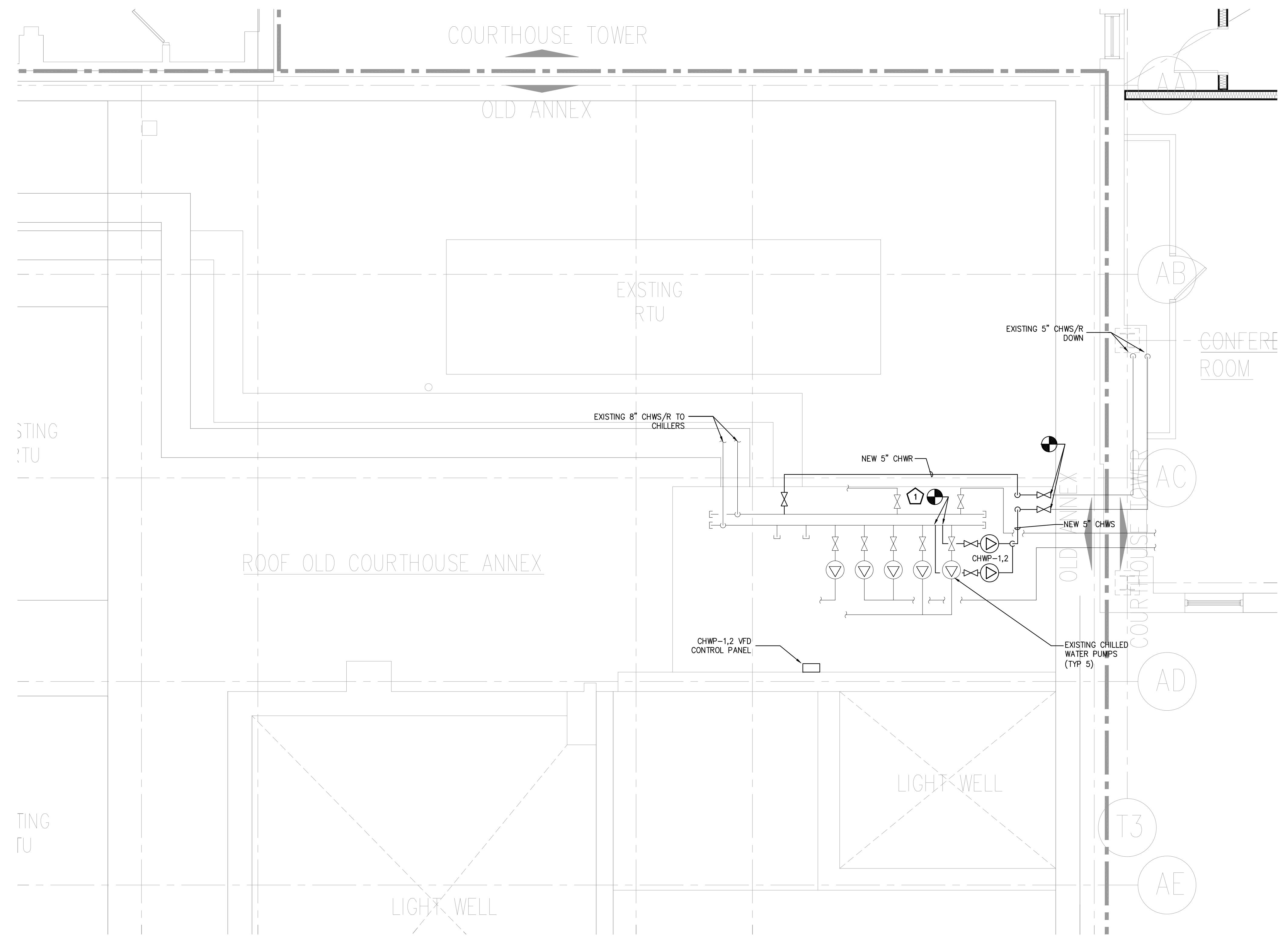
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SHEET CONTENTS:

**MECHANICAL - HVAC PLAN
ROOF**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
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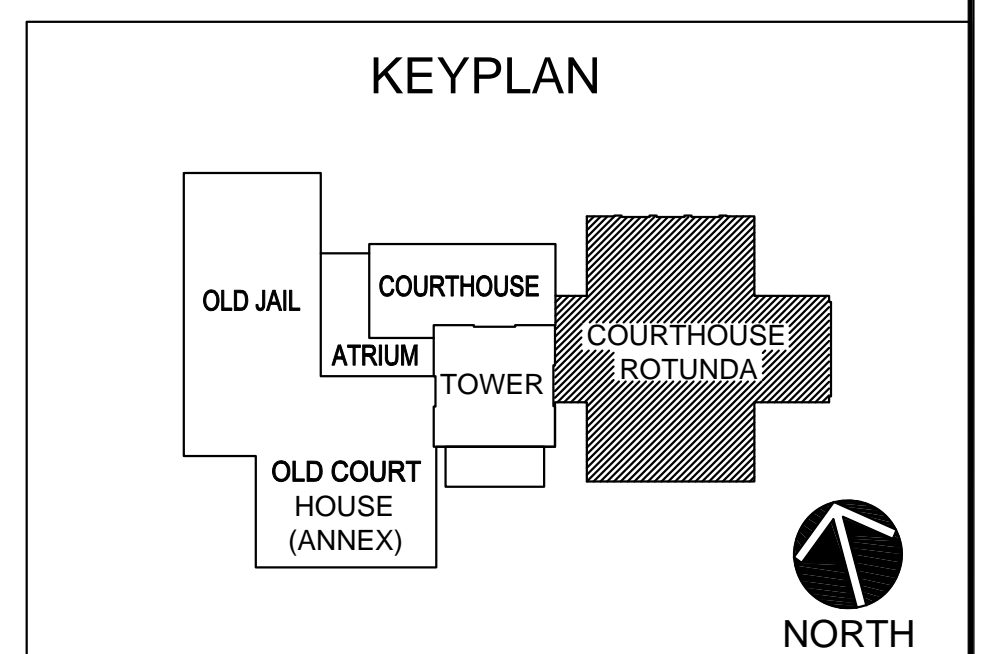
OLD ANNEX PARTIAL SEVENTH FLOOR – HVAC PLAN
SCALE: 1/4"=1'-0"

KEYED NEW WORK NOTES:

- 1. CONNECT NEW PUMPS TO EXISTING CHILLED WATER SUPPLY HEADER.

DRAWING NOTES:

- 1. REFER TO DRAWING M.101 & M.102 FOR NOTES, SYMBOLS & ABBREVIATIONS.
- 2. ALL SUPPLY DUCT SHALL BE INSULATED WITH 1-1/2" FOIL FACED DUCT WRAP.
- 3. CONTRACTOR SHALL BALANCE AIR HANDLING SYSTEMS TO QUANTITIES SHOWN ON DRAWINGS. SUBMIT BALANCE REPORT FOR APPROVAL.
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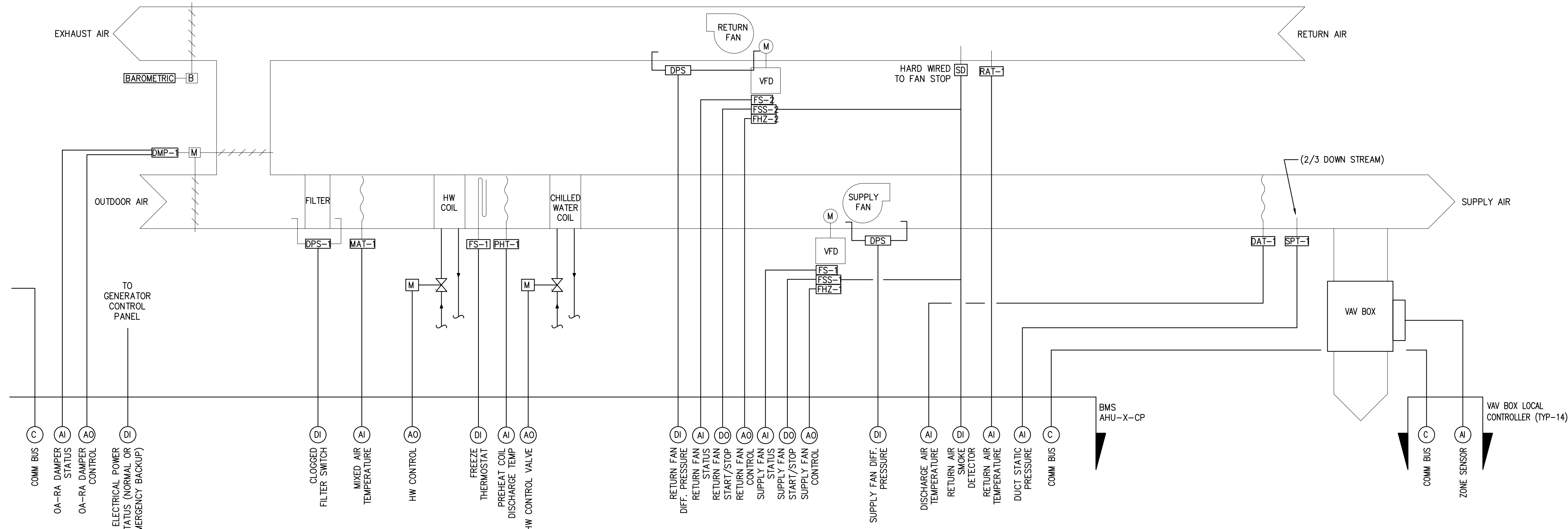
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SHEET CONTENTS:

MECHANICAL - HVAC PIPING PLAN
SEVENTH FLOOR

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

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CONTROL DIAGRAM ABBREVIATIONS	
SYMBOL	DESCRIPTION
	COMBINATION DISCONNECT MAGNETIC STARTER
	SWITCH
	BREAKGLASS STATION
	DIGITAL OUTPUT
	DIGITAL INPUT
	ANALOGUE INPUT
	ANALOG OUTPUT
	NORMALLY CLOSED
	NORMALLY OPEN
	LOCAL CENTRAL PANEL
	RECEIVER CONTROLLER
	TIME CLOCK
	START/STOP
	AVERAGING TUBE
	FIRE ALARM SIGNAL SHUTDOWN HARD WIRING BY
	SMOKE PURGE PANEL
	LEVEL SWITCH
	POSITION SWITCH
	CURRENT TRANSDUCER
	CURRENT ELEMENT
	TEMPERATURE ELEMENT
	TEMPERATURE SWITCH WITH AUTO RESET
	PRESSURE ELEMENT
	PRESSURE SWITCH HIGH
	PRESSURE SWITCH LOW
	ALARM
	RELAY
	MOTOR CONTROLLER
	OUTSIDE AIR DRY BULB TEMPERATURE
	PILOT LIGHT (RED)
	FLOW SWITCH

TYPICAL SEQUENCE OF OPERATION

TIME SCHEDULES

THE TIME SCHEDULES SHALL BE PROGRAMMED THROUGH THE MAIN FRONT END OPERATOR STATION AND STORED IN THE INDIVIDUAL CONTROLLERS. TIME SCHEDULES SHALL BE COORDINATED WITH THE BUILDING OWNER AT COMPLETION OF THE PROJECT, OR AS LISTED IN THE GENERAL BUILDING SEQUENCE OF OPERATION SCHEDULES.

SYSTEM DE-ENERGIZED

WHEN THE SYSTEM IS DE-ENERGIZED, THE OUTDOOR AIR AND EXHAUST DAMPERS SHALL CLOSE, THE RETURN AIR DAMPER SHALL OPEN, THE SUPPLY AND RETURN AIR FANS SHALL BE DE-ENERGIZED.

SYSTEM ENERGIZED

OCCUPIED MODE

THE DAYS AND TIMES GOVERNING THIS MODE OF OPERATION SHALL BE DICTATED BY THE OWNER AND PROGRAMMED INTO THE BMS SYSTEM.

THE BMS SYSTEM SHALL INITIATE THE OCCUPIED MODE. THE OUTDOOR AIR DAMPER SHALL OPEN TO ITS MINIMUM VENTILATION POSITION, AND THE RETURN AIR DAMPER SHALL POSITION ITSELF ACCORDINGLY. THE SUPPLY AIR FAN SHALL START. THE SUPPLY AIR FAN SHALL RAMP UP OR DOWN VIA THE VARIABLE FREQUENCY DRIVE (VFD) MAINTAINING A CONSTANT STATIC PRESSURE OF 1.0" W.G. (ADJUSTABLE) AT THE POINT WHERE THE DUCT-MOUNTED STATIC PRESSURE SENSOR IS LOCATED. RETURN FAN SHALL START AND MAINTAIN THE REQUIRED AIRFLOW TO MAINTAIN A SLIGHT POSITIVE PRESSURE (0.01" WC) WITHIN THE BUILDING.

DISCHARGE AIR TEMPERATURE CONTROL

THE AHU SHALL MAINTAIN CONSTANT DISCHARGE AIR TEMPERATURE AS DICTATED BY THE DISCHARGE AIR TEMPERATURE SETPOINT. THE CHILLED WATER CONTROL VALVE SHALL BE MODULATED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE. THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET BASED ON THE DISCHARGE AIR TEMPERATURE RESET SCHEDULE LISTED IN THE GENERAL BUILDING SEQUENCE OF OPERATION AND SCHEDULES.

THE HOT WATER COIL VALVE SHALL BE MODULATED TO MAINTAIN A MINIMUM OF 55°F LEAVING AIR TEMPERATURE. THE CONTROL VALVE SHALL BE MODULATED TO PROVIDE HIGHER LEAVING AIR TEMPERATURES AS REQUIRED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT.

A RETURN AIR DUCT MOUNTED SENSOR SHALL MONITOR THE RETURN AIR TEMPERATURE. THE BMS SHALL RESET SUPPLY TEMPERATURE TO PROVIDE ADEQUATE COOLING.

ECONOMIZER MODE

WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE 55°F, CHILLED WATER SHALL BE PROVIDED FOR COOLING. WHEN THE OUTDOOR AIR TEMPERATURE IS AT OR BELOW 55°F, THE OUTDOOR AIR DAMPER SHALL BE MODULATED OPEN TO PROVIDE FREE COOLING. AS THE OUTDOOR AIR DAMPER MODULATES OPEN, THE RETURN AIR DAMPER SHALL CORRESPONDINGLY MODULATE TOWARD ITS CLOSED POSITION. THE LOCAL CONTROLS SHALL LIMIT THE MIXED AIR TEMPERATURE FROM FALLING BELOW 52°F.

SPACE TEMPERATURE CONTROL

THE SPACE TEMPERATURE FOR EACH ZONE IS CONTROLLED BY THE VARIABLE AIR VOLUME (VAV) BOXES WHICH HAVE THEIR INDIVIDUAL TEMPERATURE SENSORS.

UNOCCUPIED MODE

THE DAYS AND TIMES GOVERNING THIS MODE OF OPERATION SHALL BE DICTATED BY THE OWNER AND PROGRAMMED INTO THE BMS SYSTEM.

WHEN THE SYSTEM IS INDEXED TO THE UNOCCUPIED MODE THE OUTDOOR AIR DAMPER

SHALL MOVE TO ITS FULLY CLOSED POSITION, THE SUPPLY FAN AND RETURN FAN SHALL BE DE-ENERGIZED AND THE VAV BOXES SHALL MOVE TO THEIR FULLY OPEN POSITION.

IF DURING THE UNOCCUPIED MODE THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED SPACE HEATING TEMPERATURE, THE AHU SHALL START, THE STEAM VALVE SHALL BE OPENED TO THE FULLY OPENED POSITION TO PROVIDE HEATING TO THE AREA. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED SPACE HEATING SETPOINT, THE UNIT SHALL RETURN TO THE UNOCCUPIED MODE.

IF DURING THE UNOCCUPIED MODE THE SPACE TEMPERATURE RISES ABOVE THE SPACE UNOCCUPIED COOLING TEMPERATURE SETPOINT THE UNIT SHALL START AND THE COOLING COIL VALVE SHALL MOVE TO THE OPEN POSITION TO MAINTAIN THE DISCHARGE AIR TEMPERATURE CONTROL SETPOINT TO PROVIDE COOLING FOR THE SPACE. ONCE THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED SPACE TEMPERATURE SETPOINT, THE UNIT SHALL RETURN TO THE UNOCCUPIED MODE.

MORNING WARM UP

IF THE RETURN AIR TEMPERATURE IS BELOW THE MORNING WARM UP SETPOINT WHEN THE UNIT IS INITIATED TO BEGIN THE OCCUPIED MODE THE UNIT SHALL ENTER THE MORNING WARM UP MODE. THE OUTDOOR AIR DAMPER SHALL REMAIN IN THE CLOSED POSITION. THE COOLING COIL VALVE WILL REMAIN CLOSED AND THE UNIT WILL CONTINUE TO OPERATE WITH THE FANS ONLY. ONCE THE RETURN AIR TEMPERATURE RISES ABOVE THE MORNING WARM UP SETPOINT, THE UNIT WILL ENTER THE OCCUPIED MODE.

SETPOINTS

1. DISCHARGE AIR TEMPERATURE SETPOINT 55°F (ADJ)
2. SUPPLY STATIC PRESSURE 1" WC (ADJ)
3. MORNING WARM UP MODE SETPOINT 74°F (ADJ)
4. OCCUPIED COOLING SETPOINT 74°F (ADJ)
5. OCCUPIED HEATING SETPOINT 70°F (ADJ)
6. UNOCCUPIED COOLING SETPOINT 80°F (ADJ)
7. UNOCCUPIED HEATING SETPOINT 65°F (ADJ)

SMOKE DETECTOR

UPON INDICATION OF SMOKE THE RETURN AIR SMOKE DETECTOR SHALL SHUT DOWN THE UNIT. BOTH SUPPLY AND RETURN FANS SHALL BE DE-ENERGIZED. THE OUTSIDE DAMPER SHALL RETURN TO ITS FULLY CLOSED POSITION. THE RETURN AIR DAMPER SHALL RETURN TO THE FULLY OPEN POSITION. THE UNIT SHALL REMAIN IN THIS STATE UNTIL THE SMOKE DETECTOR IS MANUALLY RESET.

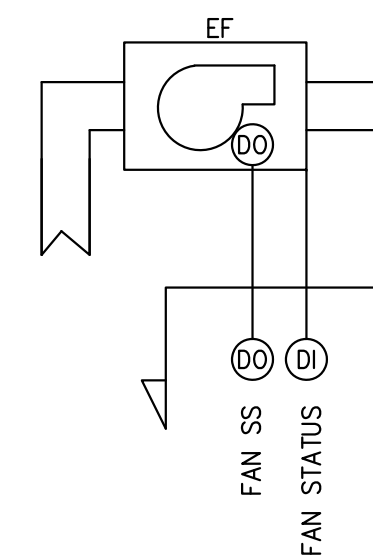
FREEZE PROTECTION

UPON DETECTION OF A FREEZING POTENTIAL THE FREEZE PROTECTION THERMOSTAT SHALL SHUT DOWN THE UNIT. BOTH SUPPLY AND RETURN FANS SHALL BE DE-ENERGIZED. THE OUTSIDE IT DAMPER SHALL RETURN TO ITS FULLY CLOSED POSITION. THE RETURN AIR DAMPER SHALL RETURN TO THE FULLY OPEN POSITION. THE HOT WATER COIL VALVE SHALL OPEN TO ITS FULLY OPEN POSITION. THE UNIT SHALL REMAIN IN THIS STATE UNTIL THE FREEZE PROTECTION THERMOSTAT IS MANUALLY RESET.

ALARMS

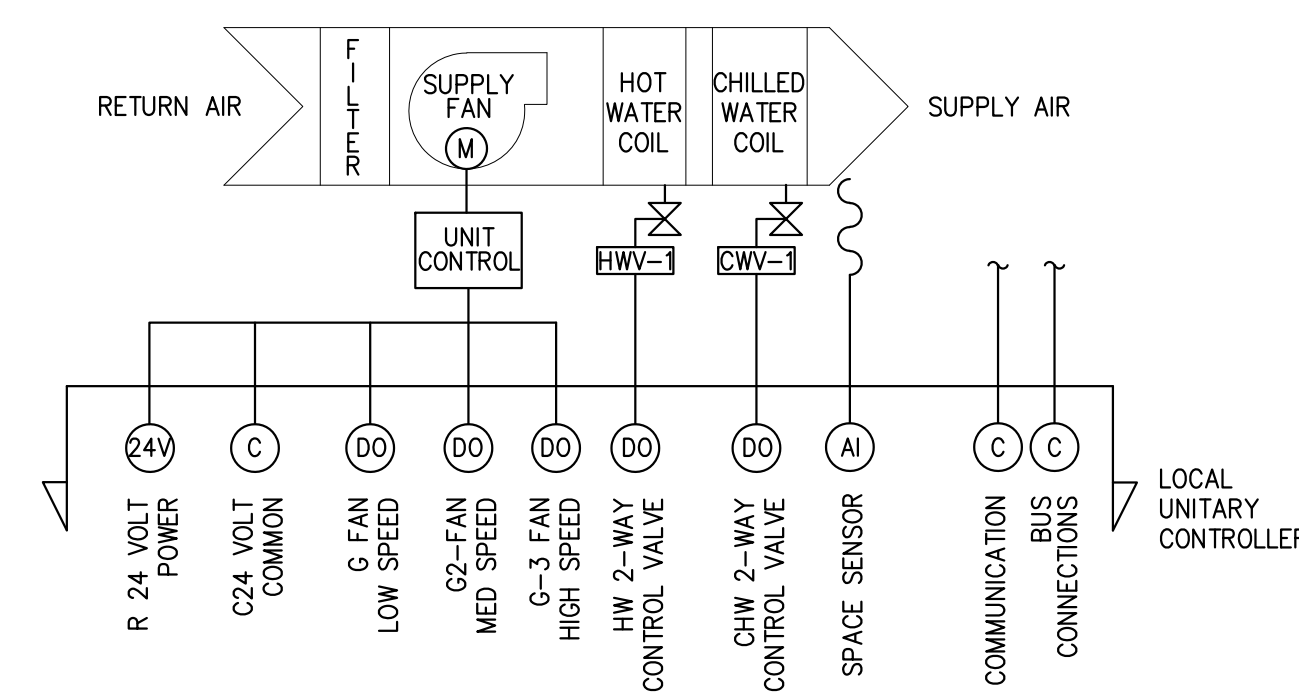
- ALARMS SHALL BE GENERATED THROUGH THE BMS SYSTEM AND SHALL INCLUDE:
1. SUPPLY FAN FAILURE
 2. RETURN FAN FAILURE
 3. SUPPLY TEMP TOO HIGH
 4. SUPPLY AIR TEMP TOO LOW
 5. RETURN AIR TOO HIGH
 6. UNABLE TO MAINTAIN STATIC PRESSURE
 7. MIXED AIR TEMP TOO LOW
 8. FREEZE PROTECTION THERMOSTAT ACTIVATED
 9. VFD FAULT
 10. SMOKE DETECTOR ACTIVATED

**AIR HANDLING UNIT (AHU-1,2)
CONTROL DIAGRAM AND SEQUENCE OF OPERATION**
NOT TO SCALE



TYPICAL CONTROL ARRANGEMENTS SHALL BE UTILIZED FOR EACH EXHAUST FAN. MULTIPLE UNITS CAN BE CONTROLLED BY COMMON CONTROL PANEL. BMS CONTRACTOR TO PROVIDE 24 VOLT CONTROL TRANSFORMER AND CIRCUIT WITH ADEQUATE CAPACITY TO POWER THE NUMBER OF RELAYS PER CONTROL PANEL. BMS CONTRACTOR TO PROVIDE RIB TYPE RELAYS AT EXHAUST FANS TO MAKE AND BREAK THE POWER CONNECTIONS. BMS CONTRACTOR SHALL ALSO PROVIDE ALL ELECTRICAL ENCLOSURES AS REQUIRED AT FAN LOCATIONS.

TYPICAL EXHAUST FAN CONTROL SEQUENCE
NOT TO SCALE



FAN COIL UNITS SEQUENCE OF OPERATION

TIME SCHEDULES

THE TIME SCHEDULES SHALL BE PROGRAMMED THROUGH THE MAIN FRONT END OPERATOR STATION AND STORED IN THE INDIVIDUAL CONTROLLERS. TIME SCHEDULES SHALL BE COORDINATED WITH THE BUILDING OWNER AT COMPLETION OF THE PROJECT, OR AS LISTED IN THE GENERAL BUILDING SEQUENCE OF OPERATION SCHEDULES.

OCCUPIED

WHEN INDEXED FOR THE OCCUPIED TIMES THE FAN COIL UNIT SHALL BE CONTROLLED BY THE LOCAL THERMOSTAT AS PROVIDED BY THE EQUIPMENT MANUFACTURER. THE LOCAL THERMOSTAT SHALL PROVIDE THE CHANGEOVER FROM HEATING TO COOLING. THE THERMOSTAT SHALL ALLOW THE USER TO PROGRAM THE FAN TO OPERATE. THE FAN CONTINUOUSLY OR CYCLE THE FAN UPON CALL FOR HEATING OR COOLING. THE THERMOSTAT SHALL ALSO PROVIDE CONTROL OF THE UNIT BASED ON THE ROOM TEMPERATURE. ROOM TEMPERATURES SHALL BE AS SCHEDULED BELOW. DURING HEATING AND COOLING CYCLES THE FAN SHALL BE PROGRAMMABLE TO AUTOMATICALLY SWITCH FAN SPEEDS BASED ON ROOM LOAD.

UNOCCUPIED

WHEN THE FAN COIL UNIT IS DE-ENERGIZED THE FAN MOTOR SHALL BE DE-ENERGIZED TO STOP THE AIRFLOW. THE HEATING VALVE SHALL MOVE TO THE FULL CLOSED POSITION AND THE COOLING VALVE SHALL MOVE TO THE FULL CLOSED POSITION. IF THE ROOM TEMPERATURE RISES ABOVE THE UNOCCUPIED COOLING SETPOINT OR FALLS BELOW THE ROOM UNOCCUPIED HEATING TEMPERATURE SETPOINT THE UNIT SHALL BE CYCLED TO PROVIDE HEATING AND COOLING ACCORDINGLY. ONCE THE TEMPERATURES ARE SATISFIED THE UNIT SHALL RETURN TO THE UNOCCUPIED MODE.

SETPOINTS

1. OCCUPIED COOLING SETPOINT 74°F (ADJ)
2. OCCUPIED HEATING SETPOINT 70°F (ADJ)
3. UNOCCUPIED COOLING SETPOINT 80°F (ADJ)
4. UNOCCUPIED HEATING SETPOINT 65°F (ADJ)

**TYPICAL FAN COIL UNIT CONTROL DIAGRAM
AND SEQUENCE OF OPERATION**
NOT TO SCALE

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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

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ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING BUSINESS
A COMPANY OF NETTA ARCHITECTS, LLC
1000 ROUTE 22 WEST, MOUNTAINVIEW, NEW JERSEY 07092
TEL: 973.578.0008 FAX: 973.578.1081
WWW.NETTAARCHITECTS.COM

JOSEPH J. HENDERSON, PE
NJ License No. 36087



PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**MECHANICAL - CONTROL DIAGRAMS
(SHEET 1)**

SUBMISSIONS

DATE	DESCRIPTION	BY	CHKD
9.25.15	95% CD SUBMIT	KD	FM
09.07.17	ISSUED FOR BID	KD	FM

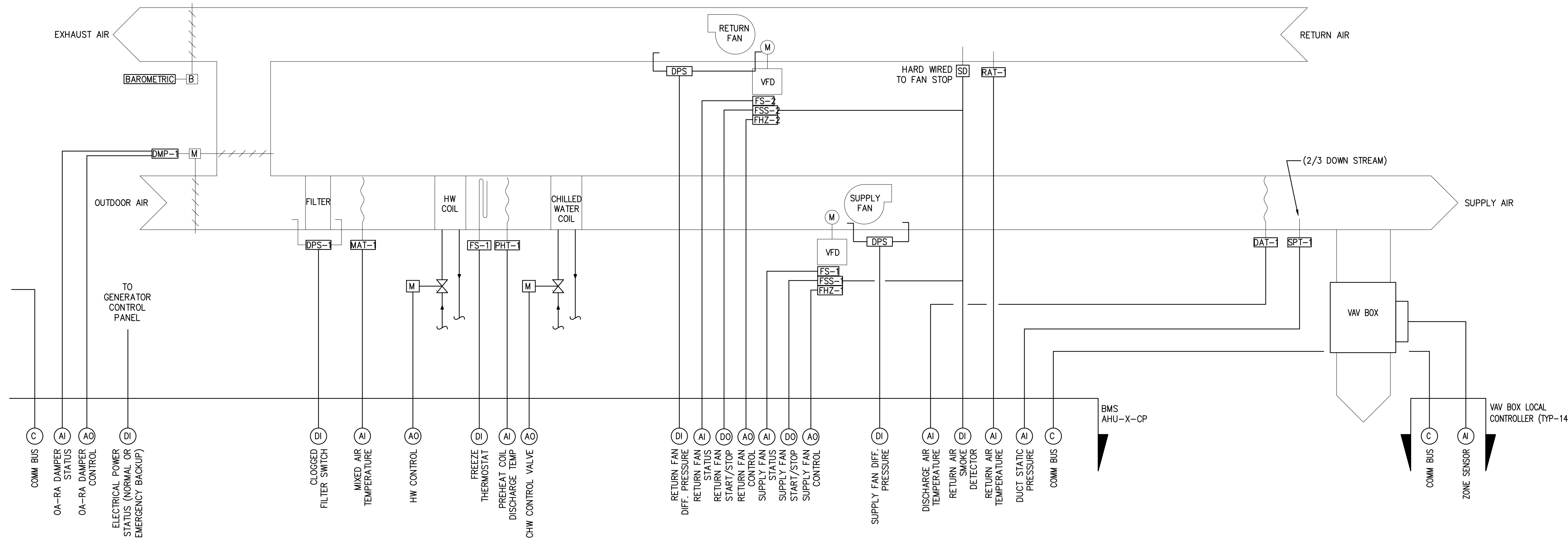
REVISIONS

DATE	DESCRIPTION	BY	CHKD

DATE

09-25-15
AS SHOWN
DRWN BY RB
CHKD BY NJN
JOB NO 2141152
SHEET: _ OF:
DWG. NO

M.701



TYPICAL SEQUENCE OF OPERATION

TIME SCHEDULES

THE TIME SCHEDULES SHALL BE PROGRAMMED THROUGH THE MAIN FRONT END OPERATOR STATION AND STORED IN THE INDIVIDUAL CONTROLLERS. TIME SCHEDULES SHALL BE COORDINATED WITH THE BUILDING OWNER AT COMPLETION OF THE PROJECT, OR AS LISTED IN THE GENERAL BUILDING SEQUENCE OF OPERATION SCHEDULES.

SYSTEM DE-ENERGIZED

WHEN THE SYSTEM IS DE-ENERGIZED, THE OUTDOOR AIR AND EXHAUST DAMPERS SHALL CLOSE, THE RETURN AIR DAMPER SHALL OPEN, THE SUPPLY AND RETURN AIR FANS SHALL BE DE-ENERGIZED.

SYSTEM ENERGIZED

OCCUPIED MODE
THE DAYS AND TIMES GOVERNING THIS MODE OF OPERATION SHALL BE DICTATED BY THE OWNER AND PROGRAMMED INTO THE BMS SYSTEM.

THE BMS SYSTEM SHALL INITIATE THE OCCUPIED MODE. THE OUTDOOR AIR DAMPER SHALL OPEN TO ITS MINIMUM VENTILATION POSITION, AND THE RETURN AIR DAMPER SHALL POSITION ITSELF ACCORDINGLY. THE SUPPLY AIR FAN SHALL START. THE SUPPLY AIR FAN SHALL RAMP UP OR DOWN VIA THE VARIABLE FREQUENCY DRIVE (VFD) MAINTAINING A CONSTANT STATIC PRESSURE OF 1.0" W.G. (ADJUSTABLE) AT THE POINT WHERE THE DUCT-MOUNTED STATIC PRESSURE SENSOR IS LOCATED. RETURN FAN SHALL START AND MAINTAIN THE REQUIRED AIRFLOW TO MAINTAIN A SLIGHT POSITIVE PRESSURE (0.01" WC) WITHIN THE BUILDING.

DISCHARGE AIR TEMPERATURE CONTROL

THE AHU SHALL MAINTAIN CONSTANT DISCHARGE AIR TEMPERATURE AS DICTATED BY THE DISCHARGE AIR TEMPERATURE SETPOINT. THE CHILLED WATER CONTROL VALVE SHALL BE MODULATED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE. THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET BASED ON THE DISCHARGE AIR TEMPERATURE RESET SCHEDULE LISTED IN THE GENERAL BUILDING SEQUENCE OF OPERATION AND SCHEDULES.

THE HOT WATER COIL VALVE SHALL BE MODULATED TO MAINTAIN A MINIMUM OF 55°F LEAVING AIR TEMPERATURE. THE CONTROL VALVE SHALL BE MODULATED TO PROVIDE HIGHER LEAVING AIR TEMPERATURES AS REQUIRED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT.

A RETURN AIR DUCT MOUNTED SENSOR SHALL MONITOR THE RETURN AIR TEMPERATURE. THE BMS SHALL RESET SUPPLY TEMPERATURE TO PROVIDE ADEQUATE COOLING.

ECONOMIZER MODE

WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE 55°F, CHILLED WATER SHALL BE PROVIDED FOR COOLING. WHEN THE OUTDOOR AIR TEMPERATURE IS AT OR BELOW 55°F, THE OUTDOOR AIR DAMPER SHALL BE MODULATED OPEN TO PROVIDE FREE COOLING. AS THE OUTDOOR AIR DAMPER MODULATES OPEN, THE RETURN AIR DAMPER SHALL CORRESPONDINGLY MODULATE TOWARD ITS CLOSED POSITION. THE LOCAL CONTROLS SHALL LIMIT THE MIXED AIR TEMPERATURE FROM FALLING BELOW 52°F.

SPACE TEMPERATURE CONTROL

THE SPACE TEMPERATURE FOR EACH ZONE IS CONTROLLED BY THE VARIABLE AIR VOLUME (VAV) BOXES WHICH HAVE THEIR INDIVIDUAL TEMPERATURE SENSORS.

UNOCCUPIED MODE

THE DAYS AND TIMES GOVERNING THIS MODE OF OPERATION SHALL BE DICTATED BY THE OWNER AND PROGRAMMED INTO THE BMS SYSTEM.

WHEN THE SYSTEM IS INDEXED TO THE UNOCCUPIED MODE THE OUTDOOR AIR DAMPER

SHALL MOVE TO ITS FULLY CLOSED POSITION, THE SUPPLY FAN AND RETURN FAN SHALL BE DE-ENERGIZED AND THE VAV BOXES SHALL MOVE TO THEIR FULLY OPEN POSITION.

IF DURING THE UNOCCUPIED MODE THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING TEMPERATURE SETPOINT THE UNIT SHALL START AND THE COOLING COIL VALVE SHALL MOVE TO THE OPEN POSITION TO MAINTAIN THE DISCHARGE AIR TEMPERATURE CONTROL SETPOINT TO PROVIDE COOLING FOR THE SPACE. ONCE THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED SPACE TEMPERATURE SETPOINT, THE UNIT SHALL RETURN TO THE UNOCCUPIED MODE.

IF DURING THE UNOCCUPIED MODE THE SPACE TEMPERATURE RISES ABOVE THE SPACE UNOCCUPIED HEATING TEMPERATURE SETPOINT THE UNIT SHALL START AND THE HEATING COIL VALVE SHALL MOVE TO THE OPEN POSITION TO MAINTAIN THE DISCHARGE AIR TEMPERATURE CONTROL SETPOINT TO PROVIDE HEATING FOR THE SPACE. ONCE THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED HEATING TEMPERATURE SETPOINT, THE UNIT SHALL RETURN TO THE UNOCCUPIED MODE.

MORNING WARM UP

IF THE RETURN AIR TEMPERATURE IS BELOW THE MORNING WARM UP SETPOINT WHEN THE UNIT IS INITIATED TO BEGIN THE OCCUPIED MODE THE UNIT SHALL ENTER THE MORNING WARM UP MODE. THE OUTDOOR AIR DAMPER SHALL REMAIN IN THE CLOSED POSITION. THE COOLING COIL VALVE WILL REMAIN CLOSED AND THE UNIT WILL CONTINUE TO OPERATE WITH THE FANS ONLY. ONCE THE RETURN AIR TEMPERATURE RISES ABOVE THE MORNING WARM UP SETPOINT, THE UNIT WILL ENTER THE OCCUPIED MODE.

SETPOINTS

1. DISCHARGE AIR TEMPERATURE SETPOINT 55°F (ADJ)
2. SUPPLY STATIC PRESSURE 1" WC (ADJ)
3. MORNING WARM UP MODE SETPOINT 74°F (ADJ)
4. OCCUPIED COOLING SETPOINT 74°F (ADJ)
5. OCCUPIED HEATING SETPOINT 70°F (ADJ)
6. UNOCCUPIED COOLING SETPOINT 80°F (ADJ)
7. UNOCCUPIED HEATING SETPOINT 65°F (ADJ)

SMOKE DETECTOR

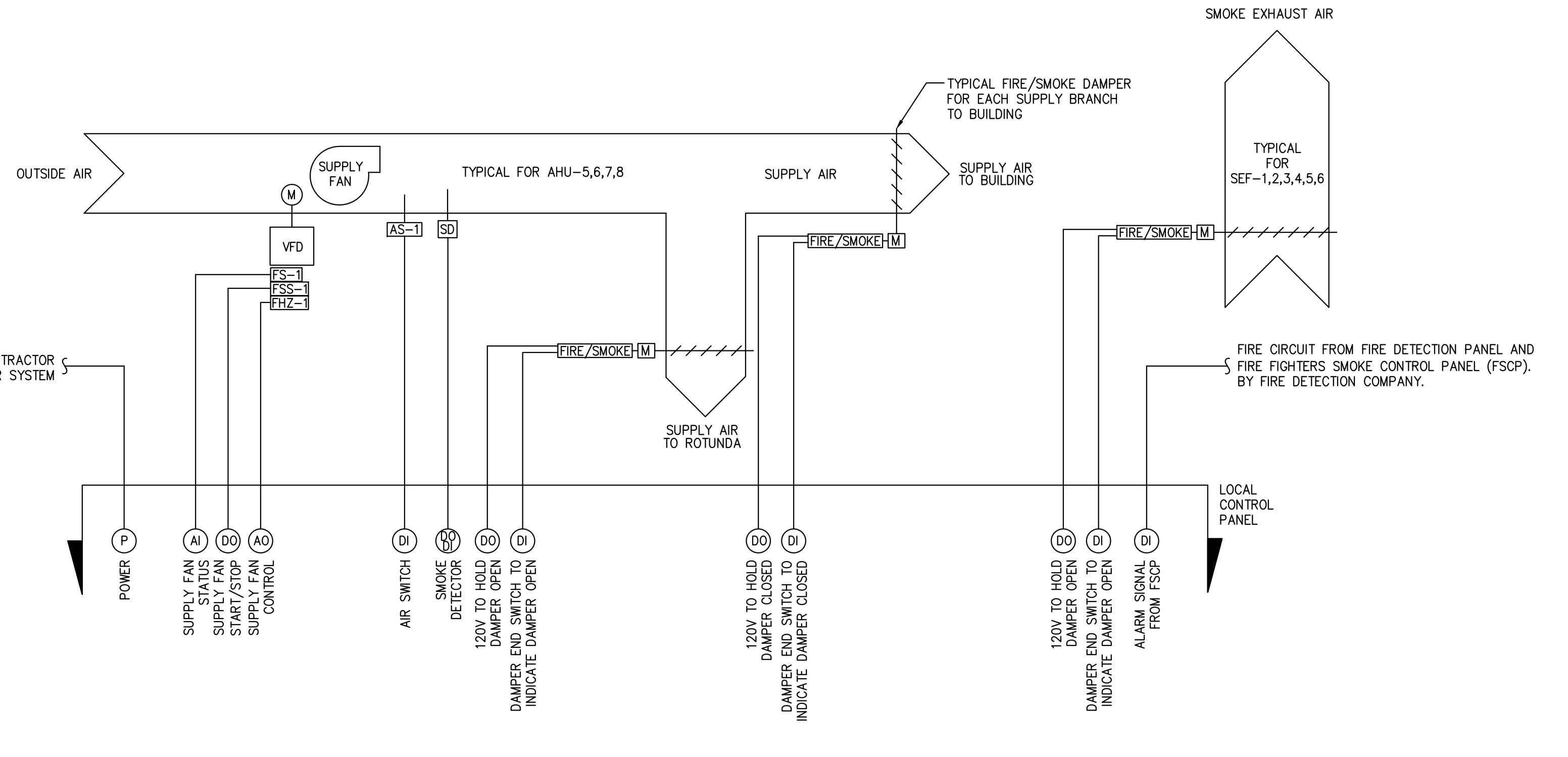
UPON INDICATION OF SMOKE THE UNIT SHALL BE USED FOR THE SMOKE PURGE SYSTEM. THE UNIT SHALL PROVIDE 100% OUTSIDE AIR AND THE RETURN FAN SHALL DE-ENERGIZE. REFER TO SMOKE PURGE CONTROL DIAGRAM. THE UNIT SHALL REMAIN IN THIS STATE UNTIL IT IS MANUALLY RESET FOR NORMAL OPERATION.

FREEZE PROTECTION

UPON DETECTION OF A FREEZING POTENTIAL, THE FREEZE PROTECTION THERMOSTAT SHALL SHUT DOWN THE UNIT. BOTH SUPPLY AND RETURN FANS SHALL BE DE-ENERGIZED. THE OUTSIDE AIR DAMPER SHALL RETURN TO ITS FULLY CLOSED POSITION. THE RETURN AIR DAMPER SHALL RETURN TO THE FULLY OPEN POSITION. THE HOT WATER COIL VALVE SHALL OPEN TO ITS FULLY OPEN POSITION. THE UNIT SHALL REMAIN IN THIS STATE UNTIL THE FREEZE PROTECTION THERMOSTAT IS MANUALLY RESET.

ALARMS

- ALARMS SHALL BE GENERATED THROUGH THE BMS SYSTEM AND SHALL INCLUDE:
1. SUPPLY FAN FAILURE
 2. RETURN FAN FAILURE
 3. SUPPLY TEMP TOO HIGH
 4. SUPPLY AIR TEMP TOO LOW
 5. RETURN AIR TOO HIGH
 6. UNABLE TO MAINTAIN STATIC PRESSURE
 7. MIXED AIR TEMP TOO LOW
 8. FREEZE PROTECTION THERMOSTAT ACTIVATED
 9. VFD FAULT
 10. SMOKE DETECTOR ACTIVATED



NOTES:

1. MECHANICAL CONTRACTOR SHALL PROVIDE A CONTROL PANEL SUBMITTAL FOR APPROVAL TO THE ENGINEER. CONTRACTOR IS RESPONSIBLE TO COORDINATE CONTROLS WITH THE FIRE DETECTION CONTRACTOR AND ELECTRICAL CONTRACTOR PRIOR TO PANEL FABRICATION.
2. CONTROL PANEL SHALL INCLUDE SWITCHES, SENSOR OR DEVICES AS REQUIRED TO PROVIDE A PROOF OF OPERATION THAT SHALL BE RELAYED BACK TO THE FSCPI.
3. ALL PARTS MATERIAL, CONTROL WIRING, ETC. SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR. POWER WIRING SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
4. CONTROLS ARRANGEMENT, SET UP AND ALL TESTING SHALL ADHERE TO THE LATEST VERSION OF THE NFPA CODE SECTION 92A.

SEQUENCE OF OPERATION:

1. ONCE THE FIRE ALARM PANEL IS INDEXED FOR A SMOKE PURGE CONDITION, AHU-5,6,7,8 SHALL ENERGIZE ITS SUPPLY FAN.
2. THE FIRE/SMOKE DAMPERS AT THE ROTUNDA SUPPLY GRILLES SHALL OPEN. ALL OTHER FIRE/SMOKE DAMPERS AT THE SUPPLY DUCTS SHALL CLOSE. RETURN DUCT DAMPERS SHALL ALSO CLOSE.
3. THE SMOKE EXHAUST FANS (SEF-1,2,3,4,5,6) SHALL ENERGIZE.

**AIR HANDLING UNIT (AHU-5,6,7,8)
CONTROL DIAGRAM AND SEQUENCE OF OPERATION**
NOT TO SCALE

SMOKE PURGE CONTROL DIAGRAM
NOT TO SCALE

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NJ License No. AI 12541

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NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
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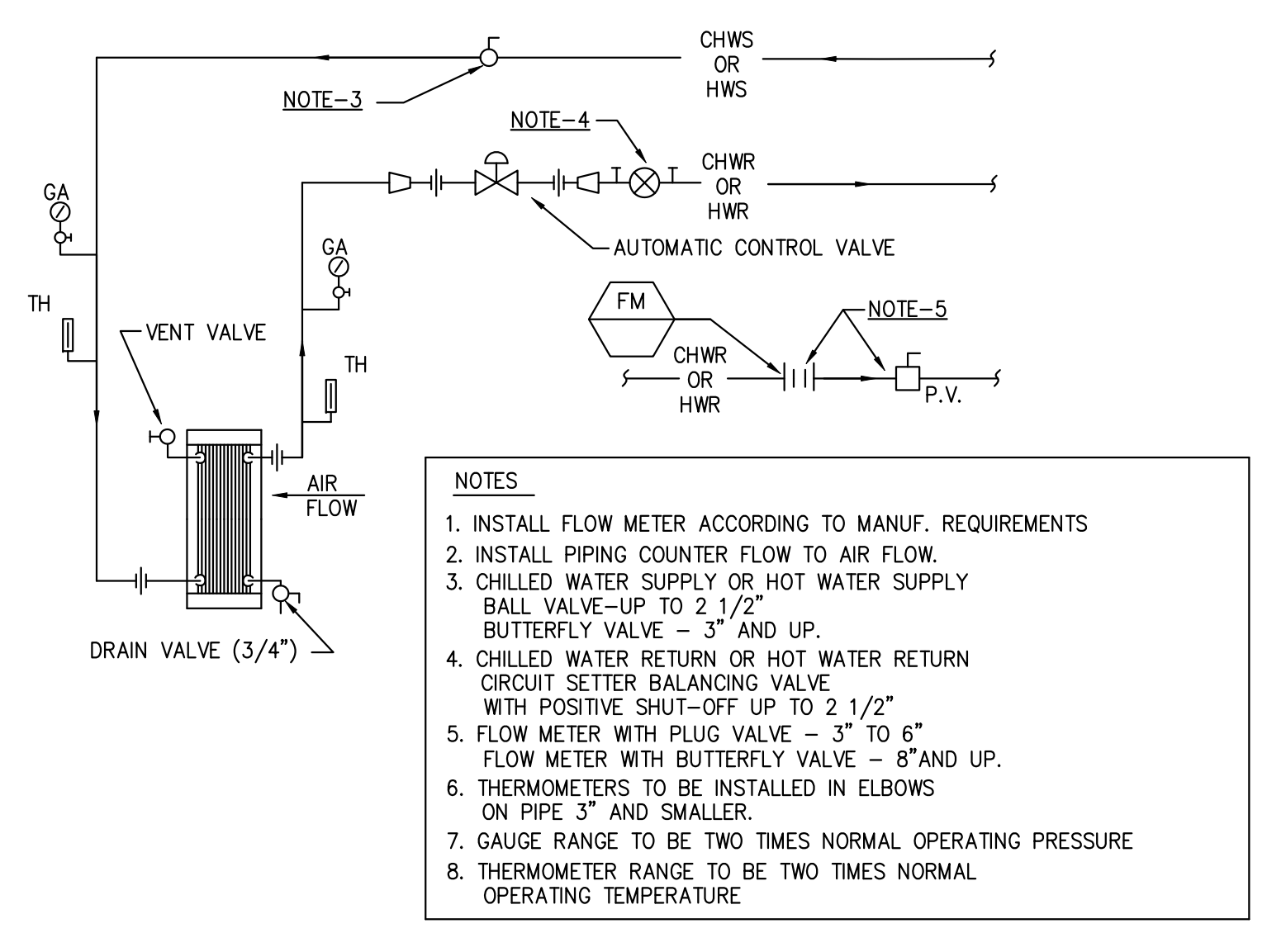


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

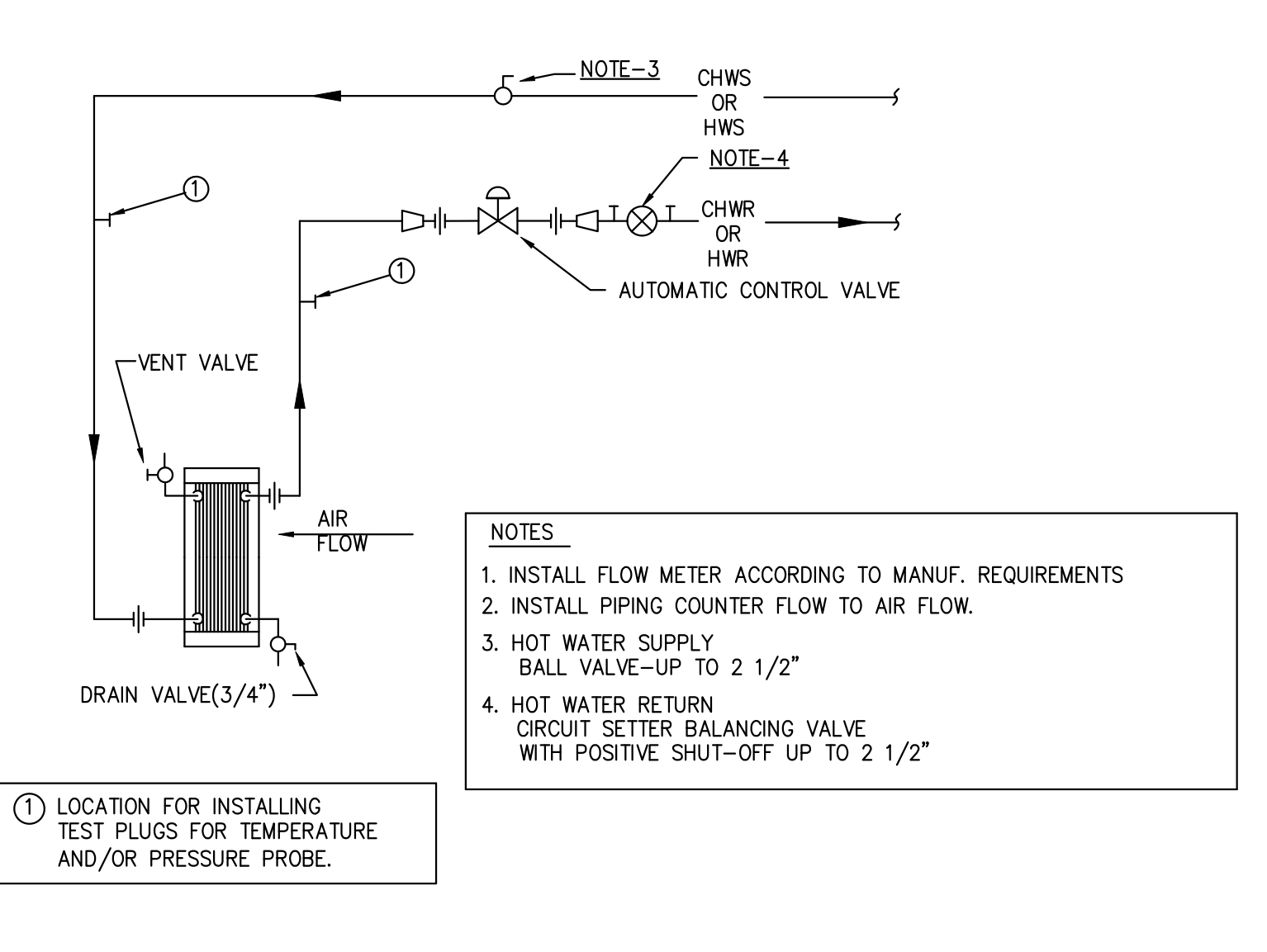
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MECHANICAL - CONTROL DIAGRAMS (SHEET 3)

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
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09.07.17	ISSUED FOR BID	KD	FM					AS SHOWN
								DRWN BY RB
								CHKD BY NJN
								JOB NO 2141152
								SHEET: _ OF:
								DWG. NO

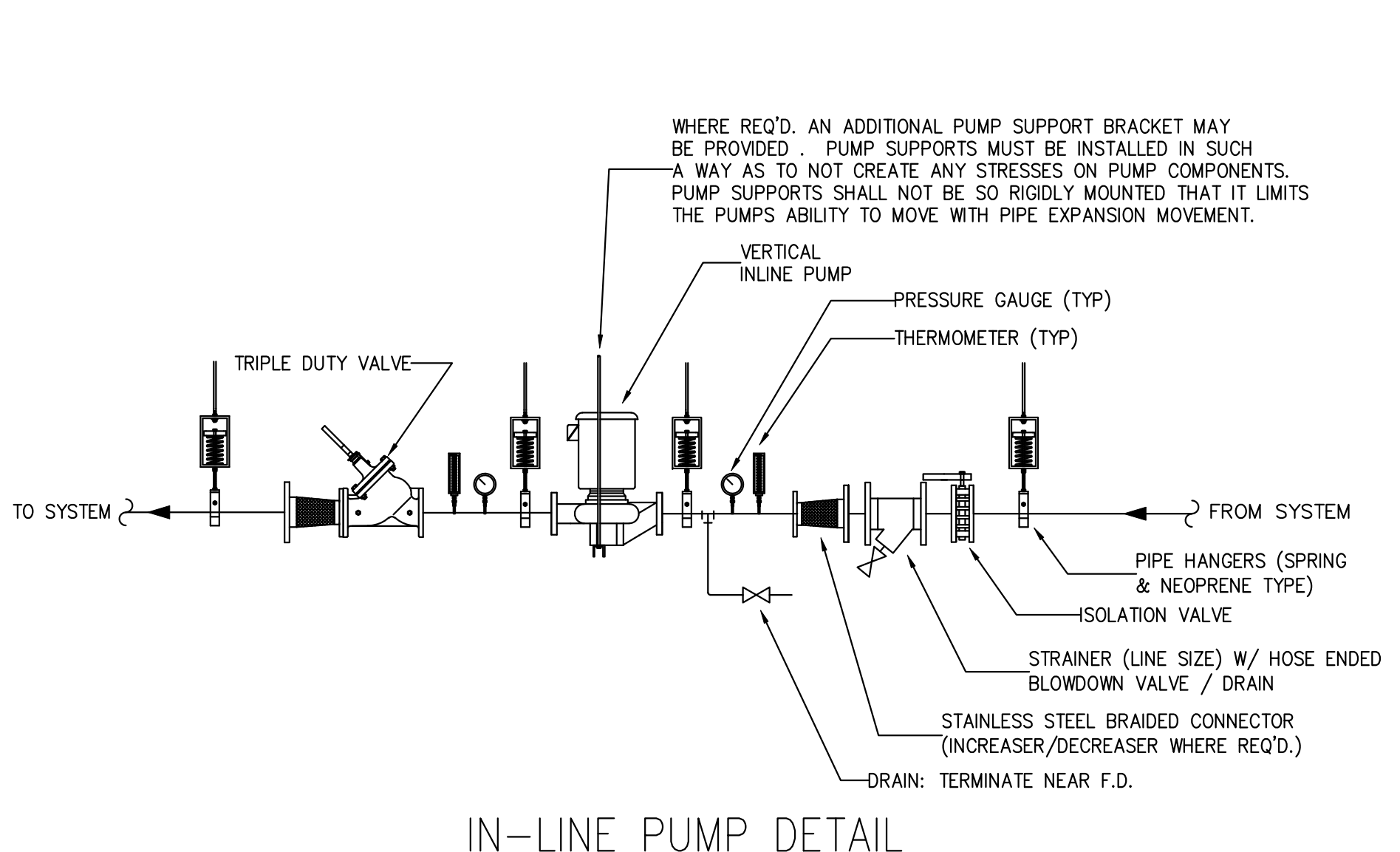
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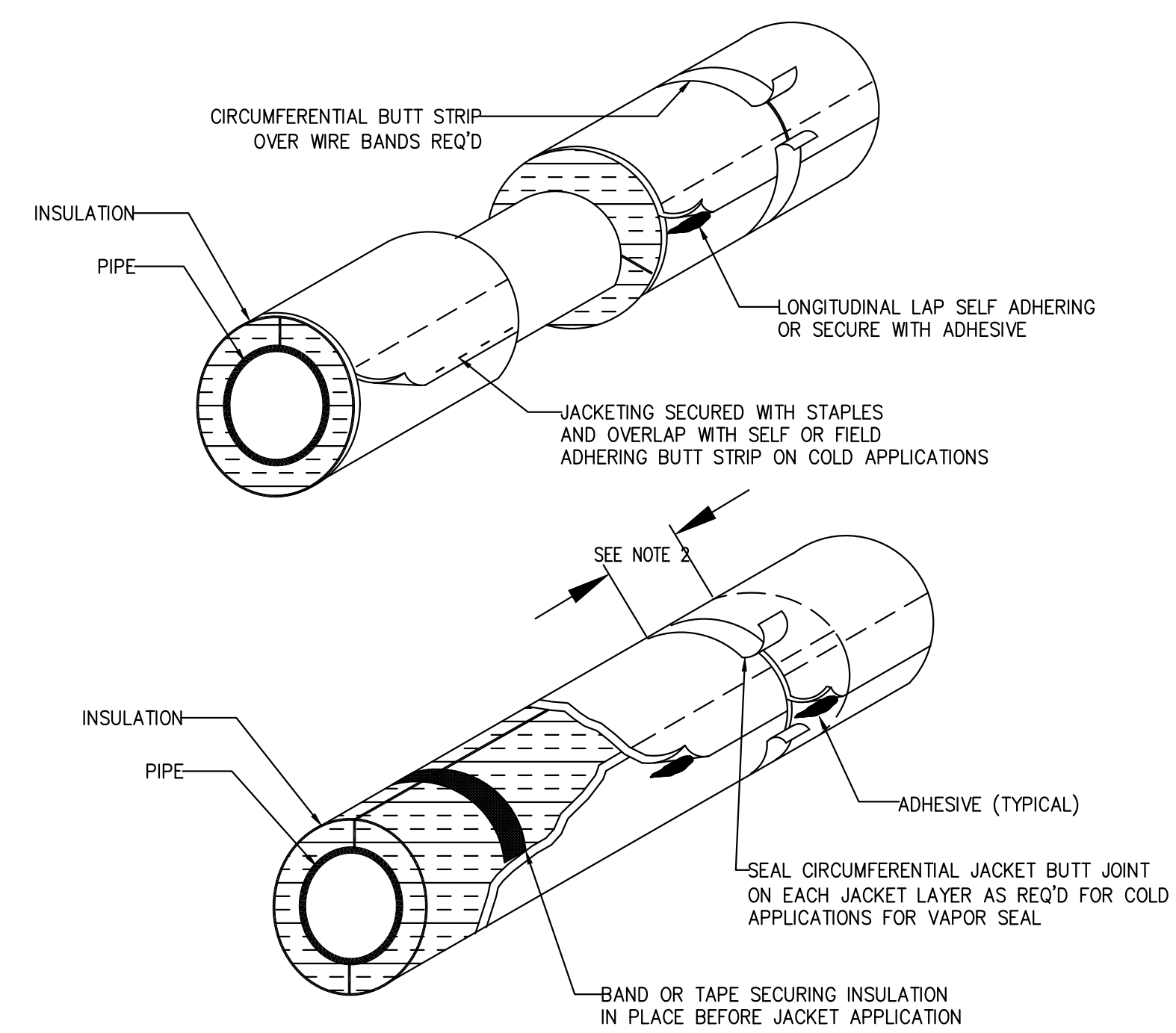
PIPING ARRANGEMENT -
CHILLED OR HOT WATER COIL
(2-WAY AUTOMATIC CONTROL VALVE)
SCALE: NONE



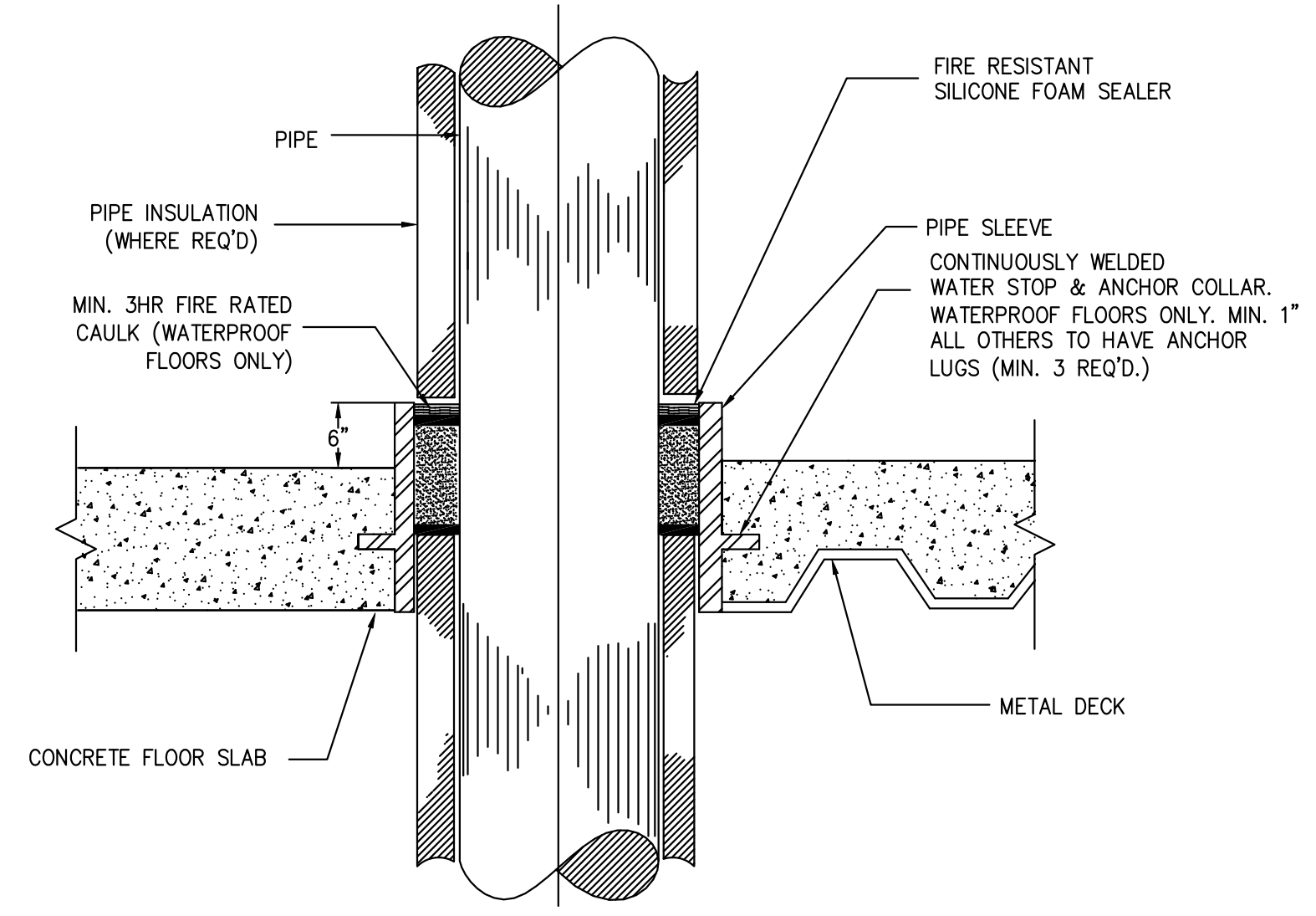
PIPING ARRANGEMENT -
HOT WATER COIL - IN VAV BOX
(2-WAY AUTOMATIC CONTROL VALVE)
SCALE: NONE



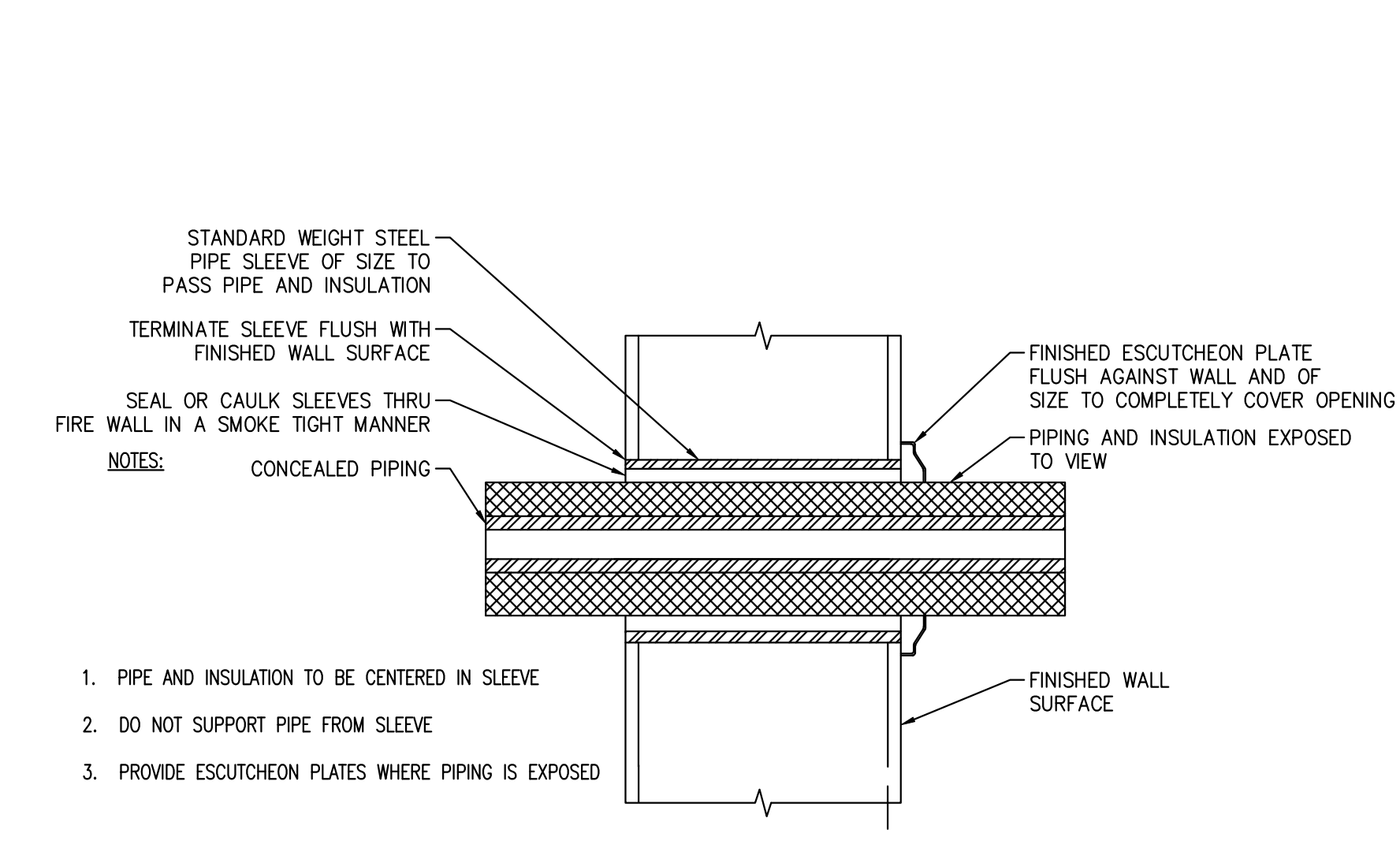
IN-LINE PUMP DETAIL
SCALE: NONE



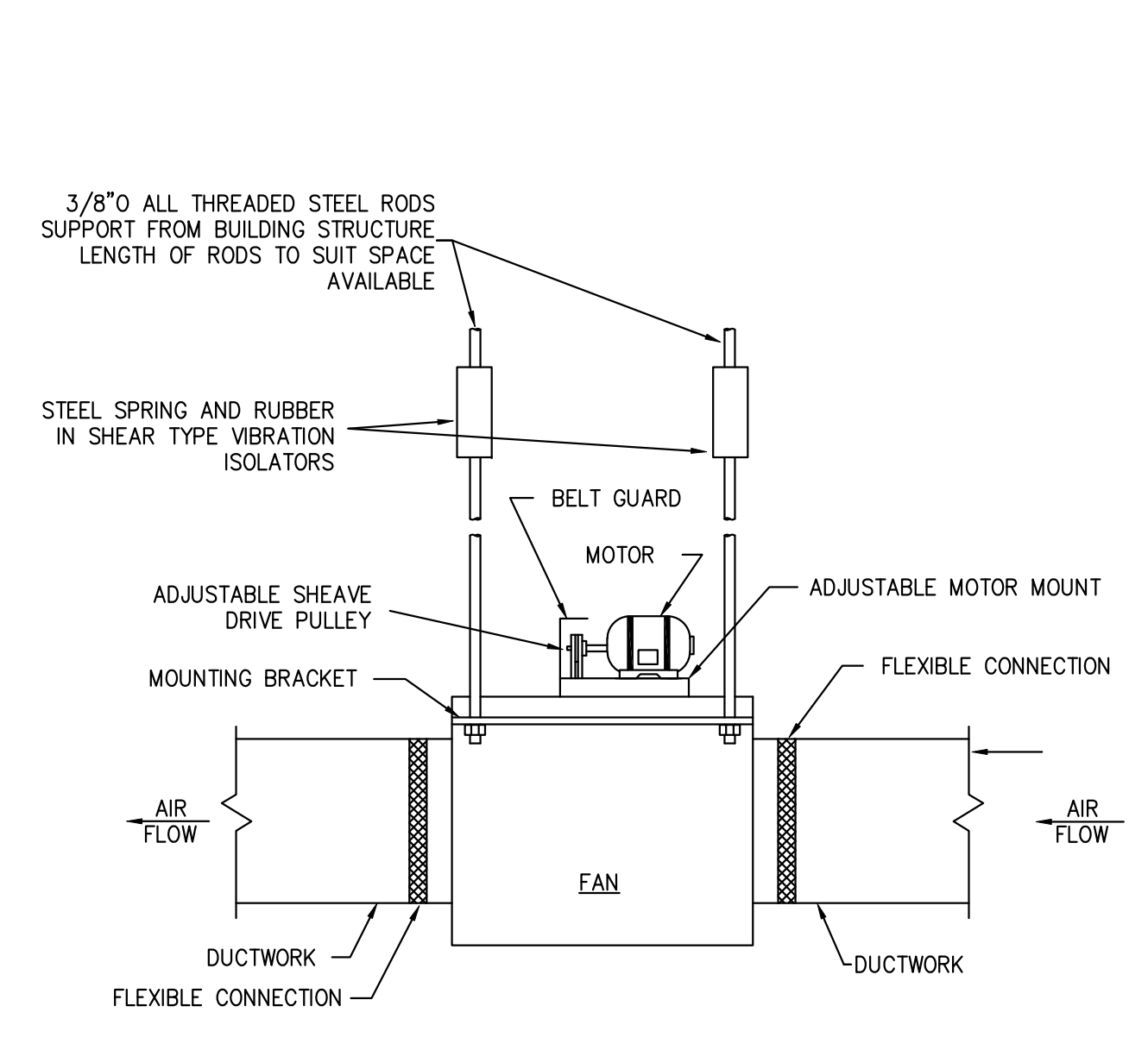
FACTORY AND FIELD APPLIED NON-METALLIC
PIPE JACKETING RUNOUTS ABOVE CEILING
SCALE: NONE



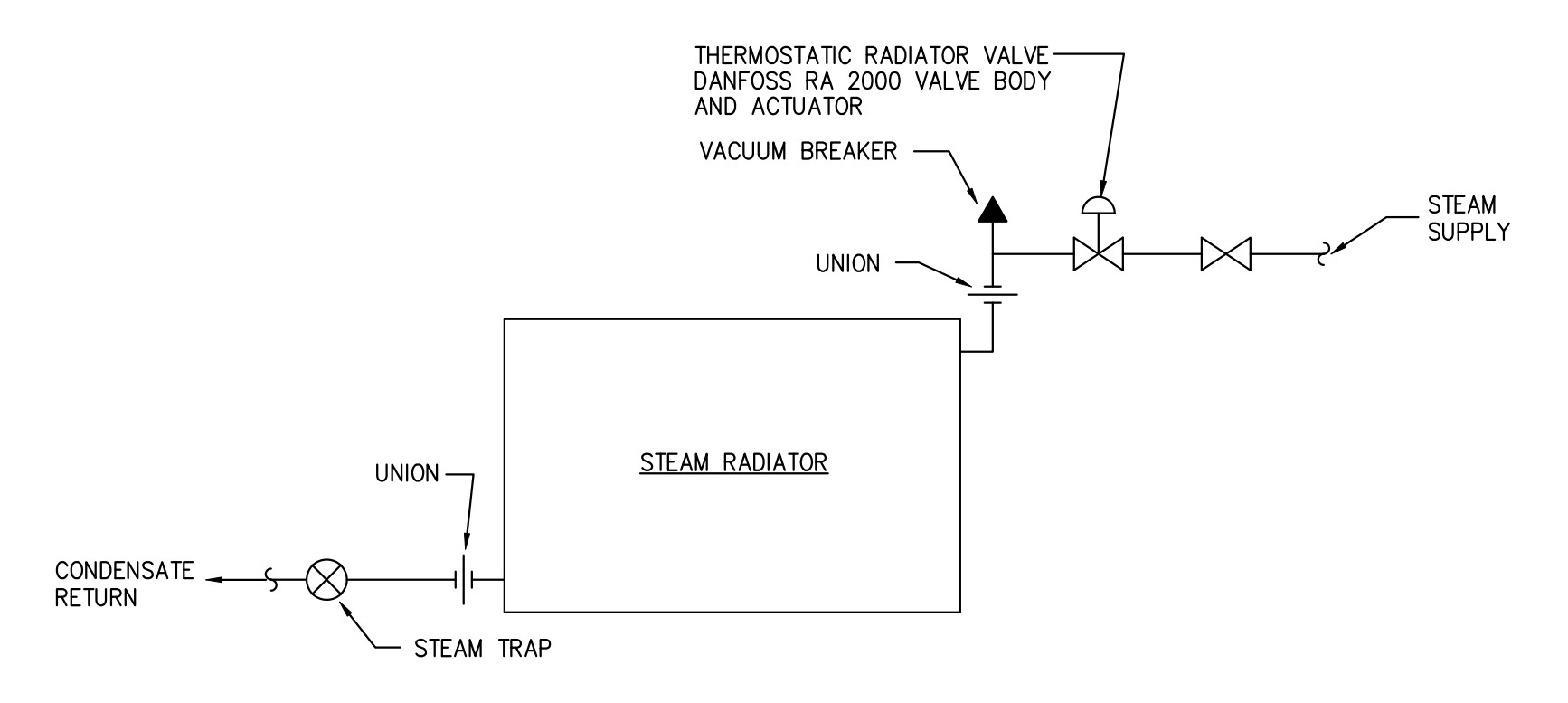
PIPE SLEEVE THROUGH FLOOR DETAIL
SCALE: NONE



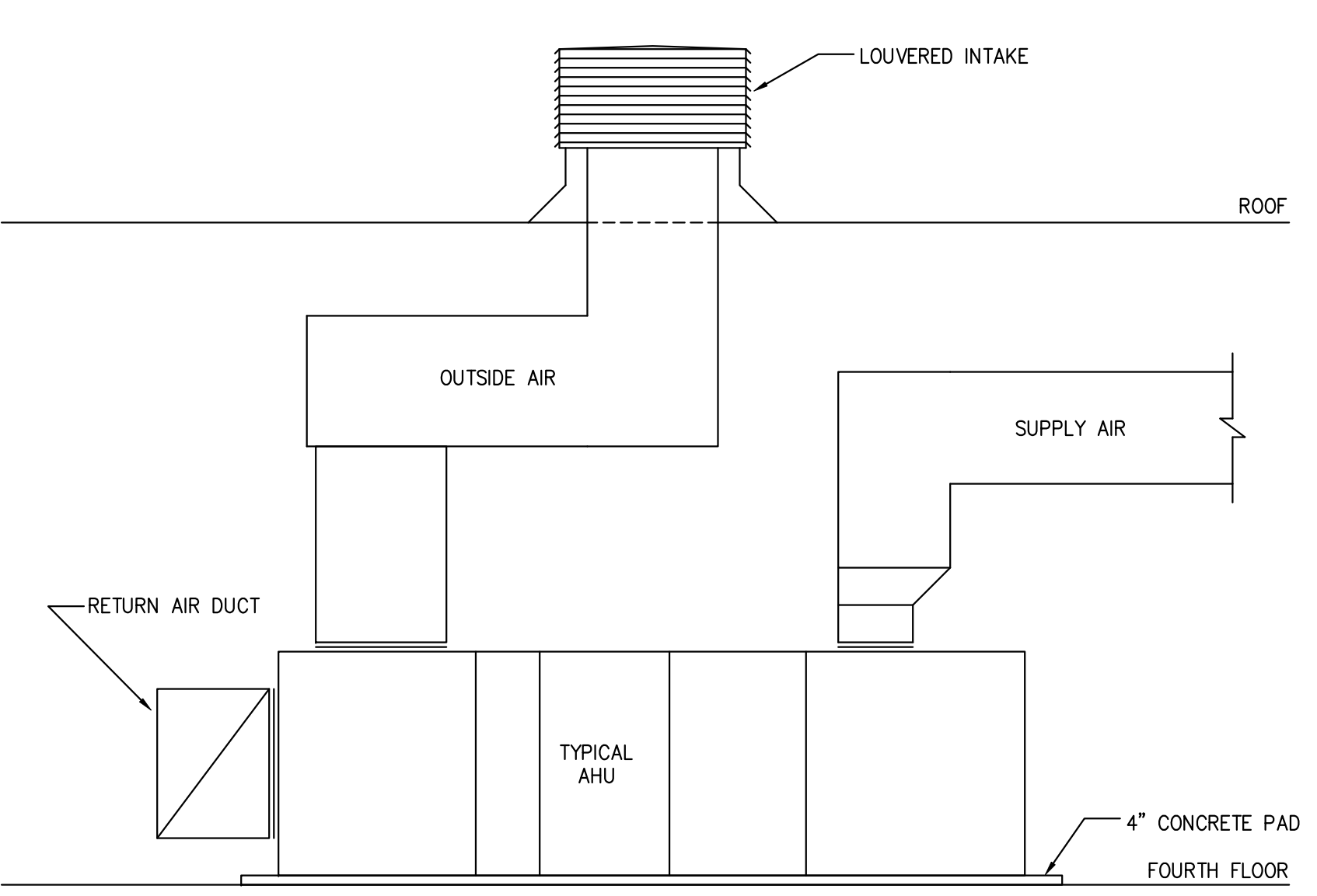
TYPICAL DETAIL
PIPE THROUGH INTERIOR WALL
SCALE: NONE



