COUNTY OF UNION

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

MEMO TO: To All Potential Bidders

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

DATE: March 14, 2016

RE: **ADDENDUM NUMBER 1**
Union County Courthouse Radio Room Tower
City of Elizabeth, County of Union, New Jersey
BA#13-2016; Union County Engineering Project #2010-033F

Attached is Addendum Number 1 for the above referenced project. Please sign the Acknowledgement of Addendum form and include it in your bid packet submission.

DIVISION OF ENGINEERING
2325 South Avenue *Scotch Plains, NJ 07076* *(908)789-3690* *fax(908)789-3674* www.ucnj.org
We're Connected to You!

Bidder's Name: _____

ACKNOWLEDGMENT OF ADDENDUM
ADDENDUM NUMBER 1
March 14, 2016
COUNTY OF UNION

Union County Courthouse Radio Room Tower — BA#13-2016; UC Engineering Project #2010-033F
City of Elizabeth, County of Union, New Jersey
(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**
Addendum Number 1 issued March 14, 2016: Attached is Addendum Number 1 prepared by Netta Architects		

ACKNOWLEDGMENT BY BIDDER:

NAME OF BIDDER: _____

ORIGINAL SIGNATURE: _____

PRINTED NAME AND TITLE: _____

DATE: _____

NETTAARCHITECTS

ADDENDUM

Project Name:

Union County Courthouse- Radio Room
Elizabeth, NJ; County of Union
BA#13-2016; Union County Engineering Project #2010-033F

Addendum No. 1

Project No. 2151188

Page 1 of 2

Date: March 14, 2016

The Following Additions, Deletions And Modifications Are Hereby Made A Part Of The Contract Documents.

INTENT:

1. Issue responses to RFI questions.
2. Provide new attachments
3. Provide new and revised Specification Sections
4. Provide revised Project Drawings.

REFERENCED RESPONSES TO RFI QUESTIONS:-

1. **Question:** Cable Tray on ceiling routing data cable not shown?
   Response: New Cable Trays indicated on Sheet E.301

2. **Question**: Where is the location of the manual Transfer Switch in the Basement?
   Response: Manual Transfer Switch location indicated on Sheet E302.1.

3. **Question**: Where is the location of the portable engine connection box ?
   Response: Portable Engine connection box location indicated on Sheet E302.2.

4. **Question**: Clarify location for 3" conduit?
   Response: The 3" conduit has been relocated to the utility closet; refer to Sheets E.302, E.303, E.304.

REFERENCED ATTACHMENTS TO SPECIFICATIONS: **NEW**

The following Attachments to Specifications, dated **March 14, 2016** are issued, as attached herein.

- Meeting Minutes from Non-Mandatory / Pre-Bid Meeting dated March 08, 2016

1084 Route 22 West, Mountainside, NJ, 07092
Tel: 973.379.0006 Fax: 973.379.1061 Email: info@nettaarchitects.com

REFERENCED PROJECT SPECIFICATIONS: **REVISED/NEW**

G-1	GENERAL SPEC (PAGE G-1 ONLY)(REVISED)
TOC	TABLE OF CONTENTS (REVISED)
011000	SUMMARY (REVISED)
096900	ACCESS FLOORING (REVISED)

REFERENCED PROJECT DRAWINGS: **REVISED**

ARCHITECTURAL

A-001	GENERAL NOTES (BLDG CODE INFORMATION)

ELECTRICAL

E.201.1	ELECTRICAL ONE LINE DIAGRAMS
E.301	ELECTRICAL POWER PLAN SIXTEENTH FLOOR
E.302	ELECTRICAL- BASEMENT THRU FIFTH FLOOR PART PLANS
E.302.1	ELECTRICAL- BASEMENT THRU FIFTH FLOOR PART PLANS
E.302.2	ELECTRICAL- BASEMENT THRU FIFTH FLOOR PART PLANS
E.303	ELECTRICAL- SIXTH THRU TENTH FLOOR PART PLANS
E.304	ELECTRICAL- ELEVENTH THRU SIXTEENTH FLOOR PART PLANS

For **Netta Architects**
Kim de Freitas, AIA, LEED BD+C

NETTAARCHITECTS

MEETING MINUTES

PROJECT NAME: **Union County Courthouse Radio Room**

DATE OF MEETING: March 08, 2016, 10:00pm-11:30am

PURPOSE: Pre-Bid Meeting

PROJECT NO.: 2151188

PREPARED BY: Kim de Freitas, AIA, NCARB, LEED BD+C

COPIES TO: Joe Hendershot, Steve Caruso, Tom McDermont, Charles Chirafesi, Walter Patrylo, Phil Triano

MTG LOCATION: UC Courthouse Conference Room

The following is our record that will document communication and direction that took place during the conference. Unless we receive clarification or amendment within five business days from receipt, the enclosed will be considered as confirmed instructions and understandings.

ATTENDEE	COMPANY	PHONE	E-MAIL
Joe Hendershot	Associated Technology, Inc	(973) 286-2860	jhendershot@atiengineers.com
Walter Patrylo	Union County	908-789-3688	wpatrylo@ucnj.org
Curt Ziznewsig	MTM 540 north Avenue Union	908-351-1177	bidsem-mnj.com
Phil Triano	Union County	908-527-4246	ptriano@ucnj.org
Amilcar Colon	Union County Sherriff Office	908-578-1436	acolon@ucnj.org
Frank Gallicchi	Electrical Applications	908-245-5222	fgbaiinc@verizon.net
Mike Glander	GPC	973-376-6616	mike@grafas.net
Kim de Freitas	Netta Architects	(973) 379-0006	kdefreitas@nettaarchitects.com
Vincenzo Napoleone	SandJ Electrical Contractors		vnapoleone@sandjeletric.com
Francisco Melendez	Netta Architects	(973) 379-0006	fmelendez@nettaarchitects.com
Steve Caruso	Emergency Services	908-347-3296	scaruso@ucnj.org

NO.	Issues Discussed:	Action
1.	**Francisco Melendez (FM) introduced Pre-Bid meeting** • Announced Bid Due date: March 24th @ 10:30am, delivered to the Admin Bldg 3rd Flr • Requires DPMC - #C009 General Construction/ Alterations and Additions • Bids to be submitted in a sealed envelope. • Drawings are available online at the union county website, free to those who register.	n/a
2.	**FM discussed Division 0 and Division 1 of the specifications** • Manual contains a Bid Checklist • This is a Prevailing Wage project • No PLA – as estimate is under 5 million • Questions to be submitted to the Division of Engineering • Last Day for questions is Thursday, March 10th, 2016 • Addendum will be issued Monday, March 14, 2016 • Bid form includes an allowance for security for third shift because the building is fully occupied. • Bid include construction contingency • Project is anticipated to be 240 calendar days (because of third shift hours) • Work will occur on the 16th and 17th floors. Access to floors from passenger elevator. Which is to be protected. • GC to coordinate with building facility • Designated dumpster area to be coordinated with Building facility • GC and all subs will require a background check. Forms will be provided	n/a
3.	**FM discussed scope of work** • Radio room exists on the 17th floor; to be relocated on the 16th floor • There will be demolition work on the 16th floor and the construction of a new raised floor room to house the equipment • GC to coordinate with Motorola, layout of equipment • Project includes FM200 • Work includes air conditioners on roof • Work includes lighting protection • Work includes 16th floor and 17th floor perimeter roof to be re-roofed • Work includes General construction • Work includes Fire protection • Power from basement from emergency generator to the 16th floor • Lighting and receptacle and new lighting throughout the 16th floor • Paint ceiling of radio room • FM200 requires testing. Room is fully pressurized • After Bids are received and awarded meeting to coordinate with 3 UC vendors • Vendor will be moving equipment • GC responsible for utilities	n/a

4.	**Question/ comments from attendees and response** **Q:** Location of connection box outside not specified on the drawings. **A:** Location to be specified on revised drawing to be issued as Addendum #1. **Q:** Conduit location on drawing within stair. **A:** Conduit to be located in adjacent utility closet on revised drawing to be issued as Addendum #1. Core drilling to occur during third shift. Floors 15-3 third have the Utility closet; 16th floor and 8th floor do not. **Q:** Location of Cable Tray on ceiling for routing data cable not specified. **A:** location to be specified on revised drawing to be issued as Addendum #1.	ATI Netta
5.	All attendees visited the 16th floor, the 15th floor and the 7th floor	
	END OF MEETING MINUTES #1	

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, Director, Division of Purchasing
Telephone: 908-527-4130
Facsimile: 908-558-2548

TITLE OF PROJECT: Union County Courthouse Radio Room Tower
City of Elizabeth, County of Union, New Jersey
BA#13-2016; Union County Engineering Project #2010-033F

BIDDER: Bidder shall be a single overall contract bidder

ARCHITECT/ENGINEER: Netta Architects
1084 Route 22 West
Mountainside, New Jersey 07092

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

Table of Contents

Division	Section Title

SPECIFICATIONS GROUP

General Requirements Subgroup

DIVISION 01 - GENERAL REQUIREMENTS

011000 ***SUMMARY (R) [ADDENDUM NO. 1]***
012100 ALLOWANCES
012200 UNIT PRICES
012500 SUBSTITUTION PROCEDURES
012600 CONTRACT MODIFICATION PROCEDURES
012900 PAYMENT PROCEDURES
013100 PROJECT MANAGEMENT AND COORDINATION
013200 CONSTRUCTION PROGRESS DOCUMENTATION
013233 PHOTOGRAPHIC DOCUMENTATION
013300 SUBMITTAL PROCEDURES
014000 QUALITY REQUIREMENTS
015000 TEMPORARY FACILITIES AND CONTROLS
016000 PRODUCT REQUIREMENTS
017300 EXECUTION
017700 CLOSEOUT PROCEDURES
017823 OPERATION AND MAINTENANCE DATA
017839 PROJECT RECORD DOCUMENTS

Facility Construction Subgroup

DIVISION 02 - EXISTING CONDITIONS

024119 SELECTIVE STRUCTURE DEMOLITION

DIVISION 03 - CONCRETE

035416 HYDRAULIC CEMENT UNDERLAYMENT

DIVISION 04 - MASONRY

NOT APPLICABLE

DIVISION 05 - METALS

055000 METAL FABRICATIONS
055213 PIPE AND TUBE RAILINGS

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

061053 MISCELLANEOUS ROUGH CARPENTRY

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

075323 ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING
078413 PENETRATION FIRESTOPPING

078446 FIRE-RESISTIVE JOINT SYSTEMS
079200 JOINT SEALANTS

DIVISION 08 - OPENINGS
081113 HOLLOW METAL DOORS AND FRAMES
087100 DOOR HARDWARE
088000 GLAZING

DIVISION 09 - FINISHES
092216 NON-STRUCTURAL METAL FRAMING
092900 GYPSUM BOARD
095113 ACOUSTICAL PANEL CEILINGS
096513 RESILIENT BASE AND ACCESSORIES
096519 RESILIENT TILE FLOORING
096900 ACCESS FLOORING (R) [ADDENDUM NO. 1]
099123 INTERIOR PAINTING
099600 HIGH PERFORMANCE COATINGS

DIVISION 10 – 11
NOT APPLICABLE

DIVISION 12 - FURNISHINGS
122413 ROLLER WINDOW SHADES

Facility Services Subgroup

DIVISION 21 - FIRE SUPPRESSION
211200 CLEAN AGENT FIRE SUPPRESSION SYSTEM

DIVISION 22 – PLUMBING
NOT APPLICABLE

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)
230517 SLEEVES AND SLEEVE SEALS FOR HVAC PIPING
230529 HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
230713 DUCT INSULATION
230719 HVAC PIPING INSULATION
232113 HYDRONIC PIPING
233113 METAL DUCTS

DIVISION 26 - ELECTRICAL
260519 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
260526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
260529 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
260533 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
260544 SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING
260553 IDENTIFICATION FOR ELECTRICAL SYSTEMS
262416 PANELBOARDS

262726 WIRING DEVICES
264113 LIGHTNING PROTECTION FOR STRUCTURES

END OF TABLE OF CONTENTS

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 to the Radio Room, Union County Courthouse Internal Stair (Tower)

1. Project Location: 2 Broad Street, Elizabeth, NJ

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.,***~~ ***[ADDENDUM NO. 1]***

~~***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. Interior alterations and modifications including but not necessarily limited to access flooring, fire stopping, railings, roofing, doors, gypsum board work, new flooring, ceilings and interior painting.
2. Fire Protection/Electrical: The scope of work includes replacing the existing fire suppression chemical agent system with a new gas agent system (all floor, wall, & ceiling penetrations shall be sealed to provide an airtight room that will allow pressurized gas agent to extinguish any fires in the room). Upon completion of the pressurized gas system installation, the Contractor shall have the system certified by an authorized representative of the Manufacturer and perform all required test. The Contractor shall also be responsible to connect the new pressurized gas agent system to the Building's Fire Alarm System and/or Automation System.

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 GENERAL SCHEDULE AND CONTRACTOR OPERATIONS ***[ADDENDUM NO. 1]***

A. Adequate notice must be given to the **County of Union** ~~***Correctional Facilities***~~ and a "Notice to Proceed" will be issued prior to commencing any of the renovation work at the ~~***Correctional Facilities***~~ ***Union County Courthouse Tower Radio Room***. A complete work schedule shall be submitted to the ~~***Correctional Facilities***~~ **County of Union** for review and approval during the pre-construction meeting.

B. The contractor shall be allowed to work under an accelerated work schedule. Contractor shall coordinate with the ~~***Correctional Facilities***~~ **County of Union** for access into the ~~***Correctional Facilities***~~ ***Union County Courthouse Tower Radio Room*** during off working hours.

C. The scheduling of all contractor operations shall be closely coordinated with the **County of Union** at a pre-construction meeting prior to the start of any of the contracted work.

D. The contractor's operations will ***protect and*** use the ~~***rear Freight***~~ ***Passenger*** Elevator as instructed by the ~~***Correctional Facilities***~~ **County of Union**. The contractors are not allowed to affect the use of any portion of the ~~***Correctional Facilities***~~ **County of Union** during any hour and no type of communication will be permitted with inmates. The contractor is responsible for erecting all barricades to separate the contracted area.

E. The contractor shall provide adequate protection for all parts of the building and its occupants when any work under this contract is performed. Maintain a safe unobstructed egress path to all exits at all times. Erect temporary partitions where indicated on plans and where required to prevent dust from entering occupied office workspaces.

1.9 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 (2^{nd} & 3^{rd} shifts)

1. If shift work is required (2^{nd} & 3^{rd} shifts) by discretion of the Owner, for contract work required in a specific area in order to not disrupt employees, the Contractor will be reimbursed for the labor differential amount from the Bid Contingency amount.

D. Work During County Holidays: The contractor shall not be allowed to work on County holidays unless the following condition is met:

1. Prior written approval is granted by the **County**. It is at the sole discretion of the **County** to allow work to be conducted during any **County** holidays.

E. Contractor Tool and Gang-box Delivery: The delivery of all heavy hand tools and gang-boxes must be between the hours of 3:00pm and 5:00pm weekdays

F. 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.

G. 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.

H. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor air intakes.

I. 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.

J. 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, 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. All workers will require a picture identification to be provided by the County prior to the start of any work and access to the jail. All workers will be required to submit to a Background History Check performed by the County, prior to gaining access to the jail.
2. The County has the right to reject any and all individuals from access to the jail based on any perceived conflict from the background checks performed, which result in a documented prior criminal offense.
3. Contractor to maintain a list of approved screened personnel with Construction Manager.

K. 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 Identification Bureau located at the Administration Building at 10 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.

1.10 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 - Two Hundred & ~~***Twenty***~~ ***Forty*** (***220 240***) Calendar Days

B. Fire Protection - On unoccupied floors, the Contractor will be able to work on the entire floor and work should be continuous until work on the floor is complete. The Contractor shall be allowed (upon approval of the Construction Manager) to work in more than one unoccupied floor if an adequate work force is provided, for both floors, and the simultaneous work in both areas does not affect the day to day operations of the facility. On occupied floors, the Contractor will be allowed to work in a portion of the floor and work in that area shall be continuous until complete with minimal disturbances to the occupants. The Contractor must supply an adequate work force, in all areas, to complete the work in the areas in the allotted time frame shown on the approved project schedule.

C. 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

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 at1000 lbf.
   b. CISCA Wheel 2: 10,000 passes at800 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.

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. ***Tate Access Floors, Inc., Distributed by Ari Products Inc [ADDENDUM NO. 1]***

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 (LF1)

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. Refer to Finish Schedule for Basis of Design floor panel covering.

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

GENERAL NOTES

1. 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.
2. 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.
3. 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.
4. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSING OF ALL DEBRIS, DISCARDED 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.
5. THE GENERAL CONTRACTOR SHALL NOT PERMIT THE OVER LOADING OF THE EXISTING STRUCTURE WITH DEBRIS FROM THE DEMOLITION AND NEW CONSTRUCTION MATERIALS.
6. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR A MINIMUM OF TWICE DAILY REMOVAL OF ALL DEMOLITION DEBRIS & A A DAILY GENERAL BROOM CLEANING.
7. DURING CONSTRUCTION/DEMOLITION, THE GENERAL CONTRACTOR SHALL PROVIDE THE NECESSARY BARRIERS TO MINIMIZE DUST, PROTECT THE PUBLIC AND MINIMIZE DAMAGE TO OTHER SURFACES OR ITEMS TO REMAIN. COORDINATE BARRIER LOCATION W/ OWNER AND ARCHITECT SO AS NOT TO INTERRUPT OPERATION OF FACILITY.
8. 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, H.V.A.C., TELEPHONE, FIRE ALARM/DETECTION, ETC.
9. 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 INTERUPTIONS TO UTILITY SERVICES.
10. 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 PLYWOODENCLOSURES AS REQUIRED FOR SAFETY AND SECURITY.
11. SHOULD UNFORSEEN CONDITIONS BE ENCOUNTERED THAT AFFECT DESIGN OR FUNCTION OF PROJECT, INVESTIGATE FULLY & CONTACT THE OWNER AND ARCHITECT. WHILE AWAITING ARCHITECTS RESPONSE, RESCHEDULE OPERATIONS IF NECESSARY TO AVOID DELAY OF OVERALL PROJECT.
12. ANY EXISTING WALL TO BE DEMOLISHED AND FOUND TO CONTAIN STRUCTURAL SUPPORTS, PLUMBING, ELECTRICAL OR OTHER SERVICES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT UPON DISCOVERY FOR DIRECTION.
13. THE CONTRACTOR SHALL VERIFY ALL JOB CONDITIONS, DIMENSIONS AND DETAILS PRIOR TO START OF CONSTRUCTION/DEMOLITION'
14. 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.
15. ALL WORKS SHALL COMPLY WITH APPLICABLE BUILDING CODES AND REGULATORY AGENCIES.
16. EACH TRADE SHALL BE RESPONSIBLE FOR REVIEWING ENTIRE SET OF DOCUMENTS & NOTING HIS WORK AS APPLICABLE & SHALL COORDINATE WITH WORK OF OTHER TRADES FOR A COMPLETE INSTALLATION. ALL WORK SHALL BE COORDINATED THROUGH THE G.C.
17. 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 TO RETUN SURFACES TO THEIR ORIGINAL CONDITION. PROVIDE SHORING & BRACING AS WELL AS PROTECTIVE BARRIERS BASED ON CONDITIONS.
18. 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 POIWER TOOLS DESIGNED FOR SAWING OR GRINDING. CUT HOLES AND SLOTS NEATLY TO SIZE REQUIRED WITH MINIMUM DISTURBANCE OF ADJACENT SURFACES. TEMPORARILY COVER OPENINGS WHEN NOT IN USE. TO AVOID MARRING EXISTING FINISHED SURFACES. 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 SHORRING & BRACING AS ELL AS PROTECTIVE BARRIERS BASED ON CONDITIONS. WET SAWING AND/OR CORING SHALL REQUIRE THE CONTRACTOR TO PROTECT ALL REMAINING SURFACESS AND ROOM AREAS FROM WATER DAMAGE AND/OR PENETRATION THE COST FOR ANY WATER DAMAGE SHALL BE BORN BY THE CONTRACTOR.
19. 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.
20. ALL PENETRATIONS THROUGH FLOOR SLABS, STAIR WALLS OR RATED PARTITIONS SHALL BE SEALED WITH A FIRE RATED SELANT, PER SPECIFICATIONS.
21. ALL NOTES ON DRAWINGS SHALL APPLY TO ENTIRE SET OF DRAWINGS.
22. DRAWINGS ARE NOT TO BE SCALED, DIMENSIONS GOVERN LARGE SCALE DRAWINGS TAKE PRECEDENCE OVER SMALL SCALE DRAWINGS.
23. THE TERMS "CONSTUCTION CONTRACTOR", "GENERAL CONTRACTOR" & "CONTRACTOR" SHALL BE UNDERSTOOD SAME UNLESS SPECIFICALLY NOTED OTHERWISE.
24. TYPICAL DIMENSIONS ARE FINISH SURFACE TO FINISH SURFACE, UNLESS NOTED.
25. 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.
26 ALL WORKS IS TO CONFORM TO DRAWINGS AND SPECIFICATIONS, AND SHALL BE NEW & BEST QUALITY OF THE KINDS SPECIFIED.
27 ALL MANUFACTURED ARTICLES, MATERIALS & EQUIPMENT SHALL BE SUPPLIED, INSTALLED, CONNECTED, ERECTED, USED, CLEANED & CONDITIONED AS DIRECTED BY THE MANUFACTURERS, UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS.
28 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).
29 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 VARIENCE WITH SAID CODES. CONTRACTOR SHALL IMMEDIATELY INFORM OWNER AND ARCHITECT,
30 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.
31 CONTRACTOR SHALL PROVIDE FULL TIME SUPERVISION FOR THE COMPLETION OF THE WORK.
32 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.
33 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.
34 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.
35 CONTACTOR 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.
36 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.
37 BUILDING IS TO REMAIN OCCUFIED 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.
38 ALL DIMENSIONS INDICATED AS PLUS/MINUS (+/-) SHALL BE FIELD VERIFIED.
39 UNO., ALL EXISTING WINDOWS, DOORS, AIR CONDITIONERS AFFECTED BY THIS PROJECT SHALL BE TURNED OVER TO THE OWNER.
40 SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.
41 CONTACTOR SHALL MAINTAIN THE LATEST SET OF DRAWINGS AND CONTRACT DOCUMENTS AT THE JOB SITE AT ALL TIMES.
42 THESE DRAWINGS HAVE BEEN PREPARED FOR A PARTICULAR BUILDING IMPROVEMENT ONLY WITH DISTINCT UNDERSTANDING THAT THEY ARE INSTRUMENTS OF SERVICE AND ARE PROPERTY OF THE ARCHITECT. 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.
43 ANY OR ALL REQUIRED FIRE EXTINGUISERS (SEE PLANS) AND ALARMS SHALL BE LOCATED & CLASSIFIED BY CODE. LOCATIONS SHOWN ON PLANS SHALL BE COORDINATED WITH AND APPROVED BY THE FIRE OFFICIAL.
44 GENERAL CONTRACTOR SHALL REPAIR & PATCH PORTIONS OF EXISTING MISSING CONCRETE ON EXPOSED BEAMS, UNDERSIDE OF SLABS AND WALLS PRIOR TO PAINTING.
46 ALL EXISTING STEAM RADIATORS TO BE REMOVE UNLESS NOTED OTHERWISE. COORDINATE WITH MECHANICAL DRAWINGS.
48 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.
50 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.
51 ANY WALL SWITCHES OR ELECTRICAL OUTLETS IN WAY OF NEW WORK SHALL BE RELOCATED. LOCATION TO BE APPROVED BY ARCHITECT.
52 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.
53 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.
54 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.
55 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 TILES, FINISHES, ETC. SHALL BE REPLACED BY THE GENERAL CONTRACTOR TO MATCH EXISTING CONDITIONS BEFORE WORK WAS DAMAGE.
56 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

A. ALL DAMAGES TO THE EXISTING FACILITY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND ALL DAMAGES TO BE REPAIRED AT HIS OWN EXPENSES.

B. 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.

C. 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.

D. ALL DEMOLITION OPERATIONS SHALL BE COORDINATED WITH APPLICABLE UTILITY COMPANY WHERE REQUIRED.

E. DASHED LINES INDICATE ITEMS TO BE REMOVED. THE LOCATIONS KEYED ON THIS DRAWINGS FOR THESE NOTES 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.

F. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED DEMOLITION PERMITS PRIOR TO BEGINNING ANY WORK.

G. 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.

H. THE CONTRACTOR SHALL KEEP THE SITE FROM 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.

I. 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.

J. 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.

K. 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.

L. 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.

M. 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.

N. PROVIDE WEATHER PROTECTION DURING ALL PHASES OF CONSTRUCTION TO EXISTING BUILDING.

O. ALL EXTERIOR SIGNAGE SHALL REMOVED AND RELOCATED AS REQUIRED BY OWNER.

P. REFER TO MECHANICAL, ELECTRICAL, AND STRUCTURAL DRAWINGS FOR THE DEMOLITION INFORMATION OF RELATED ITEMS.

Q. CONTRACTOR IS TO PROVIDE PROTECTION TO EXISTING TUNNEL SYSTEM BETWEEN OLD JAIL BUILDING & NEW ANNEX BUILDING DURING CONSTRUCTION.

R. 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

DEMO SINGLE DOOR

DEMO DOUBLE DOOR

DEMO WINDOW

DEMO EQUIPMENT

DEMO RAILING

AREA TO BE EXCAVATED

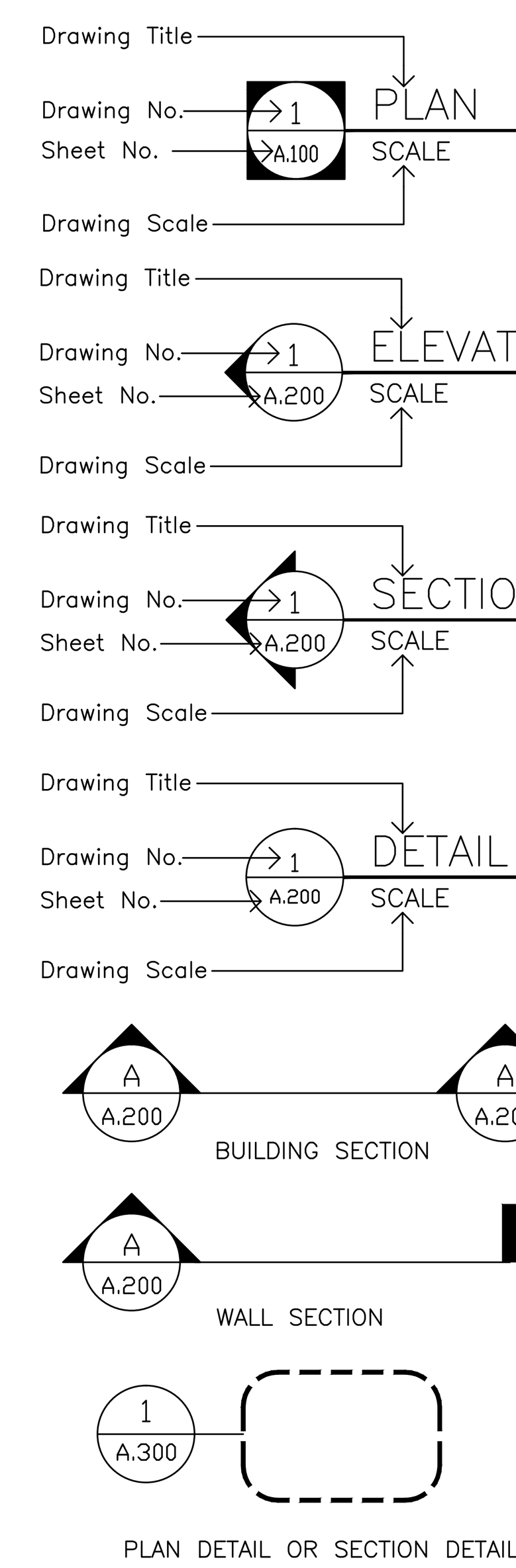
DEMO WALL

DEMOLITION KEYNOTES D1

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 BEEN 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

M1	PARTITON TYPE
A	WINDOW TYPE
1	KEYNOTES
D1	DEMOLITION KEYNOTES
1	REVISION TAG
XXX	DOOR NUMBER
	ELEVATION POINTER / WORK POINT
# FLOOR / A / #	SIGNAGE
P2	WALL FINISH
WALL FINISH / BASE FIN. / FLOOR FIN.	ROOM FINISHES



MATERIALS LEGEND

CONCRETE

BRICK OR FACEBLOCK

LIMESTONE/GRANITE

CMU

STEEL

PLYWOOD

WOOD STUD / WOOD BLOCKING

RIGID INSULATION

SHIM

CARPET

GYPSUM BOARD

EARTH

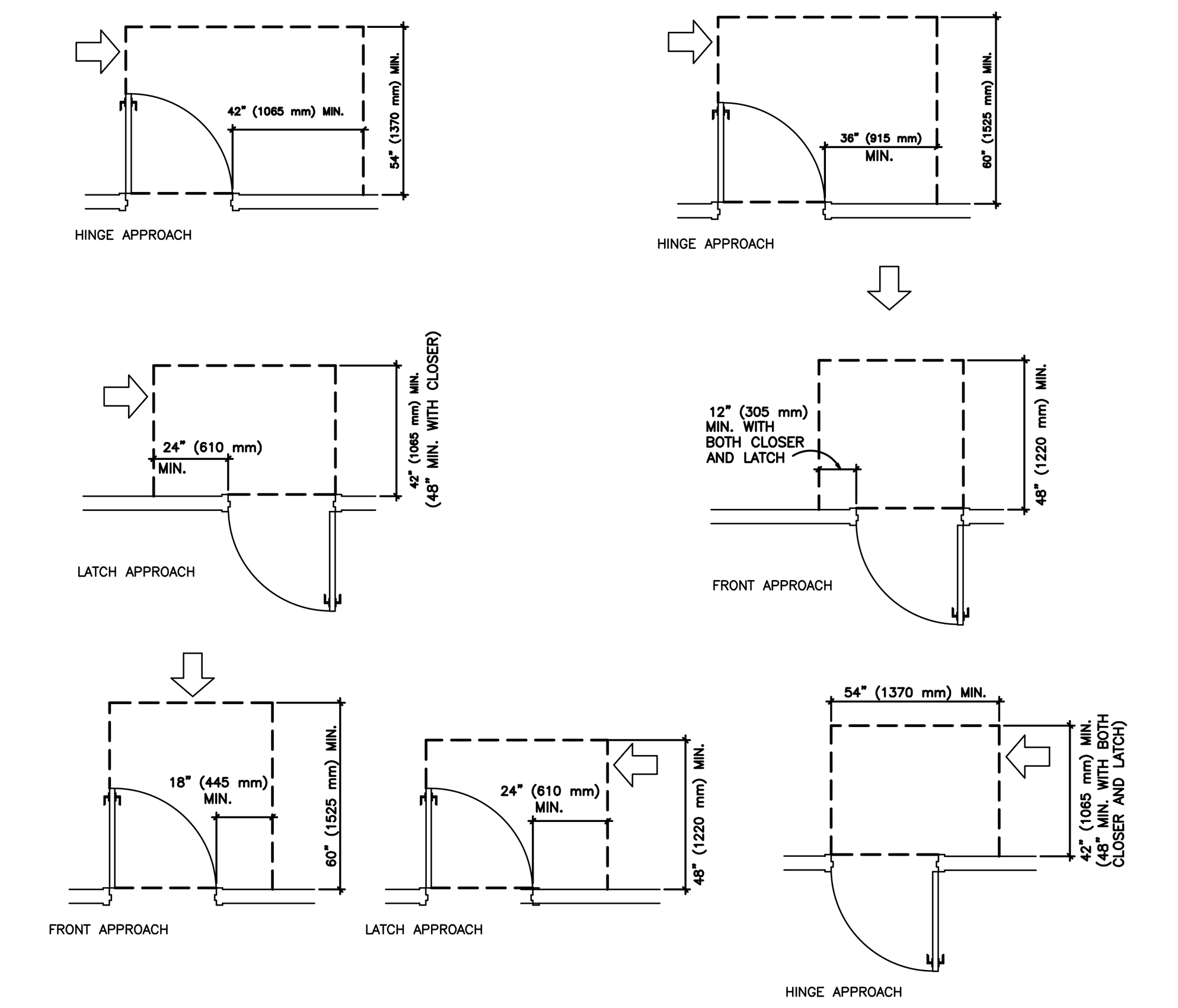
GRAVEL / POROUS FILL

BATT INSULATION

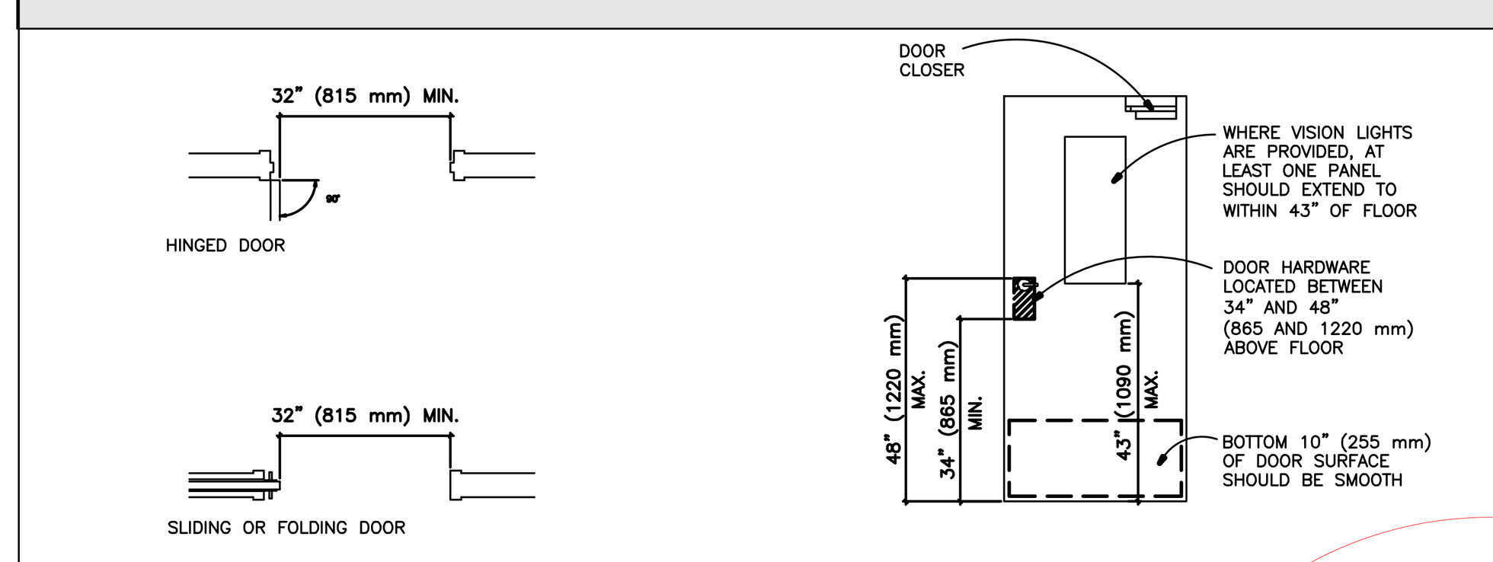
ABBREVIATIONS

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.	COLUMN
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
F.E.	FREIGHT ELEVATOR
FDN.	FOUNDATION
FIN.	FINISH
FL.	FLOOR
FLR.	FLOOR
FLUOR.	FLUORESCENT
FT.	FOOT / FEET
FTG.	FOOTING
GA.	GAUGE
GALV.	GALVANIZED
GL.	GLASS
GWB	GYPSUM WALL BOARD
GYP. BD.	GYPSUM 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
MLDG.	MOLDING
M.O.H.	MIRROR OPPOSITE HAND
MTD.	MOUNTED
MTL	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
O.C.	ON CENTER
OPNG.	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
RE.	REFERENCE
REF.	REFRIGERATOR
REFL.	REFLECTED
REQ'D.	REQUIRED
REINF.	REINFORCING
REV.	REVISION
R.H.	RIGHT HAND
RM.	ROOM
R.O.	ROUGH OPENING
R.O.D.	ROOF OVERFLOW DRAIN
SECT.	SECTION
SHO.	SHOWER
SIM.	SIMILAR
SK	SKETCH
SPECS.	SPECIFICATIONS
SQ.	SQUARE
S/STL.	STAINLESS STEEL
STL.	STEEL
STD.	STANDARD
STRUCT.	STRUCTURE
STRUCT'L	STRUCTURAL
SUSP.	SUSPENDED
T/	TOP OF
T.O.	TOP OF
TEL.	TELEPHONE
TERR.	TERRAZZO
TRANS.	TRANSFORMER
TYP.	TYPICAL
TBD.	TO BE DETERMINED
U.L.	UNDERWRITER'S LABORATORY
UNFIN.	UNFINISHED
U.O.N.	UNLESS OTHERWISE NOTED
UTIL.	UTILITY
V.B.	VINYL BASE
V.C.T.	VINYL COMPOSITION TILE
VERT.	VERTICAL
VEST.	VESTIBULE
V.I.F.	VERIFY IN FIELD
VOL.	VOLUME
VTR	VENT THRU ROOF
W/	WITH
W.C.	WATER CLOSET
WDW.	WINDOW
W.F.	WIDE FLANGE
W.O.	WINDOW OPENING
W.P.	WORKING POINT
W.W.F.	WELDED WIRE FABRIC