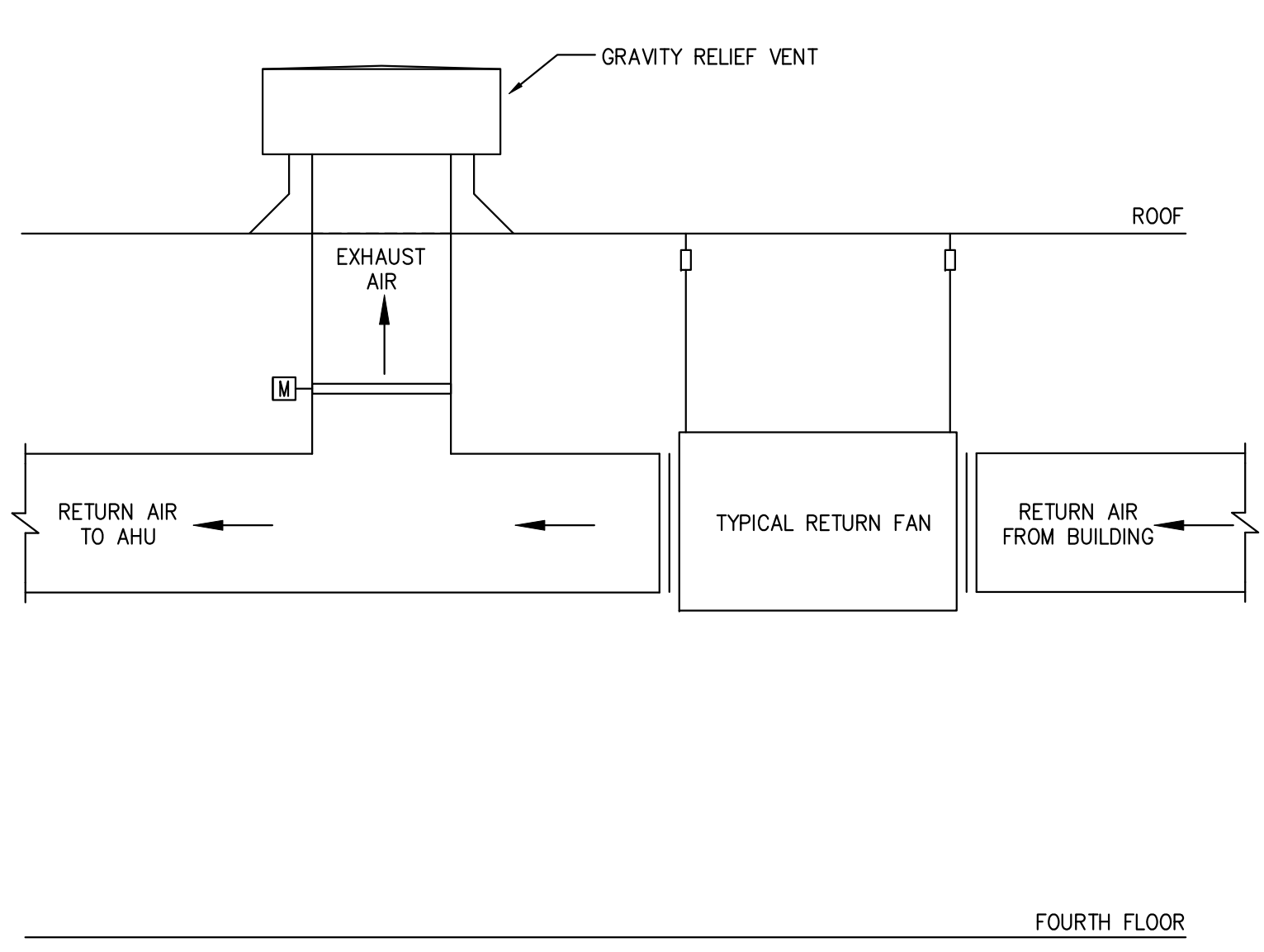
TYPICAL RETURN FAN DETAIL
SCALE: NONE



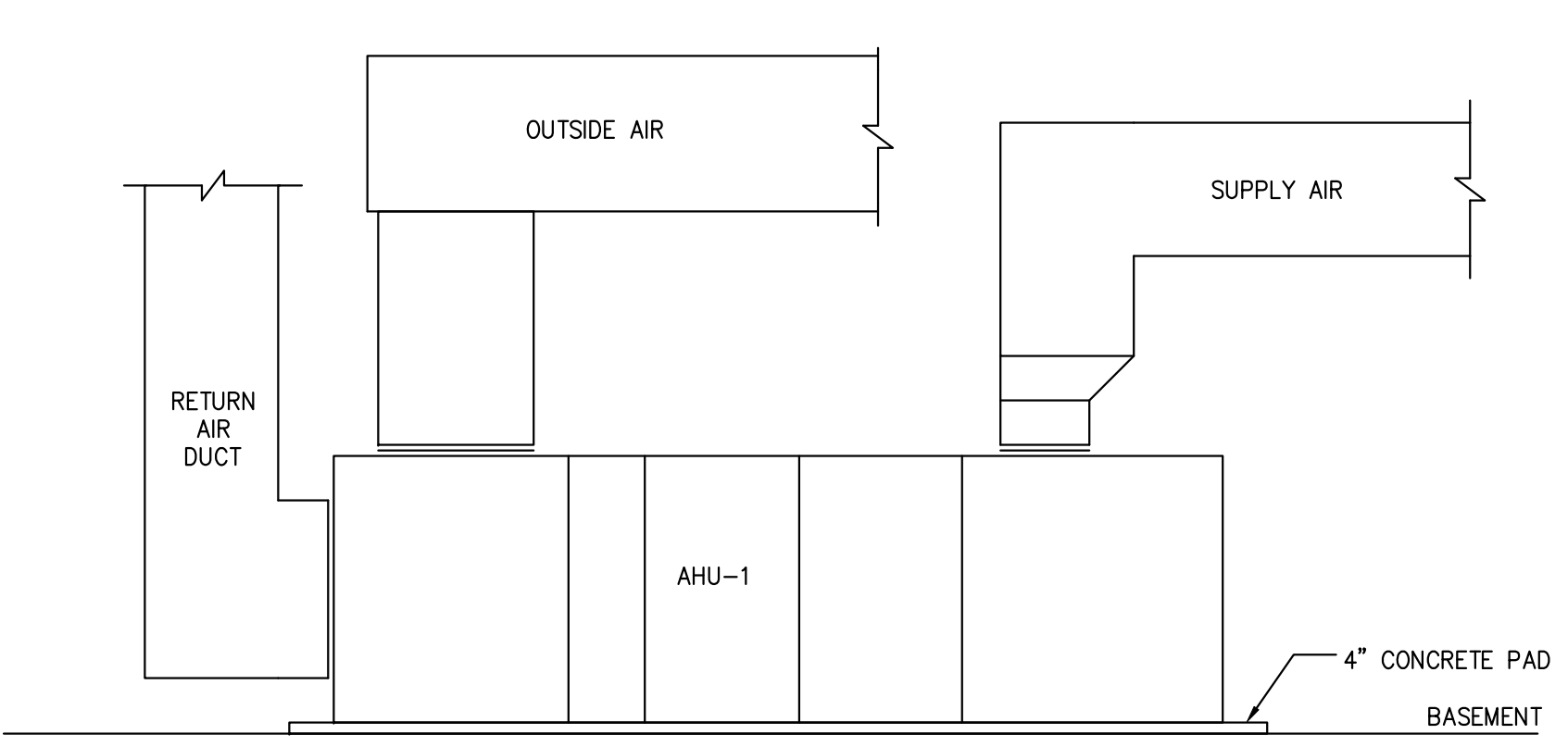
TYPICAL STEAM RADIATOR DETAIL
SCALE: NONE



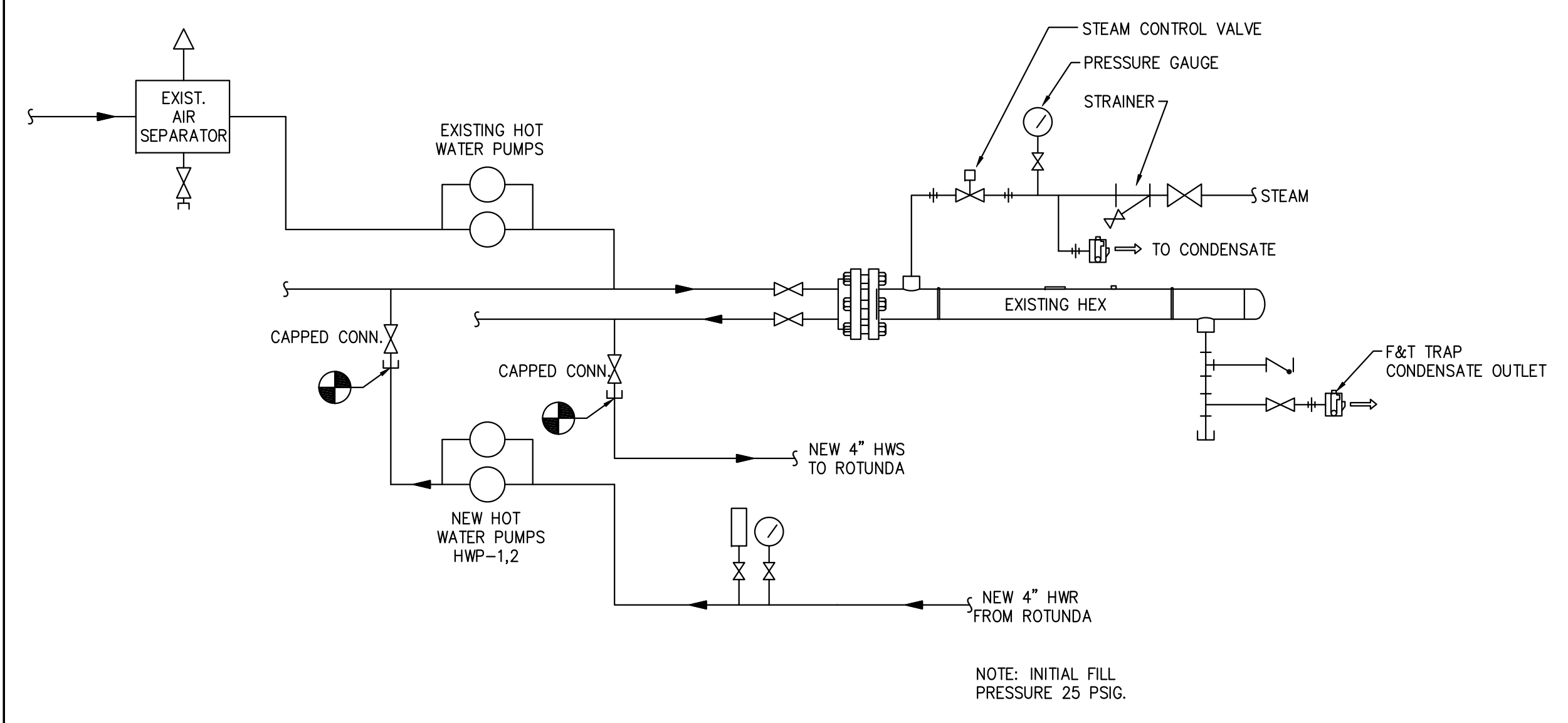
AHU-5,6,7,8 DETAIL
SCALE: NONE



TYPICAL RETURN FAN DUCT DETAIL
SCALE: NONE



AHU-1 DETAIL
SCALE: NONE



NEW HOT WATER PUMPS PIPING DETAIL
SCALE: NONE

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NJ License No. AI 14394



PROJECT:
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**MECHANICAL - DETAILS
(SHEET 2)**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY NJN
									JOB NO 2141152
									SHEET: _ OF:
									DWG. NO

M.802

ELECTRICAL PROJECT GENERAL NOTES:

- INSTALL ALL WORK IN ACCORDANCE WITH THE 2014 NATIONAL ELECTRIC CODE, NJ UNIFORM CONSTRUCTION CODE, AND ALL APPLICABLE STATE AND LOCAL CODES. WHERE THE PROJECT DRAWINGS AND/OR SPECIFICATIONS DIFFER FROM THE GOVERNING CODE(S), THE MORE STRINGENT REQUIREMENTS SHALL GOVERN THE INSTALLATION. BASE BID ACCORDINGLY.
- WHERE INFORMATION IN DIFFERENT PARTS OF THE CONTRACT DOCUMENTS ARE INTERPRETED IN DIFFERENT MANNER, THE MORE STRINGENT, IN CONTRAST, THE CONTRACTOR SHALL OBTAIN A WRITTEN INTERPRETATION FROM THE ENGINEER BEFORE COMMENCEMENT OF SUCH WORK. IN THE ABSENCE OF SUCH WRITTEN APPROVAL, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN. THE OWNER'S INTERPRETATION SHALL BE FINAL, AND SHALL NOT ENTITLE THE CONTRACTOR TO ANY ADDITIONAL COMPENSATION.
- AS A MINIMUM, INSTALL WORK IN ACCORDANCE WITH NECA 1-2010 STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION.
- WORK UNDER THIS CONTRACT INCLUDES THE FURNISHING OF EQUIPMENT, MATERIAL, TOOLS, TRANSPORTATION, SERVICES, SCAFFOLDING, SUPERVISION, LABOR AND OTHER APPURTENANCES REQUIRED FOR THE FABRICATION, INSTALLATION, OR APPLICATION AND COMPLETION OF THE WORK UNDER THIS SECTION AS SHOWN OR IMPLIED ON THE PROJECT DRAWINGS AND SPECIFICATIONS.
- ALL EQUIPMENT SUPPLIED SHALL BE UL LISTED AND/OR FACTORY MUTUAL (FM) APPROVED FOR ITS USE. INSTALLATION PRACTICES SHALL MAINTAIN THE UL AND/OR FM LABEL AND/OR LISTING OF ALL NEW AND/OR EXISTING, IMPACTED EQUIPMENT.
- PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL SUBMIT CUTSHEET INFORMATION, AND CALCULATIONS WHERE APPLICABLE, FOR ANY EQUIPMENT OR DEVICES THAT DIFFER FROM THOSE SPECIFIED ON PROJECT DRAWINGS OR SPECIFICATIONS PRIOR TO THE START OF WORK. ONLY SUBSTITUTIONS THAT REDUCE THE OWNER'S OVERALL INSTALLED COST OR PROVIDE A SUBSTANTIALLY BETTER FINISHED PROJECT WILL BE GRANTED.
- THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS, AND SHALL PAY ALL PERMIT FEES. CONTRACTOR SHALL OBTAIN ALL REQUIRED INSPECTIONS AS REQUIRED BY THE GOVERNING AUTHORITY.
- CONTRACTOR'S WORK SHALL COMPLY WITH ALL SAFETY RELATED WORK PRACTICES DETAILED IN THE LATEST EDITION OF NFPA 70E.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PLANNING HIS OWN WORK AND NOTIFY THE OWNER OR OTHER CONTRACTORS BY WRITTEN NOTICE OF IMPROPER WORK EXECUTION OR PLACEMENT OF RACEWAYS, WIRING, AND EQUIPMENT.
- UNDER NO CIRCUMSTANCES SHALL POWER BE BUILT TO ANY AREA WITHOUT PRIOR WRITTEN APPROVAL FROM BUILDING MANAGEMENT.
- THE CONTRACTOR SHALL DEVELOP A CLEAR UNDERSTANDING OF, AND SHALL ABIDE BY, ALL OWNER SITE AND SAFETY REQUIREMENTS/PROTOCOL.
- THE ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ALL WORK AS SHOWN ON THE PROJECT DRAWINGS AND SPECIFICATIONS WITH THE FOLLOWING SPECIFICATIONS:
 - THE PROJECT DRAWINGS ARE ONLY DIAGRAMMATIC IN NATURE AND ARE INTENDED TO OUTLINE THE BASIC SYSTEMS TO BE PROVIDED. THEREFORE, MINOR DETAILS AND APPURTENANCES MAY OR MAY NOT BE EXPLICITLY SHOWN. THE OMISSION OF A MINOR COMPONENT SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO FURNISH AND INSTALL ALL SUCH ITEMS NECESSARY TO PROVIDE A COMPLETE, OPERATIVE, AS-BUILT CODE COMPLIANT SYSTEM AS IS INTENDED. IF THERE ARE ANY DOUBTS TO THE EXTENT OR SCOPE OF THE WORK REQUIRED, THE ENGINEER SHALL BE CONTACTED TO PROVIDE CLARIFICATION DURING THE BID PHASE.
 - THE PROJECT DRAWINGS SHOW INTENDED EQUIPMENT LOCATIONS; THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MINOR ADJUSTMENTS OR RELOCATION NECESSARY DUE TO THE CHOICE OF EQUIPMENT AND COORDINATION CONFLICTS WITH NEW AND EXISTING FACILITIES. ANY SIGNIFICANT EQUIPMENT RELOCATION SHALL BE COORDINATED WITH THE OWNER AND OTHER TRADE CONTRACTORS, AND APPROVED BY THE ENGINEER.
- THE ARCHITECTURAL, MECHANICAL, AND PLUMBING DRAWINGS SHALL GOVERN THE INTENDED LOCATION OF ALL EQUIPMENT REQUIRING ELECTRICAL SERVICE. CONTRACTOR SHALL COORDINATE WITH THE ARCHITECTURAL, MECHANICAL, AND PLUMBING DRAWINGS, AND CONFIRM FINAL LOCATIONS IN FIELD WITH ALL INVOLVED TRADE CONTRACTORS AS REQUIRED.
- REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY. BASE BID ACCORDINGLY.
- REFER TO MECHANICAL AND PLUMBING EQUIPMENT SCHEDULES FOR NAMEPLATE INFORMATION PERTAINING TO ANY MECHANICAL AND PLUMBING EQUIPMENT REQUIRING ELECTRICAL PROVISIONS. CONTRACTOR SHALL COORDINATE ALL SUCH PROVISIONS WITH MECHANICAL AND PLUMBING DRAWINGS AS REQUIRED. BASE BID ACCORDINGLY.
- ALL WORK AND EQUIPMENT IS SHOWN IN ITS APPROXIMATE LOCATION. THE CONTRACTOR SHALL VISIT THE SITE, FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS, AND BASE HIS BID ACCORDINGLY. NO ADDITIONAL COMPENSATION SHALL BE GRANTED FOR THE CONTRACTOR'S FAILURE TO VISIT AND INSPECT THE SITE.
- THE CONTRACTOR SHALL NOT SOLELY RELY ON SCALED DRAWINGS TO OBTAIN REQUIRED DIMENSIONS AND QUANTITIES DURING BIDDING AND CONSTRUCTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD AS REQUIRED.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS, PROCEDURES, AND TECHNIQUES; BY SUBMITTING A PROPOSAL, THE CONTRACTOR AGREES AND WARRANTS THAT HE HAS COMPLETELY EXAMINED THE SITE, EXISTING FACILITIES, THE CONSTRUCTION DOCUMENTS, AND THE NATURE OF THE WORK TO BE PERFORMED. THE OWNER SHALL BE ADVISED OF ANY CONFLICTS IN THE CONTRACT DOCUMENTS DURING THE BID PHASE.
- PROJECT WORK SHALL NOT INTERFERE WITH DAILY OPERATIONS, OR COMPROMISE THE INTEGRITY OF EXISTING FACILITIES AND OPERATIONS AND/OR SERVICES WITHOUT THE OWNER'S PRIOR APPROVAL.
- COORDINATE ALL WORK WITH THAT OF OTHER TRADES AFFECTING, OR AFFECTED BY THE WORK. COOPERATE WITH OTHER TRADES TO ASSURE THE STEADY PROGRESS OF ALL WORK UNDER THIS CONTRACT.
- ARRANGE ALL WORK TO PROCEED AS RAPIDLY AS POSSIBLE IN COOPERATION WITH OTHER TRADES. COOPERATE WITH OTHER TRADES TO HAVE ALL WORK, RACEWAY, WIRING, ETC INSTALLED AS EFFICIENTLY AS POSSIBLE.
- CONTRACTOR SHALL INSTALL ALL EQUIPMENT WITH WORKING AND DEDICATED EQUIPMENT SPACES PER NEC 110.
- WIRING METHODS SHALL CONFORM WITH NEC 300.

WIRE SIZE AND CONDUIT FILL SCHEDULE FOR 15A & 20A-120, 208 AND 277V, 1Ø CIRCUITS		
NO. OF CIRCUITS	WIRE SIZE, FILL AND CONDUIT SIZE	
1	2-#12, 1-#12, 3/4" C	
2	4-#12, 1-#12, 3/4" C	
3	4-#12, 1-#12, 3/4" C	
4	8-#10, 1-#10, 3/4" C	

IF RUNS EXCEED 100 FEET, AND IF WIRE HAS NOT ALREADY BEEN INCREASED DUE TO CONDUIT FILL DERATING FACTORS, WIRE SIZES IN THIS TABLE SHALL BE INCREASED 1 SIZE FOR EACH 100 LINEAR FEET. OTHER SIZES AND FILL AS NOTED ON DRAWINGS.

- ALL BRANCH CIRCUITS SHALL BE IN CONDUIT FROM THE SOURCE PANELBOARD TO THE FIRST COVERED JUNCTION BOX AND/OR DEVICE. MC CABLE MAY BE USED IN CONCEALED LOCATIONS, WHERE PERMITTED BY CODE. FOR ALL SUBSEQUENT DEVICES AS INDICATED, ALL EXPOSED CIRCUITING SHALL BE CABLE-IN-CONDUIT AS REQUIRED.
- AT MINIMUM, GROUNDING AND BONDING PROVISIONS SHALL BE PROVIDED AND INSTALLED PER THE REQUIREMENTS OF NEC 250. WHERE THERE IS A CONFLICT BETWEEN NEC MINIMUM REQUIREMENTS AND THE DESIGN DOCUMENTS, THE CONTRACTOR SHALL CONFORM TO THE MORE STRINGENT OF THE CONFLICTING REQUIREMENTS.
- ALL EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT AND RACEWAYS SHALL BE GROUNDED. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, A SEPARATE GROUND CONDUCTOR SHALL BE RUN IN ALL CASES IN ORDER TO ENSURE CONTINUITY OF THE GROUNDING CIRCUIT FROM THE SOURCE GROUNDING BUS TO THE LOAD GROUND TERMINAL. THE RESISTANCE FROM THE SERVICE EQUIPMENT GROUND BUS TO ANY LOAD GROUND TERMINAL SHALL NOT EXCEED ONE OHM.
- ALL ISOLATED GROUND CIRCUITS SHALL HAVE A DEDICATED ISOLATED GROUND CONDUCTOR INSTALLED IN ADDITION TO THE EQUIPMENT GROUND CONDUCTOR.
- ALL EQUIPMENT OUTLETS, APPURTENANCES, AND ROUGH-IN WORK SHALL BE PROVIDED AS REQUIRED TO COMPLETE THE PROJECT WORK WHETHER OR NOT EXPLICITLY SHOWN OR INDICATED ON THE DRAWINGS. SWITCH, DEVICE, PULL, AND JUNCTION BOXES; CONDUIT BODIES; FITTINGS AND HANDLE ENCLOSURES SHALL BE SIZED, SUPPLIED AND INSTALLED PER NEC 314.
- ANY AND ALL TEMPORARY FACILITIES SHALL BE SUPPLIED AND INSTALLED PER NEC 590 UNDER ALL CIRCUMSTANCES.
- UNLESS OTHERWISE INDICATED, OR OTHERWISE REQUIRED DUE TO THE PROPER MATING OF DISSIMILAR METALS, ALL NEW ELECTRICAL DISTRIBUTION EQUIPMENT SHALL HAVE CURRENT CARRYING PARTS, AND GROUND BUS AND TERMINALS MADE OF COPPER.
- ALL NEW WIRE SHALL BE COPPER, 600 VAC, THHN, UNLESS OTHERWISE INDICATED, ALL EQUIPMENT GROUND WIRES SHALL HAVE GREEN INSULATION.
- AMPACITY OF POWER CONDUCTORS SHALL CONFORM WITH NEC 310. THE CONTRACTOR'S PROPOSED MEANS AND METHODS OF CONSTRUCTION SHALL INCLUDE ALL APPLICABLE AMPACITY DERATING FACTORS IN ORDER TO PROVIDE FINAL CIRCUIT AMPACITY AND ARRANGEMENT AS INTENDED BY THE DESIGN. ANY QUESTIONS REGARDING INTENT SHALL BE DIRECTED, IN WRITING TO THE ENGINEER. BASE BID ACCORDINGLY.
- ALL POWER WIRING TO BE MINIMUM #12 AWG SIZE, ALL CONTROL WIRING TO BE #14 AWG UNLESS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. ALL SINGLE PHASE BRANCH CIRCUIT WIRE SIZES SHALL BE INCREASED 1 TRADE SIZE FOR EACH 100 LINEAR FEET OF ONE-WAY CIRCUIT LENGTH INSTALLED.
- UNLESS OTHERWISE INDICATED ON THE DRAWINGS, OR IN THE PROJECT SPECIFICATIONS, WIRE ALL 15A AND 20A CIRCUITS USING #12 AWG, AND ALL 30A CIRCUITS USING #10 AWG.
- ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR SIZING ANY AND ALL SMALL BRANCH CIRCUIT, PANEL HOME RUNS AND DEVICE TO DEVICE CONDUIT AND WIRING NOT SPECIFICALLY SIZED ON THE DRAWINGS. WIRE AND CONDUIT SIZING SHALL BE IN STRICT ACCORDANCE WITH NEC 310-15 INCLUDING ALL APPLICABLE AMBIENT TEMPERATURE AND CONDUIT FILL DERATING AS REQUIRED. THE CONTRACTOR SHALL BE PERMITTED TO USE THE FOLLOWING TABLE AS TO BASE HIS BID.
- THE INTENT OF THE DEMOLITION AND/OR RELOCATION WORK REQUIREMENTS INCLUDE ALL LABOR AND EQUIPMENT REQUIRED TO ATTAIN THE FINAL CONDITIONS AS SHOWN ON THE ARCHITECTURAL, MECHANICAL, PLUMBING, STRUCTURAL, TEMPERATURE CONTROL, AND/OR ELECTRICAL DRAWINGS. THE CONTRACTOR SHALL REVIEW ALL OTHER TRADE DRAWINGS, AND COORDINATE WITH ALL OTHER TRADE CONTRACTORS, AND BASE HIS BID ACCORDINGLY.
- THE CONTRACTOR SHALL DISPOSE OF ALL DEMOLISHED EQUIPMENT AND CONSTRUCTION DEBRIS OFFSITE UNLESS OTHERWISE DIRECTED BY THE OWNER OR OWNER'S CONSTRUCTION REPRESENTATIVE.
- CONTRACTOR SHALL COORDINATE STORAGE OF MATERIAL, DUMPSTERS, AND PARKING WITH THE OWNER PRIOR TO MOBILIZATION.
- CONTRACTOR SHALL PROVIDE PROTECTION FOR THE OWNER AND CONSTRUCTION WORKERS IN AND AROUND THE ACTIVE CONSTRUCTION AREA(S). ADEQUATE BARRIERS AND SIGNAGE SHALL BE PROVIDED TO EXERCISE CONTROL, OF SAFE INGRESS AND EGRESS OF PREMISES. FIRE EXITS SHALL AT NO TIME BE BLOCKED.
- ANY OPENINGS CREATED DURING CONSTRUCTION FROM DEMOLITION OR PREPARATION OF NEW EQUIPMENT SHALL BE TEMPORARILY CLOSED UNTIL THE OPENING IS SEALED OR THE EQUIPMENT IS INSTALLED.
- PRIOR TO THE COMMENCEMENT OF WORK, ELECTRICAL POWER SHALL BE DISCONNECTED AND/OR SAFFED OFF AS REQUIRED, AND TO THE EXTENT INDICATED ON THE DRAWINGS, USE OF MC CABLE SHALL COMPLY WITH NEC 330, AND MEET ALL INTENDED GROUNDING REQUIREMENTS.
- THERE SHALL BE ABSOLUTELY NO SHARING OF NEUTRAL CONDUCTORS UNLESS SPECIFICALLY INDICATED OTHERWISE.
- ELECTRICAL CONTRACTOR TO BE RESPONSIBLE FOR ANY AND ALL CORE DRILLING THAT MAY BE REQUIRED FOR CONDUIT ROUTING AND INSTALLATION.
- THE CONTRACTOR SHALL DETERMINE FINAL CONDUIT ROUTING IN-FIELD AS REQUIRED. CONDUIT ROUTING SHALL BE COORDINATED WITH OTHER TRADES, AND THE OWNER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL SUBMIT A CONDUIT ROUTING PLAN THAT INCLUDES ALL WALL AND FLOOR PENETRATIONS FOR REVIEW AND APPROVAL BY THE ARCHITECT AND OWNER FOR THE PURPOSE OF COORDINATING THE STRUCTURAL INTEGRITY, FIRE RESISTANCE INTEGRITY, AND SPACE UTILIZATION OF NEW AND EXISTING FACILITIES.
- UNLESS OTHERWISE DIRECTED ON THE PLANS, NO CONDUIT SHALL BE RUN EMBEDDED IN ANY FLOOR, OR RUN IN CONTACT WITH THE EARTH.
- CONDUIT RUNS IN CORRIDORS SHALL CLEAR ALL ARCHITECTURAL FEATURES (DOORS, WINDOWS, ETC.), AND SHALL BE COORDINATED WITH ALL TRADE EQUIPMENT, PIPING, AND DUCT WORK ETC..
- ALL MECHANICAL ROTATING EQUIPMENT SHALL BE TESTED TO INSURE PROPER ROTATION. CHECK ALL BEARINGS FOR PROPER LUBRICATION PRIOR TO STARTUP. COORDINATE STARTUP WITH OTHER INVOLVED TRADES, AND EQUIPMENT VENDORS.
- UNLESS OTHERWISE INDICATED OR SPECIFIED, ALL OVERCURRENT PROTECTION DEVICES SHALL BE FULLY-RATED. SERIES RATED COMBINATIONS WILL NOT BE ACCEPTED IN LIEU OF FULLY-RATED DEVICES.
- CONDUCTORS OR CABLES INSTALLED IN CONDUIT EXPOSED TO DIRECT SUNLIGHT ON OR ABOVE ROOFTOPS SHALL BE DERATED AND SIZE-ADJUSTED IN ORDER TO COMPLY WITH NEC 310.15(B)(2)(c).
- UPON COMPLETION OF THE WORK, AND PRIOR TO RECEIVING FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE AN ACCURATE "MARKED-UP" SET OF PROJECT DRAWINGS REFLECTING ALL FIELD CHANGES. SUBMIT TO THE ARCHITECT.
- UNLESS OTHERWISE INDICATED OR SPECIFIED, THE CONTRACTOR SHALL WARRANT ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A MINIMUM PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.

ELECTRICAL PROJECT DEMOLITION NOTES:

- PRIOR TO SUBMITTING A PROPOSAL, THE ELECTRICAL CONTRACTOR SHALL VISIT AND CAREFULLY INVESTIGATE THE EXISTING AREA(S) AFFECTED BY THIS WORK IN ORDER TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. THE CONTRACTOR SHALL SUBMIT ACCORDINGLY, SUBMISSION OF PROPOSAL WILL BE CONSTRUED AS CONFIRMATION THAT A THOROUGH EXAMINATION OF THE SITE HAS BEEN MADE BY THE CONTRACTOR. LATER CLAIMS FOR UNFORESEEN EXTRA LABOR, EQUIPMENT OR MATERIALS WILL NOT BE ACCEPTED IF SAID CLAIM(S) COULD HAVE BEEN FORESEEN DURING THE SITE INVESTIGATION.
- CONTRACTOR'S WORK SHALL COMPLY WITH ALL SAFETY RELATED WORK PRACTICES DETAILED IN THE LATEST EDITION OF NFPA 70E.
- THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL ELECTRICAL FACILITIES RENDERED INACTIVE OR OBSOLETE BY THE SCOPE OF THE ARCHITECTURAL, MECHANICAL AND PLUMBING DEMOLITION WORK. THE CONTRACTOR IS ALERTED THAT SUCH ELECTRICAL FACILITIES MAY NOT BE EXPLICITLY SHOWN ON THE ELECTRICAL DEMOLITION DRAWINGS. THE CONTRACTOR SHALL VISIT THE SITE, REFER TO THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS, AND COORDINATE WITH THE GENERAL, MECHANICAL, AND PLUMBING CONTRACTOR(S), AND INCLUDE ALL ELECTRICAL DEMOLITION WORK INCLUDING BUT NOT LIMITED TO THE COMPLETE REMOVAL OF ALL ELECTRICAL AND CONTROL WIRES, CONDUIT, JUNCTION BOXES, ENCLOSURE AND RACEWAY SUPPORT SYSTEMS, DISCONNECT SWITCHES, CIRCUIT BREAKERS ETC. INTENDED FOR REMOVAL, AS REQUIRED TO COMPLETE THE WORK.
- THE INTENT OF THE DEMOLITION WORK REQUIREMENTS INCLUDE ALL LABOR AND EQUIPMENT REQUIRED TO ATTAIN THE FINAL CONDITIONS AS SHOWN ON THE ARCHITECTURAL, MECHANICAL, PLUMBING, STRUCTURAL, TEMPERATURE CONTROL, AND ELECTRICAL NEW WORK PLANS. THE CONTRACTOR SHALL REVIEW ALL OTHER TRADE DRAWINGS, AND COORDINATE WITH ALL OTHER TRADE CONTRACTORS, AND BASE HIS BID ACCORDINGLY.
- WHERE THE REMOVAL OF EXISTING FACILITIES RESULT IN THE DEENERGIZATION OF EXISTING REMAINING FACILITIES, THE CONTRACTOR SHALL INSTALL JUNCTION BOXES AND/OR OTHER DEVICES, AND PROVIDE BYPASS CONNECTIONS NECESSARY TO MAKE THE AFFECTED CIRCUITS CONTINUOUS AND READY FOR OPERATION OR AS OTHERWISE INDICATED OR INTENDED.
- THE CONTRACTOR SHALL REMOVE AND/OR RELOCATE ALL EXISTING ELECTRICAL FACILITIES THAT INTERFERE WITH THE NEW ARCHITECTURAL, MECHANICAL, PLUMBING, STRUCTURAL, AND ELECTRICAL LAYOUTS AND SYSTEMS. REFER TO THE ARCHITECTURAL, MECHANICAL, PLUMBING AND STRUCTURAL DRAWINGS, AND COORDINATE WITH THE ARCHITECTURAL, MECHANICAL, PLUMBING AND TEMPERATURE CONTROL CONTRACTORS.
- PRIOR TO THE COMMENCEMENT OF WORK, ELECTRICAL POWER SHALL BE DISCONNECTED AND/OR SAFFED OFF AS REQUIRED. TEMPORARY LIGHTING AND POWER FOR ALL TRADES, REMAINING BUILDING OCCUPANTS, AND CRITICAL BUILDING SERVICES SHALL BE PROVIDED AS REQUIRED WITHOUT EXCEPTION. UNDER NO CIRCUMSTANCES SHALL POWER BE INTERRUPTED TO ANY AREA WITHOUT PRIOR WRITTEN APPROVAL FROM BUILDING MANAGEMENT.
- TEMPORARY LIGHT STREAMERS, WHERE SPLICED, ARE TO EMPLOY COMPRESSION-TYPE FITTINGS OR SOLDERED CONNECTIONS, AND MADE UP NEATLY AND SAFELY AS REQUIRED.
- MAINTAIN CONTINUOUS ELECTRICAL SERVICE TO ALL ACTIVE AREAS AT ALL TIMES EXCEPT WHERE GIVEN WRITTEN PERMISSION BY BUILDING/PROPERTY MANAGEMENT FOR A SCHEDULED OUTAGE FOR A DECLARED OUTAGE DURATION.
- REMOVE EXPOSED CONDUITS, WIRE WAYS, OUTLET BOXES, HANGERS, SUPPORTS AND DEVICES MADE OBSOLETE BY THIS WORK UNLESS BEING REUTILIZED FOR THE NEW INSTALLATION. THE REUTILIZATION OF EXISTING FACILITIES BY THE CONTRACTOR SHALL RENDER A FINISHED INSTALLATION IN STRICT ACCORDANCE WITH THE NEC WITHOUT EXCEPTION.
- ALL ADJACENT FACILITIES IMPACTED OR TEMPORARILY DISCONNECTED TO FACILITATE DEMOLITION WORK SHALL BE RECONNECTED AND RESTORED TO A CONDITION EQUAL TO OR BETTER THAN ORIGINALLY FOUND PRIOR TO THE COMMENCEMENT OF WORK. WHERE EXISTING CONDITIONS DO NOT MEET NEC REQUIREMENTS, THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK.
- PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL TRACE EXISTING CIRCUITS AND CONFIRM OR IDENTIFY TYPE AND LOCATION OF LOAD SERVED.
- WHERE EXISTING ELECTRICAL PANELS ARE CALLED FOR REMOVAL AND OR REPLACEMENT, THE CONTRACTOR SHALL REMOVE ALL SERVING FEEDER WIRE AND CONDUIT BACK TO ITS RESPECTIVE SOURCE OF POWER OR AS OTHERWISE INDICATED.
- ALL OPEN FLOOR OUTLETS SHALL BE CAPPED WITH WALKER PARKERSBURG DUCT BLANKING PLATE NO. 1043-S (OR APPROVED EQUAL). ANY AND ALL PANEL, ENCLOSURE OR EQUIPMENT TERMINAL BOX COMPARTMENTS WITH UNOCCUPIED KNOCKOUT, RACEWAY OR CABLE ASSEMBLY PENETRATIONS SHALL BE PLUGGED WITH A LISTED DEVICE. ANY AND ALL UNOCCUPIED BREAKER SPACES IN EXISTING AND/OR NEW PANELS SHALL BE PLUGGED WITH A LISTED DEVICE OR FURNISHED WITH A SPARE, OPERABLE CIRCUIT BREAKER LISTED FOR USE IN THE PANEL. PROVIDE LISTED PLATES ON ALL UNUSED OUTLET AND JUNCTION BOXES.
- ELECTRIC PANEL COVERS ARE NOT TO BE LEFT OFF AT ANY TIME UNLESS MEN ARE WORKING ON, ADEQUATELY PROTECTING AND BARRICADING THEM AS REQUIRED. COVERS SHALL BE REPLACED EACH NIGHT BEFORE LEAVING JOB SITE.

FIRE ALARM NOTES:

- GENERAL:
IT IS THE OWNER'S INTENT TO REMOVE EXISTING FIRE ALARM SYSTEM FACILITIES IN THEIR ENTIRETY, AND REPLACE SAME WITH NEW FIRE ALARM SYSTEM FACILITIES AS REQUIRED. THE PROJECT WORK WILL LIKELY IMPACT THE MAJORITY OF THE AREA OF THE FACILITY. THE ABOVE KEY PLANS ARE GIVEN FOR INFORMATIONAL PURPOSES, AND REPRESENT THE PROPOSED CONDITIONS OF THE FACILITY AT THE COMPLETION OF PLANNED ARCHITECTURAL WORK. THE CONTRACTOR SHALL NOT RELY SOLELY ON THESE PLANS, AND SHALL COORDINATE WITH THE OWNER'S ARCHITECT FOR ALL PROPOSED ARCHITECTURAL WORK.
- DEMOLITION WORK:
1. PRIOR TO SUBMISSION OF BID, THE CONTRACTOR SHALL VISIT THE SITE IN ORDER TO DEVELOP A COMPLETE UNDERSTANDING OF THE EXISTING CONDITIONS, AND TO DEVELOP A COMPLETE SCOPE OF DEMOLITION WORK REQUIRED TO COMPLETELY REMOVE EXISTING FIRE ALARM SYSTEM FACILITIES IN THEIR ENTIRETY.
2. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL VISIT THE SITE AND SURVEY ALL EXISTING FIRE ALARM SYSTEM FACILITIES.
3. THE CONTRACTOR SHALL REMOVE ALL EXISTING FIRE ALARM SYSTEM FACILITIES FROM ALL AREAS OF THE BUILDING.
4. THE CONTRACTOR SHALL PREPARE ALL EXISTING AREAS FOR THE INSTALLATION OF THE NEW FIRE SYSTEM AS REQUIRED.
5. THE CONTRACTOR SHALL SURVEY AND PREPARE EXISTING ELECTRICAL SYSTEM FACILITIES IN ORDER TO SERVE THE NEW FIRE ALARM SYSTEM AS REQUIRED.
- INSTALLATION WORK:
1. SUPPLY AND INSTALL A NEW FIRE ALARM SYSTEM AS REQUIRED AND SPECIFIED. THE SYSTEM SHALL BE DESIGNED, INSTALLED, AND TESTED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.
2. THE NEW FIRE ALARM SYSTEM SHALL BE DESIGNED, SUPPLIED AND INSTALLED BY THE CONTRACTOR, AND TESTED IN ACCORDANCE WITH THE GOVERNING EDITION OF THE INTERNATIONAL BUILDING CODE, THE GOVERNING ADDITION OF NFPA 72, AND ACCORDANCE WITH THE SPECIFICATIONS GIVEN ON DRAWING E.803.
3. THE CONTRACTOR SHALL PROVIDE A NEW FIRE ALARM SYSTEM FOR THE APPLICABLE EDUCATIONAL FACILITY AS INDICATED. THE CONTRACTOR'S MINIMUM SCOPE OF WORK SHALL INCLUDE, HOWEVER NOT BE LIMITED TO THE FOLLOWING:
A. PROVIDE MAIN AND REMOTE FIRE ALARM CONTROL PANELS AS REQUIRED. PROVIDE NEW ZONES, NEW CONTACTS, ADDITIONAL POWER SUPPLIES AND ALL OTHER ACCESSORIES FOR A COMPLETE AND OPERATIONAL SYSTEM.
B. PROVIDE ALL ALARMING DEVICES AND DEVICE CABLEING AS REQUIRED.
C. PROVIDE MANUAL PULL STATIONS AS REQUIRED.
D. PROVIDE BATTERY BACKUP AS REQUIRED BY NFPA 72. DURATION OF BACKUP AS DICTATED BY CODE.
E. PROVIDE ALL NECESSARY RELAYS, WIRING, ALARMING DEVICES, PROGRAMMING, ETC FOR A FULLY FUNCTIONAL SYSTEM.
F. PROVIDE ALL NECESSARY INTERLOCKS WITH EXISTING FIRE PROTECTION SYSTEM FACILITIES, AIR HANDLING FACILITIES, AND/OR BUILDING TRANSPORTATION FACILITIES AS REQUIRED.
4. PRIOR TO THE COMMENCEMENT OF WORK, AND PRIOR TO ORDERING ANY EQUIPMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SHOP DRAWING SUBMITTAL PACKAGE TO THE LOCAL AUTHORITY HAVING JURISDICTION FOR REVIEW, APPROVAL AND PERMITS AS REQUIRED. REFER TO DRAWING E.803 FOR ADDITIONAL SUBMITTAL REQUIREMENTS THAT MAY APPLY. THE SUBMITTAL PACKAGE SHALL HAVE ENOUGH INFORMATION TO COMPLETE THE COMPLETE SCOPE OF SERVICES AND EQUIPMENT PROVISIONS BEING SUPPLIED AND INSTALLED BY THE CONTRACTOR. THE CONTRACTOR'S SUBMITTAL PACKAGE SHALL INCLUDE, HOWEVER NOT NECESSARILY BE LIMITED TO THE FOLLOWING:
A. FLOOR PLANS WITH THE LOCATIONS OF ALL ALARM-INITIATING AND NOTIFICATION APPLIANCES, AND ALL MAJOR EQUIPMENT FACILITIES.
B. ALARM SYSTEM RISER DIAGRAM.
C. WIRING DIAGRAMS FOR POWER, SIGNAL AND CONTROL EQUIPMENT.
D. ALARM CONTROL AND TROUBLE SHOOTING EQUIPMENT.
E. SIZES AND TYPE OF CONDUCTORS AND/OR SYSTEM WIRING.
F. VOLTAGE DROP, AND BATTERY CALCULATIONS.
G. MANUFACTURER, MODEL NUMBER, AND LISTING INFORMATION FOR ALL EQUIPMENT, DEVICES AND MATERIALS.
H. INTERFACE OF FIRE SAFETY AND CONTROL FUNCTIONS.
5. ALL INITIATING AND NOTIFICATION APPLIANCES SHALL BE LOCATED AND PROVIDED PER STATE AND LOCAL CODES AND STANDARDS.
6. PROVIDE ALL STROBE SYNCHRONIZATION DEVICES. STROBES SHALL BE SYNCHRONIZED BY FLOOR.
7. PROVIDE CONNECTIONS TO ANY FIRE PROTECTION SYSTEM(S) EQUIPMENT AS REQUIRED. THE NEW FIRE ALARM SYSTEM SHALL MAINTAIN THE PROPER FUNCTIONAL SEQUENCES OF EXISTING FIRE PROTECTION SYSTEMS, INCLUDING EXISTING MECHANICAL EXTINGUISHING, AND SPRINKLER FACILITIES ETC.
8. PROVIDE CONNECTIONS TO ANY MECHANICAL SYSTEM(S) EQUIPMENT AS REQUIRED. THE NEW FIRE ALARM SYSTEM SHALL MAINTAIN THE PROPER FUNCTIONAL SEQUENCES OF EXISTING MECHANICAL EXTINGUISHING, FIRE DAMPERS, INCLUDING AIR HANDLING EQUIPMENT SHUTDOWN AND DAMPER OPERATION.
9. PROVIDE CONNECTIONS TO ELEVATOR EQUIPMENT FOR ELEVATOR SHUTDOWN AND RECALL AS REQUIRED. THE NEW FIRE ALARM SYSTEM SHALL MAINTAIN THE PROPER FUNCTIONAL SEQUENCES OF EXISTING BUILDING TRANSPORTATION SYSTEM(S).
10. COORDINATE ALL TESTING REQUIREMENTS WITH OWNER AND AUTHORITY HAVING JURISDICTION. A MINIMUM OF 3 DAYS NOTICE SHALL BE GIVEN TO ALL PARTIES WHICH WILL BE PRESENT DURING THE TESTING PROCESS.
11. FIRE ALARM SYSTEM SHALL BE CAPABLE OF FUTURE EXPANSION FOR FULL USE OF THE BUILDING AS INTENDED.
12. PRIOR TO FINAL PAYMENT, THE CONTRACTOR SHALL SUBMIT FINAL "AS-BUILT" SYSTEM DRAWINGS TO THE OWNER.
13. REFER TO DRAWING E.803 FOR ADDITIONAL SYSTEM REQUIREMENTS THAT MAY APPLY.

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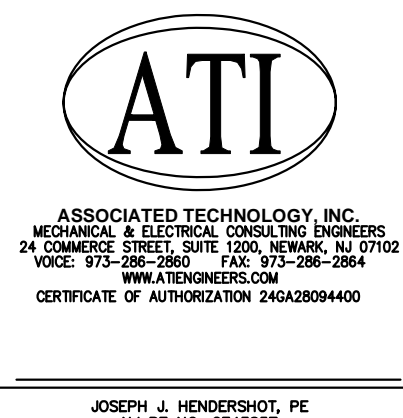
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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1043 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-378-0086 FAX: 973-378-1081
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**ELECTRICAL
GENERAL NOTES**

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
9.25.15	95% CD SUBMIT	KD	FM					09-25-15
09.07.17	ISSUED FOR BID	KD	FM					NONE
								DRWN BY RB
								CHKD BY NJN
								JOB NO 2141152
								SHEET: _ OF:
								DWG. NO

E.101

SYMBOL LEGEND

POWER AND LIGHTING		POWER AND LIGHTING (CONTINUED)		POWER AND LIGHTING (CONTINUED)		MISCELLANEOUS (CONTINUED)	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	BRANCH CIRCUIT HOME RUN TO PANELBOARD OR SWITCHBOARD. NO. OF ARROWS DENOTES NO. OF CIRCUITS. GROUND CONDUCTOR MUST BE PROVIDED FOR ALL BRANCH CIRCUITS. P - INDICATES PANEL CN - INDICATES CIRCUIT NUMBER(S) XA - WHEN USED DENOTES OVERCURRENT DEVICE AMPERE TRIP RATING XP - WHEN USED DENOTES NUMBER OF OVERCURRENT DEVICES ZV - WHEN USED DENOTES SUPPLY SYSTEM VOLTAGE VA - WHEN USED DENOTES VOLT-AMPERE LOAD LOC - WHEN USED DENOTES HOME RUN'S FINAL DESTINATION TIC - WHEN USED DENOTES ISOLATED GROUND REQUIRED		AIR CONDITIONING DISCONNECT SWITCH AS REQUIRED. RATED AS SHOWN ON DRAWINGS (EG. 30/30/3 INDICATES 30-AMP SWITCH, 30-AMP FUSES, 3-POLE), PROVIDED WITH INTEGRAL 20A GFI SERVICE RECEPTACLE. INSTALLED IN NEMA-1 ENCLOSURE UNLESS OTHERWISE NOTED. SUBSCRIPT "WP" INDICATES WEATHERPROOF (NEMA-3R ENCLOSURE).		BELL TRANSFORMER		CARD READER (BY SECURITY VENDOR). PROVIDE 3/4" C AND DRAGLINE FROM ACCESS CARD SYSTEM PANEL TO JBOX IN AN ACCESSIBLE LOCATION AHC. COORDINATE EXACT LOCATION WITH SECURITY VENDOR AND HOOKUP TO DOOR CONTROL EQUIPMENT. REFER TO ELECTRICAL DETAILS FOR ADDITIONAL INFORMATION.
	INTERMEDIATE BRANCH CIRCUIT WIRING WHERE SHOWN, NUMBER OF TIC MARKS INDICATES THE QUANTITY OF CURRENT CARRYING CONDUCTORS.		MAGNETIC CONTACTOR RATED AND AS SHOWN ON THE DRAWINGS.		DOOR CHIME		CARD READER AND KEY PAD (BY SECURITY VENDOR). PROVIDE 3/4" C AND DRAGLINE FROM ACCESS CARD SYSTEM PANEL TO JBOX IN AN ACCESSIBLE LOCATION AHC. COORDINATE EXACT LOCATION WITH SECURITY VENDOR AND HOOKUP TO DOOR CONTROL EQUIPMENT. REFER TO ELECTRICAL DETAILS FOR ADDITIONAL INFORMATION.
	SINGLE WALL POWER RECEPTACLE		COMBINATION NON-FUSIBLE DISCONNECT SWITCH/MOTOR STARTER W/ OVERLOAD PROTECTION AND AUTO/OFF/HAND SELECTOR SWITCH OR START/STOP CONTROL STATION AS NOTED. DISCONNECT SWITCH RATED AS SHOWN ON DRAWINGS (EG. 30/30/3 INDICATES 30-AMP SWITCH, 3-POLE, W/ 30-AMP FUSES). STARTER TYPE SHALL BE SELECTED AS DIRECTED IN MECHANICAL DRAWINGS. STARTER AND OVERLOAD SIZES SHALL BE SELECTED ACCORDING TO MOTOR HORSEPOWER RATING. INSTALLED IN NEMA-1 ENCLOSURE U.O.N. SUBSCRIPT "WP" INDICATES WEATHERPROOF (NEMA-3R ENCLOSURE).		DOOR CHIME PUSHBUTTON, INCHES INDICATES HEIGHT ABOVE FINISHED GRADE TO THE CENTER OF THE DEVICE.		SECURITY CAMERA (BY SECURITY VENDOR). PROVIDE 3/4" C AND DRAGLINE FROM ACCESS CARD SYSTEM PANEL TO JBOX IN AN ACCESSIBLE LOCATION AHC. COORDINATE EXACT LOCATION WITH SECURITY VENDOR.
	SINGLE WALL POWER RECEPTACLE - ABOVE COUNTER		COMBINATION FUSIBLE DISCONNECT SWITCH/MOTOR STARTER W/ OVERLOAD PROTECTION AND AUTO/OFF/HAND SELECTOR SWITCH OR START/STOP CONTROL STATION AS NOTED. DISCONNECT SWITCH RATED AS SHOWN ON DRAWINGS (EG. 30/30/3 INDICATES 30-AMP SWITCH, 3-POLE, W/ 30-AMP FUSES). STARTER TYPE SHALL BE SELECTED AS DIRECTED IN MECHANICAL DRAWINGS. STARTER AND OVERLOAD SIZES SHALL BE SELECTED ACCORDING TO MOTOR HORSEPOWER RATING. INSTALLED IN NEMA-1 ENCLOSURE U.O.N. SUBSCRIPT "WP" INDICATES WEATHERPROOF (NEMA-3R ENCLOSURE).		THERMOSTAT		EMERGENCY EXIT SIGN
	SINGLE FLOOR POWER RECEPTACLE		MOLDED CASE CIRCUIT BREAKER 3 POLE UNLESS OTHERWISE NOTED X AF - INDICATES AMPERE FRAME SIZE X AT - INDICATES AMPERE TRIP SIZE MANUF - BASIS-OF-DESIGN MANUFACTURER MOD - BASIS-OF-DESIGN MODEL NUMBER KAIC - SYMMETRICAL INTERRUPTING RATING		FIRE ALARM CONTROL PANEL		CENTER LINE
	SINGLE CEILING POWER RECEPTACLE		NON-FUSIBLE DISCONNECT SWITCH 3 POLE UNLESS OTHERWISE NOTED X AS - INDICATES SWITCH AMPERE RATING		DIGITAL ALARM COMMUNICATOR TRANSMITTER		EXISTING CONSTRUCTION & EQUIPMENT
	DUPLEX WALL POWER RECEPTACLE		FUSIBLE DISCONNECT SWITCH 3 POLE UNLESS OTHERWISE NOTED X AS - INDICATES SWITCH AMPERE RATING X AF - INDICATES FUSE AMPERE RATING		REMOTE POWER SUPPLY		EXISTING TO BE REMOVED
	DUPLEX WALL POWER RECEPTACLE - ABOVE COUNTER		FUSE RATED AS SHOWN ON DRAWINGS (EG. 30AF INDICATES 30-AMP FUSE AMPERE RATING)		REMOTE/SIGNALING/TEST STATION		NEW WORK
	DUPLEX FLOOR POWER RECEPTACLE		WIRE TROUGH/SPICE BOX. SIZE AS REQUIRED TO MEET CODE REGULATIONS		REMOTE FIRE ALARM SYSTEM ANNUNCIATOR		BREAK
	DUPLEX CEILING POWER RECEPTACLE		DISTRIBUTION TRANSFORMER. RATING AS NOTED IN DRAWINGS. SUBSCRIPT INDICATES TRANSFORMER DESIGNATION		FUSE CUTOFF PANEL		END CAP
	DUPLEX POWER RECEPTACLE - MOUNTED WITHIN SURFACE RACEWAY		3-PHASE SECONDARY WYE-CONNECTION (GROUNDED)		MANUAL PULL STATION WITH INTEGRAL ADDRESSABLE MODULE.		CONNECT TO EXISTING
	QUAD WALL POWER RECEPTACLE		GROUND ELECTRODE		ADA COMPLIANT AUDIBLE ALARM NOTIFICATION APPLIANCE. (Y - MIN. UL dBA RATINGS)		REMOVE FROM EXISTING
	QUAD WALL POWER RECEPTACLE - ABOVE COUNTER		CURRENT TRANSFORMER. SUBSCRIPT DENOTES QUANTITY		ADA COMPLIANT VISUAL ALARM NOTIFICATION APPLIANCE. (X - MIN. UL CANDELA RATINGS)		PIPE/CONDUIT PITCH
	QUAD FLOOR POWER RECEPTACLE		KILOWATT HOUR METER. "UM" DENOTES UTILITY METER, "SM" DENOTES SUBMETER.		ADA COMPLIANT COMBINATION AUDIBLE AND VISUAL ALARM NOTIFICATION APPLIANCE. (X - MIN. UL CANDELA RATINGS) (Y - MIN. UL dBA RATINGS)		DIRECTION OF FLOW
	QUAD CEILING POWER RECEPTACLE		GROUNDED BUS		ADDRESSABLE AREA SMOKE DETECTOR. SUBSCRIPT "B/A" WHEN USED DENOTES TWO DETECTORS, ONE LOCATED BELOW FINISHED CEILING AND ONE ABOVE FINISHED CEILING. SUBSCRIPT "A" WHEN USED DENOTES DETECTOR ABOVE FINISHED CEILING. SUBSCRIPT "B" WHEN USED DENOTES DETECTOR BELOW FINISHED CEILING.		PIPE/CONDUIT BREAK DOUBLE LINE
	QUAD POWER RECEPTACLE - MOUNTED WITHIN SURFACE RACEWAY		UTILIZATION EQUIPMENT MOTOR, NUMBER INDICATES HORSE POWER RATING.		ADDRESSABLE AREA HEAT DETECTOR. SUBSCRIPT "B/A" WHEN USED DENOTES TWO DETECTORS, ONE LOCATED BELOW FINISHED CEILING AND ONE ABOVE FINISHED CEILING. SUBSCRIPT "A" WHEN USED DENOTES DETECTOR ABOVE FINISHED CEILING. SUBSCRIPT "B" WHEN USED DENOTES DETECTOR BELOW FINISHED CEILING.		WORK NOTE
	QUAD WALL POWER RECEPTACLE - SPLIT WIRED		SINGLE POLE AC TOGGLE SWITCH - (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. SUBSCRIPT "K" WHEN USED DENOTES KEY-TYPE SWITCH.		ADDRESSABLE AREA COMBINATION SMOKE/HEAT DETECTOR. SUBSCRIPT "B/A" WHEN USED DENOTES TWO DETECTORS, ONE LOCATED BELOW FINISHED CEILING AND ONE ABOVE FINISHED CEILING. SUBSCRIPT "A" WHEN USED DENOTES DETECTOR ABOVE FINISHED CEILING. SUBSCRIPT "B" WHEN USED DENOTES DETECTOR BELOW FINISHED CEILING.		REVISION CLOUD (AREA OF CHANGE)
	QUAD WALL POWER RECEPTACLE - SPLIT WIRED - ABOVE COUNTER		THREE WAY AC TOGGLE SWITCH - (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. SUBSCRIPT "K" WHEN USED DENOTES KEY-TYPE SWITCH.		PHOTOELECTRIC TYPE ADDRESSABLE (OR WITH ADDRESSABLE MODULE) DUCT SMOKE DETECTOR. (S - SUPPLY, R - RETURN, X - SERVING EQUIPMENT, Y - CONTROL VOLTAGE)		REVISION NUMBER
	QUAD POWER RECEPTACLE - SPLIT WIRED - MOUNTED WITHIN SURFACE RACEWAY		FOUR WAY AC TOGGLE SWITCH - (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. SUBSCRIPT "K" WHEN USED DENOTES KEY-TYPE SWITCH.		COMBINATION SMOKE/FIRE DAMPER (S - SUPPLY, R - RETURN, X - SERVING EQUIPMENT, Y - CONTROL VOLTAGE)		SECTION CUT
	STRAIGHT BLADE, 2-POLE, 3-WIRE, 15/20 AMP (PER BRANCH CIRCUIT AMPACITY), 125-VOLT, NEMA 5-20R.		SPECIAL PURPOSE SWITCH - FLUSH MOUNTED, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION, AS SPECIFIED OR INDICATED ON THE DRAWINGS.		SMOKE DAMPER (S - SUPPLY, R - RETURN, X - SERVING EQUIPMENT, Y - CONTROL VOLTAGE)		SECTION LINE
	SUBSCRIPT "WP" - INDICATES WEATHERPROOF ENCLOSURE W/ WEATHERPROOF LIFT COVER PLATE.		SPECIAL PURPOSE SWITCH - FLUSH MOUNTED, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION, AS SPECIFIED OR INDICATED ON THE DRAWINGS.		FIRE PROTECTION SYSTEM ADDRESSABLE (OR WITH ADDRESSABLE MODULE) DUCT SMOKE DETECTOR. (S - SUPPLY, R - RETURN, X - SERVING EQUIPMENT, Y - CONTROL VOLTAGE)		DRAWING/DETAIL TITLE
	SUBSCRIPT "GFI" - INDICATES WITH CLASS "A" GROUND FAULT CIRCUIT INTERRUPTER.		SPECIAL PURPOSE SWITCH - CEILING MOUNTED, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION, AS SPECIFIED OR INDICATED ON THE DRAWINGS.		FIRE PROTECTION SYSTEM TAMPER SWITCH (PROVIDED BY OTHERS)		DIAMETER
	SUBSCRIPT "HG" - INDICATES UNIT SHALL BE LISTED AS HOSPITAL GRADE.		SINGLE POLE AUTOMATIC WALL SENSOR SWITCH - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.		FIRE PROTECTION SYSTEM FLOW SWITCH (PROVIDED BY OTHERS)		
	SUBSCRIPT "TR" - INDICATES UNIT SHALL BE LISTED AS TAMPER RESISTANT.		THREE WAY AUTOMATIC WALL SENSOR SWITCH - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.		ADDRESSABLE INTERFACE MODULE		
	SUBSCRIPT "SW" - INDICATES SWITCHED (CONTROLLED) OUTLET.		SINGLE POLE AUTOMATIC WALL SENSOR DIMMER - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.		ADDRESSABLE CONTROL MODULE		
	SUBSCRIPT "FM" - INDICATES FURNITURE MOUNTED (COORDINATE WITH FURNITURE VENDOR).		THREE WAY AUTOMATIC WALL SENSOR DIMMER - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.		ADDRESSABLE RELAY MODULE		
	SUBSCRIPT "IG" - INDICATES ISOLATED GROUND.		SINGLE POLE DIMMER - DESIGNED, TESTED AND UL LISTED TO SPECIFIC LIGHTING SOURCE/LOAD TYPE - SLIDE-TO-OFF DIMMER, (R) WHEN USED DENOTES CAPACITY RATING, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED.				
	SUBSCRIPT "DED" - INDICATES DEDICATED CIRCUIT.		THREE WAY DIMMER - DESIGNED, TESTED AND UL LISTED TO SPECIFIC LIGHTING SOURCE/LOAD TYPE - SLIDE-TO-OFF DIMMER, (R) WHEN USED DENOTES CAPACITY RATING, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED.				
	SUBSCRIPT "USB" - INDICATES UNIT SHALL INCLUDE TWO USB CHARGING PORTS.		SINGLE POLE AUTOMATIC WALL SENSOR DIMMER - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.				
	SUBSCRIPT "OPT" - WHEN USED, DENOTES COMPUTER RECEPTACLE, PROVIDE RECEPTACLE WITH GRAY FINISH. WHEN USED WITH A SPLIT-WIRED QUAD RECEPTACLE, THE SUBSCRIPT APPLIES TO ONLY ONE OF THE TWO RECEPTACES.		THREE WAY AUTOMATIC WALL SENSOR DIMMER - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.				
	SUBSCRIPT "TV" - INDICATES FOR TV MONITOR MOUNTED AT 7'-6" AFF.		OCCUPANCY SENSOR - LOW-VOLTAGE CONTROL WITH RELAY POWER PACK(S) AS REQUIRED. DIRECTIONAL SENSING AS SHOWN ON THE DRAWINGS. DASHED LINES INDICATE CONTROL WIRING. (a) SUBSCRIPT(S) INDICATES LIGHTING FIXTURES TO BE CONTROLLED, (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED OR SCHEDULED.				
	# SUBSCRIPT - WHEN USED DENOTES PANEL AND/OR CIRCUIT NUMBER.		THREE WAY AUTOMATIC WALL SENSOR DIMMER - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.				
	SPECIAL PURPOSE POWER RECEPTACLE - NEMA DESIGNATION AS INDICATED ON PLANS. "IC" SUBSCRIPT WHEN USED DENOTES ISOLATED GROUND, WITH FACEPLATE, SUBMIT FINISHES TO ARCHITECT FOR SELECTION.		SINGLE POLE DIMMER - DESIGNED, TESTED AND UL LISTED TO SPECIFIC LIGHTING SOURCE/LOAD TYPE - SLIDE-TO-OFF DIMMER, (R) WHEN USED DENOTES CAPACITY RATING, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED.				
	MULTI-SERVICE POKE-THROUGH FLOOR BOX - SEPARATE POWER AND DATA COMPARTMENTS, WITH POWER AND DATA RECEPTACLES AS SHOWN ON THE DRAWINGS OR AS OTHERWISE REQUIRED.		THREE WAY DIMMER - DESIGNED, TESTED AND UL LISTED TO SPECIFIC LIGHTING SOURCE/LOAD TYPE - SLIDE-TO-OFF DIMMER, (R) WHEN USED DENOTES CAPACITY RATING, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED.				
	MULTI-SERVICE CEILING BOX - SEPARATE POWER AND DATA COMPARTMENTS, WITH POWER AND DATA RECEPTACLES AS SHOWN ON THE DRAWINGS OR AS OTHERWISE REQUIRED.		SINGLE POLE AUTOMATIC WALL SENSOR SWITCH - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.				
	MULTI-SERVICE POWER POLE - SEPARATE POWER AND DATA COMPARTMENTS, WITH POWER AND DATA RECEPTACLES AS SHOWN ON THE DRAWINGS OR AS OTHERWISE REQUIRED.		THREE WAY AUTOMATIC WALL SENSOR DIMMER - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.				
	MULTI-SERVICE MODULAR FURNITURE WALL BOX - SEPARATE POWER AND DATA COMPARTMENTS, WITH TELE/DATA STUB AND FLEXIBLE FURNITURE SERVICE WHIPS AS REQUIRED. (N) WHEN USED DENOTES NUMBER OF INDIVIDUAL CUBICLES SERVED, FLUSH-MOUNTED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION.		SINGLE POLE DIMMER - DESIGNED, TESTED AND UL LISTED TO SPECIFIC LIGHTING SOURCE/LOAD TYPE - SLIDE-TO-OFF DIMMER, (R) WHEN USED DENOTES CAPACITY RATING, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED.				
	JUNCTION BOX - WALL MOUNTED - "WP" INDICATES WEATHERPROOF ENCLOSURE W/ WEATHERPROOF LIFT COVER PLATE. SUBSCRIPT "CLO" DENOTES CEILING MOUNTED. SUBSCRIPT "FLR" DENOTES FLOOR MOUNTED. SUBSCRIPT "XP" INDICATES EXPLOSION-PROOF. # SUBSCRIPT WHEN USED DENOTES PANEL AND/OR CIRCUIT NUMBER.		THREE WAY AUTOMATIC WALL SENSOR DIMMER - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.				
	EQUIPMENT TERMINAL BOX/BLOCK. XX WHEN USED, DENOTES REFERENCE TO SPECIFIC EQUIPMENT, ABBREVIATION, NEMA CONFIGURATION, OR EQUIPMENT SCHEDULE DESIGNATION. REFER TO MECHANICAL AND PLUMBING EQUIPMENT SCHEDULES IN MECHANICAL AND PLUMBING DRAWINGS FOR EQUIPMENT DESIGNATIONS AND CHARACTERISTICS. # SUBSCRIPT WHEN USED DENOTES PANEL AND/OR CIRCUIT NUMBER.		SINGLE POLE AUTOMATIC WALL SENSOR DIMMER - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.				
	SURFACE RACEWAY - ABOVE COUNTER.		THREE WAY AUTOMATIC WALL SENSOR DIMMER - DUAL TECHNOLOGY PASSIVE INFRARED/ULTRASONIC, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). FINISHES AS SELECTED BY THE ARCHITECT.				
	SURFACE RACEWAY - BELOW COUNTER.		OCCUPANCY SENSOR - LOW-VOLTAGE CONTROL WITH RELAY POWER PACK(S) AS REQUIRED. DIRECTIONAL SENSING AS SHOWN ON THE DRAWINGS. DASHED LINES INDICATE CONTROL WIRING. (a) SUBSCRIPT(S) INDICATES LIGHTING FIXTURES TO BE CONTROLLED, (XX) WHEN USED INDICATES SCHEDULE DESIGNATION. "OS" SUPERSUBSCRIPT INDICATES OCCUPANCY SETTING (AUTO ON/OFF); "VS" SUPERSUBSCRIPT INDICATES VACANCY SETTING (MANUAL ON/ AUTO OFF). SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED OR SCHEDULED.				
	NON-FUSIBLE TOGGLE-TYPE DISCONNECT SWITCH, RATED AS SHOWN ON DRAWINGS (EG. 30/3 INDICATES 30-AMP SWITCH, 3-POLE), INSTALLED IN NEMA-1 ENCLOSURE UNLESS OTHERWISE NOTED. SUBSCRIPT "WP" INDICATES WEATHERPROOF (NEMA-3R ENCLOSURE). SUBSCRIPT "XP" INDICATES EXPLOSION PROOF.		DIMMING CONTROL STATION. SUBSCRIPT "M" WHEN USED DENOTES MASTER UNIT, SUBSCRIPT "R" WHEN USED DENOTES REMOTE UNIT				
	NON-FUSIBLE DISCONNECT SWITCH, RATED AS SHOWN ON DRAWINGS (EG. 30/3 INDICATES 30-AMP SWITCH, 3-POLE), INSTALLED IN NEMA-1 ENCLOSURE UNLESS OTHERWISE NOTED. SUBSCRIPT "WP" INDICATES WEATHERPROOF (NEMA-3R ENCLOSURE). SUBSCRIPT "XP" INDICATES EXPLOSION PROOF.		MOTORIZED ACTUATOR				
	FUSIBLE DISCONNECT SWITCH, RATED AS SHOWN ON DRAWINGS (EG. 30/30/3 INDICATES 30-AMP SWITCH, 3-POLE, W/ 30-AMP FUSES). INSTALLED IN NEMA-1 ENCLOSURE UNLESS OTHERWISE NOTED. SUBSCRIPT "WP" INDICATES WEATHERPROOF (NEMA-3R ENCLOSURE). SUBSCRIPT "XP" INDICATES EXPLOSION PROOF.		PUSH BUTTON SWITCH				
			LOW VOLTAGE TRANSFORMER				

SYMBOL LEGEND NOTES:
 DESIGNATION "X" - WHEN USED, DENOTES REFERENCE TO SPECIFIC EQUIPMENT, ABBREVIATION, NEMA CONFIGURATION, OR EQUIPMENT SCHEDULE DESIGNATION, REFER TO MECHANICAL EQUIPMENT SCHEDULES IN MECHANICAL DRAWINGS FOR MECHANICAL EQUIPMENT DESIGNATIONS.
 DESIGNATION "Y" - WHEN USED, DENOTES DEVICE HEIGHT ABOVE FINISHED FLOOR. CONFIRM FINAL HEIGHT OF DEVICES WITH THE ARCHITECTURAL DRAWINGS.
 SUBSCRIPT "(E)" - WHEN USED, DENOTES EXISTING EQUIPMENT.
 SUBSCRIPT "(ER)" - WHEN USED, DENOTES EXISTING EQUIPMENT RELOCATED TO NEW POSITION.
 SUBSCRIPT "(ETR)" - WHEN USED, DENOTES EXISTING EQUIPMENT TO REMAIN.
 SUBSCRIPT "(RE)" - WHEN USED, DENOTES EXISTING EQUIPMENT TO BE RELOCATED.
 REFER TO ELECTRICAL MECHANICAL AND PLUMBING ABBREVIATIONS FOR OTHER POSSIBLE MARKINGS.

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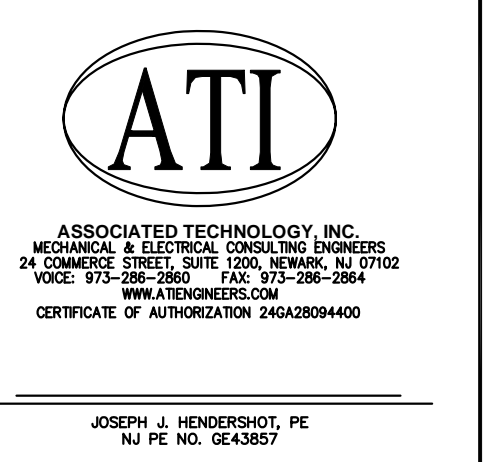
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NICHOLAS J. NETTA, AIA, NCARB
 NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
 NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
 NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
 NJ License No. AI 14394



PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL SYMBOL LEGENDS

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	E.102

ABBREVIATIONS					
ABBREV.	DESCRIPTION	ABBREV.	DESCRIPTION	ABBREV.	DESCRIPTION
A, AMPS	AMPERE	EP1-A	(EP) EM. PNL, (1) 1ST FL, (-A) SCT A	OC	ON CENTER
AC	ALTERNATING CURRENT			P	POLE
AC-1	AIR CONDITIONING UNIT #1	ER	EXISTING RELOCATED	OCPD	OVERCURRENT PROTECTION DEV.
ACCU-1	AIR-COOLED CONDENSING UNIT 1	ETB	EQUIPMENT TERMINAL BLOCK/BOX	PB	PULL BOX
A/C	AIR CONDITIONING	ETR	EXISTING TO REMAIN	PNL	PANEL
AHC	ABOVE HUNG CEILING	EUH	ELECTRIC UNIT HEATER	PP	POWER PANELBOARD
AHU-1	AIR HANDLING UNIT #1	EXH	EXHAUST	PT	POTENTIAL TRANSFORMER / PNEUMATIC TUBE SYSTEM
AIC	AMPERE INTERRUPTING CAPACITY	EXIST	EXISTING		
AF/AT	AMPERE FRAME/AMPERE TRIP	EWC	ELECTRIC WATER COOLER	PTR	PRINTER
AFF	ABOVE FINISHED FLOOR	EWB	ELECTRIC WATER HEATER	RA	RANGE
AFG	ABOVE FINISHED GRADE	FA	FIRE ALARM	RC	RICE COOKER
AP	ANNUNCIATOR PANEL	FACP	FIRE ALARM CONTROL PANEL	RE	RELOCATE EXISTING
ARCH	ARCHITECTURAL	FAU	FAUCET	REC	RECEPTACLE
AS/AF	AMPERE SWITCH/AMPERE FUSE	FBO	FURNISHED BY OTHERS	REF, REFRIG	REFRIGERATOR
ATM	AUTOMATED TELLER MACHINE	FL	FLOOR	RGS	RIGID GALVANIZED STEEL
AV	AUDIO/VISUAL	FMC	FLEXIBLE METALLIC CONDUIT	RM	ROOM
AVPS	AUDIO/VISUAL POWER STRIP	FS	FILE SERVER	RMC	RIGID METALLIC CONDUIT
AWG	AMERICAN WIRE GAUGE	GA	GAUGE	RNC	RIGID NON-METALLIC CONDUIT
BG	BREAK GLASS	GAL	GALLON	RP	RECEPTACLE PANEL
BO	BY OTHERS	GAVL	GALVANIZED	RP1-A	(RP) REC. PNL, (1) 1ST FL, (-A) SCT A
C	CONDUIT/COIL	GEN	GENERATOR		
CAB	CABINET	GFI, GFCI	GROUND FAULT CIRCUIT INTERRUPTER	RTU	ROOF-TOP UNIT
CAM	CAMERA			SAC-1	SPLIT AIR CONDITIONING UNIT #1
CAT	CATEGORY	GI	GREASE INTERCEPTOR	SCH	SCHEDULE
CB	CIRCUIT BREAKER	G, GND	GROUND	SEC	SECURITY
CCTV	CLOSED CIRCUIT TELEVISION	H	HEIGHT	SHD	SHUT DOWN
CH	COUNTER HEIGHT	HP	HORSEPOWER	SP	SPARE
CKT(S)	CIRCUIT(S)	HWCP	HOT WATER CIRCULATING PUMP	SPD	SURGE PROTECTION DEVICE
CL	CLOSET	HWH	HOT WATER HEATER	SS	STAINLESS STEEL
CLG	CEILING	IC	INTERRUPTING CAPACITY	SSB	SOLID STATE BALLAST
CM	CONSTRUCTION MANAGER / CONTROL MODULE	IDF	INTERMEDIATE DISTRIBUTION FR	STD	STANDARD
		IG	ISOLATED GROUND	SW	SWITCH
CONST	CONSTRUCTION	I/L	INTERLOCKED	SWBD	SWITCHBOARD
CO	CERTIFICATE OF OCCUPANCY / COMPANY / CONDUIT ONLY	JB	JUNCTION BOX	TC	TIME CLOCK
		KHU	KITCHEN HOOD UNIT	TCO	TEMPORARY CERT. OF OCC.
COL	COLUMN	KVA	KILOVOLT AMPERE	TELECO	TELEPHONE COMPANY
COMP/CPT	COMPUTER	KW	KILOWATT	TELE	TELEPHONE
CONF	CONFERENCE	KWH	KILOWATT HOUR	TR	TAMPER RESISTANT
CORR	CORRIDOR	L	LENGTH	TS	TAMPER SWITCH
CP	CONTROL PANEL/COMPUTER PANELBOARD	LC	LIGHTING CONTACTOR	TV	TELEVISION
		LP	LIGHTING PANELBOARD	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
CP1-A	(CP) COMP. PNL, (1) 1ST FL, (-A) SCT A	LP1-A	(LP) LTG. PNL, (1) 1ST FL, (-A) SCT A	TX-1	TOILET EXHAUST FAN #1
CR	CONTROL RELAY	LFMC	LIQUID FLEXIBLE METALLIC COND.	TYP	TYPICAL
CRS	COLD ROLLED STEEL	LTG	LIGHTING	UC	UNDERCOUNTER
CS	CONTROL STATION	MAX	MAXIMUM	UH	UNIT HEATER
C/T, CT	CURRENT TRANSFORMER	MCC	MOTOR CONTROL CENTER	UL	UNDERWRITERS LABORATORIES
CT-1	COOLING TOWER #1	MC	MECHANICAL CONTRACTOR	UM	UTILITY METER
CU	COPPER	MCM	THOUSAND CIRCULAR MILLS	UON	UNLESS OTHERWISE NOTED
CUH	CABINET UNIT HEATER	MD	MOTORIZED DAMPER	UTP	UNSHIELDED TWISTED PAIR
CWP-1	CONDENSATE WATER PUMP #1	MDP	MAIN DISTRIBUTION PANELBOARD	V	VOLT
DE	DEMO EXISTING	MDF	MAIN DISTRIBUTION FRAME	VA	VOLT-AMPERE
DH	DOOR HOLDER	MECH	MECHANICAL	W	WIRE / WIDTH / WALL-MOUNTED
DISC	DISCONNECT	MGCV	MASTER GAS CONTROL VALVE	WC	WATER COOLER
DIST	DISTRIBUTION	MIN	MINIMUM	WF	WATER FOUNTAIN
DP	DISTRIBUTION PANEL	MLO	MAIN LUGS ONLY	W/	WITH
DP1-B	(DP) DIST. PNL, (1) 1ST FL, (-B) SCT B	MP	MECHANICAL PANEL	WP	WEATHERPROOF
		MM	MONITOR MODULE	XFMR	TRANSFORMER
DPG	(DP) DISTRIBUTION PANEL, (G) GENERATOR	MP1-A	(MP) MEC. PNL, (1) 1ST FL, (-A) SCT A	ø	PHASE
D/S, DS	DISTRIBUTION SECTION	MDS	MAIN DISTRIBUTION SWITCHBOARD		
DWH-1	DOMESTIC WATER HEATER #1	MS	METER SOCKET		
DWG	DRAWING	MSD	METER SERVICE DISCONNECT		
E	EXISTING	MTD	MOUNTED		
EC	ELECTRICAL CONTRACTOR / EMPTY CONDUIT	MW	MICROWAVE OVEN		
		N	NEW		
ECUH	ELECTRIC CABINET UNIT HEATER	N, NEU	NEUTRAL		
EDPB	(EDP) EM. DIST. PNL, (B) BASEMENT	NA N/A	NOT APPLICABLE		
		NC	NORMALLY CLOSED		
EF-1	EXHAUST FAN #1	NDB	NIGHT DEPOSIT BOX		
EG	EQUIPMENT GROUND	NEC	NATIONAL ELECTRICAL CODE		
EH	ELECTRIC HEAT	NFPA	NATIONAL FIRE PROTECTION ASS.		
ELEC	ELECTRIC	NIC	NOT IN CONTRACT		
EM	EMERGENCY	NL	NIGHT LIGHT		
EMT	ELECTRIC METALLIC TUBING	NO	NORMALLY OPEN		
EP	EMERGENCY PANEL	NTS	NOT TO SCALE		

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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



ASSOCIATED TECHNOLOGY INC.
MECHANICAL & ELECTRICAL CONSULTING BUSINESS
100 WEST 31ST STREET, 10TH FLOOR, NEW YORK, NY 10001-2014
TEL: 212-310-0000 FAX: 212-310-0001
WWW.ATIARCHITECTS.COM

JOSEPH J. HENDERSON, PE
NJ License No. 36049



NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1004 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-378-0008 FAX: 973-378-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

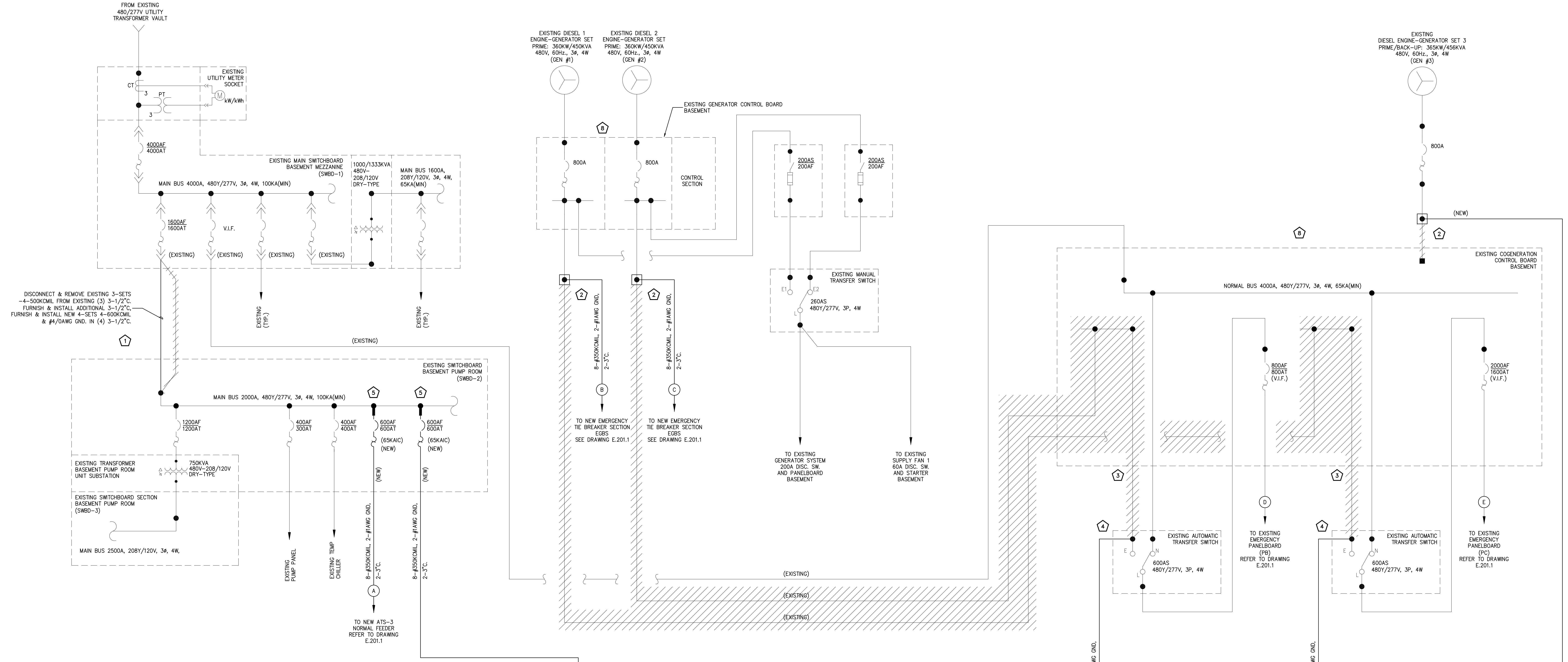
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**ELECTRICAL
ABBREVIATIONS**

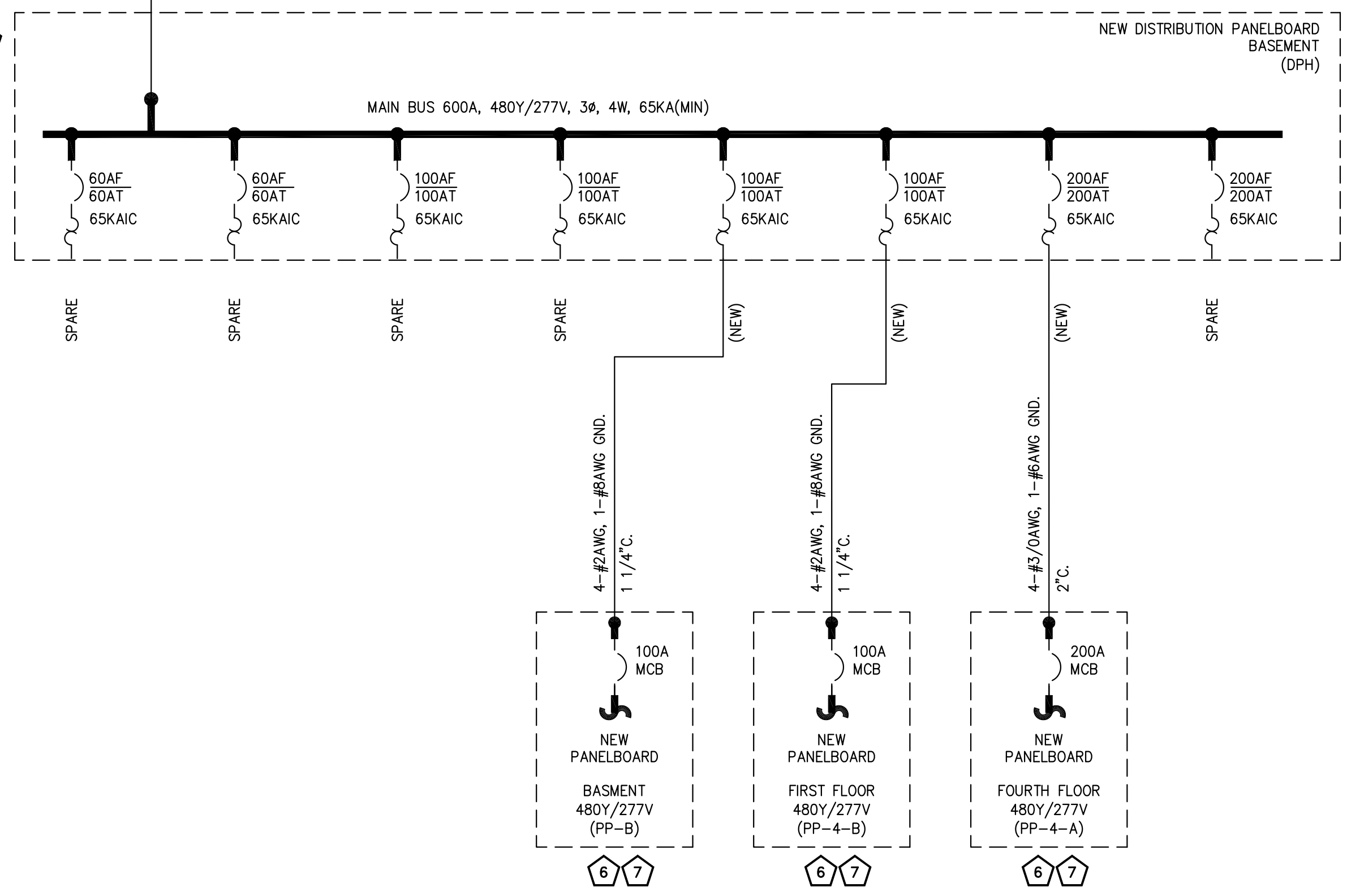
SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY NJN
									JOB NO 2141152
									SHEET: _ OF:
									DWG. NO

E.103



- DRAWING NOTES:**
- PRIOR TO THE COMMENCEMENT OF WORK, COORDINATE ALL WORK WITH ALL OTHER TRADE CONTRACTORS, THE OWNER, AND THE LOCAL POWER UTILITY (AS APPLICABLE).
 - ALL RACEWAY PENETRATIONS SHALL MAINTAIN THE INTENDED FIRE RATINGS AS SHOWN ON THE ARCHITECTURAL DRAWINGS. CONTRACTOR SHALL INCLUDE ANY AND ALL PATCHWORK REQUIRED TO INSTALL THE NEW ELECTRICAL SYSTEM AS REQUIRED. ALL FINISHES SHALL MATCH EXISTING ADJACENT CONDITIONS, AND TO A CONDITION EQUAL TO OR BETTER THAN INITIALLY FOUND.
 - FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND OWNER.
 - COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH ALL APPLICABLE SITE PLAN, ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL AND/OR PLUMBING DRAWINGS, BASE BID ACCORDINGLY.
 - ALL OVERCURRENT DEVICES SHOWN SHALL BE ASSUMED 3-POLE UNLESS OTHERWISE INDICATED.
 - ALL CONDUCTORS SHALL BE COPPER, UNLESS OTHERWISE INDICATED OR SHOWN.
 - PROVIDE ARC FLASH WARNING SIGNAGE AT ALL NEW ELECTRICAL DISTRIBUTION EQUIPMENT FACILITIES AS PER NEC 110.16.
 - PROVIDE NEW TYPED CIRCUIT DIRECTORIES OF THE "AS-BUILT" CIRCUITING CONDITIONS FOR ALL EXISTING PANELBOARD THAT ARE AFFECTED BY WORK.
 - REFER TO ALL APPLICABLE PANEL AND EQUIPMENT SCHEDULES FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
 - REFER TO THE ELECTRICAL DETAILS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
 - REFER TO DWG E.101 FOR ELECTRICAL PROJECT NOTES.
 - REFER TO DWG E.102 FOR ELECTRICAL PROJECT SYMBOLS.
 - REFER TO DWG E.103 FOR ELECTRICAL PROJECT ABBREVIATIONS.

- KEYED ONE LINE NOTES:**
- REMOVE EXISTING CABLE IN EXISTING CONDUITS AND PROVIDE NEW AS INDICATED. PROVIDE ALL LUG MODIFICATIONS AND ACCESSORIES IN EACH SWITCHBOARD AS REQUIRED FOR NEW FEEDER INSTALLATION.
 - REMOVE EXISTING EMERGENCY FEEDER CABLE OUT OF GENERATOR CONTROL BOARDS AS INDICATED AND PROVIDE NEW SPLICE AND CABLE FEEDER TO NEW TIE BREAKER SECTION EGBS. ALL SPLICES SHALL BE COMPRESSION TYPE AND INSTALLED IN AN APPROVED JUNCTION BOX AS PER NEC 314.
 - REMOVE EXISTING EMERGENCY FEEDER CABLE OUT OF COGENERATION CABINET TO ATS-1 AND ATS-2 AS INDICATED.
 - PROVIDE NEW FEEDER CONNECTION AT EXISTING ATS AS INDICATED. PROVIDE ALL LUGS AND ACCESSORIES REQUIRED FOR COMPLETE INSTALLATION AT ATS.
 - PROVIDE NEW CIRCUIT BREAKER IN EXISTING SWITCHBOARD. NEW BREAKERS SHALL MAINTAIN EXISTING SWITCHBOARD RATINGS. PROVIDE ALL LUGS AND ACCESSORIES REQUIRED FOR COMPLETE INSTALLATION IN EXISTING SWITCHBOARD.
 - PROVIDE NEW DISTRIBUTION POWER PANELBOARD AS DETAILED AND PROVIDED FOR IN PANELBOARD SPECIFICATIONS.
 - PROVIDE NEW PANELBOARD, STEP DOWN TRANSFORMER, AND LOW VOLTAGE PANELBOARD AS DETAILED AND PROVIDED FOR IN PANELBOARD SPECIFICATIONS. REFER TO PANEL SCHEDULES FOR DETAILS AND FURTHER REQUIREMENTS.
 - CONTRACTOR SHALL RETAIN SERVICES OF UNION COUNTY'S CONTROLS VENDOR (PENNETTA MECHANICAL) TO TRACE OUT AND DETERMINE FUNCTIONING RELAY AND MONITORING COMPONENTS OF THE COGENERATION CONTROL BOARD AND THE GENERATOR CONTROL BOARD. ALL CONTROL INSTRUMENTATION THAT IS NOT BEING USED OR NOT FUNCTIONING SHALL BE REMOVED. CONTRACTOR SHALL PROVIDE A REPORT OF THEIR FINDINGS TO THE ENGINEER PRIOR TO STARTING OF ANY WORK FOR APPROVAL OF PROPOSED MODIFICATIONS.



PROJECT:
**UC COURTHOUSE
 FIRE SUPPRESSION (ROTUNDA)**
 2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**ELECTRICAL
 ONE LINE DIAGRAM**

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY NUN
								JOB NO 2141152
								SHEET: _ OF:
								DWG. NO

E.201

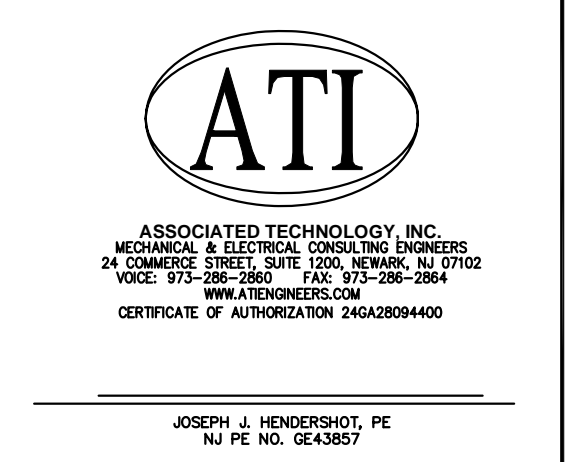
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NICHOLAS J. NETTA, AIA, NCARB
 NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
 NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
 NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
 NJ License No. AI 14394



JOSEPH J. HENDERSON, PE
 NJ License No. 36049

PANELBOARD NAME: PP-B										PANELBOARD CIRCUITING SCHEDULE										PANELBOARD LOCATION: BASEMENT MER									
CKT NO.	DESCRIPTION	LOAD (VA)	CIRCUIT BREAKER			NOTES	WIRE AND RACEWAY		CIRCUIT BREAKER			LOAD (VA)	DESCRIPTION	CKT NO.	WIRE AND RACEWAY		CIRCUIT BREAKER			LOAD (VA)	DESCRIPTION	CKT NO.							
			FRAME (A)	TRIP (A)	POLES		W	LINE	W	LINE	W				LINE	W	LINE												
1	BASEMENT AIR HANDLER AHJ-1	3,359	100	20	3	1,2,3,5	3-#12AWG,#12AWG G,3/4"	1	L1	2	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	250													
		3,359						3	L2	4	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	1400													
		3,359						5	L3	6	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	1800													
3	BASEMENT RETURN FAN RF-1	1,330	100	15	3	1,2,3,5	3-#12AWG,#12AWG G,3/4"	7	L1	8	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	792													
		1,330						9	L2	10	-	-	3	100	20	1	0												
		1,330						11	L3	12	-	-	3	100	20	1	0												
		1,454						13	L1	14	-	-	3	100	20	1	0												
		1,454						15	L2	16	-	-	3	100	20	1	0												
		1,454						17	L3	18	-	-	3	100	20	1	0												
		3,047						19	L1	20	-	-	3	100	20	1	0												
7	HOT WATER PUMP-1 VFD	3,047	100	20	3	1,2,3,5	3-#12AWG,#12AWG G,3/4"	21	L2	22	-	-	3	100	20	1	0												
		3,047						23	L3	24	-	-	3	100	20	1	0												
		3,047						25	L1	26	-	-	3	100	20	1	0												
		3,047						27	L2	28	-	-	3	100	20	1	0												
		3,047						29	L3	30	-	-	3	100	20	1	0												

CONNECTED LOAD SUMMARY		
PHASE	VA	AMPS
L1	16,402	59
L2	16,093	58
L3	14,427	52
THREE PHASE CONNECTED LOAD	46,921	56

PANEL CONSTRUCTION:
 INCOMING SERVICE: 277/480 VOLTS, 3-PHASE, 4-WIRE
 FEEDER SIZE: REFER TO THE ONE LINE DIAGRAM
 MAIN BUS: 100A
 MAIN LUGS:
 MAIN BREAKER: 100A
 BRANCH BREAKER RATINGS AS INDICATED ABOVE
 ASSEMBLY WITHSTANDING INTERRUPTING RATING: 65 KAIC SYM
 MOUNTING SURFACE

PANELBOARD SPECIFICATIONS

30 CKT, 30 1-POLE SPACES, 20" (W) X 32" (H) X 6" (D), NEMA TYPE 1, WITH DOOR-IN-DOOR PANEL, WITH LOOKING A TONGUE DOOR, COPPER BUS, SOLID NEUTRAL, WITH REMOVABLE BONDING STRAP, EQUIPMENT GROUND BAR, SERVICE ENTRANCE RATED WHERE APPLICABLE, TY PED CIRCUIT DIRECTORY PER AS-BUILT, PANEL IDENTIFICATION NAME PLATE, 75°C DEVICE TERMINALS, CONTINUOUSLY RATED DEVICES AT 40°C AMBIENT, FULLY-RATED, OR SERIES RATED MAIN-TO-BRANCH CIRCUIT BREAKERS SHALL BE PERMITTED AND SHALL BE APPROPRIATELY MARKED PER NEC REQUIREMENTS. PROVIDE REQUIRED MARKINGS PER NEC 110 AND 240.86 AS REQUIRED. PER SEMS P2-SERIES PANELBOARD OR APPROVED EQUAL.

SCHEDULE NOTES:

- INTERIOR CONCEALED CABLE AND CONDUIT SHALL BE PERMITTED TO BE SUBSTITUTED WITH METAL-CLAD CABLE (TYPE MC) AS REQUIRED AND INDICATED ON THE DRAWINGS. USE OF MC CABLE SHALL COMPLY WITH NEC 330, AND MEET ALL INTENDED GROUNDING REQUIREMENTS.
- PRIOR TO COMMENCEMENT OF WORK, COORDINATE FINAL BRANCH CIRCUIT EQUIPMENT AND DEVICE LOCATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, AND/OR APPROVED UTILIZATION EQUIPMENT SHOP DRAWINGS.
- CONTRACTOR SHALL PROVIDE BRANCH CIRCUIT BREAKER AS REQUIRED.
- PROVIDE A LISTED BREAKER BLOCKING DEVICE IN ORDER TO PREVENT INADVERTENT BREAKER OPERATION.
- CONTRACTOR SHALL MEASURE PHASE LOADS (TRUE RMS) OF PANELBOARD DURING A NORMAL OPERATING DEMAND SCENARIO, AND BALANCE BRANCH CIRCUIT LOADING ACCORDINGLY. UPON COMPLETION OF LOAD BALANCING, MODIFY BRANCH CIRCUIT PHASING IDENTIFICATION.

PANELBOARD NAME: RP-B										PANELBOARD CIRCUITING SCHEDULE										PANELBOARD LOCATION: BASEMENT MER									
CKT NO.	DESCRIPTION	LOAD (VA)	CIRCUIT BREAKER			NOTES	WIRE AND RACEWAY		CIRCUIT BREAKER			LOAD (VA)	DESCRIPTION	CKT NO.	WIRE AND RACEWAY		CIRCUIT BREAKER			LOAD (VA)	DESCRIPTION	CKT NO.							
			FRAME (A)	TRIP (A)	POLES		W	LINE	W	LINE	W				LINE	W	LINE												
1	BASEMENT HVAC POWER	500	100	20	1	1,2,3,5	2-#12AWG,#12AWG G,3/4"	1	L1	2	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	1456													
3	HWP-1,2 CONTROL PANEL	500	100	20	1	1,2,3,5	2-#12AWG,#12AWG G,3/4"	3	L2	4	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	1456													
5	ELEV. PIT & EMB RECEPTACLES	390	100	20	1	1,2,3,5	2-#12AWG,#12AWG G,3/4"	5	L3	6	-	-	3	100	20	1	0												
7	GROUND FLOOR EXH FANS-1-2-3	1,187	100	20	1	1,2,3,5	2-#12AWG,#12AWG G,3/4"	7	L1	8	-	-	3	100	20	1	0												
9	GROUND FLOOR HVAC POWER	600	100	20	1	1,2,3,5	2-#12AWG,#12AWG G,3/4"	9	L2	10	-	-	3	100	20	1	0												
11	SPARE	0	100	20	1	3	-	11	L3	12	-	-	3	100	20	1	0												
13	SPARE	0	100	20	1	3	-	13	L1	14	-	-	3	100	20	1	0												
15	SPARE	0	100	20	1	3	-	15	L2	16	-	-	3	100	20	1	0												
17	SPARE	0	100	20	1	3	-	17	L3	18	-	-	3	100	20	1	0												
19	SPARE	0	100	20	1	3	-	19	L1	20	-	-	3	100	20	1	0												
21	SPARE	0	100	20	1	3	-	21	L2	22	-	-	3	100	20	1	0												
23	SPARE	0	100	20	1	3	-	23	L3	24	-	-	3	100	20	1	0												
25	SPARE	0	100	20	1	3	-	25	L1	26	-	-	3	100	20	1	0												
27	SPARE	0	100	20	1	3	-	27	L2	28	-	-	3	100	20	1	0												
29	SPARE	0	100	20	1	3	-	29	L3	30	-	-	3	100	20	1	0												

CONNECTED LOAD SUMMARY		
PHASE	VA	AMPS
L1	3,123	25
L2	2,456	20
L3	300	3
THREE PHASE CONNECTED LOAD	5,960	17

PANEL CONSTRUCTION:
 INCOMING SERVICE: 120/208 VOLTS, 3-PHASE, 4-WIRE
 FEEDER SIZE: REFER TO THE ONE LINE DIAGRAM
 MAIN BUS: 100A
 MAIN LUGS:
 MAIN BREAKER: 100A
 BRANCH BREAKER RATINGS AS INDICATED ABOVE
 ASSEMBLY WITHSTANDING INTERRUPTING RATING: 22 KAIC SYM
 MOUNTING SURFACE

PANELBOARD SPECIFICATIONS

30 CKT, 30 1-POLE SPACES, 20" (W) X 32" (H) X 6" (D), NEMA TYPE 1, WITH DOOR-IN-DOOR PANEL, WITH LOOKING A TONGUE DOOR, COPPER BUS, SOLID NEUTRAL, WITH REMOVABLE BONDING STRAP, EQUIPMENT GROUND BAR, SERVICE ENTRANCE RATED WHERE APPLICABLE, TY PED CIRCUIT DIRECTORY PER AS-BUILT, PANEL IDENTIFICATION NAME PLATE, 75°C DEVICE TERMINALS, CONTINUOUSLY RATED DEVICES AT 40°C AMBIENT, FULLY-RATED, OR SERIES RATED MAIN-TO-BRANCH CIRCUIT BREAKERS SHALL BE PERMITTED AND SHALL BE APPROPRIATELY MARKED PER NEC REQUIREMENTS. PROVIDE REQUIRED MARKINGS PER NEC 110 AND 240.86 AS REQUIRED. PER SEMS P2-SERIES PANELBOARD OR APPROVED EQUAL.

SCHEDULE NOTES:

- INTERIOR CONCEALED CABLE AND CONDUIT SHALL BE PERMITTED TO BE SUBSTITUTED WITH METAL-CLAD CABLE (TYPE MC) AS REQUIRED AND INDICATED ON THE DRAWINGS. USE OF MC CABLE SHALL COMPLY WITH NEC 330, AND MEET ALL INTENDED GROUNDING REQUIREMENTS.
- PRIOR TO COMMENCEMENT OF WORK, COORDINATE FINAL BRANCH CIRCUIT EQUIPMENT AND DEVICE LOCATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, AND/OR APPROVED UTILIZATION EQUIPMENT SHOP DRAWINGS.
- CONTRACTOR SHALL PROVIDE BRANCH CIRCUIT BREAKER AS REQUIRED.
- PROVIDE A LISTED BREAKER BLOCKING DEVICE IN ORDER TO PREVENT INADVERTENT BREAKER OPERATION.
- CONTRACTOR SHALL MEASURE PHASE LOADS (TRUE RMS) OF PANELBOARD DURING A NORMAL OPERATING DEMAND SCENARIO, AND BALANCE BRANCH CIRCUIT LOADING ACCORDINGLY. UPON COMPLETION OF LOAD BALANCING, MODIFY BRANCH CIRCUIT PHASING IDENTIFICATION.

PANELBOARD NAME: PPE-B										PANELBOARD CIRCUITING SCHEDULE										PANELBOARD LOCATION: BASEMENT MER									
CKT NO.	DESCRIPTION	LOAD (VA)	CIRCUIT BREAKER			NOTES	WIRE AND RACEWAY		CIRCUIT BREAKER			LOAD (VA)	DESCRIPTION	CKT NO.	WIRE AND RACEWAY		CIRCUIT BREAKER			LOAD (VA)	DESCRIPTION	CKT NO.							
			FRAME (A)	TRIP (A)	POLES		W	LINE	W	LINE	W				LINE	W	LINE												
1	SPARE	0	100	20	3	3	-	1	L1	2	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	93													
		0						3	L2	4	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	229													
		0						5	L3	6	-	-	3	100	20	1	0												
3	SPARE	0	100	20	3	3	-	7	L1	8	-	-	3	100	20	1	0												
		0						9	L2	10	-	-	3	100	20	1	0												
		0						11	L3	12	-	-	3	100	20	1	0												
5	SPARE	0	100	20	1	3	-	13	L1	14	-	-	3	100	20	1	0												
7	SPARE	0	100	20	1	3	-	15	L2	16	-	-	3	100	20	1	0												
9	SPARE	0	100	20	1	3	-	17	L3	18	-	-	3	100	20	1	0												
11	SPARE	0	100	20	1	3	-	19	L1	20	-	-	3	100	20	1	0												
13	SPACE	0	-	-	1	-	-	21	L2	22	-	-	-	-	1	0													
15	SPACE	0	-	-	1	-	-	23	L3	24	-	-	-	-	1	0													
17	SPACE	0	-	-	1	-	-	25	L1	26	-	-	-	-	1	0													
19	SPACE	0	-	-	1	-	-	27	L2	28	-	-	-	-	1	0													
21	SPACE	0	-	-	1	-	-	29	L3	30	-	-	-	-	1	0													

CONNECTED LOAD SUMMARY		
PHASE	VA	AMPS
L1	4,128	15
L2	4,064	15
L3	3,835	14
THREE PHASE CONNECTED LOAD	12,026	14

PANEL CONSTRUCTION:
 INCOMING SERVICE: 277/480 VOLTS, 3-PHASE, 4-WIRE
 FEEDER SIZE: REFER TO THE ONE LINE DIAGRAM
 MAIN BUS: 100A
 MAIN LUGS:
 MAIN BREAKER: 100A
 BRANCH BREAKER RATINGS AS INDICATED ABOVE
 ASSEMBLY WITHSTANDING INTERRUPTING RATING: 65 KAIC SYM
 MOUNTING SURFACE

PANELBOARD SPECIFICATIONS

30 CKT, 30 1-POLE SPACES, 20" (W) X 32" (H) X 6" (D), NEMA TYPE 1, WITH DOOR-IN-DOOR PANEL, WITH LOOKING A TONGUE DOOR, COPPER BUS, SOLID NEUTRAL, WITH REMOVABLE BONDING STRAP, EQUIPMENT GROUND BAR, SERVICE ENTRANCE RATED WHERE APPLICABLE, TY PED CIRCUIT DIRECTORY PER AS-BUILT, PANEL IDENTIFICATION NAME PLATE, 75°C DEVICE TERMINALS, CONTINUOUSLY RATED DEVICES AT 40°C AMBIENT, FULLY-RATED, OR SERIES RATED MAIN-TO-BRANCH CIRCUIT BREAKERS SHALL BE PERMITTED AND SHALL BE APPROPRIATELY MARKED PER NEC REQUIREMENTS. PROVIDE REQUIRED MARKINGS PER NEC 110 AND 240.86 AS REQUIRED. PER SEMS P2-SERIES PANELBOARD OR APPROVED EQUAL.

SCHEDULE NOTES:

- INTERIOR CONCEALED CABLE AND CONDUIT SHALL BE PERMITTED TO BE SUBSTITUTED WITH METAL-CLAD CABLE (TYPE MC) AS REQUIRED AND INDICATED ON THE DRAWINGS. USE OF MC CABLE SHALL COMPLY WITH NEC 330, AND MEET ALL INTENDED GROUNDING REQUIREMENTS.
- PRIOR TO COMMENCEMENT OF WORK, COORDINATE FINAL BRANCH CIRCUIT EQUIPMENT AND DEVICE LOCATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, AND/OR APPROVED UTILIZATION EQUIPMENT SHOP DRAWINGS.
- CONTRACTOR SHALL PROVIDE BRANCH CIRCUIT BREAKER AS REQUIRED.
- PROVIDE A LISTED BREAKER BLOCKING DEVICE IN ORDER TO PREVENT INADVERTENT BREAKER OPERATION.
- CONTRACTOR SHALL MEASURE PHASE LOADS (TRUE RMS) OF PANELBOARD DURING A NORMAL OPERATING DEMAND SCENARIO, AND BALANCE BRANCH CIRCUIT LOADING ACCORDINGLY. UPON COMPLETION OF LOAD BALANCING, MODIFY BRANCH CIRCUIT PHASING IDENTIFICATION.

PANELBOARD NAME: RPE-B										PANELBOARD CIRCUITING SCHEDULE										PANELBOARD LOCATION: BASE									
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PANELBOARD NAME: PP-4-A										PANELBOARD LOCATION: 4TH FLOOR MER									
CKT NO.	DESCRIPTION	LOAD (VA)	CIRCUIT BREAKER			NOTES	WIRE AND RACEWAY	W	LINE	W	WIRE AND RACEWAY	NOTES	CIRCUIT BREAKER			LOAD (VA)	DESCRIPTION	CKT NO.	
			FRAME (A)	TRIP (A)	POLES								FRAME (A)	TRIP (A)	POLES				
1	FOURTH FLOOR AIR HANDLER AHJ-5	6,129	100	40	3	1,2,3,5	3-#8AWG,#10AWG G,3/4"	1	L1	2	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	500	FOURTH FLOOR FCU-8-9	2	
		6,129	100	40	3	1,2,3,5	3-#8AWG,#10AWG G,3/4"	3	L2	4	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	800	FOURTH FL VAVS 5-11, 5-12, 6-13, 6-14	4	
		6,129	100	40	3	1,2,3,5	3-#8AWG,#10AWG G,3/4"	5	L3	6	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	500	THIRD FLOOR FCU-6-7	6	
3	FOURTH FLOOR AIR HANDLER AHJ-6	6,129	100	40	3	1,2,3,5	3-#8AWG,#10AWG G,3/4"	7	L1	8	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	800	2FL VAVS 5-7, 5-8, 3FL VAVS 5-9, 5-10	8	
		6,129	100	40	3	1,2,3,5	3-#8AWG,#10AWG G,3/4"	9	L2	10	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	800	2FL VAVS 6-9, 6-10, 3FL VAVS 6-11, 6-12	10	
		6,129	100	40	3	1,2,3,5	3-#8AWG,#10AWG G,3/4"	11	L3	12	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	500	SECOND FLOOR FCU-4-5	12	
5	FOURTH FLOOR RETURN FAN RF-2	2,105	100	20	3	1,2,3,5	3-#12AWG,#12AWG G,3/4"	13	L1	14	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	500	FIRST FLOOR FCU-2-3	14	
		2,105	100	20	3	1,2,3,5	3-#12AWG,#12AWG G,3/4"	15	L2	16	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	1600	FIRST FL VAVS 4, 5, 5, 5, 6, 6, 4 TO 6-4	16	
		2,105	100	20	3	1,2,3,5	3-#12AWG,#12AWG G,3/4"	17	L3	18	2-#12AWG,#12AWG G,3/4"	1,2,3,5	100	20	1	516	LT.G.IN 4TH FL. NBH SOUTH MECH ROOM	18	
7	FOURTH FLOOR RETURN FAN RF-3	2,105	100	20	3	1,2,3,5	3-#12AWG,#12AWG G,3/4"	19	L1	20	-	3	100	20	1	0	SPARE	20	
		2,105	100	20	3	1,2,3,5	3-#12AWG,#12AWG G,3/4"	21	L2	22	-	3	100	20	1	0	SPARE	22	
		2,105	100	20	3	1,2,3,5	3-#12AWG,#12AWG G,3/4"	23	L3	24	-	3	100	20	1	0	SPARE	24	
9	SPARE	0	100	20	3	3	-	25	L1	26	-	3	100	20	1	0	SPARE	26	
		0	100	20	3	3	-	27	L2	28	-	3	100	20	1	0	SPARE	28	
		0	100	20	3	3	-	29	L3	30	-	3	100	20	1	0	SPARE	30	
		0	100	20	3	3	-	31	L1	32	-	3	100	20	1	0	SPARE	32	
11	SPARE	0	100	20	3	3	-	33	L2	34	-	3	100	20	1	0	SPARE	34	
		0	100	20	3	3	-	35	L3	36	-	3	100	20	1	0	SPARE	36	
		0	100	20	3	3	-	37	L1	38	-	3	100	20	1	0	SPARE	38	
		0	100	20	3	3	-	39	L2	40	-	3	100	20	1	0	SPARE	40	
		0	100	20	3	3	-	41	L3	42	-	3	100	20	1	0	SPARE	42	

CONNECTED LOAD SUMMARY			
PHASE	VA	AMPS	
L1	18,268	66	
L2	19,658	71	
L3	18,084	65	
THREE PHASE CONNECTED LOAD	56,020	67	

PANEL CONSTRUCTION:
INCOMING SERVICE: 277/480 VOLTS, 3-PHASE, 4-WIRE
FEEDER SIZE: REFER TO THE ONE LINE DIAGRAM
MAIN BUS: 225A
MAIN LUGS:
MAIN BREAKER: 200A
BRANCH BREAKER RATINGS AS INDICATED ABOVE
ASSEMBLY WITHSTAND/INTERRUPTING RATING: 65 KAIC SYM
MOUNTING: SURFACE

PANELBOARD SPECIFICATIONS

42 CKT, 30 1-POLE SPACES, 20" (W) X 50" (H) X 6" (D), NEMA TYPE 1, FEED-THRU LUGS, WITH DOOR-IN-DOOR PANEL, WITH LOCKING LATCHING DOOR, COPPER BUS, SOLID NEUTRAL, WITH REMOVABLE BONDING STRAP, EQUIPMENT GROUND BAR, SERVICE ENTRANCE RATED WHERE APPLICABLE, TYPED CIRCUIT DIRECTORY PER AS-BUILT, PANEL IDENTIFICATION NAME PLATE, 75°C DEVICE TERMINALS, CONTINUOUSLY RATED DEVICES AT 40°C AMBIENT, FULLY-RATED, OR SERIES-RATED MAIN-TO-BRANCH CIRCUIT BREAKERS SHALL BE PERMITTED AND SHALL BE APPROPRIATELY MARKED PER NEC REQUIREMENTS. PROVIDE REQUIRED MARKINGS PER NEC 110 AND 240.86 AS REQUIRED. PER SIEMENS P2-SERIES PANELBOARD OR APPROVED EQUAL.

SCHEDULE NOTES:

- INTERIOR CONCEALED CABLE AND CONDUIT SHALL BE PERMITTED TO BE SUBSTITUTED WITH METAL-CLAD CABLE (TYPE MC) AS REQUIRED AND INDICATED ON THE DRAWINGS. USE OF MC CABLE SHALL COMPLY WITH NEC 330, AND MEET ALL INTENDED GROUNDING REQUIREMENTS.
- PRIOR TO COMMENCEMENT OF WORK, COORDINATE FINAL BRANCH CIRCUIT EQUIPMENT AND DEVICE LOCATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, AND/OR APPROVED UTILIZATION EQUIPMENT SHOP DRAWINGS.
- CONTRACTOR SHALL PROVIDE BRANCH CIRCUIT BREAKER AS REQUIRED.
- PROVIDE A LISTED BREAKER BLOCKING DEVICE IN ORDER TO PREVENT INADVERTENT BREAKER OPERATION.
- CONTRACTOR SHALL MEASURE PHASE LOADS (TRUE RMS) OF PANELBOARD DURING A NORMAL OPERATING DEMAND SCENARIO, AND BALANCE BRANCH CIRCUIT LOADING ACCORDINGLY. UPON COMPLETION OF LOAD BALANCING, MODIFY BRANCH CIRCUIT PHASING IDENTIFICATION.

PANELBOARD NAME: RPE-4-A										PANELBOARD LOCATION: 4TH FLOOR MER									
CKT NO.	DESCRIPTION	LOAD (VA)	CIRCUIT BREAKER			NOTES	WIRE AND RACEWAY	W	LINE	W	WIRE AND RACEWAY	NOTES	CIRCUIT BREAKER			LOAD (VA)	DESCRIPTION	CKT NO.	
			FRAME (A)	TRIP (A)	POLES								FRAME (A)	TRIP (A)	POLES				
1	SPARE	0	100	20	1	3	-	1	L1	2	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	0	1ST FL. EX. HALLWAY & STAIR LIGHTING	2	
3	FOURTH FLOOR FSD POWER	200	100	20	1	1,2,3,4,5	2-#12AWG,#12AWG G,3/4"	3	L2	4	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	0	1ST FL. EX. HALLWAY & STAIR LIGHTING	4	
5	FIRST FLOOR FSD POWER	500	100	20	1	1,2,3,4,5	2-#12AWG,#12AWG G,3/4"	5	L3	6	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	0	2ND FL. EX. HALLWAY & STAIR LIGHTING	6	
7	FIRST FLOOR MAGNETIC DOOR HOLD	200	100	20	1	1,2,3,4,5	2-#12AWG,#12AWG G,3/4"	7	L1	8	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	0	2ND FL. EX. HALLWAY & STAIR LIGHTING	8	
9	SECOND FLOOR MAGNETIC DOOR HOLD	300	100	20	1	1,2,3,4,5	2-#12AWG,#12AWG G,3/4"	9	L2	10	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	0	3RD FL. EX. HALLWAY & STAIR LIGHTING	10	
11	THIRD FLOOR MAGNETIC DOOR HOLD	300	100	20	1	1,2,3,4,5	2-#12AWG,#12AWG G,3/4"	11	L3	12	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	0	3RD FL. EX. HALLWAY & STAIR LIGHTING	12	
13	FOURTH FLOOR MAGNETIC DOOR HOLD	200	100	20	1	1,2,3,4,5	2-#12AWG,#12AWG G,3/4"	13	L1	14	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	0	4TH FL. EX. HALLWAY & STAIR LIGHTING	14	
15	SPARE	0	100	20	1	3	-	15	L2	16	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	0	4TH FL. EX. HALLWAY & STAIR LIGHTING	16	
17	SPARE	0	100	20	1	3	-	17	L3	18	-	-	3	100	20	1	0	SPARE	18
19	SPARE	0	100	20	1	3	-	19	L1	20	-	-	3	100	20	1	0	SPARE	20
21	SPARE	0	100	20	1	3	-	21	L2	22	-	-	3	100	20	1	0	SPARE	22
23	SPARE	0	100	20	1	3	-	23	L3	24	-	-	3	100	20	1	0	SPARE	24
25	SPARE	0	100	20	1	3	-	25	L1	26	-	-	3	100	20	1	0	SPARE	26
27	SPARE	0	100	20	1	3	-	27	L2	28	-	-	3	100	20	1	0	SPARE	28
29	SPARE	0	100	20	1	3	-	29	L3	30	-	-	3	100	20	1	0	SPARE	30

CONNECTED LOAD SUMMARY			
PHASE	VA	AMPS	
L1	400	3	
L2	500	4	
L3	800	7	
THREE PHASE CONNECTED LOAD	1,700	5	

PANEL CONSTRUCTION:
INCOMING SERVICE: 120/208 VOLTS, 3-PHASE, 4-WIRE
FEEDER SIZE: REFER TO THE ONE LINE DIAGRAM
MAIN BUS: -
MAIN LUGS:
MAIN BREAKER: 100A
BRANCH BREAKER RATINGS AS INDICATED ABOVE
ASSEMBLY WITHSTAND/INTERRUPTING RATING: 22 KAIC SYM
MOUNTING: SURFACE

PANELBOARD SPECIFICATIONS

30 CKT, 30 1-POLE SPACES, 20" (W) X 50" (H) X 6" (D), NEMA TYPE 1, WITH DOOR-IN-DOOR PANEL, WITH LOCKING LATCHING DOOR, COPPER BUS, SOLID NEUTRAL, WITH REMOVABLE BONDING STRAP, EQUIPMENT GROUND BAR, SERVICE ENTRANCE RATED WHERE APPLICABLE, TYPED CIRCUIT DIRECTORY PER AS-BUILT, PANEL IDENTIFICATION NAME PLATE, 75°C DEVICE TERMINALS, CONTINUOUSLY RATED DEVICES AT 40°C AMBIENT, FULLY-RATED, OR SERIES-RATED MAIN-TO-BRANCH CIRCUIT BREAKERS SHALL BE PERMITTED AND SHALL BE APPROPRIATELY MARKED PER NEC REQUIREMENTS. PROVIDE REQUIRED MARKINGS PER NEC 110 AND 240.86 AS REQUIRED. PER SIEMENS P2-SERIES PANELBOARD OR APPROVED EQUAL.

SCHEDULE NOTES:

- INTERIOR CONCEALED CABLE AND CONDUIT SHALL BE PERMITTED TO BE SUBSTITUTED WITH METAL-CLAD CABLE (TYPE MC) AS REQUIRED AND INDICATED ON THE DRAWINGS. USE OF MC CABLE SHALL COMPLY WITH NEC 330, AND MEET ALL INTENDED GROUNDING REQUIREMENTS.
- PRIOR TO COMMENCEMENT OF WORK, COORDINATE FINAL BRANCH CIRCUIT EQUIPMENT AND DEVICE LOCATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, AND/OR APPROVED UTILIZATION EQUIPMENT SHOP DRAWINGS.
- CONTRACTOR SHALL PROVIDE BRANCH CIRCUIT BREAKER AS REQUIRED.
- PROVIDE A LISTED BREAKER BLOCKING DEVICE IN ORDER TO PREVENT INADVERTENT BREAKER OPERATION.
- CONTRACTOR SHALL MEASURE PHASE LOADS (TRUE RMS) OF PANELBOARD DURING A NORMAL OPERATING DEMAND SCENARIO, AND BALANCE BRANCH CIRCUIT LOADING ACCORDINGLY. UPON COMPLETION OF LOAD BALANCING, MODIFY BRANCH CIRCUIT PHASING IDENTIFICATION.

PANELBOARD NAME: PPE-4-A										PANELBOARD LOCATION: 4TH FLOOR MER									
CKT NO.	DESCRIPTION	LOAD (VA)	CIRCUIT BREAKER			NOTES	WIRE AND RACEWAY	W	LINE	W	WIRE AND RACEWAY	NOTES	CIRCUIT BREAKER			LOAD (VA)	DESCRIPTION	CKT NO.	
			FRAME (A)	TRIP (A)	POLES								FRAME (A)	TRIP (A)	POLES				
1	ROOF SMOKE EXH. FANS 1-3-5	2,313	100	20	3	3	3-#12AWG,#12AWG G,3/4"	1	L1	2	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	207	1ST FL. EXIT AND EMERGENCY LIGHTING	2	
		2,313	100	20	3	3	3-#12AWG,#12AWG G,3/4"	3	L2	4	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	179	2ND FL. EXIT AND EMERGENCY LIGHTING	4	
		2,313	100	20	3	3	3-#12AWG,#12AWG G,3/4"	5	L3	6	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	163	3RD FL. EXIT AND EMERGENCY LIGHTING	6	
3	SPARE	0	100	20	1	3	-	7	L1	8	2-#12AWG,#12AWG G,3/4"	1,2,3,4,5	100	20	1	102	4TH FL. EXIT AND EMERGENCY LIGHTING	8	
		0	100	20	1	3	-	9	L2	10	-	-	3	100	20	1	0	SPARE	10
		0	100	20	1	3	-	11	L3	12	-	-	3	100	20	1	0	SPARE	12
5	SPARE	0	100	20	1	3	-	13	L1	14	-	-	3	100	20	1	0	SPARE	14
7	SPARE	0	100	20	1	3	-	15	L2	16	-	-	3	100	20	1	0	SPARE	16
9	SPARE	0	100	20	1	3	-	17	L3	18	-	-	3	100	20	1	0	SPARE	18
11	SPARE	0	100	20	1	3	-	19	L1	20	-	-	3	100	20	1	0	SPARE	20
13	SPARE	0	100	20	1	3	-	21	L2	22	-	-	3	100	20	1	0	SPARE	22
15	SPARE	0	100	20	1	3	-	23	L3	24	-	-	3	100	20	1	0	SPARE	24
17	SPARE	0	100	20	1	3	-	25	L1	26	-	-	3	100	20	1	0	SPARE	26
19	SPARE	0	100	20	1	3	-	27	L2	28	-	-	3	100	20	1	0	SPARE	28
21	SPARE	0	100	20	1	3	-	29	L3	30	-	-	3	100	20	1	0	SPARE	30

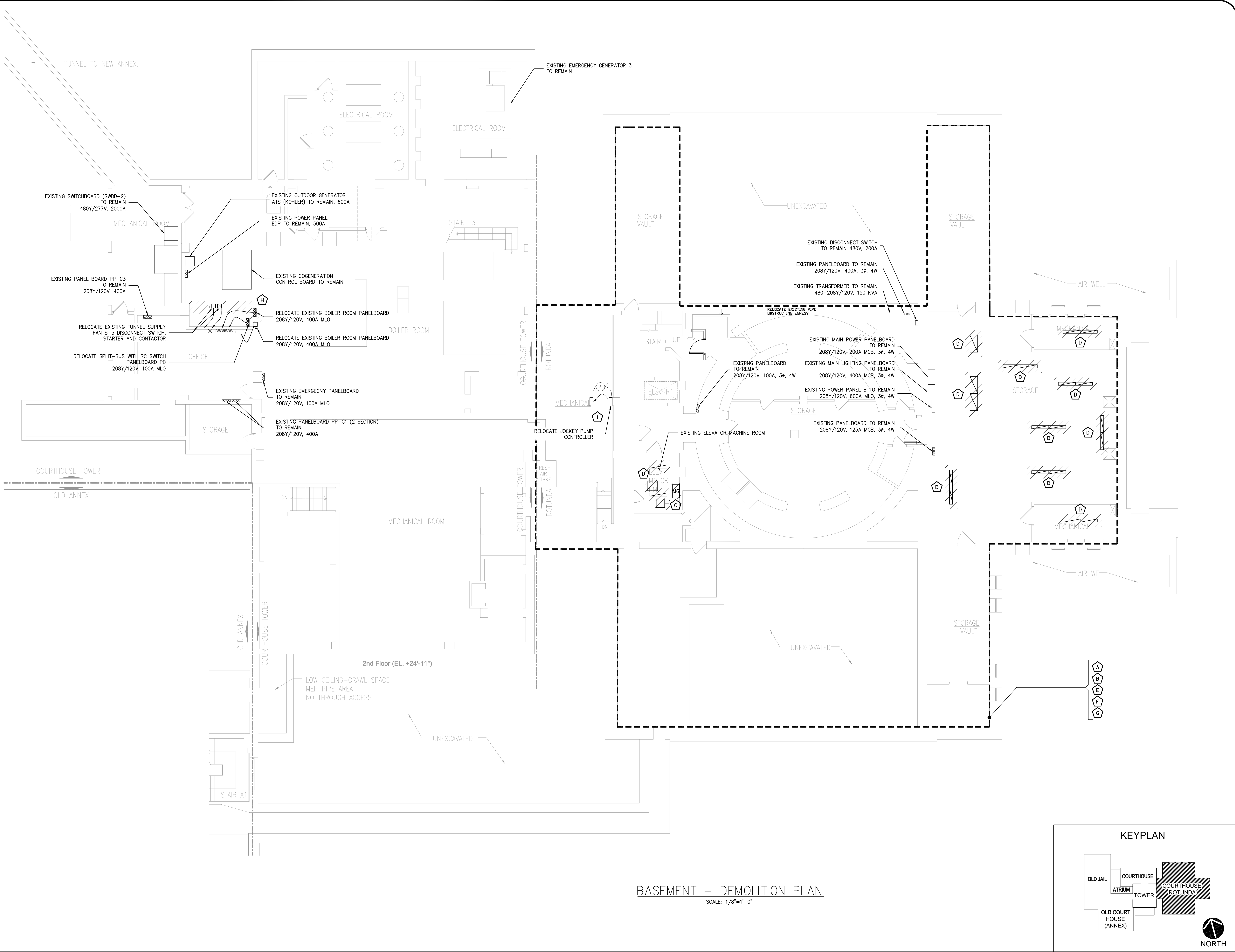
CONNECTED LOAD SUMMARY			
PHASE	VA	AMPS	
L1	3,022	11	
L2			

DRAWING NOTES:

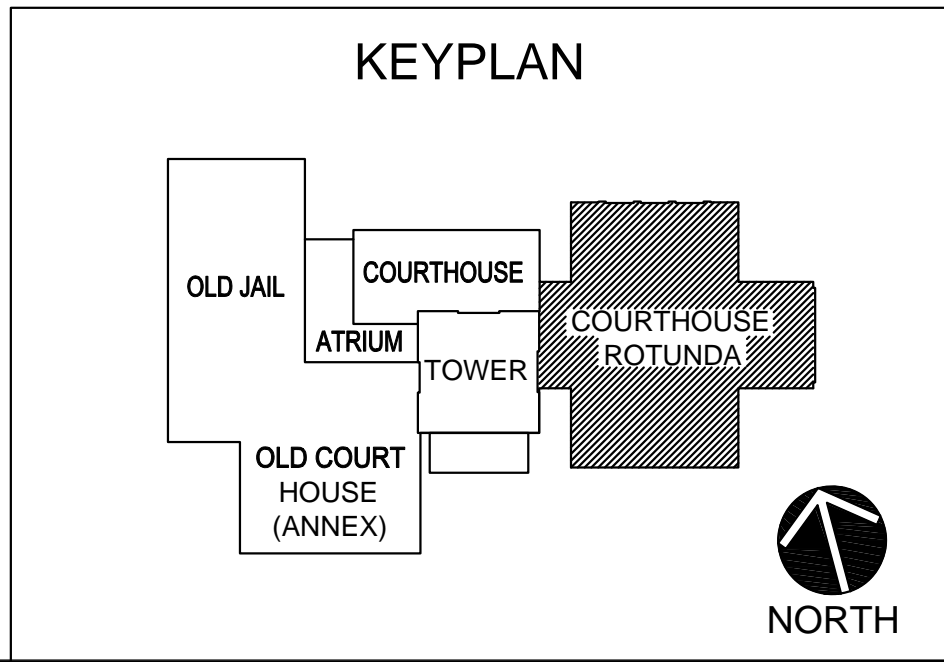
1. THE CONTRACTOR SHALL TRACE ALL EXISTING CIRCUITS IMPACTED BY THE PROJECT WORK AND DETERMINE ALL AREAS AFFECTED BY THE REQUIRED DEMOLITION WORK. THE CONTRACTOR SHALL PROVIDE ALL RECONNECTIONS OF EXISTING REMAINING LIGHTING AND/OR POWER UTILIZATION EQUIPMENT TO NEW ELECTRICAL DISTRIBUTION FACILITIES AS REQUIRED. CONTRACTOR SHALL MAINTAIN SERVICE TO ALL LIGHTING AND POWER UTILIZATION FACILITIES, WHICH ARE INTENDED TO REMAIN IN SERVICE THROUGHOUT THE DURATION OF CONSTRUCTION AND THEREAFTER. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL COORDINATE ALL SHUTDOWNS WITH THE OWNER AND OTHER TRADE CONTRACTORS AS REQUIRED.
2. CONTRACTOR SHALL MAINTAIN SERVICE OF THE EXISTING FIRE ALARM SYSTEM THROUGHOUT THE INTERIOR BUILDING SPACE THROUGHOUT THE DURATION OF CONSTRUCTION. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL COORDINATE IMPACT AND CUTOVER WITH THE OWNER AND ARCHITECT.
3. THE CONTRACTOR SHALL COORDINATE THE FINAL PROPOSED MEANS AND METHODS OF CONSTRUCTION, EQUIPMENT LOCATIONS, AND SCOPE OF WORK WITH ALL ARCHITECTURAL, MECHANICAL, PIPING, ELECTRICAL AND VENDOR DRAWINGS.
4. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL COORDINATE ALL ELECTRICAL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND OWNER AS REQUIRED. BASE BID ACCORDINGLY.
5. HATCHING USED TO DENOTE AREAS AND/OR EQUIPMENT IMPACTED BY DEMOLITION WORK.
6. REFER TO ARCHITECTURAL DEMOLITION DRAWINGS FOR EXISTING ROOM NAMES AND NUMBERS.
7. REFER TO THE PROJECT MAIN ONE LINE DIAGRAM.
8. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
9. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
10. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.

KEYED DEMOLITION WORK NOTES:

- A** DISCONNECT AND REMOVE ALL EXISTING EGRESS EMERGENCY AND EXIT LIGHTING FIXTURES AND ASSOCIATED WIRING, RACEWAY AND CONTROL DEVICES BACK TO SOURCE. EXACT FIXTURES AND EQUIPMENT ARE NOT EXPLICITLY SHOWN. CONTRACTOR SHALL FIELD VERIFY EXISTING EQUIPMENT LOCATIONS, AND BASE HIS BID ACCORDINGLY.
- B** REMOVE EXISTING SMOKE DETECTION AND/OR FIRE ALARM SYSTEM FACILITIES AND WIRING IN THEIR ENTIRETY INCLUDING ANY AND ALL ASSOCIATED EQUIPMENT AND APPURTENANCES. EXACT EQUIPMENT LOCATIONS ARE NOT EXPLICITLY SHOWN. CONTRACTOR SHALL FIELD VERIFY EXISTING EQUIPMENT LOCATIONS, AND BASE HIS BID ACCORDINGLY.
- C** DISCONNECT AND REMOVE ALL EXISTING ELEVATOR ELECTRICAL EQUIPMENT DISCONNECTS, STARTERS, AND ASSOCIATED WIRING, RACEWAY AND CONTROL DEVICES BACK TO SOURCE. EXACT RECEPTACLES AND EQUIPMENT LOCATIONS ARE NOT EXPLICITLY SHOWN. CONTRACTOR SHALL FIELD VERIFY EXISTING EQUIPMENT LOCATIONS, AND BASE HIS BID ACCORDINGLY.
- D** DISCONNECT AND REMOVE LIGHTING FIXTURE AND ASSOCIATED WIRING, RACEWAY AND CONTROL DEVICES BACK TO SOURCE. EXACT LIGHTING AND CONTROL DEVICE LOCATIONS ARE NOT EXPLICITLY SHOWN. CONTRACTOR SHALL FIELD VERIFY EXISTING EQUIPMENT LOCATIONS, AND BASE HIS BID ACCORDINGLY.
- E** CONTRACTOR SHALL COORDINATE DEMOLITION WITH THE COUNTY LOW VOLTAGE VENDOR FOR PORTIONS OF WORK WHICH AFFECT ALL LOW-VOLTAGE SYSTEMS, INCLUDING BUT NOT LIMITED TO, TELE/DATA AND SECURITY SYSTEMS, ASSOCIATED WIRING, EQUIPMENT, AND DEVICES.
- F** CONTRACTOR SHALL PATCH ALL EXISTING INTERIOR WALL AND FLOOR FINISHES IMPACTED BY THE ELECTRICAL DEMOLITION WORK. IMPACTED AREAS SHALL BE PATCHED TO MAINTAIN FIRE RATINGS AS SHOWN ON THE ARCHITECTURAL DRAWINGS AS REQUIRED. COORDINATE FINAL SCOPE OF INTERIOR PATCHWORK WITH GENERAL CONTRACTOR, BASE BID ACCORDINGLY.
- G** PRIOR TO THE COMMENCEMENT OF WORK, COORDINATE IMPACT OF EXISTING BRANCH CIRCUIT FACILITIES WITH OWNER. COORDINATE ANY AND ALL REQUIRED SHUTDOWN WITH OWNER AT LEAST SEVEN (7) DAYS PRIOR TO IMPACT.
- H** RELOCATE EXISTING BOILER ROOM PANELS, SUPPLY FAN DISCONNECT, STARTER, AND EXISTING PULL BOXES AND CONDUITS TO FACILITATE NEW ATS AND SWITCHBOARD INSTALLATION. EXTEND LINE SIDE FEEDERS AND BRANCH CIRCUIT FEEDERS AS REQUIRED. SPlice ALL CIRCUITS TO MATCH EXISTING WIRE SIZE. ALL EXISTING WIRING SHALL BE RUN IN APPROVED RACEWAY AND SPLICES SHALL BE MADE WITH COPPER COMPRESSION CONNECTORS.
- I** RELOCATE EXISTING JOCKEY PUMP CONTROLLER TO FACILITATE NEW MECHANICAL HOT WATER PUMPS SYSTEM PIPING INSTALLATION. PROVIDE STAND ALONE UNIT-STRUCT SUPPORT CONTROLLER, SUPPORTED FROM THE FLOOR AND BACK WALL. EXTEND EMERGENCY BRANCH CIRCUIT WIRING AS REQUIRED. COORDINATE WORK WITH THE MECHANICAL CONTRACTOR.



BASEMENT - DEMOLITION PLAN
SCALE: 1/8"=1'-0"



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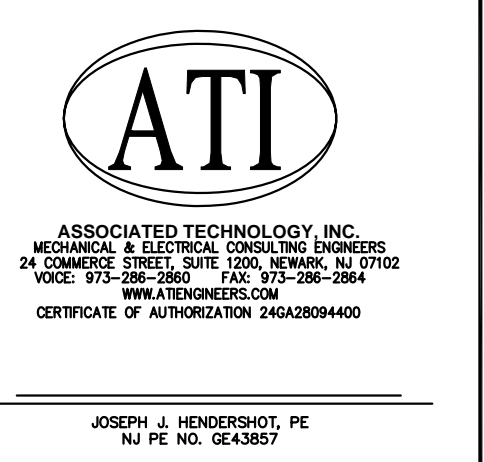
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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - DEMOLITION PLAN
BASEMENT FLOOR

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	09-25-15
9.25.15	95% CD SUBMIT	KD	FM					1/8"=1'-0"
09.07.17	ISSUED FOR BID	KD	FM					DRWN BY: RB
								CHKD BY: NJN
								JOB NO: 2141152
								SHEET: _ OF:
								DWG. NO:

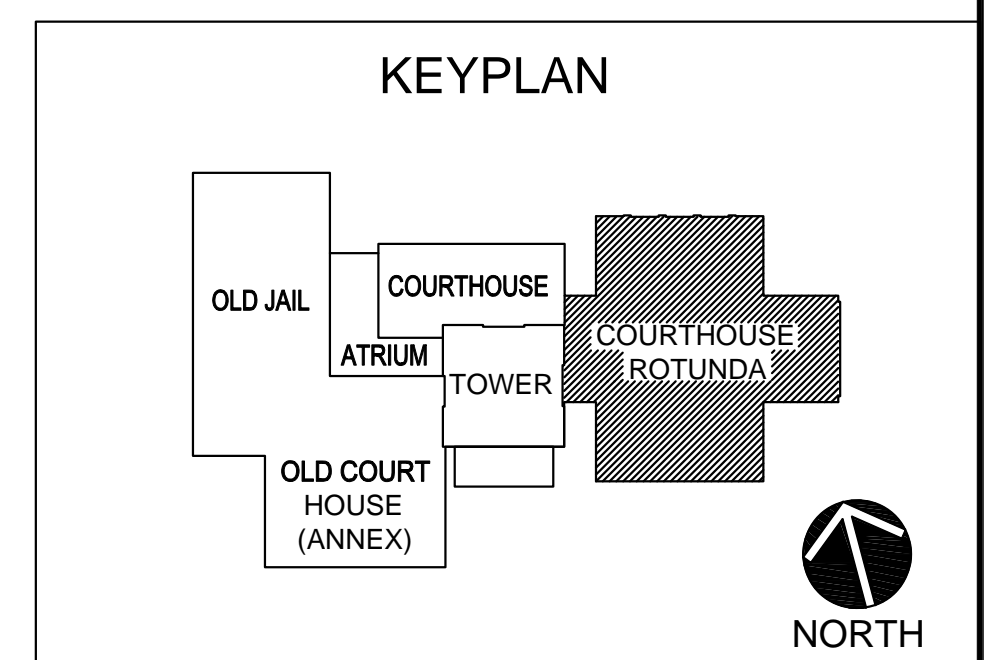
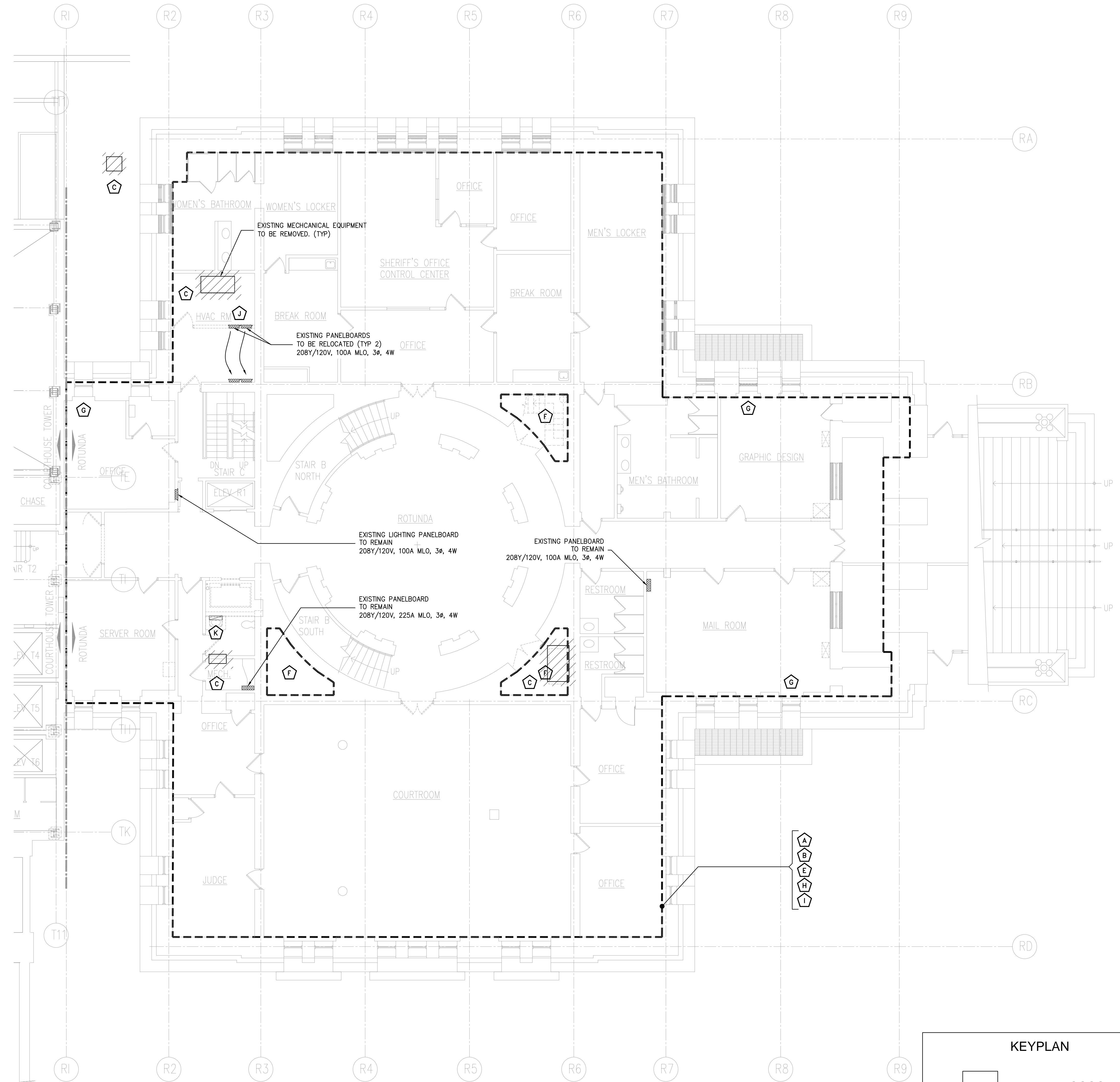
DE.300B

DRAWING NOTES:

1. THE CONTRACTOR SHALL TRACE ALL EXISTING CIRCUITS IMPACTED BY THE PROJECT WORK AND DETERMINE ALL AREAS AFFECTED BY THE REQUIRED DEMOLITION WORK. THE CONTRACTOR SHALL PROVIDE ALL RECONNECTIONS OF EXISTING REMAINING LIGHTING AND/OR POWER UTILIZATION EQUIPMENT TO NEW ELECTRICAL DISTRIBUTION FACILITIES AS REQUIRED. CONTRACTOR SHALL MAINTAIN SERVICE TO ALL LIGHTING AND POWER UTILIZATION FACILITIES WHICH ARE INTENDED TO REMAIN IN SERVICE THROUGHOUT THE DURATION OF CONSTRUCTION AND THEREAFTER. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL COORDINATE ALL SHUTDOWNS WITH THE OWNER AND OTHER TRADE CONTRACTORS AS REQUIRED.
2. CONTRACTOR SHALL MAINTAIN SERVICE OF THE EXISTING FIRE ALARM SYSTEM THROUGHOUT THE INTERIOR BUILDING SPACE THROUGHOUT THE DURATION OF CONSTRUCTION. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL COORDINATE IMPACT AND CUTOVER WITH THE OWNER AND ARCHITECT.
3. THE CONTRACTOR SHALL COORDINATE THE FINAL PROPOSED MEANS AND METHODS OF CONSTRUCTION, EQUIPMENT LOCATIONS, AND SCOPE OF WORK WITH ALL ARCHITECTURAL, MECHANICAL, PIPING, ELECTRICAL AND VENDOR DRAWINGS.
4. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL COORDINATE ALL ELECTRICAL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND OWNER AS REQUIRED. BASE BID ACCORDINGLY.
5. HATCHING USED TO DENOTE AREAS AND/OR EQUIPMENT IMPACTED BY DEMOLITION WORK.
6. REFER TO ARCHITECTURAL DEMOLITION DRAWINGS FOR EXISTING ROOM NAMES AND NUMBERS.
7. REFER TO THE PROJECT MAIN ONE LINE DIAGRAM.
8. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
9. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
10. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.

KEYED DEMOLITION WORK NOTES:

- A DISCONNECT AND REMOVE ALL EXISTING EGRESS EMERGENCY AND EXIT LIGHTING FIXTURES AND ASSOCIATED WIRING, RACEWAY AND CONTROL DEVICES BACK TO SOURCE. EXACT FIXTURES AND EQUIPMENT ARE NOT EXPLICITLY SHOWN. CONTRACTOR SHALL FIELD VERIFY EXISTING EQUIPMENT LOCATIONS, AND BASE HIS BID ACCORDINGLY.
- B REMOVE EXISTING SMOKE DETECTION AND/OR FIRE ALARM SYSTEM FACILITIES AND WIRING IN THEIR ENTIRETY INCLUDING ANY AND ALL ASSOCIATED EQUIPMENT AND APPURTENANCES. EXACT EQUIPMENT LOCATIONS ARE NOT EXPLICITLY SHOWN. CONTRACTOR SHALL FIELD-VERIFY EXISTING EQUIPMENT LOCATIONS, AND BASE HIS BID ACCORDINGLY.
- C DISCONNECT AND REMOVE ALL EXISTING HVAC EQUIPMENT DISCONNECTS, STARTERS, AND ASSOCIATED WIRING, RACEWAY AND CONTROL DEVICES BACK TO SOURCE. EXACT RECEPTACLES AND EQUIPMENT LOCATIONS ARE NOT EXPLICITLY SHOWN. CONTRACTOR SHALL FIELD-VERIFY EXISTING EQUIPMENT LOCATIONS, AND BASE HIS BID ACCORDINGLY.
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- I PRIOR TO THE COMMENCEMENT OF WORK, COORDINATE IMPACT OF EXISTING BRANCH CIRCUIT FACILITIES WITH OWNER. COORDINATE ANY AND ALL REQUIRED SHUTDOWN WITH OWNER AT LEAST SEVEN (7) DAYS PRIOR TO IMPACT.
- J RELOCATE EXISTING PANELBOARDS TO FACILITATE WALL DEMOLITION AND NEW MECHANICAL UNIT INSTALLATION. EXTEND LINE SIDE FEEDERS AND BRANCH CIRCUIT FEEDERS AS REQUIRED. ALL EXISTING WIRING SHALL BE RAN IN APPROVED RACEWAY AND SPLICES SHALL BE MADE WITH COPPER COMPRESSION CONNECTORS. COORDINATE WORK WITH THE ARCHITECT AND MECHANICAL CONTRACTOR.
- K DISCONNECT, PROTECT AND STORE EXISTING VANITY LIGHTING FIXTURE TO FACILITATE WALL DEMOLITION AND ELEVATOR SHAFT UPGRADE. COIL AND PROTECT EXISTING LIGHTING BRANCH CIRCUIT TO BE REUSED, AS REQUIRED. COORDINATE WORK WITH THE ARCHITECT.



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NJ License No. AI 14394



PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - DEMOLITION PLAN
GROUND FLOOR

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
9.25.15	95% CD SUBMIT	KD	FM					09-25-15
09.07.17	ISSUED FOR BID	KD	FM					1/8"=1'-0"
								DRWN BY: RB
								CHKD BY: NJN
								JOB NO: 2141152
								SHEET: _ OF:
								DWG. NO:

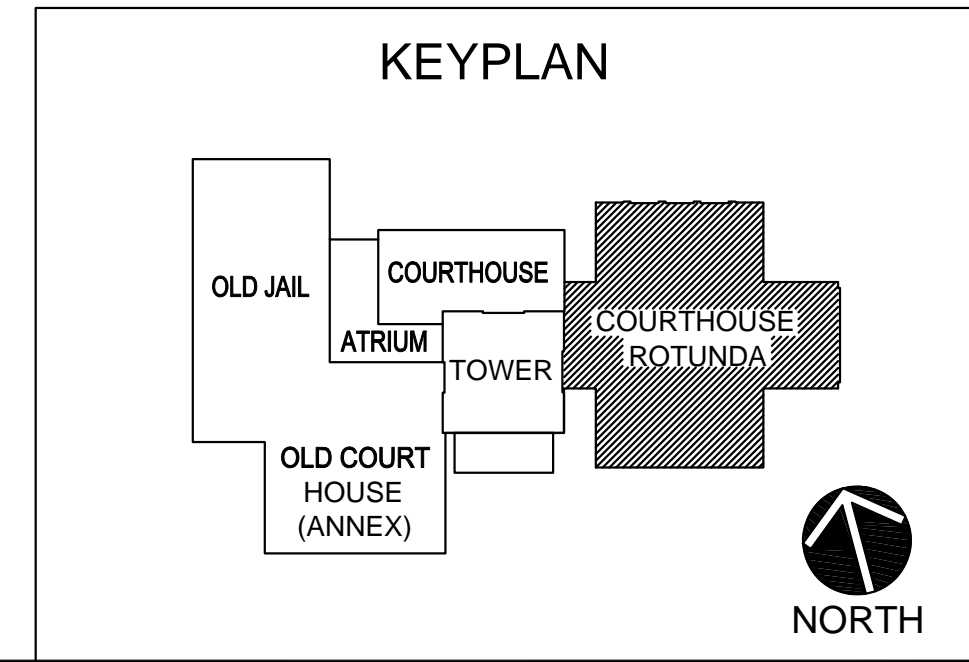
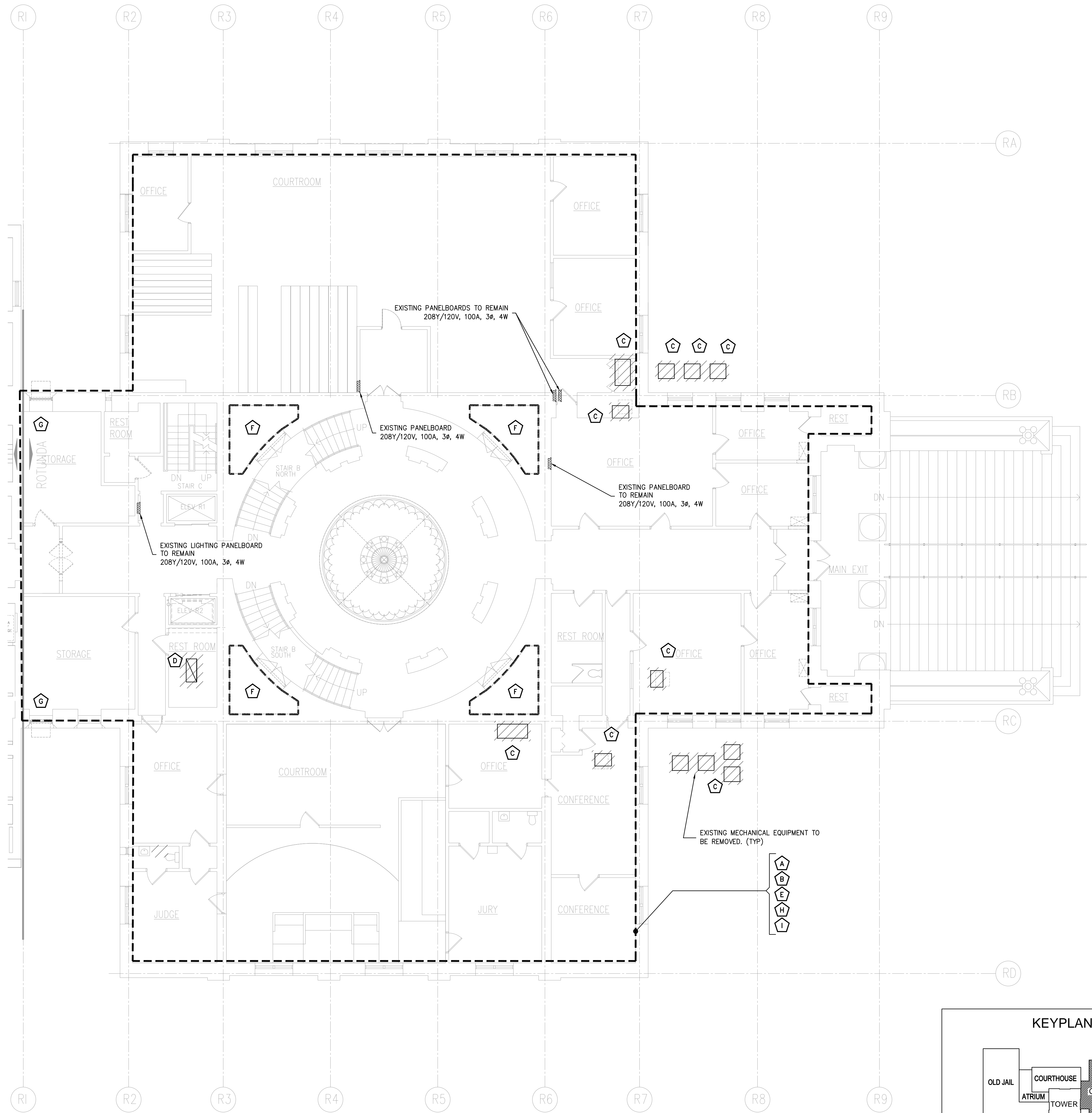
DE.300G

DRAWING NOTES:

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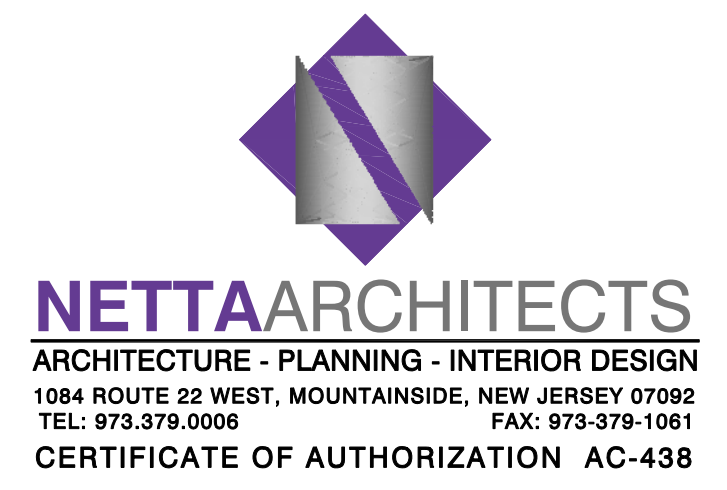
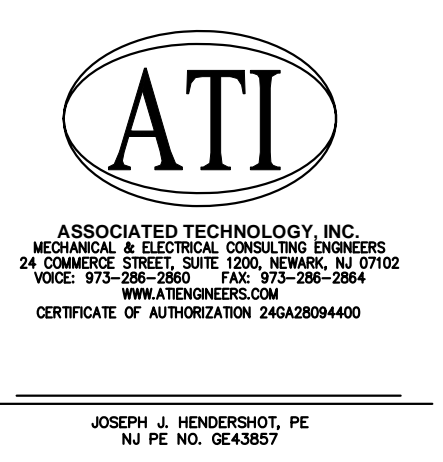
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LAURENCE K. UHER, AIA, LEED, AP
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PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - DEMOLITION PLAN
FIRST FLOOR

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
9.25.15	95% CD SUBMIT	KD	FM					09-25-15
09.07.17	ISSUED FOR BID	KD	FM					1/8"=1'-0"
								DRWN BY: RB
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								SHEET: _ OF: _
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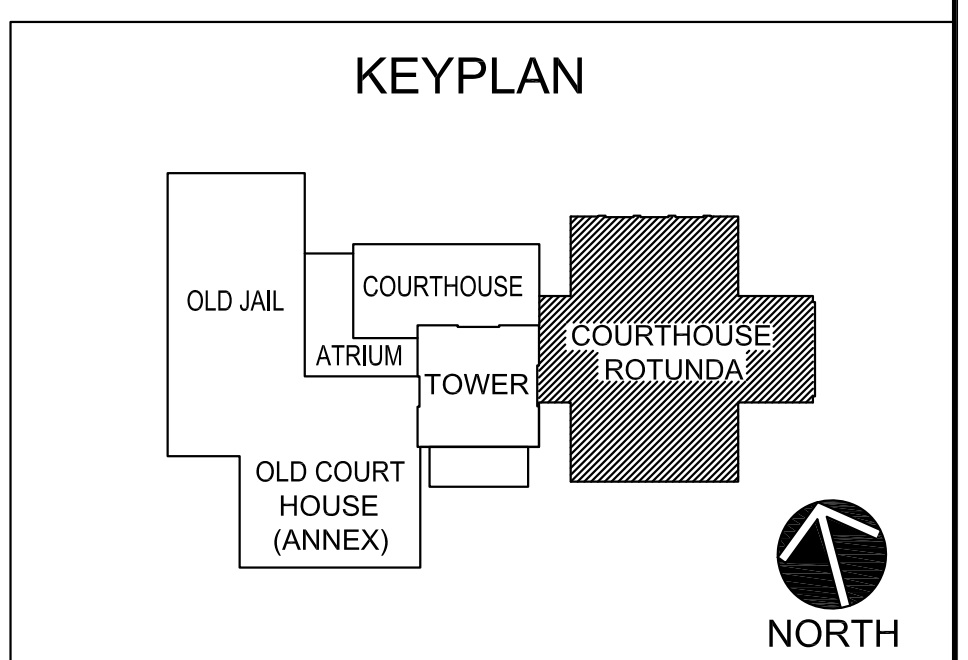
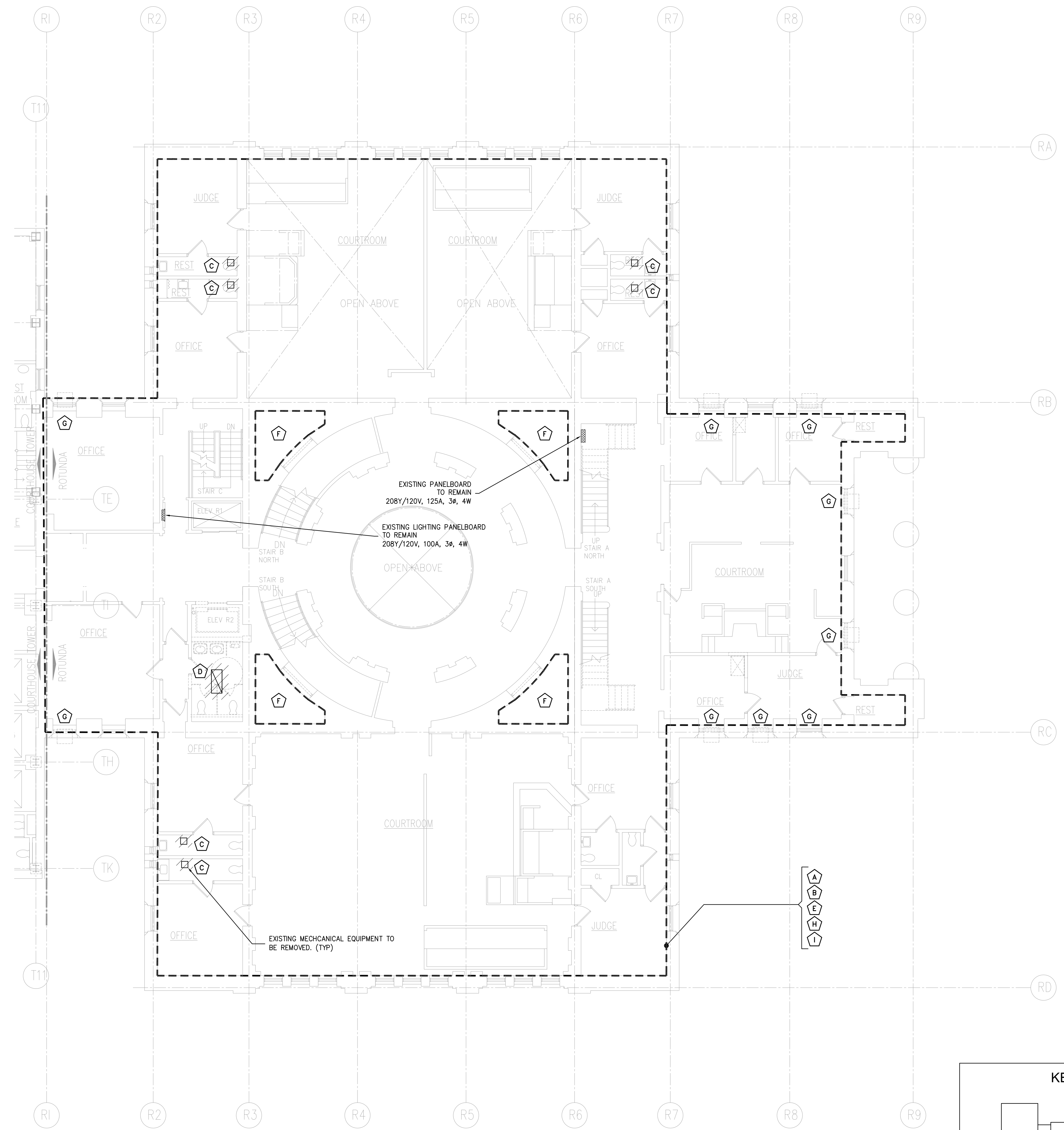
DE.301

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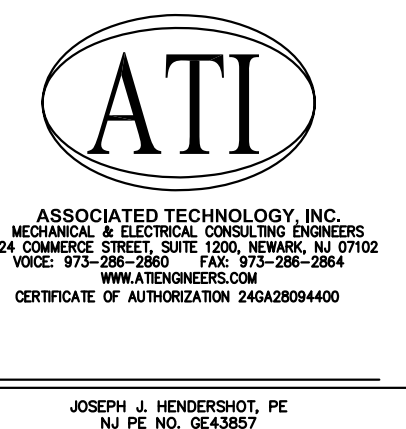
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NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - DEMOLITION PLAN SECOND FLOOR

SUBMISSIONS				REVISIONS				DATE
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE
9.25.15	95% CD SUBMIT	KD	FM					09-25-15
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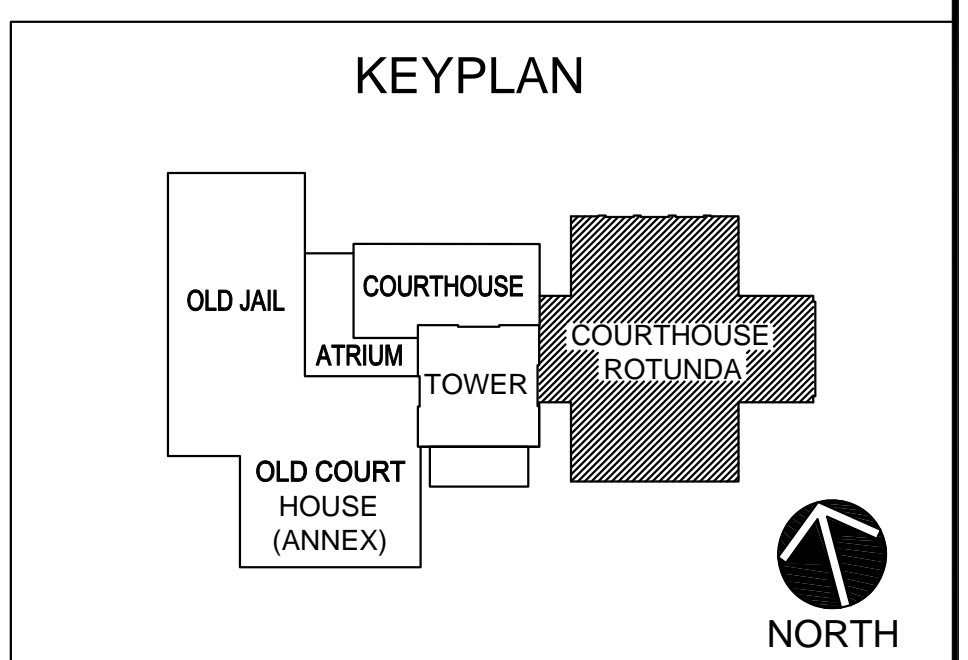
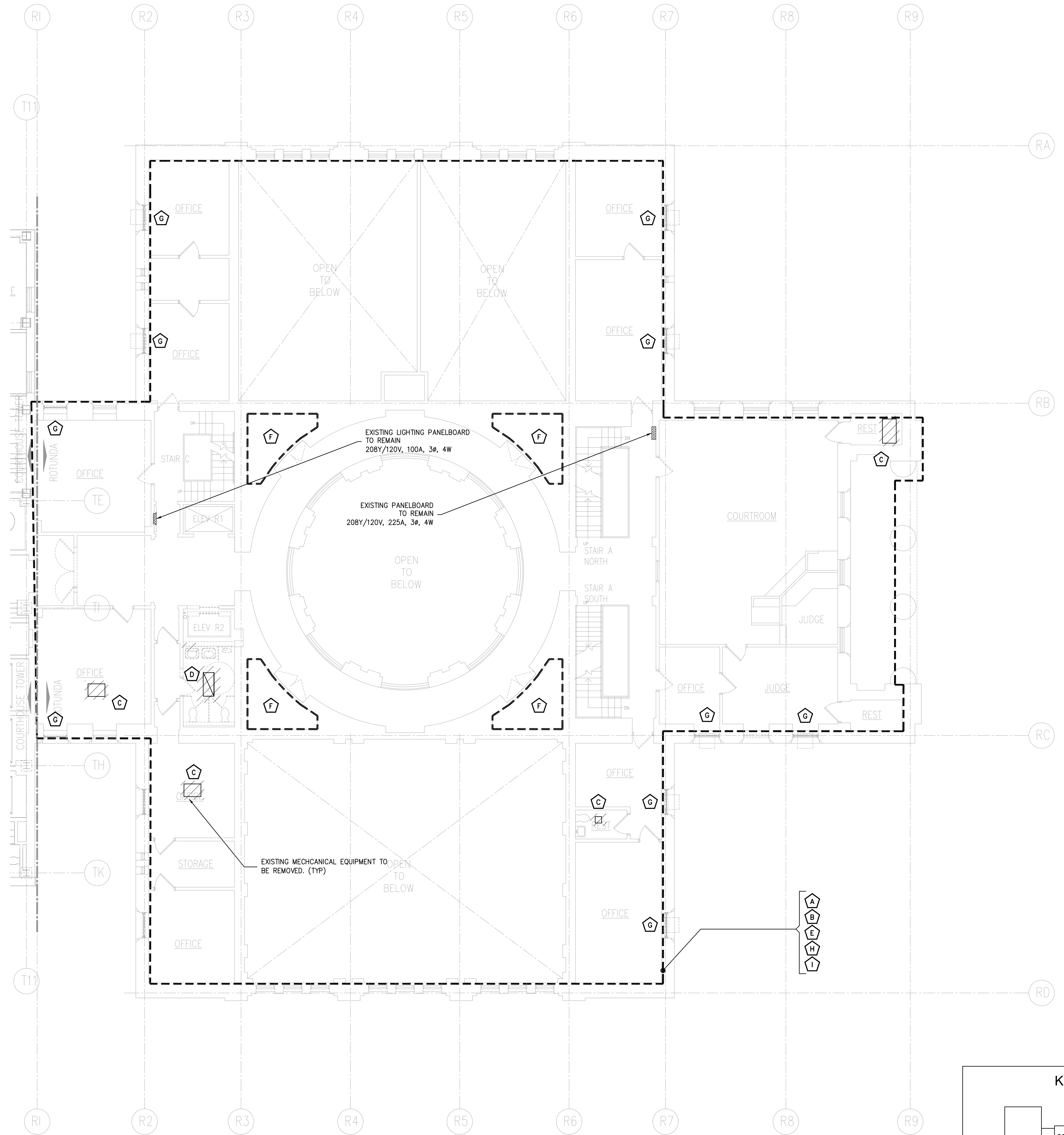
DE.302

DRAWING NOTES:

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PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - DEMOLITION PLAN
THIRD FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RJ
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

DE.303

KEYED WORK NOTES:

- 1 CONTRACTOR SHALL MOUNT NEW ELECTRICAL EQUIPMENT ON A CONCRETE HOUSEKEEPING PAD (6" WITH 6" EXTENSION BEYOND EQUIPMENT). COORDINATE PAD DETAILS AND WALL ADJUSTMENTS WITH ARCHITECT.
- 2 CONTRACTOR SHALL MOUNT NEW ELECTRICAL EQUIPMENT ON FREE-STANDING UNIT-SUPPORT, WITH PROPER WORKING SPACE AND DEDICATED ELECTRICAL EQUIPMENT SPACE CLEARANCES AS REQUIRED BY NEC ARTICLE 110.26. COORDINATE EXACT LOCATION WITH ALL EXISTING AND NEW DUCTWORK AND PIPING COMPONENTS TO BE INSTALLED IN THE SPACE.
- 3 ELEVATOR PIT LIGHTING FIXTURE SHALL BE LISTED FOR DAMP LOCATIONS, 1-LAMP 22W 120V COMPACT FLUORESCENT, CLEAR PRISMATIC GLOBE, PER MCGILL 641-FL22 UTILITY LIGHT OR AN APPROVED EQUIVALENT.
- 4 PROVIDE LINE POWER FOR HVAC CONTROL POWER. CIRCUIT TO ALL DEVICES REQUIRED BY HVAC SYSTEM DESIGN. COORDINATE WITH HVAC PLANS AND EQUIPMENT SHOP DRAWINGS FOR ALL EQUIPMENT REQUIRING CONTROL POWER.