ACCESSIBLE CLEARANCE AT SWINGING DOORS



CLEAR WIDTH OF ACCESSIBLE DOORWAY



1

BUILDING CODE INFORMATION

PROJECT NAME:	UNION COUNTY COURTHOUSE RADIO ROOM (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/2015 NEW JERSEY EDITION	N.J.A.C. 5:23-3.14
ACCESSIBILITY	ANSI-A117.1 2009	NJAC 5.23-7
PLUMBING	NATIONAL STANDARD PLUMBING CODE 2015	N.J.A.C. 5:23-3.15
ELECTRICAL	NATIONAL ELECTRICAL CODE 2014	N.J.A.C 5:23-3.16
ENERGY	ASHRAE 90.1-2013	N.J.A.C. 5:23-3.18
MECHANICAL	INTERNATIONAL MECHANICAL CODE 2015	N.J.A.C. 5.23-3.20

GENERAL BUILDING INFORMATION

	CRITERION / DESIGNATION		IBC REFERENCE
USE AND OCCUPANCY CLASSIFICATION	EXISTING BUSINESS B	ADDITION BUSINESS B	
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)

CONSTRUCTION CLASSIFICATION IA

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 3-HR	EXISTING 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

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
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

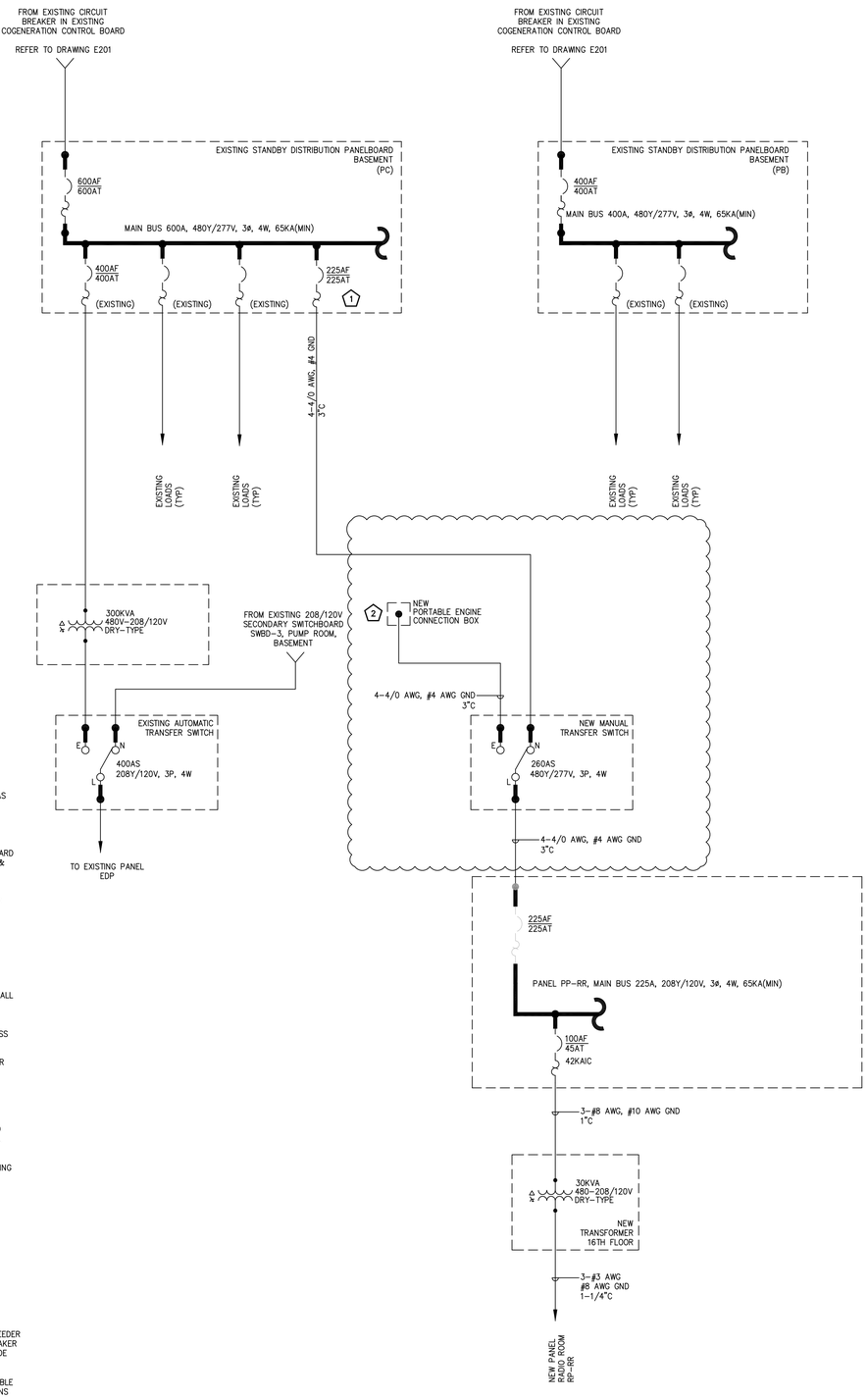
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

GENERAL , DEMOLITION NOTES & CODE

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM	03.14.16	1 ADDENDUM#01	KD	FM
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				
03.14.16	ADDENDUM #01	KD	FM				

DATE	09-15-15
SCALE	AS SHOWN
DRWN BY	BT
CHKD BY	NJN
JOB NO	2151188
SHEET:	2 OF: 35
DWG. NO	A.001



DRAWING NOTES:

1. IN CASES WHERE EXISTING PANELBOARD FACILITIES ARE BEING USED, CONTRACTOR SHALL FIELD VERIFY AVAILABLE PANELBOARD/CIRCUIT BREAKER SPACE/SPARES, AND MAKE ANY AND ALL MODIFICATION(S) AS REQUIRED TO ACCOMMODATE NEW BRANCH CIRCUIT REQUIREMENTS AS INTENDED.
2. ALL NEW CIRCUIT BREAKER(S) INSTALLED IN EXISTING PANELBOARD FACILITIES SHALL BE COMPATIBLE WITH & MANUFACTURED BY THE EXISTING PANELBOARD MANUFACTURER AND SHALL MAINTAIN PANELBOARD KAIC RATINGS, AND ALL PANELBOARD TESTING LABORATORY LABELS & LISTINGS.
3. 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.
4. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND OWNER.
5. 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.
6. ALL OVERCURRENT DEVICES SHOWN SHALL BE ASSUMED 3-POLE UNLESS OTHERWISE INDICATED.
7. ALL CONDUCTORS SHALL BE COPPER, UNLESS OTHERWISE INDICATED OR SHOWN.
8. PROVIDE ARC FLASH WARNING SIGNAGE AT ALL NEW ELECTRICAL DISTRIBUTION EQUIPMENT FACILITIES AS PER NEC 110.16.
9. PRIOR TO PREPARING FINAL TYPED PANELBOARD CIRCUIT DIRECTORIES, CONTRACTOR SHALL MEASURE PHASE LOADS (TRUE RMS) OF NEW AND EXISTING PANEL BOARDS UTILIZED TO COMPLETE THE CONTRACT WORK, AND BALANCE NEW LOAD AS REQUIRED.
10. PROVIDE NEW TYPED CIRCUIT DIRECTORIES OF THE "AS-BUILT" CIRCUITING CONDITIONS FOR ALL NEW AND EXISTING PANELBOARDS.
11. REFER TO ALL APPLICABLE PANEL AND EQUIPMENT SCHEDULES FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
12. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
13. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES AND ABBREVIATIONS.
14. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

KEYED ONE LINE NOTES:

1. CONTRACTOR SHALL PROVIDE NEW BRANCH CIRCUIT BREAKER AND FEEDER FROM EXISTING EMERGENCY PANEL-BOARD AS INDICATED. NEW BREAKER SHALL MAINTAIN EXISTING PANEL-BOARD RATINGS AND SHALL INCLUDE ALL ACCESSORIES (BUS FINGERS, EXTENSIONS, ETC).
2. CONTRACTOR SHALL PROVIDE OUTDOOR TYPE, WEATHERPROOF PORTABLE ENGINE CONNECTION BOX. ENCLOSURE SHALL HAVE BUS CONNECTIONS WITH MECHANICAL CONNECTORS FOR PHASE, NEUTRAL, AND GROUND CONDUCTORS FROM PORTABLE ENGINE. ENCLOSURE SHALL HAVE GROMMETED OPENING IN BOTTOM FOR ROUTING OF CABLES SO THAT DOOR CAN BE CLOSED. PROVIDE HINGED DOUBLE DOOR ON FRONT OF ENCLOSURE WITH INDICATION WHEN EACH BUS IS ENERGIZED. AS WELL ENCLOSURE SHALL HAVE PROVISIONS FOR LOCKING.

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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE BLVD. SUITE 2, PALM BEACH GARDENS, FL 33410
VOICE: 973-286-2800 FAX: 973-286-2844
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28039400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL
ONE LINE DIAGRAMS

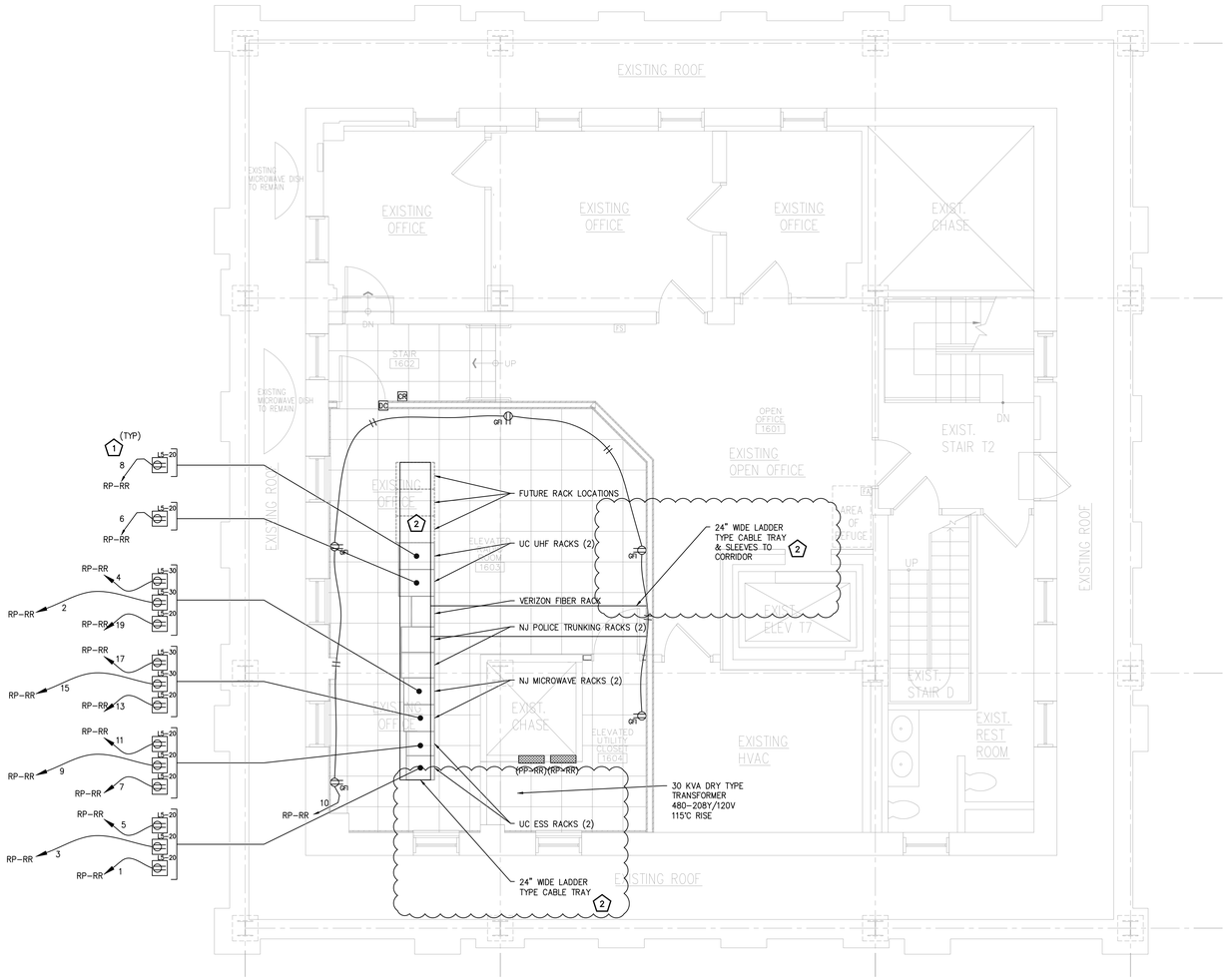
SUBMISSIONS				REVISIONS					
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD		
9.15.15	95% CD SUBMIT	KD	FM					DATE	02-04-16
10.30.15	95% CD UPDATE	KD	FM					SCALE	NONE
02.19.16	ISSUED FOR BID	KD	FM					DRWN BY	RB
03.14.16	ADDENDUM 1	KD	FM					CHKD BY	JJH
								JOB NO	2151188
								SHEET:	_ OF: 35
								DWG. NO	E.201.1

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. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
17. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES & ABBREVIATIONS.
18. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

KEYED WORK NOTES:

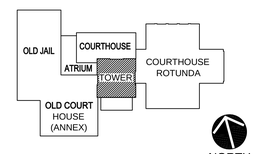
1. PROVIDE FLOOR MOUNTED RECEPTACLES AS REQUIRED. COORDINATE MOUNTING REQUIREMENTS WITH RAISED FLOOR VENDOR TO PROVIDE ANY SPECIFIC FRAMING OR MOUNTS REQUIRED TO MAINTAIN FLOORING INTEGRITY.
2. PROVIDE 24" WIDE LADDER TYPE CABLE TRAY (OR AS OTHERWISE REQUIRED BY MOTOROLA VENDOR) OVER COMPLETE LINEUP OF RACKS AS WELL AS FROM RACK LINEUPS TO EAST WALL. PROVIDE 2-4" CONDUIT SLEEVES THROUGH RADIO ROOM WALL FOR EXITING CABLES.



POWER PLAN – SIXTEENTH FLOOR

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

KEYPLAN



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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCIAL BLVD. SUITE 100 NOVATO, CALIFORNIA 94949 27702
VOICE: 919-286-1860 FAX: 919-286-2844
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENGERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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:

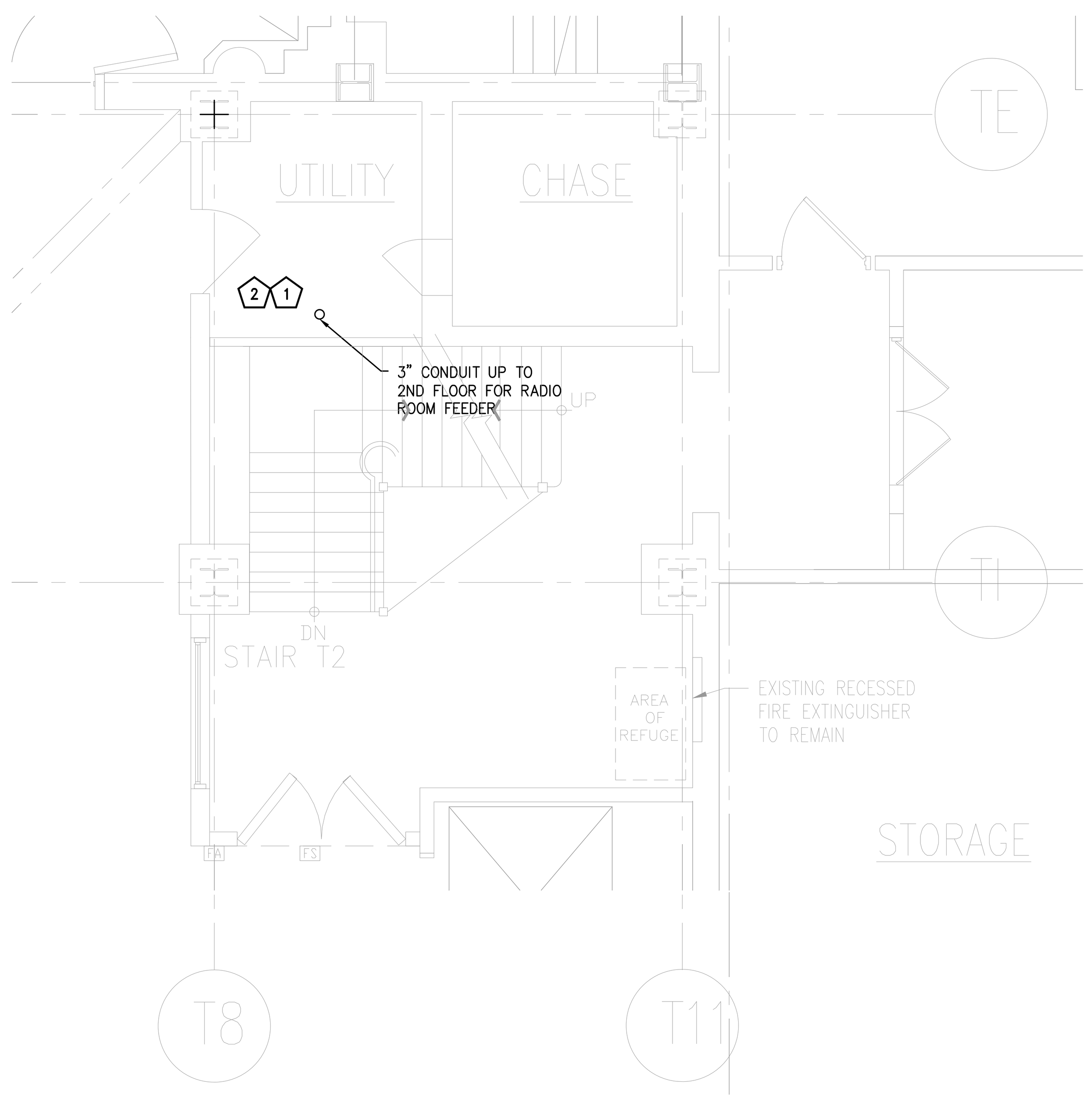
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

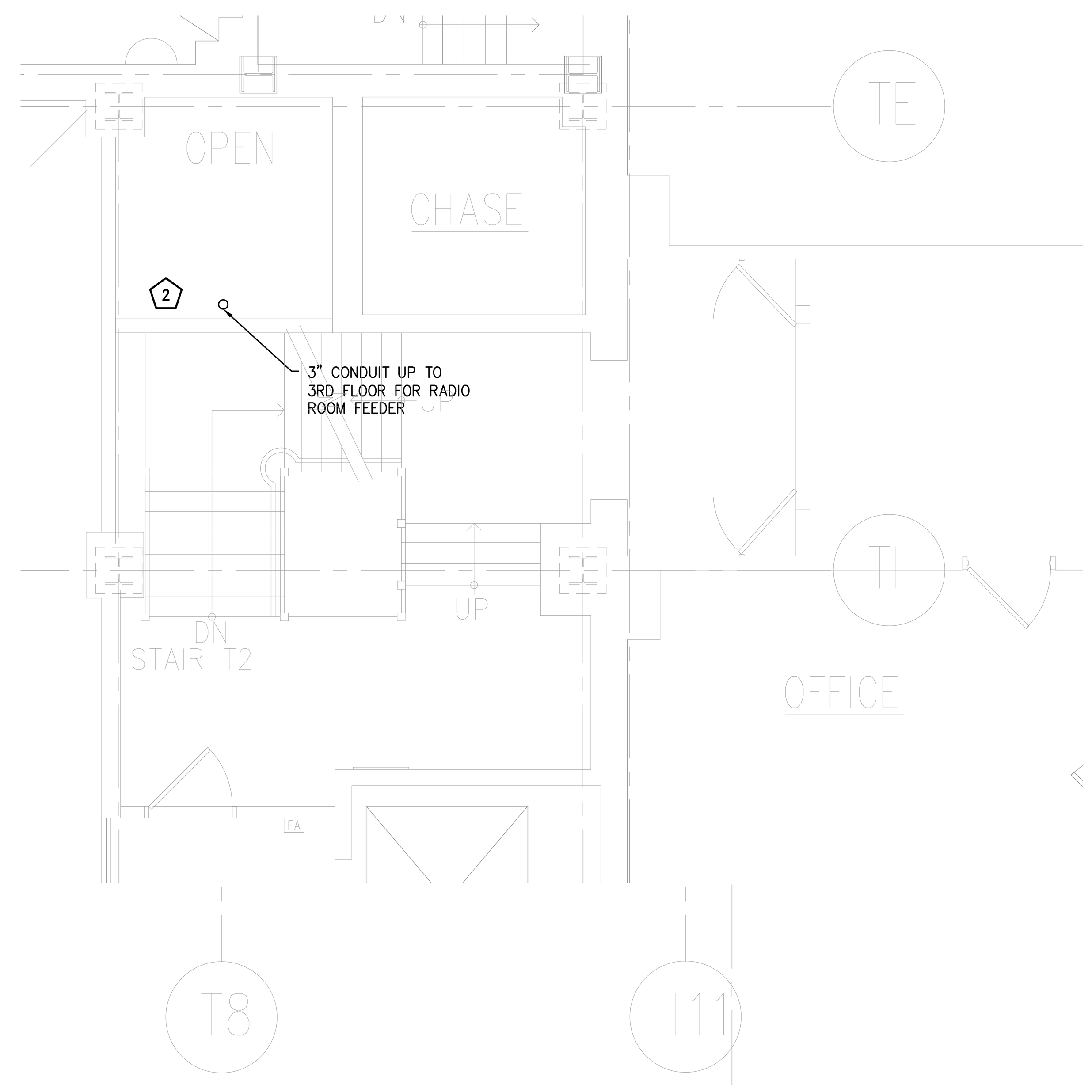
ELECTRICAL - POWER PLAN
SIXTEENTH FLOOR

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				
03.14.16	ADDENDUM 1	KD	FM				

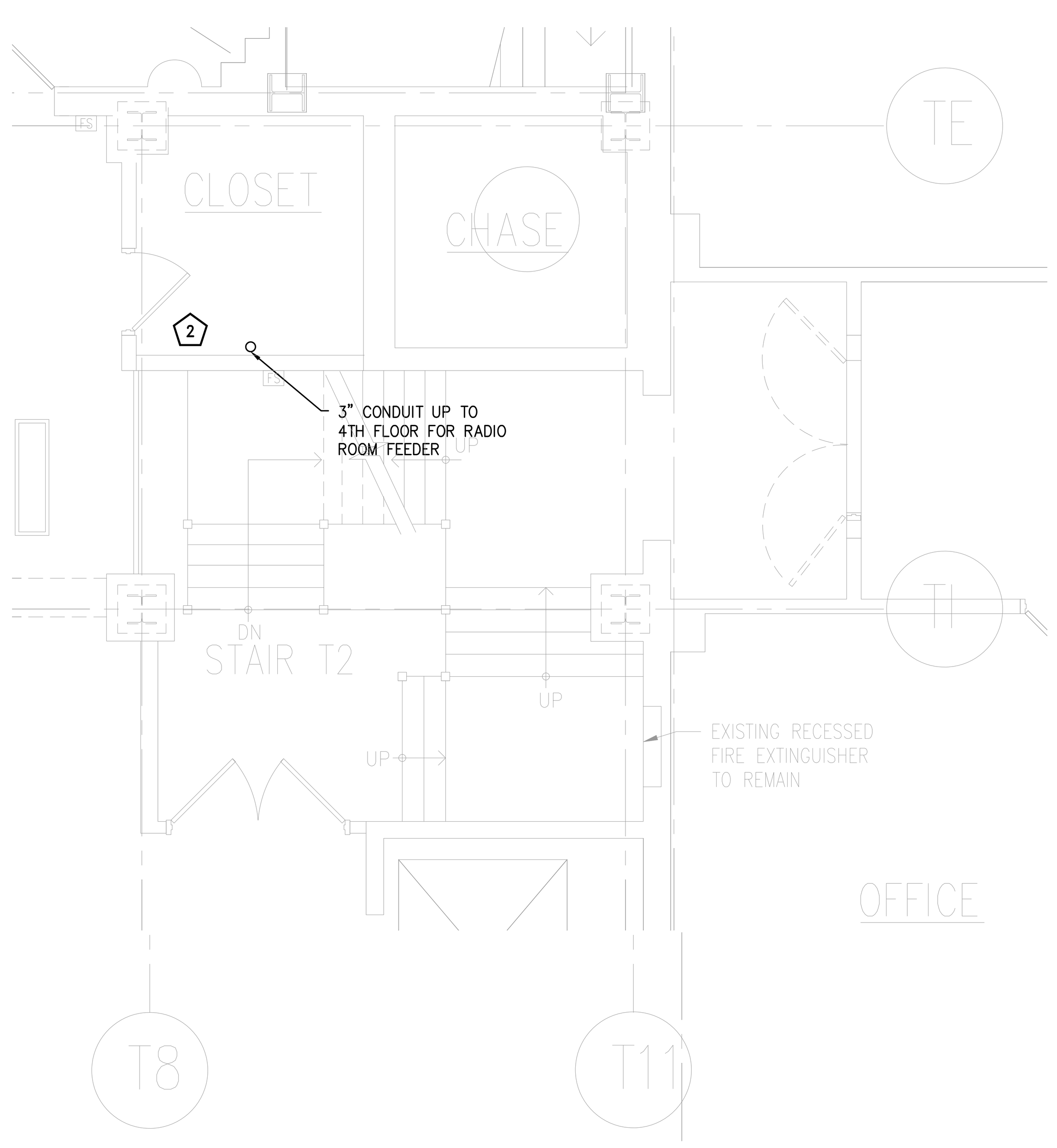
DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.301



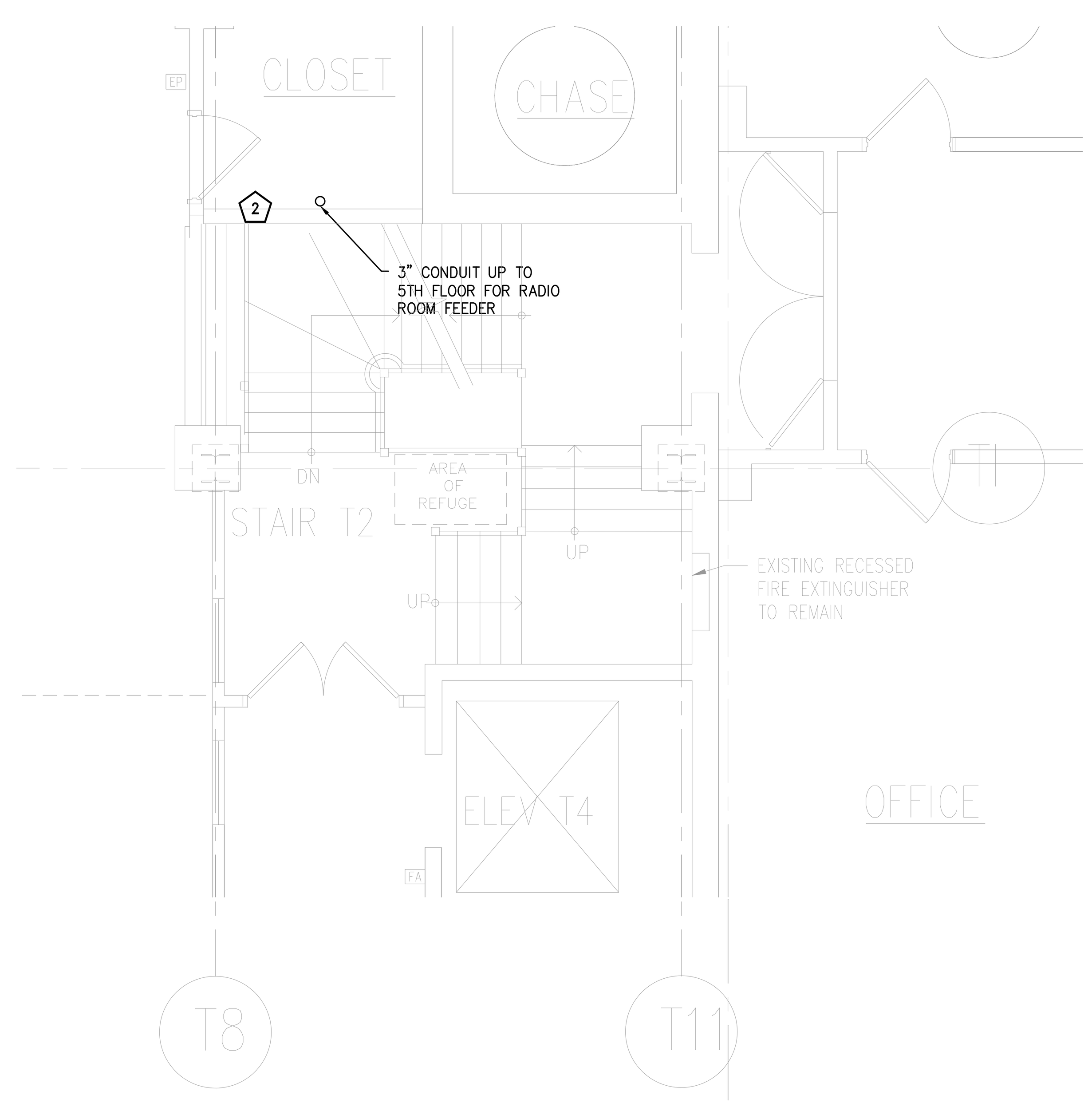
POWER PLAN – FIRST FLOOR
SCALE: 1/4"=1'-0"