CABLE AND CONDUIT:

- 1 2-#12AWG, #12AWG GND, 3/4"

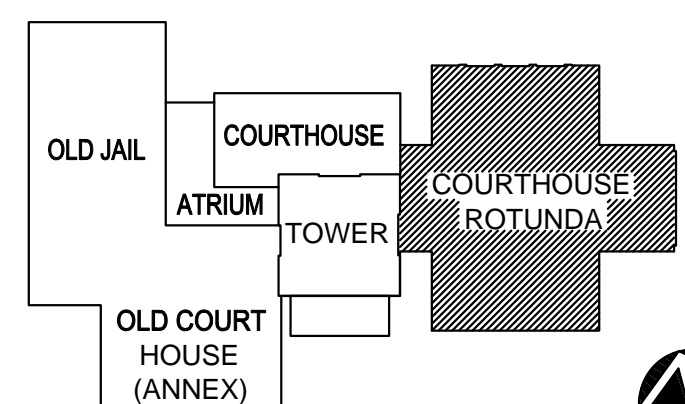
DRAWING NOTES:

- 1. CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
- 2. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
- 3. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
- 4. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
- 5. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
- 6. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
- 7. REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
- 8. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.12 AND AS REQUIRED.
- 9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
- 10. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS MARKED ACCORDINGLY.
- 11. PROVIDE INSULATED GROUNDING CONDUCTORS AS REQUIRED FOR ALL EQUIPMENT, LIGHTING FIXTURES, AND RECEPTACLES ETC. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN IN ALL ILLUSTRATED WIRING DESIGNATIONS.
- 12. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT, CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
- 13. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC 344.22 AND 352.22 RESPECTIVELY.
- 14. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
- 15. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
- 16. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
- 17. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
- 18. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.

**MAIN SWITCHBOARD
MEZZANINE - POWER PLAN**
SCALE: 1/4"=1'-0"

BASEMENT - POWER PLAN
SCALE: 1/8"=1'-0"

KEYPLAN



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FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118
MARK E. BESS, AIA, NCARB
NJ License No. AI 16160
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**ELECTRICAL - POWER PLAN
BASEMENT FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY NJK
									JOB NO 2141152
									SHEET: _ OF:
									DWG. NO

E.300B

KEYED WORK NOTES:

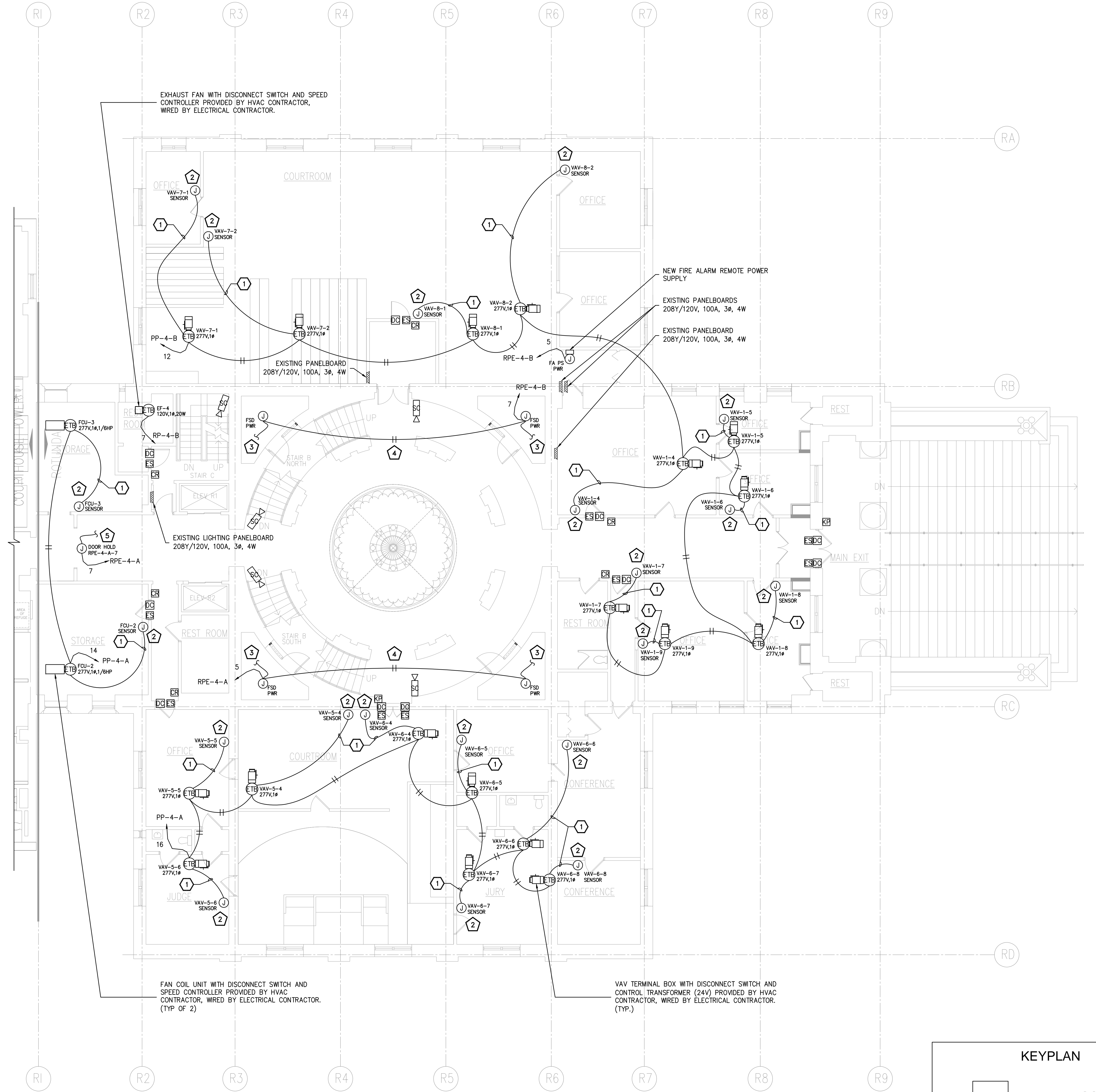
- 1 PROVIDE LINE POWER FOR NEW AHU. COORDINATE FINAL MCA AND MOP REQUIREMENTS WITH MECHANICAL CONTRACTOR SELECTIONS.
- 2 PROVIDE A ROUGH-IN JUNCTION BOX AND CONDUIT FOR EACH THERMOSTAT/SENSOR UNIT AS REQUIRED. VERIFY FINAL PROVISIONS AND EQUIPMENT LOCATIONS WITH THE APPLICABLE TRADE CONTRACTOR(S) AS REQUIRED.
- 3 PROVIDE EMERGENCY CIRCUIT FOR FIRE SMOKE DAMPERS. FEED FROM INDICATED PANEL WITH A BREAKER EQUIPPED WITH A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULES FOR OTHER REQUIREMENTS. COORDINATE QUANTITY OF DAMPERS WITH HVAC AND FIRE ALARM PLANS.
- 4 PRIOR TO COMMENCING ANY INSTALLATION WORK INSIDE THE COURTHOUSE ROTUNDA, OBTAIN APPROVAL FROM THE ARCHITECT AND OWNER OF THE PROPOSED CONDUIT ROUTING AND DEVICE INSTALLATION AND ENSURE COMPLIANCE WITH THE REGISTERED NJ HISTORIC PRESERVATION OFFICE FOR THE SPACE.
- 5 PROVIDE EMERGENCY CIRCUIT FOR MAGNETIC LOCK DOOR HOLDERS. FEED FROM INDICATED PANEL WITH A BREAKER EQUIPPED WITH A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULES FOR OTHER REQUIREMENTS. COORDINATE QUANTITY OF DEVICES WITH FIRE ALARM PLANS.

CABLE AND CONDUIT:

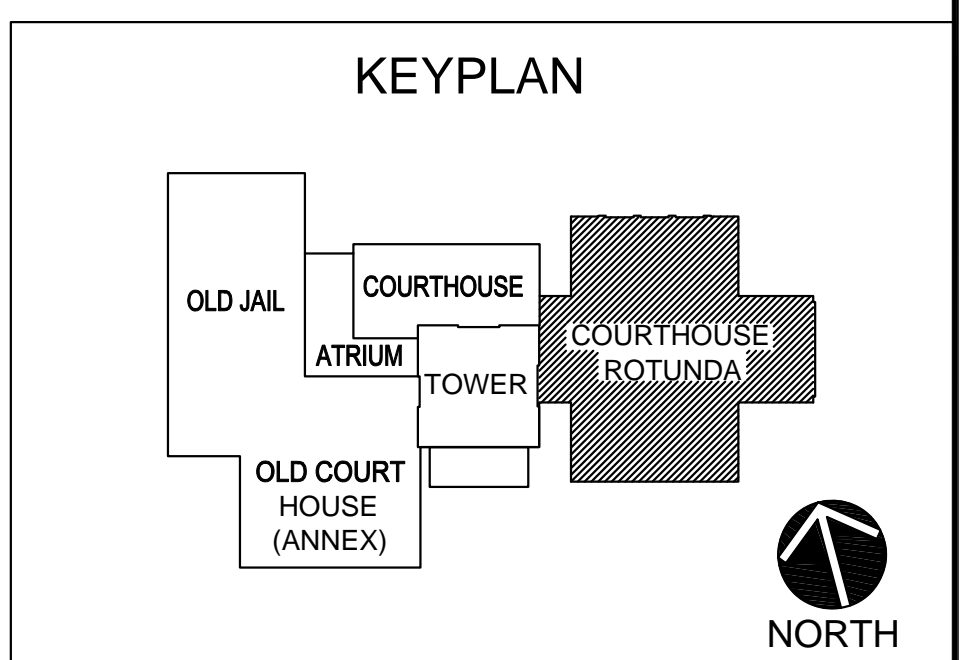
- 1 3/4" AND DRAGLINE (CONDUIT ONLY)

DRAWING NOTES:

1. CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
2. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
3. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
4. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
5. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
6. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
7. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
8. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
10. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS MARKED ACCORDINGLY.
11. PROVIDE INSULATED GROUNDING CONDUCTORS AS REQUIRED FOR ALL EQUIPMENT, LIGHTING FIXTURES, AND RECEPTACLES ETC. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN IN ALL ILLUSTRATED WIRING DESIGNATIONS.
12. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
13. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 310.15(C), CHAPTER 9 RESPECTIVELY.
14. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PREMIUM USE, AND SHALL CONFORM WITH NEC 300.22.
15. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
16. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
17. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
18. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



FIRST FLOOR - POWER PLAN
SCALE: 1/8"=1'-0"



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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - POWER PLAN
FIRST FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY NJN
									JOB NO 2141152
									SHEET: _ OF:
									DWG. NO

E.301

KEYED WORK NOTES:

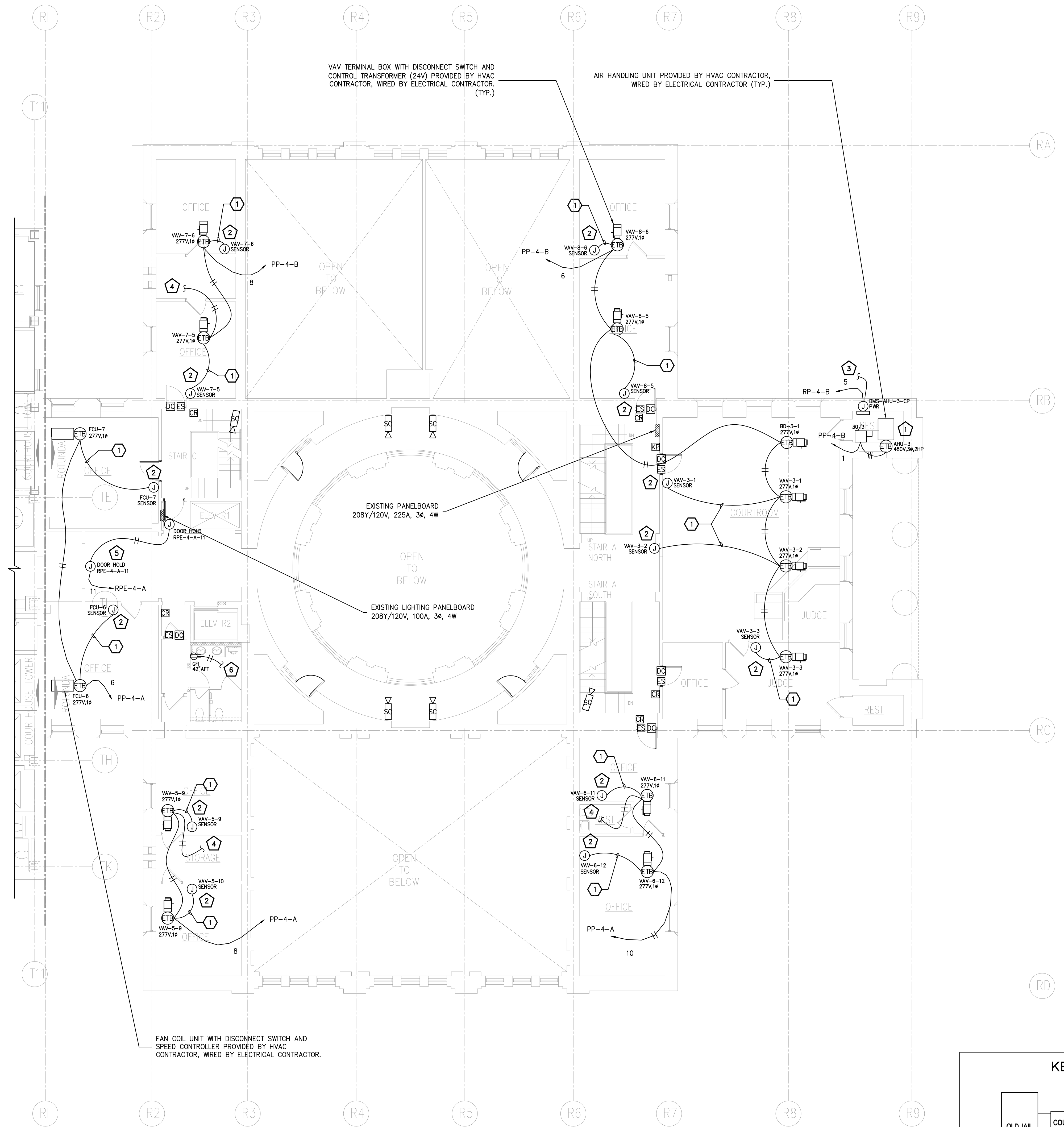
- 1 PROVIDE LINE POWER FOR NEW AHU. COORDINATE FINAL MCA AND MOP REQUIREMENTS WITH MECHANICAL CONTRACTOR SELECTIONS.
- 2 PROVIDE A ROUGH-IN JUNCTION BOX AND CONDUIT FOR EACH THERMOSTAT/SENSOR UNIT AS REQUIRED. VERIFY FINAL PROVISIONS AND EQUIPMENT LOCATIONS WITH THE APPLICABLE TRADE CONTRACTOR(S) AS REQUIRED.
- 3 PROVIDE LINE POWER FOR HVAC CONTROL POWER. CIRCUIT TO ALL DEVICES REQUIRED BY HVAC SYSTEM DESIGN. COORDINATE WITH HVAC PLANS AND EQUIPMENT SHOP DRAWINGS FOR ALL EQUIPMENT REQUIRING CONTROL POWER.
- 4 CONNECT CIRCUIT TO VAV BOXES ON THE SECOND FLOOR DIRECTLY BELOW. REFER TO DRAWING E.302.
- 5 PROVIDE EMERGENCY CIRCUIT FOR MAGNETIC LOCK DOOR HOLDERS. FEED FROM INDICATED PANEL WITH A BREAKER EQUIPPED WITH A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULES FOR OTHER REQUIREMENTS. COORDINATE QUANTITY OF DEVICES WITH FIRE ALARM PLANS.
- 6 EXTEND EXISTING LOCAL RECEPTACLE BRANCH CIRCUIT TO NEW GFI DUPLEX RECEPTACLE.

CABLE AND CONDUIT:

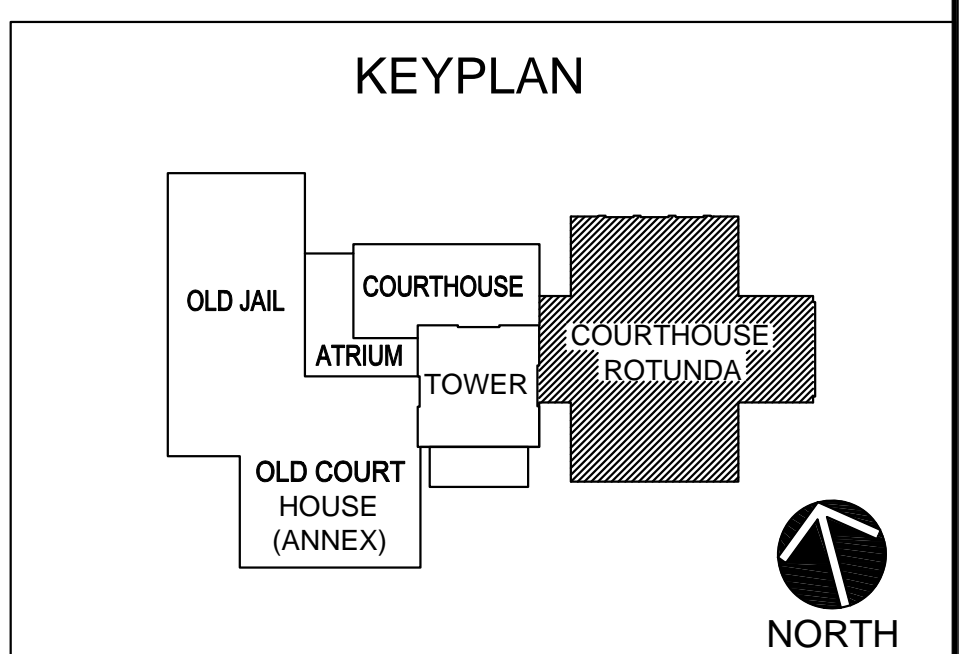
- 1 3/4" C AND DRAGLINE (CONDUIT ONLY)

DRAWING NOTES:

1. CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
2. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
3. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
4. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
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6. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
7. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
8. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
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12. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
13. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABL 1, CHAPTER 9 RESPECTIVELY.
14. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PREMIUM USE, AND SHALL CONFORM WITH NEC 300.22.
15. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
16. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
17. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
18. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



THIRD FLOOR – POWER PLAN
SCALE: 1/8"=1'-0"



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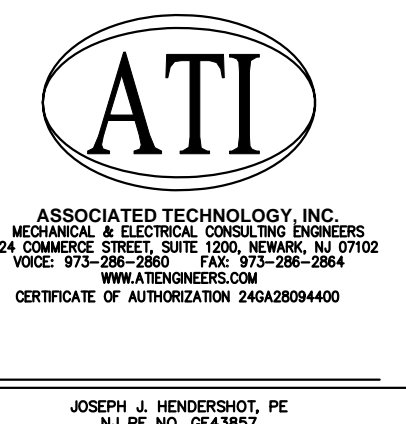
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NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - POWER PLAN
THIRD FLOOR

SUBMISSIONS				REVISIONS				DATE	
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RJ
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

E.303

KEYED WORK NOTES:

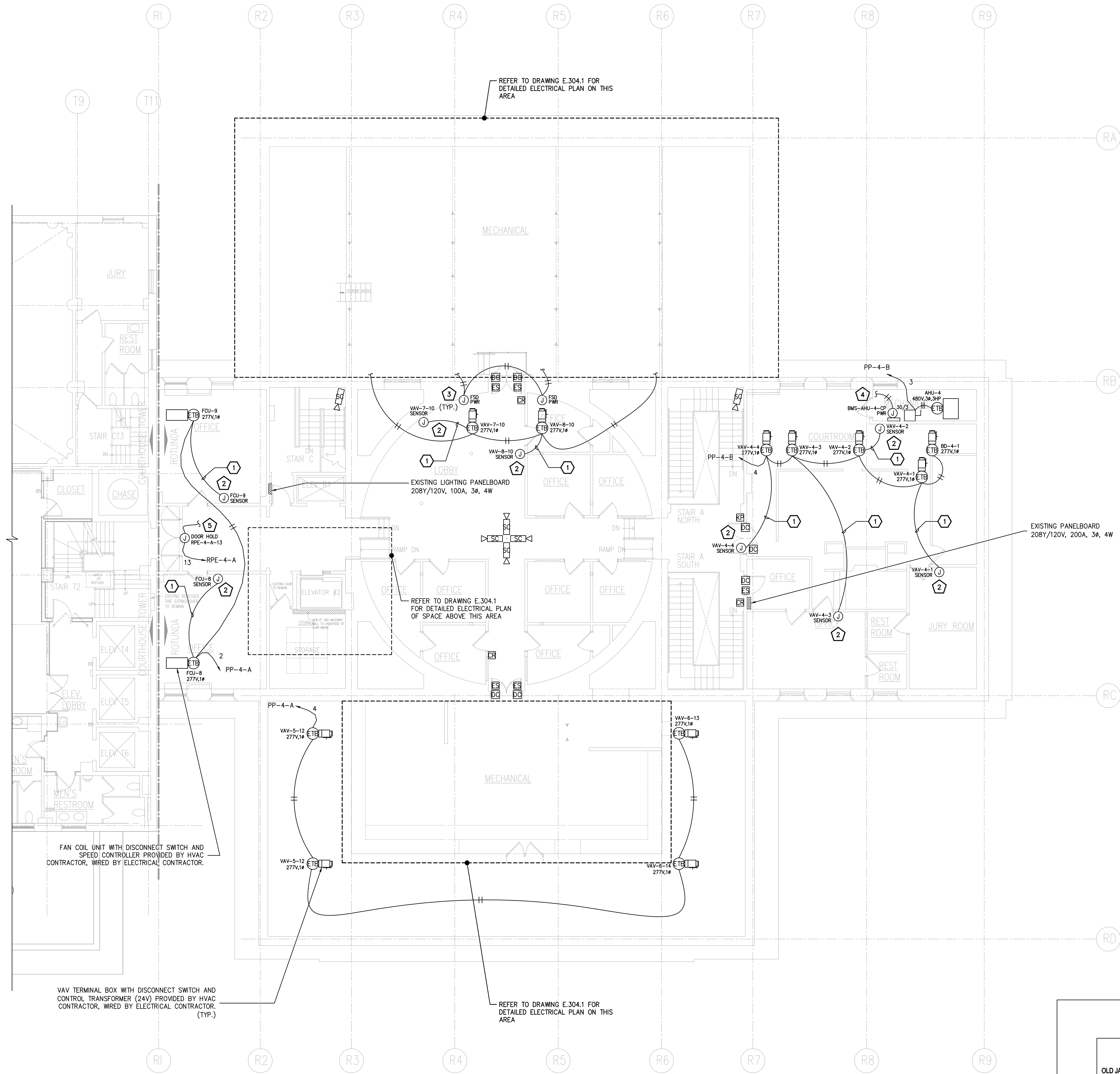
- 1 PROVIDE LINE POWER FOR NEW AHU. COORDINATE FINAL MCA AND MOP REQUIREMENTS WITH MECHANICAL CONTRACTOR SELECTIONS.
- 2 PROVIDE A ROUGH-IN JUNCTION BOX AND CONDUIT FOR EACH THERMOSTAT/SENSOR UNIT AS REQUIRED. VERIFY FINAL PROVISIONS AND EQUIPMENT LOCATIONS WITH THE APPLICABLE TRADE CONTRACTOR(S) AS REQUIRED.
- 3 PROVIDE EMERGENCY CIRCUIT FOR FIRE SMOKE DAMPERS. FEED FROM INDICATED PANEL WITH A BREAKER EQUIPPED WITH A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULES FOR OTHER REQUIREMENTS. COORDINATE QUANTITY OF DAMPERS WITH HVAC AND FIRE ALARM PLANS.
- 4 PROVIDE LINE POWER FOR HVAC CONTROL POWER. CIRCUIT TO ALL DEVICES REQUIRED BY HVAC SYSTEM DESIGN. COORDINATE WITH HVAC PLANS AND EQUIPMENT SHOP DRAWINGS FOR ALL EQUIPMENT REQUIRING CONTROL POWER.
- 5 PROVIDE EMERGENCY CIRCUIT FOR MAGNETIC LOCK DOOR HOLDERS. FEED FROM INDICATED PANEL WITH A BREAKER EQUIPPED WITH A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULES FOR OTHER REQUIREMENTS. COORDINATE QUANTITY OF DEVICES WITH FIRE ALARM PLANS.

CABLE AND CONDUIT:

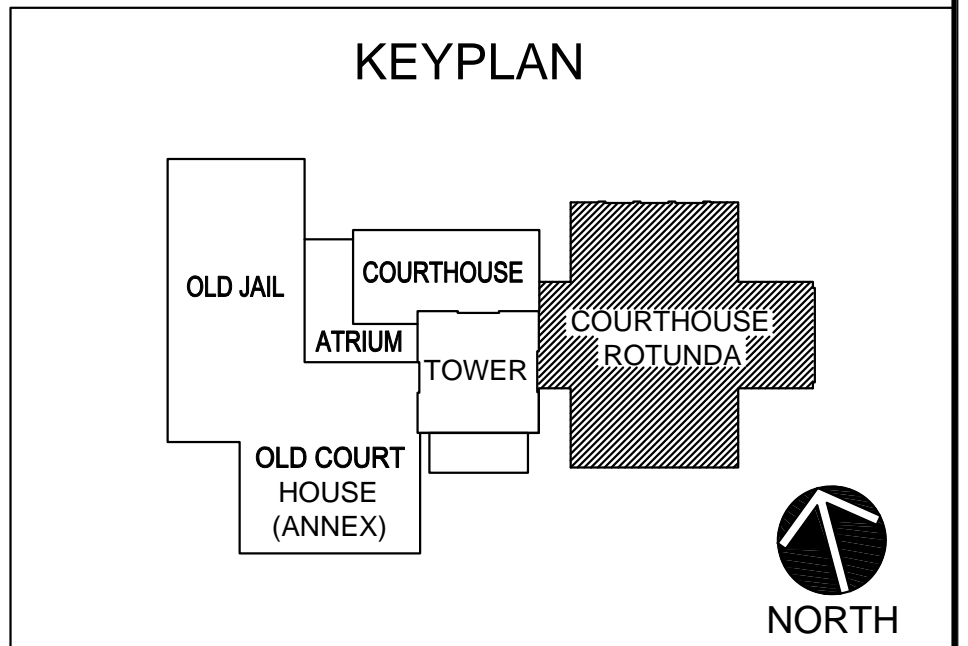
- 1 3/4" AND DRAGLINE (CONDUIT ONLY)

DRAWING NOTES:

1. CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
2. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
3. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
4. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
5. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
6. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
7. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
8. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
10. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS MARKED ACCORDINGLY.
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13. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABL 31, CHAPTER 9 RESPECTIVELY.
14. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
15. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
16. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
17. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
18. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



FOURTH FLOOR – POWER PLAN
SCALE: 1/8"=1'-0"



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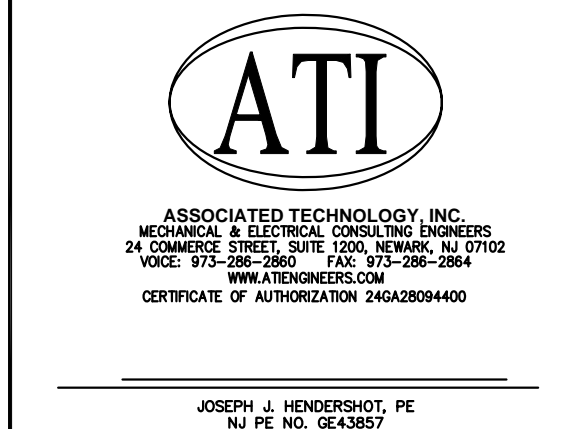
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PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - POWER PLAN
FOURTH FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RJ
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

E.304

KEYED WORK NOTES:

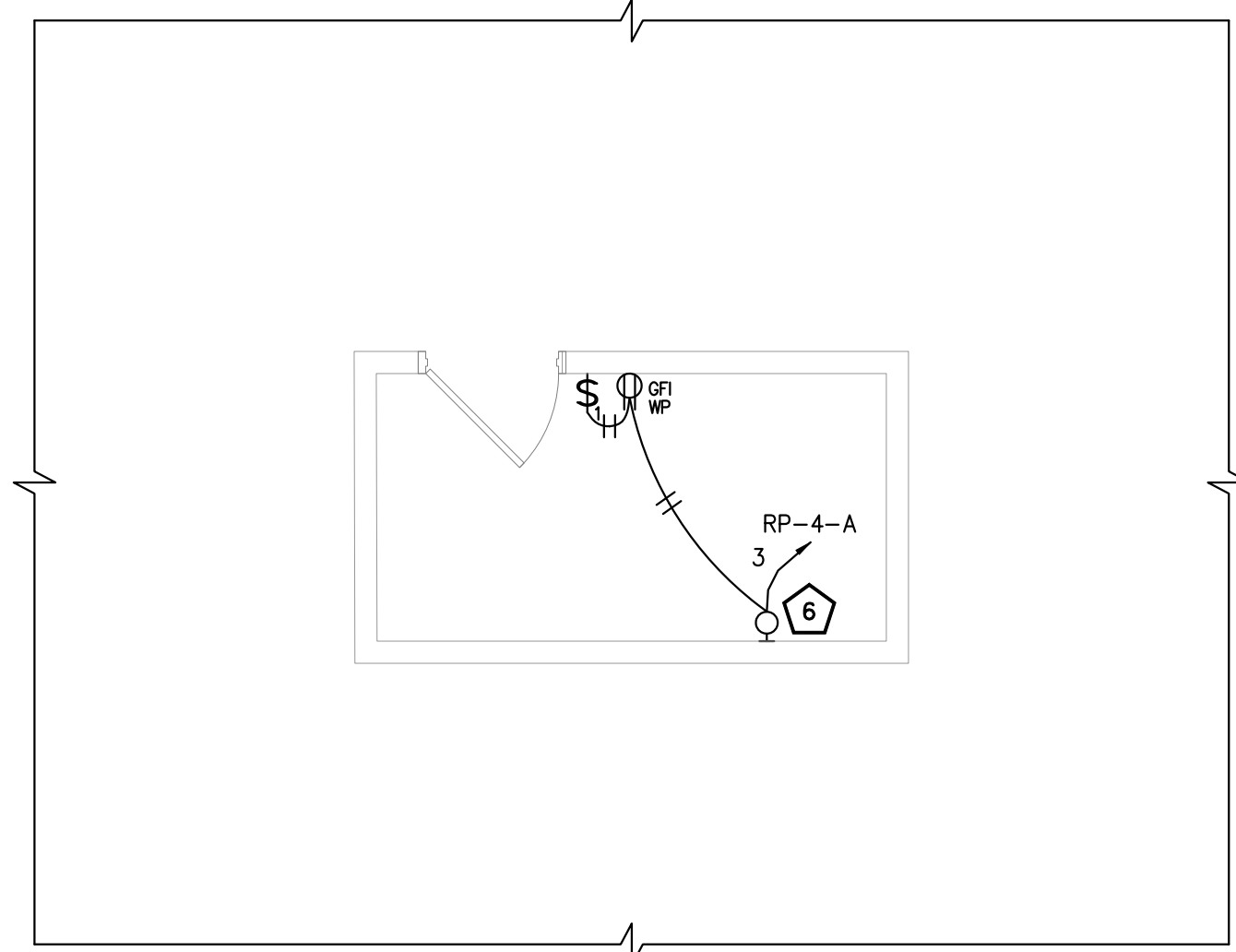
1. CONTRACTOR SHALL MOUNT NEW ELECTRICAL EQUIPMENT ON A CONCRETE HOUSEKEEPING PAD (6" H WITH 6" EXTENSION BEYOND EQUIPMENT). COORDINATE PAD DETAILS AND WALL ADJUSTMENTS WITH ARCHITECT.
2. CONTRACTOR SHALL MOUNT NEW ELECTRICAL EQUIPMENT ON FREE-STANDING UNIT-STRUT SUPPORT, WITH PROPER WORKING SPACE AND DEDICATED ELECTRICAL EQUIPMENT SPACE CLEARANCES AS REQUIRED BY NEC ARTICLE 110.26. COORDINATE EXACT LOCATION WITH ALL EXISTING AND NEW DUCTWORK AND PIPING COMPONENTS TO BE INSTALLED IN THE SPACE.
3. PROVIDE EMERGENCY CIRCUIT FOR FIRE SMOKE DAMPERS. FEED FROM INDICATED PANEL WITH A BREAKER EQUIPPED WITH A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULES FOR OTHER REQUIREMENTS. COORDINATE QUANTITY OF DAMPERS WITH HVAC AND FIRE ALARM PLANS.
4. PROVIDE LINE POWER FOR HVAC CONTROL POWER. CIRCUIT TO ALL DEVICES REQUIRED BY HVAC SYSTEM DESIGN. COORDINATE WITH HVAC PLANS AND EQUIPMENT SHOP DRAWINGS FOR ALL EQUIPMENT REQUIRING CONTROL POWER.
5. CONNECT TO BRANCH CIRCUIT TO EACH ROOF TOP EXHAUST FAN VIA CORRESPONDING MOTOR STARTER AS INDICATED. REFER TO DRAWING E.305 ELECTRICAL - POWER PLAN - ROOF.
6. ELEVATOR MACHINE ROOM LIGHTING FIXTURE SHALL BE LISTED FOR DAMP LOCATIONS, 1-LAMP 22W 120V COMPACT FLUORESCENT, CLEAR PRISMATIC GLOBE, PER MCGILL 641-FL22 UTILITY LIGHT OR AN APPROVED EQUIVALENT.
7. PROVIDE LINE POWER FOR NEW AHU. COORDINATE FINAL MCA AND MOP REQUIREMENTS WITH MECHANICAL CONTRACTOR SELECTIONS.
8. PROVIDE DEDICATED EMERGENCY CIRCUIT FOR SECURITY ACCESS CARD PANEL. PRIOR TO CIRCUIT INSTALLATION COORDINATE EXACT LOCATION AND POWER REQUIREMENTS WITH THE SECURITY VENDOR.

CABLE AND CONDUIT:

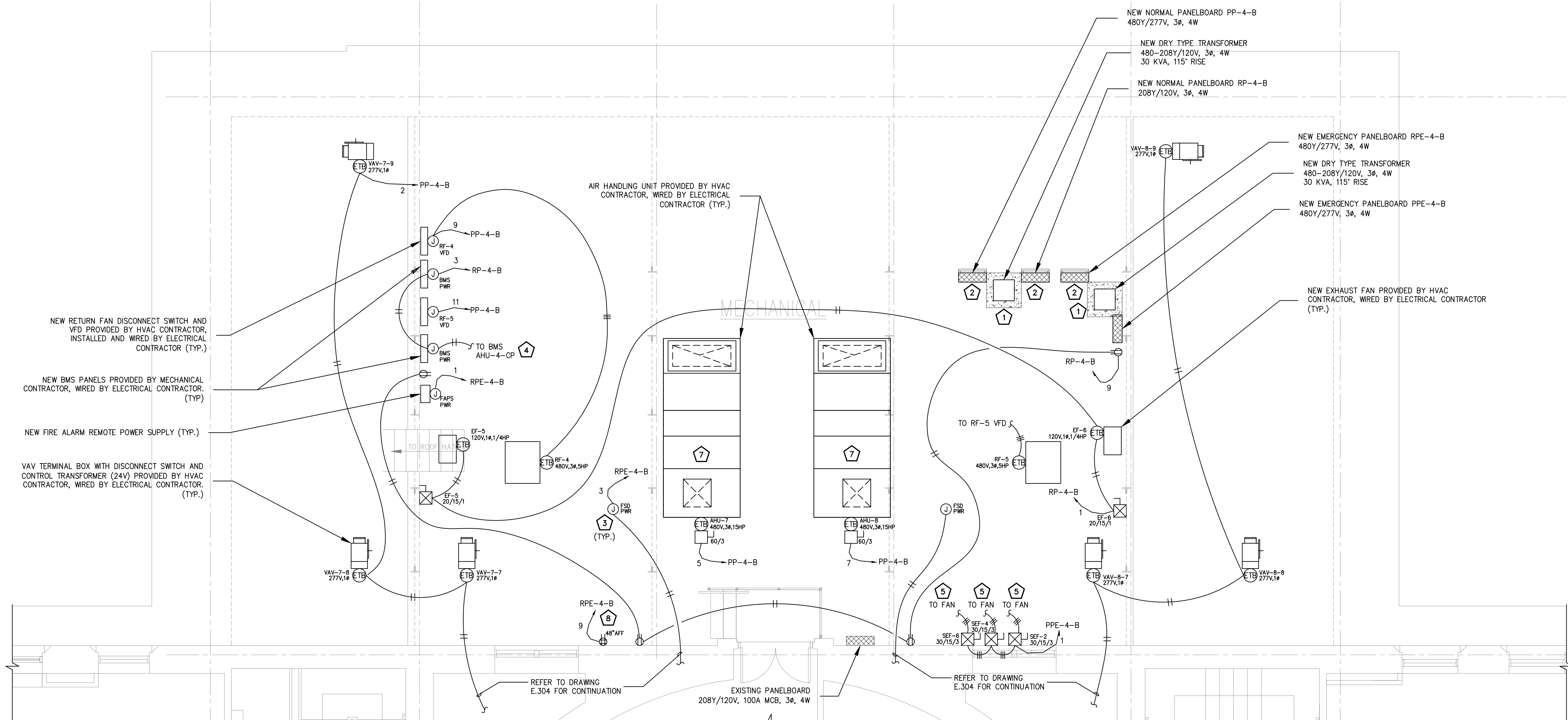
1. 3/4" C AND DRAGLINE (CONDUIT ONLY)

DRAWING NOTES:

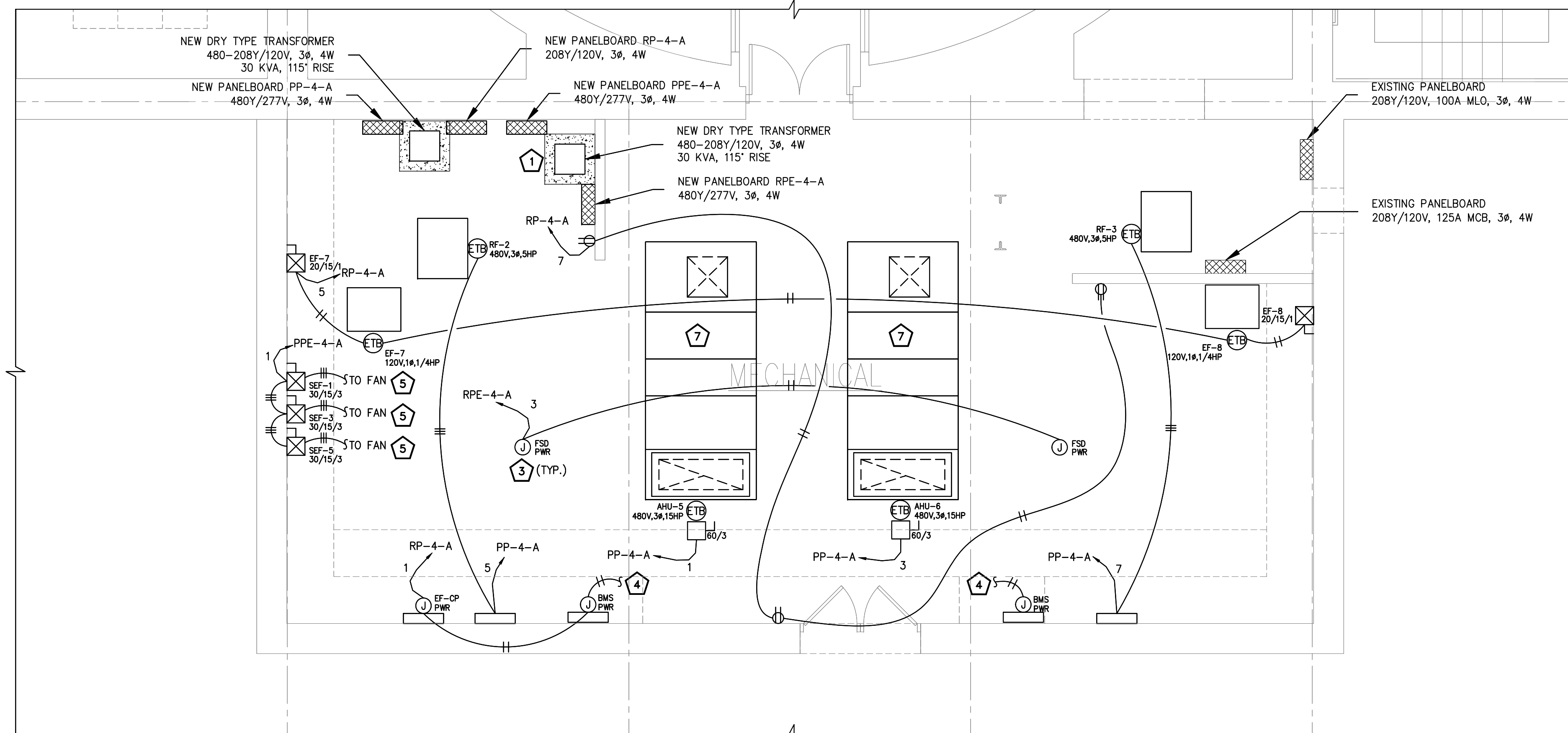
1. CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
2. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
3. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
4. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
5. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
6. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
7. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
8. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
9. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
10. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS MARKED ACCORDINGLY.
11. PROVIDE INSULATED GROUNDING CONDUCTORS AS REQUIRED FOR ALL EQUIPMENT, LIGHTING FIXTURES, AND RECEPTACLES ETC. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN IN ALL ILLUSTRATED WIRING DESIGNATIONS.
12. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
13. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABL 31, CHAPTER 9 RESPECTIVELY.
14. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
15. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
16. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
17. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
18. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



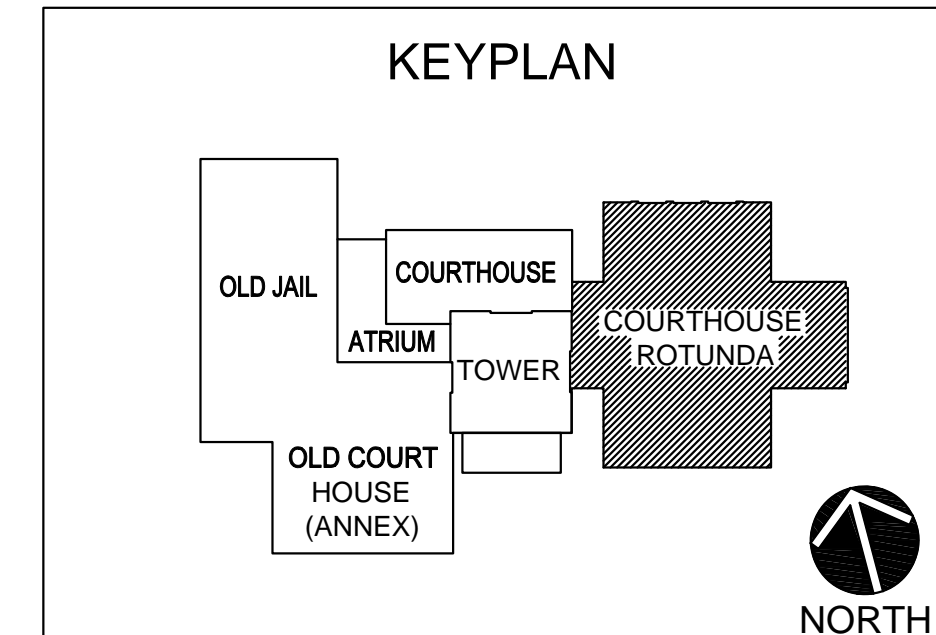
FOURTH FLOOR ATTIC
ELEVATOR MACHINE ROOM - ENLARGED POWER PLAN
SCALE: 1/4"=1'-0"



FOURTH FLOOR NORTH MECHANICAL ROOM - ENLARGED POWER PLAN
SCALE: 1/4"=1'-0"



FOURTH FLOOR SOUTH MECHANICAL ROOM - ENLARGED POWER PLAN
SCALE: 1/4"=1'-0"



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NJ License No. AI 12118
MARK E. BESS, AIA, NCARB
NJ License No. AI 16160
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - POWER PLAN
ENLARGED FOURTH FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

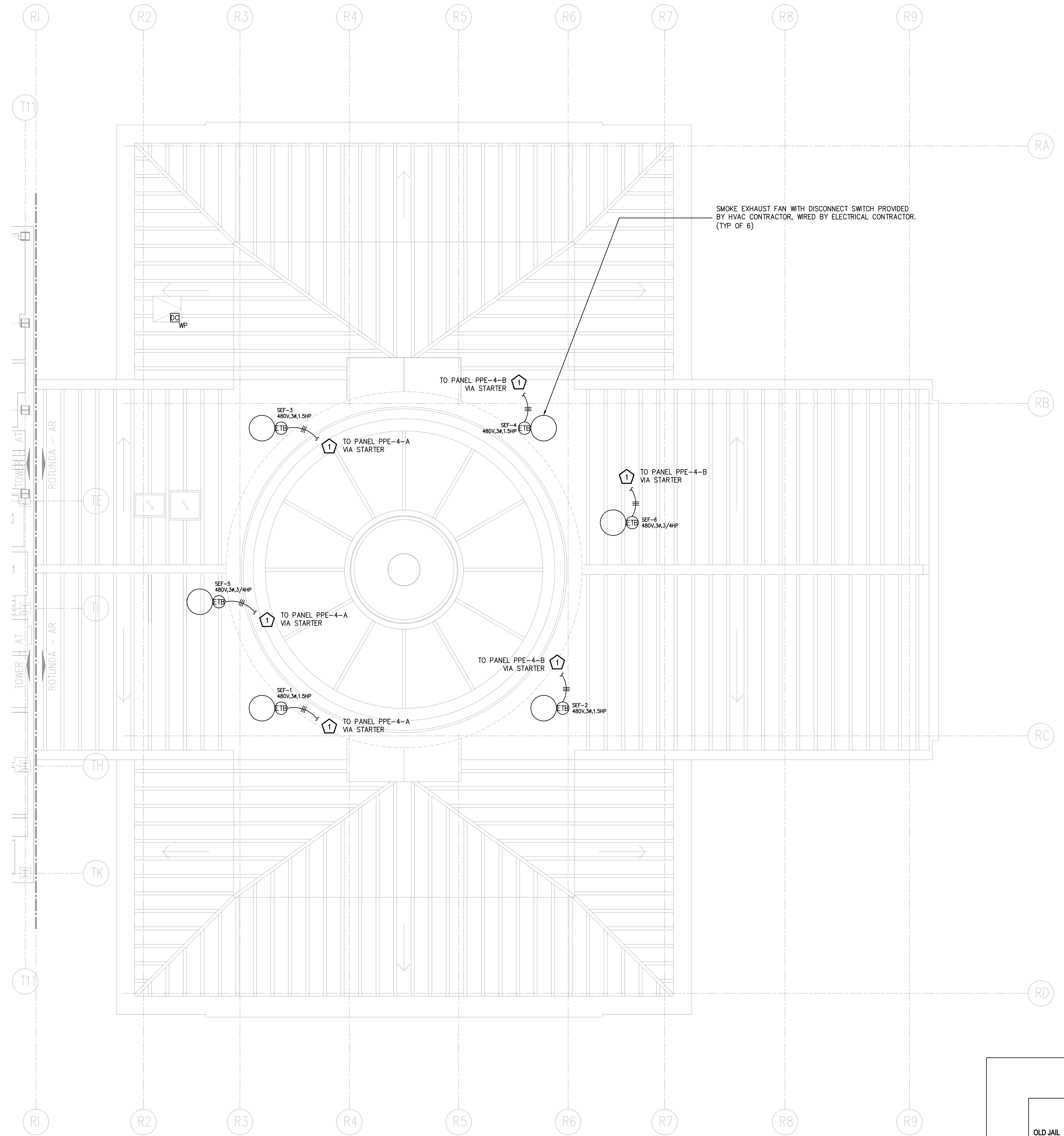
E.304.1

KEYED WORK NOTES:

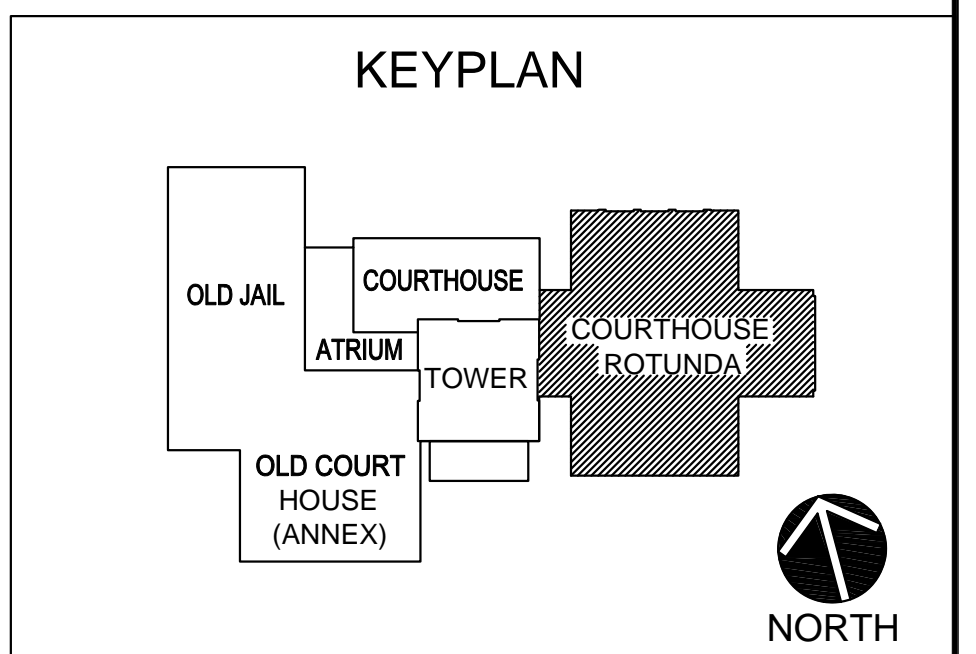
FOR ROOF TOP SMOKE EXHAUST FAN CIRCUIT PANEL DESIGNATIONS REFER TO DRAWING E.304 ELECTRICAL POWER PLAN FOURTH FLOOR.

DRAWING NOTES:

- CONTRACTOR SHALL SUBMIT COLOR OPTION FOR ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
- COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
- CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
- COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
- FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
- REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
- REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
- ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
- ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
- HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS MARKED ACCORDINGLY.
- PROVIDE INSULATED GROUNDING CONDUCTORS AS REQUIRED FOR ALL EQUIPMENT, LIGHTING FIXTURES, AND RECEPTACLES ETC. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN IN ALL ILLUSTRATED WIRING DESIGNATIONS.
- ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
- WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9 RESPECTIVELY.
- ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
- REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
- REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
- REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
- REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



ROOF - POWER PLAN
SCALE: 1/8"=1'-0"



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NJ License No. AI 12118
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NJ License No. AI 16160
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - POWER PLAN
ROOF

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY NJN
									JOB NO 2141152
									SHEET: _ OF:
									DWG. NO

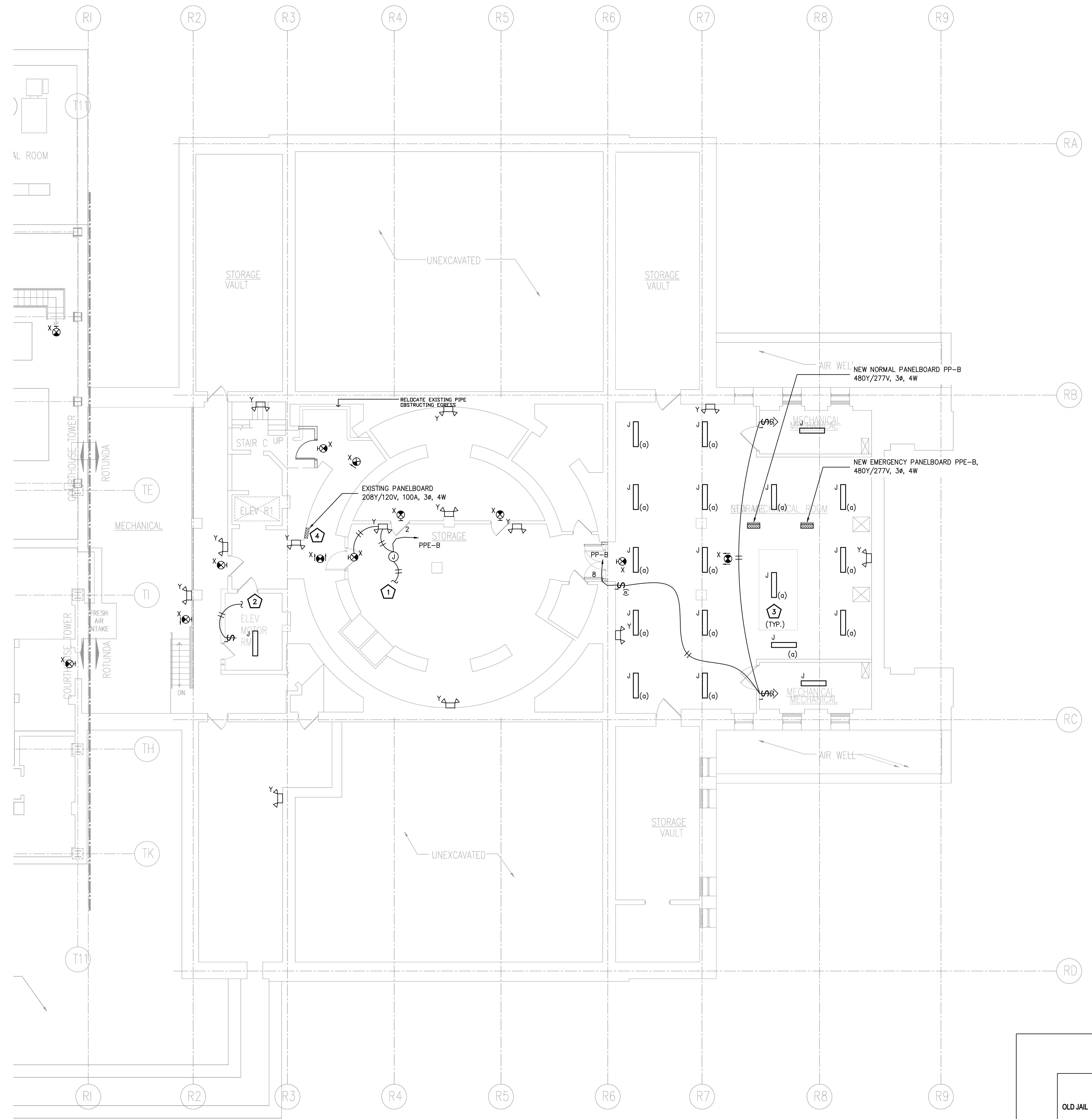
E.305

KEYED WORK NOTES:

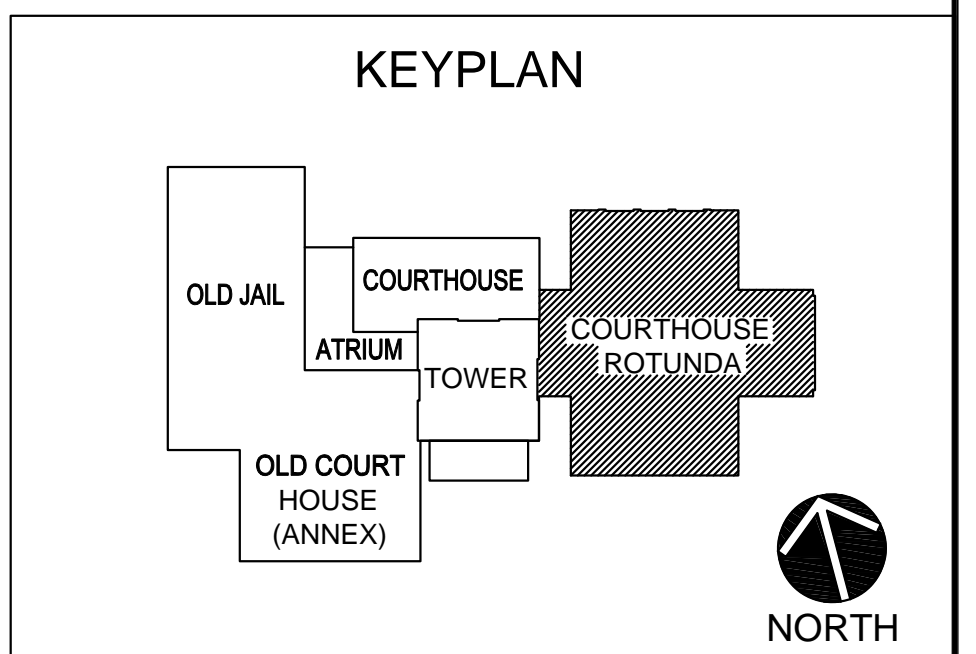
1. CONNECT ALL EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ON FLOOR TO INDICATED PANEL-BOARD CIRCUIT. PROVIDE BREAKER BLOCKING DEVICE IN PANELBOARD FOR CIRCUIT. COORDINATE FINAL LOCATION OF LIGHTING, SIGNAGE AND DIRECTIONALS WITH ARCHITECT.
2. CONNECT ELEVATOR MACHINE ROOM NEW LIGHTING FIXTURE TO EXISTING LOCAL LIGHTING CIRCUIT.
3. MECHANICAL ROOM NEW LIGHTING FIXTURES EXACT LOCATIONS SHALL BE INSTALLED IN COORDINATION WITH THE EXISTING AND NEW PIPING, CONDUIT, DUCTWORK, AND ALL OTHER MECHANICAL AND PLUMBING SYSTEM COMPONENTS. COORDINATE WORK WITH ALL APPLICABLE TRADES.
4. FIELD VERIFY EXISTING HALLWAY, STAIRS, AND COURTROOMS LIGHTING CIRCUITS. DISCONNECT EXISTING BRANCH WIRING FROM SOURCE AND EXTEND TO NEW EMERGENCY PANEL "PPE-B", LOCATED ON THE 4TH FLOOR MECHANICAL ROOM. BREAKER SHALL UTILIZE A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULE ON SHEET E.202 FOR MORE INFORMATION.

DRAWING NOTES:

1. CONTRACTOR'S FINAL INSTALLATION SHALL MEET THE GOVERNING EDITION OF THE NEW JERSEY ENERGY CONSERVATION CODE.
2. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
3. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
4. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9.
5. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LIGHTING FIXTURE AND CONTROL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
6. SUBMIT COLOR OPTIONS FOR ALL LIGHTING FIXTURES AND CONTROL DEVICES FOR SELECTION BY ARCHITECT.
7. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS APPROPRIATELY MARKED.
8. PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTORS FOR ALL LIGHTING FIXTURES AS REQUIRED. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN ON CERTAIN WIRING DESIGNATIONS.
9. ALL WIRING TO BE #12AWG WITH #12AWG GND UNLESS OTHERWISE NOTED OR REQUIRED DUE TO CONDUCTOR DERATING FOR MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY OR CABLE ASSEMBLY.
10. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT, CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
11. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN). CONTRACTOR SHALL SUBMIT COLOR OPTIONS FOR ANY AND ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
12. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE TENANT.
13. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
14. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR FINAL LOCATIONS OF NEW MECHANICAL AND PLUMBING EQUIPMENT.
15. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
16. CONTRACTOR SHALL CONDUCT ALL NECESSARY EMERGENCY LIGHTING TEST(S) FOR THE AUTHORITY HAVING JURISDICTION.
17. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
18. CONDUCTORS OR CABLES INSTALLED IN CONDUIT EXPOSED TO DIRECT SUNLIGHT ON OR ABOVE ROOFTOPS SHALL BE DERATED AND SIZE-ADJUSTED IN ORDER TO COMPLY WITH NEC 310.15(B)(2)(c).
19. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS, AND LEGENDS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
20. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
21. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
22. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



BASEMENT - LIGHTING PLAN
SCALE: 1/8"=1'-0"



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MARK E. BESS, AIA, NCARB
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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**ELECTRICAL - LIGHTING PLAN
BASEMENT FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

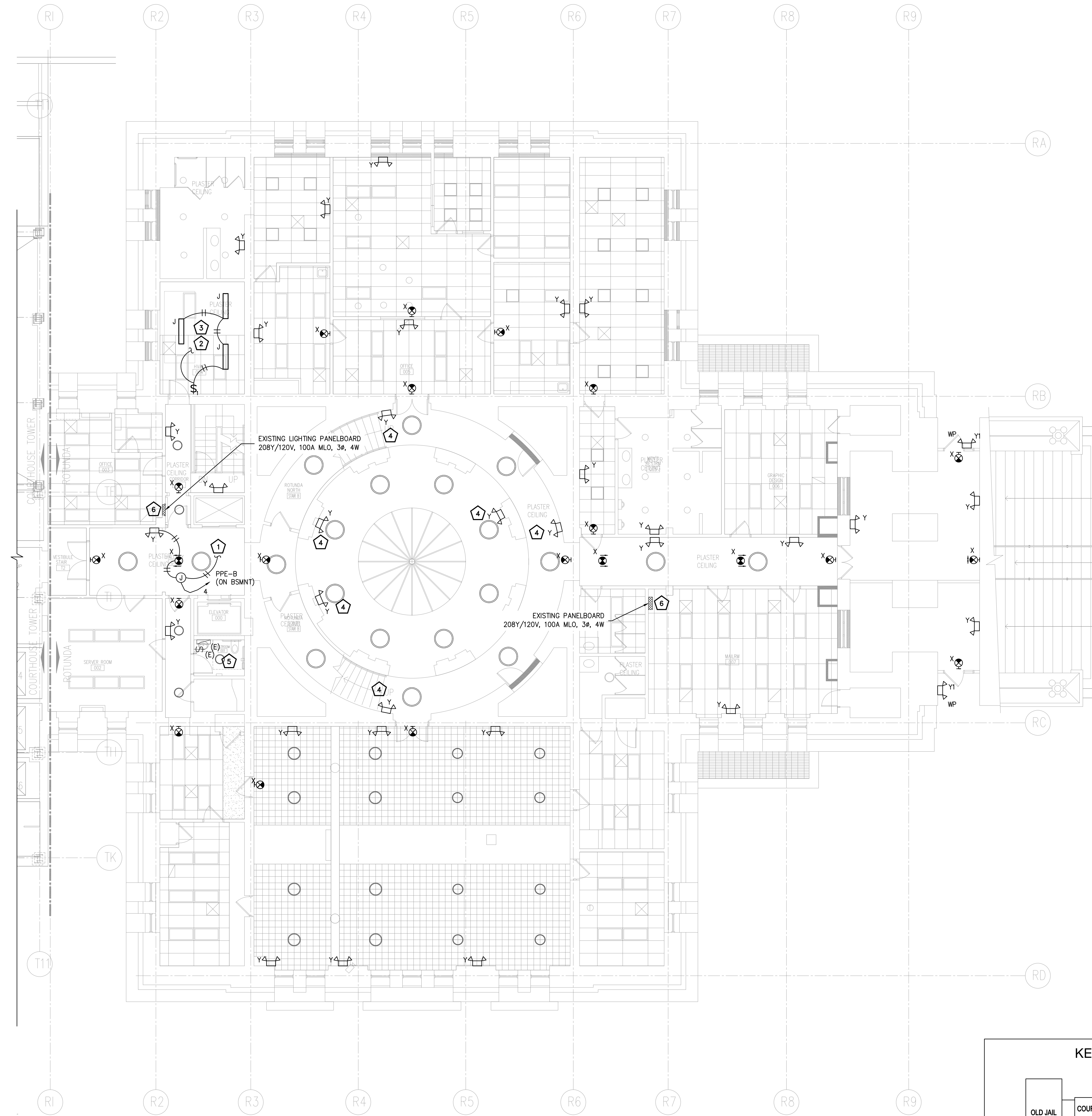
E.400B

KEYED WORK NOTES:

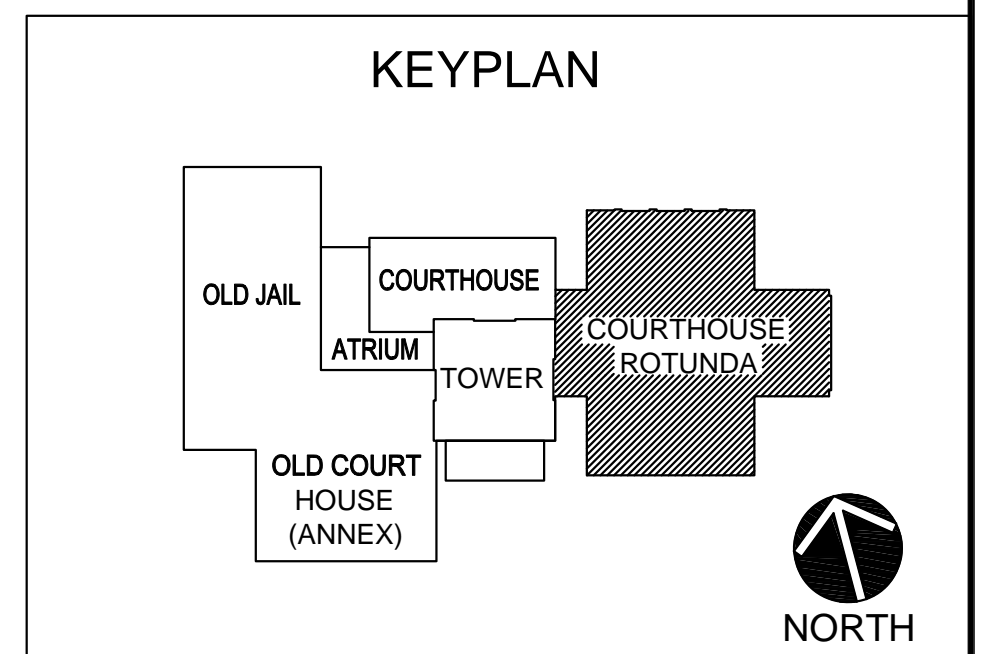
1. CONNECT ALL EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ON FLOOR TO INDICATED PANEL-BOARD CIRCUIT. PROVIDE BREAKER BLOCKING DEVICE IN PANELBOARD FOR CIRCUIT. COORDINATE FINAL LOCATION OF LIGHTING, SIGNAGE AND DIRECTIONALS WITH ARCHITECT.
2. CONNECT NEW LIGHTING FIXTURES TO EXISTING LOCAL LIGHTING CIRCUIT.
3. MECHANICAL ROOM NEW LIGHTING FIXTURES EXACT LOCATIONS SHALL BE INSTALLED IN COORDINATION WITH THE EXISTING AND NEW PIPING, CONDUIT, DUCTWORK, AND ALL OTHER MECHANICAL AND PLUMBING SYSTEM COMPONENTS. COORDINATE WORK WITH ALL APPLICABLE TRADES.
4. PRIOR TO COMMENCING ANY INSTALLATION WORK INSIDE THE COURTHOUSE ROTUNDA, OBTAIN APPROVAL FROM THE ARCHITECT AND OWNER OF THE PROPOSED CONDUIT ROUTING AND DEVICE INSTALLATION AND ENSURE COMPLIANCE WITH THE REGISTERED NJ HISTORIC PRESERVATION OFFICE FOR THE SPACE.
5. INSTALL VANITY LIGHTING FIXTURE ON NEW WALL AND CONNECT TO LOCAL LIGHTING BRANCH CIRCUIT. EXTEND CIRCUIT WIRING AS REQUIRED. COORDINATE NEW INSTALLATION WITH THE ARCHITECT.
6. FIELD VERIFY EXISTING HALLWAY, STAIRS, AND COURTROOMS LIGHTING CIRCUITS. DISCONNECT EXISTING BRANCH WIRING FROM SOURCE AND EXTEND TO NEW EMERGENCY PANEL "PPE-B", LOCATED ON THE 4TH FLOOR MECHANICAL ROOM. BREAKER SHALL UTILIZE A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULE ON SHEET E.202 FOR MORE INFORMATION.