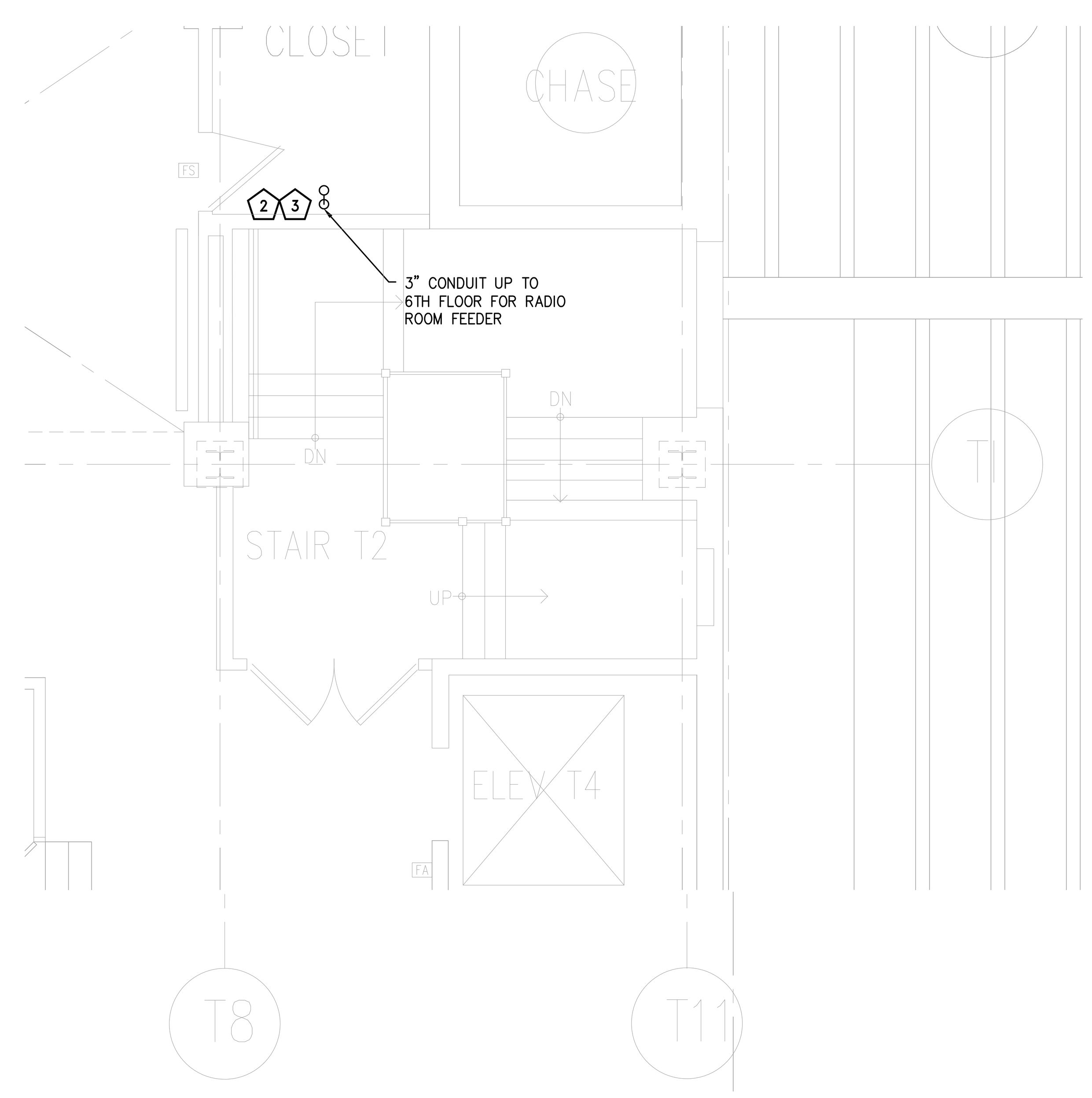
POWER PLAN – SECOND FLOOR
SCALE: 1/4"=1'-0"



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



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



POWER PLAN – FIFTH FLOOR
SCALE: 1/4"=1'-0"

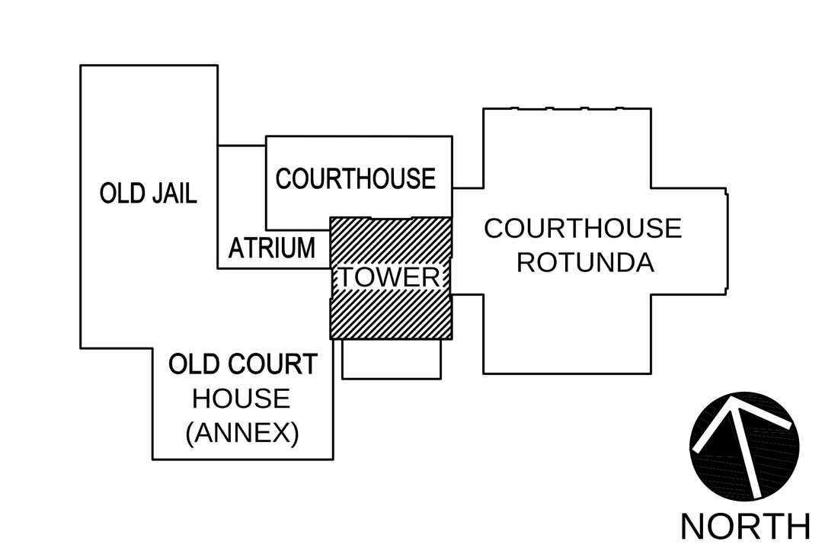
KEYED NEW WORK NOTES:

1. PROVIDE NEW FEEDER FROM NEW BREAKER IN EXISTING PANEL PC AS INDICATED ON ONE LINE DIAGRAM. REFER TO DRAWING E302.1 FOR LOCATION OF MANUAL TRANSFER SWITCH, PORTABLE ENGINE BOX, AND CONDUIT FEEDER RUNS.
2. FOR EACH PENETRATION, PROVIDE NEW CORE DRILLS AND SUPPORT CONDUITS WITH RISER CLAMPS. FIRE STOP EACH PENETRATION IN ACCORDANCE WITH DETAILS. PROVIDE FLOOR MOUNTED JUNCTION BOX FOR CABLE PULLING EVERY 3RD FLOOR.
3. CONTRACTOR SHALL OFFSET CONDUIT AS REQUIRED TO ACHIEVE INDICATED ROUTING.

DRAWING NOTES:

1. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
2. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH–IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
3. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
4. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN–FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
5. REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
6. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.12 AND AS REQUIRED.
7. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
8. 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.
9. 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.
10. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
11. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
12. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES AND ABBREVIATIONS.
13. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

KEYPLAN



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

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

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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:

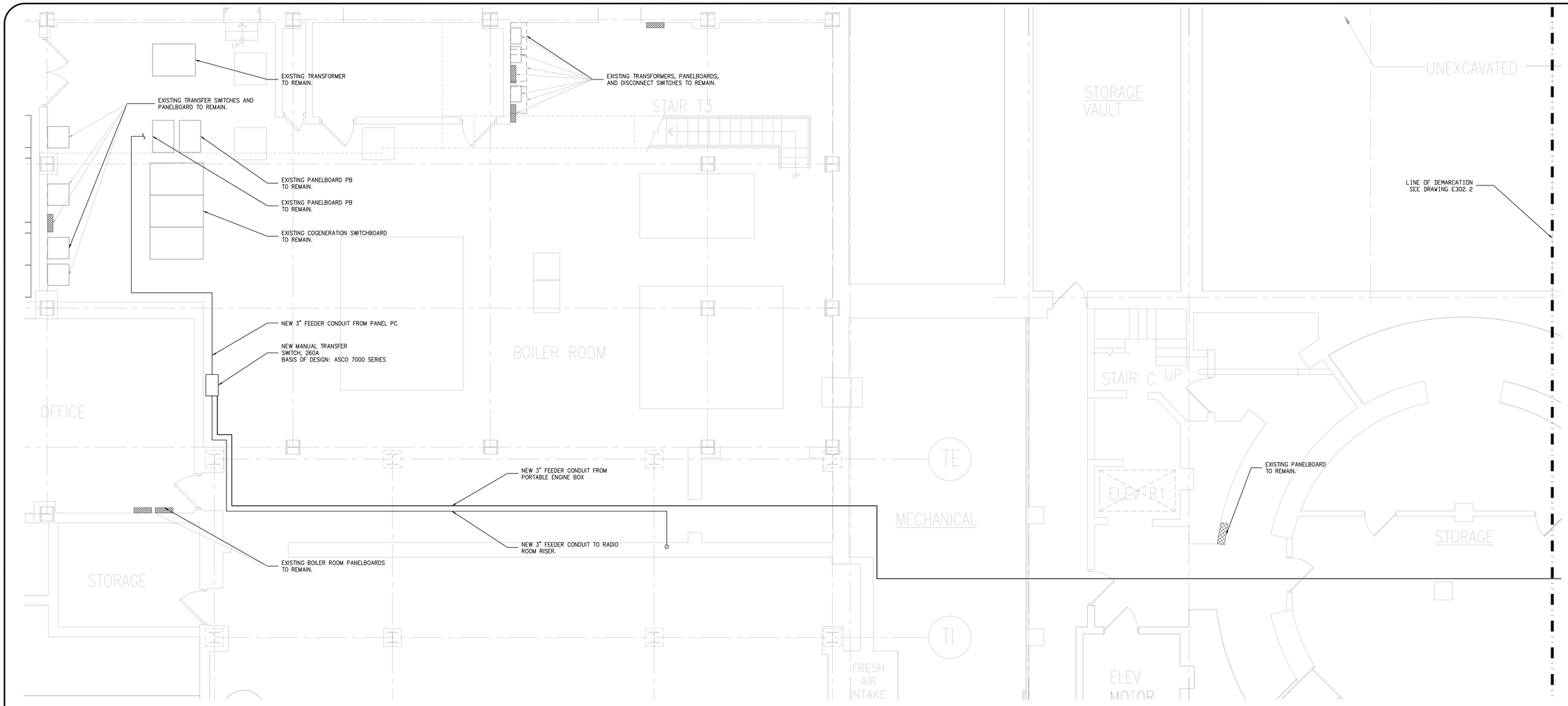
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - BASEMENT THRU FIFTH FLOOR PART PLANS

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				
03.14.16	ADDENDUM 1	KD	FM				

DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.302



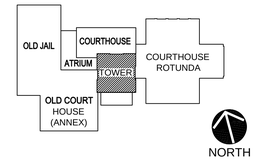
PARTIAL POWER PLAN – BASEMENT

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

DRAWING NOTES:

1. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
2. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
3. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
4. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
5. REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
6. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.12 AND AS REQUIRED.
7. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
8. 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.
9. 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.
10. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
11. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
12. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES AND ABBREVIATIONS.
13. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

KEYPLAN



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, PLUMBING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2800 FAX: 973-286-2864
www.atiengineers.com
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.378.0008 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

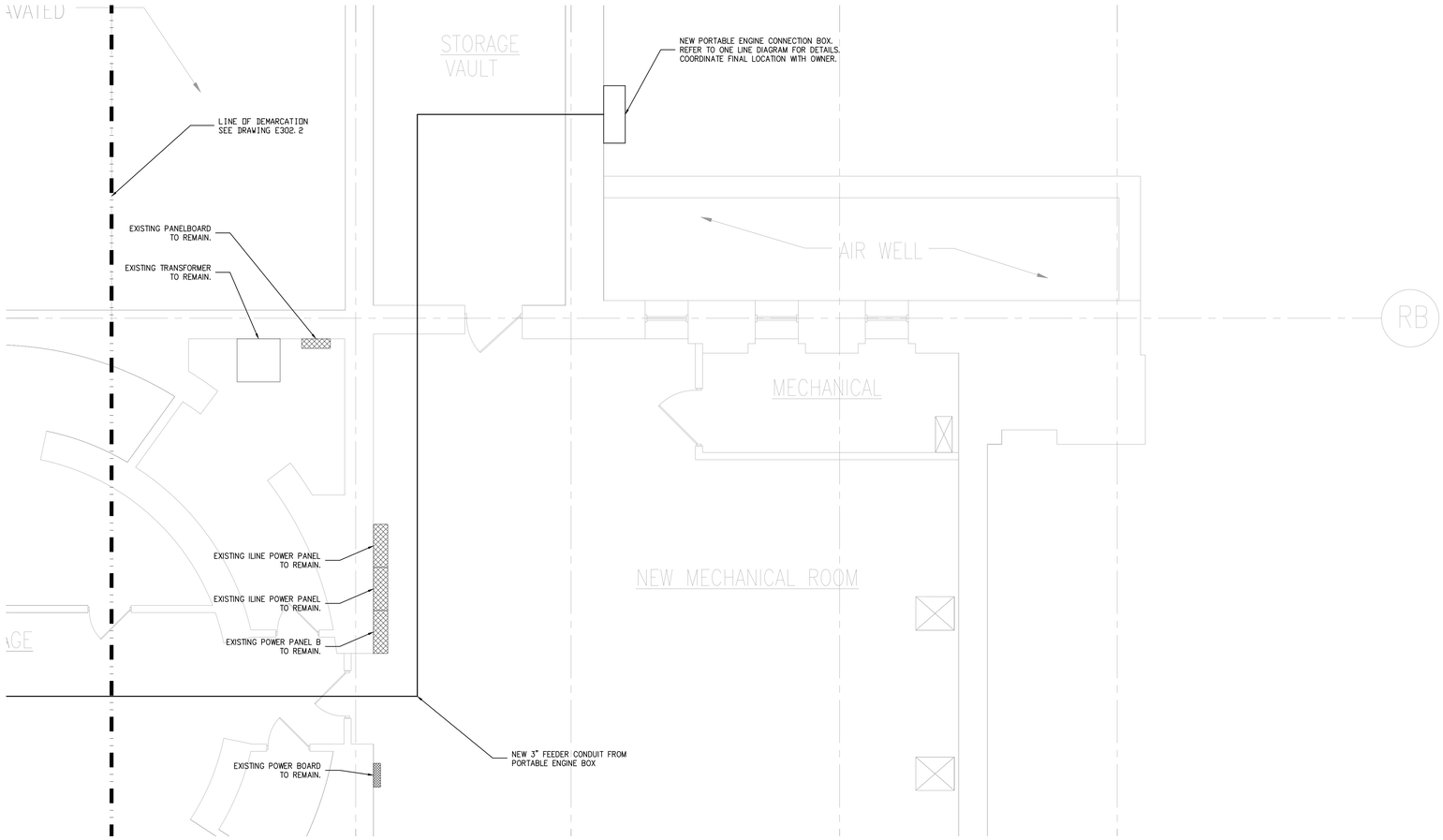
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - BASEMENT THRU FIFTH FLOOR PART PLANS

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				
03.14.16	ADDENDUM 1	KD	FM				

DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.302.1



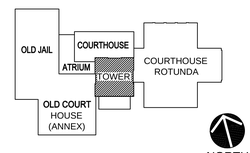
PARTIAL POWER PLAN – BASEMENT

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

DRAWING NOTES:

1. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
2. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
3. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
4. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
5. REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
6. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.12 AND AS REQUIRED.
7. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
8. 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.
9. 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.
10. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
11. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
12. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES AND ABBREVIATIONS.
13. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

KEYPLAN



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

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

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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:

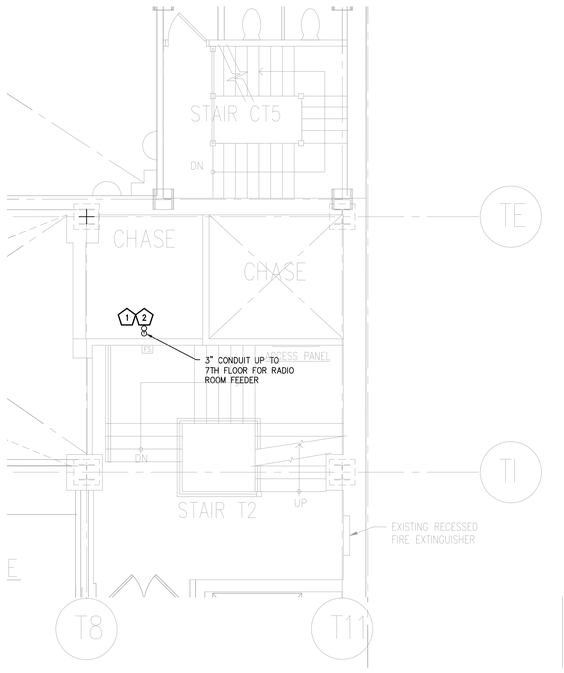
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - BASEMENT THRU FIFTH FLOOR PART PLANS

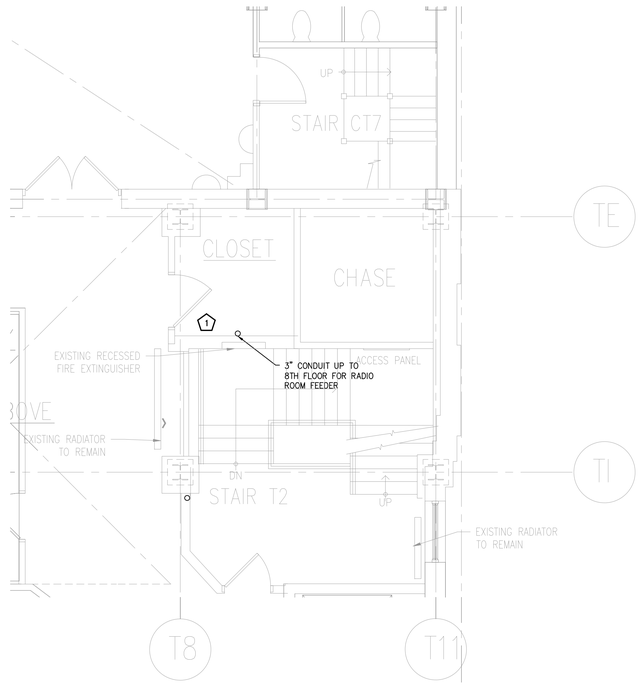
SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				
03.14.16	ADDENDUM 1	KD	FM				

DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.302.2



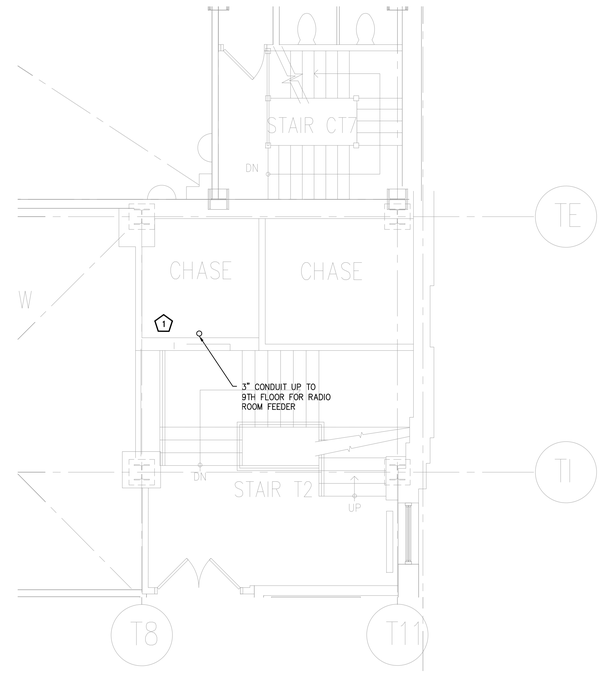
POWER PLAN – SIXTH FLOOR

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



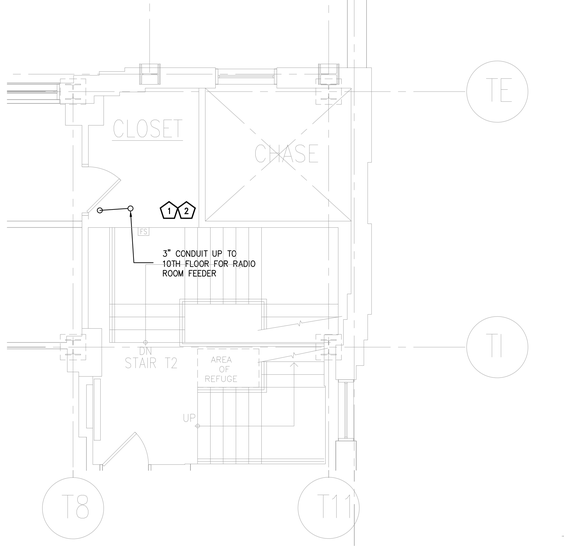
POWER PLAN – SEVENTH FLOOR

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



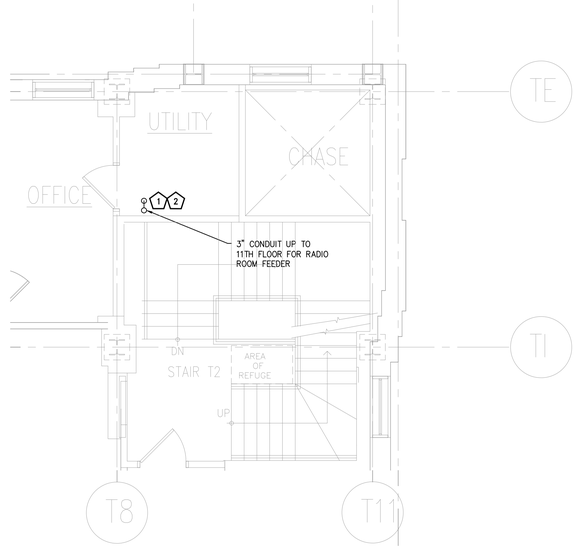
POWER PLAN – EIGHTH FLOOR

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



POWER PLAN – NINTH FLOOR

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



POWER PLAN – TENTH FLOOR

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

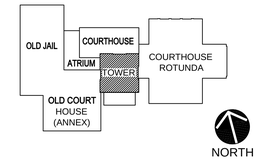
KEYED NEW WORK NOTES:

1. FOR EACH PENETRATION, PROVIDE NEW CORE DRILLS AND SUPPORT CONDUITS WITH RISER CLAMPS. FIRE STOP EACH PENETRATION IN ACCORDANCE WITH DETAILS. PROVIDE FLOOR MOUNTED JUNCTION BOX FOR CABLE PULLING EVERY 3RD FLOOR. CONTRACTOR SHALL COORDINATE ACTUAL ROUTING WITH FIELD CONDITIONS AS REQUIRED AND PROVIDE ALL OFFSETS.
2. CONTRACTOR SHALL OFFSET CONDUIT AS REQUIRED TO ACHIEVE INDICATED ROUTING.

DRAWING NOTES:

1. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
2. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
3. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
4. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
5. REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75'C TERMINALS, 40'C AMBIENT TEMPERATURE.
6. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.12 AND AS REQUIRED.
7. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
8. 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.
9. 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.
10. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
11. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
12. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES AND ABBREVIATIONS..
13. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

KEYPLAN



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 ENGINEERS
24 COMMERCE ST., SUITE 1400, NEWARK, NEW JERSEY 07102
(973) 379-1200 FAX: (973) 379-1061
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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:

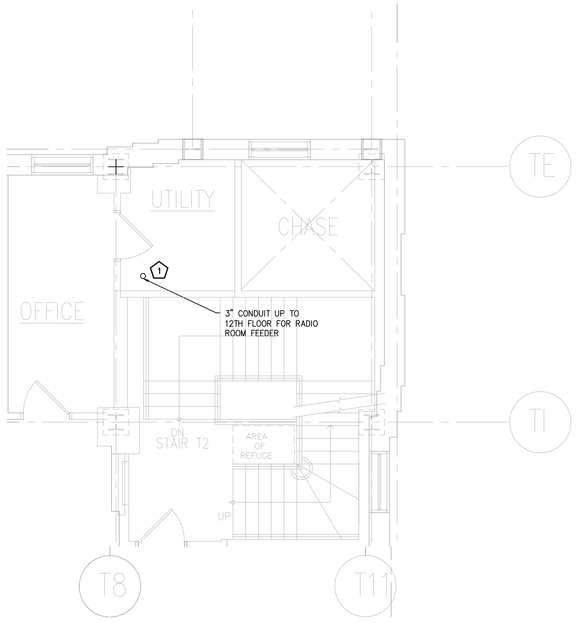
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - SIXTH THRU TENTH FLOOR PART PLANS

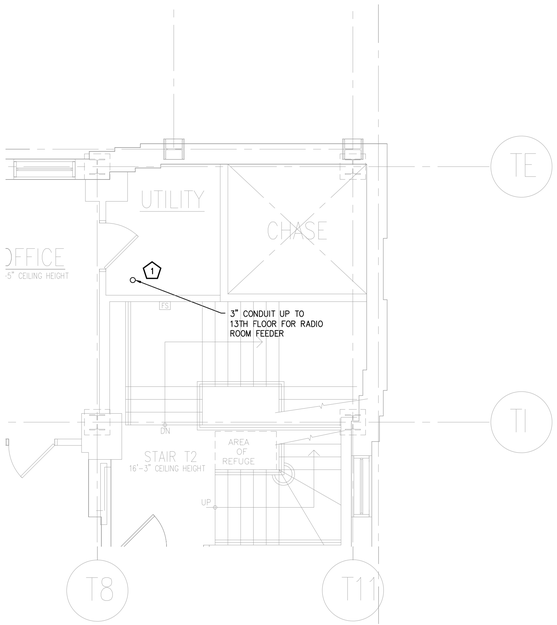
SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				
03.14.16	ADDENDUM 1	KD	FM				

DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.303



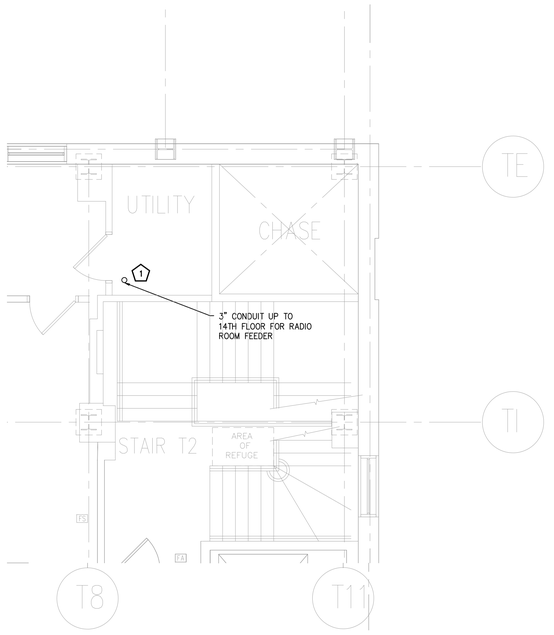
POWER PLAN – ELEVENTH FLOOR

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



POWER PLAN – TWELFTH FLOOR

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



POWER PLAN – THIRTEENTH FLOOR

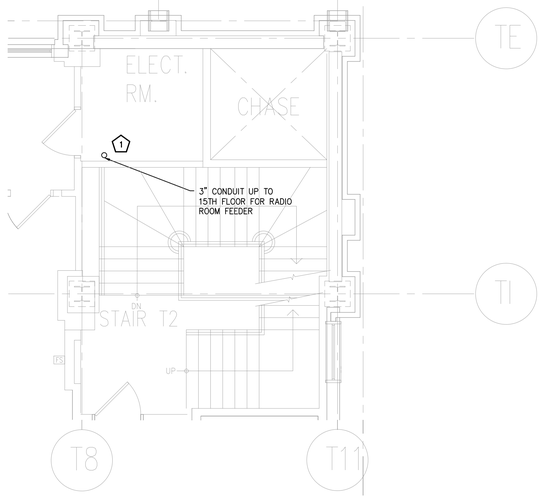
SCALE: 1/4"=1'-0"

KEYED NEW WORK NOTES:

1. FOR EACH PENETRATION, PROVIDE NEW CORE DRILLS AND SUPPORT CONDUITS WITH RISER CLAMPS. FIRE STOP EACH PENETRATION IN ACCORDANCE WITH DETAILS. PROVIDE FLOOR MOUNTED JUNCTION BOX FOR CABLE PULLING EVERY 3RD FLOOR. CONTRACTOR SHALL COORDINATE ACTUAL ROUTING WITH FIELD CONDITIONS AS REQUIRED AND PROVIDE ALL OFFSETS.
2. CONTRACTOR SHALL OFFSET CONDUIT AS REQUIRED TO ACHIEVE INDICATED ROUTING.

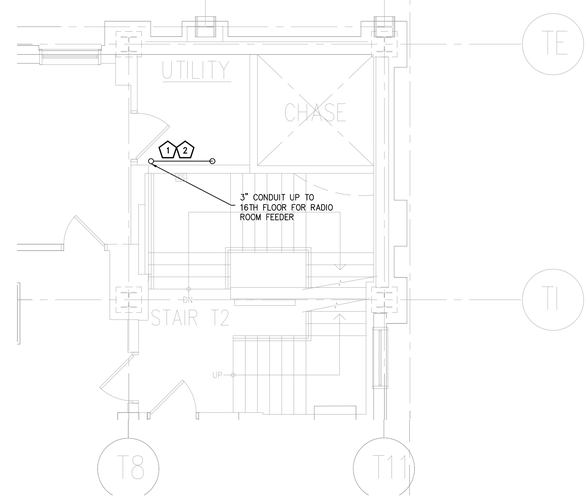
DRAWING NOTES:

1. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
2. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
3. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
4. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
5. REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
6. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.12 AND AS REQUIRED.
7. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
8. 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.
9. 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.
10. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
11. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
12. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES AND ABBREVIATIONS..
13. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.



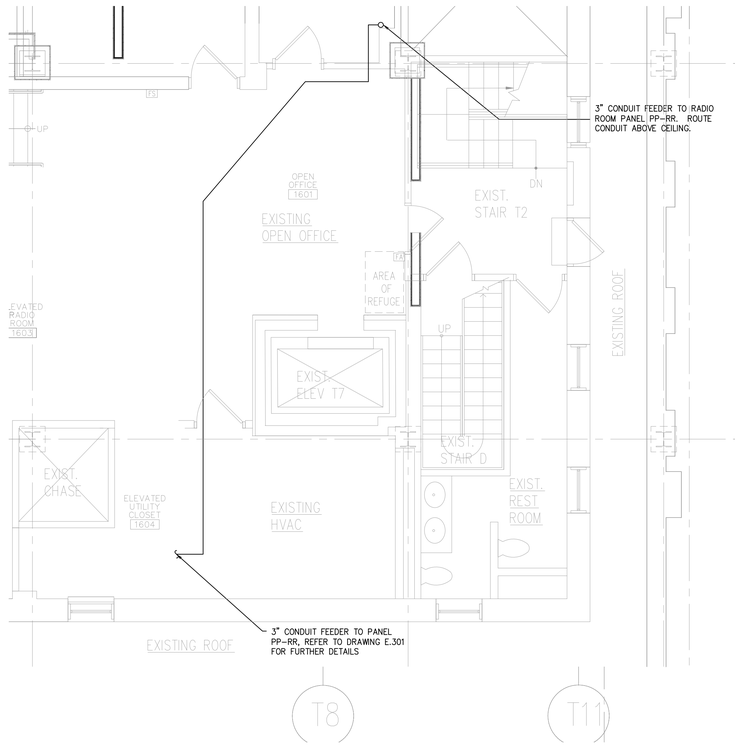
POWER PLAN – FOURTEENTH FLOOR

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



POWER PLAN – FIFTEENTH FLOOR

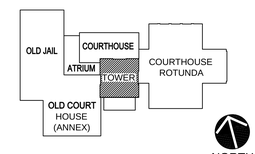
SCALE: 1/4"=1'-0"



POWER PLAN – SIXTEENTH FLOOR

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

KEYPLAN



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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-8000 FAX: 973-286-8001
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - ELEVENTH THRU SIXTEENTH FLOOR PART PLANS

SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					
10.30.15	95% CD UPDATE	KD	FM					
02.19.16	ISSUED FOR BID	KD	FM					
03.14.16	ADDENDUM 1	KD	FM					

DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.304

PROJECT MANUAL

FOR

UNION COUNTY COURTHOUSE RADIO ROOM TOWER

CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY

BA#13-2016; UNION COUNTY ENGINEERING PROJECT #2010-033F

01 MARCH 2016

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. Pellettiere, 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 RADIO ROOM TOWER
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
BA#13-2016; Union County Engineering Project #2010-033F

TABLE OF CONTENTS

Cover Sheet: County Officials
NB-1: Notice to Bidders

GENERAL SPECIFICATIONS
Definitions
Section 1: BID FORM
Section 2: WITHDRAWAL OF BID DUE TO MISTAKE
Section 3: QUALIFICATIONS OF BIDDERS AND REQUIRED SUBMISSIONS
Section 4: INTERPRETATIONS AND ADDENDA
Section 5: OBLIGATION OF BIDDER TO INSPECT SITE AND CONTRACT DOCUMENTS
Section 6: BID AND PERFORMANCE GUARANTEE
Section 7: COMMENCEMENT AND COMPLETION
Section 8: BIDDER AFFIDAVIT
Section 9: CLASSIFICATION AND QUALIFICATION OF BIDDERS
Section 10: UNCOMPLETED CONTRACTS (BUILDING PROJECTS ONLY)
Section 11: BID SECURITY
Section 12: LABOR AND MATERIALS
Section 13: INSURANCE REQUIREMENTS
Section 14: INDEMNIFICATION REQUIREMENTS
Section 15: ROYALTIES AND PATENTS
Section 16: PLANS AND SPECIFICATIONS
Section 17: GUARANTEE AGAINST DEFECTIVE WORK
Section 18: TRAFFIC AND STREET MAINTENANCE
Section 19: CONTRACTOR'S EMPLOYEES
Section 20: OWNERSHIP DISCLOSURES REQUIRED
Section 21: NON-COLLUSION AFFIDAVIT
Section 22: EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCES
Section 23: COMPLIANCE WITH NEW JERSEY PREVAILING WAGE ACT
Section 24: BRAND NAME OR EQUAL
Section 25: LINES AND GRADES
Section 26: NUMBER OF WORKING DAYS
Section 27: PROMPT PAYMENT OF CONSTRUCTION CONTRACTS (NJ Prompt Payment Act)
Section 28: STOPPING WORK ON ACCOUNT OF BAD WEATHER
Section 29: ACCESS FOR OTHER CONTRACTORS
Section 30: CONDEMNED MATERIALS AND WORK
Section 31: STORAGE
Section 32: FINAL CLEAN UP
Section 33: SUB-LETTING OF WORK
Section 34: SAFETY
Section 35: QUALITY, SAFETY AND PERFORMANCE STANDARDS
Section 36: MATTERS NOT MENTIONED IN CONTRACT DOCUMENTS
Section 37: PERMITS
Section 38: CONTRACTOR TO PROVIDE PROOF OF PAYMENT
Section 39: CHANGE ORDERS
Section 40: SUPPLEMENTAL WORK
Section 41: FORM OF CONTRACT
Section 42: PROGRESS PAYMENTS
Section 43: INSPECTION
Section 44: DAMAGES
Section 45: LIQUIDATED DAMAGES
Section 46: AFFIRMATIVE ACTION REQUIREMENTS
Section 47: INVESTMENT ACTIVITES WITH IRAN

GENERAL SPECIFICATIONS CONTINUED

Section 48: COMPLIANCE WITH THE PUBLIC WORKS CONTRACTOR REGISTRATION ACT (N.J.S.A. 34:11-56.48 et seq)
Section 49: UTILITIES
Section 50: MATERIAL COMPLIANCE AND SHOP DRAWINGS
Section 51: PRECONSTRUCTION
Section 52: DISPUTES UNDER THE CONTRACT
Section 53: RESOLUTION NO. 2014-0408 ADOPTED ON MAY 8, 2014 BY THE UNION COUNTY BOARD OF CHOSEN FREEHOLDERS
Section 54: ORDINANCE NO. 557-2002 ADOPTED ON SEPTEMBER 5, 2002 BY THE BOARD OF CHOSEN FREEHOLDERS
Section 55: CONTRACTOR BUSINESS REGISTRATION CERTIFICATE (New Mandatory Requirement – Effective 1/18/2010
Section 56: BID PROTEST - LEGAL FEES AND COSTS
Section 57: AMERICAN GOODS AND PRODUCTS WHERE POSSIBLE
Section 58: NEW JERSEY PAY-TO-PLAY REQUIREMENTS
Section 59: STATEMENT OF EQUIPMENT TO BE USED IN CONSTRUCTION
Section 60: NEW JERSEY SALES AND USE TAX REQUIREMENTS

BIDDING DOCUMENTS

Bid Document Submission Checklist
Bidding Documents
Bid Form
Consent of Surety
Bidder Signature Page
Bidder Disclosure Statement
Subcontractor Identification Statement: List of Subcontractors
Subcontractor Identification Certification
Acknowledgement of Addendum
Contractor Business Registration Certificate
Affirmative Action Requirement
Experience Statement
Certificate of Bidder Showing Ability to Perform Contract
Non-Collusion Affidavit
Contractor Registration Advisement
Americans with Disabilities Act
Contractor Responsibility Certification
Affidavit of General Contractor & Subcontractor OSHA Compliance
Statement of Bidder's Qualifications
Contractor Performance Record
Affidavit Regarding List of Disbarred, Suspended or Disqualified Bidders
Prior Negative Experience Questionnaire-Certification
Contractor's Certification of Compliance - New Jersey Prevailing Wage Act
Uncompleted Contracts Affidavit
Certificate of Insurance Statement
Collection of Use Tax on Sales to Local Governments Statement
Time of Completion
Disclosure of Investment Activities in Iran

NEW JERSEY PREVAILING WAGE DETERMINATION DOCUMENTS

SS - STANDARD SPECIFICATIONS SS-1

STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR AIA DOCUMENT A-101/2007
(Draft form until contract is awarded**)**

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION AIA DOCUMENT A-201/2007
(Draft form until contract is awarded**)**

COUNTY OF UNION
NOTICE TO BIDDERS

Sealed bids will be received by the director of the Division of Purchasing, or his designee, at the County of Union, New Jersey on March 24, 2016 at 10:30 a.m., prevailing time, in the 3rd Floor Conference Room, U.C. Administration Building, 10 Elizabethtown Plaza, Elizabeth, New Jersey for:

UNION COUNTY COURTHOUSE RADIO ROOM TOWER
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
BA#13-2016; UNION COUNTY ENGINEERING PROJECT #2010-033F

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 $500.00 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 **pre-bid meeting** will be held on March 8, 2016 at 10:30 am. The meeting will be located at the Union County Facilities Conference Room, 2 Broad Street, Elizabethtown Plaza, Elizabeth, New Jersey 07202. Specific questions regarding the project will be addressed at the pre-bid meeting.

Bidders on this project are required to be classified by the State of NJ, Division of Property Management and Construction (DPMC) under classification(s) # C009 – General Construction / Alterations and Additions, as well as other documentary requirements in the INSTRUCTION TO BIDDERS found in the bid specification. 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.

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, R.P.P.S., MPA, ACTING 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, Director, Division of Purchasing
Telephone: 908-527-4130
Facsimile: 908-558-2548

TITLE OF PROJECT: Union County Courthouse Radio Room Tower
City of Elizabeth, County of Union, New Jersey
BA#13-2016; Union County Engineering Project #2010-033F

BIDDER: Bidder shall be a single overall contract bidder

ARCHITECT/ENGINEER: Netta Architects
1084 Route 22 West
Mountainside, New Jersey 07092

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 Services, Inc.
96 East Main Street, Little Falls, NJ 07424
Office: (973) 837-1515

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 of Bid (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 of Bid (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 these 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 Contactor'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 Michael M. Yuska, QPA, 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, Michael M. Yuska, 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 or Design Professional as the case may be 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 52 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 on-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;
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

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 statues 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. l7:27-7.2; 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. l7:27-7.2. 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:

(l) 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 contactor 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 l0 of the Administrative Code (NJAC 17:27).**

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

47. INVESTMENT ACTIVITIES WITH IRAN

Pursuant to P.L. 2012, c.25, 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.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

53. RESOLUTION NO. 2014-0408 ADOPTED ON MAY 8, 2014 BY THE UNION COUNTY BOARD OF CHOSEN FREEHOLDERS

In addition to compliance with the New Jersey Prevailing Wage Act, the Contractor shall comply with the requirement as set forth in Resolution No. 2014-0408 adopted on May 8, 2014 by the Union County Board of Chosen Freeholders.

UNION COUNTY BOARD OF CHOSEN FREEHOLDERS RESOLUTION NO. 2014-0408 DATED: 05/08/2014

WHEREAS, the County of Union recognizes there is a need to ensure that all work on significant public construction and maintenance contracts is performed by responsible, qualified firms that maintain the capacity, expertise, personnel, and other qualifications and resources necessary to successfully perform public contracts in a timely, reliable, and cost-effective manner; and

WHEREAS, in order to effectuate the purpose of selecting responsible contractors for significant public contracts and to protect Union County's capital investments in such contracts prospective contractors and subcontractors should be required to meet pre-established, clearly-defined, minimum standards relating to contractor responsibility, including requirements and criteria concerning qualifications, competency, expertise, adequacy of resources, including equipment, financial and personnel, and satisfactory records regarding past project performance, safety, legal compliance and business integrity; and

WHEREAS, the County has a compelling interest in assuring that its Public Works Projects meet the highest standard of safety and quality; and

WHEREAS, due to the critical impact that skilled construction craft labor has on public works projects, and due to the limited availability of skilled construction craft labor and imminent craft labor skill shortages, it is necessary to require contractors and subcontractors to participate in established, formal apprenticeship training programs for the purpose of both promoting successful project delivery and ensuring future workforce development; and

WHEREAS, an apprenticeship program is a structured system of training designed to prepare individuals for occupations and life long careers in skilled trades and crafts by providing a wage-paying job that incorporates extensive workplace and classroom training under the supervision of experienced workers, in preparation for highly skilled occupations; and

WHEREAS, apprenticeship programs are a critical component in public safety, by ensuring that workers on public projects are properly trained, able, competent and capable craftsmen, and provide assurance of compliance with the County's bid specifications and achieve high quality standards; and

WHEREAS, for an apprenticeship program to be fully effective, the public and private sectors must recognize its value and commit to supporting its mission; and

WHEREAS, Union County has long recognized the value of apprenticeship programs through its support of the Union County Vocational-Technical Schools, which offer training programs to help ensure that Union County will continue to produce a skilled and educated work force in the trade specialties, and thus, strengthen Union County's economy by fostering the development of highly paid trade and craft careers; and

WHEREAS, the use of apprenticeship programs or apprenticeship trained employees on Union County Public Works Projects will serve the dual goal of providing the County with assurance that its public works projects are completed with a well-trained workforce, in a highly skilled and timely fashion, while creating opportunities for careers in the skilled trades and craft industry for County residents.

WHEREAS, the County of Union also recognizes that it is beneficial to their employees to utilize fair business, employment, and training practices that have a positive impact on local communities affected by such contracts.

NOW, THEREFORE, BE IT RESOLVED by the Board of Chosen Freeholders of the County of Union as follows:

1. The County of Union shall require compliance with the provisions of this Resolution by business entities seeking to provide services to the County of Union as specified herein. The requirements of this Resolution are intended to supplement, not replace, existing contractor qualifications and performance standards or criteria currently required by law, public policy or contracting documents, including but not limited to Union County's DPMC classification and Project Labor Agreement policies

2. All contractors and subcontractors that perform significant work on any public facility or public works project, including construction, alteration, renovation, repair, service, or maintenance work, shall meet the requirements of this Resolution. For purposes of this Resolution, the term "significant work" shall be defined as any work or activity covered under the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25 et seq.

3. All firms engaged in contracts covered by this Resolution shall be qualified responsible contractors or subcontractors that have sufficient capabilities in all respects to successfully perform contracts on which they are engaged, including the necessary experience, equipment, technical skills and qualifications and organizational, financial and personnel resources. Firms bidding on public contracts shall also be required to

have a satisfactory past performance record and a satisfactory record of legal compliance, integrity and business ethics. Compliance with these standards shall be established by compliance with the requirements set forth in paragraph 8 of this Resolution.

4. As a condition of performing work on public works contracts over the public works threshold, the general contractor shall provide certification that he and each subcontractor working on the project shall have at least one (1) employee who has successfully completed the OSHA 10-hour construction safety and health course. As a condition of performing work on public works contracts of $500,000.00 or more total cost of project, the general contractor shall provide certification that each subcontractor working on the project shall have at least one (1) employee who has successfully completed the OSHA 30-hour construction safety and health course.

5. All contractors and subcontractors that perform significant work on any public facility or public works project shall be required to affirmatively provide evidence of and confirm compliance with proof of participation in an Apprenticeship Program currently registered and approved by the United States Department of Labor ("USDOL"), the New Jersey Department of Labor ("NJDOL") or any state having equal to or higher requirements as either the USDOL or NJDOL apprenticeship programs. Additionally, Apprenticeship Programs shall meet the criteria set forth in Section 8(i) of this Resolution.

6. As a condition of performing work on public works contracts subject to this Resolution, a general contractor seeking award of a contract shall submit a Contractor Responsibility Certification at the time it submits its bid for contract.

7. The Contractor Responsibility Certification shall be completed on a form provided by the Union County Purchasing Department and shall reference the project for which a bid is being submitted by name and contract or project number.

8. In the Contractor Responsibility Certification, general contractors and subcontractors shall certify the following facts regarding their past performance and work history and its current qualifications and performance capabilities:

a. The firm has all valid, effective licenses, registrations or certificates required by federal, state, county, or local law, including, but not limited to, licenses, registrations, certificates required to: (1) do business in the designated locale; and (2) perform the contract work it seeks to perform. These shall include, but not be limited to,

licenses, registrations or certificates for any type of trade work or specialty work, which the firm proposes to self-perform.

b. The firm meets the bonding requirements for the contract, as required by applicable law or contract specifications and any insurance requirements, as required by applicable law or contract specifications, including general liability insurance, workers compensation insurance and unemployment insurance requirements.

c. The firm has not been debarred by any federal, state or local government agency or authority in the past three (3) years.

d. The firm has not defaulted on any project in the past three (3) years.

e. The firm has not had any type of business, contracting or trade license, registration, or other certification suspended or revoked in the past three (3) years.

f. The firm has not been cited and found guilty for a willful violation of federal or state safety laws in the past three (3) years.

g. The firm and/or its owners have not been convicted of any crime relating to the contracting business by a final decision of a court or government agency in the past three (3) years.

h. The firm will pay all craft employees that it employs on the project the current wage rates and benefits as required under applicable Federal or State prevailing wage laws.

i. The firm participates in an Apprenticeship Program that is currently registered with the USDOL, the NJDOL or any state having equal to or higher requirements as either the USDOL or NJDOL apprenticeship programs, for each craft or trade in which it apprentices. The firm shall provide proof of meeting this qualification standard by submitting appropriate documentation as an attachment to this Certification. The firm shall continue to participate in applicable apprenticeship programs for the full duration of the contract work. The apprenticeship program in which the firm participates shall have graduated at least one (1) enrollee in each of the past three (3) years.

9. The County of Union may conduct any additional inquiries to verify that the prospective awardee and its subcontractors have the technical qualifications and performance capabilities necessary to successfully

perform the contract and that the firms have a sufficient record of legal compliance and business integrity to justify the award of a public contract. In conducting such inquiries, the County of Union may seek relevant information from the firm, its prior clients or customers, its subcontractors or any other relevant source.

10. If any provision of this Resolution shall be held to be invalid or unenforceable by a court of competent jurisdiction, any such holding shall not invalidate any other provisions of this Resolution and all remaining provisions shall remain in full force and effect.

NOW, THEREFORE, BE IT RESOLVED by the Board of Chosen Freeholders of the County of Union that it hereby establishes and adopts the Responsible Contractor Policy, and it hereby authorizes the County Manager to sign any and all documents necessary to make said Policy effective immediately.

54. 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.

55. 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 <u>not</u> 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 <u>registered</u> 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.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

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 M. SCUTARI, DIRECTOR
DIVISION OF PURCHASING

BID DOCUMENT SUBMISSION CHECKLIST

ALL SIGNATURES AND SEALS SHALL BE ORIGINALS UNLESS OTHERWISE SPECIFIED
BID SHEETS SHOULD NOT BE SUBMITED 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

_____ Contractor Responsibility Certification

_____ Affidavit of General Contractor and Subcontractor OSHA Compliance

_____ 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

_____ Time of Completion

_____ Disclosure of Investment Activities in Iran form

I HAVE TAKEN THE FOLLOWING ACTIONS:

_____ Visited the site and attended the Pre-Bid Meeting **(Where applicable)**

_____ 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)**
- **SPECIFCATIONS: 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 RADIO ROOM TOWER
CITY OF ELIZABETH, COUNTY OF UNION, NEW JERSEY
BA No. 13-2016; Union County Engineering Project No. 2010-033F

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.

BASE BID ITEMS:

ITEM NO.	DESCRIPTION	UNIT	TOTAL AMOUNT
1	DIVISION 1 – SECURITY ALLOWANCE	LS	$80,000.00
2	DIVISION 1 – GENERAL REQUIREMENTS	LS	
3	DIVISION 2 – EXISTING CONDITIONS – SELECTIVE DEMO	LS	
4	DIVISION 3 – CONCRETE	LS	
5	DIVISION 5 – METALS	LS	
6	DIVISION 6 – WOOD, PLASTICS, & COMPOSITES	LS	
7	DIVISION 7 – THERMAL & MOISTURE PROTECTION	LS	
8	DIVISION 8 – OPENINGS	LS	
9	DIVISION 9 – FINISHES	LS	
10	DIVISION 12 – FURNISHINGS	LS	
11	DIVISION 21 – FIRE SUPPRESSION	LS	
12	DIVISION 23 – HVAC	LS	
13	DIVISION 26 – ELECTRICAL	LS	

TOTAL BASE BID ITEMS (NO 1 THROUGH 13):

_____ _____
Written Figures

Bidder's Name_____

BID CONTINGENCY: (To be used if and when directed by the County)

ONE HUNDERD SIXTY THOUSAND DOLLARS	**$160,000.00**
Written	Figures

TOTAL BASE BID ITEMS NOS. 1 THROUGH 13 PLUS BID CONTINGENCY:

_____	_____
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_____

BIDDER DISCLOSURE STATEMENT

N.J.S.A. 52:25-24.2 (P.L. 1977 c. 33)

Failure of the bidder/respondent to submit the required information is cause for automatic rejection.
CHECK ONE

☐ I certify that the list below contains the names and home addresses of all stockholders holding 10% or more of the issued and outstanding stock of the undersigned.

OR

☐ I certify that no one stockholder owns 10% or more of the issued and outstanding stock of the undersigned.

LEGAL NAME OF BIDDER:_____

Check the box that represents the type of business organization:

☐Partnership ☐Corporation ☐Sole Proprietorship
☐Limited Partnership ☐Limited Liability Company ☐Limited Liability Partnership
☐Subchapter S Corporation

Complete if the bidder/respondent is one of the 3 types of corporations:

Date Incorporated:_____ **Where Incorporated:**_____

BUSINESS ADDRESS:

Street Address	**City**	**State**	**Zip Code**

Telephone # **Fax #**

Pursuant to N.J.S.A. 52:25-24.2, also referred to as P.L. 1977, c. 33, no corporation or partnership shall be awarded any contract for the performance of any work or the furnishing of any materials or supplies, unless, prior to the receipt of the bid or accompanying the bid of said corporation or partnership, there is submitted a statement setting forth the names and addresses of all stockholders in the corporation or partnership who own ten (10) percent or more of its stock of any class, or of all individual partners in the partnership who own a ten (10) percent or greater interest therein. Further, the Attorney General has concluded that the provisions of N.J.S.A. 52:25-24.2, in referring to corporations and partnerships, are intended to apply to all forms of business entities, including, but not limited to, corporations, limited partnerships, limited liability companies, limited liability partnerships, Subchapter S corporations, partnerships and sole proprietorships.

Bidders are required to disclose whether they are a partnership, corporation, limited liability company or sole proprietorship. The Stockholder Disclosure Certification form shall be completed, signed and notarized. Failure of the bidder to submit the required information is cause for automatic rejection of the bid.

Bidder's Name_____

BIDDER DISCLOSURE STATEMENT – (Continued)

N.J.S.A. 52:25-24.2, also referred to as **P.L. 1977, Ch. 33**, requires all corporate, limited liability and partnership bidders for state, county, municipal or school district contracts to submit a list of names and addresses of all stockholders owning 10% or more of their stock or 10% or more of the stock of the corporate stockholders or in the case of partnership or limited liability company, the names and addresses of those partners or owners owning 10% or greater interest in the partnership or limited liability company. Furthermore, the Union County Board of Chosen Freeholders requires a statement from all Bidders, which must indicate all Principals of Bidders.

You must set forth the name, home address, title and percentage of ownership of every person who is an owner of the bidder. You must also set forth the business form of the bidder.

II. Principals:

NAME	HOME ADDRESS	TITLE	% OF OWNERSHIP
1.			
2.			
3.			
4.			

If one or more of the owners of the Bidder is itself a corporation, limited liability company or partnership, then for that corporation, limited liability company or partnership owner you must set forth the name, home address, title and percentage of ownership of every person who is an owner of that corporation, limited liability company or partnership.

NAME	HOME ADDRESS	TITLE	% OF OWNERSHIP
1.			
2.			
3.			
4.			

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

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

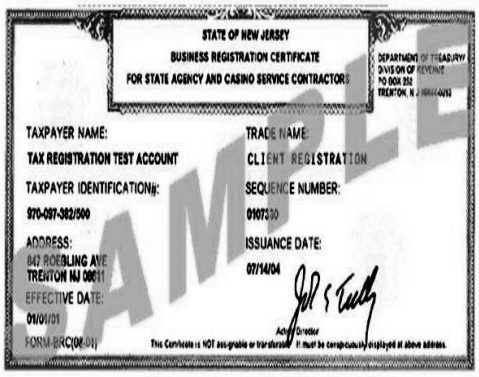
Mandatory Requirement

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


STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE
FOR STATE AGENCY AND CASINO SERVICE CONTRACTORS

TAXPAYER NAME:
TAX REGISTRATION TEST ACCOUNT

TRADE NAME:
CLIENT REGISTRATION

TAXPAYER IDENTIFICATION#:
970-087-382/000

SEQUENCE NUMBER:
0107330

ADDRESS:
847 ROEBLING AVE
TRENTON NJ 08611

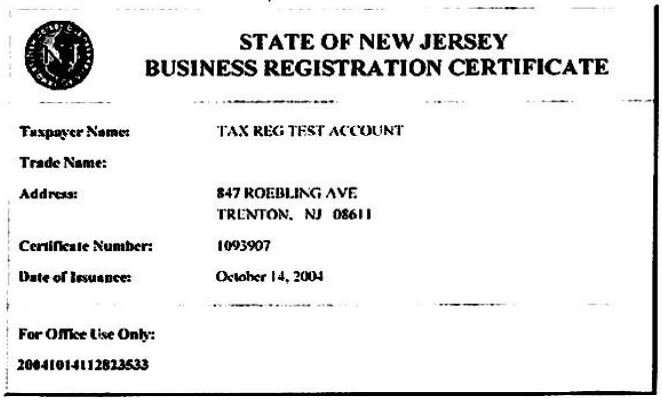
ISSUANCE DATE:
07/14/04

EFFECTIVE DATE:
01/01/01

FORM BRC(08.01)

This Certificate is NOT assignable or transferable. It must be conspicuously displayed at above address.

SAMPLE


STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

Taxpayer Name: TAX REG TEST ACCOUNT

Trade Name:

Address: 847 ROEBLING AVE
TRENTON, NJ 08611

Certificate Number: 1093907

Date of Issuance: October 14, 2004

For Office Use Only:

20041014112823533

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 **NAME OF BIDDER**

_____

Date

_____

_____

_____

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_____

CERTIFICATE OF BIDDER SHOWING ABILITY TO PERFORM CONTRACT

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 ("Contractor'), and that I executed said proposal with full authority to do so; and that said Contractor, pursuant to N.J.S.A. 40A:11-20, certifies that it owns, leases or controls all the necessary equipment required by the Plans, Specifications and Advertisements under this Bids are asked for.

If the Bidder is not the actual owner or lessee of any such equipment, then the Bidder shall attach to this Certificate information identifying the source from which the equipment will be obtained, and such information shall be accompanied by a certificate from the owner or person in control of the equipment definitively granting to the Bidder the control of the equipment required during such time as may be necessary for the completion of that portion of the contract.

_____
(Also type or print name of affiant under signature)

By:_____

Bidder's Name_____

NON-COLLUSION AFFIDAVIT

(N.J.S.A. 52:34-15)

STATE OF _____)
) **SS:**_____
COUNTY OF _____)

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 thereunto, 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_____

CONTRACTOR RESPONSIBILITY CERTIFICATION

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 following Project ("Contractor'):

_____,

and that I executed said proposal with full authority to do so;

With respect to past performance, work history, current qualifications and performance capabilities, I certify the following with respect to the Bidder/General Contractor and all of the subcontractors on this Project, I certify the following:

a. The firms have all valid, effective licenses, registrations or certificates required by federal, state, county, or local law, including, but not limited to, licenses, registrations, certificates required to: (1) do business in the designated locale; and (2) perform the contract work it seeks to perform. These include, but are not limited to, licenses, registrations or certificates for any type of trade work or specialty work to be self-performed by Bidder and/or subcontractors.

b. The firms meet the bonding requirements for the contract, as required by applicable law or the specifications and any insurance requirements, as required by applicable law or the specifications, including general liability insurance, workers compensation insurance and unemployment insurance requirements.

c. The firms have not been debarred by any federal, state or local government agency or authority in the past three (3) years.

d. The firms have not defaulted on any project in the past three (3) years.

e. The firms have not had any type of business, contracting or trade license, registration, or other certification suspended or revoked in the past three (3) years.

f. The firms have not been cited and found guilty for a willful violation of federal or state safety laws in the past three (3) years.

g. The firms and/or its owners have not been convicted of any crime relating to the contracting business by a final decision of a court or government agency in the past three (3) years.

h. The firms will pay all craft employees that it employs on the project the current wage rates and benefits as required under applicable Federal or State prevailing wage laws.

i. The firms participates in an Apprenticeship Program that is currently registered with the USDOL, the NJDOL or any state having equal to or higher requirements as either the USDOL or NJDOL apprenticeship programs, for each craft or trade in which it apprentices. The apprenticeship program in which the firm participates shall have graduated at least one (1) enrollee in each of the past three (3) years.

***** Proof of meeting this qualification standard shall be attached to this form. Bidder shall provide proof of meeting this qualification for those subcontractors required to be identified either pursuant to law or the requirements of the specifications.**

The firms shall continue to participate in the applicable apprenticeship programs for the full duration of the contract work.

_____
Name of Bidder/General 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_____

AFFIDAVIT OF GENERAL CONTRACTOR & SUBCONTRACTOR

OSHA COMPLIANCE

STATE OF NEW JERSEY / _____)

Specify, if Other) SS:

COUNTY OF _____)

In accordance with Union County Resolution 2014-0408 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:

1) I am _____ of the firm of _____ _____, the Bidder and General Contractor making the Proposal for the above named Project.

2) I have executed the said Proposal with full authority to do so.

3) Said Bidder/General Contractor and each subcontractor working on the Project have at least one (1) employee who has successfully completed the OSHA 10-hour construction safety and health course.

4) If this Project is in excess of $500,000.00, the Bidder/General Contractor and each subcontractor working on the Project has at least one (1) employee who has successfully completed the OSHA 30-hour construction safety and health course.

_____
Name of Bidder/General Contractor

By:_____
(Signature of Authorized Representative)

(Continued on next page)

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_____

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.

Bidder's Name_____

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 contact 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 _____, 200___.

_____

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 SOUCE (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 FRM 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_____

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 **240 calendar days** from the date of the notice to proceed.

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_____

DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN – (Continued)

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.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

10 INSURANCE AND BONDS

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	TBD

, 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 id 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 Contact 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 sued 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 [redacted] percent ([redacted] %). 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 [redacted] percent ([redacted] %);

.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 it 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

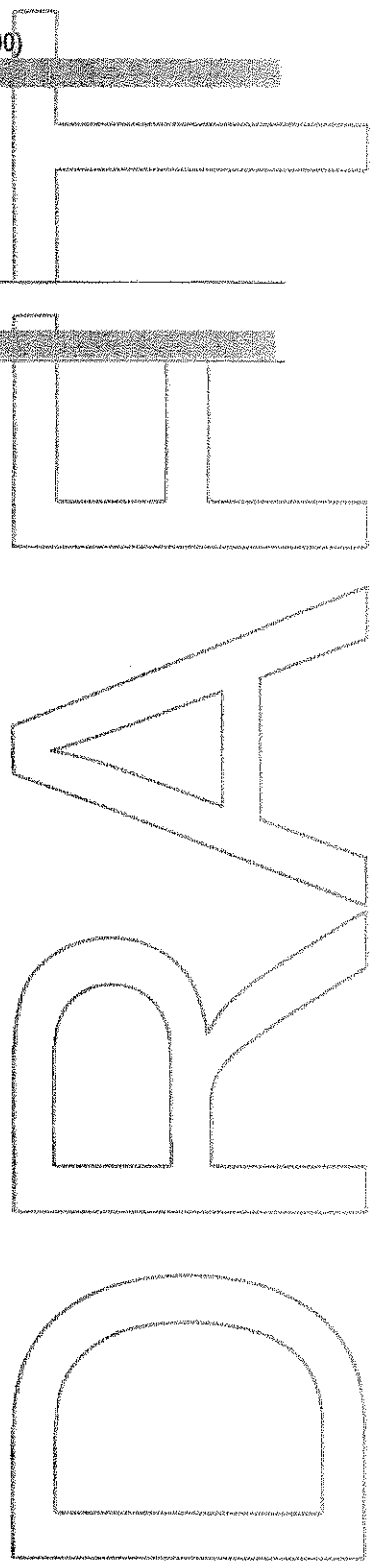
The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201–2007.

(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)*	CONTRACTOR *(Signature)*
« »« »	« »« »
(Printed name and title)	*(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)
« »« »
« »

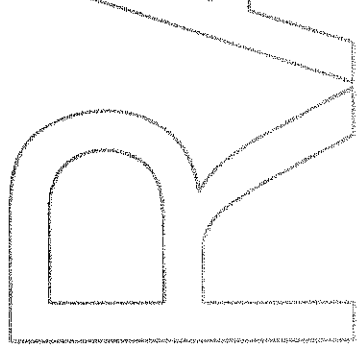
THE ENGINEER, OR HIS DESIGNEE :
(Name, legal status and address)
« »« »
« »

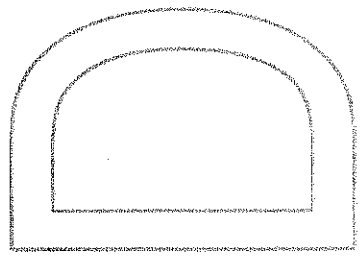
TABLE OF ARTICLES

1	GENERAL PROVISIONS
2	OWNER
3	CONTRACTOR
4	ENGINEER, OR HIS DESIGNEE :
5	SUBCONTRACTORS
6	CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
7	CHANGES IN THE WORK
8	TIME
9	PAYMENTS AND COMPLETION
10	PROTECTION OF PERSONS AND PROPERTY
11	INSURANCE AND BONDS
12	UNCOVERING AND CORRECTION OF WORK
13	MISCELLANEOUS PROVISIONS
14	TERMINATION OR SUSPENSION OF THE CONTRACT
15	CLAIMS AND DISPUTES

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.





ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

INDEX
(Topics and numbers in bold are section headings.)