DRAWING NOTES:

1. CONTRACTOR'S FINAL INSTALLATION SHALL MEET THE GOVERNING EDITION OF THE NEW JERSEY ENERGY CONSERVATION CODE.
2. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
3. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
4. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9.
5. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LIGHTING FIXTURE AND CONTROL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
6. SUBMIT COLOR OPTIONS FOR ALL LIGHTING FIXTURES AND CONTROL DEVICES FOR SELECTION BY ARCHITECT.
7. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS APPROPRIATELY MARKED.
8. PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTORS FOR ALL LIGHTING FIXTURES AS REQUIRED. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN ON CERTAIN WIRING DESIGNATIONS.
9. ALL WIRING TO BE #12AWG WITH #12AWG GND UNLESS OTHERWISE NOTED OR REQUIRED DUE TO CONDUCTOR DERATING FOR MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY OR CABLE ASSEMBLY.
10. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
11. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN). CONTRACTOR SHALL SUBMIT COLOR OPTIONS FOR ANY AND ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
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13. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
14. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR FINAL LOCATIONS OF NEW MECHANICAL AND PLUMBING EQUIPMENT.
15. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
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17. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
18. CONDUCTORS OR CABLES INSTALLED IN CONDUIT EXPOSED TO DIRECT SUNLIGHT ON OR ABOVE ROOFTOPS SHALL BE DERATED AND SIZE-ADJUSTED IN ORDER TO COMPLY WITH NEC 310.15(D)(2)(c).
19. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS, AND LEGENDS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
20. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
21. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
22. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



GROUND FLOOR – LIGHTING PLAN
SCALE: 1/8"=1'-0"



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PROJECT:
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**ELECTRICAL - LIGHTING PLAN
GROUND FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
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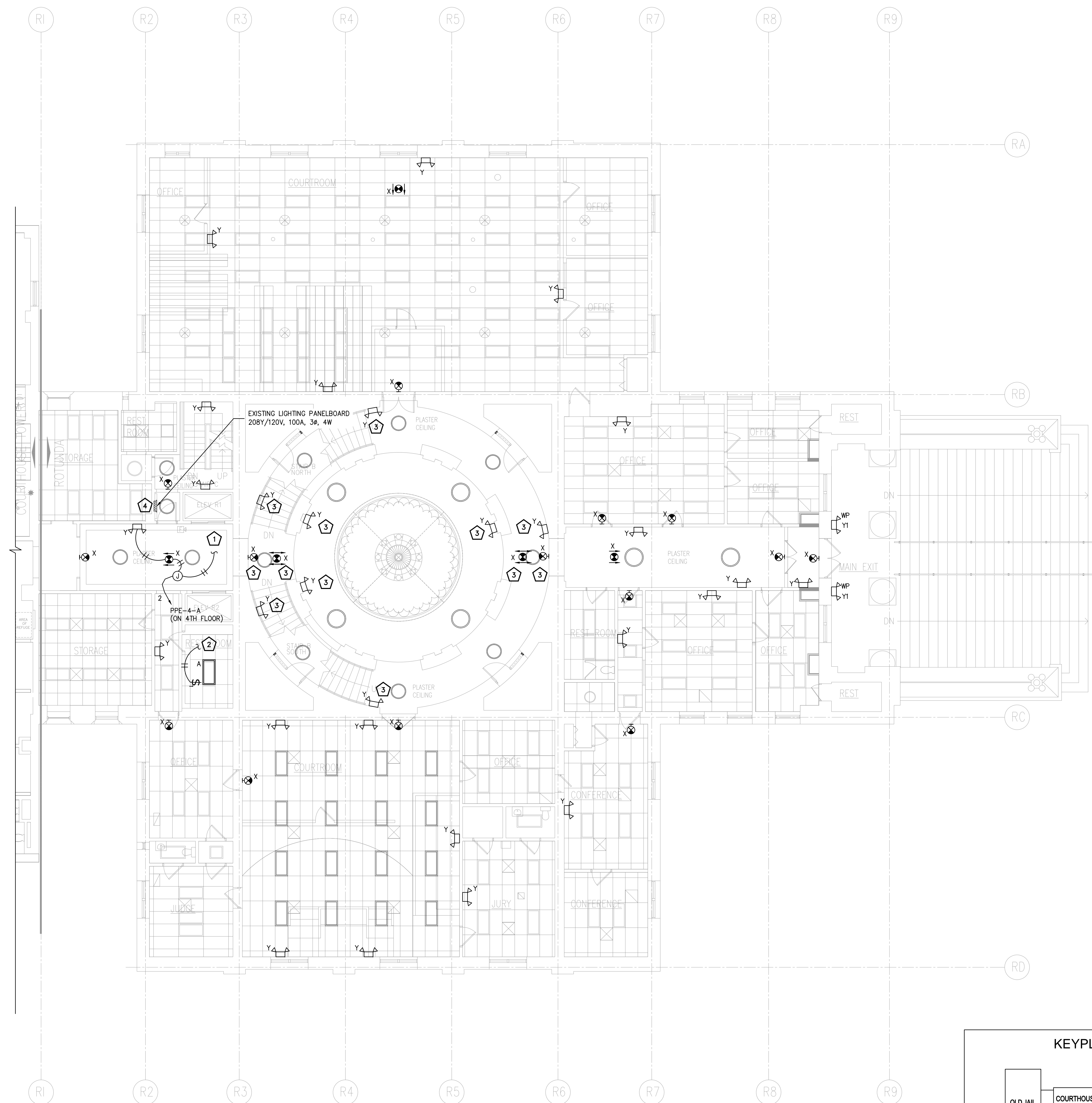
E.400G

KEYED WORK NOTES:

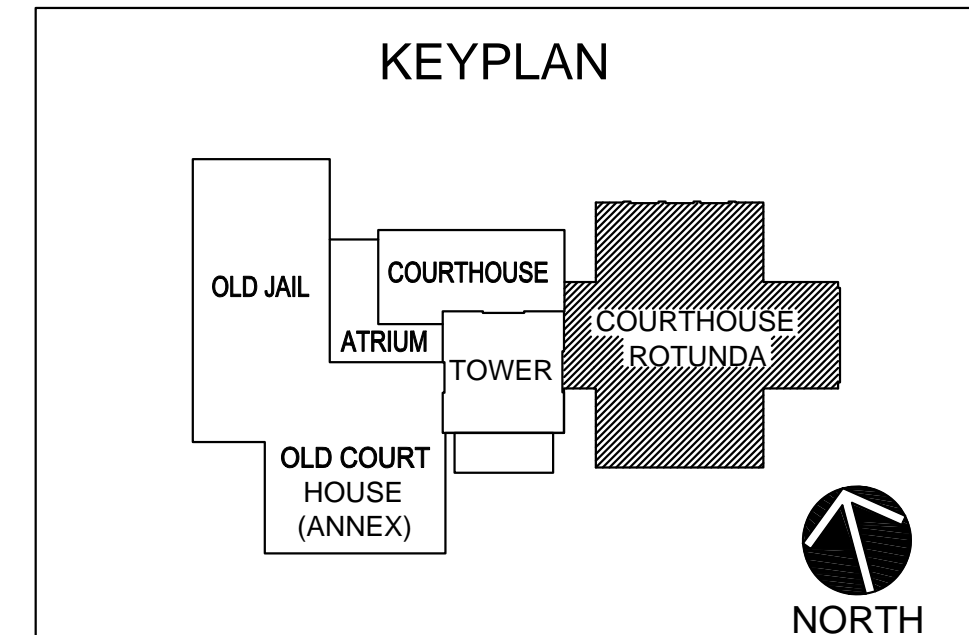
1. CONNECT ALL EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ON FLOOR TO INDICATED PANEL-BOARD CIRCUIT. PROVIDE BREAKER BLOCKING DEVICE IN PANELBOARD FOR CIRCUIT. COORDINATE FINAL LOCATION OF LIGHTING, SIGNAGE AND DIRECTIONALS WITH ARCHITECT.
2. CONNECT NEW LIGHTING FIXTURES TO EXISTING LOCAL LIGHTING CIRCUIT.
3. PRIOR TO COMMENCING ANY INSTALLATION WORK INSIDE THE COURTHOUSE ROTUNDA, OBTAIN APPROVAL FROM THE ARCHITECT AND OWNER OF THE PROPOSED CONDUIT ROUTING AND DEVICE INSTALLATION AND ENSURE COMPLIANCE WITH THE REGISTERED NJ HISTORIC PRESERVATION OFFICE FOR THE SPACE.
4. FIELD VERIFY EXISTING HALLWAY, STAIRS, AND COURTROOMS LIGHTING CIRCUITS. DISCONNECT EXISTING BRANCH WIRING FROM SOURCE AND EXTEND TO NEW EMERGENCY PANEL "RPE-4-A", LOCATED ON THE 4TH FLOOR MECHANICAL ROOM. BREAKER SHALL UTILIZE A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULE ON SHEET E.203 FOR MORE INFORMATION.

DRAWING NOTES:

1. CONTRACTOR'S FINAL INSTALLATION SHALL MEET THE GOVERNING EDITION OF THE NEW JERSEY ENERGY CONSERVATION CODE.
2. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
3. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
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5. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LIGHTING FIXTURE AND CONTROL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
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7. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS APPROPRIATELY MARKED.
8. PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTORS FOR ALL LIGHTING FIXTURES AS REQUIRED. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN ON CERTAIN WIRING DESIGNATIONS.
9. ALL WIRING TO BE #12AWG WITH #12AWG GND UNLESS OTHERWISE NOTED OR REQUIRED DUE TO CONDUCTOR DERATING FOR MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY OR CABLE ASSEMBLY.
10. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
11. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN). CONTRACTOR SHALL SUBMIT COLOR OPTIONS FOR ANY AND ALL WIRING DEVICES AND DEVICE PLATES FOR SELECTION BY ARCHITECT.
12. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE TENANT.
13. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
14. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR FINAL LOCATIONS OF NEW MECHANICAL AND PLUMBING EQUIPMENT.
15. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
16. CONTRACTOR SHALL CONDUCT ALL NECESSARY EMERGENCY LIGHTING TEST(S) FOR THE AUTHORITY HAVING JURISDICTION.
17. ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
18. CONDUCTORS OR CABLES INSTALLED IN CONDUIT EXPOSED TO DIRECT SUNLIGHT ON OR ABOVE ROOFTOPS SHALL BE DERATED AND SIZE-ADJUSTED IN ORDER TO COMPLY WITH NEC 310.15(B)(2)(c).
19. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS, AND LEGENDS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
20. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
21. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
22. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



FIRST FLOOR - LIGHTING PLAN
SCALE: 1/8"=1'-0"



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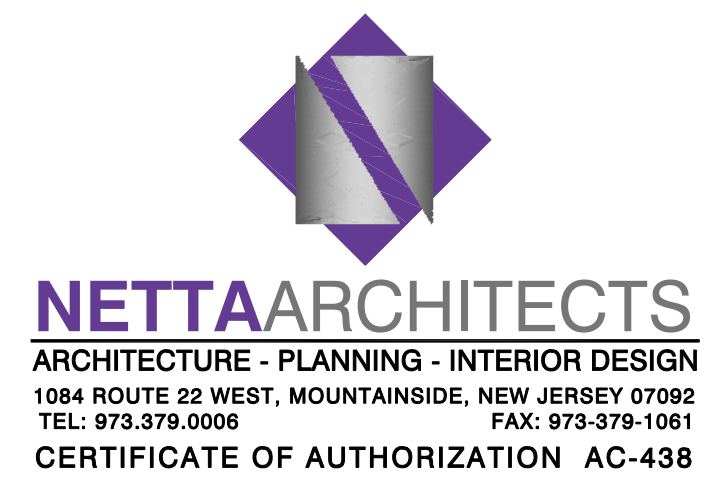
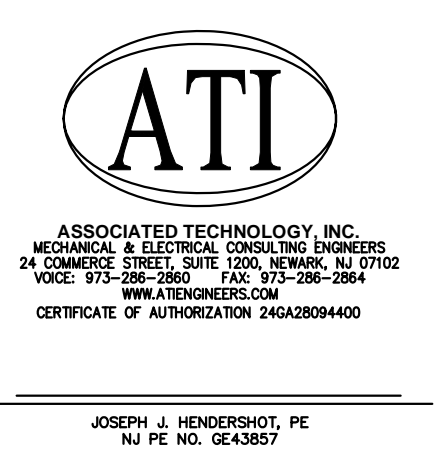
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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - LIGHTING PLAN
FIRST FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY NJN
									JOB NO 2141152
									SHEET: _ OF:
									DWG. NO

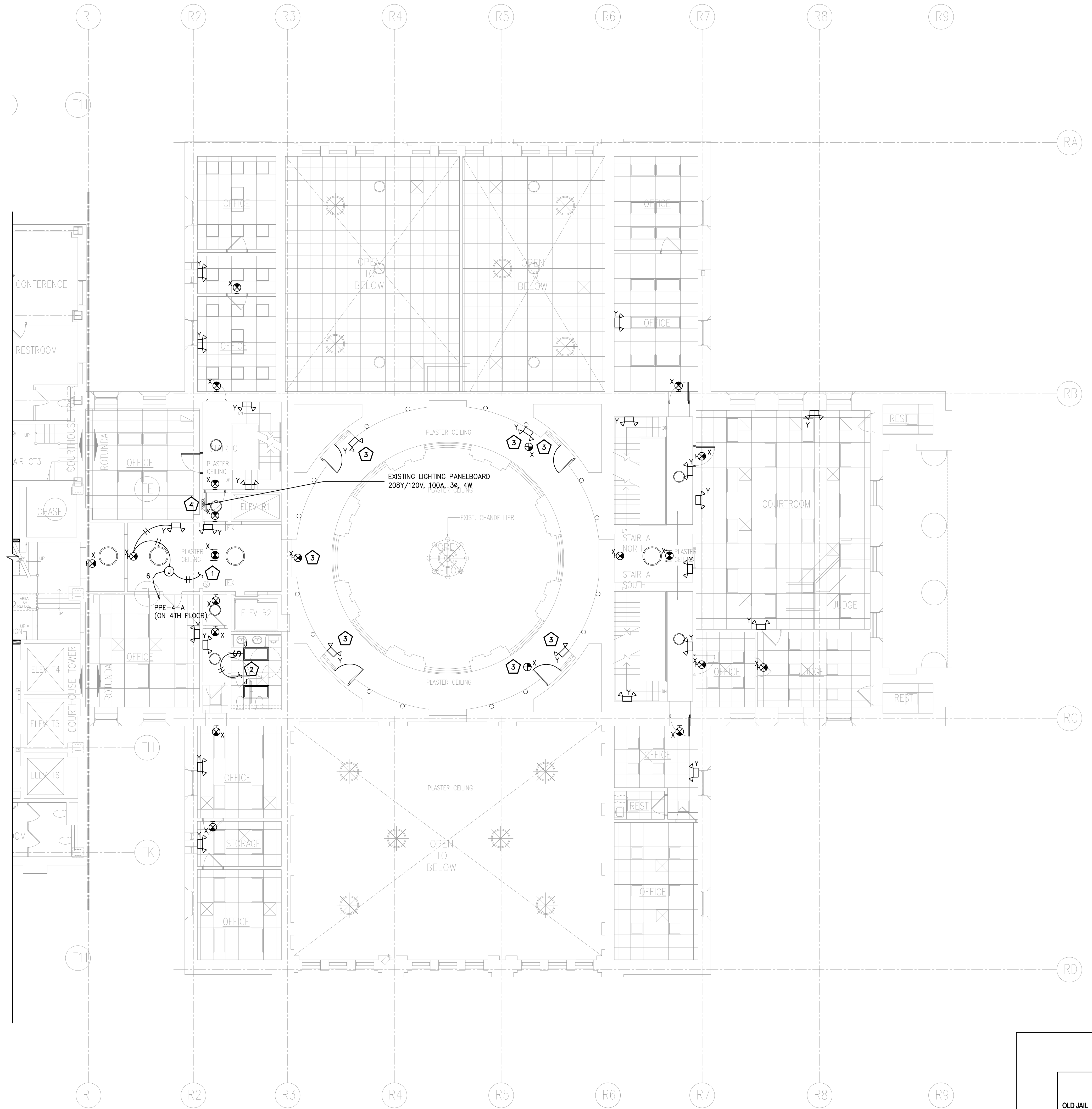
E.401

KEYED WORK NOTES:

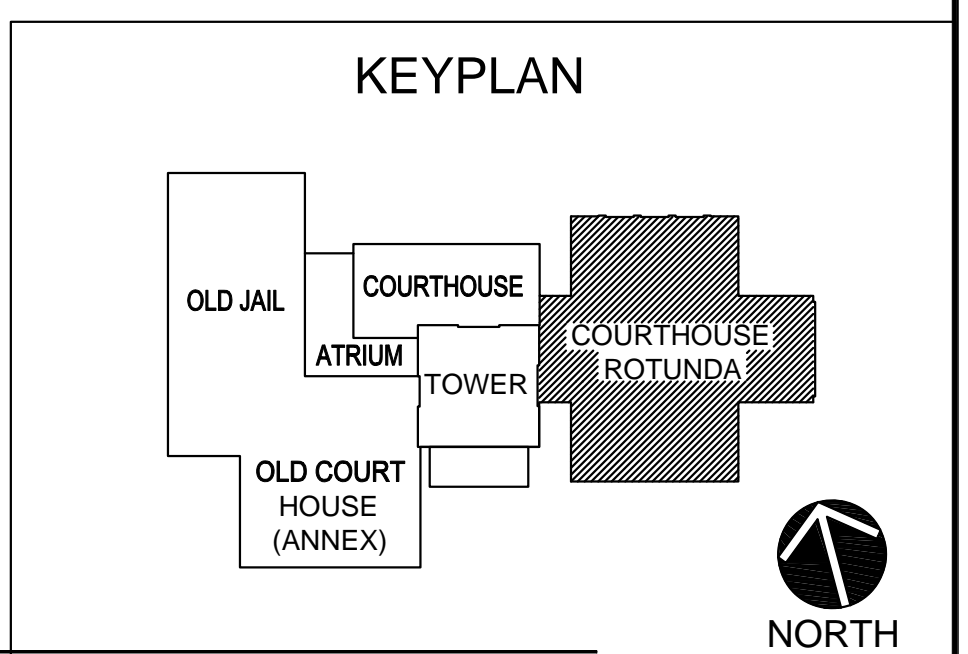
1. CONNECT ALL EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ON FLOOR TO INDICATED PANEL-BOARD CIRCUIT. PROVIDE BREAKER BLOCKING DEVICE IN PANELBOARD FOR CIRCUIT. COORDINATE FINAL LOCATION OF LIGHTING, SIGNAGE AND DIRECTIONALS WITH ARCHITECT.
2. CONNECT NEW LIGHTING FIXTURES TO EXISTING LOCAL LIGHTING CIRCUIT.
3. PRIOR TO COMMENCING ANY INSTALLATION WORK INSIDE THE COURTHOUSE ROTUNDA, OBTAIN APPROVAL FROM THE ARCHITECT AND OWNER OF THE PROPOSED CONDUIT ROUTING AND DEVICE INSTALLATION AND ENSURE COMPLIANCE WITH THE REGISTERED NJ HISTORIC PRESERVATION OFFICE FOR THE SPACE.
4. FIELD VERIFY EXISTING HALLWAY, STAIRS, AND COURTROOMS LIGHTING CIRCUITS. DISCONNECT EXISTING BRANCH WIRING FROM SOURCE AND EXTEND TO NEW EMERGENCY PANEL "RPE-4-A", LOCATED ON THE 4TH FLOOR MECHANICAL ROOM. BREAKER SHALL UTILIZE A BREAKER BLOCKING DEVICE. REFER TO PANEL SCHEDULE ON SHEET E.203 FOR MORE INFORMATION.

DRAWING NOTES:

1. CONTRACTOR'S FINAL INSTALLATION SHALL MEET THE GOVERNING EDITION OF THE NEW JERSEY ENERGY CONSERVATION CODE.
2. REFER TO NEC TABLE 310.15 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
3. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.120 AND AS REQUIRED.
4. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IS USED, NEC TABLE 310.15(B)(2)(A) DERATING FACTORS SHALL BE APPLIED. IN ADDITION, CONDUIT FILL SHALL COMPLY WITH NEC TABLE 1, CHAPTER 9.
5. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LIGHTING FIXTURE AND CONTROL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
6. SUBMIT COLOR OPTIONS FOR ALL LIGHTING FIXTURES AND CONTROL DEVICES FOR SELECTION BY ARCHITECT.
7. HOMERUNS ARE SHOWN IN LOCATIONS FOR DRAWING CLARITY. CONTRACTOR MAY CHOOSE TO FEED POWER FROM OTHER LOCATIONS AS LONG AS FUNCTIONAL INTENT IS MAINTAINED, AND FIELD DRAWINGS APPROPRIATELY MARKED.
8. PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTORS FOR ALL LIGHTING FIXTURES AS REQUIRED. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN ON CERTAIN WIRING DESIGNATIONS.
9. ALL WIRING TO BE #12AWG WITH #12AWG GND UNLESS OTHERWISE NOTED OR REQUIRED DUE TO CONDUCTOR DERATING FOR MORE THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY OR CABLE ASSEMBLY.
10. ALL EXPOSED WIRING SHALL BE IN EMT CONDUIT. CONCEALED WIRING, AND WIRING IN DROP CEILING CAVITIES SHALL BE PERMITTED TO BE MC CABLE WITH LISTED FITTINGS AND GROUNDING ARMOR UNLESS INDICATED OTHERWISE.
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21. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
22. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.



THIRD FLOOR – LIGHTING PLAN
SCALE: 1/8"=1'-0"



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PROJECT:
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**ELECTRICAL - LIGHTING PLAN
THIRD FLOOR**

SUBMISSIONS				REVISIONS				DATE
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9.25.15	95% CD SUBMIT	KD	FM					DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY NJN
								JOB NO 2141152
								SHEET: _ OF:
								DWG. NO

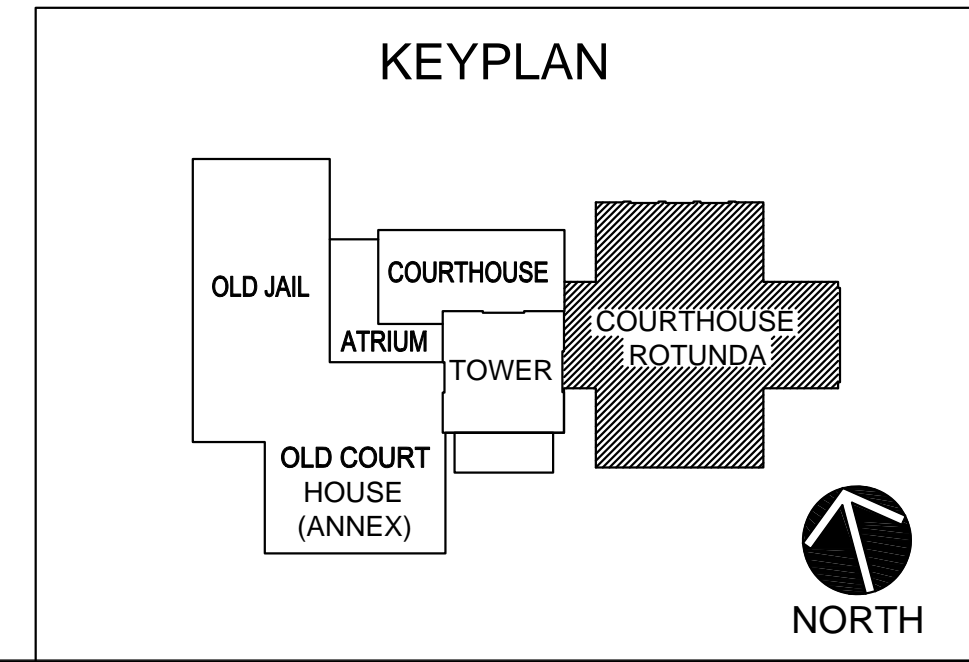
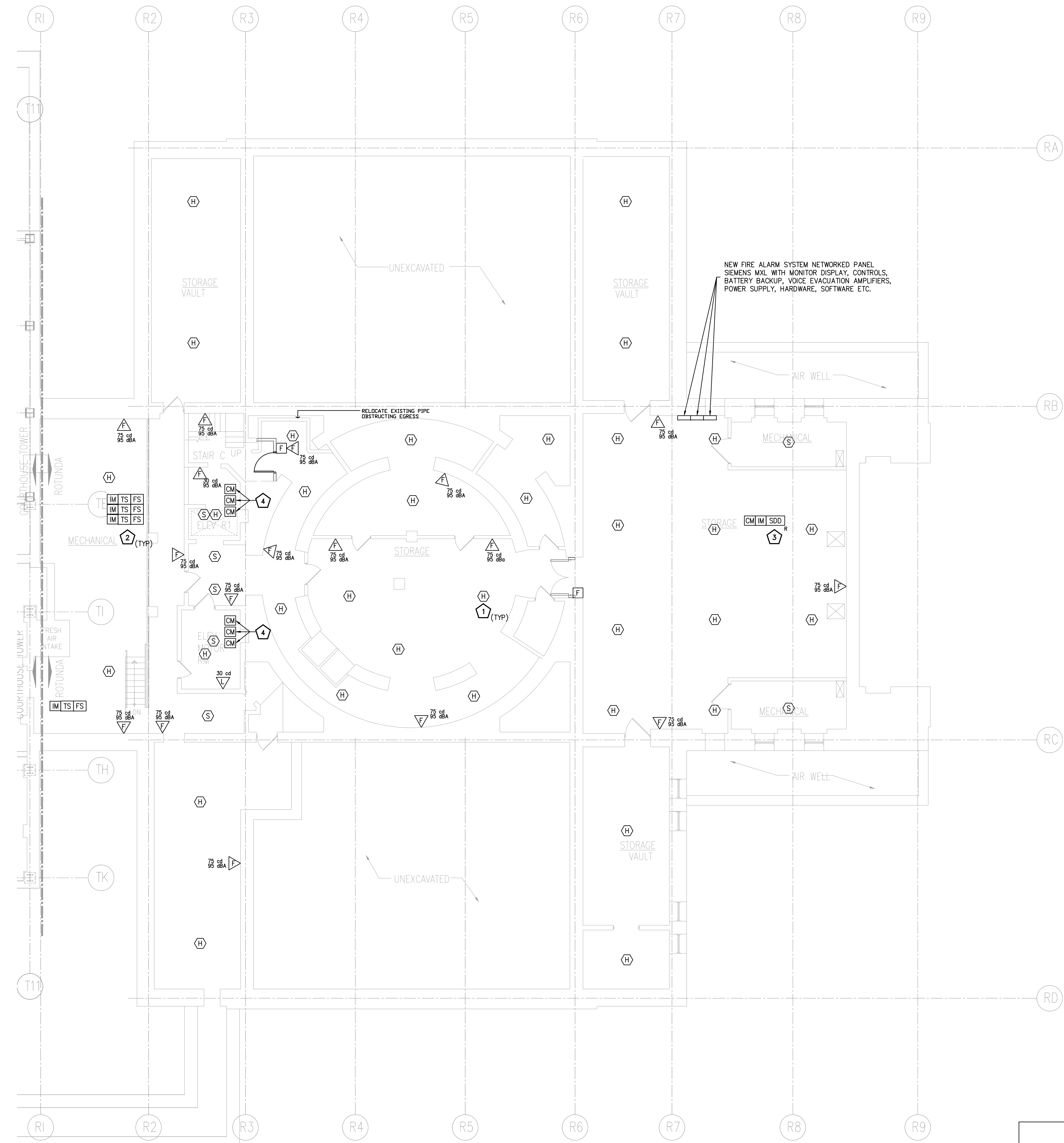
E.403

DRAWING NOTES:

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- PROVIDE ALL FIRE ALARM APPLIANCE ROUGH-IN FACILITIES AS REQUIRED.
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- REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.
- REFER TO DRAWING E.600 FOR FIRE ALARM RISER DIAGRAM.

KEYED WORK NOTES:

- NEW FIRE ALARM DEVICE AS PART OF NEW BUILDING WIDE SYSTEM. INTEGRATE AS INDICATED ON RISER DIAGRAM AND NOTES.
- NEW SPRINKLER SYSTEM INTERFACE AND RELAY MODULES. COORDINATE FINAL LOCATIONS AND QUANTITIES WITH SPRINKLER CONTRACTOR.
- NEW DUCT SMOKE DETECTOR(S) PROVIDED BY THE FIRE ALARM CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR. WIRE THE NEW DUCT SMOKE DETECTOR EQUIPMENT AS REQUIRED.
- PROVIDE NEW CONTROL MODULES TO THE ELEVATOR CONTROLLER FOR ELEVATOR RECALL TO PRIMARY FLOOR, ALTERNATE FLOOR, AND ELEVATOR SHUTDOWN PRIOR TO ACTIVATION OF SPRINKLERS IN THE SHAFT. COORDINATE INSTALLATION WITH THE ELEVATOR AND FIRE PROTECTION CONTRACTORS.



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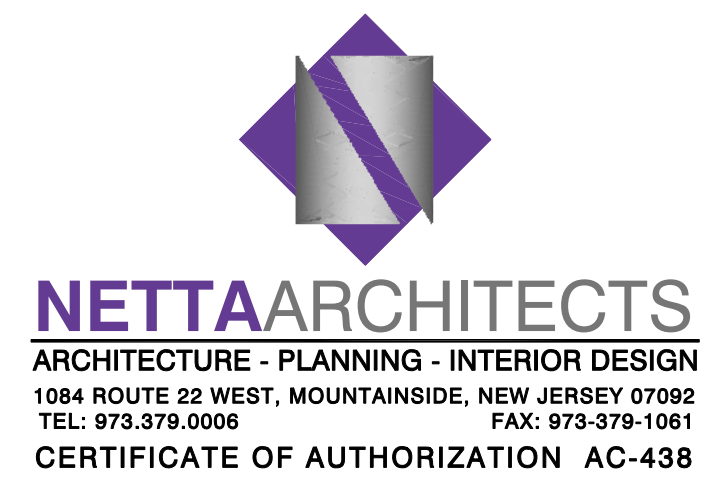
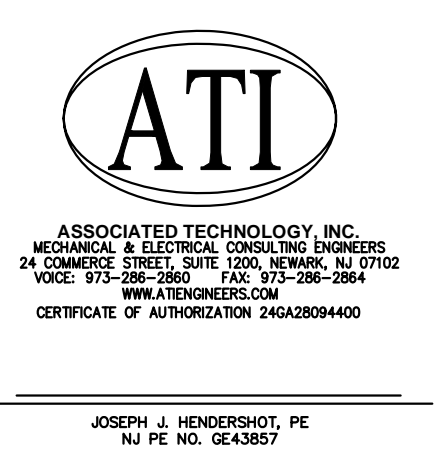
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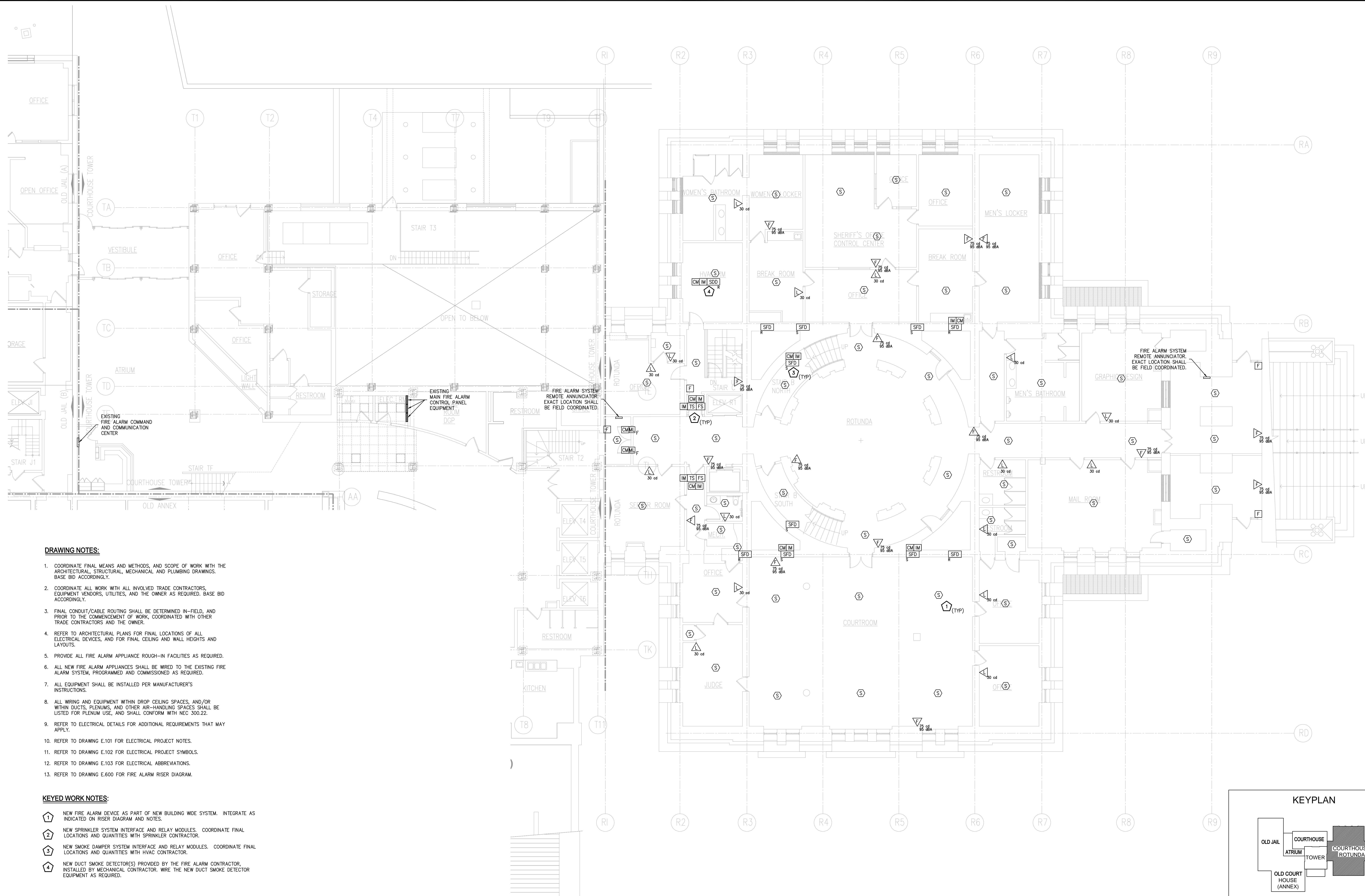


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - FIRE ALARM PLAN
BASEMENT FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

E.500B

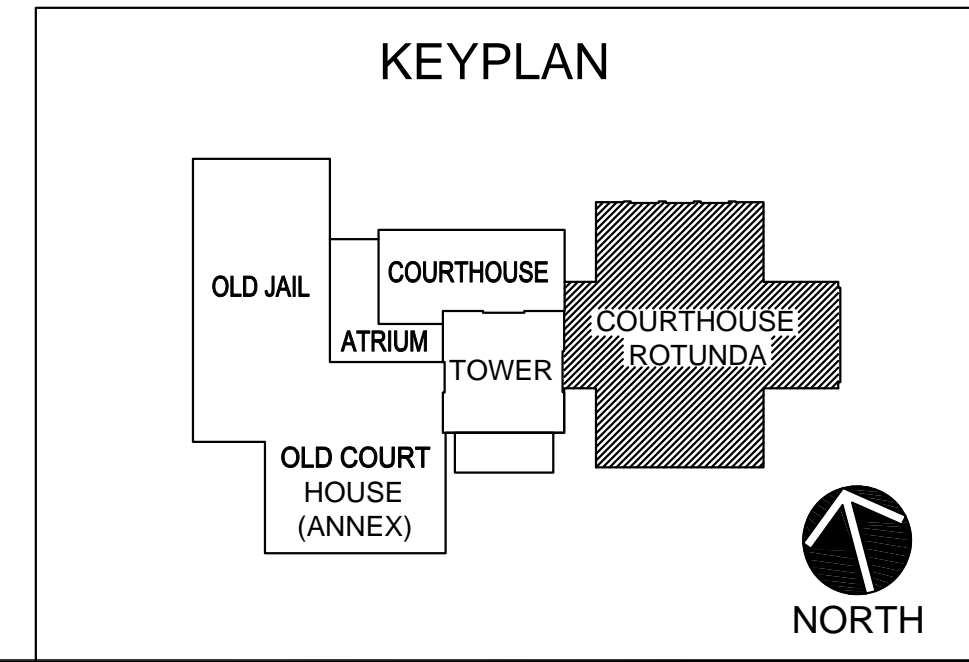


DRAWING NOTES:

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12. REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.
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KEYED WORK NOTES:

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- 3 NEW SMOKE DAMPER SYSTEM INTERFACE AND RELAY MODULES. COORDINATE FINAL LOCATIONS AND QUANTITIES WITH HVAC CONTRACTOR.
- 4 NEW DUCT SMOKE DETECTOR(S) PROVIDED BY THE FIRE ALARM CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR. WIRE THE NEW DUCT SMOKE DETECTOR EQUIPMENT AS REQUIRED.



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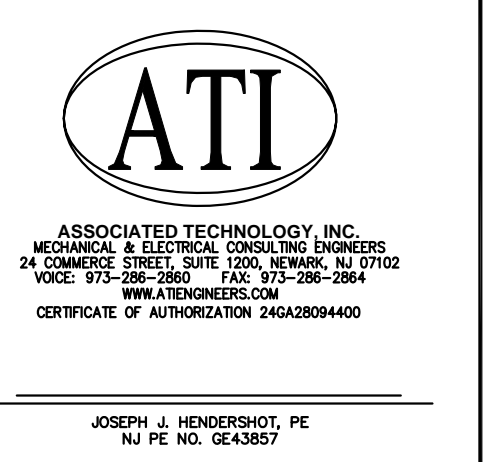
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PROJECT:
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**ELECTRICAL - FIRE ALARM PLAN
GROUND FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	1/8"=1'-0"
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
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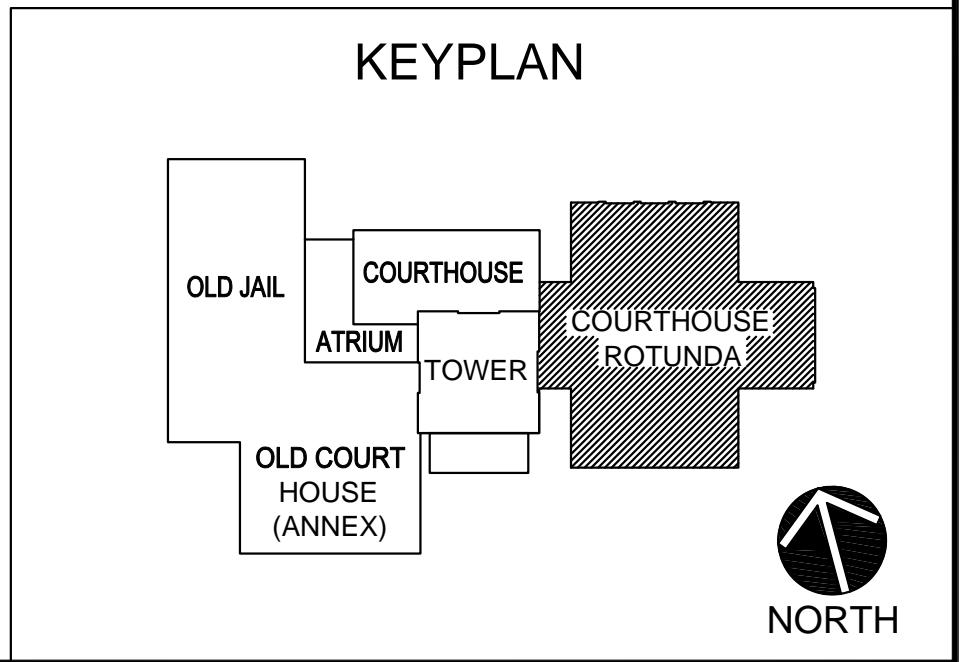
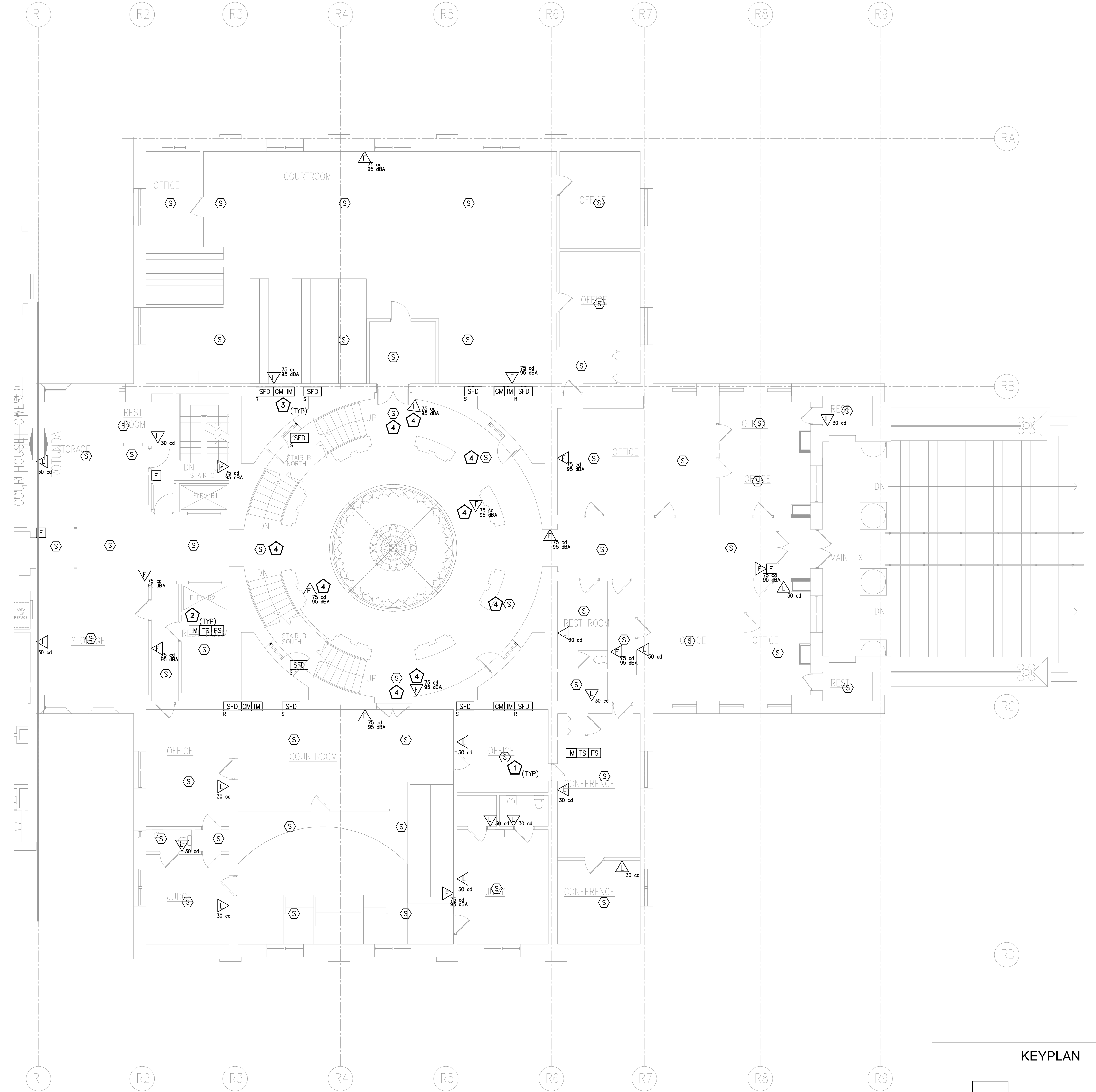
E.500G

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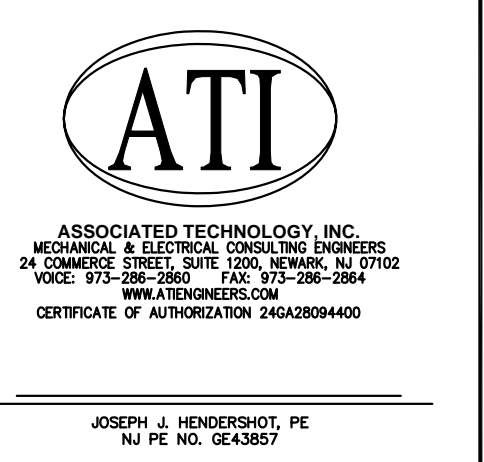
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PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - FIRE ALARM PLAN
FIRST FLOOR

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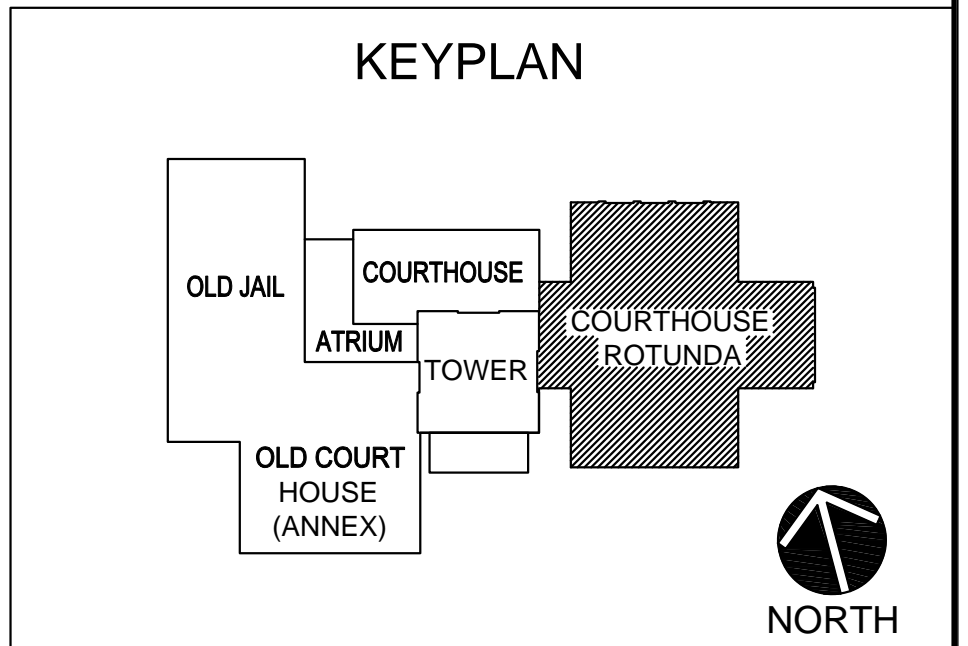
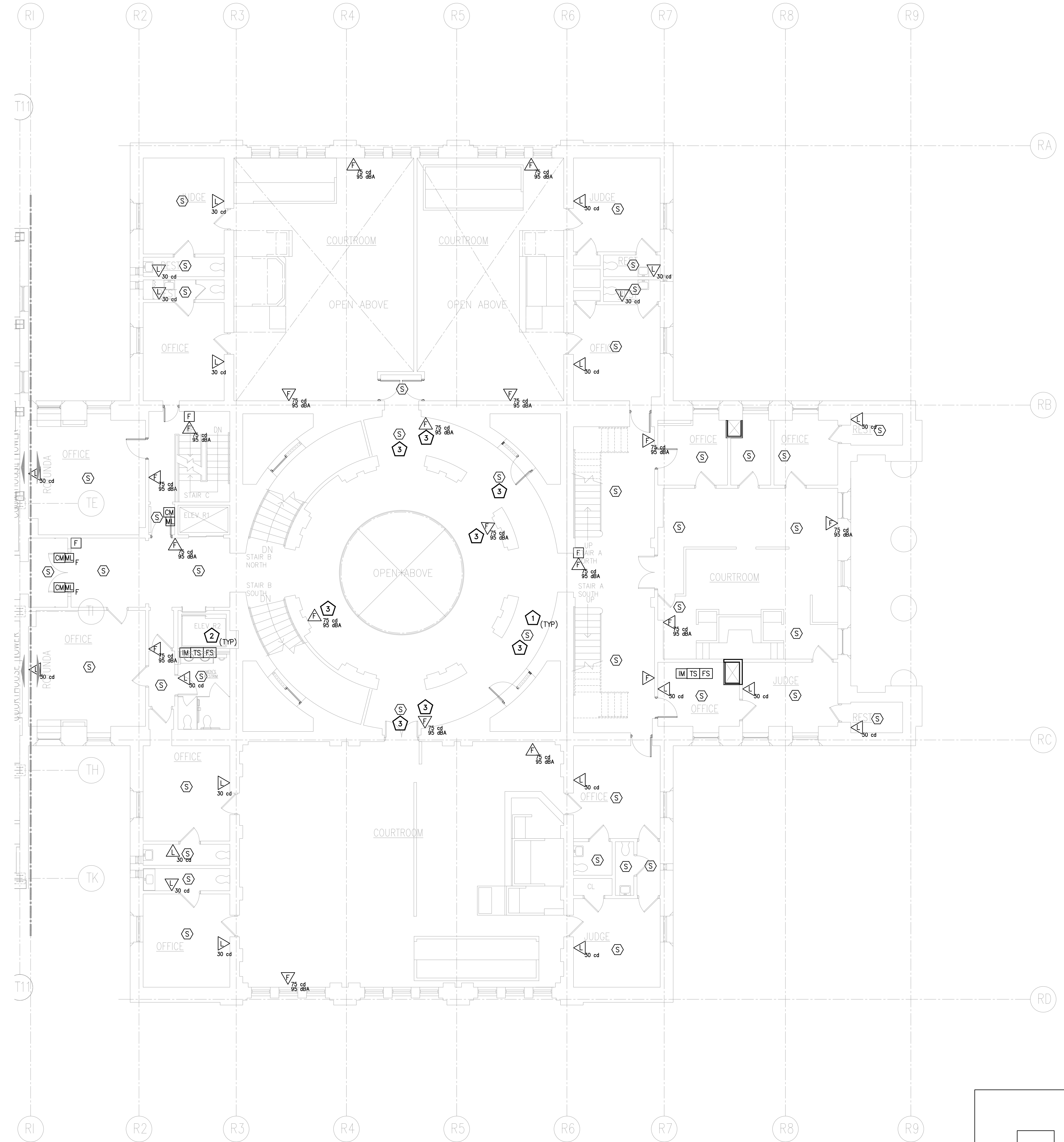
E.501

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- NEW SPRINKLER SYSTEM INTERFACE AND RELAY MODULES. COORDINATE FINAL LOCATIONS AND QUANTITIES WITH SPRINKLER CONTRACTOR.
- PRIOR TO COMMENCING ANY INSTALLATION WORK INSIDE THE COURTHOUSE ROTUNDA, OBTAIN APPROVAL FROM THE ARCHITECT AND OWNER OF THE PROPOSED CONDUIT ROUTING AND DEVICE INSTALLATION AND ENSURE COMPLIANCE WITH THE REGISTERED NJ HISTORIC PRESERVATION OFFICE FOR THE SPACE.



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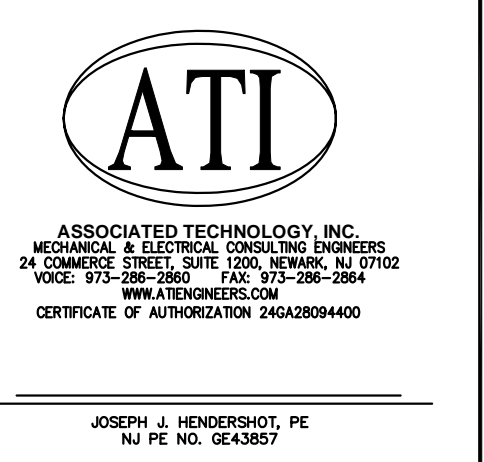
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NICHOLAS J. NETTA, AIA, NCARB
NJ License No. AI 12541

FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - FIRE ALARM PLAN
SECOND FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY NJN
									JOB NO 2141152
									SHEET: _ OF:
									DWG. NO

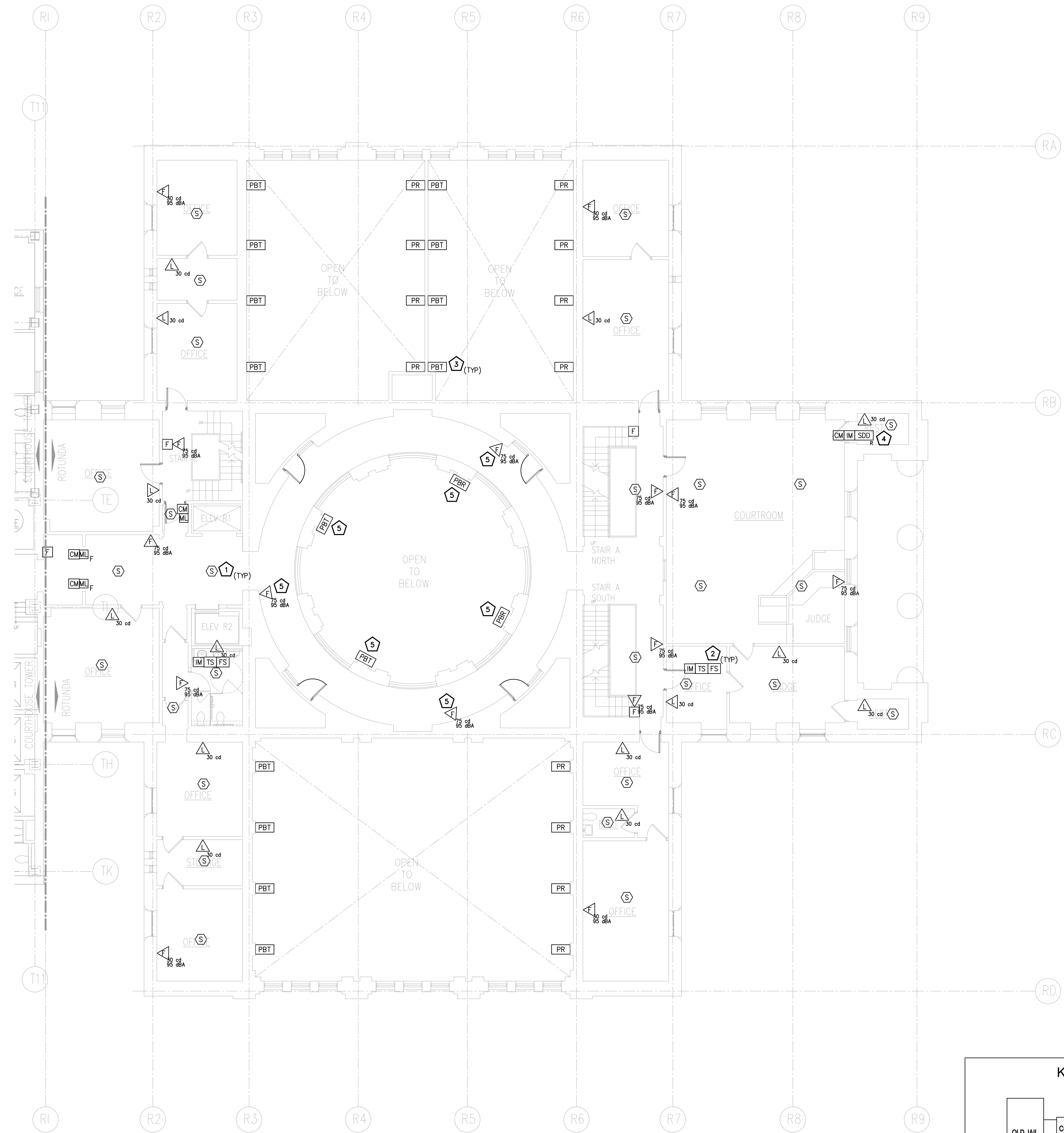
E.502

DRAWING NOTES:

- COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
- COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
- FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
- REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
- PROVIDE ALL FIRE ALARM APPLIANCE ROUGH-IN FACILITIES AS REQUIRED.
- ALL NEW FIRE ALARM APPLIANCES SHALL BE WIRED TO THE EXISTING FIRE ALARM SYSTEM, PROGRAMMED AND COMMISSIONED AS REQUIRED.
- ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
- ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
- REFER TO ELECTRICAL DETAILS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
- REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
- REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
- REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.
- REFER TO DRAWING E.600 FOR FIRE ALARM RISER DIAGRAM.

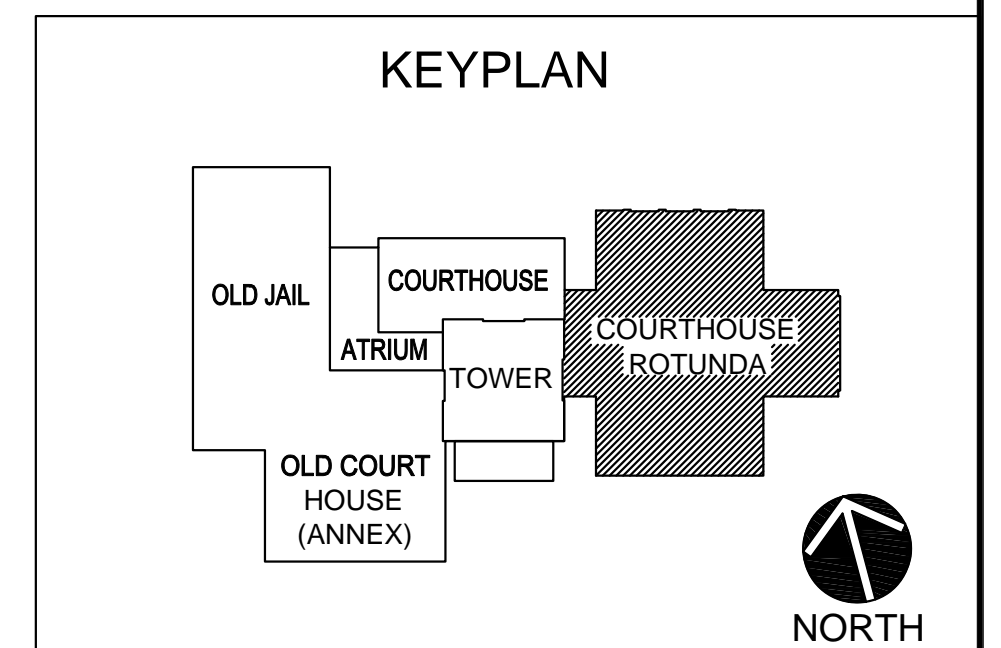
KEYED WORK NOTES:

- NEW FIRE ALARM DEVICE AS PART OF NEW BUILDING WIDE SYSTEM. INTEGRATE AS INDICATED ON RISER DIAGRAM AND NOTES.
- NEW SPRINKLER SYSTEM INTERFACE AND RELAY MODULES. COORDINATE FINAL LOCATIONS AND QUANTITIES WITH SPRINKLER CONTRACTOR.
- NEW BEAM TYPE SMOKE DETECTORS WITH TRANSMITTER/RECEIVER UNITS. COORDINATE FINAL PLACEMENT, QUANTITY OF DEVICES, AND SPACING BETWEEN UNITS WITH MANUFACTURER'S RECOMMENDATIONS AND FIELD CONDITIONS.
- NEW DUCT SMOKE DETECTOR(S) PROVIDED BY THE FIRE ALARM CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR. WIRE THE NEW DUCT SMOKE DETECTOR EQUIPMENT AS REQUIRED.
- PRIOR TO COMMENCING ANY INSTALLATION WORK INSIDE THE COURTHOUSE ROTUNDA, OBTAIN APPROVAL FROM THE ARCHITECT AND OWNER OF THE PROPOSED CONDUIT ROUTING AND DEVICE INSTALLATION AND ENSURE COMPLIANCE WITH THE REGISTERED NJ HISTORIC PRESERVATION OFFICE FOR THE SPACE.



THIRD FLOOR – FIRE ALARM PLAN

SCALE: 1/8"=1'-0"



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NJ License No. AI 12541
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NJ License No. AI 12118
MARK E. BESS, AIA, NCARB
NJ License No. AI 16160
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**ELECTRICAL - FIRE ALARM PLAN
THIRD FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY NJN
									JOB NO 2141152
									SHEET: _ OF:
									DWG. NO

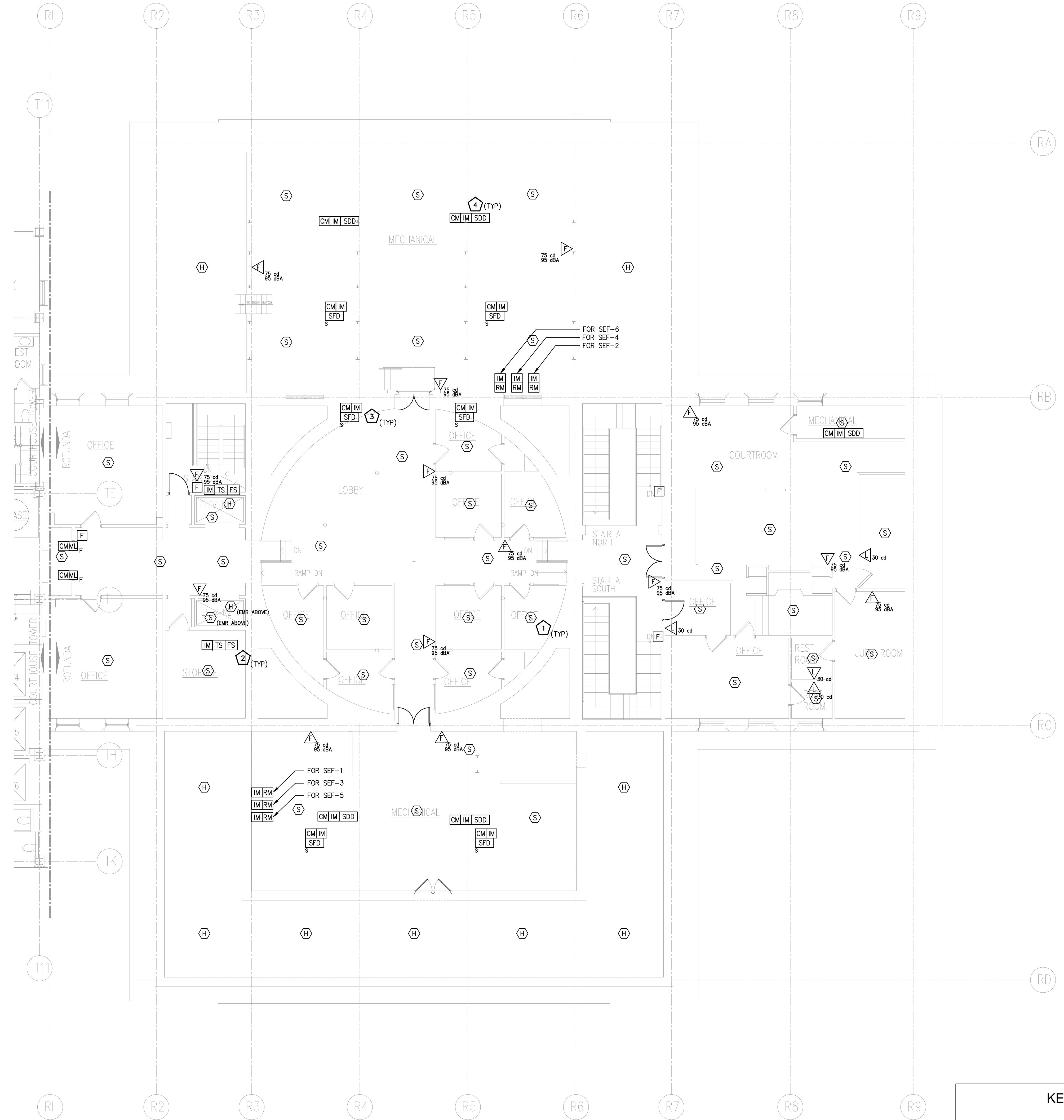
E.503

DRAWING NOTES:

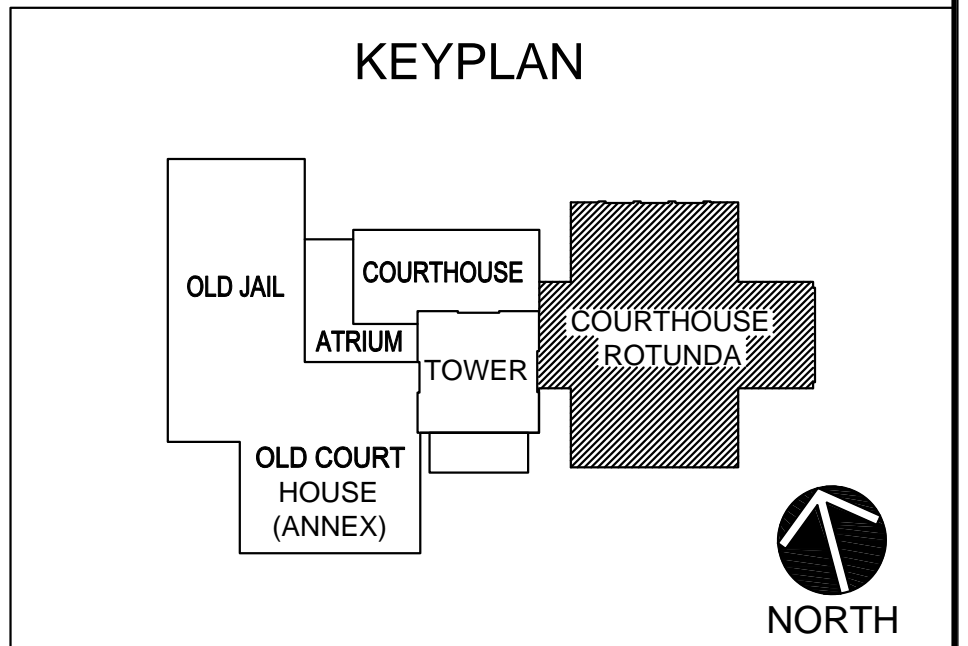
- COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
- COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
- FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
- REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
- PROVIDE ALL FIRE ALARM APPLIANCE ROUGH-IN FACILITIES AS REQUIRED.
- ALL NEW FIRE ALARM APPLIANCES SHALL BE WIRED TO THE EXISTING FIRE ALARM SYSTEM, PROGRAMMED AND COMMISSIONED AS REQUIRED.
- ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
- ALL WIRING AND EQUIPMENT WITHIN DROP CEILING SPACES, AND/OR WITHIN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES SHALL BE LISTED FOR PLENUM USE, AND SHALL CONFORM WITH NEC 300.22.
- REFER TO ELECTRICAL DETAILS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
- REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
- REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.
- REFER TO DRAWING E.103 FOR ELECTRICAL ABBREVIATIONS.
- REFER TO DRAWING E.600 FOR FIRE ALARM RISER DIAGRAM.

KEYED WORK NOTES:

- NEW FIRE ALARM DEVICE AS PART OF NEW BUILDING WIDE SYSTEM. INTEGRATE AS INDICATED ON RISER DIAGRAM AND NOTES.
- NEW SPRINKLER SYSTEM INTERFACE AND RELAY MODULES. COORDINATE FINAL LOCATIONS AND QUANTITIES WITH SPRINKLER CONTRACTOR.
- NEW SMOKE DAMPER SYSTEM INTERFACE AND RELAY MODULES. COORDINATE FINAL LOCATIONS AND QUANTITIES WITH HVAC CONTRACTOR.
- NEW DUCT SMOKE DETECTOR(S) PROVIDED BY THE FIRE ALARM CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR. WIRE THE NEW DUCT SMOKE DETECTOR EQUIPMENT AS REQUIRED.



FOURTH FLOOR - FIRE ALARM PLAN
SCALE: 1/8"=1'-0"



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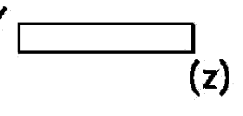
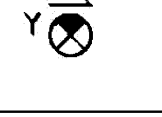


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL - FIRE ALARM PLAN
FOURTH FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

E.504

LUMINAIRE SCHEDULE											
TYPE	SYMBOL	DESCRIPTION	LAMPING	BALLAST	MOUNTING	MANUFACTURER	MODEL	VOLTS	MAX INPUT WATTS	KEY NOTES	REMARKS
A	 (z)	2x4 RECESSED TROFFER, #12 PATTERN ACRYLIC, 0.125" THICK LENS, LONG-LIFE LEDS 90% LED LUMEN MAINTENANCE AT 60,000 HOURS, 3500K, 4000 LUMENS, ELDOLED 0-10VOLT DIMMING DRIVER, 22 GAUGE COLD-ROLLED STEEL HOUSING.	LED-3500K	LED 0-10V DIMMING DRIVER	RECESSED/CLG GRD	LITHONIA	20TL-4-40L-EZ-1-UP35	277	39	1,2,3,4,5	"Y" DENOTES FIXTURE CALLOUT. "Z" WHEN USED DENOTES CIRCUIT SWITCHING DESIGNATION. VERIFY GRID TYPE WITH ARCHITECTURAL PLANS.
J	 (z)	4" LONG STEM PENDANT AND SURFACE MOUNTED, LOW-PROFILE CURVED-BASKET LED WARM-WHITE FIXTURE, 100% ACRYLIC PRISM TO DIFFUSER, LONG-LIFE LEDS 90% LED LUMEN MAINTENANCE AT 60,000 HOURS, 3500K, 4800 LUMENS, ELDOLED 0-10VOLT DIMMING DRIVER, DIE FORMED FROM COLD-GAUGE STEEL, NARROW HOUSING.	LED-3500K	LED 0-10V DIMMING DRIVER	PENDANT / SURFACE	LITHONIA	LBL4-4800LM-80CR-35K-NODIM-MVOLT	277	41	1,2,4,5	"Y" DENOTES FIXTURE CALLOUT. "Z" WHEN USED DENOTES CIRCUIT SWITCHING DESIGNATION.
X		EDGE-LIT EXIT, RED 6" LETTERING ON CLEAR BACKGROUND, AUTO TEST, SELF-DIAGNOSTICS, UL924, NFPA 101, NYC APPROVED WHERE APPLICABLE, NUMBER OF FACES AND DIRECTIONAL ARROWS AS INDICATED ON THE DRAWINGS. WALL/SURFACE MOUNTED PER DRAWINGS AND FINAL CONDITIONS, WHITE HOUSING.	LED PER MANUFACTURER	90 MIN SEALED NICKEL CADMIUM BATTERY	RECESSED/CEILING GRID AND GYP. BD. VERIFY IN FIELD.	LITHONIA	EDGR-X-R/RMR-EL	277	5	1,2,3,4,5	"Y" DENOTES FIXTURE CALLOUT. VERIFY GRID TYPE WITH ARCHITECTURAL PLANS.
Y		EMERGENCY WALL MOUNTED LED LIGHT UNIT, INTEGRATED TEST SWITCH, SELF-DIAGNOSTICS, UL924, NFPA 101, IMPACT RESISTANT THERMOPLASTIC AND UL94-0 FLAME RATED, FULLY ADJUSTABLE STYLE HEADS, 90 MINUTE MINIMUM BATTERY EMERGENCY ILLUMINATION.	(2) 1.5W LED	90 MIN SEALED NICKEL CADMIUM BATTERY	RECESSED/CEILING GRID AND GYP. BD. VERIFY IN FIELD.	LITHONIA	ELMG-LED-SD	277	1	1,2,3,4,5	"Y" DENOTES FIXTURE CALLOUT.
Y1		EXTERIOR NEMA 4X WALL MOUNTED LED LIGHT UNIT, TEST SWITCH, SELF-DIAGNOSTICS, IP66, UL924, NFPA 101, 90 MINUTE MINIMUM BATTERY EMERGENCY ILLUMINATION, RUGGED HEAVY-DUTY, POLYCARBONATE CLEAR HOUSING LENS AND POLYCARBONATE SEALED GASKETED AND CORROSION RESISTANT HOUSING.	(2) 5W LED	90 MIN SEALED LEAD ACID BATTERY	SURFACE/WALL	LITHONIA	INDXB18-UP05VS-SEL	277	19	1,2,4,5	"Y" DENOTES FIXTURE CALLOUT.
GENERAL SCHEDULE NOTES:				SCHEDULE KEY NOTES:							
<ol style="list-style-type: none"> THE ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ALL NEW LIGHTING FIXTURES AND LAMPS AS REQUIRED. "NL" WHEN SHOWN ON THE PLANS DENOTES 24HR, 7DAY/7NIGHT LIGHT OPERATION AS REQUIRED. REFER TO ELECTRICAL DETAILS FOR FURTHER REQUIREMENTS. ALL EMERGENCY LIGHTING SHALL SERVE MULTI-LAMPS/LEDS, AND SHALL COMPLY WITH NEC 700.16. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL SUBMIT ALL LIGHTING FIXTURES TO THE ARCHITECT FOR APPROVAL OF OVERALL LIGHTING DESIGN AND FIXTURE FINISHES. UPON RECEIVING LIGHTING FIXTURE APPROVALS FROM THE ARCHITECT, THE CONTRACTOR SHALL SUBMIT THE LIGHTING FIXTURE SUBMITTALS TO THE ENGINEER FOR REVIEW AND APPROVAL. CONFIRM ALL FIXTURE LOCATIONS, MOUNTING HEIGHTS, AND ANY LAYOUT/COORDINATION SHOP DRAWING REQUIREMENTS WITH ARCHITECTURAL DRAWINGS. ALL LUMINAIRES, LUMINAIRE COMPONENTS, AND APPURTENANCES SHALL BE SUPPLIED AND INSTALLED PER MANUFACTURERS INSTRUCTIONS. RECESSED, LAY IN FIXTURES WHERE APPLICABLE SHALL BE COMPATIBLE WITH THE HUNG CEILING SYSTEM. PRIOR TO COMMENCEMENT OF WORK, COORDINATE HUNG CEILING SYSTEM TYPES WITH THE GENERAL TRADES CONTRACTOR. ALL FLUORESCENT LUMINAIRES THAT UTILIZE DOUBLE ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE SHALL BE SUPPLIED AND/OR INSTALLED WITH A DISCONNECTING MEANS PER NEC 410.130 (5). 				<ol style="list-style-type: none"> PRIOR TO ORDERING FIXTURES, CONTRACTOR SHALL CONFIRM CEILING TYPE AND FINAL MOUNTING METHOD(S), WITH ARCHITECTURAL DRAWINGS. PRIOR TO ORDERING FIXTURES, CONTRACTOR SHALL VERIFY ALL CEILING TYPES, CEILING GRID SIZES AND CHARACTERISTICS (WHERE APPLICABLE), AND INSTALLATION METHODS WITH THE GENERAL TRADES CONTRACTOR. FINAL FIXTURE MAKE, MODEL AND LAMPING AS APPROVED BY THE ARCHITECT. PRIOR TO INSTALLATION, CONTRACTOR SHALL FIELD-COORDINATE FINAL MOUNTING CONDITIONS, ANCHORING LOCATIONS, AND ANCHORING METHOD(S). COORDINATE FIXTURE SELECTION WITH OWNER, CIVIL ENGINEER, AND ARCHITECT AS REQUIRED. WHERE APPLICABLE, REFER TO THE CIVIL SITE PLAN DRAWINGS FOR FINAL SITE LIGHTING REQUIREMENTS INCLUDING MOUNTING AND INSTALLATION CONDITIONS, MOUNTING HEIGHTS, AND FIXTURE SELECTION. DRAWING REQUIREMENTS SHALL GOVERN. 							

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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



ASSOCIATED TECHNOLOGY, INC.
MEMBER OF THE NETTA ARCHITECTS GROUP
1000 ROUTE 22 WEST, MOUNTAINVIEW, NJ 07092
TEL: 973-378-0088 FAX: 973-378-1061
WWW.NETTAARCHITECTS.COM

JOSEPH J. HENDERSON, PE
NJ License No. 364087



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1004 ROUTE 22 WEST, MOUNTAINVIEW, NEW JERSEY 07092
TEL: 973-378-0088 FAX: 973-378-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

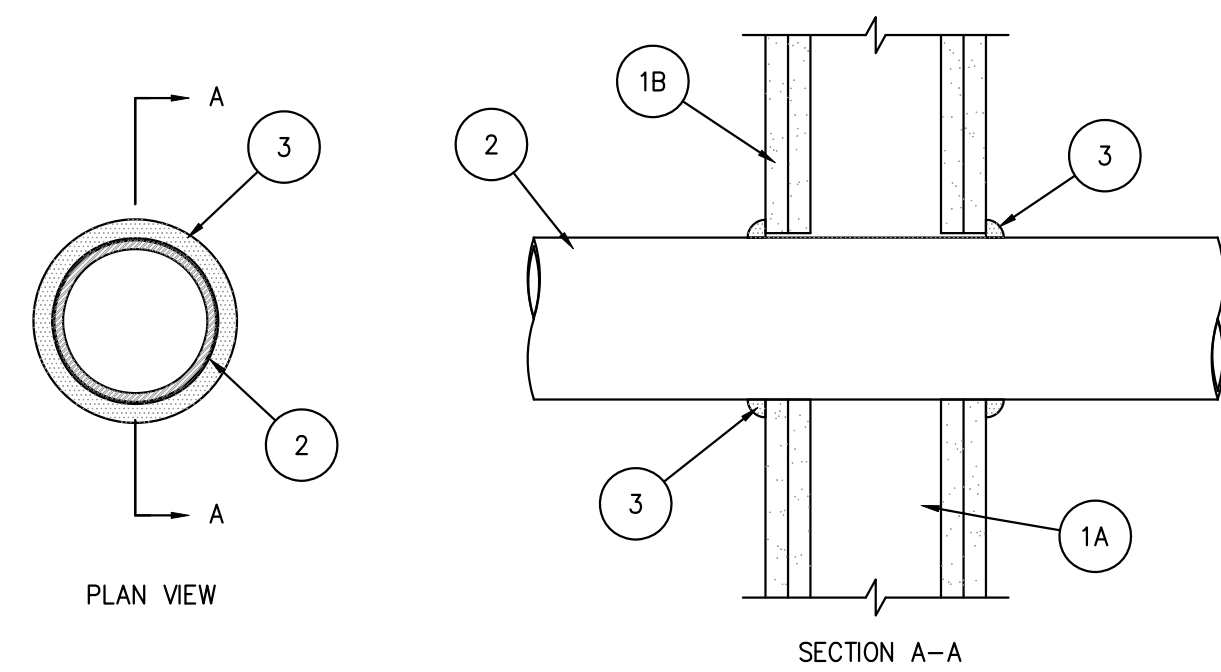
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**ELECTRICAL
EQUIPMENT SCHEDULES**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NUN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	E.701

SPECIFIED TECHNOLOGIES INC.
SYSTEM NO. W-L-1344
F RATINGS - 1 AND 2 HR (SEE ITEM 1)
T RATING - 1/4 HR
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
L RATING AT 400°F - LESS THAN 1 CFM/SQ FT

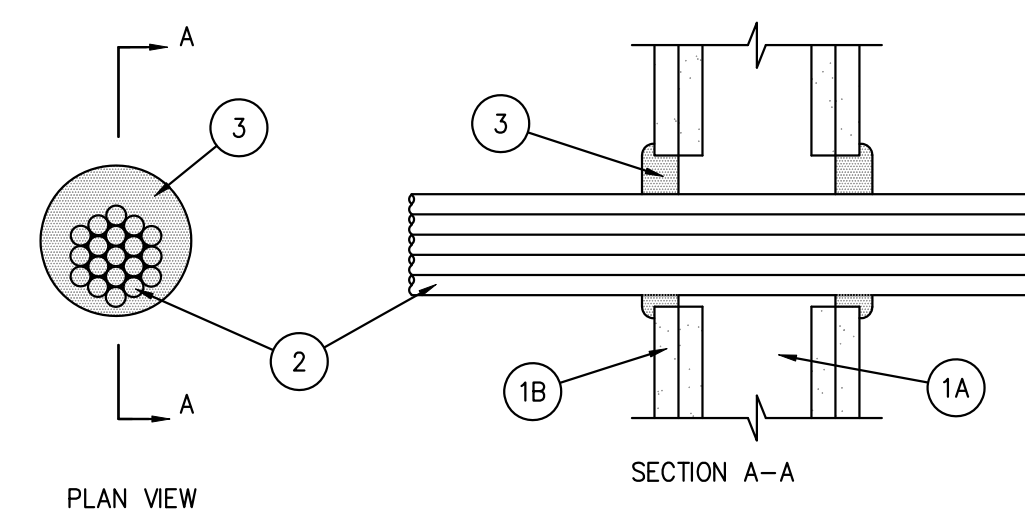


DETAIL NOTES:

- WALL ASSEMBLY - THE 1 OR 2 HR FIRE RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
 - STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2x4 (51x102 MM) LUMBER SPACED MAX 16" (406 MM) OC. STEEL STUDS TO BE MIN 3-1/2" (89 MM) WIDE AND SPACED MAX 24" (610 MM) OC.
 - GYPSUM BOARD* - THICKNESS, TYPE, NUMBER OF LAYER AND FASTENERS AS REQUIRED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIA. OF OPENING IS 5" (127 MM). THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE ASSEMBLY IN WHICH IT IS INSTALLED.
- THROUGH PENETRANTS - ONE METALLIC PIPE, CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MIN OF 0" (0 MM POINT CONTACT) TO MAX 1/8" (3.2 MM). PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDERS OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
 - COPPER TUBING - NOM 4" (102 MM) DIA. (OR SMALLER) TYPE M (OR HEAVIER) COPPER TUBING.
 - COPPER PIPE - NOM 4" (102 MM) DIA. (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
 - STEEL PIPE - NOM 4" (102 MM) DIA. (OR SMALLER) SCHEDULE 5 (OR HEAVIER) STEEL PIPE.
 - CONDUIT - NOM 4" (102 MM) DIA. (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR RIGID STEEL CONDUIT.
 - IRON PIPE - NOM 4" (102 MM) DIA. (OR SMALLER) CAST OR DUCTILE IRON PIPE.
- FILL VOID OR CAVITY MATERIALS* - SEALANT OR PUTTY - MIN 1/2" (13 MM) DIAMETER BEAD OF SEALANT OR PUTTY APPLIED CONTINUOUSLY AROUND THE PENETRANT ON THE WALL SURFACES ON BOTH SIDERS OF THE WALL.