Acceptance of Nonconforming Work
9.6.6, 9.9.3, **12.3**
Acceptance of Work
9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3
Access to Work
3.16, 6.2.1, 12.1
Accident Prevention
10
Acts and Omissions
3.2, 3.3.2, 3.12.8, 3.18, 4.2.3, 8.3.1, 9.5.1, 10.2.5, 10.2.8, 13.4.2, 13.7, 14.1, 15.2
Addenda
1.1.1, 3.11.1
Additional Costs, Claims for
3.7.4, 3.7.5, 6.1.1, 7.3.7.5, 10.3, 15.1.4
Additional Inspections and Testing
9.4.2, 9.8.3, 12.2.1, **13.5**
Additional Insured
11.1.4
Additional Time, Claims for
3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, **15.1.5**
Administration of the Contract
3.1.3, **4.2**, 9.4, 9.5
Advertisement or Invitation to Bid
1.1.1
Aesthetic Effect
4.2.13
Allowances
3.8, 7.3.8
All-risk Insurance
11.3.1, 11.3.1.1
Applications for Payment
4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5.1, 9.6.3, 9.7, 9.10, 11.1.3
Approvals
2.1.1, 2.2.2, 2.4, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10, 4.2.7, 9.3.2, 13.5.1
Arbitration
8.3.1, 11.3.10, 13.1.1, 15.3.2, **15.4**
ENGINEER, OR HIS DESIGNEE
4
Engineer, or his designee , Definition of
4.1.1
Engineer, or his designee , Extent of Authority
2.4.1, 3.12.7, 4.1, 4.2, 5.2, 6.3, 7.1.2, 7.3.7, 7.4, 9.2, 9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.5.1, 13.5.2, 14.2.2, 14.2.4, 15.1.3, 15.2.1
Engineer, or his designee , Limitations of Authority and Responsibility
2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2, 4.2.3, 4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4, 9.4.2, 9.5.3, 9.6.4, 15.1.3, 15.2
Engineer, or his designee 's Additional Services and Expenses
2.4.1, 11.3.1.1, 12.2.1, 13.5.2, 13.5.3, 14.2.4
Engineer, or his designee 's Administration of the Contract
3.1.3, 4.2, 3.7.4, 15.2, 9.4.1, 9.5
Engineer, or his designee 's Approvals
2.4.1, 3.1.3, 3.5, 3.10.2, 4.2.7
Engineer, or his designee 's or Engineer's Authority to Reject Work
3.5, 4.2.6, 12.1.2, 12.2.1
Engineer, or his designee 's Copyright
1.1.7, 1.5
Engineer, or his designee 's Decisions
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3, 7.3.7, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4.1, 9.5, 9.8.4, 9.9.1, 13.5.2, 15.2, 15.3
Engineer, or his designee 's Inspections
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 13.5
Engineer, or his designee 's Instructions
3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.5.2
Engineer, or his designee 's Interpretations
4.2.11, 4.2.12
Engineer, or his designee 's Project Representative
4.2.10
Engineer, or his designee 's Relationship with Contractor
1.1.2, 1.5, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.2, 4.1.3, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3.7, 12, 13.4.2, 13.5, 15.2
Engineer, or his designee 's Relationship with Subcontractors
1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3.7
Engineer, or his designee 's Representations
9.4.2, 9.5.1, 9.10.1
Engineer, or his designee 's Site Visits
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.5
Asbestos
10.3.1
Attorneys' Fees
3.18.1, 9.10.2, 10.3.3
Award of Separate Contracts
6.1.1, 6.1.2
Award of Subcontracts and Other Contracts for Portions of the Work
5.2
Basic Definitions
1.1
Bidding Requirements
1.1.1, 5.2.1, 11.4.1
Binding Dispute Resolution
9.7, 11.3.9, 11.3.10, 13.1.1, 15.2.5, 15.2.6.1, 15.3.1, 15.3.2, 15.4.1

Boiler and Machinery Insurance
11.3.2
Bonds, Lien
7.3.7.4, 9.10.2, 9.10.3
Bonds, Performance, and Payment
7.3.7.4, 9.6.7, 9.10.3, 11.3.9, **11.4**
Building Permit
3.7.1
Capitalization
1.3
Certificate of Substantial Completion
9.8.3, 9.8.4, 9.8.5
Certificates for Payment
4.2.1, 4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4, 15.1.3
Certificates of Inspection, Testing or Approval
13.5.4
Certificates of Insurance
9.10.2, 11.1.3
Change Orders
1.1.1, 2.4.1, 3.4.2, 3.7.4, 3.8.2.3, 3.11.1, 3.12.8, 4.2.8, 5.2.3, 7.1.2, 7.1.3, 7.2, 7.3.2, 7.3.6, 7.3.9, 7.3.10, 8.3.1, 9.3.1.1, 9.10.3, 10.3.2, 11.3.1.2, 11.3.4, 11.3.9, 12.1.2, 15.1.3
Change Orders, Definition of
7.2.1
CHANGES IN THE WORK
2.2.1, 3.11, 4.2.8, 7, 7.2.1, 7.3.1, 7.4, 8.3.1, 9.3.1.1, 11.3.9
Claims, Definition of
15.1.1
CLAIMS AND DISPUTES
3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, 9.10.4, 10.3.3, **15**, 15.4
Claims and Timely Assertion of Claims
15.4.1
Claims for Additional Cost
3.2.4, 3.7.4, 6.1.1, 7.3.9, 10.3.2, **15.1.4**
Claims for Additional Time
3.2.4, 3.7.46.1.1, 8.3.2, 10.3.2, **15.1.5**
Concealed or Unknown Conditions, Claims for
3.7.4
Claims for Damages
3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.1.1, 11.3.5, 11.3.7, 14.1.3, 14.2.4, 15.1.6
Claims Subject to Arbitration
15.3.1, 15.4.1
Cleaning Up
3.15, 6.3
Commencement of the Work, Conditions Relating to
2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3, 6.2.2, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.3.1, 11.3.6, 11.4.1, 15.1.4
Commencement of the Work, Definition of
8.1.2
Communications Facilitating Contract Administration
3.9.1, **4.2.4**
Completion, Conditions Relating to
3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1, 9.10, 12.2, 13.7, 14.1.2
COMPLETION, PAYMENTS AND
9
Completion, Substantial
4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2, 13.7
Compliance with Laws
1.6.1, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 4.1.1, 9.6.4, 10.2.2, 11.1, 11.3, 13.1, 13.4, 13.5.1, 13.5.2, 13.6, 14.1.1, 14.2.1.3, 15.2.8, 15.4.2, 15.4.3
Concealed or Unknown Conditions
3.7.4, 4.2.8, 8.3.1, 10.3
Conditions of the Contract
1.1.1, 6.1.1, 6.1.4
Consent, Written
3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 11.3.1, 13.2, 13.4.2, 15.4.4.2
Consolidation or Joinder
15.4.4
CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
1.1.4, **6**
Construction Change Directive, Definition of
7.3.1
Construction Change Directives
1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3, **7.3**, 9.3.1.1
Construction Schedules, Contractor's
3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2
Contingent Assignment of Subcontracts
5.4, 14.2.2.2
Continuing Contract Performance
15.1.3
Contract, Definition of
1.1.2
CONTRACT, TERMINATION OR SUSPENSION OF THE
5.4.1.1, 11.3.9, **14**
Contract Administration
3.1.3, **4**, 9.4, 9.5
Contract Award and Execution, Conditions Relating to
3.7.1, 3.10, 5.2, 6.1, 11.1.3, 11.3.6, 11.4.1
Contract Documents, Copies Furnished and Use of
1.5.2, 2.2.5, 5.3
Contract Documents, Definition of
1.1.1
Contract Sum
3.7.4, 3.8, 5.2.3, 7.2, 7.3, 7.4, 9.1, 9.4.2, 9.5.1.4, 9.6.7, 9.7, 10.3.2, 11.3.1, 14.2.4, 14.3.2, 15.1.4, 15.2.5
Contract Sum, Definition of
9.1

Contract Time
3.7.4, 3.7.5, 3.10.2, 5.2.3, 7.2.1.3, 7.3.1, 7.3.5, 7.4, 8.1.1, 8.2.1, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 14.3.2, 15.1.5.1, 15.2.5
Contract Time, Definition of
8.1.1
CONTRACTOR
3
Contractor, Definition of
3.1, 6.1.2
Contractor's Construction Schedules
3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2
Contractor's Employees
3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3, 11.1.1, 11.3.7, 14.1, 14.2.1.1
Contractor's Liability Insurance
11.1
Contractor's Relationship with Separate Contractors and Owner's Forces
3.12.5, 3.14.2, 4.2.4, 6, 11.3.7, 12.1.2, 12.2.4
Contractor's Relationship with Subcontractors
1.2.2, 3.3.2, 3.18.1, 3.18.2, 5, 9.6.2, 9.6.7, 9.10.2, 11.3.1.2, 11.3.7, 11.3.8
Contractor's Relationship with the Engineer, or his designee
1.1.2, 1.5, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.3, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3.7, 12, 13.5, 15.1.2, 15.2.1
Contractor's Representations
3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2
Contractor's Responsibility for Those Performing the Work
3.3.2, 3.18, 5.3.1, 6.1.3, 6.2, 9.5.1, 10.2.8
Contractor's Review of Contract Documents
3.2
Contractor's Right to Stop the Work
9.7
Contractor's Right to Terminate the Contract
14.1, 15.1.6
Contractor's Submittals
3.10, 3.11, 3.12.4, 4.2.7, 5.2.1, 5.2.3, 9.2, 9.3, 9.8.2, 9.8.3, 9.9.1, 9.10.2, 9.10.3, 11.1.3, 11.4.2
Contractor's Superintendent
3.9, 10.2.6
Contractor's Supervision and Construction Procedures
1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.5, 7.3.7, 8.2, 10, 12, 14, 15.1.3
Contractual Liability Insurance
11.1.1.8, 11.2
Coordination and Correlation
1.2, 3.2.1, 3.3.1, 3.10, 3.12.6, 6.1.3, 6.2.1
Copies Furnished of Drawings and Specifications
1.5, 2.2.5, 3.11
Copyrights
1.5, 3.17
Correction of Work
2.3, 2.4, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, **12.2**
Correlation and Intent of the Contract Documents
1.2
Cost, Definition of
7.3.7
Costs
2.4.1, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3, 7.3.3.3, 7.3.7, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6, 11.3, 12.1.2, 12.2.1, 12.2.4, 13.5, 14
Cutting and Patching
3.14, 6.2.5
Damage to Construction of Owner or Separate Contractors
3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 11.1.1, 11.3, 12.2.4
Damage to the Work
3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4.1, 11.3.1, 12.2.4
Damages, Claims for
3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.1.1, 11.3.5, 11.3.7, 14.1.3, 14.2.4, 15.1.6
Damages for Delay
6.1.1, 8.3.3, 9.5.1.6, 9.7, 10.3.2
Date of Commencement of the Work, Definition of
8.1.2
Date of Substantial Completion, Definition of
8.1.3
Day, Definition of
8.1.4
Decisions of the Engineer, or his designee
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 15.2, 6.3, 7.3.7, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4, 9.5.1, 9.8.4, 9.9.1, 13.5.2, 14.2.2, 14.2.4, 15.1, 15.2
Decisions to Withhold Certification
9.4.1, **9.5**, 9.7, 14.1.1.3
Defective or Nonconforming Work, Acceptance, Rejection and Correction of
2.3.1, 2.4.1, 3.5, 4.2.6, 6.2.5, 9.5.1, 9.5.2, 9.6.6, 9.8.2, 9.9.3, 9.10.4, 12.2.1
Definitions
1.1, 2.1.1, 3.1.1, 3.5, 3.12.1, 3.12.2, 3.12.3, 4.1.1, 15.1.1, 5.1, 6.1.2, 7.2.1, 7.3.1, 8.1, 9.1, 9.8.1
Delays and Extensions of Time
3.2, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, **8.3**, 9.5.1, 9.7, 10.3.2, 10.4.1, 14.3.2, 15.1.5, 15.2.5
Disputes
6.3, 7.3.9, 15.1, 15.2
Documents and Samples at the Site
3.11
Drawings, Definition of
1.1.5
Drawings and Specifications, Use and Ownership of
3.11
Effective Date of Insurance
8.2.2, 11.1.2
Emergencies
10.4, 14.1.1.2, 15.1.4

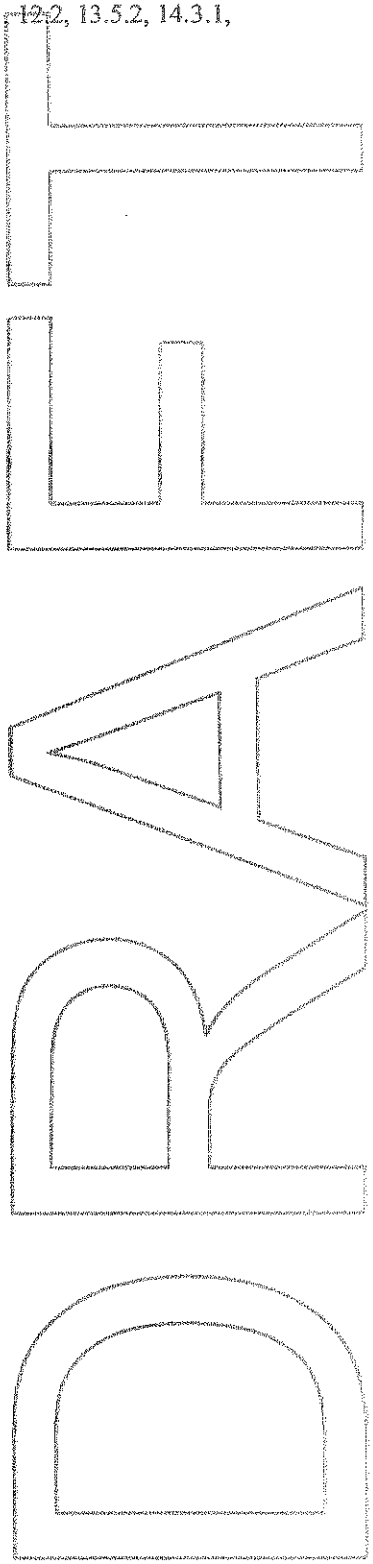
Employees, Contractor's
3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3.3, 11.1.1, 11.3.7, 14.1, 14.2.1.1
Equipment, Labor, Materials or
1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13.1, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Execution and Progress of the Work
1.1.3, 1.2.1, 1.2.2, 2.2.3, 2.2.5, 3.1, 3.3.1, 3.4.1, 3.5, 3.7.1, 3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.5, 8.2, 9.5.1, 9.9.1, 10.2, 10.3, 12.2, 14.2, 14.3.1, 15.1.3
Extensions of Time
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3, 7.4, 9.5.1, 9.7, 10.3.2, 10.4.1, 14.3, 15.1.5, 15.2.5
Failure of Payment
9.5.1.3, 9.7, 9.10.2, 13.6, 14.1.1.3, 14.2.1.2
Faulty Work
(See Defective or Nonconforming Work)
Final Completion and Final Payment
4.2.1, 4.2.9, 9.8.2, **9.10**, 11.1.2, 11.1.3, 11.3.1, 11.3.5, 12.3.1, 14.2.4, 14.4.3
Financial Arrangements, Owner's
2.2.1, 13.2.2, 14.1.1.4
Fire and Extended Coverage Insurance
11.3.1.1
GENERAL PROVISIONS
1
Governing Law
13.1
Guarantees (See Warranty)
Hazardous Materials
10.2.4, **10.3**
Identification of Subcontractors and Suppliers
5.2.1
Indemnification
3.17, **3.18**, 9.10.2, 10.3.3, 10.3.5, 10.3.6, 11.3.1.2, 11.3.7
Information and Services Required of the Owner
2.1.2, **2.2**, 3.2.2, 3.12.4, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 11.4, 13.5.1, 13.5.2, 14.1.1.4, 14.1.4, 15.1.3
Initial Decision
15.2
Initial Decision Maker, Definition of
1.1.8
Initial Decision Maker, Decisions
14.2.2, 14.2.4, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Initial Decision Maker, Extent of Authority
14.2.2, 14.2.4, 15.1.3, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Injury or Damage to Person or Property
10.2.8, 10.4.1
Inspections
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 12.2.1, 13.5
Instructions to Bidders
1.1.1
Instructions to the Contractor
3.2.4, 3.3.1, 3.8.1, 5.2.1, 7, 8.2.2, 12, 13.5.2
Instruments of Service, Definition of
1.1.7
Insurance
3.18.1, 6.1.1, 7.3.7, 9.3.2, 9.8.4, 9.9.1, 9.10.2, **11**
Insurance, Boiler and Machinery
11.3.2
Insurance, Contractor's Liability
11.1
Insurance, Effective Date of
8.2.2, 11.1.2
Insurance, Loss of Use
11.3.3
Insurance, Owner's Liability
11.2
Insurance, Property
10.2.5, **11.3**
Insurance, Stored Materials
9.3.2
INSURANCE AND BONDS
11
Insurance Companies, Consent to Partial Occupancy
9.9.1
Intent of the Contract Documents
1.2.1, 4.2.7, 4.2.12, 4.2.13, 7.4
Interest
13.6
Interpretation
1.2.3, **1.4**, 4.1.1, 5.1, 6.1.2, 15.1.4
Interpretations, Written
4.2.11, 4.2.12, 15.1.4
Judgment on Final Award
15.4.2
Labor and Materials, Equipment
1.1.3, 1.1.6, **3.4**, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Labor Disputes
8.3.1
Laws and Regulations
1.5, 3.2.3, 3.6, 3.7, 3.12.10, 3.13.1, 4.1.1, 9.6.4, 9.9.1, 10.2.2, 11.1.1, 11.3, 13.1.1, 13.4, 13.5.1, 13.5.2, 13.6.1, 14, 15.2.8, 15.4
Liens
2.1.2, 9.3.3, 9.10.2, 9.10.4, 15.2.8
Limitations, Statutes of
12.2.5, 13.7, 15.4.1.1
Limitations of Liability
2.3.1, 3.2.2, 3.5, 3.12.10, 3.17, 3.18.1, 4.2.6, 4.2.7, 4.2.12, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 10.2.5, 10.3.3, 11.1.2, 11.2, 11.3.7, 12.2.5, 13.4.2
Limitations of Time
2.1.2, 2.2, 2.4, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7, 5.2, 5.3.1, 5.4.1, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 11.1.3, 11.3.1.5, 11.3.6, 11.3.10, 12.2, 13.5, 13.7, 14, 15

Loss of Use Insurance
11.3.3
Material Suppliers
1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.6, 9.10.5
Materials, Hazardous
10.2.4, **10.3**
Materials, Labor, Equipment and
1.1.3, 1.1.6, 1.5.1, 3.4.1, 3.5, 3.8.2, 3.8.3, 3.12,
3.13.1, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2,
9.3.3, 9.5.1.3, 9.10.2, 10.2.1.2, 10.2.4, 14.2.1.1,
14.2.1.2
Means, Methods, Techniques, Sequences and
Procedures of Construction
3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2
Mechanic's Lien
2.1.2, 15.2.8
Mediation
8.3.1, 10.3.5, 10.3.6, 15.2.1, 15.2.5, 15.2.6, **15.3**,
15.4.1
Minor Changes in the Work
1.1.1, 3.12.8, 4.2.8, 7.1, **7.4**
MISCELLANEOUS PROVISIONS
13
Modifications, Definition of
1.1.1
Modifications to the Contract
1.1.1, 1.1.2, 3.11, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7,
10.3.2, 11.3.1
Mutual Responsibility
6.2
Nonconforming Work, Acceptance of
9.6.6, 9.9.3, **12.3**
Nonconforming Work, Rejection and Correction of
2.3.1, 2.4.1, 3.5, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3,
9.10.4, 12.2.1
Notice
2.2.1, 2.3.1, 2.4.1, 3.2.4, 3.3.1, 3.7.2, 3.12.9, 5.2.1,
9.7, 9.10, 10.2.2, 11.1.3, 12.2.2.1, 13.3, 13.5.1,
13.5.2, 14.1, 14.2, 15.2.8, 15.4.1
Notice, Written
2.3.1, 2.4.1, 3.3.1, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 9.7,
9.10, 10.2.2, 10.3, 11.1.3, 11.3.6, 12.2.2.1, **13.3**, 14,
15.2.8, 15.4.1
Notice of Claims
3.7.4, 10.2.8, **15.1.2**, 15.4
Notice of Testing and Inspections
13.5.1, 13.5.2
Observations, Contractor's
3.2, 3.7.4
Occupancy
2.2.2, 9.6.6, 9.8, 11.3.1.5
Orders, Written
1.1.1, 2.3, 3.9.2, 7, 8.2.2, 11.3.9, 12.1, 12.2.2.1,
13.5.2, 14.3.1
OWNER
2
Owner, Definition of
2.1.1
Owner, Information and Services Required of the
2.1.2, **2.2**, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2,
9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 11.3, 13.5.1,
13.5.2, 14.1.1.4, 14.1.4, 15.1.3
Owner's Authority
1.5, 2.1.1, 2.3.1, 2.4.1, 3.4.2, 3.8.1, 3.12.10, 3.14.2,
4.1.2, 4.1.3, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3,
7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.1, 9.3.2, 9.5.1, 9.6.4,
9.9.1, 9.10.2, 10.3.2, 11.1.3, 11.3.3, 11.3.10, 12.2.2,
12.3.1, 13.2.2, 14.3, 14.4, 15.2.7
Owner's Financial Capability
2.2.1, 13.2.2, 14.1.1.4
Owner's Liability Insurance
11.2
Owner's Relationship with Subcontractors
1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2
Owner's Right to Carry Out the Work
2.4, 14.2.2
Owner's Right to Clean Up
6.3
Owner's Right to Perform Construction and to
Award Separate Contracts
6.1
Owner's Right to Stop the Work
2.3
Owner's Right to Suspend the Work
14.3
Owner's Right to Terminate the Contract
14.2
Ownership and Use of Drawings, Specifications
and Other Instruments of Service
1.1.1, 1.1.6, 1.1.7, **1.5**, 2.2.5, 3.2.2, 3.11.1, 3.17,
4.2.12, 5.3.1
Partial Occupancy or Use
9.6.6, **9.9**, 11.3.1.5
Patching, Cutting and
3.14, 6.2.5
Patents
3.17
Payment, Applications for
4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5, 9.6.3, 9.7, 9.8.5, 9.10.1,
14.2.3, 14.2.4, 14.4.3
Payment, Certificates for
4.2.5, 4.2.9, 9.3.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1,
9.10.3, 13.7, 14.1.1.3, 14.2.4
Payment, Failure of
9.5.1.3, 9.7, 9.10.2, 13.6, 14.1.1.3, 14.2.1.2
Payment, Final
4.2.1, 4.2.9, 9.8.2, 9.10, 11.1.2, 11.1.3, 11.4.1, 12.3.1,
13.7, 14.2.4, 14.4.3
Payment Bond, Performance Bond and
7.3.7.4, 9.6.7, 9.10.3, **11.4**
Payments, Progress
9.3, 9.6, 9.8.5, 9.10.3, 13.6, 14.2.3, 15.1.3

PAYMENTS AND COMPLETION
9
Payments to Subcontractors
5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 14.2.1.2
PCB
10.3.1
Performance Bond and Payment Bond
7.3.7.4, 9.6.7, 9.10.3, **11.4**
Permits, Fees, Notices and Compliance with Laws
2.2.2, 3.7, 3.13, 7.3.7.4, 10.2.2
PERSONS AND PROPERTY, PROTECTION OF
10
Polychlorinated Biphenyl
10.3.1
Product Data, Definition of
3.12.2
Product Data and Samples, Shop Drawings
3.11, **3.12**, 4.2.7
Progress and Completion
4.2.2, **8.2**, 9.8, 9.9.1, 14.1.4, 15.1.3
Progress Payments
9.3, **9.6**, 9.8.5, 9.10.3, 13.6, 14.2.3, 15.1.3
Project, Definition of
1.1.4
Project Representatives
4.2.10
Property Insurance
10.2.5, **11.3**
PROTECTION OF PERSONS AND PROPERTY
10
Regulations and Laws
1.5, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 4.1.1, 9.6.4, 9.9.1, 10.2.2, 11.1, 11.4, 13.1, 13.4, 13.5.1, 13.5.2, 13.6, 14, 15.2.8, 15.4
Rejection of Work
3.5, 4.2.6, 12.2.1
Releases and Waivers of Liens
9.10.2
Representations
3.2.1, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.4.2, 9.5.1, 9.8.2, 9.10.1
Representatives
2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.1, 4.2.2, 4.2.10, 5.1.1, 5.1.2, 13.2.1
Responsibility for Those Performing the Work
3.3.2, 3.18, 4.2.3, 5.3.1, 6.1.3, 6.2, 6.3, 9.5.1, 10
Retainage
9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3
Review of Contract Documents and Field Conditions by Contractor
3.2, 3.12.7, 6.1.3
Review of Contractor's Submittals by Owner and Engineer, or his designee
3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 6.1.3, 9.2, 9.8.2
Review of Shop Drawings, Product Data and Samples by Contractor
3.12
Rights and Remedies
1.1.2, 2.3, 2.4, 3.5, 3.7.4, 3.15.2, 4.2.6, 5.3, 5.4, 6.1, 6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.2, 12.2.4, **13.4**, 14, 15.4
Royalties, Patents and Copyrights
3.17
Rules and Notices for Arbitration
15.4.1
Safety of Persons and Property
10.2, 10.4
Safety Precautions and Programs
3.3.1, 4.2.2, 4.2.7, 5.3.1, **10.1**, 10.2, 10.4
Samples, Definition of
3.12.3
Samples, Shop Drawings, Product Data and
3.11, **3.12**, 4.2.7
Samples at the Site, Documents and
3.11
Schedule of Values
9.2, 9.3.1
Schedules, Construction
3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2
Separate Contracts and Contractors
1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 12.1.2
Shop Drawings, Definition of
3.12.1
Shop Drawings, Product Data and Samples
3.11, **3.12**, 4.2.7
Site, Use of
3.13, 6.1.1, 6.2.1
Site Inspections
3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.4.2, 9.10.1, 13.5
Site Visits, Engineer, or his designee's
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.5
Special Inspections and Testing
4.2.6, 12.2.1, 13.5
Specifications, Definition of
1.1.6
Specifications
1.1.1, **1.1.6**, 1.2.2, 1.5, 3.11, 3.12.10, 3.17, 4.2.14
Statute of Limitations
13.7, 15.4.1.1
Stopping the Work
2.3, 9.7, 10.3, 14.1
Stored Materials
6.2.1, 9.3.2, 10.2.1.2, 10.2.4
Subcontractor, Definition of
5.1.1
SUBCONTRACTORS
5
Subcontractors, Work by
1.2.2, 3.3.2, 3.12.1, 4.2.3, 5.2.3, 5.3, 5.4, 9.3.1.2, 9.6.7

Subcontractual Relations
5.3, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 14.1, 14.2.1
Submittals
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.7, 9.2, 9.3, 9.8, 9.9.1, 9.10.2, 9.10.3, 11.1.3
Submittal Schedule
3.10.2, 3.12.5, 4.2.7
Subrogation, Waivers of
6.1.1, **11.3.7**
Substantial Completion
4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, **9.8**, 9.9.1, 9.10.3, 12.2, 13.7
Substantial Completion, Definition of
9.8.1
Substitution of Subcontractors
5.2.3, 5.2.4
Substitution of Engineer, or his designee
4.1.3
Substitutions of Materials
3.4.2, 3.5, 7.3.8
Sub-subcontractor, Definition of
5.1.2
Subsurface Conditions
3.7.4
Successors and Assigns
13.2
Superintendent
3.9, 10.2.6
Supervision and Construction Procedures
1.2.2, **3.3**, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.7, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.3
Surety
5.4.1.2, 9.8.5, 9.10.2, 9.10.3, 14.2.2, 15.2.7
Surety, Consent of
9.10.2, 9.10.3
Surveys
2.2.3
Suspension by the Owner for Convenience
14.3
Suspension of the Work
5.4.2, 14.3
Suspension or Termination of the Contract
5.4.1.1, 14
Taxes
3.6, 3.8.2.1, 7.3.7.4
Termination by the Contractor
14.1, 15.1.6
Termination by the Owner for Cause
5.4.1.1, **14.2**, 15.1.6
Termination by the Owner for Convenience
14.4
Termination of the Engineer, or his designee
4.1.3
Termination of the Contractor
14.2.2
TERMINATION OR SUSPENSION OF THE CONTRACT
14
Tests and Inspections
3.1.3, 3.3.3, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 10.3.2, 11.4.1.1, 12.2.1, **13.5**
TIME
8
Time, Delays and Extensions of
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, **8.3**, 9.5.1, 9.7, 10.3.2, 10.4.1, 14.3.2, 15.1.5, 15.2.5
Time Limits
2.1.2, 2.2, 2.4, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2, 5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 11.1.3, 12.2, 13.5, 13.7, 14, 15.1.2, 15.4
Time Limits on Claims
3.7.4, 10.2.8, **13.7**, 15.1.2
Title to Work
9.3.2, 9.3.3
Transmission of Data in Digital Form
1.6
UNCOVERING AND CORRECTION OF WORK
12
Uncovering of Work
12.1
Unforeseen Conditions, Concealed or Unknown
3.7.4, 8.3.1, 10.3
Unit Prices
7.3.3.2, 7.3.4
Use of Documents
1.1.1, 1.5, 2.2.5, 3.12.6, 5.3
Use of Site
3.13, 6.1.1, 6.2.1
Values, Schedule of
9.2, 9.3.1
Waiver of Claims by the Engineer, or his designee
13.4.2
Waiver of Claims by the Contractor
9.10.5, 13.4.2, 15.1.6
Waiver of Claims by the Owner
9.9.3, 9.10.3, 9.10.4, 12.2.2.1, 13.4.2, 14.2.4, 15.1.6
Waiver of Consequential Damages
14.2.4, 15.1.6
Waiver of Liens
9.10.2, 9.10.4
Waivers of Subrogation
6.1.1, **11.3.7**
Warranty
3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.4, 12.2.2, 13.7
Weather Delays
15.1.5.2
Work, Definition of
1.1.3

Written Consent
1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 11.4.1, 13.2, 13.4.2, 15.4.4.2
Written Interpretations
4.2.11, 4.2.12
Written Notice
2.3, 2.4, 3.3.1, 3.9, 3.12.9, 3.12.10, 5.2.1, 8.2.2, 9.7, 9.10, 10.2.2, 10.3, 11.1.3, 12.2.2, 12.2.4, 13.3, 14, 15.4.1
Written Orders
1.1.1, 2.3, 3.9, 7, 8.2.2, 12.1, 12.2, 13.5.2, 14.3.1, 15.1.2



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 hall, 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 proved 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 repaced 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 incrred by the Onwer 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 alleges 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 ure 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 wiring 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

§5.3.1By 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, tortuous conduct, or other reasons uncontemplated 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 engage 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 no 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 From 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.

.1

§ 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 from Certificate of Insurance. Theses 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 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 of 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 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

§ 11.3.1Contractor, 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 Owner 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 it representative.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

§ 13.1.1The 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 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 tradeand 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) 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 off wages less than the prevailing wage required to be paid by such contract, the Ownert 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 XV11 of Title 29, Code of Federal Regulations.

§ 13.1.5.4 Part 126 – Safety and Heath Regulations for Construction, Chapter XVII of Title 29, Code of Federal Regulations.

§ 13.1.5.3 N.J.A.C. 8:59-5.1-5.109requirements properly label any substances stored in containers) of the Woker 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 ACTIONE EMPLOYMENT LAW

Contractor agrees to comply with the terns 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 not withstanding 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 if 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 who 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 if 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 thereunto, 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

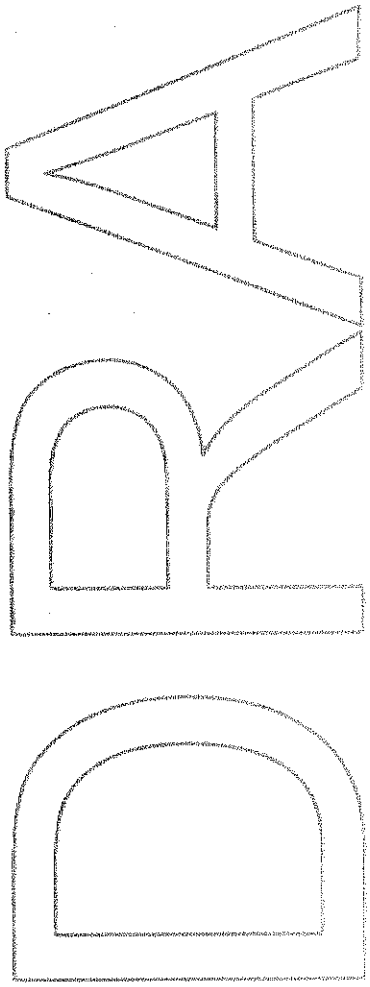
§ 19.1.1 The Contractor acknowledges and agrees that pursuant to P.L. 2004, c. 57, enacted by the State of New Jersey on June 29, 2004, contractors or contractors with subcontractors, or their affiliates, who enter into contracts

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 preceeding 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.



STATE OF NEW JERSEY
Department of Labor and Workforce Development
Division of Wage and Hour Compliance - Public Contracts Section
PO Box 389
Trenton, NJ 08625-0389

PREVAILING WAGE RATE DETERMINATION

The New Jersey Prevailing Wage Act (N.J.S.A. 34:11-56.25 et seq.) requires that the Department of Labor and Workforce Development establish and enforce a prevailing wage level for workers engaged in public works in order to safeguard their efficiency and general well being and to protect them as well as their employers from the effects of serious and unfair competition.

Prevailing wage rates are wage and fringe benefit rates based on the collective bargaining agreements established for a particular craft or trade in the locality in which the public work is performed. In New Jersey, these rates vary by county and by the type of work performed.

Applicable prevailing wage rates are those wages and fringe benefits in effect on the date the contract is awarded. All pre-determined rate increases listed at the time the contract is awarded must also be paid, beginning on the dates specified. Rates that have expired will remain in effect until new rates are posted.

Prevailing Wage Rate

The prevailing wage rate for each craft will list the effective date of the rate and the following information:

W = Wage Rate per Hour **B** = Fringe Benefit Rate per Hour* **T** = Total Rate per Hour

* Fringe benefits are an integral part of the prevailing wage rate. Employers not providing such benefits must pay the fringe benefit amount directly to the employee each payday. Employers providing benefits worth less than the fringe benefit amount must pay the balance directly to the employee each payday.

Unless otherwise stated in the Prevailing Wage Rate Determination, the fringe benefit rate for overtime hours remains at the straight time rate.

When the Overtime Notes in the Prevailing Wage Rate Determination state that the overtime rates are "inclusive of benefits," the benefit rate is increased by the same factor as the wage rate (i.e. multiplied by 1.5 for time and one-half, multiplied by 2 for double time, etc.).

Apprentice Rate Schedule

An “apprentice” is an individual who is registered with the United States Department of Labor - Office of Apprenticeship and enrolled in a certified apprenticeship program during the period in which they are working on the public works project.

The apprentice wage rate is a percentage of the journeyman wage rate, unless otherwise indicated. The apprentice benefit rate is the full journeyman benefit rate, unless otherwise indicated.

If there is no apprentice rate schedule listed, the individual must be paid at least the journeyman rate even if that individual is in a certified apprentice program for that trade.

If there is no ratio of apprentices to journeymen listed for a particular craft, then the ratio shall be one (1) apprentice to every four (4) journeymen.

Comments/Notes

For each craft listed there will be comments/notes that cover the definition of the regular workday, shift differentials, overtime, recognized holidays, and any other relevant information.

Public Works Contractor Registration

The Public Works Contractor Registration Act (N.J.S.A. 34:11-56.48, et seq.) requires that **all** contractors, subcontractors, or lower tier subcontractors who are working on or who bid on public works projects register with the Department of Labor and Workforce Development. Applications are available at *www.nj.gov/labor* (click on Wage & Hour and then go to Registration & Permits).

Pursuant to N.J.S.A. 34:11-56.51:

No contractor shall bid on any contract for public work as defined in section 2 of P.L.1963, c. 150 (C.34:11-56.26) unless the contractor is registered pursuant to this act. No contractor shall list a subcontractor in a bid proposal for the contract unless the subcontractor is registered pursuant to P.L.1999, c.238 (C.34:11-56.48 et seq.) at the time the bid is made. No contractor or subcontractor, including a subcontractor not listed in the bid proposal, shall engage in the performance of any public work subject to the contract, unless the contractor or subcontractor is registered pursuant to that act.

Snow Plowing

Snow plowing contracts are <u>not</u> subject to the New Jersey Prevailing Wage Act or the Public Works Contractor Registration Act.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Air Conditioning & Refrigeration - Service and Repair **PREVAILING WAGE RATE**

	03/19/15
Journeyman (Mechanic)	W36.18 B21.10 T57.28

Expiration Date: 02/29/2016

Craft: Air Conditioning & Refrigeration - Service and Repair **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
As Shown	Mo. 1-3	Mo. 4-12	2nd Year	3rd Year	4th Year	5th Year		Wage = %	of Jnymn	Wage
Wage and Bene	50%	55%	60%	65%	75%	85%		Bene = %	of Jnymn	Bene

Ratio of Apprentices to Journeymen - 1:4

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES ENTERING PROGRAM AFTER 3-1-13:

INTERVAL	PERIOD AND RATES					
As Shown	1st Year	2nd Year	3rd Year	4th Year	5th Year	Wage =% of Jnymn Wage
Wage and Benefit	40%	50%	60%	70%	80%	Bene. =% of Jnymn Wage

Craft: Air Conditioning & Refrigeration - Service and Repair **COMMENTS/NOTES**

THESE RATES MAY BE USED FOR THE FOLLOWING:
- Service/Repair/Maintenance Work to EXISTING facilities.
- Replacement or Installation of air conditioning and refrigeration equipment when the combined tonnage does not exceed 15 tons for refrigeration, or 25 tons for air conditioning.
- Replacement or Installation of "packaged" or "unitary" rooftop-type units when the combined tonnage of the units does not exceed 75 tons.

NOTE: These rates may NOT be used for any work in new construction (including work on new additions).

The regular workday shall consist of 8 hours, starting between 6:00 AM and 10:00 AM, Monday through Friday.

SHIFT DIFFERENTIALS:
- The second and third shifts shall be paid an additional 15% of the hourly rate.
- All shifts must run for a minimum of 5 consecutive days.

OVERTIME:
Hours worked in excess of 8 per day or before or after the regular workday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sunday and holidays shall be paid at double the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Boilermaker **PREVAILING WAGE RATE**

	01/01/16
Foreman	W47.00 B41.02 T88.02
General Foreman	W49.00 B42.00 T91.00
Journeyman	W42.00 B39.42 T81.42

Expiration Date: 12/31/2016

Craft: Boilermaker **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 Hours	65%	70%	75%	80%	85%	90%	95%			
Benefit =	33.33	34.20	35.08	35.94	36.82	37.69	38.55			

Ratio of Apprentices to Journeymen - *

* 1 apprentice will be allowed for the first 5 journeymen, 1 apprentice for the next 10 journeymen and 1 apprentice for each succeeding 20 journeymen up to a maximum of 5 apprentices per contractor on any one job.

Craft: Boilermaker **COMMENTS/NOTES**

HIGH WORK: All apprentices working on the erection, repair, or dismantling of smoke stacks, standpipes, or water towers shall be paid the Journeyman rate.

The regular workday shall consist of 8 hours, between 8:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall work 7½ hours and receive 8 hours pay, at a rate equal to the regular hourly rate plus 10%.
- The third shift shall work 7 hours and receive 8 hours pay, at a rate equal to the regular hourly rate plus 20%.
- For "Municipal Water Works" projects only, the following shall apply: Two, four day, 10 hour shifts may be worked at straight time Monday through Thursday. The day shift shall work four days, at 10 hours, for 10 hours pay. The second shift shall work four days, at nine and a half hours, for 10 hours pay, plus 10% the hourly rate for new work and .25 cents on repair work. Friday may be used as a make-up day at straight time, due to weather conditions, hoilday or any other circumstances beyond the employer's control.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays (except Labor Day) shall be paid at double the hourly rate. All hours on Labor Day shall be paid at four times the hourly rate.
- If any other craft employed by the same contractor, or a subcontractor thereof, receives double time in lieu of time and one-half, then the Boilermaker shall receive double time in lieu of time and one-half.
- For "Municipal Water Works" projects only, the following shall apply: Four 10 hour days may be worked Monday through

Thursday at straight time. Friday may be used as a make-up day for a day lost to inclement weather, holiday or other conditions beyond the control of the employer. Overtime shall be paid for any hours that exceed 10 hours per day or 40 hours per week.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

County - UNION

Craft: Boilermaker - Minor Repairs **PREVAILING WAGE RATE**

	01/01/16
Foreman	W30.29 B16.17 T46.46
General Foreman	W30.79 B16.17 T46.96
Mechanic	W28.79 B16.17 T44.96

Expiration Date: 12/31/2016

Craft: Boilermaker - Minor Repairs **COMMENTS/NOTES**

NOTE: These rates apply to MINOR REPAIR WORK ONLY (repair work in the field for which the contract amount does not exceed $20,000.00).

OVERTIME:
Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays (except Labor Day) shall be paid at double the hourly rate. All hours on Labor Day shall be paid at four times the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Good Friday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Thanksgiving Day, day after Thanksgiving, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Bricklayer, Stone Mason **PREVAILING WAGE RATE**

	11/02/15
Deputy Foreman	W41.25 B30.58 T71.83
Foreman	W44.25 B30.58 T74.83
Journeyman	W38.25 B30.58 T68.83

Expiration Date: 04/30/2016

Craft: Bricklayer, Stone Mason **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	40%	50%	55%	60%	65%	70%	75%	80%		
Benefits	3.72	4.65	5.12	5.58	20.22	21.56	22.91	24.25		

Ratio of Apprentices to Journeymen - 1:5

Craft: Bricklayer, Stone Mason **COMMENTS/NOTES**

The regular workday shall consist of 8 hours, between 6:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the first, or day shift, shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 15%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 15%, inclusive of benefits, and the third shift shall receive the regular rate plus 20%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 15%, inclusive of benefits, and the third shift shall receive the regular rate plus 20%, inclusive of benefits.

OVERTIME:
- The first 2 hours in excess of 8 per day, or before or after the regular workday that are not shift work, Monday through Friday, shall be paid at time and one-half the regular rate, inclusive of benefits. Any additional overtime shall be paid at double the regular rate, inclusive of benefits. The first 10 hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. Any additional overtime shall be paid at double the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Saturday may be used as a make-up day for hours lost to inclement weather.
- When Bricklayers/Stone Masons work on Saturday with Laborers, and no other crafts are working on the project for the day, benefits may be paid at straight time. If other crafts are present, the applicable overtime rate for benefits shall be paid.

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 will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Carpenter **PREVAILING WAGE RATE**

	11/01/15
Foreman	W51.81 B29.53 T81.34
Journeyman	W45.05 B25.68 T70.73

Expiration Date: 04/30/2016

Craft: Carpenter **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	40%	45%	50%	55%	60%	65%	70%	75%	85%	95%
Benefit	57% of	Appren	tice	Wage	Rate		for all	intervals		

Ratio of Apprentices to Journeymen - 1:4

Craft: Carpenter **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- When there are 2 or more Carpenters on a job, 1 shall be designated as a Foreman.
- When there are 21 or more Carpenters on a job, 2 shall be designated as Foremen.

The regular workday shall consist of 8 hours, starting between 7:00 AM and 9:00 AM.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 15%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 15% and the third shift shall receive the regular rate plus 20%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 15% and the third shift shall receive the regular rate plus 20%, inclusive of benefits.

OVERTIME:
- All hours in excess of 8 per day, or before or after an established shift that are not shift work, and all hours on Saturdays shall be paid at time and one-half the hourly 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 be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost due 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, 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.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Carpenter - Resilient Flooring **PREVAILING WAGE RATE**

	11/01/15
Foreman	W51.81 B29.53 T81.34
Journeyman	W45.05 B25.68 T70.73

Expiration Date: 04/30/2016

Craft: Carpenter - Resilient Flooring **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	40%	45%	50%	55%	60%	65%	70%	75%	85%	95%
Benefit	57%	of	Appren	tice	Wage	Rate		for all	intervals	

Ratio of Apprentices to Journeymen - *

* 1 apprentice shall be allowed to every 2 journeymen or major fraction therof. No more than 3 apprentices on any one job or project.

Craft: Carpenter - Resilient Flooring **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- On any job where there are 4 or more Carpenters of Resilient Flooring, 1 must be designated a Foreman.

FOR SYNTHETIC TURF INSTALLATION ONLY:
- The rate shall be 90% of the wage and benefit rate.

The regular workday consists of 8 hours, starting between 6:00 AM and 9:00 AM.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the day shift, shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular wage rate plus 15%.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular wage rate, the second shift shall receive the regular wage rate plus 15% and the third shift shall receive the regular wage rate plus 20%.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular wage rate plus 15% and the third shift shall receive the regular wage rate plus 20%.

OVERTIME:
- Hours in excess of 8 per day or 40 per week, or before or after the regular workday, Monday through Friday, shall be paid at time and one-half the wage rate. Saturday may be used as a make-up day, at straight time, up to 8 hours, for hours lost to reasons beyond the control of the employer, up to a total of 40 hours per week; hours in excess of 8 on Saturday shall then be paid at time and one-half the wage rate. If Saturday is not a make-up day, all hours on Saturday shall be paid at time and one-half the wage rate. All hours on Sundays and holidays shall be paid at double the wage rate.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for hours lost to reasons beyond the control of the employer. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the wage 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 will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Cement Mason **PREVAILING WAGE RATE**

See "Bricklayer, Stone Mason" Rates

Expiration Date:

Craft: Cement Mason **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									

Ratio of Apprentices to Journeymen - 1:4

Craft: Cement Mason **COMMENTS/NOTES**

See "Bricklayer, Stone Mason" Rates

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Diver **PREVAILING WAGE RATE**

	11/06/15
Diver	W55.34 B43.07 T98.41
Tender	W43.38 B43.07 T86.45

Expiration Date: 04/30/2016

Craft: Diver **COMMENTS/NOTES**

NOTE: All dive crews must consist of a Tender, a Diver, and a standby Diver (standby Diver is the same rate as a Diver).

DEPTH & PENETRATION RATES: Divers shall be paid the following depth and penetration rates, in addition to the regular hourly rate, when applicable:

AIR DIVES:
0-59 feet: No additional wage
60-74 feet: + $0.25 per foot
5-125 feet: + $0.78 per foot
126-200 feet: + $1.60 per foot

MIXED GAS DIVES:
0-74 feet: No additional wage
75-125 feet: + $1.00 per foot
126-200 feet: + $2.00 per foot

PENETRATION DIVES:
126-200 feet: + $1.50 per foot
201-275 feet: + $1.75 per foot
276-350 feet: + $2.00 per foot
351-425 feet: + $2.50 per foot

OVERTIME:
Hours in excess of 8 per day, Monday through Friday, 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.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Presidential Election Day, Thanksgiving Day, Christmas Day. Veterans' Day may be switched with the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Dockbuilder **PREVAILING WAGE RATE**

	11/06/15
Foreman	W50.14 B43.07 T93.21
Foreman (Concrete Form Work)	W50.14 B35.23 T85.37
Journeyman	W43.60 B43.07 T86.67
Journeyman (Concrete Form Work)	W43.60 B35.23 T78.83

Expiration Date: 04/30/2016

Craft: Dockbuilder **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	17.44	21.80	28.34	34.88						
Benefit	29.28	for all	intervals		Concrete	Form Work	Only Ben.	= 24.03	for all	intervals

Ratio of Apprentices to Journeymen - *

* When there are 4 or fewer Dockbuilders on a job, no more than 1 may be an apprentice. When there are 5 or more Dockbuilders, there may be 1 apprentice for every 5 Dockbuilders.

Craft: Dockbuilder **COMMENTS/NOTES**

CREOSOTE HANDLING:
When handling creosote products on land piledriving, floating marine construction, and construction of wharves, the worker shall receive an additional $0.25 per hour.

HAZARDOUS WASTE WORK:
- Hazardous waste removal work on a state or federally designated hazardous waste site where Level A, B, or C personal protection is required: an additional 20% of the hourly rate, per hour.
- Hazardous waste removal work in Level D, or where personal protection is not required: an additional $1.00 per hour.

CERTIFIED WELDER: When required on the job by the project owner, a Certified Welder shall receive an additional $1.00 per hour.

FOREMAN REQUIREMENTS:
The first Dockbuilder on the job shall be designated a Foreman.

OVERTIME:
Hours in excess of 8 per day, Monday through Friday, 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.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Presidential Election Day, Thanksgiving Day, Christmas Day. Veterans' Day may be switched with the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Drywall Finisher **PREVAILING WAGE RATE**

	05/04/15	05/01/16	05/01/17
Foreman	W41.80 B22.60 T64.40	W43.05 B22.60 T65.65	W44.30 B22.60 T66.90
General Foreman	W43.70 B22.60 T66.30	W44.95 B22.60 T67.55	W46.20 B22.60 T68.80
Journeyman	W38.00 B22.60 T60.60	W39.25 B22.60 T61.85	W40.50 B22.60 T63.10

Expiration Date: 04/30/2018

Craft: Drywall Finisher **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
4 Months	30%	40%	50%	60%	70%	75%	80%	85%	90%	
Benefits	Intervals	1 to 3 =	9.85	Intervals	4 to 6 =	12.28	Intervals	7 to 9 =	14.95	

Ratio of Apprentices to Journeymen - 1:4

Craft: Drywall Finisher **COMMENTS/NOTES**

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, and the third shift shall receive 8 hours pay for 7 hours of work.
- Shift work must run for a minimum of 5 consecutive workdays.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, 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.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Electrician **PREVAILING WAGE RATE**

	06/02/15	05/30/16	05/29/17	05/28/18
Cable Splicer	W57.52 B32.88 T90.40	W58.71 B33.74 T92.45	W60.08 B34.53 T94.61	W61.52 B35.35 T96.87
Foreman	W58.56 B33.47 T92.03	W59.77 B34.34 T94.11	W61.17 B35.15 T96.32	W62.64 B35.98 T98.62
Journeyman	W52.29 B29.90 T82.19	W53.37 B30.67 T84.04	W54.62 B31.39 T86.01	W55.93 B32.13 T88.06

Expiration Date: 05/31/2019

Craft: Electrician **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	40%	49%	58%	68%	80%		of Jour	neyman	Wage	Rate
Benefit	40%	49%	58%	68%	80%		of Jour	neyman	Benefit	Rate

Ratio of Apprentices to Journeymen - 2:3

Craft: Electrician **COMMENTS/NOTES**

THESE RATES ALSO APPLY TO THE FOLLOWING:
-All burglar and fire alarm work.
-All fiber optic work.
-Teledata work in new construction.
-Teledata work involving 16 Voice/Data Lines or more.

The regular workday shall be 8 hours, between 8:00 AM and 4:30 PM.

FOREMAN REQUIREMENTS:
- On any job where there are 1 to 10 Journeymen electricians, 1 shall be designated a Foreman.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- 2nd Shift (4:30 PM to 12:30 AM) shall receive 8 hours pay for 7.5 hours work + an additional 10% of the regular rate, per hour, inclusive of benefits.
- 3rd Shift (12:30 AM to 8:00 AM) shall receive 8 hours pay for 7 hours work + an additional 15% of the regular rate, per hour, inclusive of benefits.

OVERTIME:
Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, 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, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Electrician - Teledata (15 Voice/Data Lines & Less) **PREVAILING WAGE RATE**

	11/06/15
Master Technician/General Foreman	W51.01 B29.16 T80.17
Senior Technician/Lead Foreman (21-30 Workers on Job)	W46.70 B26.69 T73.39
Technician A/Foreman (11-20 Workers on Job)	W44.73 B25.57 T70.30
Technician B/Working Foreman (4-10 Workers on Job)	W42.77 B24.45 T67.22
Technician C/Journeyman (1-3 Workers on Job)	W39.24 B22.43 T61.67

Expiration Date: 10/30/2016

Craft: Electrician - Teledata (15 Voice/Data Lines & Less) **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	19.66	20.97	23.15	25.77	28.83	31.45	34.51	37.56		
Benefits	8.15	8.70	9.60	10.69	11.96	13.04	14.31	15.57		

Ratio of Apprentices to Journeymen - 2:3

Craft: Electrician - Teledata (15 Voice/Data Lines & Less) **COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES ENTERING PROGRAM AFTER 10-31-14:

INTERVAL	PERIOD AND RATES							
6 Months	17.47	18.78	20.97	23.59	26.64	29.27	32.32	35.38
Benefits	7.25	7.79	8.70	9.78	11.05	12.14	13.40	14.67

NOTES:
- These rates are for service, maintenance, moves, and/or changes affecting 15 Voice/Data (teledata) lines or less. These rates may NOT be used for any teledata work in new construction (including additions) or any fiber optic work.
- The number of Teledata workers on the jobsite is the determining factor for which Foreman category applies .

The regular workday shall be 8 hours, between 8:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:

- Shift work must run for a minimum of 5 consecutive workdays.
- 2nd Shift (4:30 PM to 12:30 AM) shall receive 8 hours pay for 7.5 hours work + an additional 10% of the regular rate, per hour, inclusive of benefits.
- 3rd Shift (12:30 AM to 8:00 AM) shall receive 8 hours pay for 7 hours work + an additional 15% of the regular rate, per hour, inclusive of benefits.

OVERTIME:
Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, 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, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Electrician - Teledata (16 Instruments & More) **PREVAILING WAGE RATE**

See "Electrician" Rates

Expiration Date:

Craft: Electrician - Teledata (16 Instruments & More) **COMMENTS/NOTES**

See ELECTRICIAN Rates

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Electrician- Outside Commercial **PREVAILING WAGE RATE**

	08/20/15	05/30/16	05/29/17	05/28/18
Cable Splicer	W57.79 B32.60 T90.39	W58.99 B33.46 T92.45	W60.37 B34.24 T94.61	W61.82 B35.06 T96.88
Certified Welder	W55.17 B31.13 T86.30	W56.31 B31.94 T88.25	W57.62 B32.68 T90.30	W59.01 B33.47 T92.48
Equipment Operator	W52.54 B29.64 T82.18	W53.63 B30.42 T84.05	W54.88 B31.13 T86.01	W56.20 B31.88 T88.08
Foreman (1-10 Journeyman workers on job)	W58.84 B33.20 T92.04	W60.07 B34.07 T94.14	W61.47 B34.86 T96.33	W62.94 B35.70 T98.64
Foreman (11-20 Journeyman workers on job)	W60.42 B34.09 T94.51	W61.67 B34.98 T96.65	W63.11 B35.79 T98.90	W64.63 B36.66 T101.29
General Foreman (21-30 Journeyman workers on job)	W62.00 B34.98 T96.98	W63.28 B35.89 T99.17	W64.76 B36.73 T101.49	W66.32 B37.61 T103.93
General Foreman (31-60 Journeyman workers on job)	W67.25 B37.94 T105.19	W68.65 B38.94 T107.59	W70.25 B39.84 T110.09	W71.94 B40.80 T112.74
General Foreman (61+ Journeyman workers on job)	W68.30 B38.53 T106.83	W69.72 B39.54 T109.26	W71.34 B40.46 T111.80	W73.06 B41.44 T114.50
Groundman	W31.52 B17.79 T49.31	W32.18 B18.26 T50.44	W32.93 B18.68 T51.61	W33.72 B19.13 T52.85
Journeyman Lineman/Technician	W52.54 B29.64 T82.18	W53.63 B30.42 T84.05	W54.88 B31.13 T86.01	W56.20 B31.88 T88.08
Sub-Foreman	W58.84 B33.20 T92.04	W60.07 B34.07 T94.14	W61.47 B34.86 T96.33	W62.94 B35.70 T98.64

Expiration Date: 05/31/2019

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Electrician- Outside Commercial **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 Hours	60%	65%	70%	75%	80%	85%	90%			
Benefits	56.4% of	Journey	man	wage	+ $.01					

Craft: Electrician- Outside Commercial **COMMENTS/NOTES**

EFFECTIVE 5-30-16- The apprentice benefit rate shall be 56.7% + $.01.
EFFECTIVE 5-29-17- The apprentice benefit rate shall be 56.7% + $.01.
EFFECTIVE 5-28-18- The apprentice benefit rate shall be 56.7% + $.01.

* FOR UTILITY WORK PLEASE SEE STATEWIDE RATES

The regular worday shall be 8 hours, between 8:00 AM and 4:30 PM.

FOREMAN REQUIREMENTS:
On jobs where there are 2 Journeymen, one shall be a Foreman. The following number of Foreman, General Foreman, Assistant General Foreman and Sub-Foreman shall be required with respect to number of Journeymen on site:
2-10 Journeymen (1 Foreman)
11-20 Journeymen (1 Foreman and 1 Sub-Foreman)
21-30 Journeymen (1 Foreman and 2 Sub-Foremen)

SHIFT DIFFERENTIALS:
Shift work must run for a minimum of 5 consecutive workdays.
2nd Shift (4:30 PM to 12:30 AM): 8 hrs. pay for 7.5 hrs. work + an additional 10% of the regular rate, inclusive of benefits.
3rd Shift (12:30 AM to 8:00 AM): 8 hrs. pay for 7 hrs. work + an additional 15% of the regular rate per hour, inclusive benefits.

OVERTIME:
Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, 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, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day and Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Electrician-Utility Work (North) **PREVAILING WAGE RATE**

Rates are located in the "Statewide" rate package

Expiration Date:

Craft: Electrician-Utility Work (North) **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	60%	65%	70%	75%	80%	85%	90%			
Benefits	62.5% of	Appren	tice	Wage	Rate	for all	intervals			

Craft: Electrician-Utility Work (North) **COMMENTS/NOTES**

Electrician-Utility Work (North) rates are located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Electrician-Utility Work (South) **PREVAILING WAGE RATE**

Rates are located in the "Statewide" rate package

Expiration Date:

Craft: Electrician-Utility Work (South) **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	26.72	28.95	31.18	33.41	35.63	37.86	40.09			
Benefits	23.08	24.40	25.72	27.02	28.33	29.64	30.94			

Craft: Electrician-Utility Work (South) **COMMENTS/NOTES**

Electrician-Utility Work (South) rates are located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Elevator Constructor **PREVAILING WAGE RATE**

	03/27/15	03/17/16	03/17/17	03/17/18
Journeyman	W59.55 B38.02 T97.57	W60.96 B39.77 T100.73	W62.64 B41.56 T104.20	W64.48 B43.36 T107.84

Expiration Date: 03/16/2019

Craft: Elevator Constructor **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	26.62	32.75	38.71	44.66						
Benefits	30.23	31.32	32.81	34.30						

Ratio of Apprentices to Journeymen - 1:1

Craft: Elevator Constructor **COMMENTS/NOTES**

The regular workday shall consist of either 7 or 8 hours to be established at the beginning of the project, between 7:00 AM and 4:30 PM.

OVERTIME:
For all hours worked before or after the regular workday, Monday through Friday, and all hours on Saturday and Sunday , shall be paid at double the hourly rate. Holiday pay is one days wages (8 hours) plus double the hourly rate for all hours worked.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day and the day after, Christmas Day. Saturday holidays shall be observed on the previous Friday and Sunday holidays shall be observed on the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Elevator Modernization & Service **PREVAILING WAGE RATE**

	03/27/15	03/17/16	03/17/17	03/17/18
Journeyman	W46.92 B36.46 T83.38	W47.91 B38.17 T86.08	W49.14 B39.91 T89.05	W50.49 B41.66 T92.15

Expiration Date: 03/16/2019

Craft: Elevator Modernization & Service **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	26.62	25.81	30.50	35.19						
Benefits	30.16	30.47	31.80	33.13						

Ratio of Apprentices to Journeymen - 1:1

Craft: Elevator Modernization & Service **COMMENTS/NOTES**

MODERNIZATION (addition, replacement, refurbishing, relocation, or changes in design or appearance, of elevator equipment in existing buildings):

- The regular workday consists of 8 hours, between 7:00 AM and 4:30 PM.

- Overtime:
Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturday and Sunday shall be paid at time and one-half the hourly rate. Holiday pay is one days wages (8 hours) plus time and one-half the hourly rate for all hours worked.

SERVICE (repair or replacement of parts for the purpose of maintaining elevator equipment in good operating condition):

- The regular workday consists of 8 hours, between 6:00 AM and 6:00 PM.

- Overtime:
Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturday shall be paid at time and one-half the hourly rate. All hours on Sunday and holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS (Modernization and Service): New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day and the day after, Christmas Day. Saturday holidays shall be observed on the previous Friday and Sunday holidays shall be observed on the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Glazier **PREVAILING WAGE RATE**

	06/11/15	05/01/16
Foreman	W46.50 B22.65 T69.15	W0.00 B0.00 T70.65
General Foreman	W48.50 B22.89 T71.39	W0.00 B0.00 T72.89
Journeyman	W42.50 B22.17 T64.67	W0.00 B0.00 T66.17

Expiration Date: 04/30/2017

Craft: Glazier **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
4 Months	30%	40%	50%	60%	70%	75%	80%	85%	90%	
Benefits	Intervals	1 to 3 =	6.51	Intervals	4 to 6 =	9.33	Intervals	7 to 9 =	11.67	

Ratio of Apprentices to Journeymen - 1:4

Craft: Glazier **COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES ENTERING PROGRAM AS OF 5-1-14:

INTERVAL	PERIOD AND RATES							
6 Months	50%	55%	60%	65%	70%	75%	80%	90%
Benefits	8.10	8.10	10.34	10.34	11.51	11.51	14.62	14.62

Hazard/Height Pay: +$1.00 per hour

FOREMAN REQUIREMENTS:
- When there are 4 or more Glaziers on a job, 1 must be designated a Foreman.
- When there are 15 or more Glaziers on a job, 1 must be designated a General Foreman.

The regular workday shall consist of 8 hours, between 7:00 AM and 5:30 PM, Monday to Friday.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, and the third shift shall receive 8 hours pay for 7 hours of work.

OVERTIME:
Hours in excess of 8 per day, or before or after the regular workday Monday through Friday, and all hours on Saturdays 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, General Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Heat & Frost Insulator **PREVAILING WAGE RATE**

	10/13/15
Foreman	W51.77 B29.42 T81.19
General Foreman	W54.32 B30.53 T84.85
Journeyman	W50.49 B28.86 T79.35

Expiration Date: 09/18/2016

Craft: Heat & Frost Insulator **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	23.39	27.74	33.52	39.36						
Benefits	17.46	20.63	22.69	24.56						

Ratio of Apprentices to Journeymen - 1:3

Craft: Heat & Frost Insulator **COMMENTS/NOTES**

NOTE: These rates apply to the installing of insulation on hot and cold mechanical systems.

The regular workday shall be 8 hours between 8:00 AM and 4:30 PM.

SHIFT DIFFERENTIAL:
- Shift work must run for a minimum of 5 consecutive workdays.
- Second Shift shall work 7.5 hours and receive 8 hours pay, at the regular rate, plus 25% per hour.
- Third Shift shall work 7 hours and receive 8 hours pay, at the regular rate, plus 30% per hour.

OVERTIME:
The first 2 hours in excess of 8 per day, hours outside of the regular workday Monday through Friday that are not shift work, and the first 10 hours on Saturday, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours in excess of 10 per day, and all hours on Sunday and holidays (except Labor Day) shall be paid at double the regular rate, inclusive of benefits. All hours on Labor Day shall be paid at triple the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Presidential Election Day, Thanksgiving Day and Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Heat & Frost Insulator - Asbestos Worker **PREVAILING WAGE RATE**

	10/13/15
Asbestos Helper Abatement	W33.52 B22.69 T56.21
Firestop/Hazmat	W26.93 B9.25 T36.18
Foreman	W51.77 B29.42 T81.19

Expiration Date: 09/18/2016

Craft: Heat & Frost Insulator - Asbestos Worker **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
	SEE	HEAT &	FROST	INSULATOR						

Ratio of Apprentices to Journeymen - 1:3

Craft: Heat & Frost Insulator - Asbestos Worker **COMMENTS/NOTES**

NOTE: These rates apply only to the removal of insulation materials/asbestos from mechanical systems, including containment erection and demolition, and placing material in appropriate containers.

The regular workday shall be 8 hours between 8:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- The second shift shall work 7.5 hours and receive 8 hours pay at the regular rate, plus 25% per hour.
- The third shift shall work 7 hours and receive 8 hours pay at the regular rate, plus 30% per hour.

OVERTIME: The first 2 hours in excess of 8 per day, hours outside of the regular workday Monday through Friday that are not shift work, and the first 10 hours on Saturday, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours in excess of 10 per day, and all hours on Sunday and holidays (except Labor Day) shall be paid at double the regular rate, inclusive of benefits. All hours on Labor Day shall be paid at triple the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Presidential Election Day, Thanksgiving Day and Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Ironworker **PREVAILING WAGE RATE**

	01/08/16	07/01/16	07/01/17
Rod /Fence Foreman	W41.74 B42.77 T84.51	W0.00 B0.00 T86.51	W0.00 B0.00 T88.51
Rod/Fence Journeyman	W38.74 B42.77 T81.51	W0.00 B0.00 T83.51	W0.00 B0.00 T85.51
Structural Foreman	W44.29 B42.77 T87.06	W0.00 B0.00 T88.81	W0.00 B0.00 T90.56
Structural Journeyman	W41.29 B42.77 T84.06	W0.00 B0.00 T85.81	W0.00 B0.00 T87.56

Expiration Date: 06/30/2018

Craft: Ironworker **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	50%	60%		Yearly	70%	80%	90%			

Ratio of Apprentices to Journeymen - 1:4

Craft: Ironworker **COMMENTS/NOTES**

HAZARDOUS WASTE WORK: On hazardous waste removal work on a state or federally designated hazardous waste site where the Ironworker is required to wear Level A,B, or C personal protection: + $3.00 per hour

The regular workday consists of 8 hours between 6:00 AM and 4:30 PM.

FOREMAN REQUIREMENTS:
When there are 2 or more Ironworkers on a job, 1 shall be designated a Foreman.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule is established, the first, or day shift , shall be established on an 8 hour basis .The second shift shall be established on an 8 hour basis, and receive the regular rate plus 15%.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 15%, and the third shift shall receive the regular rate plus 20%.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis.
- When an irregular shift is established for the Ironworker (Structural) classification, the rate shall be paid at time and one-half the regular rate, inclusive of benefits. When an irregular shift is established for the Rod /Fence classification, the shift shall be established on an 8 hour basis and receive the regular rate, plus 20%.

OVERTIME:
- All hours in excess of 8 per day, or before or after an established shift that are 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 Sunday and holidays shall be paid at double the hourly rate, inclusive of benefits. Saturday may be used as a make-up day for a day lost to inclement weather. If Saturday is not a make-up day, all hours on Saturday shall be paid at time and one-half the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be 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, 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.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Laborer - Asbestos & Hazardous Waste Removal **PREVAILING WAGE RATE**

	12/17/14
Foreman	W38.00 B16.20 T54.20
Journeyman (Handler)	W36.00 B16.20 T52.20

Expiration Date: 11/30/2015

Craft: Laborer - Asbestos & Hazardous Waste Removal **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	27.96	28.66	29.72	31.84						
Benefits	16.15	for	all	intervals						

Ratio of Apprentices to Journeymen - *

* Ratio of apprentices to journeymen shall not be more than one apprentice for the first journeyman and no more than (1) apprentice for each additional three (3) journeymen.