TYPICAL DETAIL
FIRESTOPPING - CONDUIT THROUGH GYPSUM WALL
SCALE: NONE

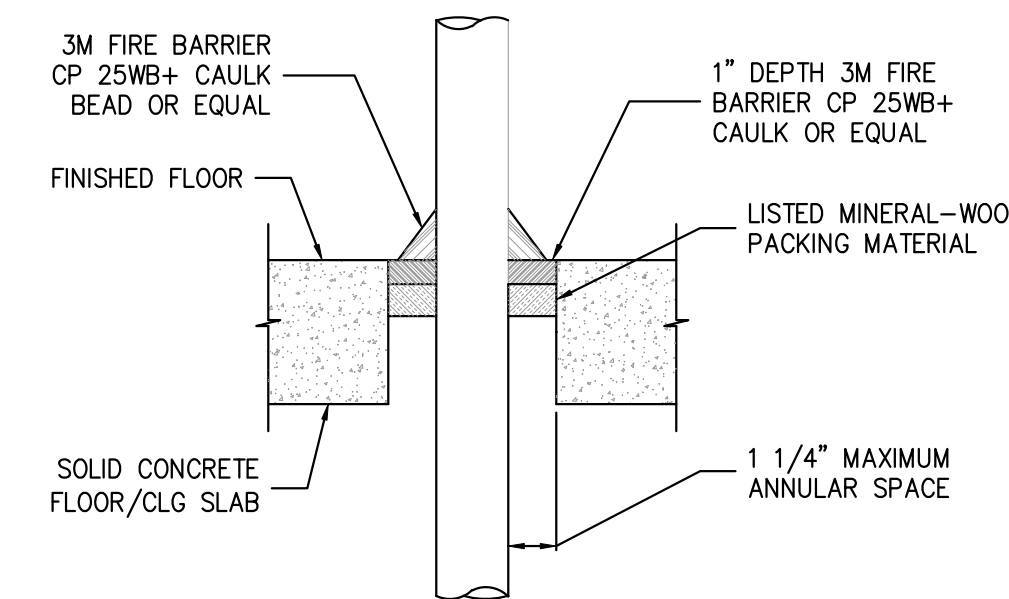
SPECIFIED TECHNOLOGIES INC.
SYSTEM NO. W-L-3135
F RATINGS - 1 AND 2 HR (SEE ITEM 1)
T RATING - 0 HR



DETAIL NOTES:

- WALL ASSEMBLY - THE 1 OR 2 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
 - STUDS - WALL FRAMING SHALL CONSIST OF EITHER WOOD STUDS OF STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2x4 LUMBER SPACED 16" OC. STEEL STUDS TO BE MIN 3-5/8" WIDE AND SPACED 24" OC.
 - GYPSUM BOARD* - 5/8" THICK, 4" WIDE WITH SQUARE OR TAPPED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIA. OF OPENING IS 4". THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.
- CABLES - AGGREGATE CROSS-SECTIONAL AREA OF CABLES TO BE MAX 47 PERCENT OF THE CROSS-SECTIONAL AREA OF THE OPENING. CABLES TO BE TIGHTLY BUNDLED. THE ANNULAR SPACE WITHIN THE FIRESTOP SYSTEM SHALL BE MIN 1/4" TO MAX 3/4" CABLES TO BE RIGIDLY SUPPORTED ON BOTH SIDERS OF THE WALL. ANY COMBINATION OF THE FOLLOWING TYPES AND SIZES OF CABLES MAY BE USED:
 - MAX 200 PAIR NO. 24 AWG (OR SMALLER) COPPER CONDUCTOR CABLE WITH POLYVINYL CHLORIDE (PVC) JACKETING AND INSULATION AND JACKET.
 - MAX 3/C NO. 2/0 AWG (OR SMALLER) ALUMINUM OR COPPER CONDUCTOR SERVICES ENTRANCE CABLE WITH PVC INSULATION AND JACKET.
 - MAX 3/C NO. 8 AWG (OR SMALLER) NONMETALLIC SHEATHED (ROMEX) CABLE WITH COPPER CONDUCTORS, PVC INSULATION AND JACKET.
 - MAX 7/C NO. 2.0 AWG (OR SMALLER) MULTICONDUCTOR POWER AND CONTROL CABLES WITH XLPE OR PVC INSULATION AND JACKET.
 - MAX RG59/U (OR SMALLER) COAXIAL CABLE WITH FLUORINATED ETHYLENE INSULATION AND JACKETING.
 - MAX 62.5/48 FIBER OPTIC CABLE WITH PVC INSULATION AND JACKETING.
 - MAX 4 PAIR NO. 24 AWG (OR SMALLER) COPPER CONDUCTOR CATEGORY 5 CABLE WITH HALYARD INSULATION AND JACKETING.
- FILL VOID OR CAVITY MATERIALS* - PUTTY - MIN 5/8" THICKNESS OF FILL MATERIAL INSTALLED WITHIN ANNULUS, ADDITIONAL 1/4" THICKNESS OF PUTTY INSTALLED TO FORM A CROWN AROUND THE CIRCUMFERENCE OF THE CABLE BUNDLE ON BOTH SIDERS OF THE WALL. SPECIFIED TECHNOLOGIES INC. - SPECSAL PUTTY BEARING THE UL CLASSIFICATION MARKING.

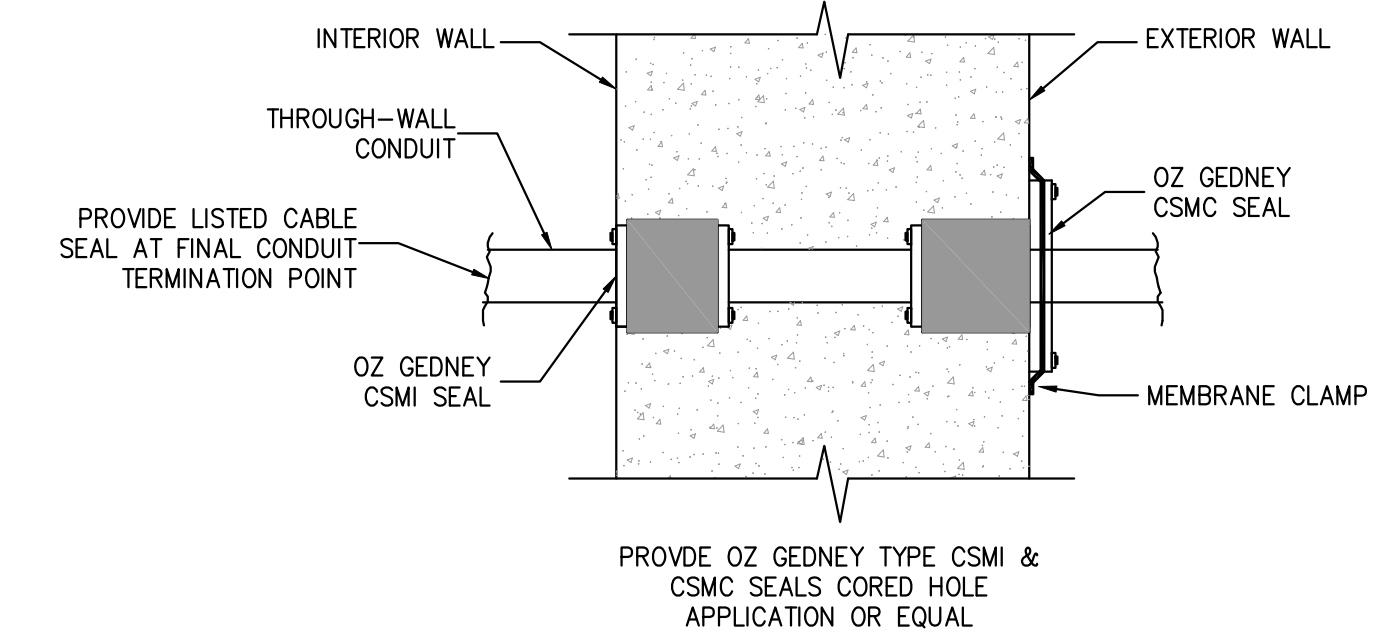
TYPICAL DETAIL
FIRESTOPPING - CABLE(S) THROUGH GYPSUM WALL
SCALE: NONE



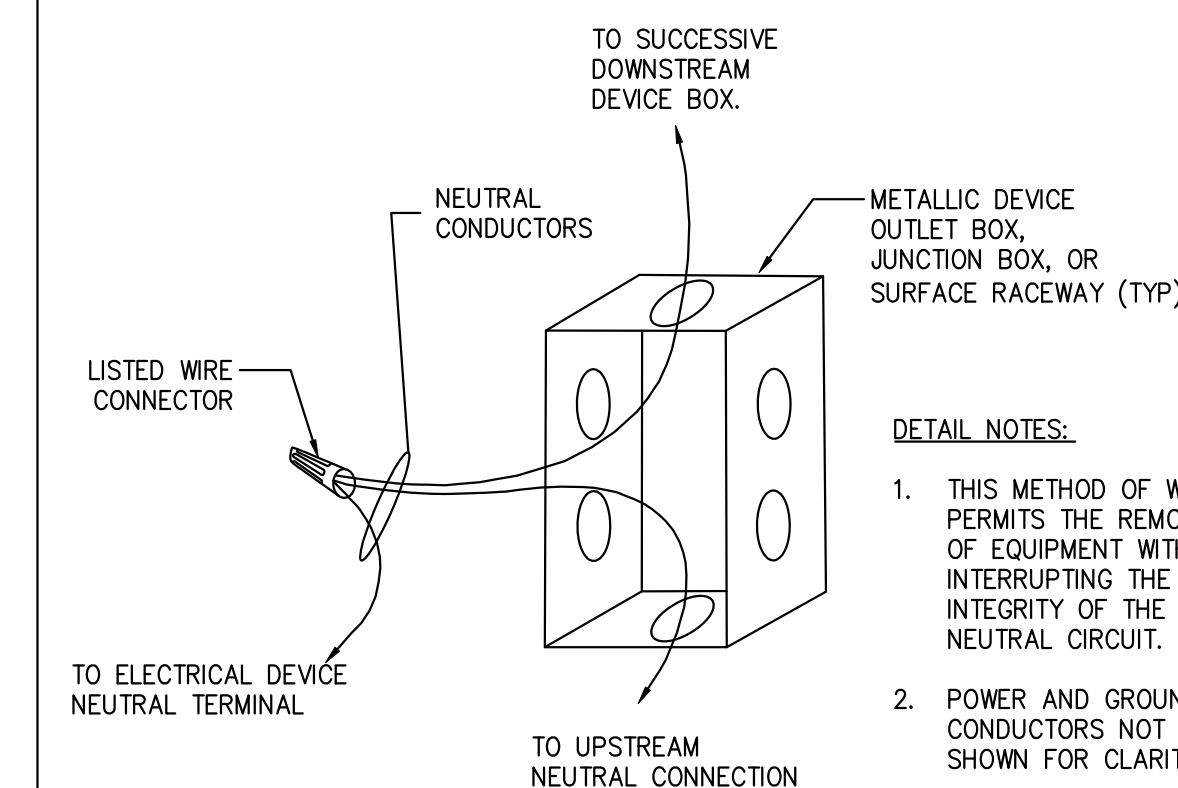
DETAIL NOTES:

- COORDINATE WITH ARCHITECTURAL PLANS TO CONFIRM FINAL FIRE RATINGS REQUIREMENTS. REQUIREMENTS SHOWN ON ARCHITECTURAL PLANS SHALL SUPERSEDE THIS DETAIL.

TYPICAL DETAIL
FIRESTOPPING - CONDUIT THROUGH MASONRY FLR/WALL
SCALE: NONE



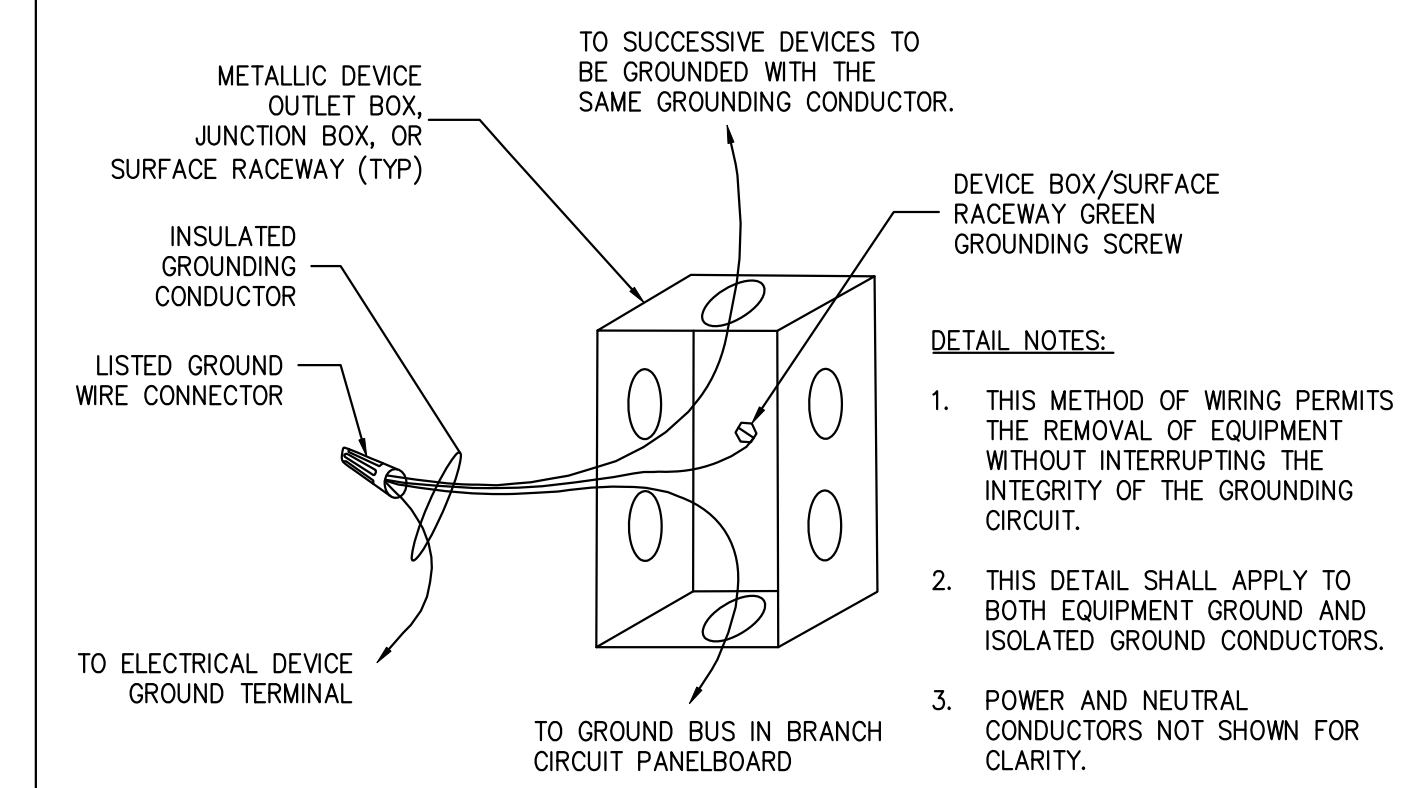
TYPICAL DETAIL
EXTERIOR THROUGH-WALL CONDUIT SEAL
SCALE: NONE



DETAIL NOTES:

- THIS METHOD OF WIRING PERMITS THE REMOVAL OF EQUIPMENT WITHOUT INTERRUPTING THE INTEGRITY OF THE NEUTRAL CIRCUIT.
- POWER AND GROUNDING CONDUCTORS NOT SHOWN FOR CLARITY.

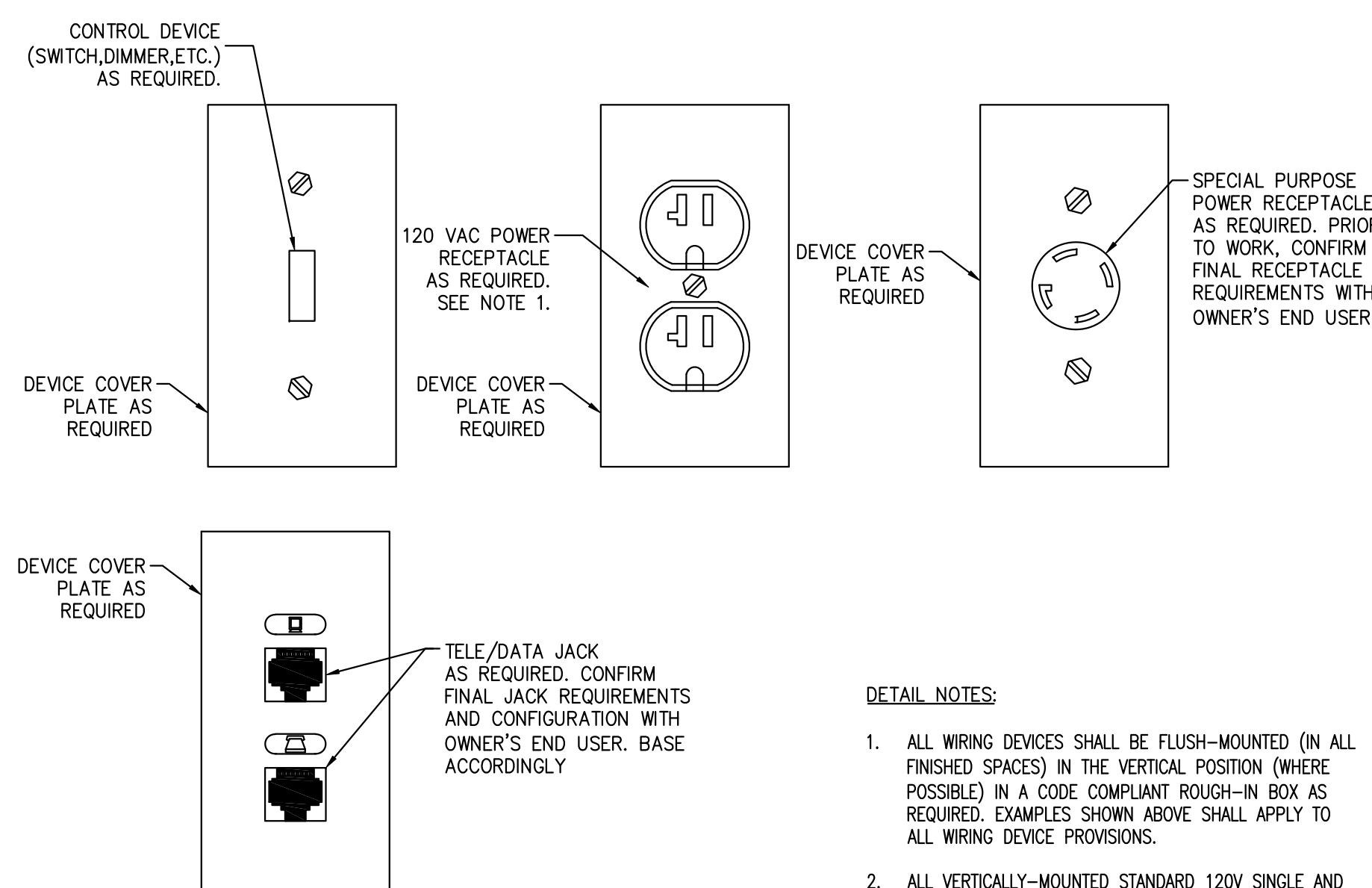
TYPICAL DETAIL
NEUTRAL TERMINATION FOR MULTI-WIRE CIRCUITS
SCALE: NONE



DETAIL NOTES:

- THIS METHOD OF WIRING PERMITS THE REMOVAL OF EQUIPMENT WITHOUT INTERRUPTING THE INTEGRITY OF THE GROUNDING CIRCUIT.
- THIS DETAIL SHALL APPLY TO BOTH EQUIPMENT GROUND AND ISOLATED GROUND CONDUCTORS.
- POWER AND NEUTRAL CONDUCTORS NOT SHOWN FOR CLARITY.

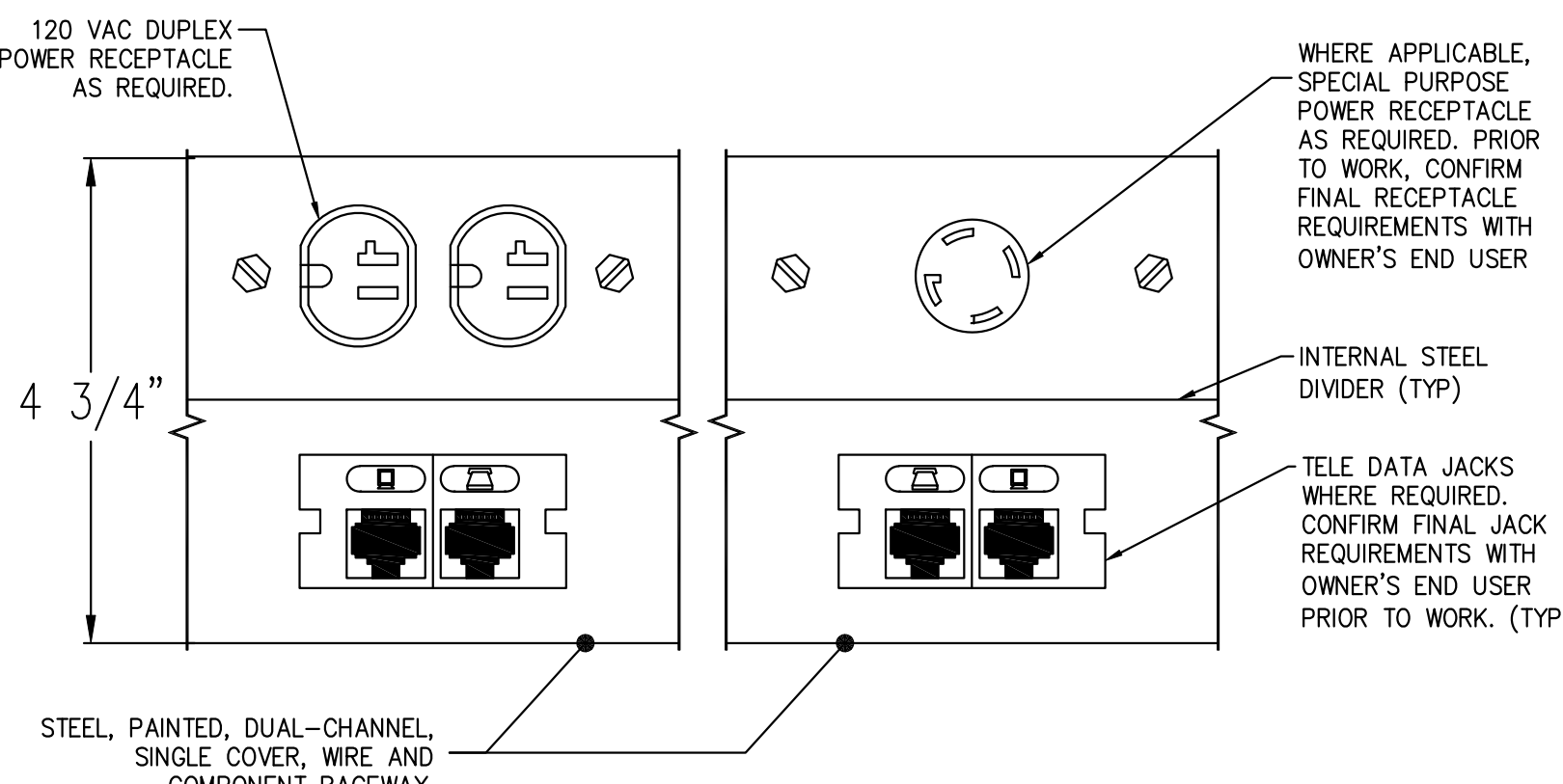
TYPICAL DETAIL
DEVICE GROUNDING CONNECTION
SCALE: NONE



DETAIL NOTES:

- ALL WIRING DEVICES SHALL BE FLUSH-MOUNTED (IN ALL FINISHED SPACES) IN THE VERTICAL POSITION (WHERE POSSIBLE) IN A CODE COMPLIANT ROUGH-IN BOX AS REQUIRED. EXAMPLES SHOWN ABOVE SHALL APPLY TO ALL WIRING DEVICE PROVISIONS.
- ALL VERTICALLY-MOUNTED STANDARD 120V SINGLE AND DUPLEX POWER RECEPTACLES SHALL BE INSTALLED "GROUND DOWN".
- PROVIDE A DETAILED PRODUCT SHOP DRAWING SUBMITTAL (INCLUDING FINISH OPTIONS FOR ALL COMPONENTS) FOR REVIEW/SELECTION BY THE ENGINEER AND ARCHITECT.

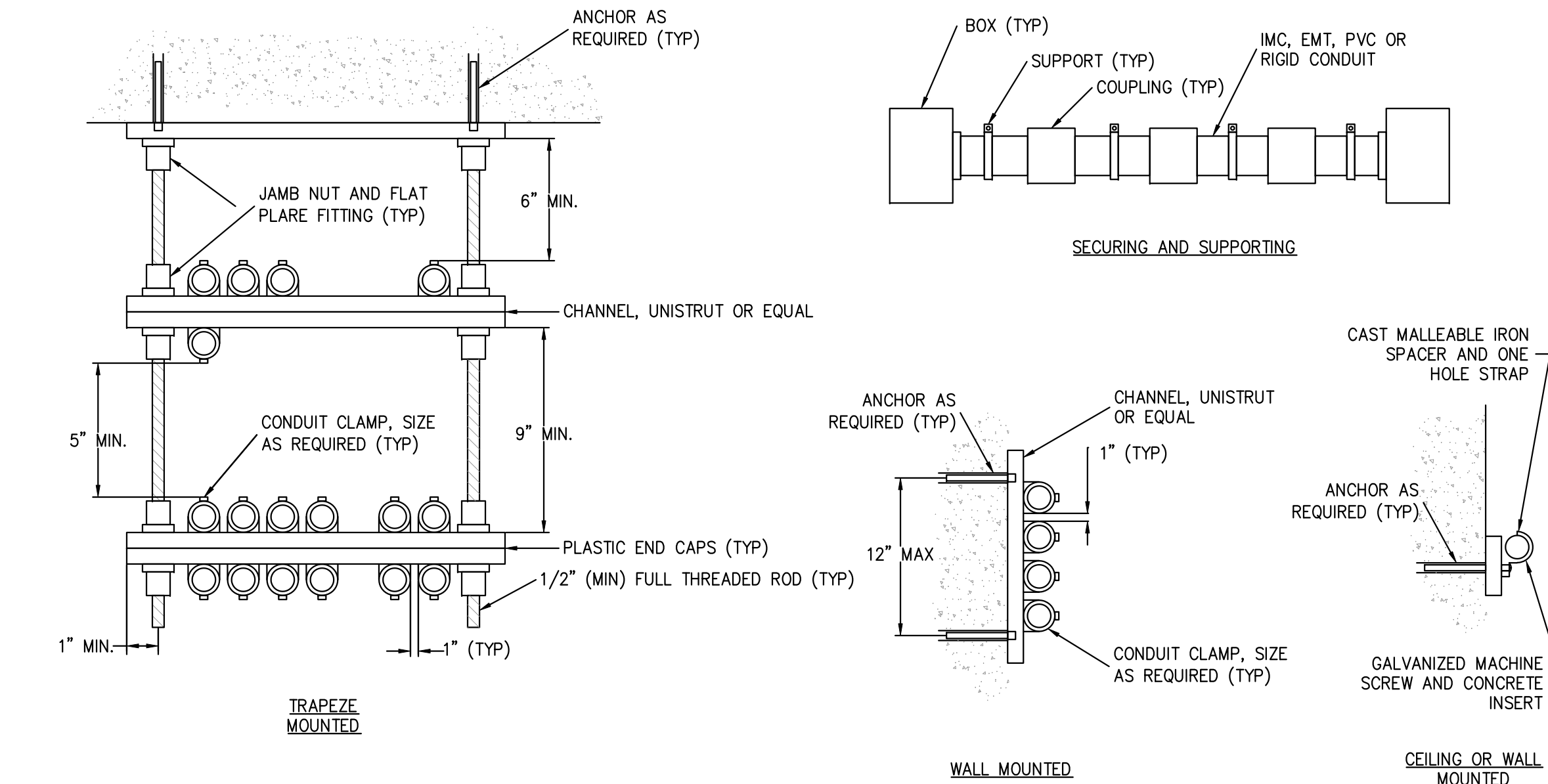
TYPICAL DETAIL
FLUSH-MOUNTED WIRING DEVICES
SCALE: NONE



DETAIL NOTES:

- PROVIDE AND ALL RACEWAY FITTINGS AS REQUIRED. ALL RACEWAY FITTING AND/OR COMPONENT SHALL BE LISTED FOR THE INTENDED USE.
- PROVIDE A DETAILED SURFACE RACEWAY PRODUCT SHOP DRAWING SUBMITTAL (INCLUDING FINISH OPTIONS FOR ALL COMPONENTS) FOR REVIEW/SELECTION BY THE ENGINEER AND ARCHITECT.

TYPICAL DETAIL
ABOVE/BELOW-COUNTER SURFACE RACEWAY
SCALE: NONE



DETAIL NOTES:

- CONDUIT SECURING AND SUPPORTING SHALL BE PER NEC 342-30 (IMC), 344-30 (RMC), 352-30 (RNG) AND/OR 358-30 (EMT). EXPANSION FITTINGS FOR RNC PER NEC 352.44.

TYPICAL DETAIL
CONDUIT MOUNTING AND INSTALLATION
SCALE: NONE

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MARK E. BESS, AIA, NCARB
NJ License No. AI 16160
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



ASSOCIATED TECHNOLOGY INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
200 WEST WASHINGTON ST., SUITE 200
ROSELAND, NJ 07068-2004
TEL: 973.378.0088 FAX: 973.378.1081
WWW.ATINETWORKS.COM
CERTIFICATE OF AUTHORIZATION 240000400

NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.378.0088 FAX: 973.378.1081
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

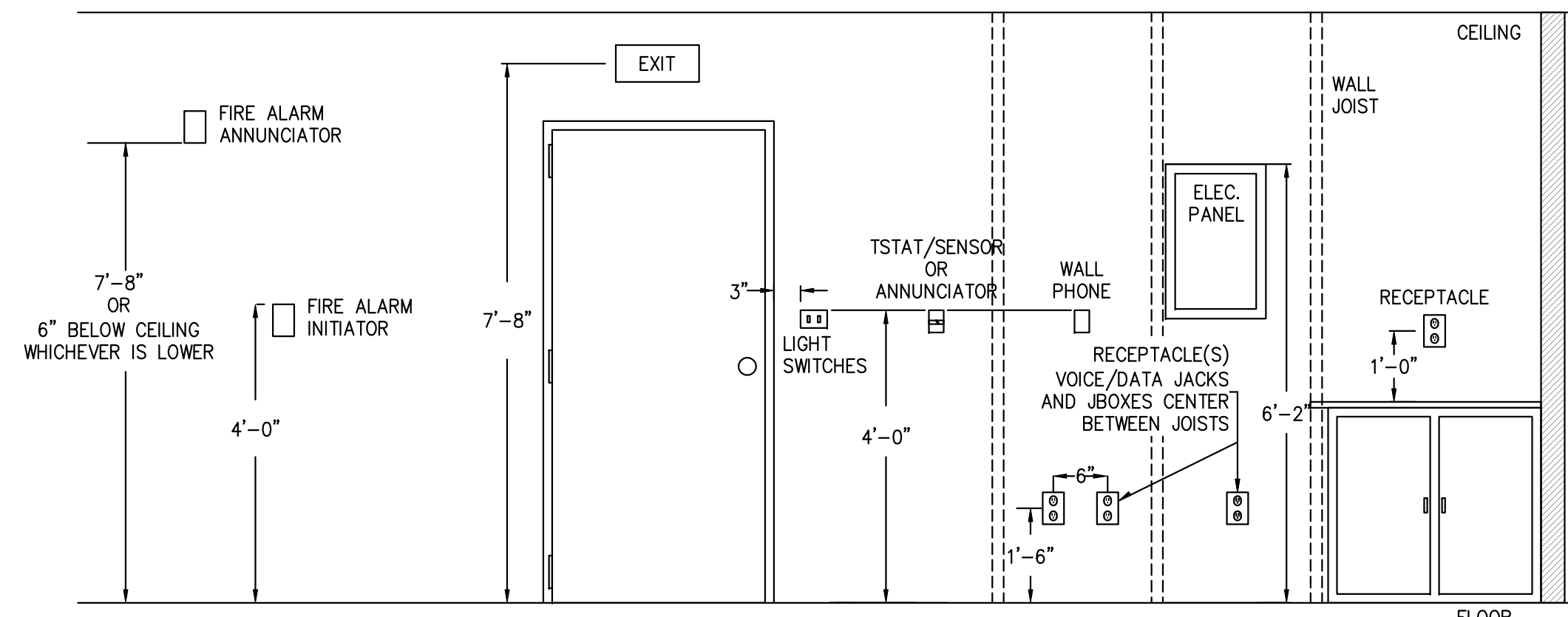
UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL
DETAILS
(SHEET 1)

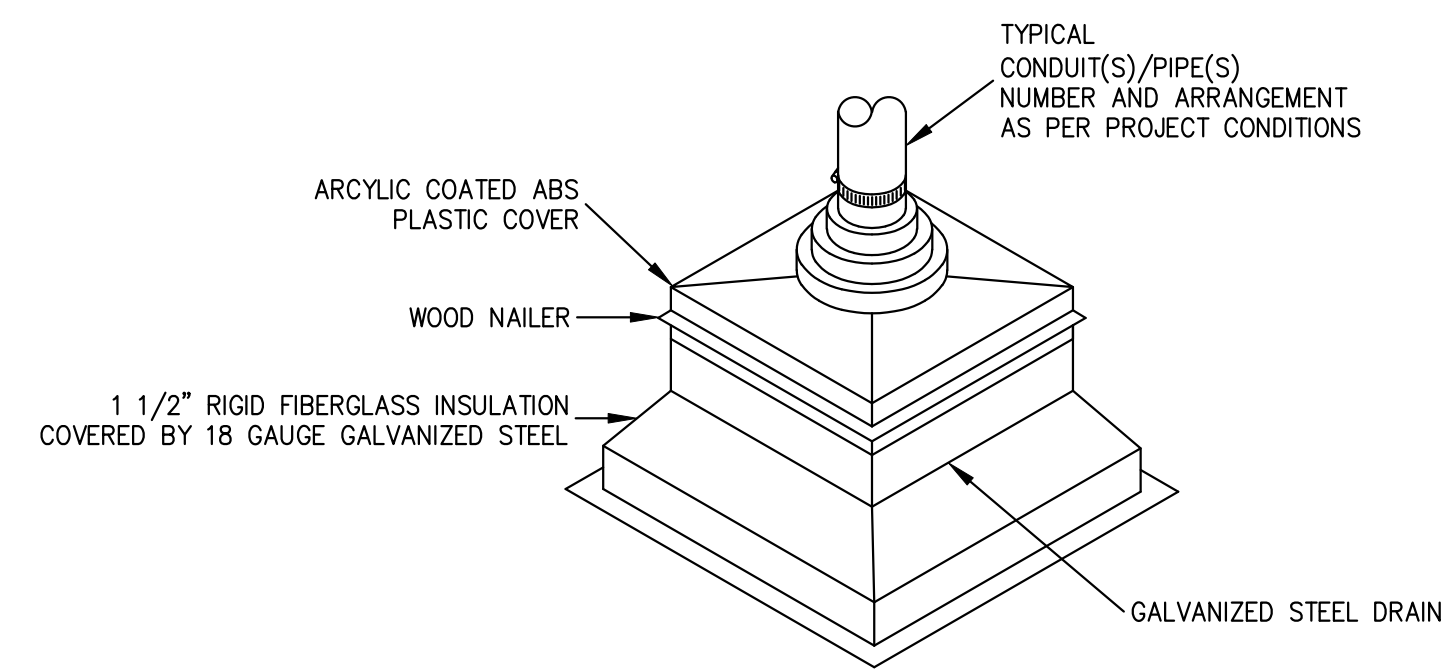
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09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NUN
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								DWG. NO	

E.801



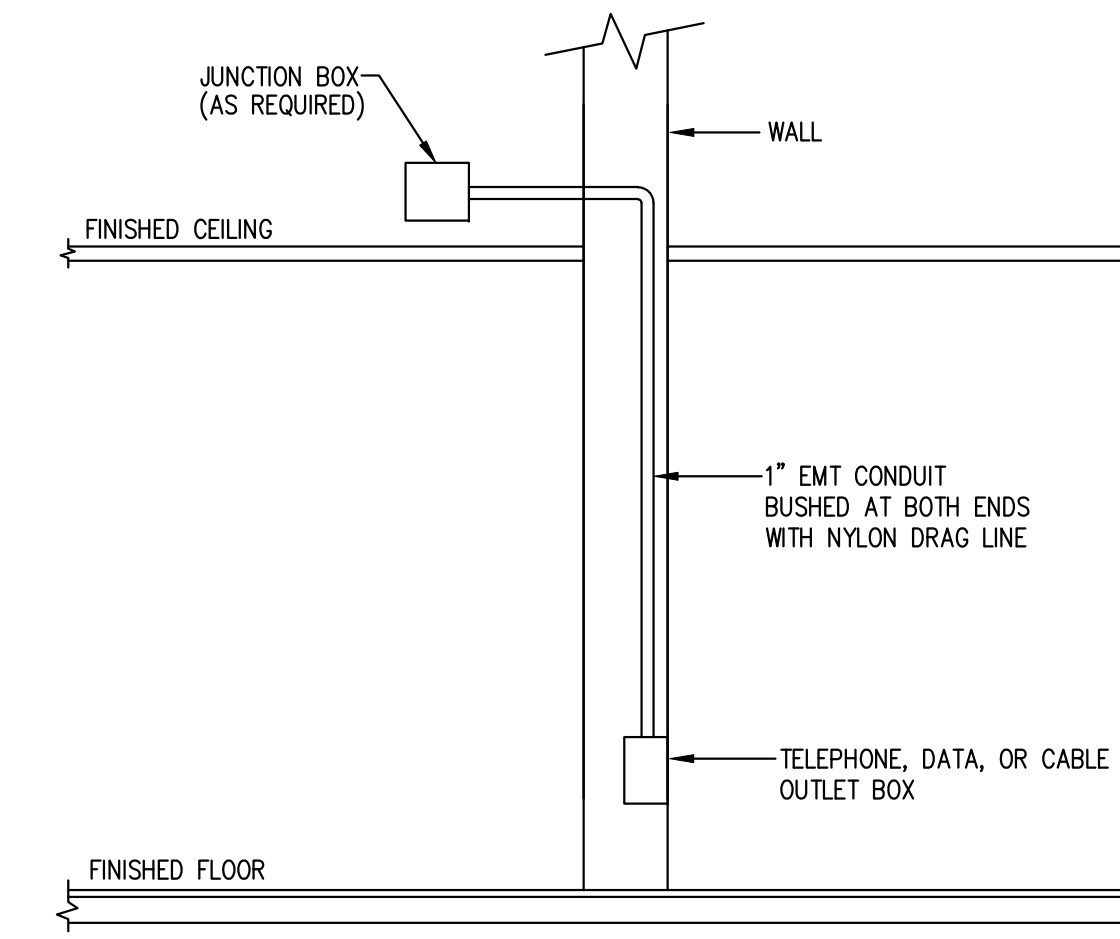
- DETAIL NOTES:**
- COORDINATE ALL LOCATIONS OF ELECTRICAL EQUIPMENT WITH ARCHITECTURAL DRAWINGS.
 - USE THESE DEVICE MOUNTING HEIGHTS UNLESS OTHERWISE INDICATED ON ARCHITECTURAL DRAWINGS.
 - DEVICE HEIGHTS SHOWN FOR INFORMATIONAL PURPOSES ONLY. HEIGHTS APPLY FOR INSTALLED DEVICES AND EQUIPMENT.

**TYPICAL DETAIL
EQUIPMENT MOUNTING HEIGHTS**
SCALE: NONE



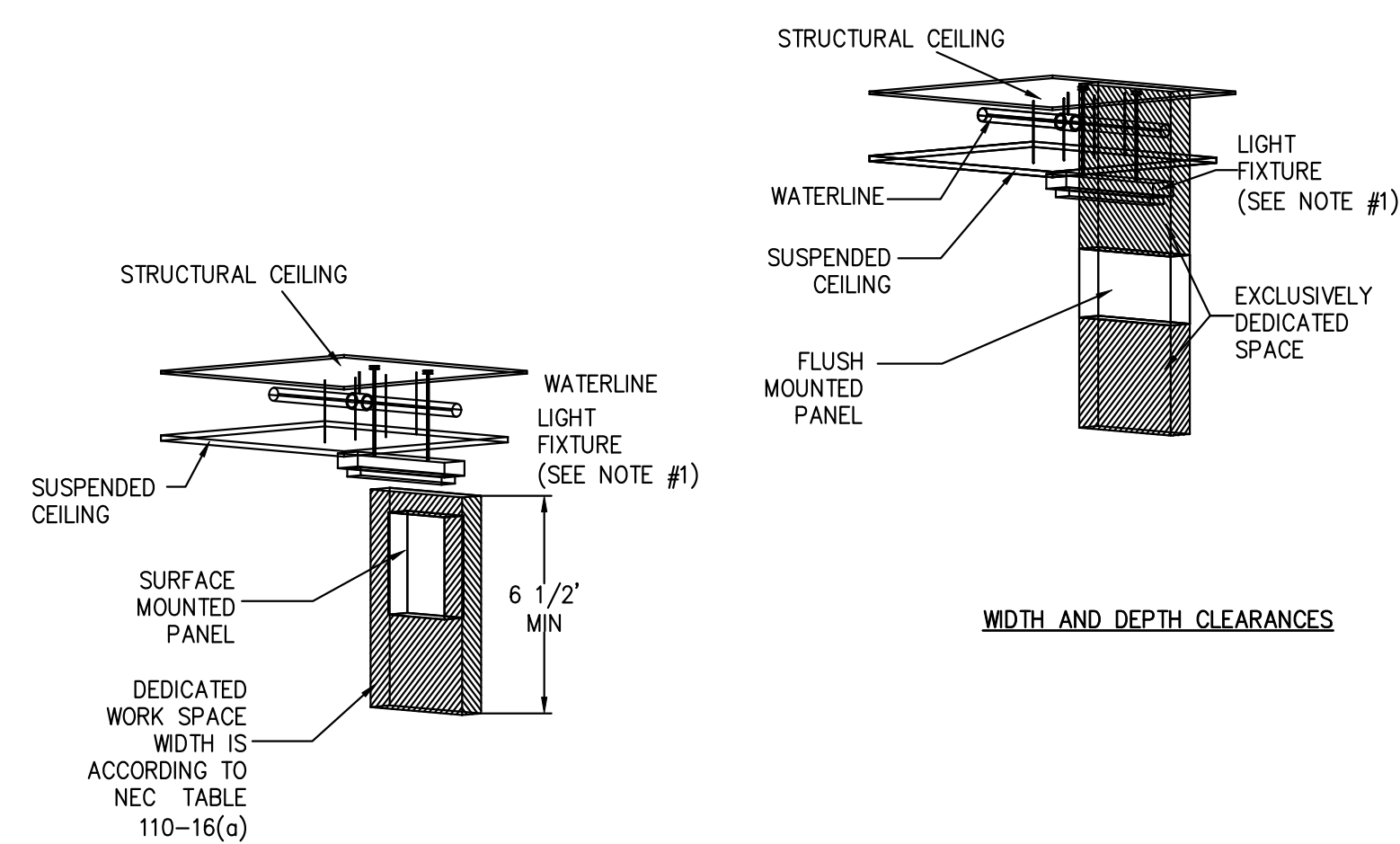
- DETAIL NOTES:**
- CONDUIT PENETRATING THE ROOF SHALL SHARE PENETRATION PORTAL(S) WITH OTHER TRADE EQUIPMENT PORTAL(S) SUPPLIED AND INSTALLED BY OTHERS. PRIOR TO SUBMITTING PROPOSAL, THE CONTRACTOR SHALL COORDINATE THE FINAL DIVISION OF RESPONSIBILITY WITH THE GENERAL TRADES CONTRACTOR.
 - PRIOR TO THE COMMENCEMENT OF WORK, THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE FINAL NUMBER, ARRANGEMENT AND LOCATION OF ALL ROOFTOP CONDUIT AND CONDUIT ROOF PENETRATIONS IN FIELD WITH THE MECHANICAL, PLUMBING AND GENERAL TRADES CONTRACTORS IN ORDER TO ASSURE PROPER PORTAL FACILITIES ARE PROVIDED BY THE RESPONSIBLE TRADE CONTRACTOR(S).

**TYPICAL DETAIL
PIPE PORTAL INSTALLATION**
SCALE: NONE



- DETAIL NOTES:**
- CONTRACTOR SHALL PROVIDE ALL CONDUIT, WIREWAY AND APPURTENANCES AS REQUIRED.
 - CONTRACTOR SHALL ROUGH-IN ALL FLUSH-MOUNTED JUNCTION BOXES AS REQUIRED. COORDINATE FINAL EQUIPMENT LOCATIONS WITH ARCHITECTURAL DRAWINGS, AND FURNITURE EQUIPMENT SHOP DRAWINGS.

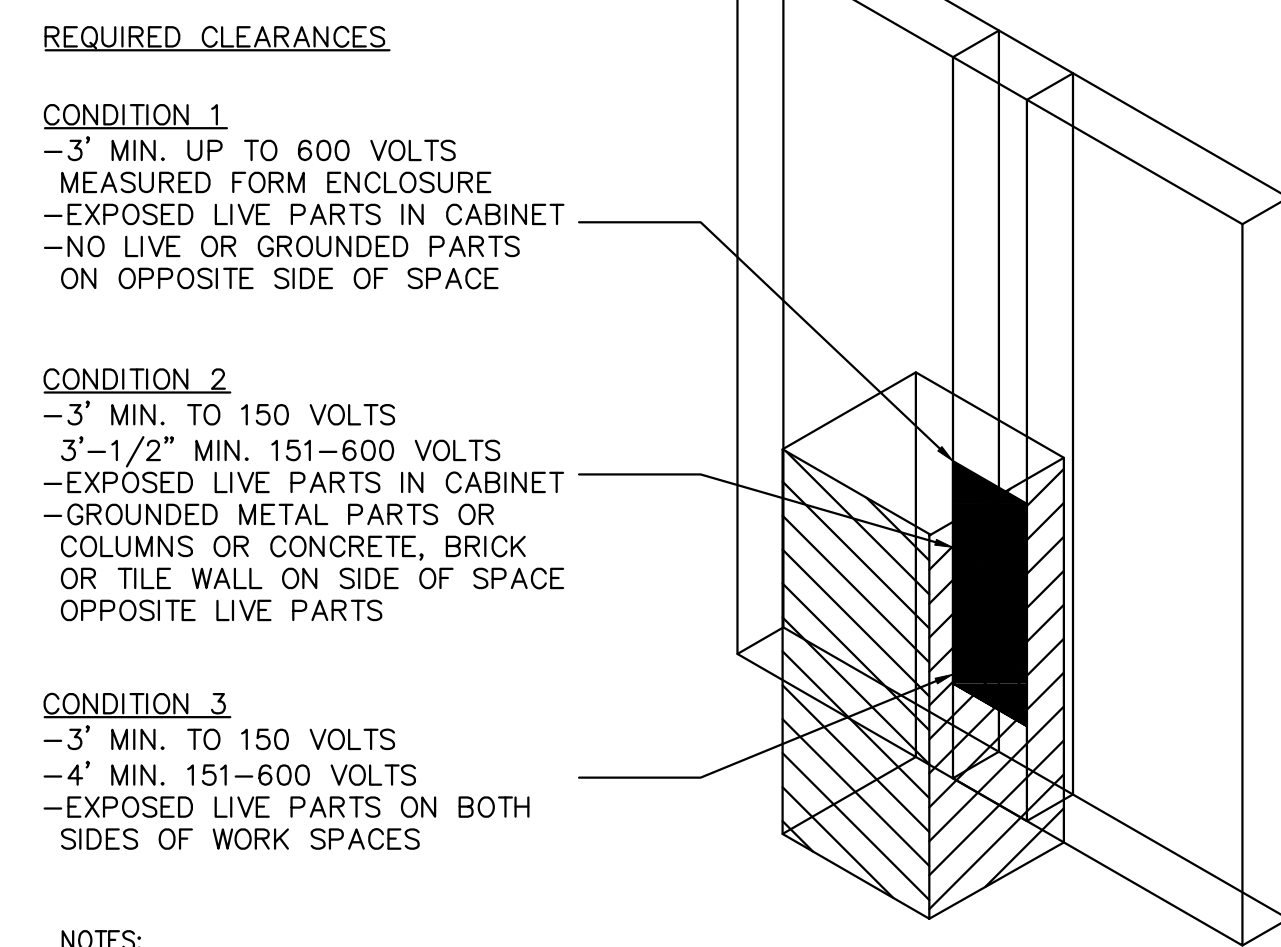
**TYPICAL DETAIL
CONDUIT STUB FOR TELEPHONE/DATA/CABLE SERVICES**
SCALE: NONE



- NOTES:**
- POSITION LIGHT FIXTURE OUT IN FRONT OF PANEL BY AT LEAST 6".

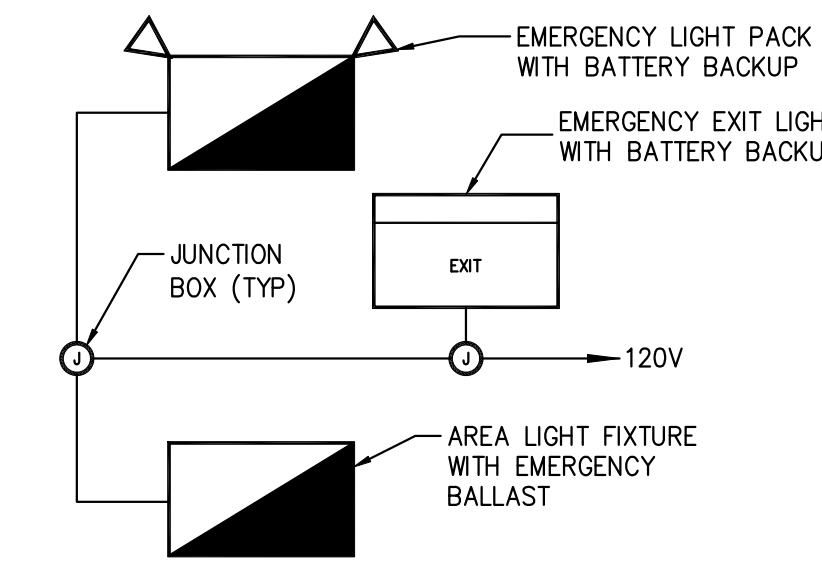
NORMAL VOLTAGE TO GROUND	CONDITIONS		
	1	2	3
0 - 150	3	3	3
151 - 600	3	3 1/2	4

**TYPICAL DETAIL
DEDICATED AND WORKING
CLEARANCE FOR PANELBOARDS**
SCALE: NONE



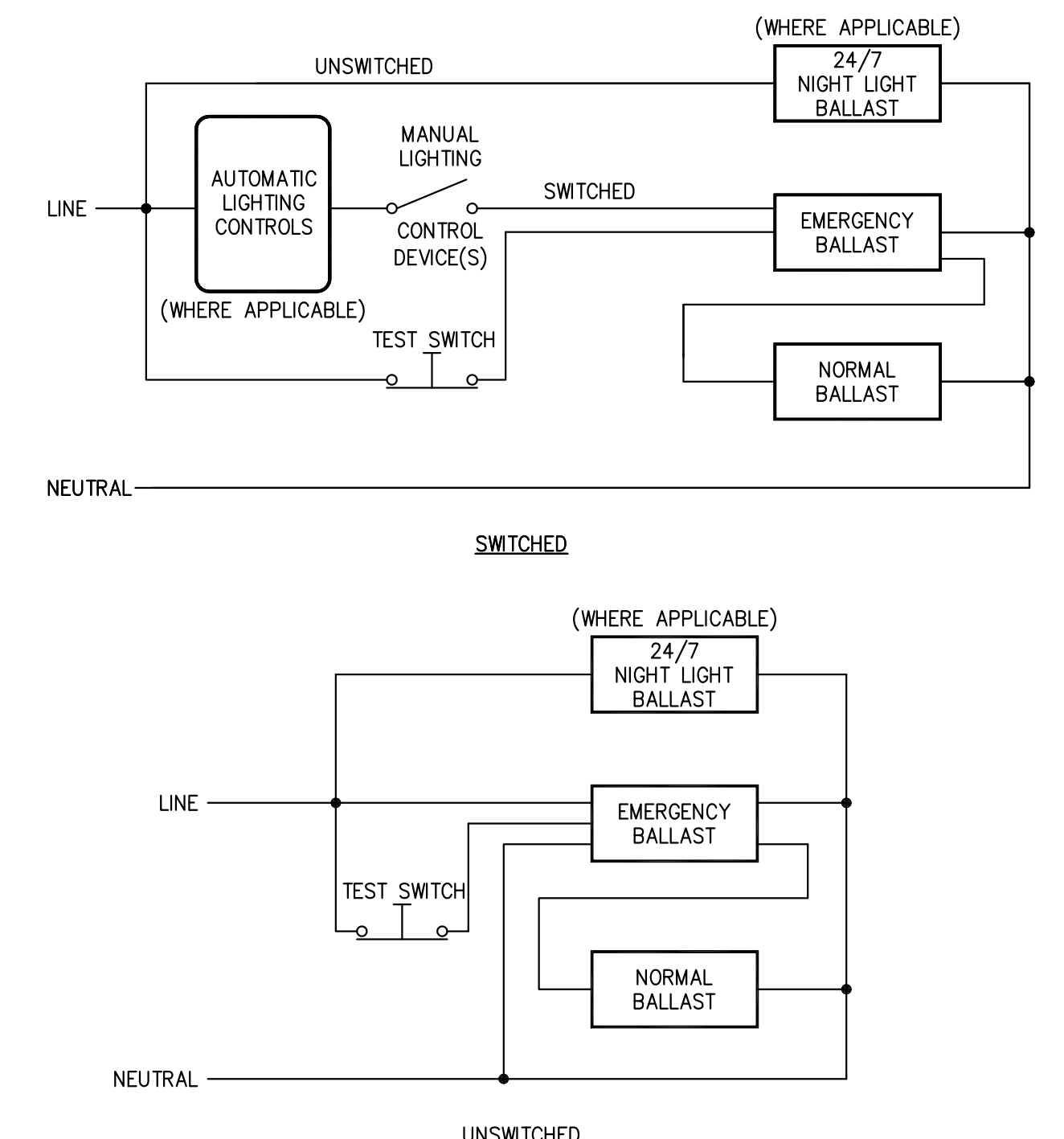
- NOTES:**
- THERE IS NO ACCESS FROM THE REAR.
 - IF ANY ENCLOSURE FOR ELECTRICAL EQUIPMENT REQUIRES REAR ACCESS TO ANY LIVE CONNECTIONS OR TO RENEWABLE OR ADJUSTABLE PARTS (SUCH AS FUSES OR SWITCHES), THEN THE SAME WORK CLEARANCES WOULD BE REQUIRED AT THE REAR OF THE ENCLOSURE AS SHOWN FOR THE FRONT. DISTANCES MUST BE MEASURED FROM THE LIVE PARTS IF THEY ARE EXPOSED, OR FROM THE FRONT SURFACE OF A CABINET OR HOUSING OF ENCLOSED PARTS.
 - NO OBSTRUCTIONS OF ANY KIND PERMITTED IN REQUIRED WORK SPACE FOR ALL CONDITIONS.

**TYPICAL DETAIL
CLEARANCES FOR PANEL BOARD
ENCLOSURES IN WORKSPACES**
SCALE: NONE



- DETAIL NOTES:**
- CONNECT TO 120/277V LOCAL LIGHTING CIRCUIT (AHEAD OF ANY SWITCHING AND/OR AUTOMATIC CONTROLS) FOR CHARGING AND AREA PROTECTION IN ACCORDANCE WITH NEC 700-12.
 - IN AREAS WHERE (3) OR MORE GENERAL LIGHTING CIRCUITS ARE PROVIDED, PROVIDE A DEDICATED POWER CIRCUIT PER NEC 700-12(F) EXCEPTION 1. IN EXISTING INSTALLATIONS, WHERE DEDICATED POWER CIRCUITS EXIST, INTERCONNECT TO EXISTING POWER CIRCUITS AS REQUIRED.
 - WHERE SEPARATE POWER CIRCUITS ARE EMPLOYED, PROVIDE A LISTED CIRCUIT BREAKER BLOCKING DEVICE THAT PROHIBITS INADVERTENT CIRCUIT BREAKER OPERATION.

**TYPICAL DETAIL
EMERGENCY LIGHTING CONNECTIONS**
SCALE: NONE



- DETAIL NOTES:**
- ONLY PRIMARY CIRCUITS SHOWN. LAMP LEADS NOT SHOWN.
 - EMERGENCY BALLASTS SHALL SERVE TWO FIXTURE LAMPS MINIMUM, UNLESS OTHERWISE INDICATED ON THE PLANS.
 - FINAL WIRING AND INSTALLATION PROVISIONS SHALL BE PER MANUFACTURER'S INSTRUCTIONS.
 - PROVIDE EMERGENCY BALLASTS PER BOONE B33 (2500 LUMENS MIN), OR FIXTURE MANUFACTURER APPROVED EQUIVALENT.
 - PROVIDE NIGHT LIGHT BALLAST ONLY WHERE APPLICABLE, AND PER FIXTURE MANUFACTURER INSTRUCTIONS.

**TYPICAL DETAIL
EMERGENCY BALLAST WIRING SCHEMATICS**
SCALE: NONE

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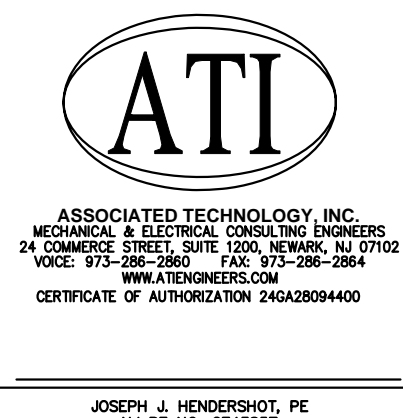
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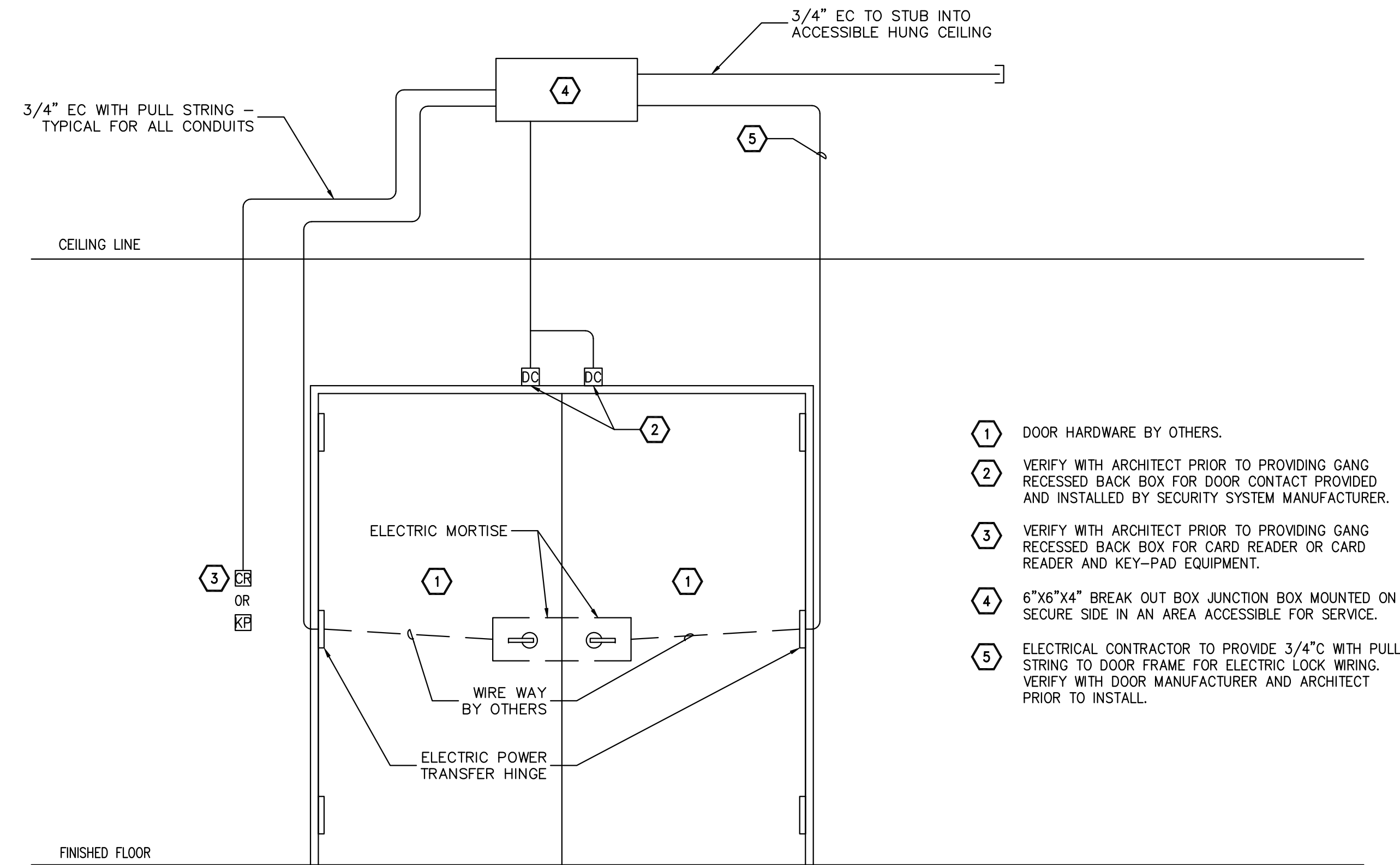
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PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
ELECTRICAL DETAILS (SHEET 2)

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	NONE
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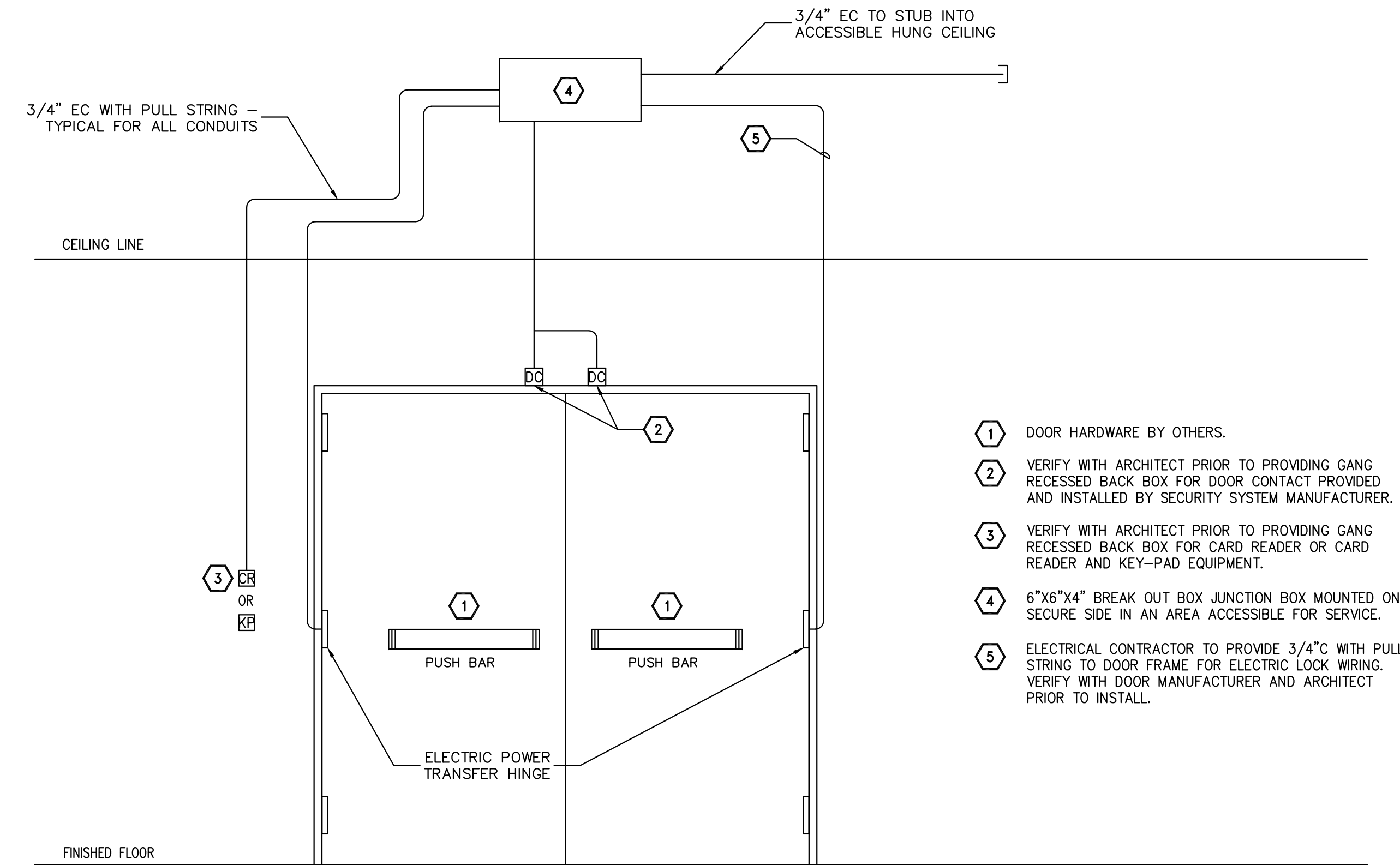
- ① DOOR HARDWARE BY OTHERS.
- ② VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR DOOR CONTACT PROVIDED AND INSTALLED BY SECURITY SYSTEM MANUFACTURER.
- ③ VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR CARD READER OR CARD READER AND KEY-PAD EQUIPMENT.
- ④ 6"x6"x4" BREAK OUT BOX JUNCTION BOX MOUNTED ON SECURE SIDE IN AN AREA ACCESSIBLE FOR SERVICE.
- ⑤ ELECTRICAL CONTRACTOR TO PROVIDE 3/4" C WITH PULL STRING TO DOOR FRAME FOR ELECTRIC LOCK WIRING. VERIFY WITH DOOR MANUFACTURER AND ARCHITECT PRIOR TO INSTALL.

DETAIL NOTES:

- 1. REFER TO FLOOR PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES.
- 2. COORDINATE EXACT LOCATION AND QUANTITY OF SECURITY DEVICES WITH SECURITY VENDOR.

DOUBLE DOOR WITH CARD READER,
OR CARD READER AND KEYPAD

SCALE: NONE



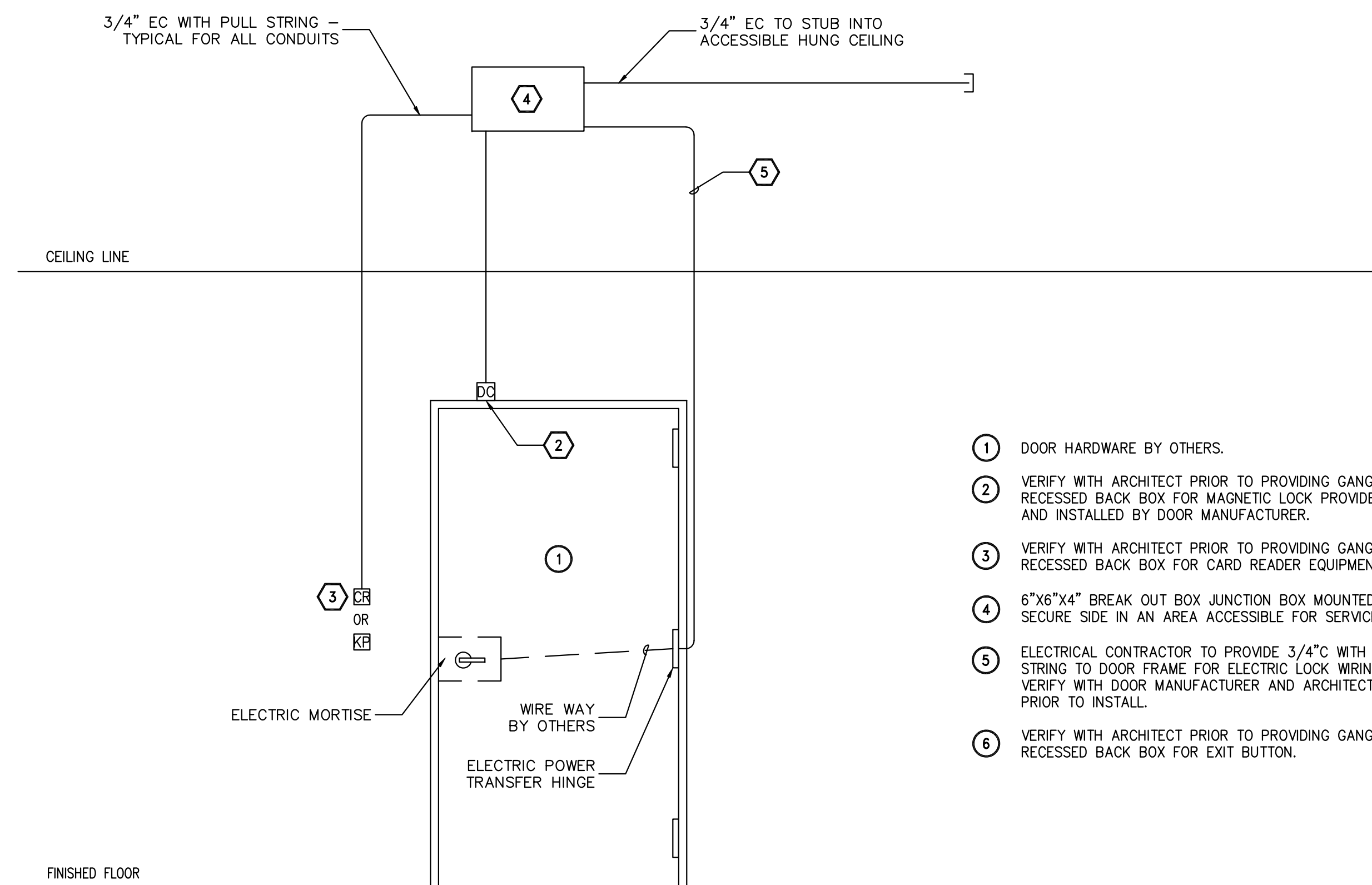
- ① DOOR HARDWARE BY OTHERS.
- ② VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR DOOR CONTACT PROVIDED AND INSTALLED BY SECURITY SYSTEM MANUFACTURER.
- ③ VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR CARD READER OR CARD READER AND KEY-PAD EQUIPMENT.
- ④ 6"x6"x4" BREAK OUT BOX JUNCTION BOX MOUNTED ON SECURE SIDE IN AN AREA ACCESSIBLE FOR SERVICE.
- ⑤ ELECTRICAL CONTRACTOR TO PROVIDE 3/4" C WITH PULL STRING TO DOOR FRAME FOR ELECTRIC LOCK WIRING. VERIFY WITH DOOR MANUFACTURER AND ARCHITECT PRIOR TO INSTALL.

DETAIL NOTES:

- 1. REFER TO FLOOR PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES.
- 2. COORDINATE EXACT LOCATION AND QUANTITY OF SECURITY DEVICES WITH SECURITY VENDOR.

DOUBLE DOOR (PUSH BAR) WITH CARD READER,
OR CARD READER AND KEYPAD

SCALE: NONE



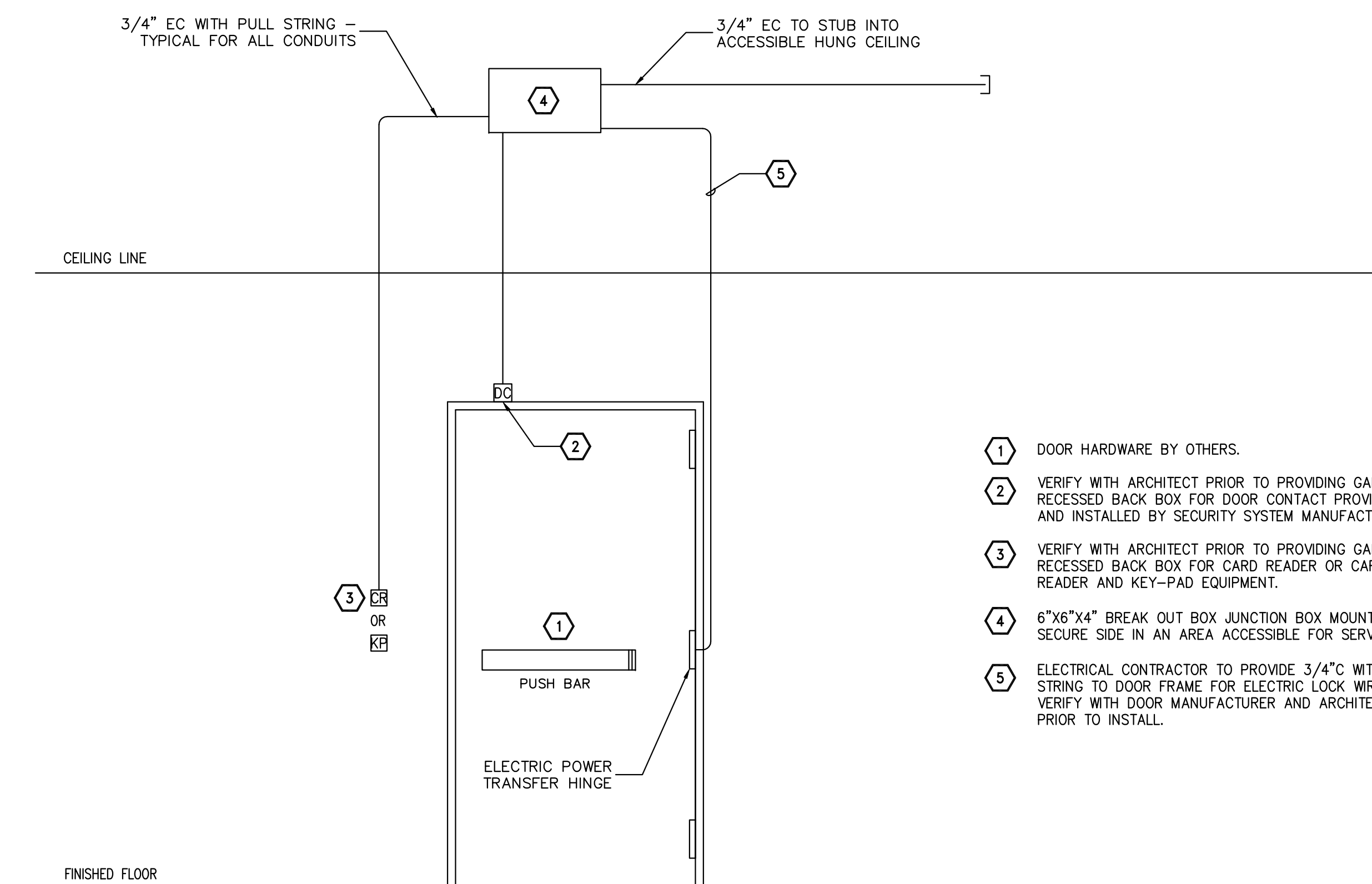
- ① DOOR HARDWARE BY OTHERS.
- ② VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR MAGNETIC LOCK PROVIDED AND INSTALLED BY DOOR MANUFACTURER.
- ③ VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR CARD READER EQUIPMENT.
- ④ 6"x6"x4" BREAK OUT BOX JUNCTION BOX MOUNTED ON SECURE SIDE IN AN AREA ACCESSIBLE FOR SERVICE.
- ⑤ ELECTRICAL CONTRACTOR TO PROVIDE 3/4" C WITH PULL STRING TO DOOR FRAME FOR ELECTRIC LOCK WIRING. VERIFY WITH DOOR MANUFACTURER AND ARCHITECT PRIOR TO INSTALL.
- ⑥ VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR EXIT BUTTON.

DETAIL NOTES:

- 1. REFER TO FLOOR PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES.
- 2. COORDINATE EXACT LOCATION AND QUANTITY OF SECURITY DEVICES WITH SECURITY VENDOR.

SINGLE DOOR WITH CARD READER
OR CARD READER AND KEYPAD

SCALE: NONE



- ① DOOR HARDWARE BY OTHERS.
- ② VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR DOOR CONTACT PROVIDED AND INSTALLED BY SECURITY SYSTEM MANUFACTURER.
- ③ VERIFY WITH ARCHITECT PRIOR TO PROVIDING GANG RECESSED BACK BOX FOR CARD READER OR CARD READER AND KEY-PAD EQUIPMENT.
- ④ 6"x6"x4" BREAK OUT BOX JUNCTION BOX MOUNTED ON SECURE SIDE IN AN AREA ACCESSIBLE FOR SERVICE.
- ⑤ ELECTRICAL CONTRACTOR TO PROVIDE 3/4" C WITH PULL STRING TO DOOR FRAME FOR ELECTRIC LOCK WIRING. VERIFY WITH DOOR MANUFACTURER AND ARCHITECT PRIOR TO INSTALL.

DETAIL NOTES:

- 1. REFER TO FLOOR PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES.
- 2. COORDINATE EXACT LOCATION AND QUANTITY OF SECURITY DEVICES WITH SECURITY VENDOR.

SINGLE DOOR (PUSH BAR) WITH CARD READER,
OR CARD READER AND KEYPAD

SCALE: NONE

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PROJECT:

UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL
DETAILS
(SHEET 4)

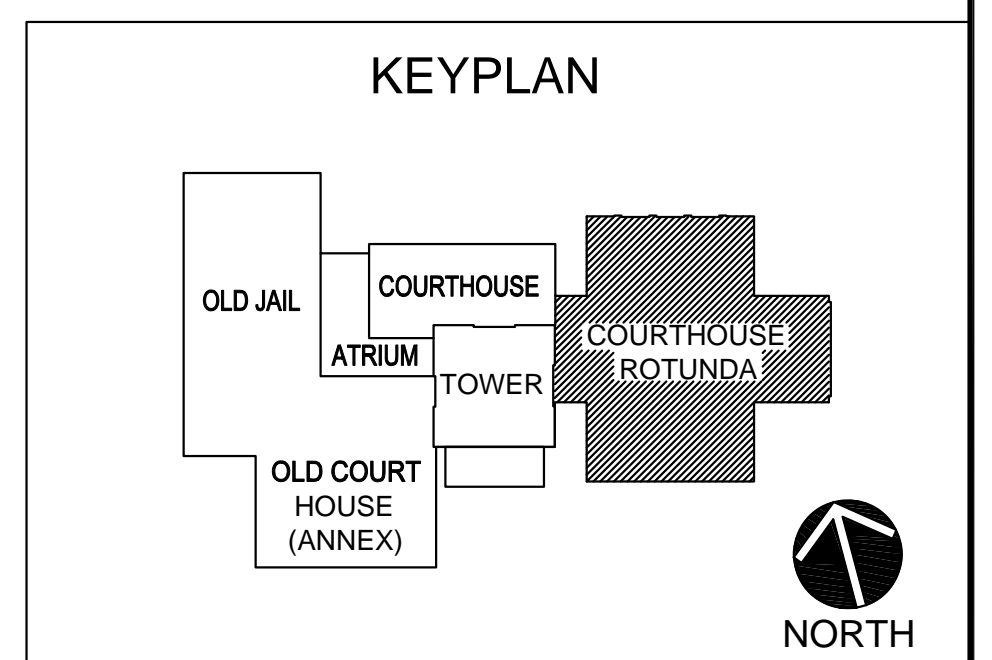
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09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NUN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	E.804

GENERAL PLUMBING NOTES:

- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE NATIONAL STANDARD PLUMBING CODE (NSPC), NEW JERSEY UNIFORM CONSTRUCTION CODE, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
- PROVIDE A COMPLETE OPERABLE SYSTEM INSTALLED IN A WORKMANLIKE MANNER. OUTLINE DESCRIPTION AND EQUIPMENT DOES NOT LIMIT CONTRACTOR'S LIABILITY FOR THE INSTALLATION OF A COMPLETE OPERABLE SYSTEM.
- CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
- CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
- CONTRACTOR SHALL NOT FASTEN ANY EQUIPMENT AND MATERIAL FROM ROOF DECKING. CONTRACTOR SHALL SUPPORT EQUIPMENT AND MATERIAL FROM BEAMS. IF NECESSARY, CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT STEEL ON METAL TO ATTACH TO BEAMS.
- FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
- THE WORK INDICATED ON THESE DRAWINGS IS DIAGRAMMATIC AND IS INTENDED TO SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND DESIGN INTENT. CONTRACTOR MAY MAKE FIELD CHANGES TO THE DESIGN DOCUMENTS ONLY WHEN REQUESTING AND RECEIVING APPROVAL FROM THE ENGINEER. CONTRACTOR FIELD CHANGES SHALL NOT RESULT IN ANY ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL WARRANT ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
- CONTRACTOR SHALL PROVIDE PROTECTION FOR THE OWNER AND CONSTRUCTION WORKERS IN AND AROUND THE CONSTRUCTION AREA. ADEQUATE BARRIERS SHALL BE PROVIDED TO EXERCISE CONTROL OF SAFE INGRESS AND EGRESS OF PREMISES. FIRE EXITS SHALL AT NO TIME BE BLOCKED.
- ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
- CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
- WHERE INFORMATION IN DIFFERENT PARTS OF THE CONTRACT DOCUMENTS ARE INTERPRETED BY THE CONTRACTOR TO BE DUPLICATED, THE CONTRACTOR SHALL OBTAIN A WRITTEN APPROVAL OF HIS INTERPRETATION FROM THE ENGINEER BEFORE DELETING THE SCOPE OR WORK HE INTERPRETS AS BEING A DUPLICATION. IN THE ABSENCE OF SUCH WRITTEN APPROVAL, THE CONTRACTOR SHALL NOT EXCLUDE ANY ITEM SHOWN IN DIFFERENT PARTS OF THE CONTRACT, FOR EITHER CONTRACTOR'S INTERPRETATION OF DUPLICATION OR CONTRADICTION AS INDICATED ABOVE. THE OWNER'S DETERMINATION SHALL BE FINAL AND SHALL NOT ENTITLE THE CONTRACTOR TO ANY ADDITIONAL COMPENSATION.
- THE CONTRACTOR SHALL PROVIDE NEW PLUMBING FIXTURES, PIPING, INSULATION, VALVES, AND APPURTENANCES AS SHOWN ON THE DRAWINGS AND AS REQUIRED FOR A COMPLETE WORKING SYSTEM.
- DURING CONSTRUCTION ALL OPEN ENDS OF EXISTING PIPING SHALL BE PLUGGED AND CAPPED WITH PLASTIC OR METAL CAPS TO KEEP DIRT OUT OF THE SYSTEM.
- NO DEAD ENDS SHALL BE LEFT ON ANY DRAINAGE PIPING UPON COMPLETION OF WORK.
- NEW SHUT-OFF VALVES SHALL BE PROVIDED AS REQUIRED TO ISOLATE DIFFERENT AREAS OF THE PLUMBING VALVES AS REQUIRED FOR IMPLEMENTATION OF PROJECT SCOPE.
- VENT PIPE SHALL BE GRADED TO DRAIN OUT ALL MOISTURE AND PREVENT SCALE ACCUMULATION.
- ALL VALVES AND SPECIALTIES SHALL BE SO PLACED AS TO PERMIT EASY OPERATION AND ACCESS.
- THE CONTRACTOR SHALL INSULATE ALL HOT AND COLD DOMESTIC WATER PIPING AFTER TESTING THE SYSTEM.
- BEFORE BEING PLACED INTO SERVICE ALL POTABLE WATER PIPING SHALL BE CLEANED, FLUSHED, AND DISINFECTED.
- ALL ACOUSTIC CEILING MATERIALS DISTURBED BY THIS CONSTRUCTION SHALL BE REPLACED WITH NEW.
- WHEN THE NEW EQUIPMENT IS INSTALLED BY OTHERS, THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL NEW APPROPRIATE ROUGHING AND MAKING FINAL CONNECTIONS SUCH AS COLD, WATER, HOT WATER, VENTS, GAS, ETC.
- INSTALL PIPE TO UNIFORM FITCHES BETWEEN POINTS FOR WHICH ELEVATIONS ARE ESTABLISHED OR SHALL BE VERIFIED BY USE OF LEVEL OR OTHER APPROVED METHOD. PIPE INVERT SHALL BE ADJUSTED BY THE ADDITIONS OR SUBTRACTION OF FULL BEDDING AND NOT BY WEDGING OR BLOCKING.
- ALL BRACKETS, PLATES, CHANNELS, ETC. SHALL BE GALVANIZED UNLESS OTHERWISE NOTED.
- PROVIDE DRAIN CLEANOUTS ON ALL DRAIN LINES SHOWN ON DRAWINGS AND AS REQUIRED BY LOCAL JURISDICTION.
- PROVIDE VALVED AND CAPPED CONNECTIONS AT ALL LOW POINTS IN PIPING SYSTEMS REQUIRED FOR DRAINING SYSTEM.
- ALL WATER PIPES LOCATED OUTSIDE THE HEATED STRUCTURE, LESS THAN 4' BELOW GRADE, AND/OR SUBJECT TO FREEZING SHALL BE INSULATED AND HEAT TRACED. COORDINATE REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
- ALL GALVANIZED PARTS SHALL BE PAINTED BY THE PLUMBING CONTRACTOR.
- CHANGES IN DIRECTION IN DRAINAGE PIPING SHALL BE MADE WITH APPROPRIATE USE OF 45° WYES, LONG SWEEPS, QUARTER, SIXTH, EIGHTH, OR SIXTEENTH BENDS.
- BELOW GROUND SANITARY PIPING SHALL BE EXTRA HEAVY CAST IRON PIPE. ABOVE GROUND, SANITARY, AND VENT PIPING SHALL BE FABRICATED WITH STANDARD WEIGHT CAST IRON NO HUB PIPE WITH NEOPRENE GASKETS AND STAINLESS STEEL CLAMP-AND-SHIELD ASSEMBLIES.

PLUMBING DEMOLITION NOTES:

- CONTRACTOR SHALL REMOVE ALL EXISTING PLUMBING SYSTEMS, PIPING, VALVES, CONTROL SYSTEMS, AND SUPPORTS ON THE PROJECT INCLUSIVE TO THE POINT OF CONNECTION ON THE RISER STACKS. PLUMBING SYSTEMS SHALL BE DEFINED AS WASTE, DOMESTIC WATER, VENT, AND GAS PIPING. ALL DEMOLISHED EQUIPMENT SHALL BE REMOVED OFFSITE AND DISPOSED OF IN A SAFE AND LAWFUL MANNER.
- CONTRACTOR SHALL VISIT THE SITE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AS WELL AS THE MEANS AND METHODS OF THE WORK. FAILURE TO DO SO WILL NOT QUALIFY FOR LATER CLAIMS DUE TO THE SCOPE OF WORK REQUIRED.
- PROTECT ALL EXISTING SPACES AND SURFACES WHILE PERFORMING THE CONTRACT SCOPE OF WORK. CONTRACTOR SHALL PATCH, PAINT, AND REPAIR ANY EXISTING OR NEW SURFACES DAMAGED DURING THE COURSE OF WORK TO THE EXISTING CONDITIONS OR BETTER.
- CONTRACTOR SHALL CAP EXISTING PIPES NOT TO BE DEMOLISHED FLUSH WITH EXISTING SURFACES. SEAL OPENING AIR TIGHT.
- REMOVE GAS PIPING CONNECTION FROM HVAC EQUIPMENT AND KITCHEN EQUIPMENT (IF REQUIRED) BACK TO METER TO FACILITATE DEMOLITION OF EQUIPMENT BY OTHER TRADES. COORDINATE WITH OTHER TRADES.
- COORDINATE ALL DEMOLITION WORK WITH THE GENERAL CONTRACTOR OR OWNER'S REPRESENTATIVE BEFORE PROCEEDING WITH WORK.



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FRANCISCO J. MELENDEZ, SR., AIA
NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**PLUMBING
GENERAL NOTES**

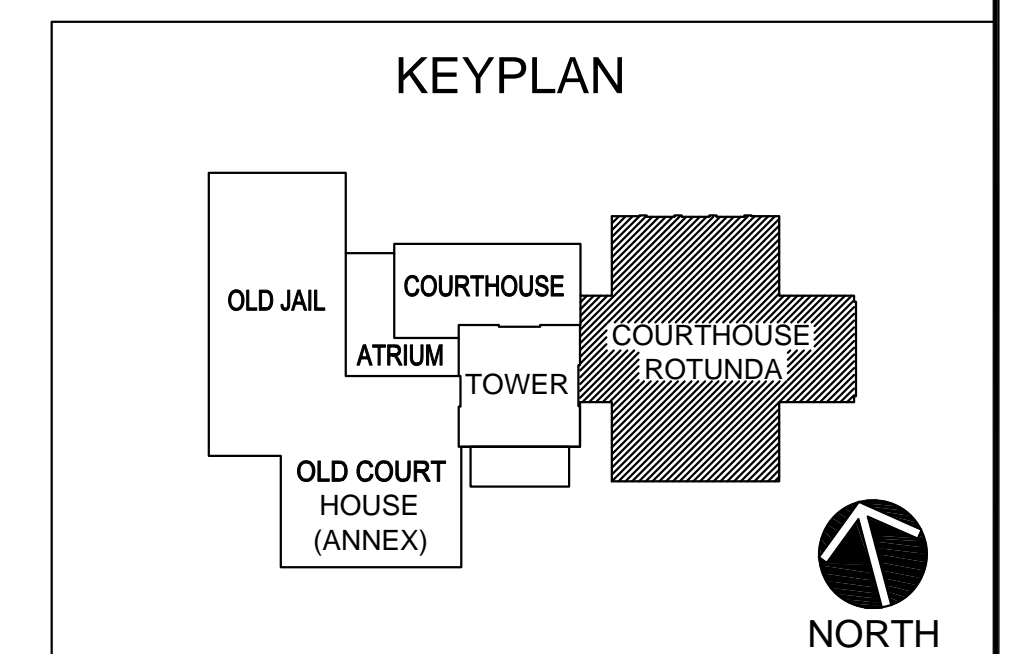
SUBMISSIONS				REVISIONS				DATE	09-25-15
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9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	P.101

SYMBOL LEGEND	
GENERAL	
SYMBOL	DESCRIPTION
	CENTER LINE
	EXISTING CONSTRUCTION & EQUIPMENT
	EXISTING TO BE REMOVED
	NEW WORK
	BREAK
	END CAP
	CONNECT TO EXISTING
	REMOVE FROM EXISTING
	PIPE PITCH
	DIRECTION OF FLOW
	PIPE BREAK DOUBLE LINE
	WORK NOTE
	REVISION CLOUD (AREA OF CHANGE)
	REVISION NUMBER
	SECTION CUT
	SECTION LINE
	DRAWING/DETAIL TITLE SCALE: NONE
	ROOM NAME/NUMBER
	DIAMETER

PIPING SYMBOL LEGEND		
PLUMBING /GAS		
PIPING	ABBREVIATION	DESCRIPTION
	S	STORM, SOIL OR WASTE PIPING BELOW GRADE
	V	VENT PIPING
	CW	COLD WATER PIPING
	HW	HOT WATER PIPING
	HWR	HOT WATER RETURN PIPING
	SAN	SANITARY/WASTE/SOIL PIPING
	PD	PUMP DISCHARGE
	IW	INDIRECT WASTE
	ST	STORM PIPING
	TW	TEMPERED WATER
	SA	SUCTION AIR PIPING
	G	GAS PIPING
	HPG	HIGH PRESSURE GAS
		ELECTRIC HEAT TRACED PIPING
	A / CA	COMPRESSED AIR PIPING
	WHR /SA	WATER HAMMER ARRESTER / SHOCK ABSORBER
		PIPE CAP
		PIPE UP END
		PIPE DOWN END
		PIPE UP RISE
		CAP TAKE-OFF
		TOP CONNECTION, 45° OR 90°
		BOTTOM CONNECTION, 45° OR 90°
		SIDE CONNECTION
		PIPING CONNECTION TO EQUIP. (UNIT) ON FLR. ABOVE
		SLEEVE
VALVES/GAUGES	ABBREVIATION	DESCRIPTION
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
	CVB	CURB VALVE AND BOX
	BV	BALL VALVE
	GV	GATE VALVE
	CV	CHECK VALVE
		GAS SHUT-OFF VALVE
		MOTOR OPERATED VALVE

PIPING SYMBOL LEGEND	
PLUMBING /GAS CONT.	
SYMBOL	DESCRIPTION
	SOLENOID VALVE
	PRESSURE REDUCING VALVE
	CIRCUIT SETTER
	3-WAY VALVE
	THERMOSTATIC MIXING VALVE
	STRAINER
	STRAINER WITH BLOW DOWN
	BACKFLOW PREVENTER
	UNION
	THERMOMETER
	PRESSURE GAUGE
	AUTOMATIC AIR VENT PIPED TO NEAREST DRAIN
	FLEXIBLE CONNECTION
	VACUUM BREAKER
	BALANCING VALVE
TRAPS/DRAINS	DESCRIPTION
	RD ROOF DRAIN
	FD FLOOR DRAIN
	RD/OFD ROOF DRAIN AND OVERFLOW DRAIN
	FS FLOOR SINK
	CI CLEAN OUT IN RISER
	CDP CLEAN OUT DECK PLATE
	TRAP
	REGULAR TRAP WITH CLEAN OUT
	HOUSE TRAP
	HOUSING TRAP
	CLEAN OUT TO GRADE
	UP TO CLEAN OUT DECK PLATE
	FLOW ORIFICE
	HUB DRAIN
	SHOWER HEAD
	SHOWER ASSEMBLY
	HOSE BIBB
	STRAIGHT TEE
	45 DEGREE WYE

ABBREVIATIONS LIST	
ABBREVIATION	DESCRIPTION
ABD	AUTOMATIC BALL DRIP
ABF	ABOVE FINISHED FLOOR
BBF	BACKFLOW PREVENTER
CI	CAST IRON
CFH	CUBIC FEET PER HOUR
CFS	CUBIC FEET PER SECOND
CLG	CEILING
CO	CLEAN OUT
CONN.	CONNECT
CS	CUP SINK
CVB	CURB VALVE & BOX
DIA	DIAMETER
DCA	DOUBLE CHECK DETECTOR ASSEMBLY
DIP	DUCTILE IRON PIPE
DN	DOWN
DS	DOWN SPOUT
DW	DISHWASHER
DFU	DRAINAGE FIXTURE UNITS
DWG	DRAWING
ELEV	ELEVATION
EW	ELECTRIC WATER COOLER
EW	EYE WASH
F	FIRE LINE
FAI	FRESH AIR INLET
FCO	FLOOR CLEAN OUT
FS	FLOW SWITCH
FE	FIRE EXTINGUISHER
FF	FINISHED FLOOR
FH	FIRE HYDRANT
F-R-L	FILTER-REGULATOR-LUBRICATOR
FFD/HUB DR	FUNNEL FLOOR DRAIN/HUB DRAIN
FT	FEET
FU	FIXTURE UNIT
GAL	GALLON
HC	HANDICAP
H&CW	HOT & COLD WATER
INV./I.E.	INVERT ELEVATION
LAV	LAVATORY
MAX.	MAXIMUM
MIN.	MINIMUM
MC	MECHANICAL CONTRACTOR
MOCV	METER OUTLET CONTROL VALVE
MR	MOP RECEPTOR
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OFD	OVERFLOW DRAIN
PL	PROPERTY LINE
PSI	POUNDS PER SQUARE INCH
RPZ	REDUCED PRESSURE ZONE
RCV	RISER CONTROL VALVE
RD	ROOF DRAIN
SA	SHOCK ARRESTER
SSK	SERVICE SINK
TYP	TYPICAL
UR	URINAL
U/S	UNDER THE FLOOR SLAB
VIR	VENT THRU ROOF
W/	WITH
WC	WATER CLOSET
WCOP	WALL CLEANOUT PLATE



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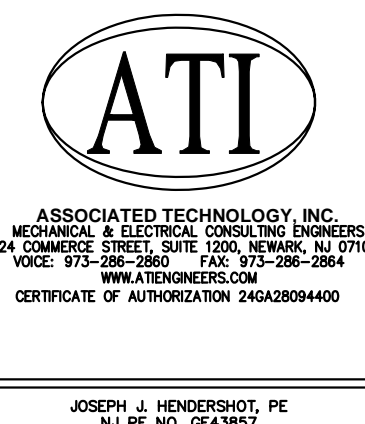
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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

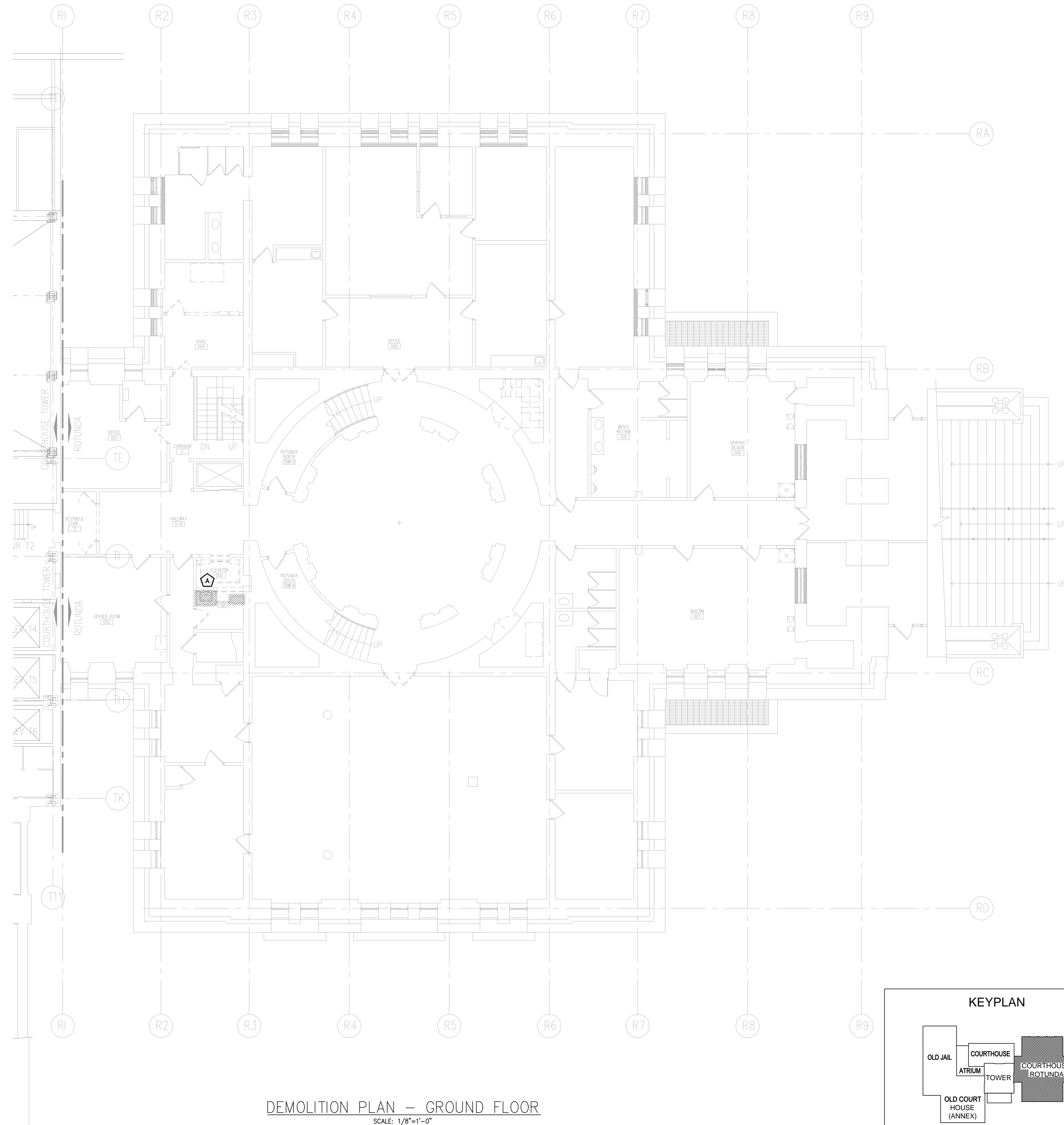


PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

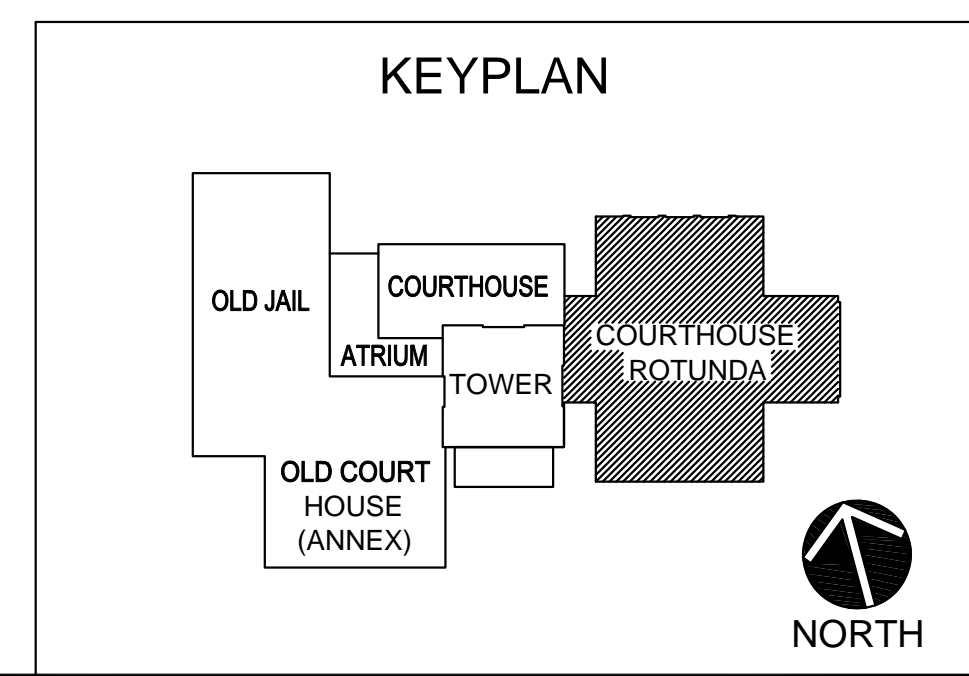
SHEET CONTENTS:
PLUMBING SYMBOLS

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY NJN
									JOB NO 2141152
									SHEET: _ OF:
									DWG. NO

P.102



DEMOLITION PLAN -- GROUND FLOOR
SCALE: 1/8"=1'-0"



KEYED DEMOLITION WORK NOTES:

△ REMOVE WATER CLOSET AND LAVATORY. MODIFY SANITARY, VENT, CW & HW PIPING TO ACCOMMODATE NEW ELEVATOR CMU WALL AND LOCATIONS OF NEW WATER CLOSET AND LAVATORY. SEE DWG. P.300G

DRAWING NOTES:

1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.

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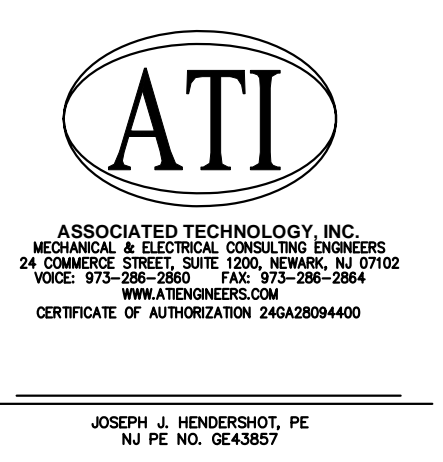
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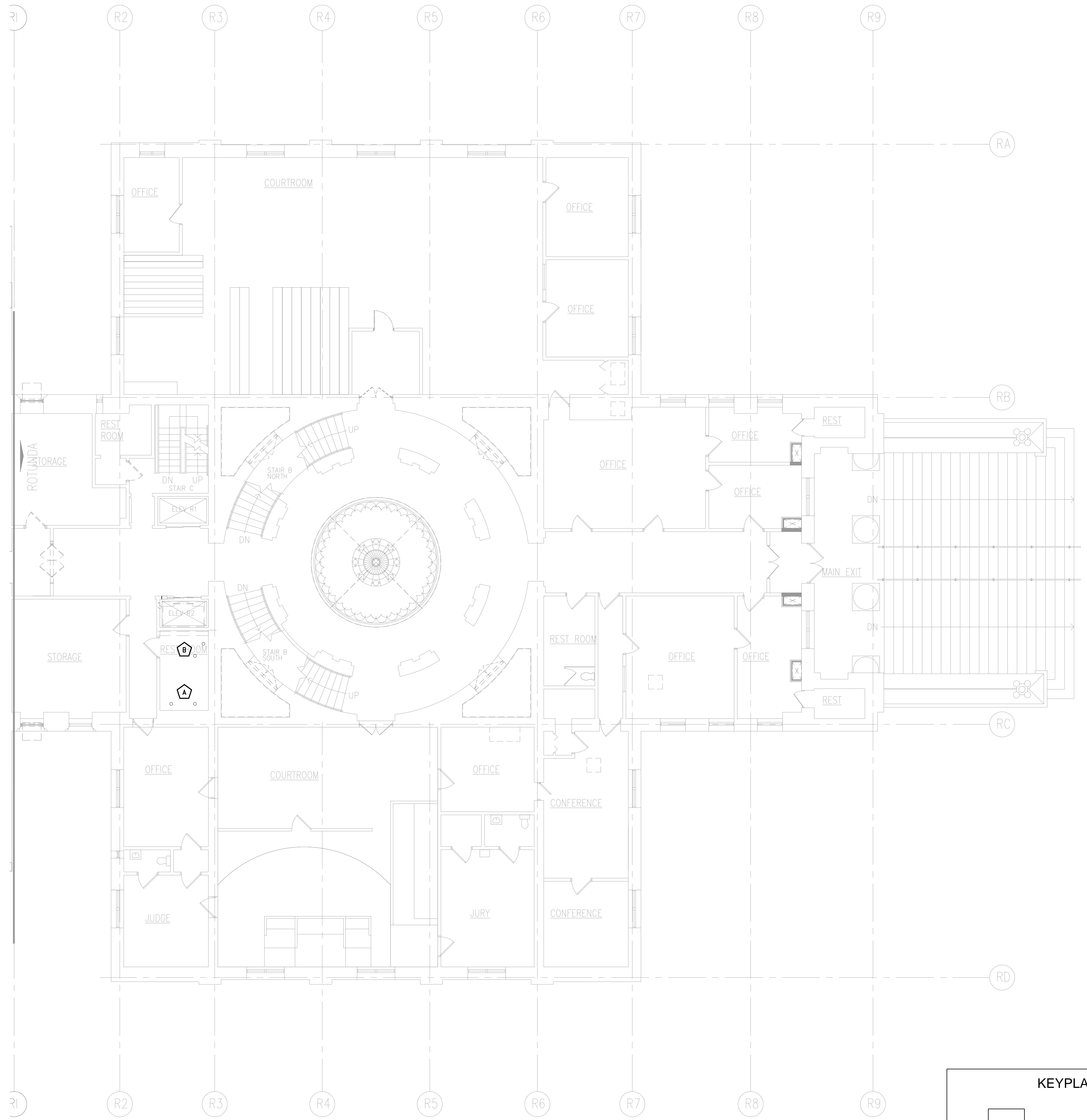


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**PLUMBING - DEMOLITION PIPING PLAN
GROUND FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

DP.300G

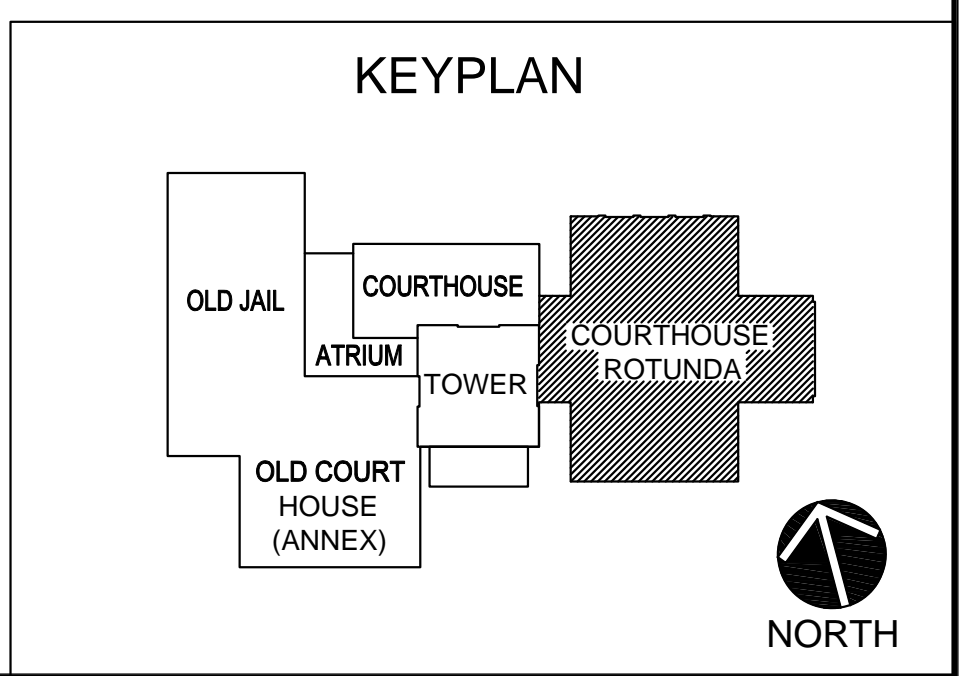


KEYED DEMOLITION WORK NOTES:

- A** EXISTING 4" SANITARY LINES UP TO WC.
- B** EXISTING 3" SANITARY UP TO FLOOR DRAIN & 2" SANITARY UP TO URINAL TO BE REMOVED AND PIPING MODIFIED TO ACCOMMODATE THE NEW ADA ELEVATOR INSTALLATION.

DRAWING NOTES:

1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.



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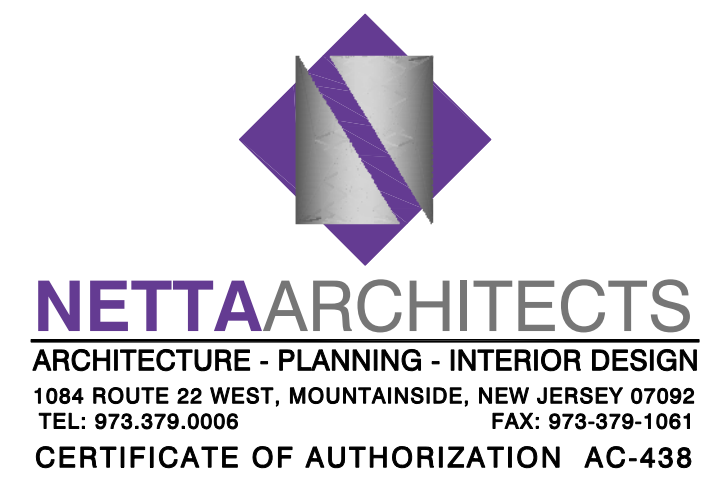
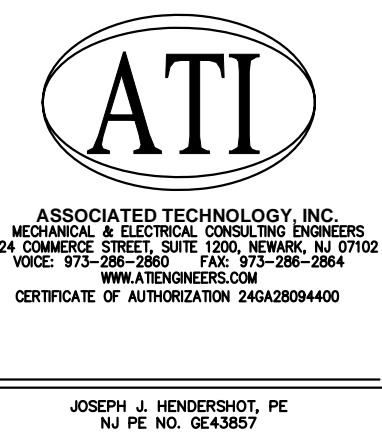
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NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

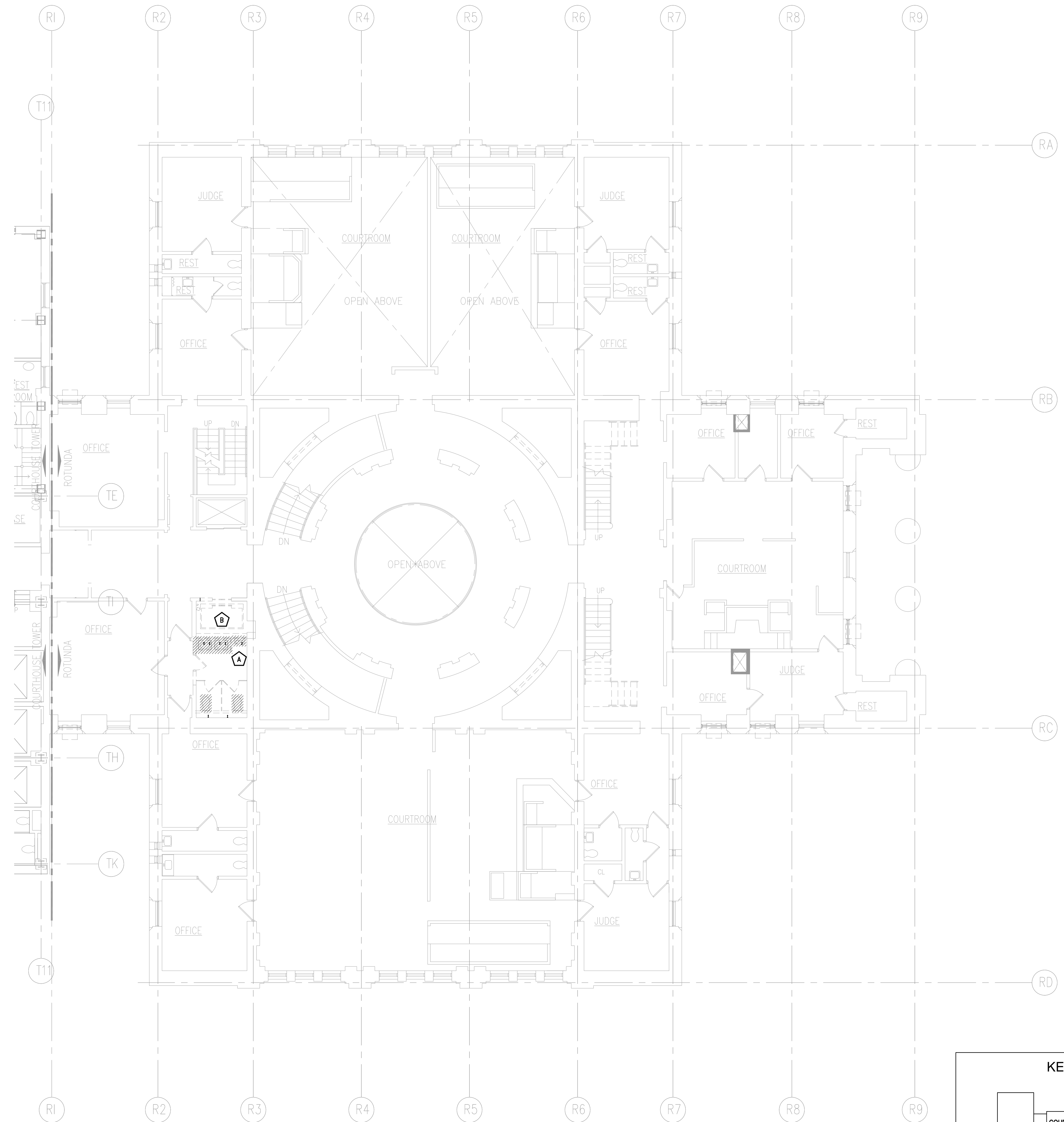


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**PLUMBING - DEMOLITION PIPING PLAN
FIRST FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
09.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

DP.301



KEYED DEMOLITION WORK NOTES:

- A** REMOTE EXISTING PLUMBING FIXTURES, SUPPORTS AND CHAIR CARRIES. PREPARE SANITARY, VENT, CW & HW PIPING FOR CONNECTIONS TO NEW FIXTURES. SEE DWG P.302 FOR NEW WORK.
- B** REMOVE SANITARY, VENT, CW & HW RISERS THAT WILL INTERFERE WITH THE INSTALLATION OF THE PROPOSED ELEVATOR. SEE DWG P.302 FOR NEW WORK.

DRAWING NOTES:

- 1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.

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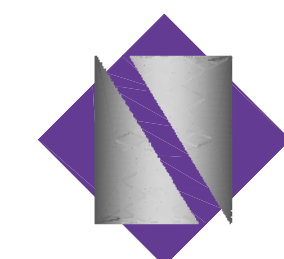
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ASSOCIATED TECHNOLOGY INC.
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24 CAMDEN DRIVE, SUITE 100, WILMINGTON, NJ 08090
TEL: 856-281-2888 FAX: 856-281-2844
WWW.ATINETWORKS.COM

JOSEPH J. HENDERSON, PE
NJ License No. 360887



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-378-0088 FAX: 973-378-1061
CERTIFICATE OF AUTHORIZATION AC-438

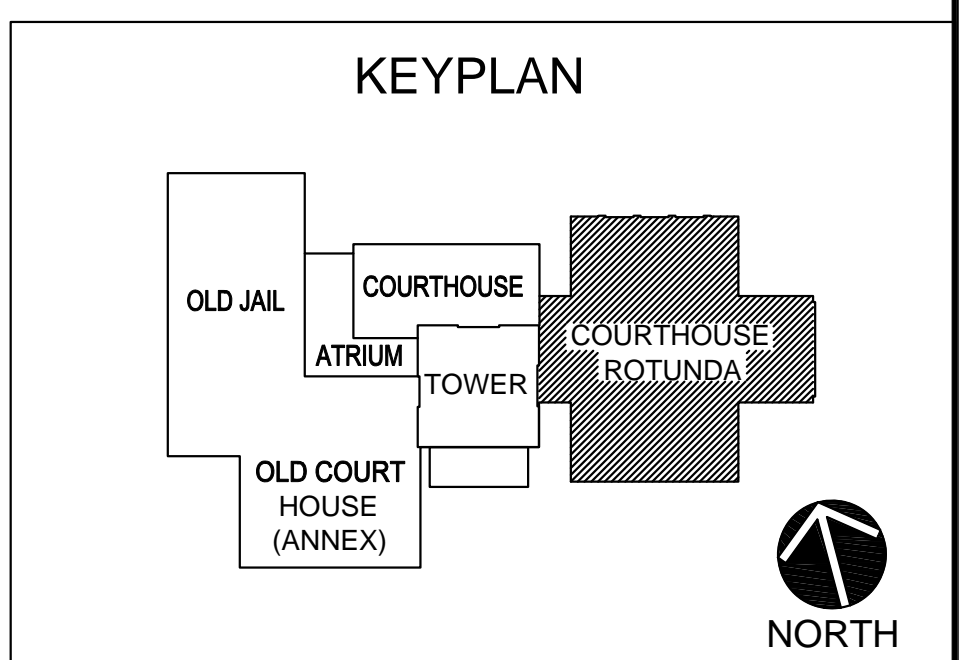
PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

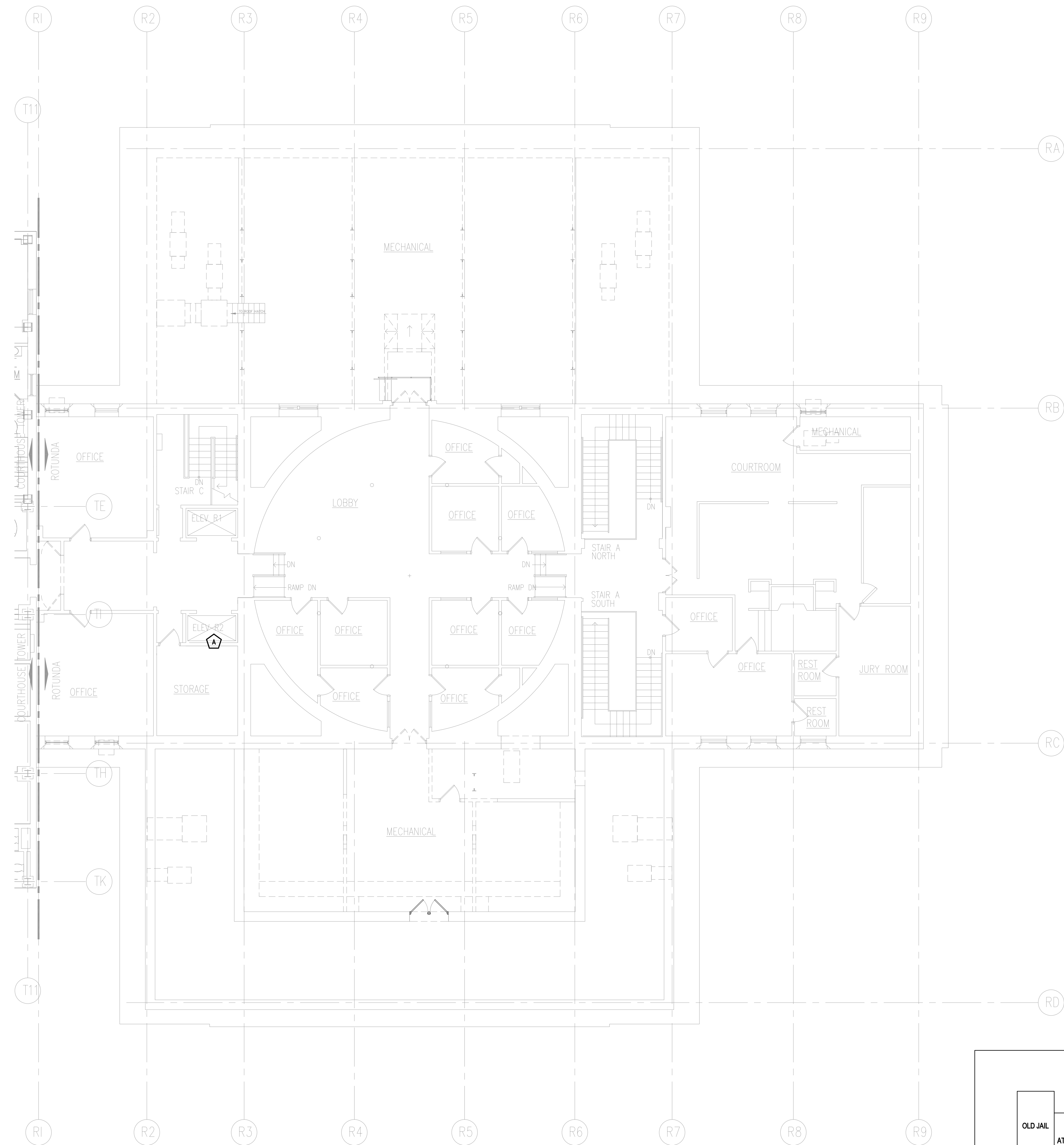
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**PLUMBING - DEMOLITION PIPING PLAN
SECOND FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	



DP.302

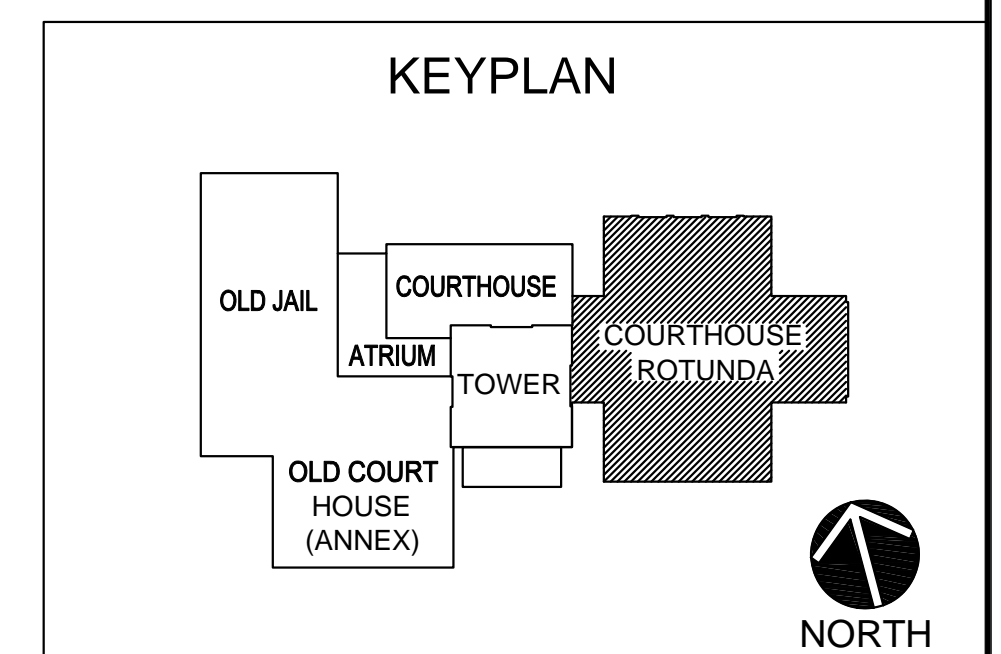


KEYED DEMOLITION WORK NOTES:

- A REMOVE VENT PIPING THAT WILL INTERFERE WITH THE INSTALLATION OF THE PROPOSED ELEVATOR. SEE DWG P.302 FOR NEW WORK.

DRAWING NOTES:

- 1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.



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NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



PROJECT:

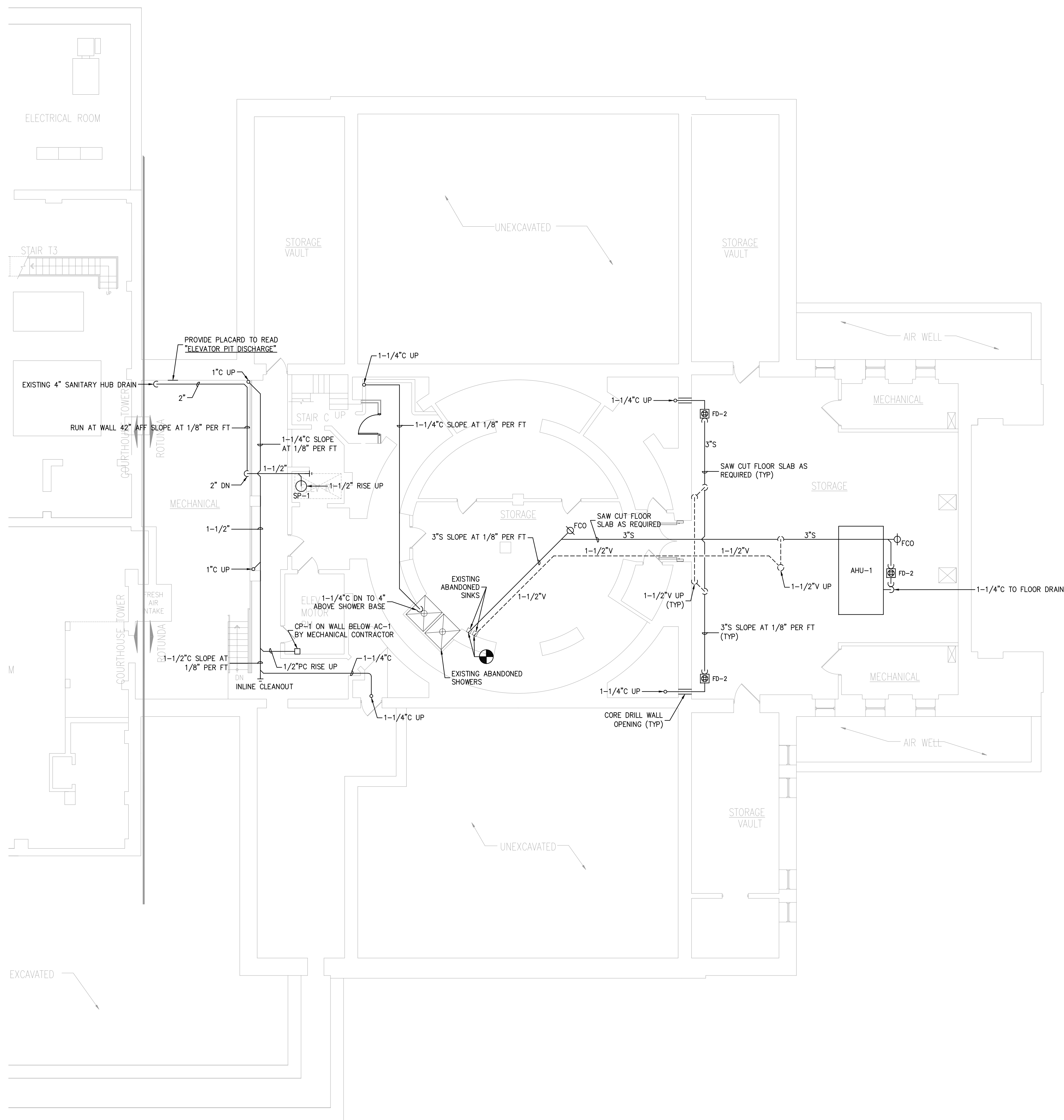
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**PLUMBING - DEMOLITION PIPING PLAN
THIRD FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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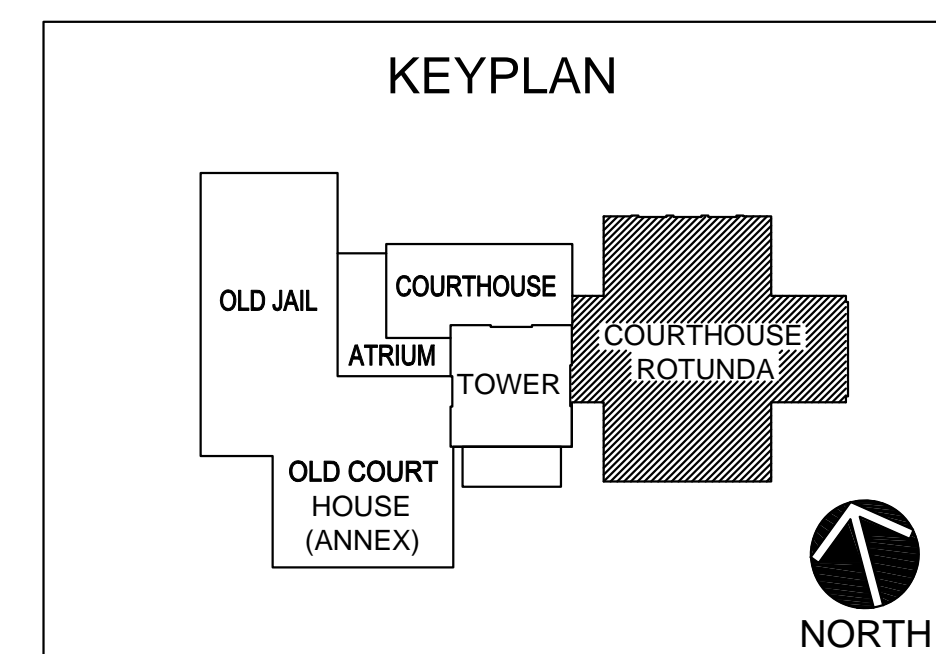
DP.304



DRAWING NOTES:

- REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.
- ALL DOMESTIC WATER PIPING SHALL BE COPPER TYPE L. PROVIDE 1-1/2" FIBERGLASS INSULATION ON ALL SUPPLY AND RETURN LINES. WHERE LINES PENETRATE THE FLOOR PROVIDE RISER CLAMPS.
- ALL SANITARY AND VENT PIPING SHALL BE STANDARD WEIGHT CAST IRON, NO HUB, NEOPRENE GASKETS, AND CLAMP-AND-SHIELD ASSEMBLIES. UNDERGROUND PIPING SHALL BE EXTRA HEAVY CAST IRON. WHERE LINES PENETRATE THE FLOOR PROVIDE RISER CLAMPS.
- ALL CONDENSATE PIPING SHALL BE COPPER TYPE M.
- COORDINATE ALL FINAL PIPING REQUIREMENTS FOR EQUIPMENT PROVIDED BY OTHER TRADES WITH FINAL EQUIPMENT SUBMITTALS PRIOR TO INSTALLATION. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION AS RECOMMENDED BY MANUFACTURER.

PIPING PLAN - BASEMENT
SCALE: 1/8"=1'-0"



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PROJECT:

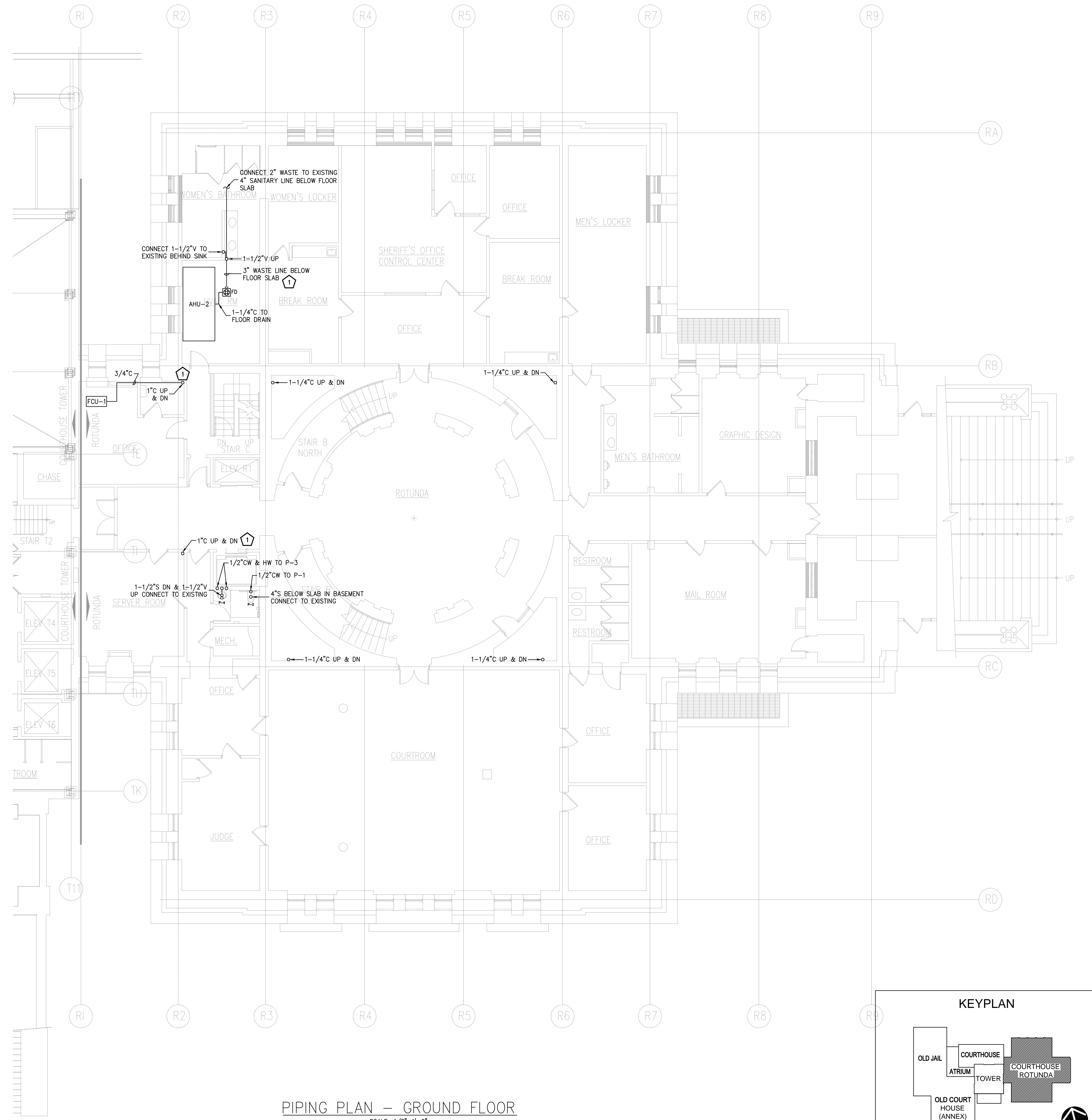
**UC COURTHOUSE
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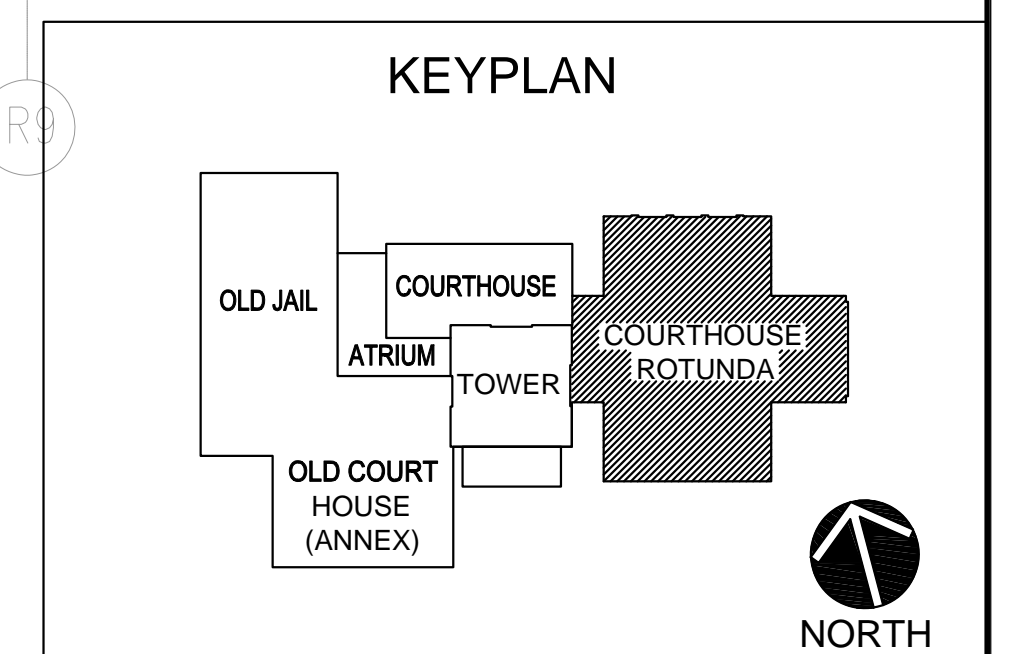
**PLUMBING PIPING PLAN
BASEMENT**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

P.300B



PIPING PLAN - GROUND FLOOR
SCALE: 1/8"=1'-0"



KEYED NEW WORK NOTES:

- 1. CORE DRILLING OF THE FLOOR SLAB BY THE GENERAL CONTRACTOR.

DRAWING NOTES:

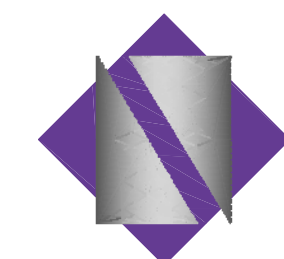
- 1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.

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NJ License No. AI 14394



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MECHANICAL & ELECTRICAL CONSULTING BUSINESS
25 COMPANY DRIVE, SUITE 100, PLAINFIELD, NJ 07060
TEL: 973-278-2883 FAX: 973-278-2844
WWW.ATIARCHITECTS.COM
CERTIFICATE OF AUTHORIZATION 2646666666



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ARCHITECTURE - PLANNING - INTERIOR DESIGN
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TEL: 973.378.0088 FAX: 973.378.1081
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

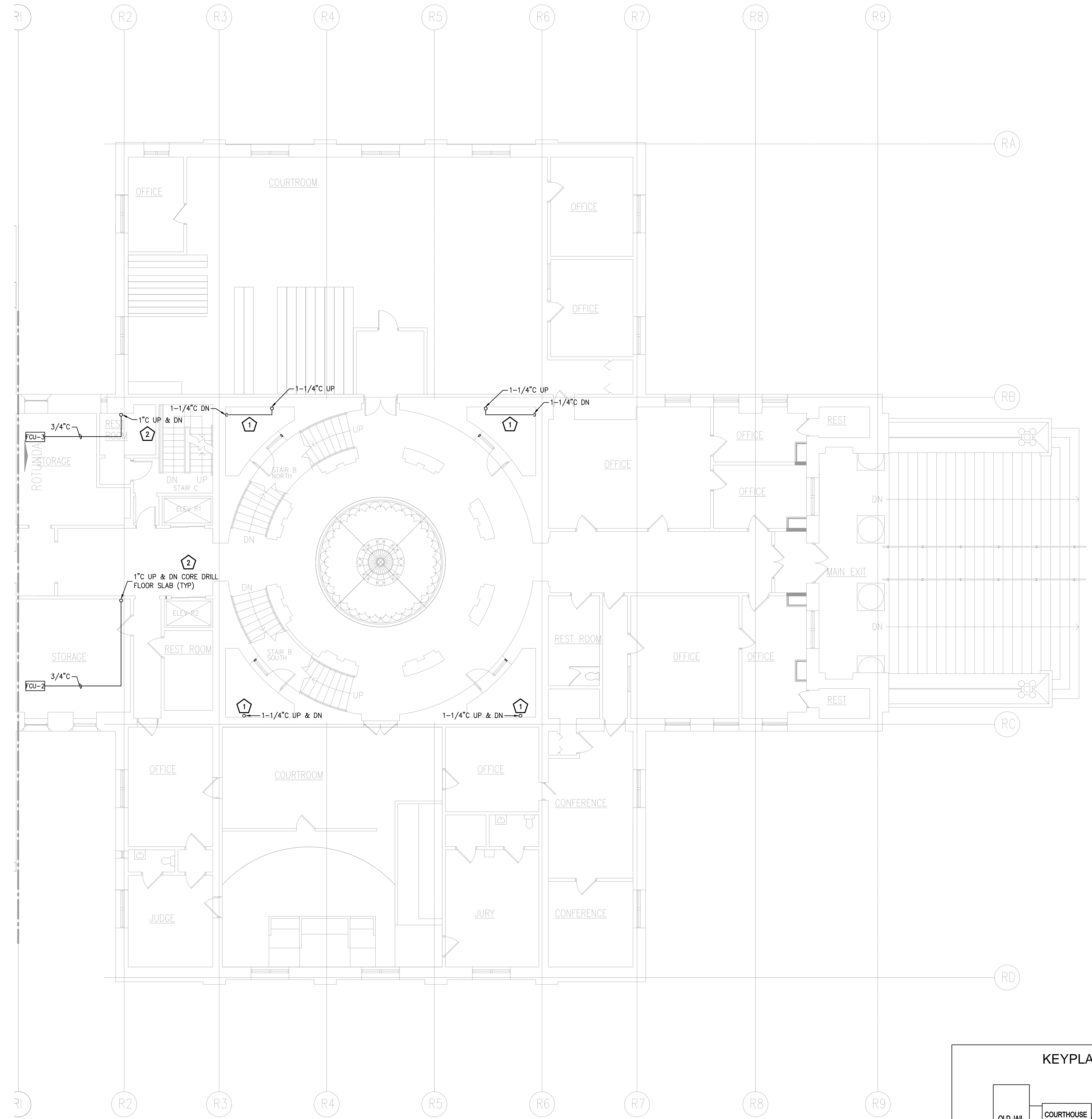
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FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**PLUMBING - PIPING PLAN
GROUND FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
09.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
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P.300G



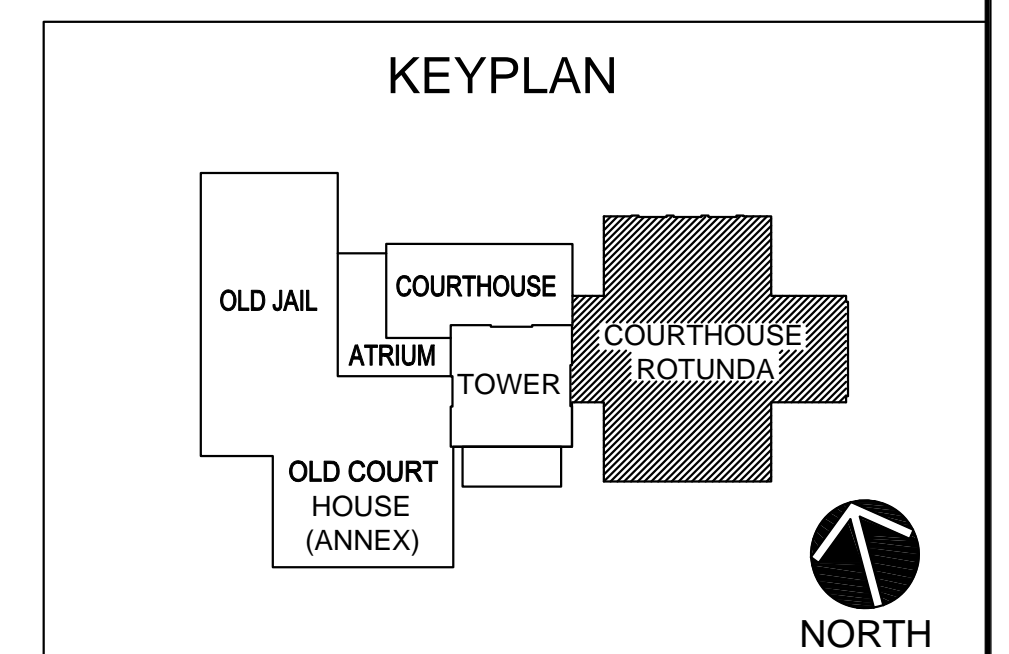
KEYED NEW WORK NOTES:

- 1 COORDINATE WITH MECHANICAL DUCTWORK AND FIRE PROTECTION PIPING.
- 2 CORE DRILLING OF THE FLOOR SLAB BY THE GENERAL CONTRACTOR.

DRAWING NOTES:

1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.
2. ALL DOMESTIC WATER PIPING SHALL BE COPPER TYPE L. PROVIDE 1-1/2" FIBERGLASS INSULATION ON ALL SUPPLY AND RETURN LINES. WHERE LINES PENETRATE THE FLOOR PROVIDE RISER CLAMPS.
3. ALL SANITARY AND VENT PIPING SHALL BE STANDARD WEIGHT CAST IRON, NO HUB, NEOPRENE GASKETS, AND CLAMP-AND-SHIELD ASSEMBLIES. UNDERGROUND PIPING SHALL BE EXTRA HEAVY CAST IRON. WHERE LINES PENETRATE THE FLOOR PROVIDE RISER CLAMPS.
4. ALL CONDENSATE PIPING SHALL BE COPPER TYPE M.
5. COORDINATE ALL FINAL PIPING REQUIREMENTS FOR EQUIPMENT PROVIDED BY OTHER TRADES WITH FINAL EQUIPMENT SUBMITTALS PRIOR TO INSTALLATION. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION AS RECOMMENDED BY MANUFACTURER.

PIPING PLAN - FIRST FLOOR
SCALE: 1/8"=1'-0"



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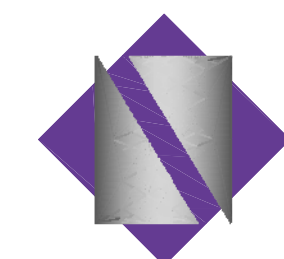
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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394



ASSOCIATED TECHNOLOGY INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
1000 ROUTE 206, SUITE 100, HANOVER, NJ 07930
TEL: 973-378-2888 FAX: 973-378-2884
WWW.ATITECHCONS.COM

JOSEPH J. HENDERSON, PE
NJ PE NO. 36389



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-378-0088 FAX: 973-378-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

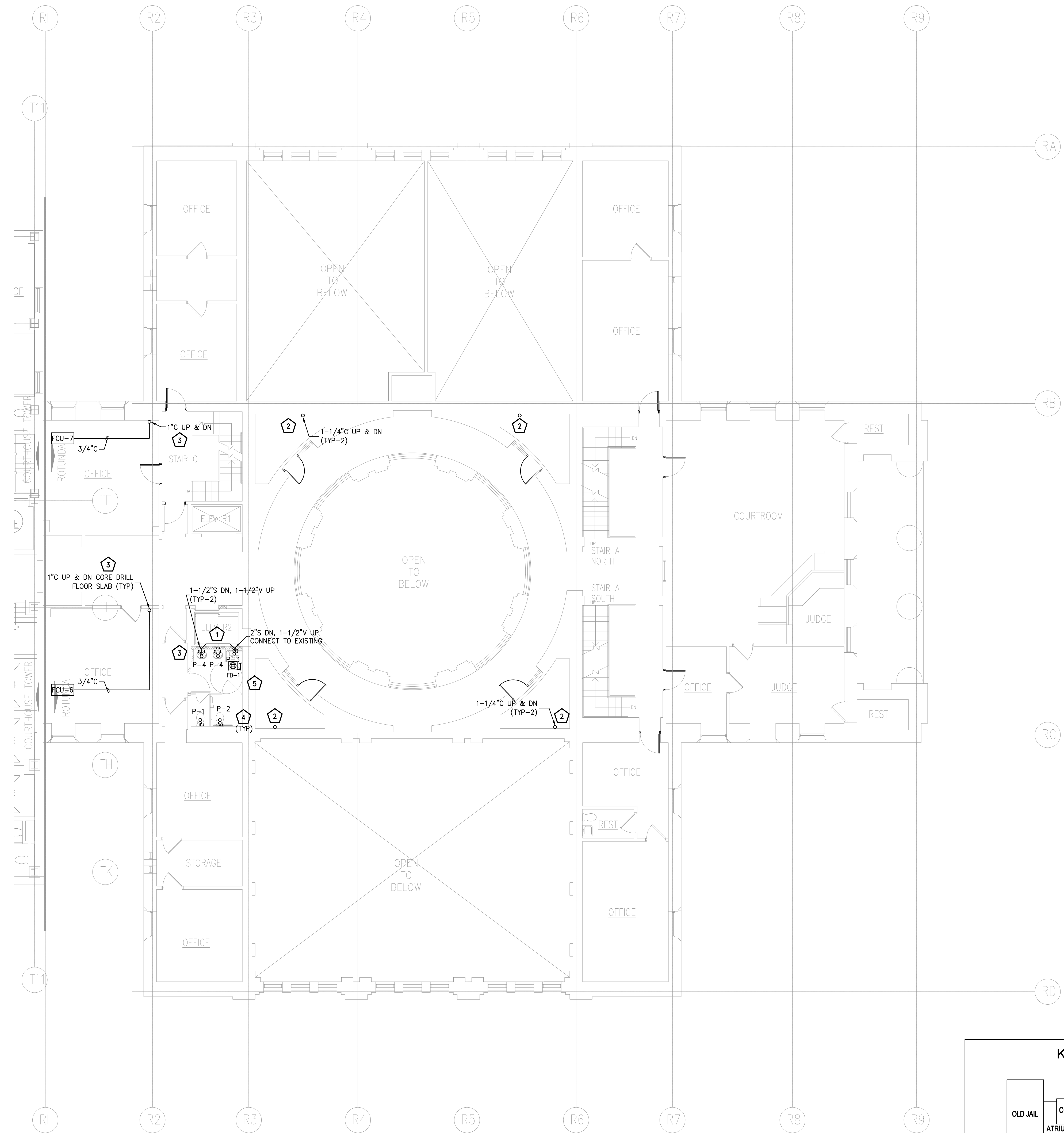
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

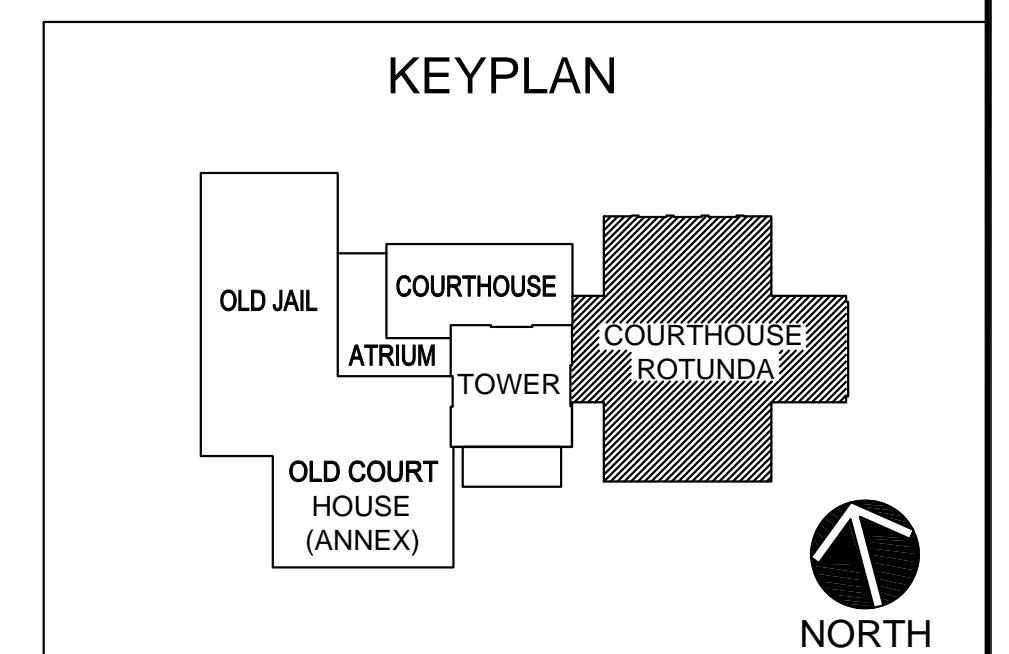
**PLUMBING - PIPING PLAN
FIRST FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

P.301



PIPING PLAN - THIRD FLOOR
SCALE: 1/8"=1'-0"



KEYED NEW WORK NOTES:

- 1 OFFSET EXISTING SANITARY VENT, CW & HW PIPING IN SHAFT TO CLEAR THE NEW ELEVATOR INSTALLATION. REMOVE PIPING FROM WALL AND ROUTE AS REQUIRED FOR FLOOR MOUNTED INSTALLATION. COORDINATE FINAL DETAILS WITH ARCHITECTURAL PLANS FOR WALL RELOCATION AND ELEVATOR WORK. PROVIDE NEW FIXTURES AS SCHEDULED. PROVIDE NEW TRAPS, FLEXIBLE WATER LINES, AND SHUTOFF VALVES.
- 2 COORDINATE WITH MECHANICAL DUCTWORK AND FIRE PROTECTION PIPING.
- 3 CORE DRILLING OF THE FLOOR SLAB BY THE GENERAL CONTRACTOR.
- 4 EXISTING TOILETS TO BE REPLACED WITH NEW UNITS. RE-ROUTE SANITARY, VENT, AND DOMESTIC WATER AS REQUIRED FOR FLOOR MOUNTED INSTALLATION. REFER TO SCHEDULE FOR NEW FIXTURES. PROVIDE NEW TRAP, FLEXIBLE WATER LINE, AND SHUTOFF VALVE.
- 5 PROVIDE NEW FLOOR DRAIN. ROUTE 3" SANITARY LINE TO EXISTING RISER IN WALL FOR CONNECTION.

DRAWING NOTES:

1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.
2. ALL DOMESTIC WATER PIPING SHALL BE COPPER TYPE L. PROVIDE 1-1/2" FIBERGLASS INSULATION ON ALL SUPPLY AND RETURN LINES. WHERE LINES PENETRATE THE FLOOR PROVIDE RISER CLAMPS.
3. ALL SANITARY AND VENT PIPING SHALL BE STANDARD WEIGHT CAST IRON, NO HUB, NEOPRENE GASKETS, AND CLAMP-AND-SHIELD ASSEMBLIES. UNDERGROUND PIPING SHALL BE EXTRA HEAVY CAST IRON. WHERE LINES PENETRATE THE FLOOR PROVIDE RISER CLAMPS.
4. ALL CONDENSATE PIPING SHALL BE COPPER TYPE M.
5. COORDINATE ALL FINAL PIPING REQUIREMENTS FOR EQUIPMENT PROVIDED BY OTHER TRADES WITH FINAL EQUIPMENT SUBMITTALS PRIOR TO INSTALLATION. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION AS RECOMMENDED BY MANUFACTURER.

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NJ License No. AI 14394



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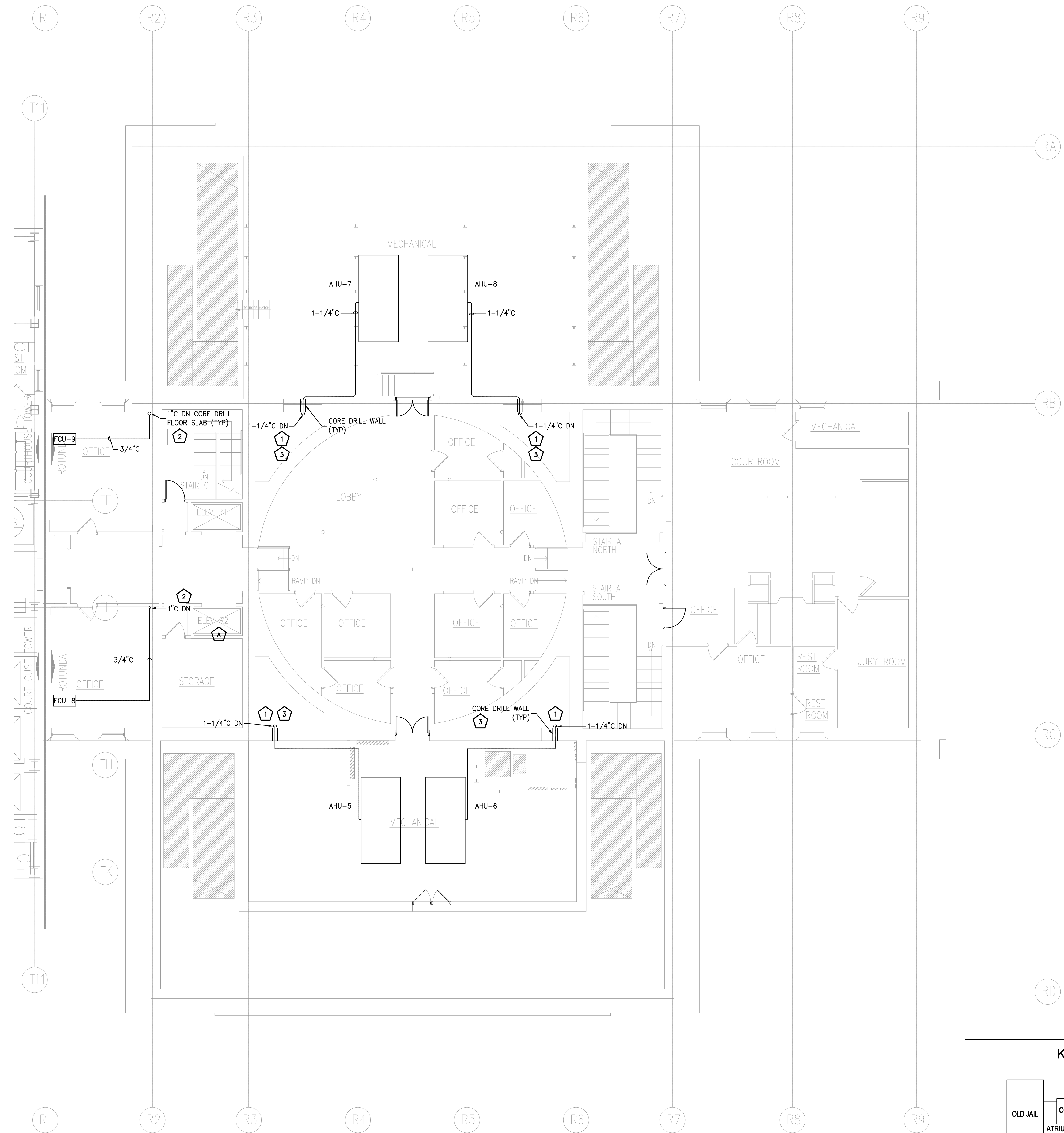
UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

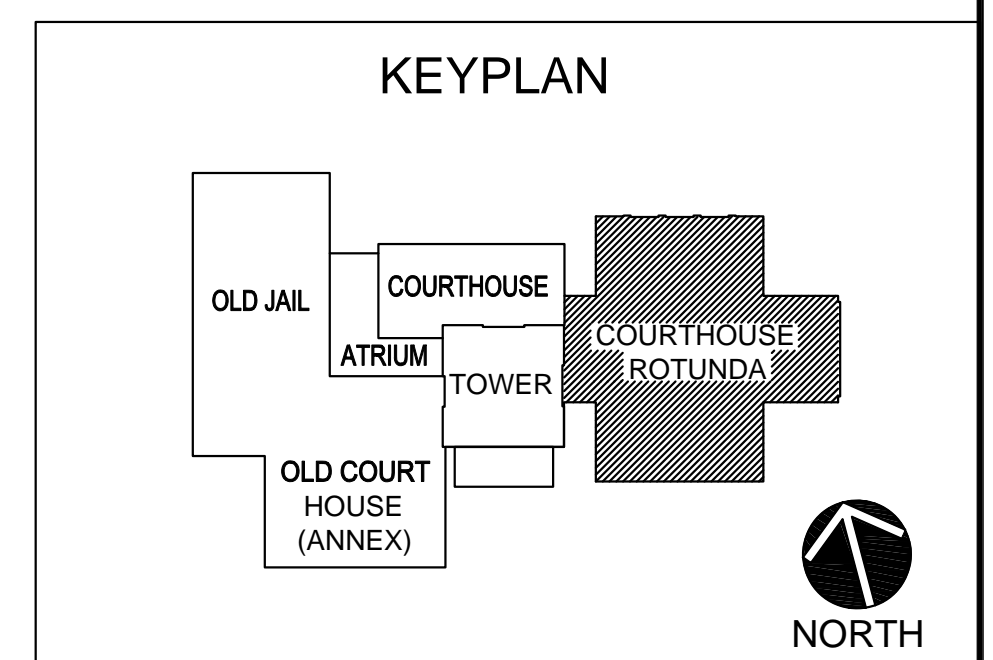
PLUMBING - PIPING PLAN
THIRD FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
09.07.17	ISSUED FOR BID	KD	FM						CHKD BY NJN
									JOB NO 2141152
									SHEET: _ OF:
									DWG. NO

P.303



PIPING PLAN - FOURTH FLOOR
SCALE: 1/8"=1'-0"



KEYED NEW WORK NOTES:

- 1 COORDINATE WITH MECHANICAL DUCTWORK AND FIRE PROTECTION PIPING.
- 2 CORE DRILLING OF THE FLOOR SLAB BY THE GENERAL CONTRACTOR.
- 3 CORE DRILL OF THE WALL BY THE GENERAL CONTRACTOR.