Craft: Laborer - Asbestos & Hazardous Waste Removal **COMMENTS/NOTES**

NOTE: These rates apply to work in connection with Asbestos, Radiation, Hazardous Waste, Lead, Chemical, Biological, Mold Remediation and Abatement.

The regular workday shall be 8 hours between 6:00 AM and 6:00 PM.

OVERTIME:
- Hours in excess of 8 per day, Monday through Saturday, and all hours on Sunday and holidays shall be paid at time and one-half the regular rate.
- When the owner (Public Body) mandates that work is to be performed on Sunday, those hours may be worked at straight time, up to 8 hours per day, up to 40 hours per week.
- Benefits on ALL overtime hours shall be paid at straight time.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Good Friday, Easter, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Laborer - Building **PREVAILING WAGE RATE**

	11/02/15
Class A Journeyman	W30.90 B25.97 T56.87
Class B Journeyman	W30.40 B25.97 T56.37
Class C Journeyman	W25.84 B25.97 T51.81
Foreman	W34.76 B25.97 T60.73
General Foreman	W38.63 B25.97 T64.60

Expiration Date: 04/30/2016

Craft: Laborer - Building **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	60%	70%	80%	90%						
Benefit	22.72	22.72	22.72	22.72						

Ratio of Apprentices to Journeymen - *

* Ratio of apprentices to journeymen shall not be more than one apprentice for the first journeyman and no more than (1) apprentice for each additional three (3) journeymen.

Craft: Laborer - Building **COMMENTS/NOTES**

CLASS A: Specialist laborer including mason tender or concrete pour crew; scaffold builder (scaffolds up to 14 feet in height); operator of forklifts, Bobcats (or equivalent machinery), jack hammers, tampers, motorized tampers and compactors, vibrators, street cleaning machines, hydro demolition equipment, riding motor buggies, conveyors, burners; and nozzlemen on gunite work.
CLASS B: Basic laborer - includes all laborer work not listed in Class A or Class C.
CLASS C: Janitorial-type light clean-up work associated with the TURNOVER of a project, or part of a project, to the owner. All other clean-up work is Class B.

The regular workday shall be 8 hours between 6:00 AM and 6:00 PM.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- When a 2-shift schedule is worked, including a day shift, both shifts shall be establised on the basis of 8 hours pay for 8 hours worked. The second shift shall receive the regular rate plus an additional 10%.

- When a 3-shift schedule is worked, the day shift shall be established on the basis of 8 hours pay for 8 hours worked, the second shift shall be established on the basis of 8 hours pay for 7.5 hours worked, and the third shift shall be established on the basis of 8 hours pay for 7 hours worked. The day shift shall receive the regular rate, the second shift shall receive the regular rate plus an additional 10%, and the third shift shall receive the regular rate plus an additional 15%.
- When a second or third shift is worked with no day shift, the second or third shift shall be established on the basis of 8 hours pay for 8 hours worked. The second shift shall receive the regular rate plus an additional 10%, and the third shift shall receive the regular rate plus an additional 15%.

OVERTIME:
- Hours in excess of 8 per day, or outside the regular workday that are not shift work, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. Saturday may be used as a make-up day (paid at straight time) for a day lost to inclement weather, or for a holiday that is observed during the work week, Monday through Friday. All hours on Sundays and holidays shall be paid at double the regular rate.
- Four 10-hour days may be worked Monday to Thursday, at straight time, with Friday used 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 regular rate.
- Benefits on ALL overtime hours shall be paid at time and one-half.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Laborer - Heavy & General **PREVAILING WAGE RATE**

Rates are located in the
"Statewide" rate package

Expiration Date:

Craft: Laborer - Heavy & General **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
1000 Hours	60%	70%	80%	90%						
Benefit	18.03	for	all	intervals						

Ratio of Apprentices to Journeymen - *

* No more than 1 apprentice for the first journeyman and no more than 1 apprentice for each additional 3 journeymen.

Craft: Laborer - Heavy & General **COMMENTS/NOTES**

Heavy & General Laborer rates are located in the "Statewide" rate package.

With respect to the APPRENTICE RATE SCHEDULE, the following shall apply:

On 9-1-15- benefits shall be $18.03.
On 3-1-16- benefits shall be $18.78.
On 9-1-16- benefits shall be $18.78.
On 3-1-17- benefits shall be $19.53.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Millwright **PREVAILING WAGE RATE**

	11/01/15
Foreman	W52.30 B30.36 T82.66
Journeyman	W45.48 B26.47 T71.95

Expiration Date: 04/30/2016

Craft: Millwright **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	40%	45%	50%	55%	60%	65%	70%	75%	85%	95%
Benefits	57% of	Appren	tice	Wage	Rate	for all	intervals	+ $.55		

Ratio of Apprentices to Journeymen - 1:4

Craft: Millwright **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- When there are 2 or more Millwrights on a job, 1 shall be designated as a Foreman.
- When there are 21 or more Millwrights on a job, 2 shall be designated as Foremen.

The regular workday shall consist of 8 hours, starting between 7:00 AM and 9:00 AM.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 15%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 15% and the third shift shall receive the regular rate plus 20%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 15% and the third shift shall receive the regular rate plus 20%, inclusive of benefits.

OVERTIME:
- All hours in excess of 8 per day, or before or after an established shift that are not shift work, and all hours on Saturdays shall be paid at time and one-half the hourly 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 be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost due 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, 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 will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Operating Engineer **PREVAILING WAGE RATE**

Rates are located in the
"Statewide" rate package

Expiration Date:

Craft: Operating Engineer **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	60%	70%	80%	90%						

Ratio of Apprentices to Journeymen - *

* 1 apprentice for each piece of heavy equipment. At least 10 pieces of heavy equipment or a minimum of 5 Operating Engineers must be on site.

Craft: Operating Engineer **COMMENTS/NOTES**

Operating Engineer rates are located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Operating Engineer - Field Engineer **PREVAILING WAGE RATE**

Rates are located in the
"Statewide" rate package

Expiration Date:

Craft: Operating Engineer - Field Engineer **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	70%	75%	of Rod/	Chainman	Wage					
Yearly			80%	90%	Transit/	Instrument	man	Wage		

Ratio of Apprentices to Journeymen - *

* No more than 1 Field Engineer Apprentice per Survey Crew.

Craft: Operating Engineer - Field Engineer **COMMENTS/NOTES**

Operating Engineer - Field Engineer rates are located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Painter - Bridges **PREVAILING WAGE RATE**

	05/22/15	05/01/16	05/01/17
Foreman	W56.38 B25.67 T82.05	W58.63 B25.67 T84.30	W61.13 B25.67 T86.80
General Foreman	W58.38 B25.67 T84.05	W60.63 B25.67 T86.30	W63.13 B25.67 T88.80
Journeyman	W51.38 B25.67 T77.05	W53.63 B25.67 T79.30	W56.13 B25.67 T81.80

Expiration Date: 01/31/2019

Craft: Painter - Bridges **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	40%	50%			60%	70%		80%	90%	
Benefits	Intervals	1 to 2 =	8.88	Intervals	3 to 4 =	10.81	Intervals	5 to 6 =	13.48	

Ratio of Apprentices to Journeymen - 1:4

Craft: Painter - Bridges **COMMENTS/NOTES**

These rates apply to: All bridges that span waterways, roadways, railways and canyons. All tunnels, overpasses, viaducts and all appurtenances.

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Painter - Line Striping **PREVAILING WAGE RATE**

	12/01/15	12/01/16	12/01/17
Foreman (Charge Person)	W35.80 B16.10 T51.90	W36.80 B16.90 T53.70	W38.05 B17.74 T55.79
Helper (1st Year)	W28.05 B16.10 T44.15	W29.05 B16.90 T45.95	W30.30 B17.74 T48.04
Helper (2nd Year)	W29.38 B16.10 T45.48	W30.38 B16.90 T47.28	W31.63 B17.74 T49.37
Helper (3rd Year)	W31.53 B16.10 T47.63	W32.53 B16.90 T49.43	W33.78 B17.74 T51.52
Journeyman	W35.30 B16.10 T51.40	W36.30 B16.90 T53.20	W37.55 B17.74 T55.29

Expiration Date: 11/30/2018

Craft: Painter - Line Striping **COMMENTS/NOTES**

OVERTIME:
Hours in excess of 8 per day, Monday through Saturday, and all hours on Sundays and holidays 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, Veterans Day, Thanksgiving Day and Christmas Day. Veterans Day may be substituted for the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Painter - New Construction **PREVAILING WAGE RATE**

	06/30/15	05/01/16	05/01/17
Foreman	W41.54 B22.35 T63.89	W42.91 B22.35 T65.26	W44.39 B22.35 T66.74
General Foreman	W45.31 B22.81 T68.12	W46.81 B22.81 T69.62	W48.43 B22.81 T71.24
Journeyman	W37.76 B21.90 T59.66	W39.01 B21.90 T60.91	W40.36 B21.90 T62.26

Expiration Date: 04/30/2018

Craft: Painter - New Construction **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
4 Months	30%	40%	50%	60%	70%	75%	80%	85%	90%	
Benefits	Intervals	1 to 3 =	8.00	Intervals	4 to 6 =	10.00	Intervals	7 to 9 =	11.00	

Ratio of Apprentices to Journeymen - 1:4

Craft: Painter - New Construction **COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES ENTERING PROGRAM ON 5-1-14:

INTERVAL	PERIOD AND RATES							
6 Months	40%	45%	55%	65%	70%	75%	80%	90%
Benefits	8.00	8.00	10.00	10.00	11.00	11.00	14.00	14.00

Spraying, sandblasting, lead abatement, work on tanks or stacks, work performed above 3 stories or 30 feet in height, or using swing scaffolds requires an additional 10% of the wage rate.

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturdays 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.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, General Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Painter - Repainting **PREVAILING WAGE RATE**

	06/30/15	05/01/16	05/01/17
Foreman	W31.41 B18.45 T49.86	W32.79 B18.45 T51.24	W34.17 B18.45 T52.62
General Foreman	W34.27 B18.45 T52.72	W35.77 B18.45 T54.22	W37.39 B18.45 T55.84
Journeyman	W28.56 B18.45 T47.01	W29.81 B18.45 T48.26	W31.16 B18.45 T49.61

Expiration Date: 04/30/2018

Craft: Painter - Repainting **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
	SEE	PAINTER	NEW	CONSTR UC	TION					

Ratio of Apprentices to Journeymen - 1:4

Craft: Painter - Repainting **COMMENTS/NOTES**

NOTE: These rates may only be used on jobs where no major alterations occur, and where not more than 3 other trades are present on the job, but may NOT, under any circumstances, be used for work on bridges, stacks, elevated tank, or generating stations.

Spraying, sandblasting, lead abatement, work on tanks or stacks, work performed above 3 stories or 30 feet in height, or using swing scaffolds requires an additional 10% of the wage rate.

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

OVERTIME:
- Hours in excess of 8 per day and 40 per week 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.
- Four 10-hour days may be worked, at straight time, Monday through Sunday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, General Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Painter- Containment **PREVAILING WAGE RATE**

	05/22/15	05/01/16	05/01/17
Journeyman	W32.93 B22.92 T55.85	W35.18 B22.92 T58.10	W37.68 B22.92 T60.60

Expiration Date: 01/31/2019

Craft: Painter- Containment **COMMENTS/NOTES**

NOTE: These rates shall require no painting, but used in a supporting capacity only, such as wrapping, boxing, fencing, etc. on tanks.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate..

RECOGNIZED HOLIDAYS: New Year's Day President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Painter-Elevated Water Tanks **PREVAILING WAGE RATE**

	05/22/15	05/01/16	05/01/17
Foreman	W46.17 B22.92 T69.09	W48.42 B22.92 T71.34	W50.92 B22.92 T73.84
General Foreman	W48.17 B22.92 T71.09	W50.42 B22.92 T73.34	W52.92 B22.92 T75.84
Journeyman	W41.17 B22.92 T64.09	W43.42 B22.92 T66.34	W45.92 B22.92 T68.84

Expiration Date: 01/31/2019

Craft: Painter-Elevated Water Tanks **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
	SEE	PAINTER	BRIDGES							

Craft: Painter-Elevated Water Tanks **COMMENTS/NOTES**

These rates apply to: All new and repaint elevated water tanks (interior and exterior).

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Painter-Structural Steel **PREVAILING WAGE RATE**

	05/22/15	05/01/16	05/01/17
Foreman	W45.12 B23.26 T68.38	W47.37 B23.26 T70.63	W49.87 B23.26 T73.13
General Foreman	W47.12 B23.26 T70.38	W49.37 B23.26 T72.63	W51.87 B23.26 T75.13
Journeyman	W40.12 B23.26 T63.38	W42.37 B23.26 T65.63	W44.87 B23.26 T68.13

Expiration Date: 01/31/2019

Craft: Painter-Structural Steel **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
	SEE	PAINTER	BRIDGES							

Craft: Painter-Structural Steel **COMMENTS/NOTES**

These rates apply to: All work in power plants (any aspect). On steeples, on dams, on hangers, transformers, substations, etc. and on open steel, whether new or repaint. All new work (excluding traditional commercial painting work) in refineries, tank farms, water/sewerage treatment facilities and on pipelines.

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Paperhanger - New Construction **PREVAILING WAGE RATE**

	06/30/15	05/01/16	05/01/17
Foreman	W42.51 B21.44 T63.95	W43.83 B21.44 T65.27	W45.32 B21.44 T66.76
Journeyman	W38.65 B22.01 T60.66	W39.85 B22.01 T61.86	W41.20 B22.01 T63.21

Expiration Date: 04/30/2018

Craft: Paperhanger - New Construction **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
4 Months	30%	40%	50%	60%	70%	75%	80%	85%	90%	
Benefits	Intervals	1 to 3 =	8.00	Intervals	4 to 6 =	10.00	Intervals	7 to 9 =	11.00	

Ratio of Apprentices to Journeymen - 1:4

Craft: Paperhanger - New Construction **COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES ENTERING PROGRAM ON 5-1-14:

INTERVAL	PERIOD AND RATES							
6 Months	40%	45%	55%	65%	70%	75%	80%	90%
Benefits	8.00	8.00	10.00	10.00	11.00	11.00	14.00	14.00

FOREMEN REQUIREMENTS:
- When there are 4 or more Paperhangers on a job, 1 shall be designated a Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays 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.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, General Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Paperhanger - Renovation **PREVAILING WAGE RATE**

	06/30/15	05/01/16	05/01/17
Foreman	W32.21 B18.53 T50.74	W33.58 B18.53 T52.11	W35.06 B18.53 T53.59
Journeyman	W29.28 B18.53 T47.81	W30.53 B18.53 T49.06	W31.88 B18.53 T50.41

Expiration Date: 04/30/2018

Craft: Paperhanger - Renovation **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
	SEE	PAPER-	HANGER	NEW	CONSTR UC	TION				

Ratio of Apprentices to Journeymen - 1:4

Craft: Paperhanger - Renovation **COMMENTS/NOTES**

NOTE: These rates may only be used on jobs where no major alterations occur, and where not more than 3 other trades are present on the job, but may NOT, under any circumstances, be used for work on bridges, stacks, elevated tanks, or generating stations.

FOREMEN REQUIREMENTS:
- When there are 4 or more Paperhangers on a job, 1 shall be designated a Foreman.

OVERTIME:
- Hours in excess of 8 per day and 40 per week shall be paid at time and one-half the regular rate.
- Four 10-hour days may be worked, at straight time, Monday through Sunday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Pipefitter **PREVAILING WAGE RATE**

	05/01/15
Foreman	W50.42 B38.67 T89.09
Journeyman	W46.67 B35.80 T82.47

Expiration Date: 04/30/2016

Craft: Pipefitter **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	35%	45%	55%	65%	75%					
Benefit	76.5% of	Appren	tice	Wage	Rate + .10	cents				

Ratio of Apprentices to Journeymen - 1:5

Craft: Pipefitter **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- When there are 2 or more Journeyman Pipefitters on a job, 1 shall be designated a Foreman.
- There shall be a Foreman for every 8 Journeyman Pipefitters on a job.

The regular workday shall be 8 hours between 7:00 AM and 3:30 PM.

SHIFT DIFFERENTIAL:
- 2nd Shift (3:30 PM-11:30 PM) shall work 7.5 hours and receive 8 hours pay at the regular rate, plus 25% per hour.
- 3rd Shift (11:30 PM-7:00 AM) shall work 7 hours and receive 8 hours pay at the regular rate, plus 30% per hour.

OVERTIME:
- All hours worked in excess of 8 per day, Monday through Friday, and all hours worked on Saturday, shall be paid at time and one-half, inclusive of benefits. All hours on Sunday and holidays shall be paid at double time, inclusive of benefits.
- By mutual agreement, employees may work four 10-hour days, Monday to Thursday, at straight time rate. Friday may be used as a make-up day for a day lost to inclement weather, and may be paid at straight time. If Friday is not a make-up day, the first 8 hours shall be paid at time and one-half, inclusive of benefits; hours in excess of 8 shall be paid at double time, inclusive of benefits.

SHIFT DIFFERENTIAL (Maintenance Work Only):
- 2nd Shift (3:30 PM-11:30 PM) shall work 7.5 hours and receive 8 hours pay at the regular rate, plus 10% per hour.
- 3rd Shift (11:30 PM-7:00 AM) shall work 7 hours and receive 8 hours pay at the regular rate, plus 15% per hour.

OVERTIME (Maintenance Work Only):
- All hours in excess of 8 per day, Monday through Saturday, shall be paid at time and one-half, inclusive of benefits. All hours on Sundays and holidays shall be paid at double time, inclusive of benefits.

NOTE: Maintenance work is work to repair, restore, or improve the efficiency of existing facilities. This does NOT apply to ANY new construction.

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 are observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Plasterer **PREVAILING WAGE RATE**

See Bricklayer, Stone Mason Rates

Expiration Date:

Craft: Plasterer **COMMENTS/NOTES**

See BRICKLAYER, STONE MASON Rates

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Plumber **PREVAILING WAGE RATE**

	05/01/15
Foreman	W54.39 B31.94 T86.33
General Foreman	W57.91 B31.94 T89.85
Journeyman	W50.36 B31.94 T82.30

Expiration Date: 04/30/2016

Craft: Plumber **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	30%	45%	55%	65%	75%					
Benefits	12.24	18.04	19.65	21.28	22.89					

Ratio of Apprentices to Journeymen - *

* Employers may employ 1 apprentice on any job where 1 or 2 journeymen are employed. Thereafter, 1 apprentice may be employed for every 4 journeymen.

Craft: Plumber **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- On any job having 2 or more Plumbers, 1 must be designated a Foreman.
- On any job having 9 or more Plumbers, 2 shall be designated as Foremen.

The regular workday shall consist of 8 hours between 7:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must continue for a minimum of 5 consecutive workdays.
- When two shifts are worked, the second shift shall work 7.5 hours and receive 8 hours pay, at a rate equal to the hourly rate plus 10%, inclusive of benefits.
- When a third shift is worked, the third shift shall work 7 hours and receive 8 hours pay, at a rate equal to the hourly rate plus 15%, inclusive of benefits.

OVERTIME:
- All hours in excess of 8 per day, or before of after the regular workday that are not shift work, Monday through Friday, and all hours on Saturday, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays, shall be paid at double the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost due to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half, 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 will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Roofer **PREVAILING WAGE RATE**

	06/02/15
Foreman	W36.27 B24.04 T60.31
Journeyman	W35.27 B24.04 T59.31

Expiration Date: 05/31/2016

Craft: Roofer **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	40%	50%	60%	70%	80%	90%				
Benefits	1.85	1.85	21.25	21.25	21.25	21.25				

Ratio of Apprentices to Journeymen - *

* A) For roofing jobs that are of the 1 or single ply nature: 1:2 or fraction thereof
B) For roofing jobs on new built up roofs: 1:3 or fraction thereof
C) For roofing jobs that are of a tear-off nature: 1:2 or fraction thereof
D) For roofing jobs {not requiring complete removal of existing systems, installation done over existing roof}: 1:3 or fraction thereof

Craft: Roofer **COMMENTS/NOTES**

Pitch: +.50 per hour

Mop Man: +.30 per hour

The regular workday consists of 8 hours between 8:00 AM and 4:30 PM.

OVERTIME:
Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturdays, Sundays, and holidays shall be paid at time and one-half the regular rate.

RECOGNIZED HOLIDAYS: New Year's Day, Good Friday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Sheet Metal Sign Installation **PREVAILING WAGE RATE**

	10/22/15
Foreman	W32.89 B29.26 T62.15
Journeyman	W31.64 B29.26 T60.90

Expiration Date: 03/31/2016

Craft: Sheet Metal Sign Installation **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
1000 hours	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%
Benefits	9.84	11.24	12.61	14.01	15.76	17.17	18.60	20.03	21.44	22.85

Ratio of Apprentices to Journeymen - 1:3

Craft: Sheet Metal Sign Installation **COMMENTS/NOTES**

FOREMAN REQUIREMENT:
When there are 6 or more Sheet Metal Sign Installers on a job, 1 shall be designated a Foreman.

The regular workday consists of 8 hours, between 7:00 AM and 3:30 PM.

OVERTIME:
Hours before or after the regular workday, Monday though Friday, and all hours worked on Saturday shall be paid at time and one-half the hourly rate. All hours on Sunday and holidays shall be paid at double the hourly rate.

Four(4) 10 hour days may be worked, Monday through Friday, at straight time, for projects lasting at least one week in duration. The fifth day may be used as a make-up day at straight time for a day lost due to inclement weather. However, if the fifth day is not a make-up day, all hours worked will be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and the day after, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Sheet Metal Worker **PREVAILING WAGE RATE**

	07/23/15
Foreman	W49.22 B37.00 T86.22
General Foreman	W50.22 B37.00 T87.22
Journeyman	W45.72 B37.00 T82.72

Expiration Date: 05/31/2016

Craft: Sheet Metal Worker **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	35%	45%	55%	65%	of	Journey	man	Wage	Rate	
Benefit	35%	45%	55%	65%	of	Journey	man	Benefit	Rate	

Ratio of Apprentices to Journeymen - 1:4

Craft: Sheet Metal Worker **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- When there are 2 or more Sheet Metal Workers on a project, 1 must be designated a Foreman.
- When there are 17 or more Sheet Metal Workers on a project, 1 must be designated a General Foreman.
- When there is only 1 Sheet Metal Worker (1 Journeyman) on a project, he/she shall receive $1.00 more than the regular Journeyman's rate.

The regular workday is 8 hours between 7:00 AM and 4:30 PM.

SHIFT DIFFERENTIAL:
- 2nd Shift (3:30 PM - 12:00 AM) : +17% of regular hourly rate
- Shift work must run for a minimum of 5 consecutive workdays.

OVERTIME:
- Hours in excess of 8 per day, or before or after the regular workday, that are not shift work, and the first 10 hours on Saturdays shall be paid at time and one-half of the regular rate, inclusive of benefits. Hours in excess of 10 per day on Saturday, and all hours on Sundays and holidays shall be at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Friday, at straight time, with hours in excess of 10 per day, and hours in excess of 40 per week paid at the overtime rates listed above.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Sprinkler Fitter **PREVAILING WAGE RATE**

	01/01/16
Foreman	W61.73 B24.92 T86.65
General Foreman	W64.66 B24.92 T89.58
Journeyman	W57.73 B24.92 T82.65

Expiration Date: 06/30/2016

Craft: Sprinkler Fitter **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
1000 Hours	9.50	11.25	28.87	31.75	34.64	37.52	40.41	43.30	46.18	49.07
Benefits	10.37	10.37	20.67	20.67	20.67	20.67	Intervals	7 to 10	Jourymn	Ben.

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES REGISTERED AS OF 7-1-13:

INTERVAL	PERIOD AND RATES									
1000 hours	14.43	17.32	23.09	25.98	31.75	34.64	40.41	43.30	49.07	51.96
Benefits	10.37	10.37	20.67	20.67	20.67	20.67	Intervals 7 to 10 receive		Journeyman Ben.	

Craft: Sprinkler Fitter **COMMENTS/NOTES**

The regular workday consists of 8 consecutive hours between 6:00 AM and 4:30 PM.

FOREMAN REQUIREMENTS:
- The first Sprinkler Fitter on the job must be designated a Foreman.
- On any job having 12 or more Sprinkler Fitters, one must be designated a General Foreman.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 2 consecutive workdays.
- 2nd and 3rd shift shall receive an additional 15% of the regular rate, per hour.
- Any "off hours" shift starting at 8:00 PM or later shall receive an additional 25% of the regular rate, per hour.

OVERTIME:
The first 2 hours in excess of 8 per day, after the regular workday that are not shift work, Monday through Friday, shall be paid at time and one-half the regular rate. Hours worked in excess of 10 per day, Monday through Friday, and all hours on Saturday, Sunday and holidays, shall be paid double the regular rate.
Four 10 hour days may be worked, Monday through Thursday, at striaght-time.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Tile Finisher-Marble **PREVAILING WAGE RATE**

	01/01/16	07/01/16	01/01/17	07/01/17	01/01/18
Finisher	W45.35 B31.19 T76.54	W45.66 B31.95 T77.61	W46.01 B32.68 T78.69	W46.32 B33.44 T79.76	W46.66 B34.18 T80.84

Expiration Date: 06/30/2018

Craft: Tile Finisher-Marble **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
750 Hours	50%	55%	65%	70%	75%	85%	90%	95%		

Ratio of Apprentices to Journeymen - 1:4

Craft: Tile Finisher-Marble **COMMENTS/NOTES**

OVERTIME:
Hours in excess of 7 per day, Monday through Friday, and the first 7 hours on Saturdays shall be paid at time and one half the regular rate, inclusive of benefits. Hours in excess of 7 on Saturdays and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day and the day after, Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Tile Setter - Ceramic **PREVAILING WAGE RATE**

	12/07/15	06/06/16	12/05/16
Finisher	W42.42 B28.39 T70.81	W0.00 B0.00 T71.63	W0.00 B0.00 T72.45
Setter	W54.93 B31.33 T86.26	W0.00 B0.00 T87.39	W0.00 B0.00 T88.52

Expiration Date: 06/01/2017

Craft: Tile Setter - Ceramic **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
750 Hours	50%	55%	60%	65%	70%	75%	85%	95%	100%	

Ratio of Apprentices to Journeymen - 1:4

Craft: Tile Setter - Ceramic **COMMENTS/NOTES**

OVERTIME:
Hours in excess of 7 per day, and the first 10 hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Saturdays after 10 hours shall be paid double the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Tile Setter - Marble **PREVAILING WAGE RATE**

	01/01/16	07/01/16	01/01/17	07/01/17	01/01/18
Tile Setter	W56.89 B32.21 T89.10	W57.32 B33.23 T90.55	W57.74 B34.26 T92.00	W58.18 B35.27 T93.45	W58.53 B36.37 T94.90

Expiration Date: 06/30/2018

Craft: Tile Setter - Marble **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
750 Hours	50%	55%	65%	70%	75%	85%	90%	95%		

Ratio of Apprentices to Journeymen - 1:4

Craft: Tile Setter - Marble **COMMENTS/NOTES**

OVERTIME:
Hours in excess of 7 per day, Monday through Friday, and the first 7 hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. Hours in excess of 7 on Saturdays, and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day and the day after, Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Tile Setter - Mosaic & Terrazzo **PREVAILING WAGE RATE**

	01/08/16	07/01/16	01/01/17
Grinder or Assistant	W49.47 B33.23 T82.70	W0.00 B0.00 T83.85	W0.00 B0.00 T85.00
Mechanic	W51.08 B33.24 T84.32	W0.00 B0.00 T85.47	W0.00 B0.00 T86.62

Expiration Date: 06/30/2017

Craft: Tile Setter - Mosaic & Terrazzo **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
750 Hours	50%	55%	65%	70%	75%	85%	90%	95%		

Ratio of Apprentices to Journeymen - 1:5

Craft: Tile Setter - Mosaic & Terrazzo **COMMENTS/NOTES**

The regular workday consists of 7 hours, between 8:00 AM and 3:30 PM.

OVERTIME:
- Hours in excess of 7 per day, or before or after the regular workday, Monday through Friday, 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.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Monday after Easter, Memorial Day, July 4th, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day and the day after, Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Truck Driver **PREVAILING WAGE RATE**

	11/02/15
Bucket, Utility, Pick-up, Fuel Delivery trucks	W35.60 B31.76 T67.36
Dump truck, Asphalt Distributor, Tack Spreader	W35.60 B31.76 T67.36
Euclid-type vehicles (large, off-road equipment)	W35.75 B31.76 T67.51
Helper on Asphalt Distributor truck	W35.60 B31.76 T67.36
Slurry Seal, Seeding/Fertilizing/ Mulching truck	W35.60 B31.76 T67.36
Straight 3-axle truck	W35.65 B31.76 T67.41
Tractor Trailer (all types)	W35.75 B31.76 T67.51
Vacuum or Vac-All truck (entire unit)	W35.60 B31.76 T67.36
Winch Trailer	W35.85 B31.76 T67.61

Expiration Date: 04/30/2016

Craft: Truck Driver **COMMENTS/NOTES**

BLENDED RATE:
When a truck driver is performing work on the site and also serving as a material delivery driver, the driver shall be paid a "blended rate" which shall be 80% of the above-listed wage rates, plus the full benefit rate. This rate shall be used when the driver "round robins" for a minimum of 6 hours during the work day.

HAZARDOUS WASTE REMOVAL:
- On hazardous waste removal work on a State designated hazardous waste site where the driver is in direct contact with hazardous materials and when personal protective equipment is required for respiratory, skin, and eye protection, the driver shall receive an additional $3.00 per hour (with or without protective gear).
- A hazardous waste related certified worker at a designated hazardous waste site who is not working in a zone requiring level A, B or C personal protection shall receive an additional $1.00 per hour.

TRUCK FOREMAN: $.75 cents per hour above regular rate. Overtime shall be increased accordingly.

The regular workday shall be 8 hours, starting between 6:00 AM and 8:00 AM.

SHIFT DIFFERENTIAL:
- Shifts starting at 4:00 PM (2nd Shift): + $2.50 per hour.
- Shifts starting at 12:00 AM (midnight/3rd Shift): time and one-half the hourly rate.
- Shifts starting at a time other than from 6:00 AM to 8:00 AM, when such hours are mandated by the project owner: + $2.50 per hour.

OVERTIME:
- Hours in excess of 8 per day, or before or after 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 hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Employees may work four 10-hour days at straight time, Monday through Thursday, with Friday used as a make-up day for a lost day. If Friday is not a make-up day, then 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 (Decoration Day), July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. The day after Thanksgiving may be substituted for Veterans' Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Truck Driver-Material Delivery Driver **PREVAILING WAGE RATE**

	05/01/12
Driver	W22.90 B10.17 T33.07

Expiration Date: 05/30/2016

Craft: Truck Driver-Material Delivery Driver **COMMENTS/NOTES**

BLENDED RATE:
When a truck driver is performing work on the site and also serving as a material delivery driver, the driver shall be paid a "blended rate". See the "Truck Driver" craft for the blended rates.

Truck Foreman/Shop Steward: +$0.25 per hour

SHIFT DIFFERENTIALS:
- 2nd Shift shall receive an additional $0.50 per hour
- 3rd Shift shall receive time and one-half the hourly rate.

OVERTIME:
- Hours in excess of 8 per day, or before or after the regular workday that are not shift work, Monday through Friday, and all hours on Saturday shall be paid at time and one-half the hourly rate. All hours on Sundays shall be paid at two and one-half times the hourly rate. All hours on holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day (Decoration Day), July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. The day after Thanksgiving may be substituted for Veterans' Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Welder **PREVAILING WAGE RATE**

Welder

Expiration Date:

Craft: Welder **COMMENTS/NOTES**

Welders rate is the same as the craft to which the welding is incidental.

STATEWIDE RATES

TERRITORY
ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

OPERATING ENGINEERS **Rates Expiration Date : 06/30/2017**

{For apprentice rates refer to "Operating Engineers" apprentice rates in any county rate package}

On all machines, including pile drivers with booms of 100 feet and over (including jib) the Operating Engineer shall receive the regular hourly rate plus: $1.00 per hour on rigs with 100 foot Boom (including jib) up to 139 feet, and $2.00 per hour on rigs with 140 foot Boom (including jib) and over. On all hoists where "Cat Head" or "Sheave Point" is 100 feet or more above ground level, the same differential pay shall apply as applicable to booms 100 feet and over.