DRAWING NOTES:

- 1. REFER TO DRAWING P-101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.
- 2. ALL DOMESTIC WATER PIPING SHALL BE COPPER TYPE L. PROVIDE 1-1/2" FIBERGLASS INSULATION ON ALL SUPPLY AND RETURN LINES. WHERE LINES PENETRATE THE FLOOR PROVIDE RISER CLAMPS.
- 3. ALL SANITARY AND VENT PIPING SHALL BE STANDARD WEIGHT CAST IRON, NO HUB, NEOPRENE GASKETS, AND CLAMP-AND-SHIELD ASSEMBLIES. UNDERGROUND PIPING SHALL BE EXTRA HEAVY CAST IRON. WHERE LINES PENETRATE THE FLOOR PROVIDE RISER CLAMPS.
- 4. ALL CONDENSATE PIPING SHALL BE COPPER TYPE M.
- 5. COORDINATE ALL FINAL PIPING REQUIREMENTS FOR EQUIPMENT PROVIDED BY OTHER TRADES WITH FINAL EQUIPMENT SUBMITTALS PRIOR TO INSTALLATION. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION AS RECOMMENDED BY MANUFACTURER.

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NJ License No. AI 16160
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PROJECT:

UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

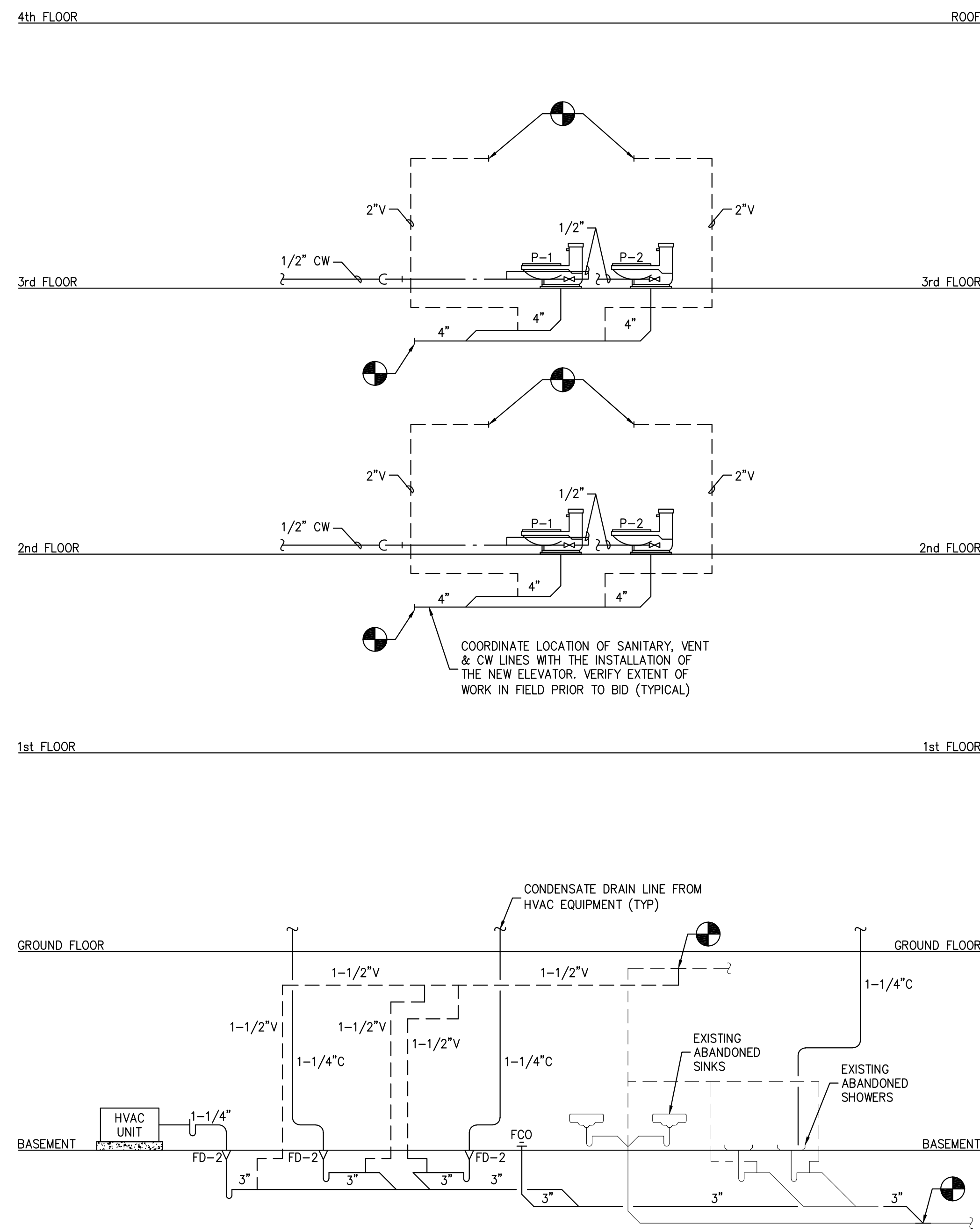
PLUMBING - PIPING PLAN
FOURTH FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM						DRWN BY RB
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									JOB NO 2141152
									SHEET: _ OF:
									DWG. NO

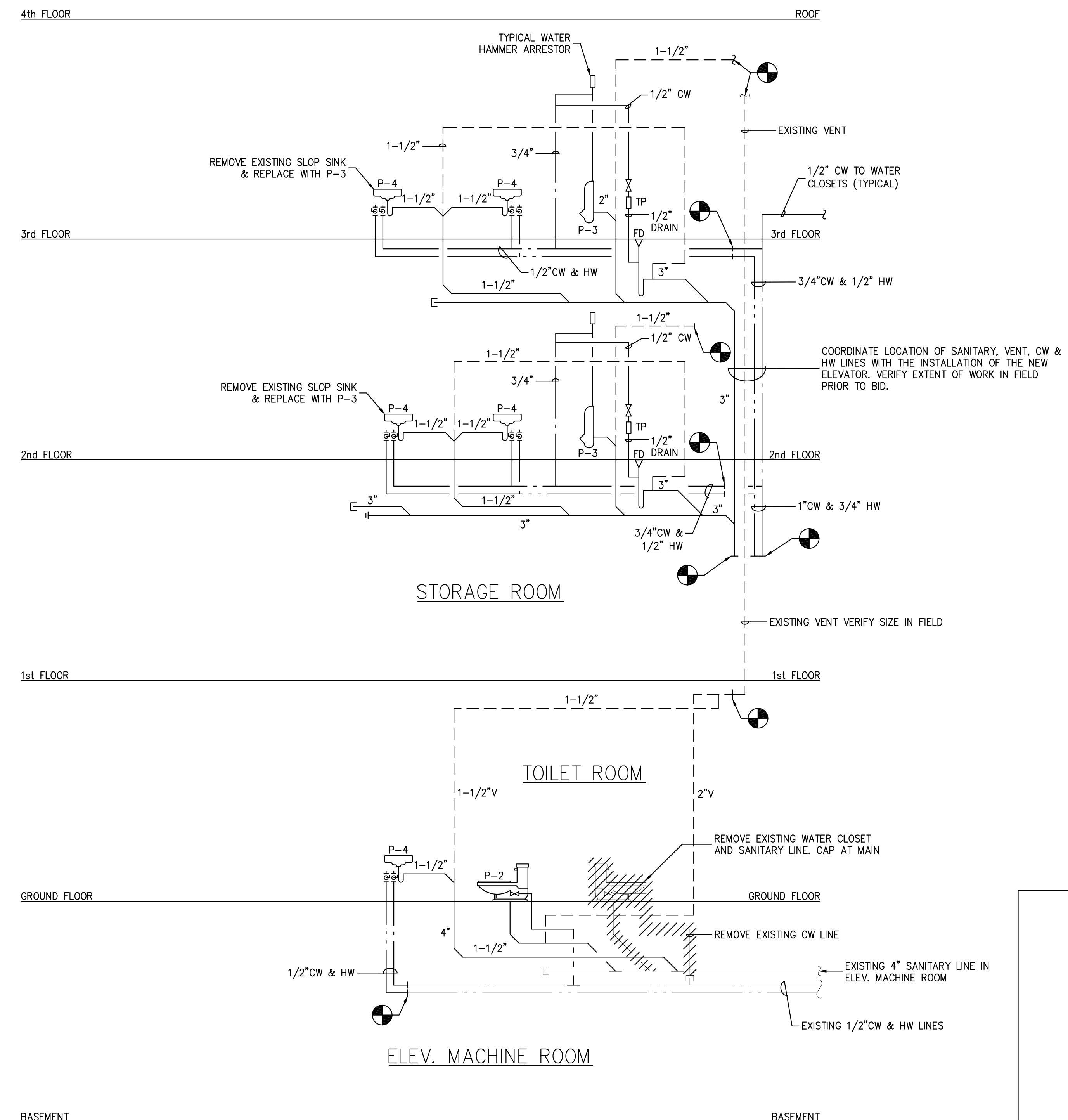
P.304

PLUMBING FIXTURE CONNECTION SCHEDULE

MARK	P-1	P-2	P-3	P-4	FD-1	FD-2	TP	SP-1
FIXTURE	WATER CLOSET	ADA WATER CLOSET	URINAL	LAVATORY	FLOOR DRAIN	FLOOR DRAIN	TRAP PRIMER	ELEVATOR SUMP PUMP
MANUFACTURER	AMERICAN STANDARD	AMERICAN STANDARD	AMERICAN STANDARD	AMERICAN STANDARD	J.R. SMITH	J.R. SMITH	PPP INC.	WELL PUMP
CATALOG NUMBER	2467.016	2467.016	6501.100	0491.019	2005 YB	2110	PR-500	1411
MOUNTING	FLOOR	FLOOR	WALL	COUNTERTOP	FLOOR	FLOOR	INLINE	ELEVATOR PIT
WASTE SIZE	4"	4"	2"	1-1/2"	3"	3"	1/2"	1-1/2"
VENT SIZE	2"	2"	1-1/2"	1-1/2"	1-1/2"	1-1/2"	-	-
COLD WATER SIZE	1/2"	1/2"	3/4"	1/2"	-	-	1/2"	-
HOT WATER SIZE	-	-	-	1/2"	-	-	-	-
DRAINAGE FIXTURE UNITS (DFU)	4	4	4	1	-	-	-	-
SUPPLY FIXTURE UNITS (SFU)	2.5	2.5	4	1	-	-	-	-
ACCESSORIES AND REMARKS	*CADET RIGHT HEIGHT* 1.8 GALLONS PER FLUSH, ELONGATED TOILET, PRESSURE ASSISTED SIPHON JET ACTION, AMERICAN STANDARD NO. 295SST.024 SOLID PLATIC WHITE OPEN FRONT SEAT WITH COVER. FURNISH ADA COMPLIANT TRIP LEVER ON OPEN SIDE OF COMPARTMENT CHROME PLATED STOP VALVE, SUPPLY PIPE AND ESCUTCHEON.	*CADET RIGHT HEIGHT* 1.8 GALLONS PER FLUSH, ELONGATED TOILET, PRESSURE ASSISTED SIPHON JET ACTION, AMERICAN STANDARD NO. 295SST.024 SOLID PLATIC WHITE OPEN FRONT SEAT WITH COVER. FURNISH ADA COMPLIANT TRIP LEVER ON OPEN SIDE OF COMPARTMENT CHROME PLATED STOP VALVE, SUPPLY PIPE AND ESCUTCHEON.	TOP SPUD SLOAN ROYAL 186-1 J.R. SMITH FIXTURE SUPPORT	VITREOUS CHINA 4" CENTERS, 19" DIAMETER BOWL, GRIP DRAIN, 1-1/2" P-TRAP, 1/2" STOP VALVES AND SUPPLY PIPE CHROME PLATED. FAUCET MODEL 7335.003 TRUEBRO LAV-GUARD 103EZ	CAST IRON WITH ADJUSTABLE NICKEL BRONZE STRAINER AND SEDIMENT BUCKET. TRAP PRIMER FITTING	CAST IRON BODY AND BAR GRATE	1/2 HP, 115/160 50 GPM AT 15 FT. HEAD, CAST IRON HOUSING FLOAT SWITCH, POWER CORD, SCREENED INLET. SEE DETAIL	



RISER DIAGRAM
SCALE: NONE



PROJECT:
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
**PLUMBING
RISER DIAGRAM & PLUMBING SCHEDULE**

SUBMISSIONS				REVISIONS				DATE	09-25-15
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9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
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								JOB NO	2141152
								SHEET	_ OF:
								DWG. NO	

P.601

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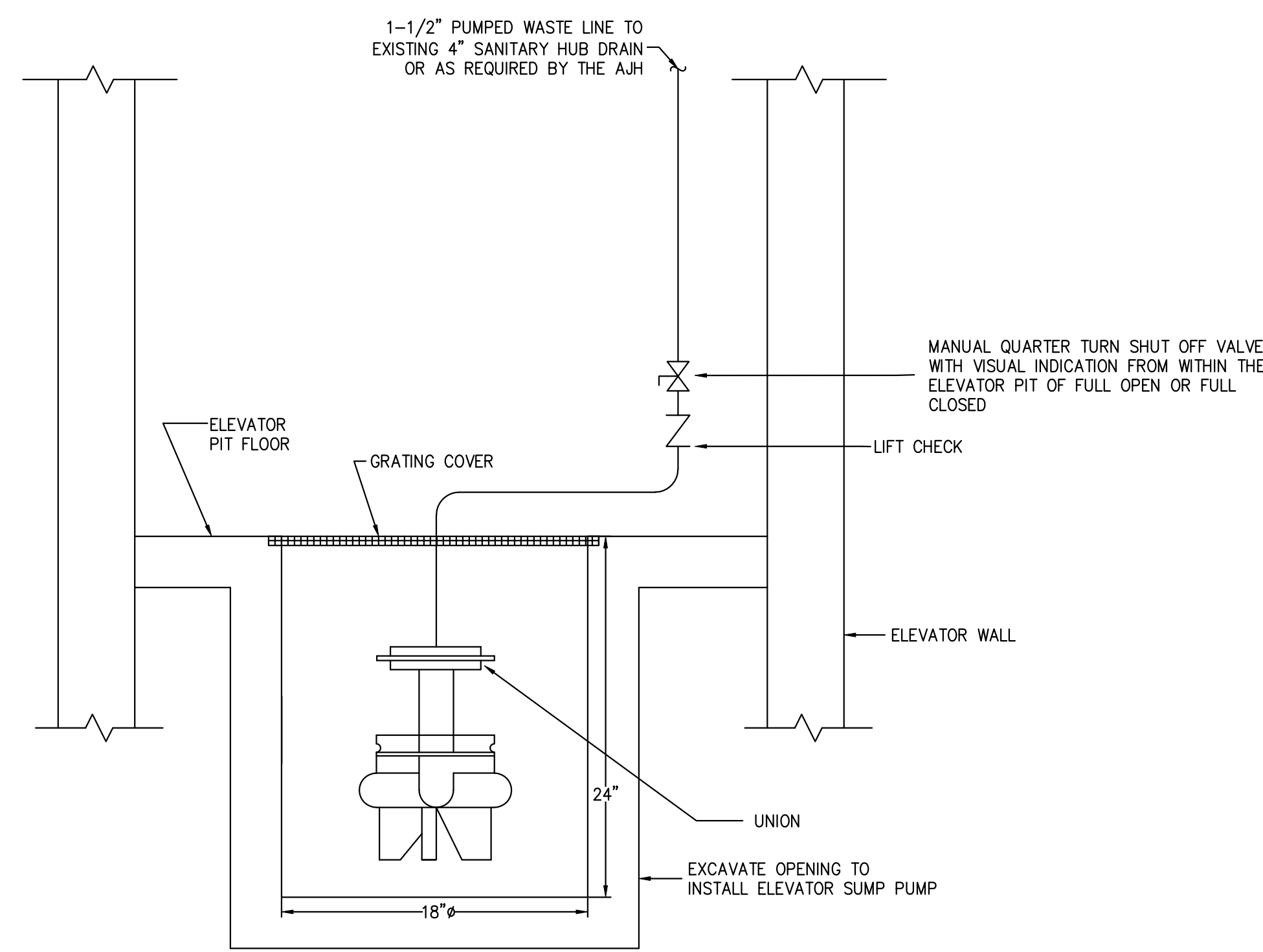
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LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

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JOSEPH J. HENDERSON, PE
NJ License No. 36049



ELEVATOR SUMP PUMP - SP-1

A SINGLE SUMP PUMP SHALL BE FURNISHED AS COMPLETE UNIT.

PUMP SHALL BE WEIL PUMP MODEL 1411 HERMETICALLY SEALED DRY RUN TYPE WITH EPOXY ENCAPSULATION WHICH IS NON-AGING, MOISTURE, ACID AND ALKALI RESISTANT PERMITTING PUMPS TO OPERATE WITHOUT OVERHEATING AT A LOW OR NO WATER LEVEL.

PUMP SHALL BE SUBMERSIBLE TYPE, CAST IRON CONSTRUCTION, POLYMER IMPELLER, SEMI-OPEN TYPE, HEAVY DUTY MECHANICAL SEAL WITH FACES "SILICON CARBIDE" COATED, STAINLESS STEEL SELF-CLEANING SUCTION STRAINER, 15' OF NEOPRENE JACKETED POWER CABLE, 300 SERIES STAINLESS STEEL SHAFT.

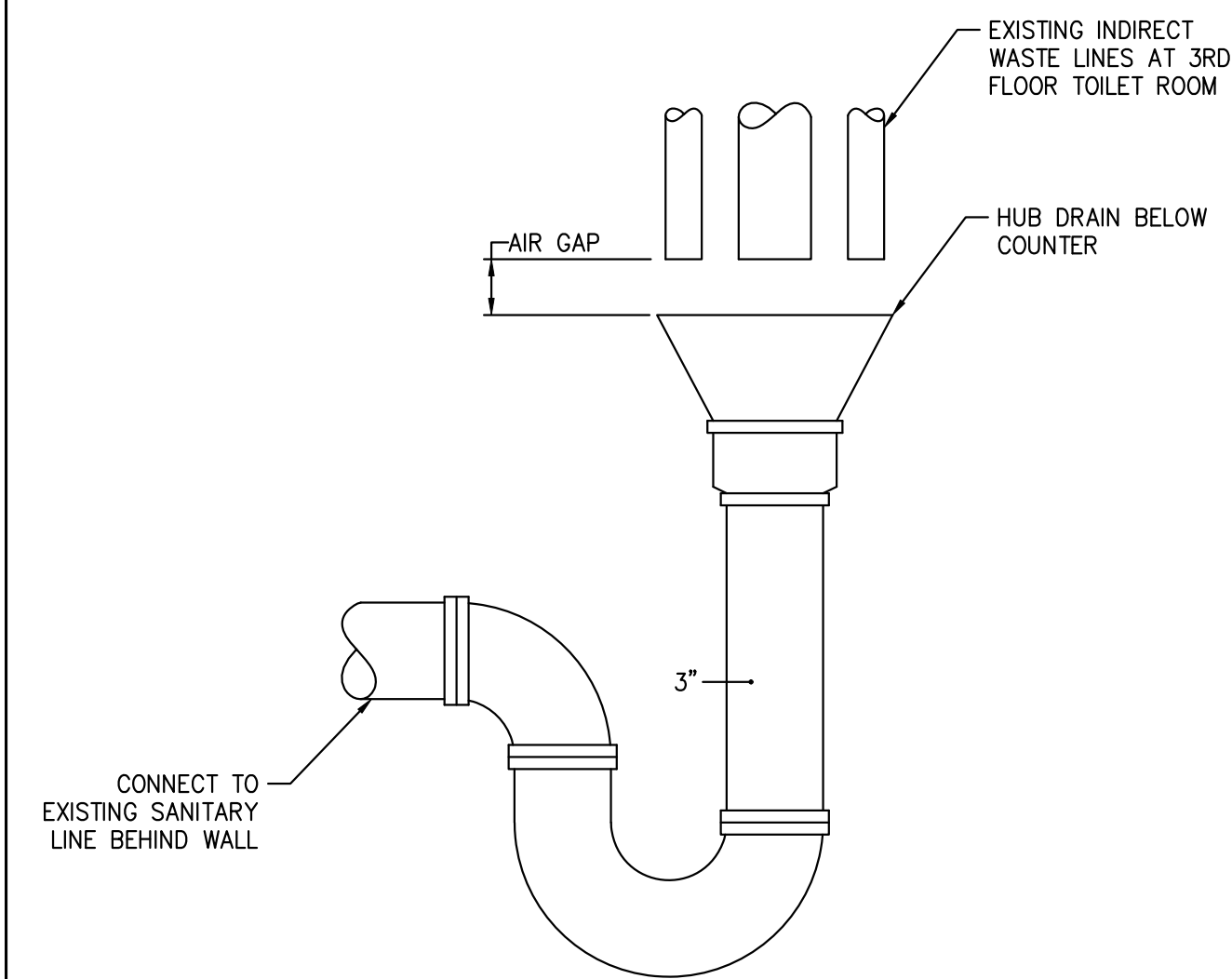
PUMP TO HAVE A CAPACITY OF 50 GPM AT A TOTAL DYNAMIC HEAD OF 20 FEET AND TO OPERATE AT 3450 RPM. PUMP TO HAVE CURVE CHARACTERISTICS SO AS NOT TO OVERLOAD THE 1/2 HP MOTOR AT ANY POINT THROUGHOUT ITS ENTIRE RANGE.

MOTOR TO BE 1/2 HP, SINGLE PHASE, 60 HERTZ, 115 VOLTS, 3450 RPM, HOUSED IN AIR FILLED WATERTIGHT CAST IRON MOTOR SHELL WITH THE WINDINGS HAVING CLASS "F" INSULATION, NEMA-5 AND PRELUBRICATED DOUBLE SEAL BEARINGS. OIL FILLED MOTORS ARE NOT ACCEPTABLE.

PROVIDE CHECK AND GATE VALVES ON THE DISCHARGE OF THE PUMP. COMPLETE THE PIPING AS SHOWN AND CLEAN THE BASIN OF ALL DEBRIS BEFORE STARTING PUMPS INTO OPERATION.

ELEVATOR SUMP PUMP DETAIL

SCALE: NONE

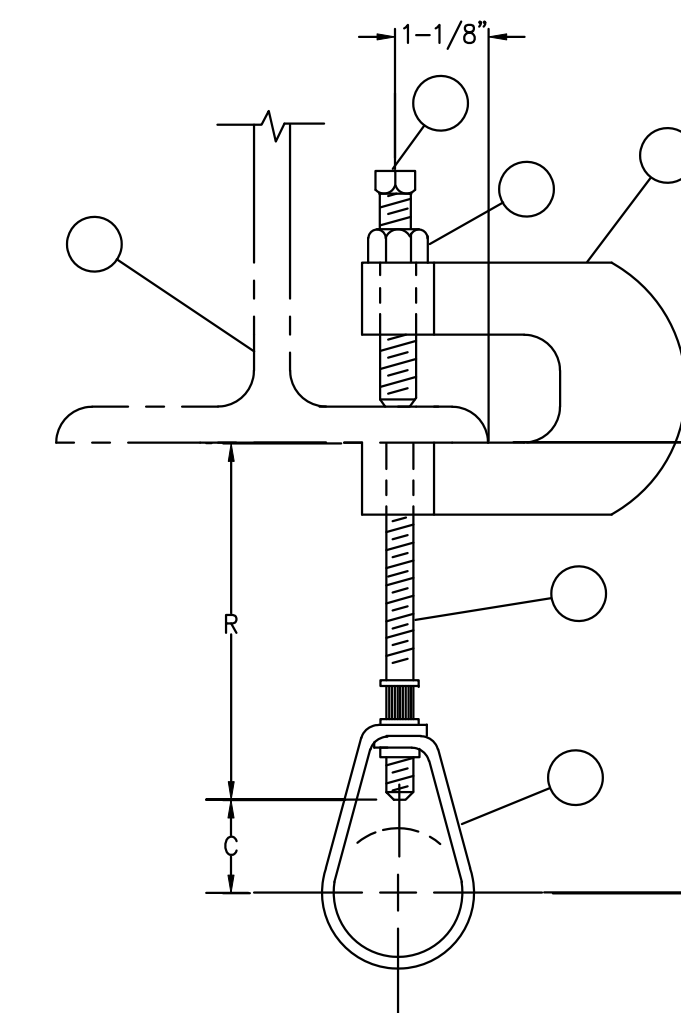


HUB DRAIN WITH FUNNEL DETAIL

SCALE: NONE

DESIGN DATA FOR C-CLAMP HANGER

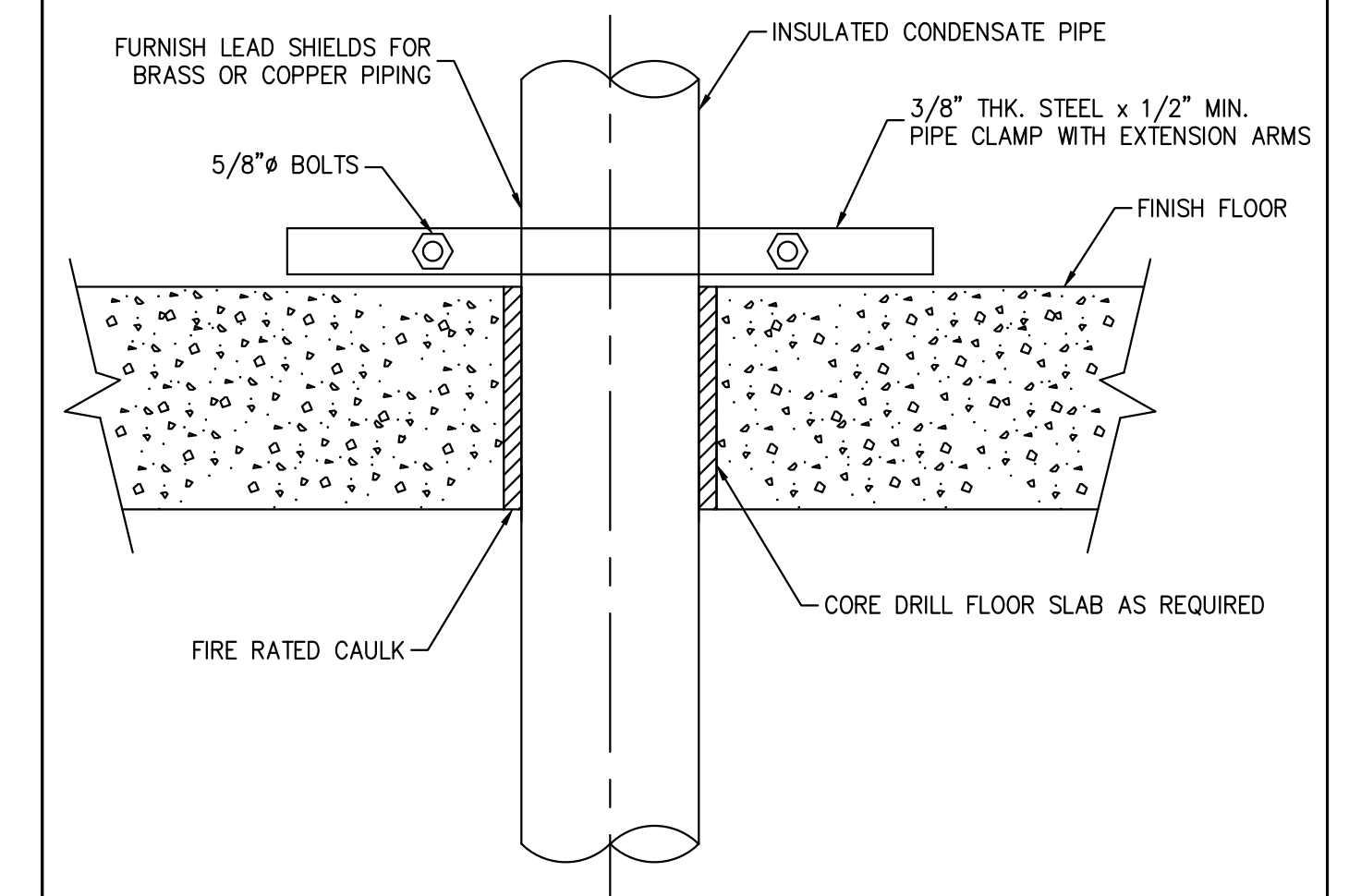
Nominal Pipe Size	Minimum A Dimension inches	Hanger Takeout inches	Rod Diameter inches
1/2	3 1/2	-1 1/4	3/8
3/4	3 1/2	-1 1/4	3/8
1	3 1/2	-1 1/4	3/8
1 1/4	3 3/4	-1 1/2	3/8
1 1/2	4	-1 1/2	3/8
2	4 1/4	-1 3/4	3/8
2 1/2	5	-2 1/4	3/8
3	5 1/2	-2 1/2	3/8
4	6	-3	3/8



STANDARD C-CLAMP PIPE HANGER

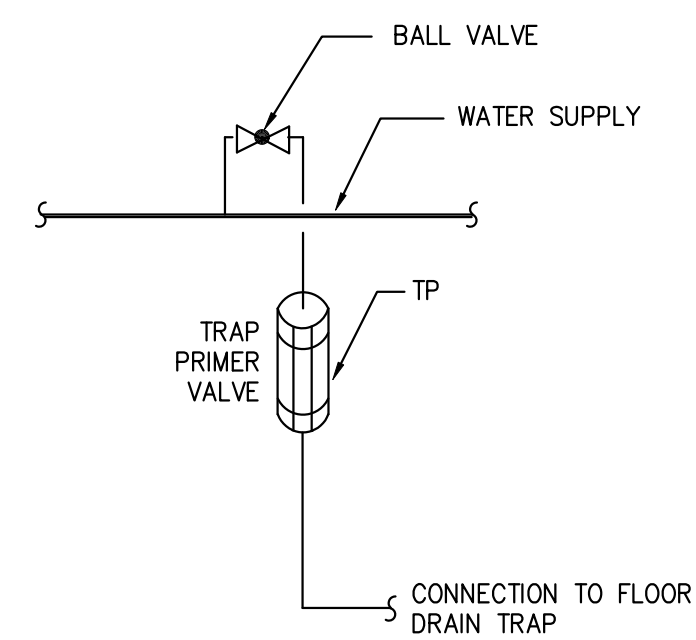
SCALE: NONE

- Components:
1. C-Clamp
 2. Set Screw
 3. Lock Nut
 4. Hanger Rod
 5. Adjustable Hanger Ring
 6. Steel Beam or Bar Joist



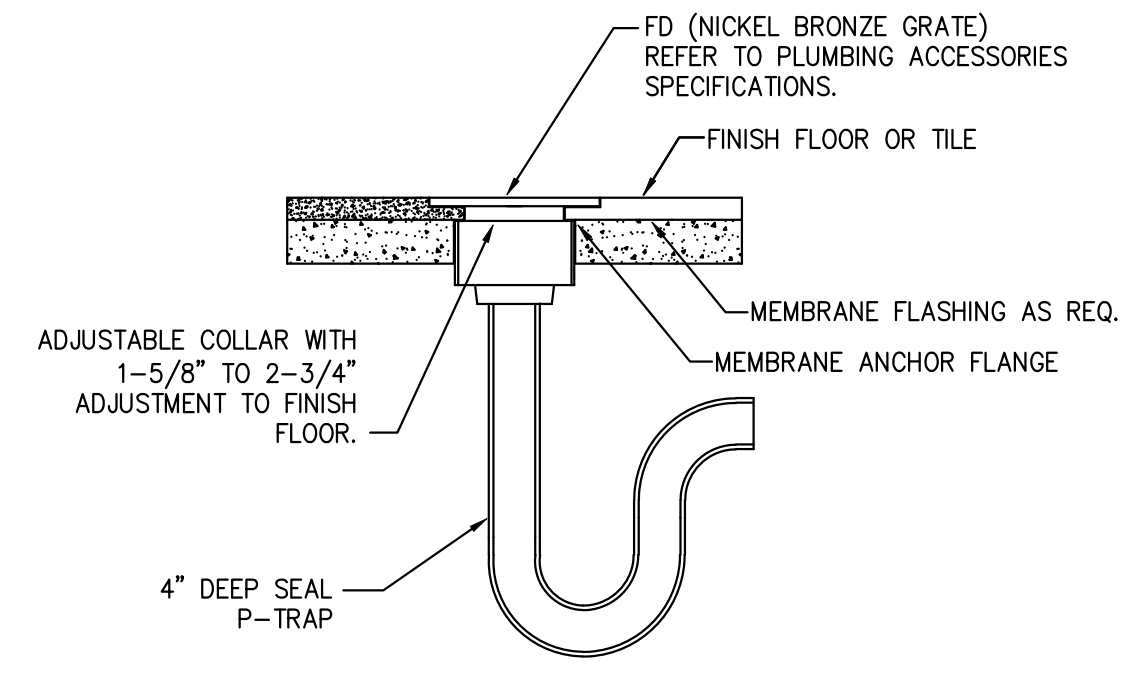
PIPE RISER SUPPORT DETAIL

SCALE: NONE



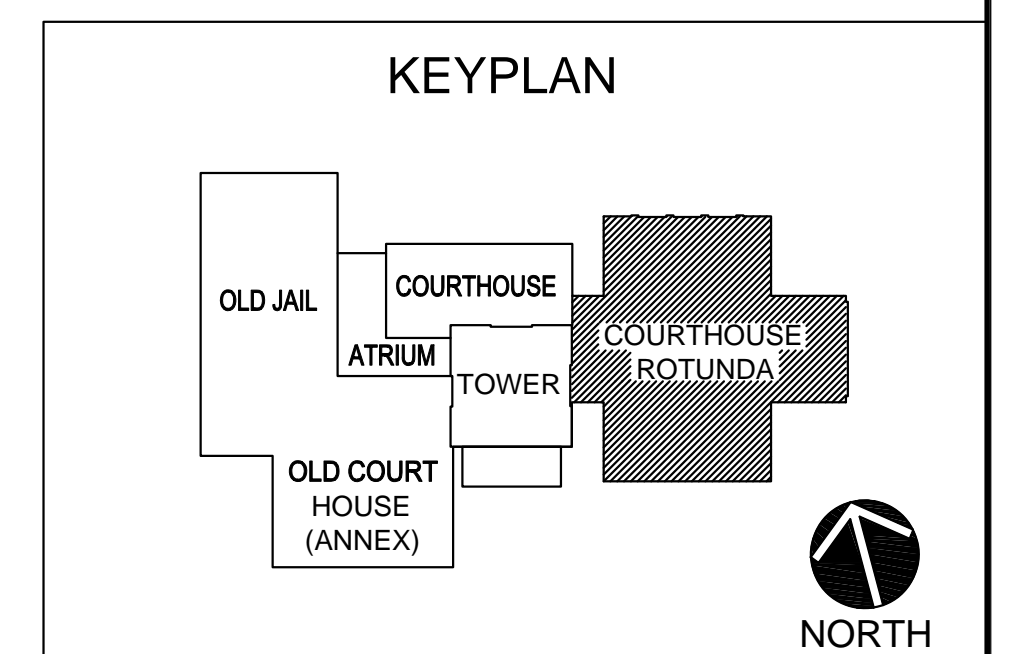
TRAP PRIMER DETAIL

SCALE: NONE



TOILET AREA FLOOR DRAIN

SCALE: NONE



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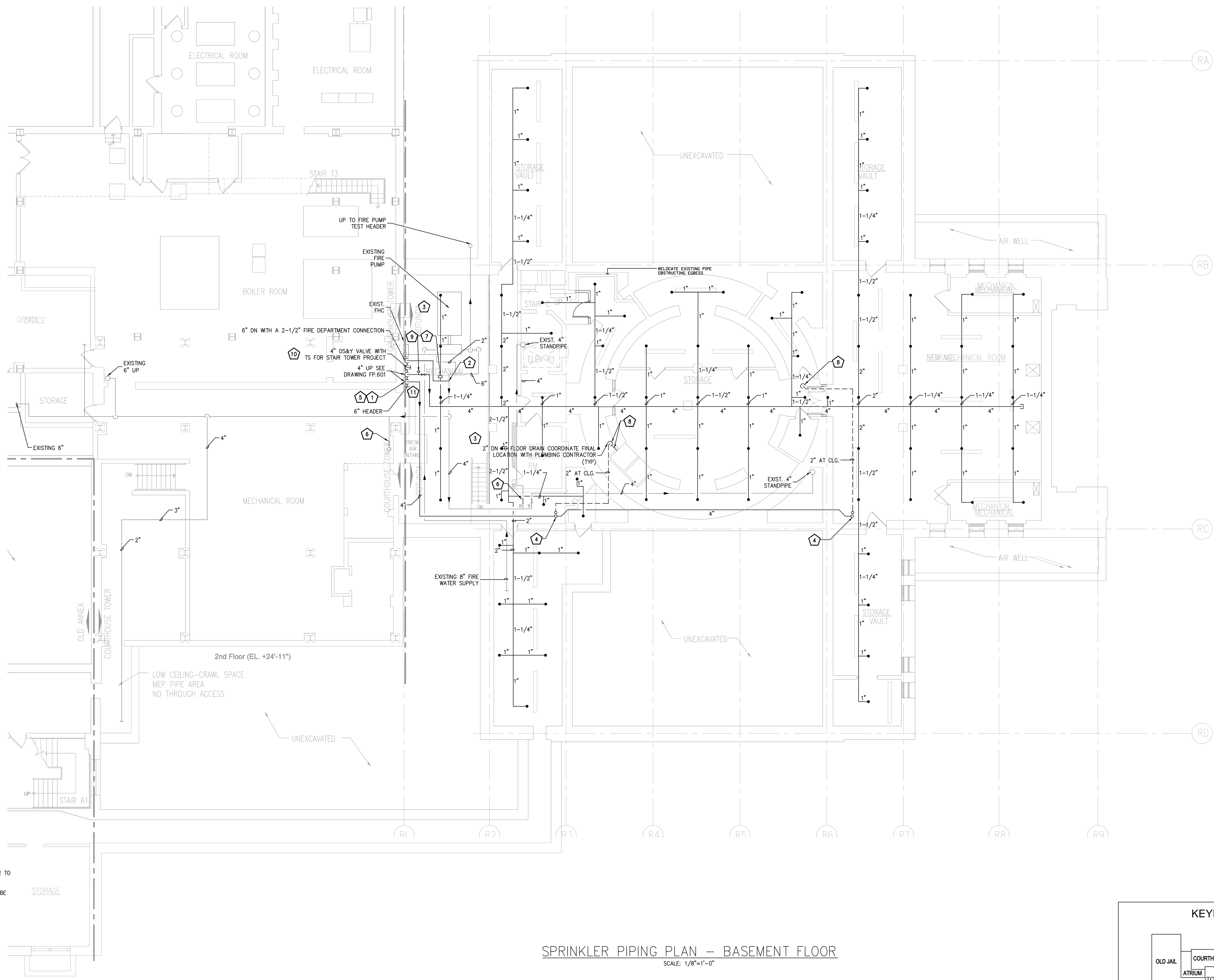
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**PLUMBING
DETAILS (SHEET 1)**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

P.801



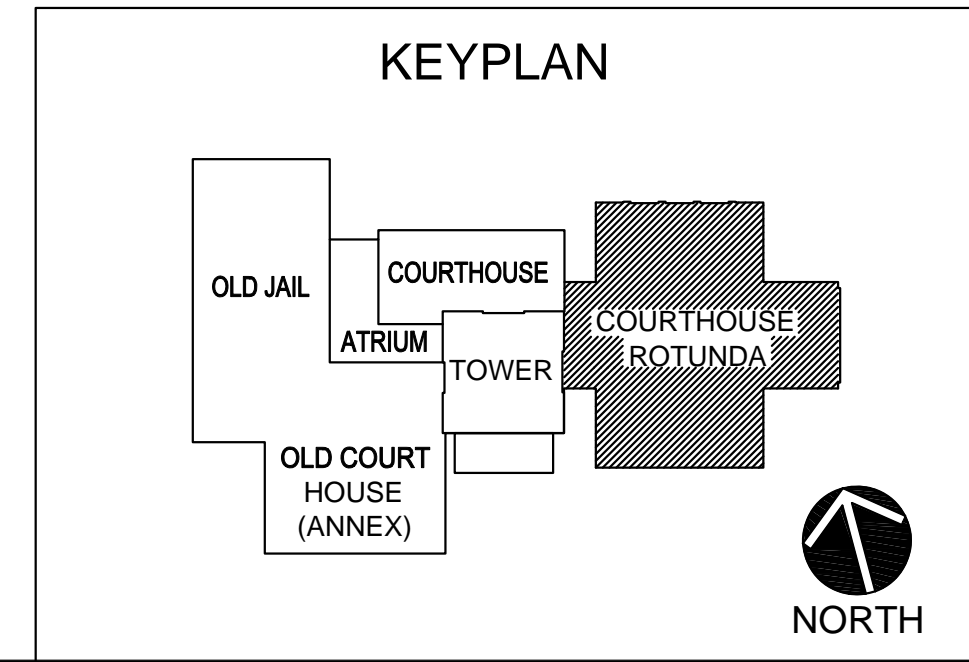
KEYED NEW WORK NOTES:

- 1. INSTALL NEW SPRINKLER ALARM VALVE STATION. SEE DETAIL ON DRAWING FP.601.
- 2. MAKE NEW CONNECTION TO EXISTING 6" FIREWATER MAIN AT THE CEILING.
- 3. MAKE PROVISIONS FOR ADDITIONAL SPRINKLER HEADS IN THIS AREA DUE TO OBSTRUCTIONS.
- 4. INSTALL 4" SPRINKLER MAIN UP AND 2" TEST DRAIN DOWN.
- 5. RUN 2" TEST DRAIN TO NEAREST FLOOR DRAIN.
- 6. EXISTING 6" VALVE WITH SUPERVISORY SWITCH AND FLOW SWITCH TO REMAIN.
- 7. INSTALL NEW O.S.&Y VALVE WITH SUPERVISORY SWITCH AND FLOW SWITCH AND CONNECT TO THE ALARM CONTROL PANEL.
- 8. DRAIN NEW 2" TEST DRAIN INTO EXISTING FUNNEL DRAIN ABOVE FINISHED FLOOR.
- 9. REMOVE EXISTING HOSE CABINET AND HOSE CONNECTIONS. PROVIDE NEW 2-1/2" HOSE CONNECTION PRIOR TO SPRINKLER ZONE CONNECTIONS.
- 10. 4" OS&Y WITH TS AND CAPPED CONNECTION TO BE PROVIDED UNDER THIS CONTRACT AND PIPING SHALL BE CONTINUED UNDER STAIR TOWER PROJECT.
- 11. EXISTING COMPRESSED AIR PIPING SHALL BE RELOCATED BY THE MECHANICAL CONTRACTOR. SPRINKLER CONTRACTOR TO PROVIDE COORDINATION PRIOR TO THE COMMENCEMENT OF WORK.

DRAWING NOTES:

- 1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.
- 2. SPRINKLER CONTRACTOR SHALL CORE DRILL ALL HOLES NECESSARY TO ACCOMMODATE PIPING.

SPRINKLER PIPING PLAN – BASEMENT FLOOR
SCALE: 1/8"=1'-0"



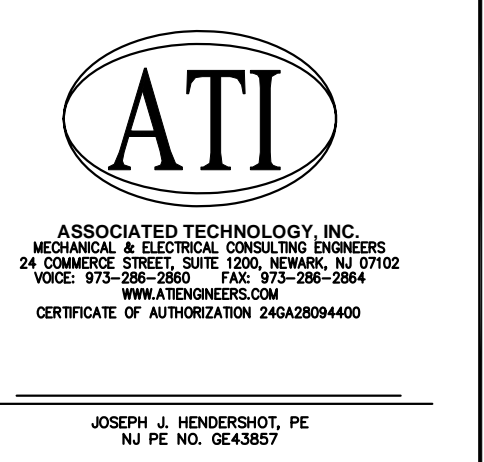
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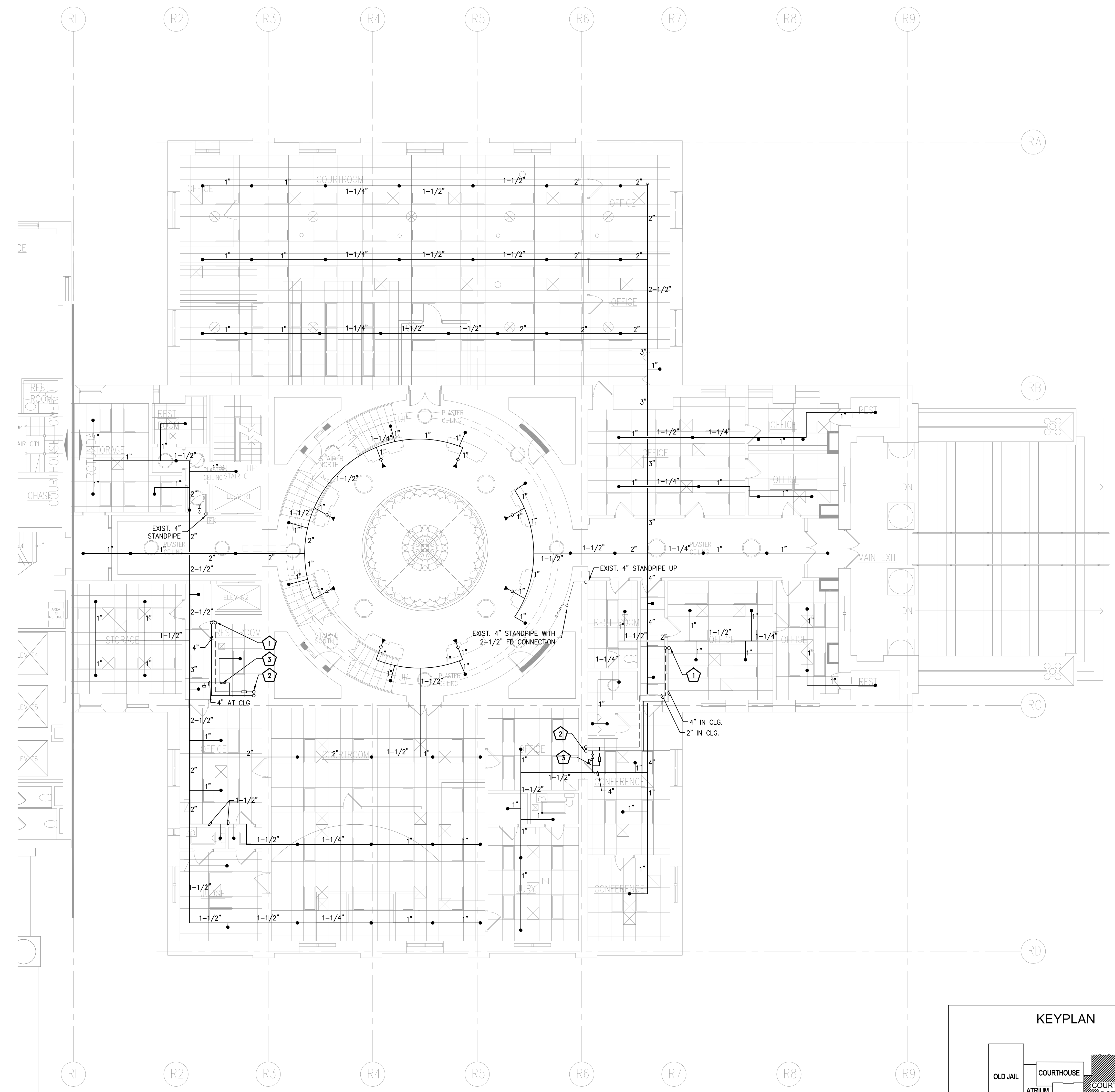


PROJECT: **UC COURTHOUSE FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:
FIRE PROTECTION - SPRINKLER PIPING PLAN BASEMENT FLOOR

SUBMISSIONS				REVISIONS				DATE	09-25-15
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								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

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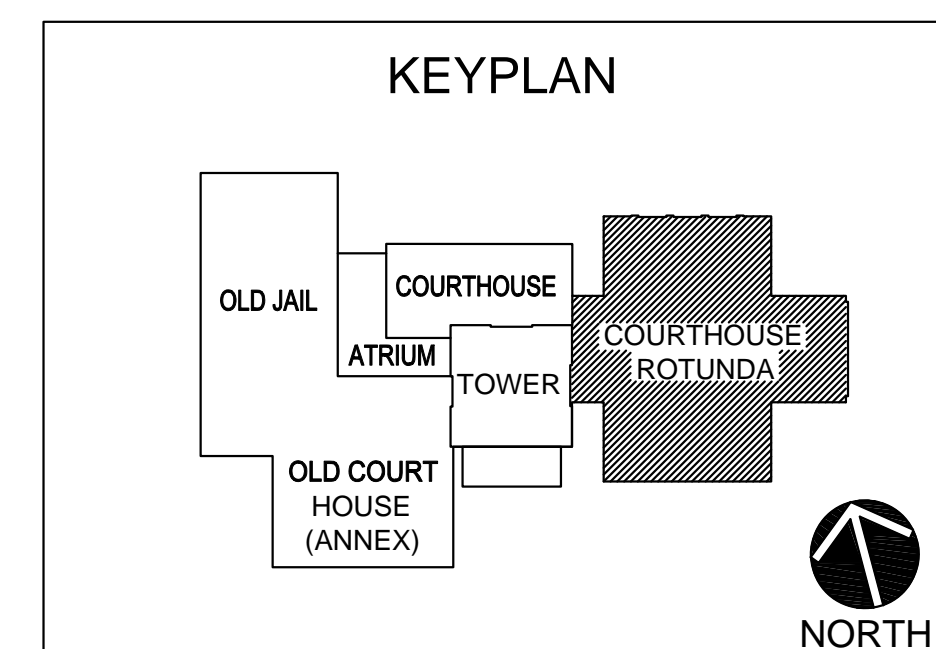


KEYED NEW WORK NOTES:

- 1. INSTALL NEW 4" SPRINKLER MAIN AND 2" TEST DRAIN UP TO FLOOR ABOVE.
- 2. INSTALL NEW 4" SPRINKLER MAIN AND 2" TEST DRAIN DOWN TO FLOOR BELOW.
- 3. INSTALL FLOOR CONTROL VALVE WITH SUPERVISORY AND FLOW SWITCH AND CONNECT TO FIRE ALARM CONTROL PANEL.

DRAWING NOTES:

- 1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.



SPRINKLER PIPING PLAN - FIRST FLOOR
SCALE: 1/8"=1'-0"

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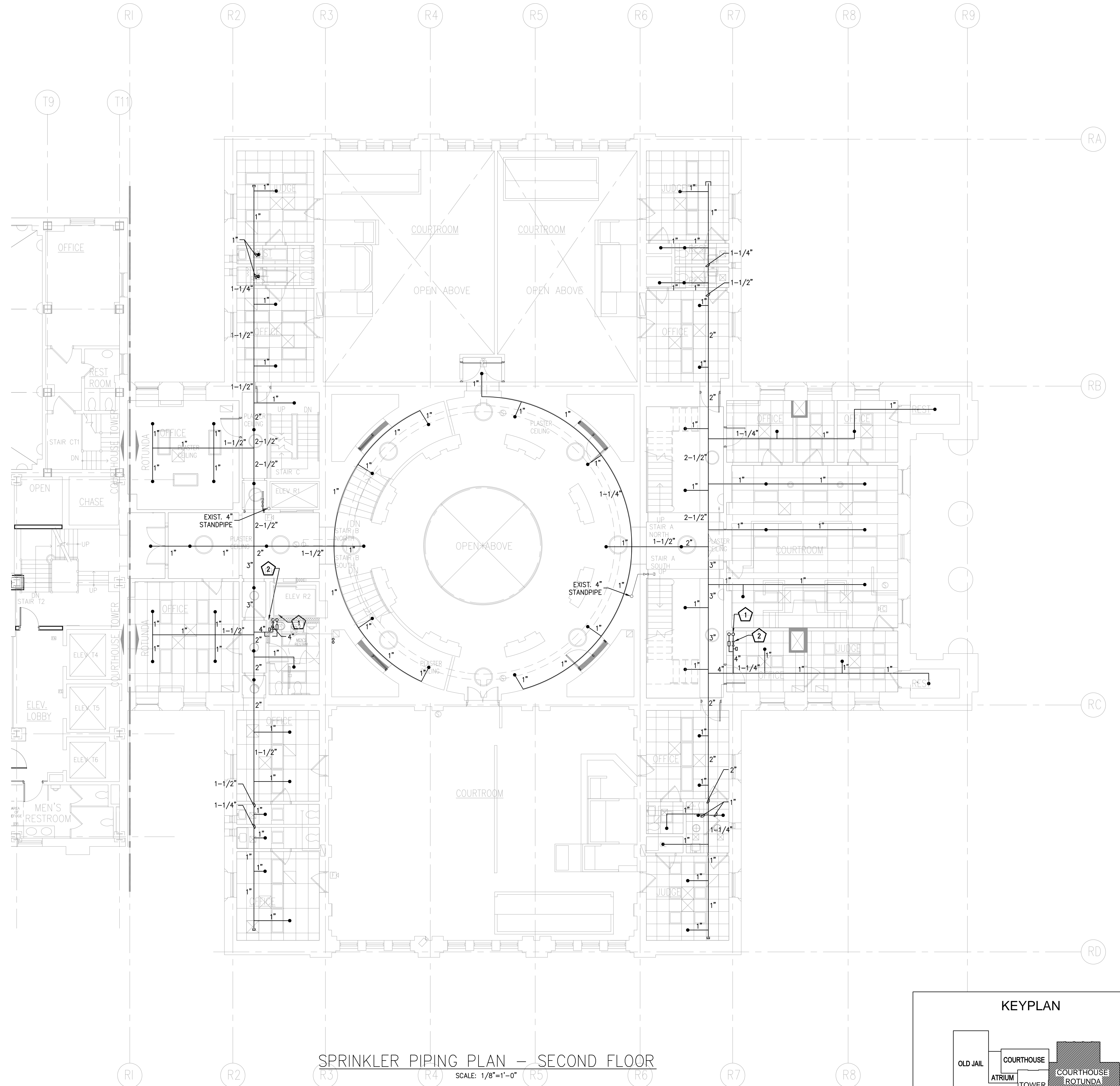


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

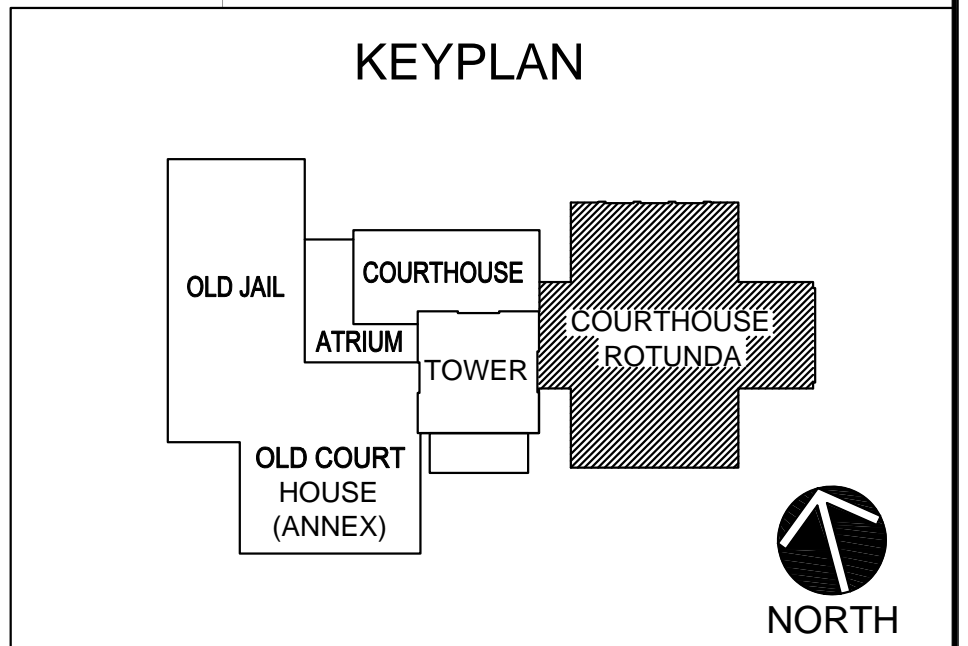
SHEET CONTENTS:
**FIRE PROTECTION - SPRINKLER PIPING PLAN
FIRST FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
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09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

FP.301



SPRINKLER PIPING PLAN - SECOND FLOOR
SCALE: 1/8"=1'-0"



KEYED NEW WORK NOTES:

- 1. INSTALL NEW 4" SPRINKLER MAIN AND 2" TEST DRAIN UP AND DOWN.
- 2. INSTALL FLOOR CONTROL VALVE WITH SUPERVISORY AND FLOW SWITCH AND CONNECT TO FIRE ALARM CONTROL VALVE.

DRAWING NOTES:

- 1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.

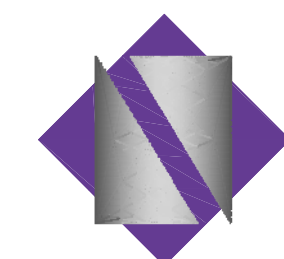
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ASSOCIATED TECHNOLOGY INC.
MECHANICAL & ELECTRICAL CONSULTING BUSINESS
24 CAMDEN DRIVE, SUITE 100, WILMINGTON, NJ 08090
TEL: 856-281-2888 FAX: 856-281-2884
WWW.ATITECHNOLOGY.COM
CERTIFICATE OF AUTHORIZATION 284894840

JOSEPH J. HENDERSON, PE
NJ License No. 364087



NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973-378-0081 FAX: 973-378-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

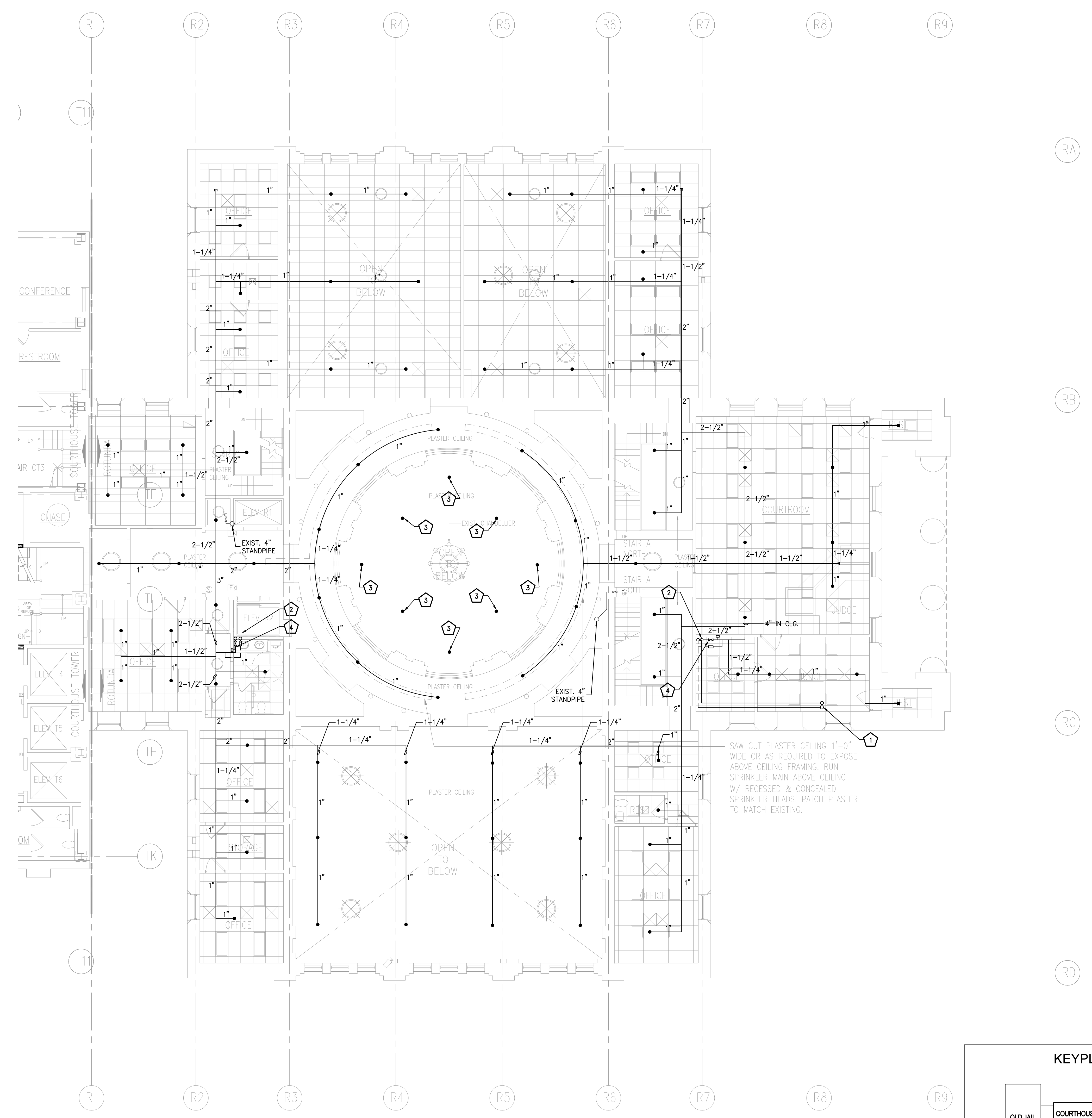
**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**FIRE PROTECTION - SPRINKLER PIPING PLAN
SECOND FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

FP.302



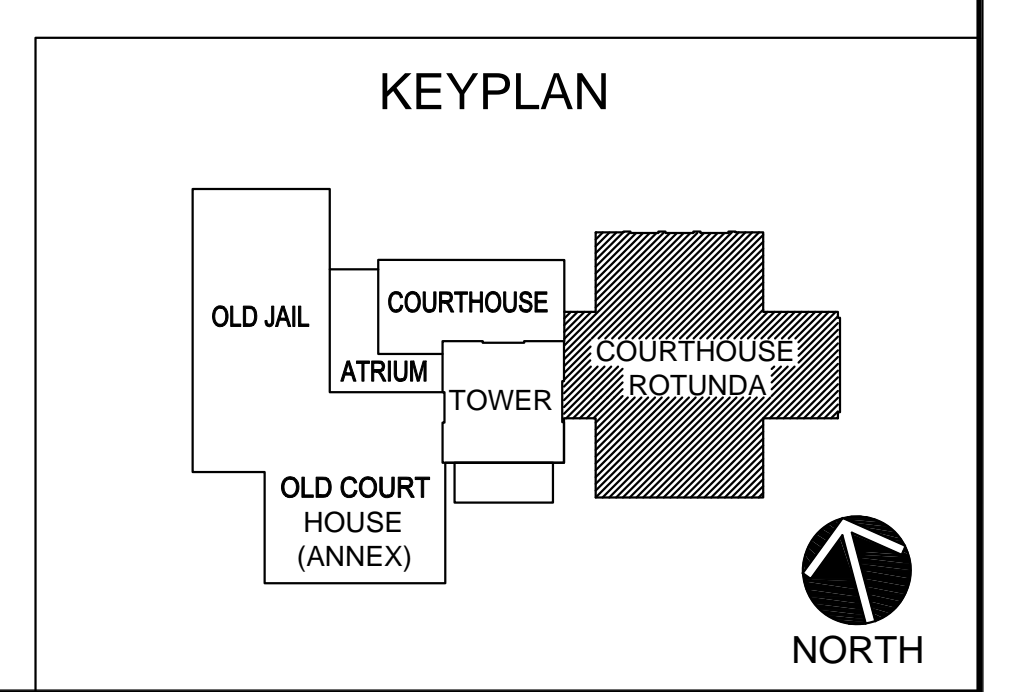
SPRINKLER PIPING PLAN - THIRD FLOOR
SCALE: 1/8"=1'-0"

KEYED NEW WORK NOTES:

- 1. INSTALL NEW 4" SPRINKLER MAIN AND 2" TEST DRAIN UP TO FLOOR ABOVE.
- 2. INSTALL NEW 4" SPRINKLER MAIN AND 2" TEST DRAIN DOWN TO FLOOR BELOW.
- 3. SEE DRAWING FP.304 FOR PIPING TO THE SPRINKLER IN THE ROTUNDA AREA.
- 4. INSTALL FLOOR CONTROL VALVE WITH SUPERVISORY AND FLOW SWITCH AND CONNECT TO FIRE ALARM CONTROL PANEL.

DRAWING NOTES:

- 1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.



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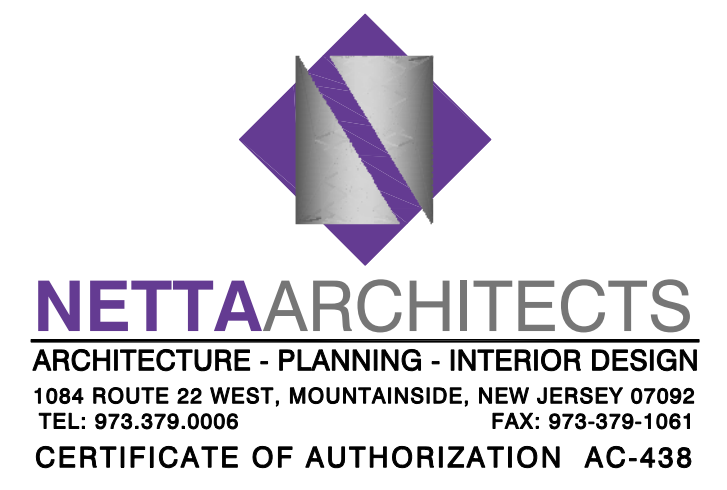
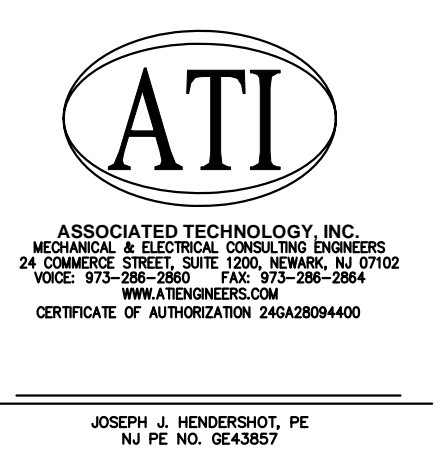
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NJ License No. AI 12118

MARK E. BESS, AIA, NCARB
NJ License No. AI 16160

LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

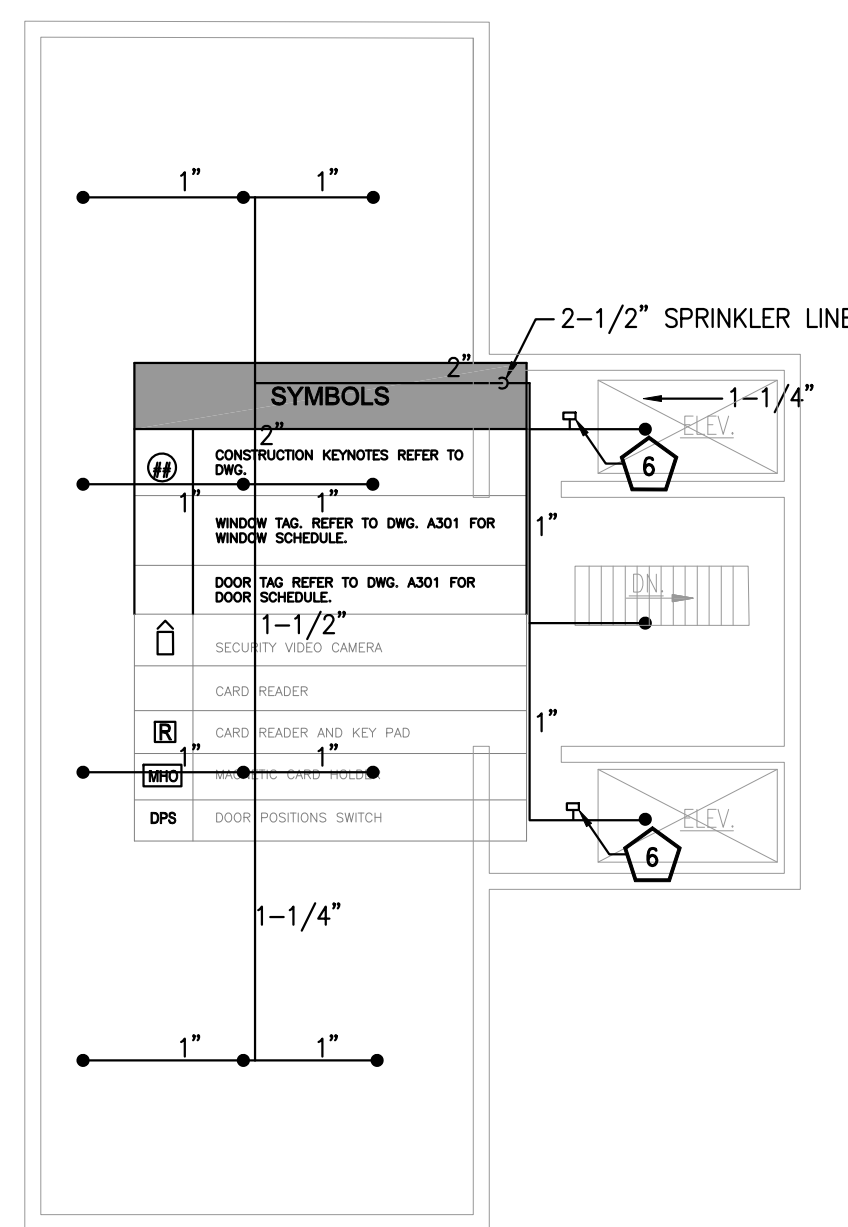


PROJECT: UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)
2 Broad Street, Elizabeth New Jersey

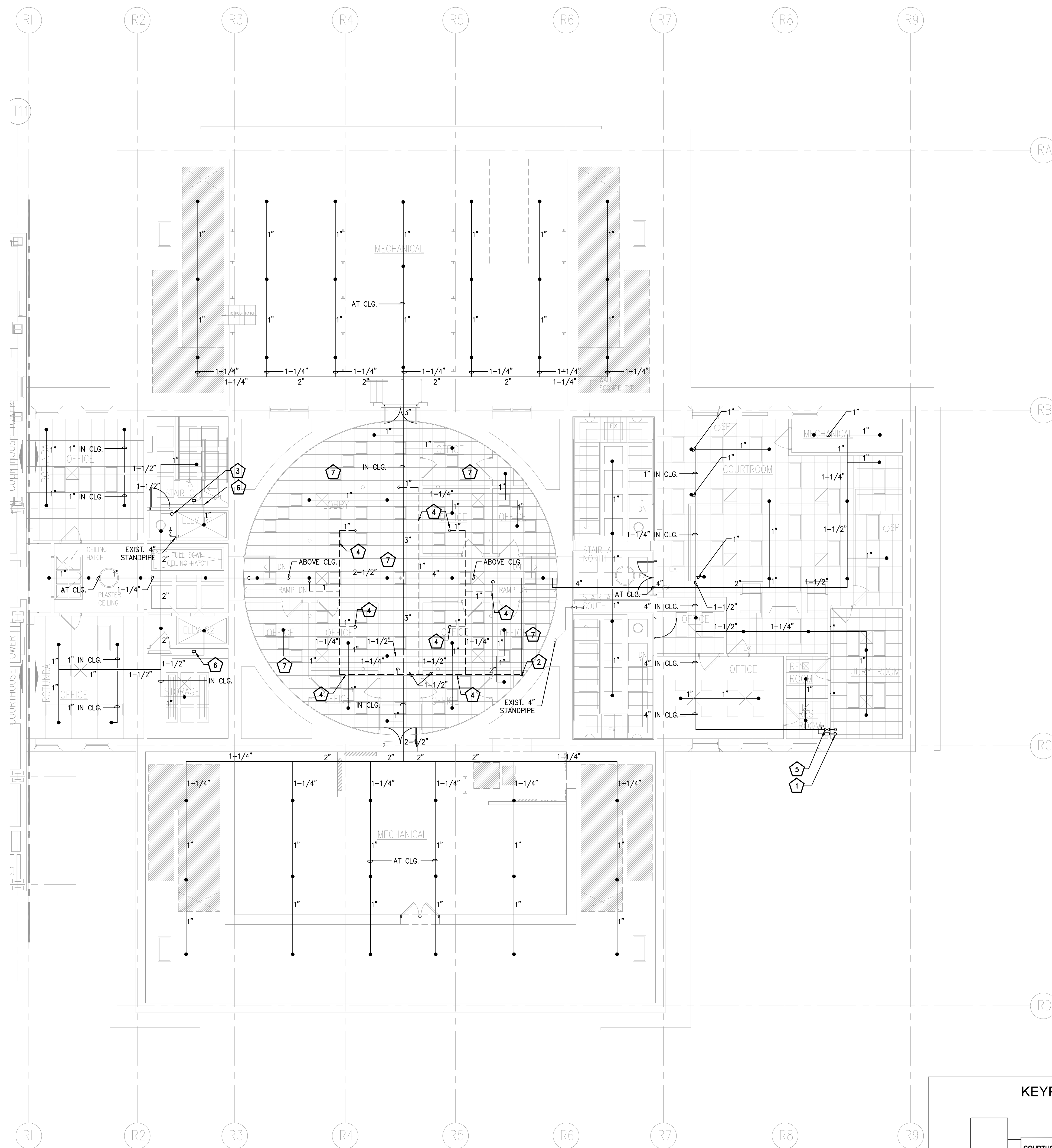
SHEET CONTENTS:
**FIRE PROTECTION - SPRINKLER PIPING PLAN
THIRD FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
9.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	

FP.303



SPRINKLER PIPING PLAN – ATTIC SPACE
SCALE: 1/8"=1'-0"



SPRINKLER PIPING PLAN – FOURTH FLOOR
SCALE: 1/8"=1'-0"

KEYED NEW WORK NOTES:

1. INSTALL NEW 4" SPRINKLER MAIN AND 2" TEST DRAIN DOWN TO FLOOR BELOW.
2. INSTALL NEW SPRINKLER MAIN DOWN TO BELOW FLOOR SPRINKLER SYSTEM SERVING THE ROTUNDA DOME.
3. INSTALL SPRINKLER PIPING UP TO ATTIC SPACE ABOVE. SEE PART PLAN ON THIS SHEET.
4. INSTALL PIPING IN FLOOR SPACE BELOW (ABOVE DOME).
5. INSTALL FLOOR CONTROL VALVE WITH SUPERVISORY AND FLOW SWITCH AND CONNECT TO FIRE ALARM CONTROL PANEL.
6. INSTALL UPRIGHT SPRINKLER AT THE TOP OF ELEVATOR SHIF. THE SPRINKLER HEAD TEMPERATURE RATING SHALL BE PER NFPA LISTING FOR HOISTWAY. COORDINATE SUPERVISORY SWITCH WITH ELECTRICAL CONTRACTOR TO CONNECT TO FIRE ALARM CONTROL PANEL.
7. INSTALL SPRINKLER PROTECTION IN CONCEALED SPACE BELOW RAISED FLOORING AREA IF REQUIRED BY NFPA 13.

DRAWING NOTES:

1. REFER TO DRAWING P101 FOR NOTES, SYMBOLS, & ABBREVIATIONS.

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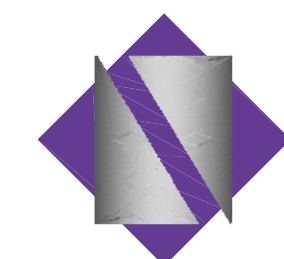
LAURENCE K. UHER, AIA, LEED, AP
NJ License No. AI 14394

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ASSOCIATED TECHNOLOGY INC.
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1000 ROUTE 22 WEST, MOUNTAINVIEW, NJ 07092
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CERTIFICATE OF AUTHORIZATION 284884840

JOSEPH J. HENDERSON, PE
NJ License No. 360489



NETTA ARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINVIEW, NEW JERSEY 07092
TEL: 973.378.0081 FAX: 973.378.1061
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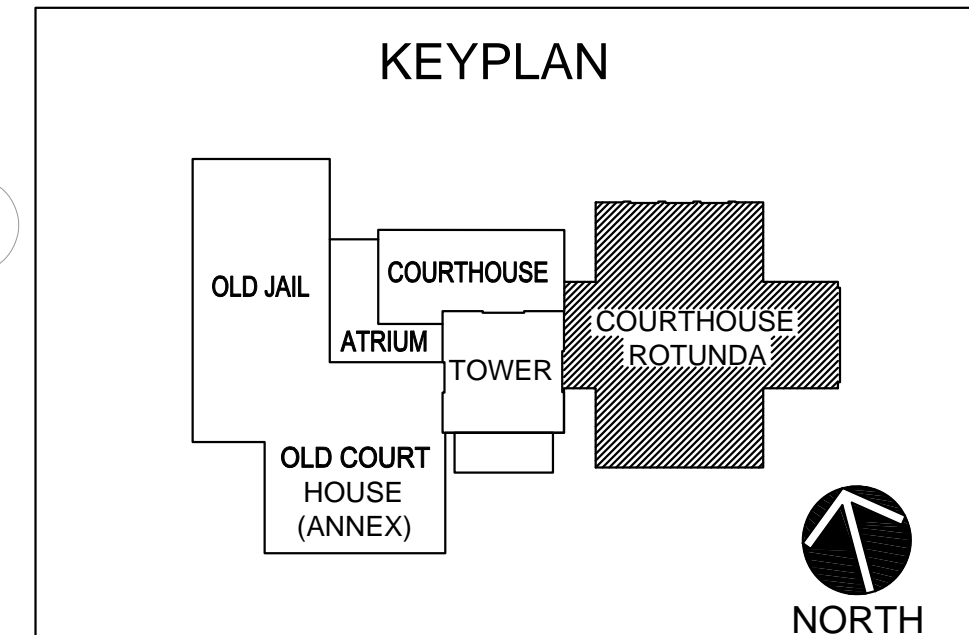
PROJECT:

**UC COURTHOUSE
FIRE SUPPRESSION (ROTUNDA)**
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

**FIRE PROTECTION - SPRINKLER PIPING PLAN
FOURTH FLOOR**

SUBMISSIONS				REVISIONS				DATE	09-25-15
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	SCALE	AS SHOWN
09.25.15	95% CD SUBMIT	KD	FM					DRWN BY	RB
09.07.17	ISSUED FOR BID	KD	FM					CHKD BY	NJN
								JOB NO	2141152
								SHEET:	_ OF:
								DWG. NO	



FP.304