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, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

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 : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
45.48	30.63	76.11	77.11	78.26

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 : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
45.48	30.63	76.11	77.11	78.26

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 : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
43.57	30.63	74.20	75.20	76.35

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 (Hetzel, Rexomatic & similar types)

Concrete Vibrator

OPERATING ENGINEERS **Rates Expiration Date : 06/30/2017**

Effective Dates:

	01/08/2016		**07/01/2016**	**01/01/2017**
Rate	Fringe	Total	Total	Total
43.57	30.63	74.20	75.20	76.35

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 : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
43.57	30.63	74.20	75.20	76.35

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

Skimmmer Machine (boom type)

Steel Cutting Machine (service & maintenance)

Tamrock Drill

Tractor

Transfer Machines

Tug Captains

Tug Master (Power Boats)

OPERATING ENGINEERS **Rates Expiration Date : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
43.57	30.63	74.20	75.20	76.35

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:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
40.23	30.63	70.86	71.86	73.01

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:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
37.65	30.63	68.28	69.28	70.43

CLASSIFICATIONS:

Field Engineer - Rodman or Chainman

OPERATING ENGINEERS **Rates Expiration Date : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
47.81	30.63	78.44	79.44	80.59

CLASSIFICATIONS:

Lead Engineer, Foreman Engineer, Safety Engineer (minimum)

OPERATING ENGINEERS **Rates Expiration Date : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
47.07	30.63	77.70	78.70	79.85

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

Helicoptor Co-Pilot

Helicoptor Communications Engineer

Juntann Pile Driver

Locomotive (large)

Mucking Machine

Pavement & Concrete Breaker (Superhammer & Hoe Ram)

OPERATING ENGINEERS **Rates Expiration Date : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
47.07	30.63	77.70	78.70	79.85

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 : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
41.94	30.63	72.57	73.57	74.72

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 : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
41.94	30.63	72.57	73.57	74.72

CLASSIFICATIONS:

Steam Generator or Boiler

Stone Spreader

Tamping Machine (vibrating ride-on type)

Temporary Heating Plant (Nelson or other type, including proprane, 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:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
48.89	30.63	79.52	80.52	81.67

CLASSIFICATIONS:

Helicoptor Pilot/Engineer

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
52.07	30.63	82.70	84.45	86.35

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:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
51.07	30.63	81.70	83.45	85.35

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 : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
49.07	30.63	79.70	80.70	81.85

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types) , under 100 tons with a boom (including jib and/or leads) 140 ft. and over

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
50.07	30.63	80.70	82.45	84.35

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:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
48.07	30.63	78.70	79.70	80.85

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 : 06/30/2017**

{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, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

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:

	01/08/2016		**07/01/2016**	**01/01/2017**
Rate	Fringe	Total	Total	Total
50.70	30.63	81.33	82.33	83.48

CLASSIFICATIONS:

Helicopter Pilot or Engineer

STRUCTURAL STEEL ERECTION **Rates Expiration Date : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
46.64	30.63	77.27	78.27	79.42

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:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
43.98	30.63	74.61	75.61	76.76

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 : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
42.45	30.63	73.08	74.08	75.23

CLASSIFICATIONS:

Compressor (Single)

Generators

Welding Machines, Gas, Diesel, Or Electric Converters of any type-single

Welding System, Multiple (Rectifier Transformer Type)

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
40.69	30.63	71.32	72.32	73.47

CLASSIFICATIONS:

Assistant Engineer/Oiler

Drillers Helper

Field Engineer - Transit/Instrument Man

Maintenance Apprentice (Deckhand)

Maintenance Apprentice (Oiler)

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
48.26	30.63	78.89	79.89	81.04

CLASSIFICATIONS:

Lead Engineer, Foreman Engineer, Safety Engineer (Minimum)

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
37.65	30.63	68.28	69.28	70.43

CLASSIFICATIONS:

Field Engineer - Rodman or Chainman

STRUCTURAL STEEL ERECTION **Rates Expiration Date : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
47.40	30.63	78.03	79.03	80.18

CLASSIFICATIONS:

Field Engineer-Chief of Party

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
54.09	30.63	84.72	86.47	88.37

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:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
52.43	30.63	83.06	84.81	86.71

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms including jib, less than 140 ft. abovr 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:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
51.09	30.63	81.72	82.72	83.87

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:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
49.43	30.63	80.06	81.06	82.21

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.

STRUCTURAL STEEL ERECTION **Rates Expiration Date : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
51.09	30.63	81.72	82.72	83.87

CLASSIFICATIONS:

Helicopter Co-Pilot

Helicopter Communications Engineer

TEST BORING PRELIMINARY TO CONSTRUCTION-SOUTH/WEST **Rates Expiration Date : 06/30/2017**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Hunterdon, Mercer, Monmouth, Ocean, Salem, Sussex, Warren

On all machines, including pile drivers with booms of 100 feet and over (including jib) the Operating Engineer shall receive the regular hourly rate plus: $1.00 per hour on rigs with 100 foot Boom (including jib) up to 139 feet, and $2.00 per hour on rigs with 140 foot Boom (including jib) and over. On all hoists where "Cat Head" or "Sheave Point" is 100 feet or more above ground level, the same differential pay shall apply as applicable to booms 100 feet and over.

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, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

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:

	01/08/2016		**07/01/2016**	**01/01/2017**
Rate	Fringe	Total	Total	Total
47.07	30.63	77.70	78.70	79.85

CLASSIFICATIONS:

Driller

TEST BORING PRELIMINARY TO CONSTRUCTION-SOUTH/WEST **Rates Expiration Date : 06/30/2017**

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
40.23	30.63	70.86	71.86	73.01

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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
39.00	26.53	65.53	67.03	68.13	70.53

CLASSIFICATIONS:

Walking Boss & Superintendent

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
38.70	26.53	65.23	66.73	67.83	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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
38.20	26.53	64.73	66.23	67.33	69.73

CLASSIFICATIONS:

Iron Foreman, Caulking Foreman, Form Foreman, Cement Finishing Foreman, Concrete Foreman, Track Foreman, Cleanup Foreman, Grout Foreman

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
40.70	26.53	67.23	68.73	69.83	72.23

CLASSIFICATIONS:

Blaster

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
37.65	26.53	64.18	65.68	66.78	69.18

CLASSIFICATIONS:

Top Labor Foreman

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
37.30	26.53	63.83	65.33	66.43	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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
37.15	26.53	63.68	65.18	66.28	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)

FREE AIR TUNNEL JOBS **Rates Expiration Date : 08/31/2017**

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
36.65	26.53	63.18	64.68	65.78	68.18

CLASSIFICATIONS:

All Others (including Powder Watchman, Change House Attendant, Top Laborer)

DRILL FOR GROUND WATER SUPPLY **Rates Expiration Date : 06/30/2017**

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:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
45.82	30.63	76.45	77.45	78.60

CLASSIFICATIONS:

Driller

Effective Dates:

01/08/2016			07/01/2016	01/01/2017
Rate	Fringe	Total	Total	Total
38.98	30.63	69.61	70.61	71.76

CLASSIFICATIONS:

Driller's Helper

OPERATING ENGINEERS MARINE-DREDGING **Rates Expiration Date : 09/30/2015**

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:

10/01/2014

Rate	Fringe	Total
35.63	12.89	48.52

CLASSIFICATIONS:

Lead Dredgerman, Operator, Leverman

Licensed Tug Operator (over 1000 HP)

Effective Dates:

10/01/2014

Rate	Fringe	Total
30.81	12.50	43.31

CLASSIFICATIONS:

Derrick Operator, Spider/Spill Barge Operator

Engineer, Electrician, Chief Welder, Chief Mate

Fill Placer, Operator II

Licensed Boat Operator

Maintenance Engineer

Effective Dates:

10/01/2014

Rate	Fringe	Total
29.01	12.36	41.37

CLASSIFICATIONS:

Certified Welder

OPERATING ENGINEERS MARINE-DREDGING **Rates Expiration Date : 09/30/2015**

Effective Dates:

10/01/2014

Rate	Fringe	Total
28.22	12.00	40.22

CLASSIFICATIONS:

Mate, Drag Barge Operator, Steward, Assistant Fill Placer

Welder

Effective Dates:

10/01/2014

Rate	Fringe	Total
27.30	11.92	39.22

CLASSIFICATIONS:

Boat Operator

Effective Dates:

10/01/2014

Rate	Fringe	Total
22.68	11.25	33.93

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:

03/01/2015			03/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total
35.00	19.69	54.69	56.10	57.77

CLASSIFICATIONS:

Foreman

Effective Dates:

03/01/2015			03/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total
32.40	19.69	52.09	53.45	55.07

CLASSIFICATIONS:

Box man

Effective Dates:

03/01/2015			03/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total
30.40	19.69	50.09	51.45	53.02

CLASSIFICATIONS:

Microsurface/Slurry Preparation

Effective Dates:

03/01/2015			03/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total
30.40	19.69	50.09	51.45	53.02

CLASSIFICATIONS:

Squeegee man

MICROSURFACING/SLURRY SEAL **Rates Expiration Date : 02/28/2018**

Effective Dates:

03/01/2015			03/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total
28.90	19.69	48.59	49.95	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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
38.50	26.53	65.03	66.53	67.63	70.03

CLASSIFICATIONS:

Paving Foreman

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
37.05	26.53	63.58	65.08	66.18	68.58

CLASSIFICATIONS:

Head Raker

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
36.90	26.53	63.43	64.93	66.03	68.43

CLASSIFICATIONS:

Raker, Screedman, Luteman

ASPHALT LABORERS - SOUTH **Rates Expiration Date : 08/31/2017**

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
36.65	26.53	63.18	64.68	65.78	68.18

CLASSIFICATIONS:

Tampers, Smoothers, Kettlemen,
Painters, Shovelers, Roller Boys

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
36.75	26.53	63.28	64.78	65.88	68.28

CLASSIFICATIONS:

Milling Controller

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
36.95	26.53	63.48	64.98	66.08	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:

11/13/2015			10/17/2016	10/17/2017
Rate	Fringe	Total	Total	Total
30.17	24.10	54.27	56.21	58.15

CLASSIFICATIONS:

Helper (4th year helper)

Effective Dates:

11/13/2015			10/17/2016	10/17/2017
Rate	Fringe	Total	Total	Total
37.82	24.10	61.92	64.13	66.34

CLASSIFICATIONS:

Driller

Effective Dates:

11/13/2015			10/17/2016	10/17/2017
Rate	Fringe	Total	Total	Total
43.42	24.10	67.52	69.93	72.34

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:

	09/01/2015		**03/01/2016**	**09/01/2016**	**03/01/2017**
Rate	Fringe	Total	Total	Total	Total
36.25	26.53	62.78	64.28	65.38	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:

	09/01/2015		**03/01/2016**	**09/01/2016**	**03/01/2017**
Rate	Fringe	Total	Total	Total	Total
36.95	26.53	63.48	64.98	66.08	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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
37.20	26.53	63.73	65.23	66.33	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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
40.75	26.53	67.28	68.78	69.88	72.28

CLASSIFICATIONS:

"A" Rate:
blaster

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
38.50	26.53	65.03	66.53	67.63	70.03

CLASSIFICATIONS:

"FOREMAN" Rate:
labor foreman, asphalt foreman, drill foreman, pipe foreman, grade foreman, finisher foreman, concrete foreman

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
39.50	26.53	66.03	67.53	68.63	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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
36.25	26.53	62.78	64.28	65.38	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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
36.25	26.53	62.78	64.98	66.08	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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
36.95	26.53	63.48	64.98	66.08	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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
36.95	26.53	63.48	64.98	66.08	68.48

CLASSIFICATIONS:

wagon or directional drill operator; drill master

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
40.75	26.53	67.28	68.78	69.88	72.28

CLASSIFICATIONS:

blaster

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
38.50	26.53	65.03	66.53	67.63	70.03

CLASSIFICATIONS:

labor foreman, drill foreman, pipe foreman, grade foreman, finisher foreman, concrete foreman

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
39.50	26.53	66.03	67.53	68.63	71.03

CLASSIFICATIONS:

general foreman

HEAVY & GENERAL LABORERS - SOUTH **Rates Expiration Date : 08/31/2017**

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
37.20	26.53	63.73	65.23	66.33	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 : 05/31/2016**

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:

06/02/2015

Rate	Fringe	Total
52.53	26.14	78.67

CLASSIFICATIONS:

Pipeline Journeyman Welder

PIPELINE - MAINLINE TRANSMISSION **Rates Expiration Date : 05/31/2016**

Effective Dates:

06/02/2015

Rate	Fringe	Total
52.53	26.14	78.67

CLASSIFICATIONS:

Pipeline Journeyman

Effective Dates:

06/02/2015

Rate	Fringe	Total
31.82	18.28	50.10

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:

	11/01/2015		11/01/2016
Rate	Fringe	Total	Total
55.95	21.10	77.05	79.13

CLASSIFICATIONS:

Pipeline Journeyman Welder

Effective Dates:

	11/01/2015		11/01/2016
Rate	Fringe	Total	Total
55.95	21.10	77.05	79.13

CLASSIFICATIONS:

Pipeline Journeyman

Effective Dates:

	11/01/2015		11/01/2016
Rate	Fringe	Total	Total
36.22	15.29	51.51	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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
38.50	26.53	65.03	66.53	67.63	70.03

CLASSIFICATIONS:

Asphalt Foreman

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
37.20	26.53	63.73	65.23	66.33	68.73

CLASSIFICATIONS:

Asphalt Screedman

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
36.95	26.53	63.48	64.98	66.08	68.48

CLASSIFICATIONS:

Asphalt Raker or Lute Man

ASPHALT LABORERS- NORTH **Rates Expiration Date : 08/31/2017**

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
36.25	26.53	62.78	64.28	65.38	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 wokday 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:

	11/29/2015		**12/04/2016**
Rate	Fringe	Total	Total
50.52	33.84	84.36	87.27

CLASSIFICATIONS:

Chief Lineman

Effective Dates:

	11/29/2015		**12/04/2016**
Rate	Fringe	Total	Total
47.66	31.93	79.59	82.34

CLASSIFICATIONS:

Journeyman Lineman

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date : 12/03/2017**

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
47.66	31.93	79.59	82.34

CLASSIFICATIONS:

Special License Operator

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
47.18	31.61	78.79	81.51

CLASSIFICATIONS:

Transit Man

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
45.75	30.65	76.40	79.04

CLASSIFICATIONS:

Line Equipment Operator

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
40.03	26.82	66.85	69.17

CLASSIFICATIONS:

Dynamite Man

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
56.24	37.68	93.92	97.16

CLASSIFICATIONS:

General Foreman

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
54.81	36.72	91.53	94.68

CLASSIFICATIONS:

Assistant General Foreman

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date : 12/03/2017**

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
53.38	35.76	89.14	92.21

CLASSIFICATIONS:

Line Foreman

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
38.60	25.86	64.46	66.69

CLASSIFICATIONS:

Straight Light Mechanical Leader

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
36.70	24.58	61.28	63.40

CLASSIFICATIONS:

Groundman Winch Operator

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
36.70	24.58	61.28	63.40

CLASSIFICATIONS:

Groundman Truck Operator

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
36.22	24.26	60.48	62.57

CLASSIFICATIONS:

Straight Light Mechanic

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
36.22	24.26	60.48	62.57

CLASSIFICATIONS:

Line Equipment Mechanic

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date : 12/03/2017**

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
30.98	20.75	51.73	53.52

CLASSIFICATIONS:

Groundman 2nd Year

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
28.60	19.16	47.76	49.39

CLASSIFICATIONS:

Groundman 1st Year

Effective Dates:

11/29/2015			12/04/2016
Rate	Fringe	Total	Total
47.18	31.61	78.79	81.51

CLASSIFICATIONS:

Line Equipment Foreman

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date : 11/30/2017**

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 wokday 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 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:

	12/01/2015		**11/29/2016**
Rate	Fringe	Total	Total
57.01	43.16	100.17	102.92

CLASSIFICATIONS:

General Foreman

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date : 11/30/2017**

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
50.78	39.48	90.26	93.01

CLASSIFICATIONS:

Foreman

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
48.10	37.90	86.00	88.75

CLASSIFICATIONS:

Small Job Foreman

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
44.54	35.82	80.36	83.11

CLASSIFICATIONS:

Heavy Equipment Operator

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
44.54	35.82	80.36	83.11

CLASSIFICATIONS:

Cable Splicer

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
44.54	35.82	80.36	83.11

CLASSIFICATIONS:

Journeyman Lineman

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
44.54	35.82	80.36	83.11

CLASSIFICATIONS:

Journeyman Welder

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date : 11/30/2017**

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
44.54	35.82	80.36	83.11

CLASSIFICATIONS:

Journeyman Painter

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
35.63	30.58	66.21	68.96

CLASSIFICATIONS:

Light Equipment Operator

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
31.18	27.97	59.15	61.90

CLASSIFICATIONS:

Groundman Truck Driver

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
28.95	26.65	55.60	58.35

CLASSIFICATIONS:

Groundman 3rd Year

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
26.72	25.33	52.05	54.80

CLASSIFICATIONS:

Groundman 2nd Year

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
24.50	24.04	48.54	51.29

CLASSIFICATIONS:

Groundman 1st Year

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date : 11/30/2017**

Effective Dates:

12/01/2015			11/29/2016
Rate	Fringe	Total	Total
19.60	21.16	40.76	43.51

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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
58.50	26.53	85.03	86.78	88.31	91.28

CLASSIFICATIONS:

Walking Boss & Superintendent

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
58.05	26.53	84.58	86.03	87.86	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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
57.30	26.53	83.83	85.58	87.11	90.08

CLASSIFICATIONS:

Iron Foreman, Caulking Foreman, Form Foreman, Cement Finishing Foreman, Concrete Foreman, Track Foreman, Clean-up Foreman, Grout Foreman

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
61.05	26.53	87.58	89.33	90.86	93.83

CLASSIFICATIONS:

Blaster

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
56.48	26.53	83.01	84.76	86.28	89.26

CLASSIFICATIONS:

Top Labor Foreman

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
55.95	26.53	82.48	84.23	85.76	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:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
55.73	26.53	82.26	84.01	85.53	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)

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS **Rates Expiration Date : 08/31/2017**

Effective Dates:

09/01/2015			03/01/2016	09/01/2016	03/01/2017
Rate	Fringe	Total	Total	Total	Total
54.98	26.53	81.51	83.26	84.78	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 to the Radio Room, Union County Courthouse Internal Stair (Tower)

1. Project Location: 2 Broad Street, Elizabeth, NJ

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. Interior alterations and modifications including but not necessarily limited to access flooring, fire stopping, railings, roofing, doors, gypsum board work, new flooring, ceilings and interior painting.
2. Fire Protection/Electrical: The scope of work includes replacing the existing fire suppression chemical agent system with a new gas agent system (all floor, wall, & ceiling penetrations shall be sealed to provide an airtight room that will allow pressurized gas agent to extinguish any fires in the room). Upon completion of the pressurized gas system installation, the Contractor shall have the system certified by an authorized representative of the Manufacturer and perform all required test. The Contractor shall also be responsible to connect the new pressurized gas agent system to the Building's Fire Alarm System and/or Automation System.

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 GENERAL SCHEDULE AND CONTRACTOR OPERATIONS

A. Adequate notice must be given to the **County of Union Correctional Facilities** and a "Notice to Proceed" will be issued prior to commencing any of the renovation work at the **Correctional Facilities**. A complete work schedule shall be submitted to the **Correctional Facilities** for review and approval during the pre-construction meeting.

B. The contractor shall be allowed to work under an accelerated work schedule. Contractor shall coordinate with the **Correctional Facilities** for access into the **Correctional Facilities** during off working hours.

C. The scheduling of all contractor operations shall be closely coordinated with the **County of Union** at a pre-construction meeting prior to the start of any of the contracted work.

D. The contractor's operations will use the rear Freight Elevator as instructed by the **Correctional Facilities**. The contractors are not allowed to affect the use of any portion of the **Correctional Facilities** during any hour and no type of communication will be permitted with inmates. The contractor is responsible for erecting all barricades to separate the contracted area.

E. The contractor shall provide adequate protection for all parts of the building and its occupants when any work under this contract is performed. Maintain a safe unobstructed egress path to all exits at all times. Erect temporary partitions where indicated on plans and where required to prevent dust from entering occupied office workspaces.

1.9 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 (2^{nd} & 3^{rd} shifts)

1. If shift work is required (2^{nd} & 3^{rd} shifts) by discretion of the Owner, for contract work required in a specific area in order to not disrupt employees, the Contractor will be reimbursed for the labor differential amount from the Bid Contingency amount.

D. Work During County Holidays: The contractor shall not be allowed to work on County holidays unless the following condition is met:

1. Prior written approval is granted by the **County**. It is at the sole discretion of the **County** to allow work to be conducted during any **County** holidays.

E. Contractor Tool and Gang-box Delivery: The delivery of all heavy hand tools and gang-boxes must be between the hours of 3:00pm and 5:00pm weekdays

F. 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.

G. 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.

H. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor air intakes.

I. 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.

J. 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, 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. All workers will require a picture identification to be provided by the County prior to the start of any work and access to the jail. All workers will be required to submit to a Background History Check performed by the County, prior to gaining access to the jail.
2. The County has the right to reject any and all individuals from access to the jail based on any perceived conflict from the background checks performed, which result in a documented prior criminal offense.
3. Contractor to maintain a list of approved screened personnel with Construction Manager.

K. 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 Identification Bureau located at the Administration Building at 10 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.

1.10 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 - Two Hundred & Twenty (220) Calendar Days

B. Fire Protection - On unoccupied floors, the Contractor will be able to work on the entire floor and work should be continuous until work on the floor is complete. The Contractor shall be allowed (upon approval of the Construction Manager) to work in more than one unoccupied floor if an adequate work force is provided, for both floors, and the simultaneous work in both areas does not affect the day to day operations of the facility. On occupied floors, the Contractor will be allowed to work in a portion of the floor and work in that area shall be continuous until complete with minimal disturbances to the occupants. The Contractor must supply an adequate work force, in all areas, to complete the work in the areas in the allotted time frame shown on the approved project schedule.

C. 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

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. Contingency allowances.

C. Related Sections:

1. 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 LUMP-SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include, freight, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, insurance and similar costs related to products and materials selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Construction Manager for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.

D. At Project closeout, credit unused amounts remaining in the contingency 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.

3.3 SCHEDULE OF ALLOWANCES AND BID CONTINGENCY

A. Lump Sum Allowance #1 - Security / Corrections Officer: Provide a security/corrections officer during 3rd shift, holiday and weekend work periods in the amount of Eighty Thousand Dollars ($ 80,000).

B. Bid Contingency: To be used as the owner elects, in the amount of One Hundred-Sixty Thousand Dollars ($ 160,000.00).

END OF SECTION 012100

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. Division 01 Section "Allowances" for products selected under an allowance.
2. Division 01 Section "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.

A. Substitutions for Convenience: Not allowed unless otherwise indicated.

B. 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 by 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 a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional Owner responsibilities. 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 Contract Documents producing 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.

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. Division 01 Section ”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 Division 01 Section "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 Division 01 Section "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

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.

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. Division 01 Section "Allowances" for procedural requirements governing the handling and processing of allowances.
2. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
3. Division 01 Section "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.

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 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 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: 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.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

D. 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.

E. 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.

F. 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.

G. 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.

H. 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.

I. 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.

J. 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.

K. 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. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Division 01 Section "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 Oracle's Primavera 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. Review of mockups.
i. Possible conflicts.
j. Compatibility requirements.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written instructions.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. 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. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
2. Division 01 Section "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 Division 01 Section "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 Division 01 Section "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. 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.

5. 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.

6. 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.

7. 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 Division 01 Section "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. Division 01 Section "Submittal Procedures" for submitting photographic documentation.
2. Division 01 Section "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.

1.3 PHOTOGRAPHS

A. Basis for Bids: Base number of construction photographs on average of 10 photographs per payment application 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 QUALITY ASSURANCE

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.6 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.

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. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
3. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
4. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

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 tor shall pay a fee of $500.00 to Architect prior to release of files.
    e. The following digital data files will by 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.

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 Division 01 Section "Project Management and Coordination."

G. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

H. Application for Payment and Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."

J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."

K. Maintenance Data: Comply with requirements specified in Division 01 Section "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 Division 01 Section "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.

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 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. Division 01 Section "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 Division 01 Section "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 Division 01 Section "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 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. Division 01 Section "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 with metering and payment of use charges. 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 with metering and with payment of use charges. 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. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

C. 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.

D. 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. 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.

B. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.

C. 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. General: Union County will not supply any areas for use, by the Contractor, for either on-site storage or field offices. The Contractor is responsible to obtain an off-site area that will be used for either storage of materials or field office’s for use by their employees or Subcontractors.

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. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

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 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 condition 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.

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)

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. Parking: No on-site or off- site parking will be provided. Employees of the Contractor and Subcontractors are responsible for their own parking.

C. 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.

D. 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 Division 01 Section "Execution."

E. 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.

F. 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. 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.

D. 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.

E. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

F. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

G. 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.

H. 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. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. 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 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 Division 01 Section "Closeout Procedures."

END OF SECTION 015000

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. Division 01 Section "Allowances" for products selected under an allowance.

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 Division 01 Section "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 Division 01 Section "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 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.

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 Division 01 Section "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 Division 01 Section "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: _____

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. Division 01 Section "Summary" for limits on use of Project site.
2. Division 01 Section "Submittal Procedures" for submitting surveys.
3. Division 01 Section "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. Division 01 Section "Selective Structure Demolition" for demolition and removal of selected portions of the building.
5. Division 01 Section "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 Division 01 Section "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 Division 01 Section "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 Division 01 Section "Temporary Facilities and Controls."

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 Division 01 Section "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. Division 01 Section "Photographic Documentation" for submitting final completion construction photographic documentation.
2. Division 01 Section "Execution" for progress cleaning of Project site.
3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
4. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

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.
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 Division 01 Section "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 Division 01 Section "Temporary Facilities and Controls." Prepare written report.

D. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls."

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. Division 01 Section "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. Division 01 Section "Execution" for final property survey.
2. Division 01 Section "Closeout Procedures" for general closeout procedures.
3. Division 01 Section "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 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 035416 - HYDRAULIC CEMENT UNDERLAYMENT

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. Hydraulic-cement-based underlayment for use below interior floor coverings.

B. Related Sections:

1. Division 09 Sections for patching and leveling compounds applied with floor coverings.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Plans indicating substrates, locations, and average depths of underlayment based on survey of substrate conditions.

C. Manufacturer Certificates: Signed by manufacturers of both underlayment and floor covering system certifying that products are compatible.

D. Qualification Data: For Installer.

E. Minutes of pre-installation conference.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Installer who is approved by manufacturer for application of underlayment products required for this Project.

B. Product Compatibility: Manufacturers of both underlayment and floor covering system certify in writing that products are compatible.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials to comply with manufacturer's written instructions to prevent deterioration from moisture or other detrimental effects.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature and humidity, ventilation, and other conditions affecting underlayment performance.

1. Place hydraulic-cement-based underlayments only when ambient temperature and temperature of substrates are between 50 and 80 deg. F.

1.7 COORDINATION

A. Coordinate application of underlayment with requirements of floor covering products, including adhesives, specified in Division 09 Sections, to ensure compatibility of products.

PART 2 - PRODUCTS

2.1 HYDRAULIC-CEMENT-BASED UNDERLAYMENTS

A. Underlayment: Hydraulic-cement-based, polymer-modified, self-leveling product that can be applied in minimum uniform thicknesses of 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. Ardex; K-15 Self-Leveling Underlayment Concrete.
b. Bonsal, W. R. Company; Self-Leveling Underlayment.
c. MAPEI Corporation; Ultraplan 1.

3. Cement Binder: ASTM C 150, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C 219.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.
5. Underlayment Additive: Resilient-emulsion product of underlayment manufacturer formulated for use with underlayment when applied to substrate and conditions indicated.

B. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch; or coarse sand as recommended by underlayment manufacturer.

1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.

C. Water: Potable and at a temperature of not more than 70 deg. F.

D. Reinforcement: For underlayment applied to wood substrates, provide galvanized metal lath or other corrosion-resistant reinforcement recommended in writing by underlayment manufacturer.

E. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.

F. Corrosion-Resistant Coating: Recommended in writing by underlayment manufacturer for metal substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for conditions affecting performance.

1. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Prepare and clean substrate according to manufacturer's written instructions.

1. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.
2. Fill substrate voids to prevent underlayment from leaking.

B. Concrete Substrates: Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.

1. Moisture Testing: Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates do not exceed a maximum moisture-vapor-emission rate of 3 lbs. of water per 1000 sq. ft. in 24 hours.

2. Install underlayment reinforcement recommended in writing by manufacturer.

C. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

3.3 APPLICATION

A. General: Mix and apply underlayment components according to manufacturer's written instructions.

1. Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.
2. Coordinate application of components to provide optimum underlayment-to-substrate and inter-coat adhesion.
3. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.

B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.

C. Apply underlayment to produce uniform, level surface.

1. Apply a final layer without aggregate to produce surface.
2. Feather edges to match adjacent floor elevations.

D. Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.

E. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.

F. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

3.4 PROTECTION

A. Protect underlayment from concentrated and rolling loads for remainder of construction period.

END OF SECTION 035416

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); Coro thane 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 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: AWPA 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 AWPA 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 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 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:

1. Mechanical door hardware for the following:

a. Swinging doors.

B. Products furnished, but not installed, under this Section include the products listed below. Coordinating and scheduling the purchase and delivery of these products remain requirements of this Section.

1. Pivots thresholds weather stripping and lock cylinders to be installed under other Sections.
2. Permanent lock cores to be installed by Contractor.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each exposed product and for each color and texture specified.

C. Other Action Submittals:

1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

a. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
b. Content: Include the following information:

1) Identification number, location, hand, fire rating, size, and material of each door and frame.
2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.

2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as follows:

1. For door hardware, an Architectural Hardware Consultant (AHC).

C. Source Limitations: Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

D. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.

E. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meet requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

1. Air Leakage Rate: Maximum air leakage of0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch wg of water.

F. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

G. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines ICC/ANSI A117.1.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:

a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
b. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
4. Adjust door closer sweep periods so that, from an 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 leading edge of the door.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

B. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.
   a. Exit Devices: Two years from date of Substantial Completion.
   b. Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled on Drawings to comply with requirements in this Section.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.

2.2 HINGES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Baldwin Hardware Corporation.
   b. Hager Companies.
   c. IVES Hardware; an Ingersoll-Rand company.
   d. McKinney Products Company; an ASSA ABLOY Group company.
   e. Stanley Commercial Hardware; Div. of The Stanley Works.

2.3 MECHANICAL LOCKS AND LATCHES

A. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.

2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Rabbet Front and Strike: Provide on locksets for rabbeted meeting stiles.

B. Mortise Locks: BHMA A156.13; Operational Grade 1; stamped steel case with steel or brass parts; Series 1000.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Accurate Lock & Hardware Co.
b. Adams Rite Manufacturing Co.; an ASSA ABLOY Group company.
c. Arrow USA; an ASSA ABLOY Group company.
d. Best Access Systems; Div. of Stanley Security Solutions, Inc.
e. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
f. Falcon Lock; an Ingersoll-Rand company.
g. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
h. Schlage Commercial Lock Division; an Ingersoll-Rand company.
i. Yale Security Inc.; an ASSA ABLOY Group company.

2.4 EXIT LOCKS AND EXIT ALARMS

A. Exit Locks and Alarms: BHMA A156.29, Grade 1.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Arrow USA; an ASSA ABLOY Group company.
b. Detex Corporation.
c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.

2.5 EXIT DEVICES AND AUXILIARY ITEMS

A. Exit Devices and Auxiliary Items: BHMA A156.3.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Adams Rite Manufacturing Co.; an ASSA ABLOY Group company.
b. Arrow USA; an ASSA ABLOY Group company.
c. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
d. Door Controls International, Inc.
e. DORMA Architectural Hardware; Member of The DORMA Group North America.
f. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
g. Von Duprin; an Ingersoll-Rand company.
h. Yale Security Inc.; an ASSA ABLOY Group company.

2.6 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.
1. Grand Master Key System: Change keys, a master key, and a grand master key operate cylinders.
2. Existing System:

a. Master key or grand master key locks to Owner's existing system.

3. Keyed Alike: Key all cylinders to same change key.

B. Keys: Brass.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:

a. Notation: "DO NOT DUPLICATE."

2. Quantity: In addition to one extra key blank for each lock, provide the following:

a. Cylinder Change Keys: Three.
b. Master Keys: Five.
c. Grand Master Keys: Five.
d. Great-Grand Master Keys: Five.

2.7 OPERATING TRIM

A. Operating Trim: BHMA A156.6; stainless steel, unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Burns Manufacturing Incorporated.
b. Don-Jo Mfg., Inc.
c. Forms + Surfaces.
d. Hager Companies.
e. Hiawatha, Inc.
f. IVES Hardware; an Ingersoll-Rand company.
g. Rockwood Manufacturing Company.
h. Trimco.

2.8 ACCESSORIES FOR PAIRS OF DOORS

A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release; and with internal override.

B. Carry-Open Bars: BHMA A156.3; prevent the inactive leaf from opening before the active leaf; provide polished brass or bronze carry-open bars with strike plate for inactive leaves of pairs of doors unless automatic or self-latching bolts are used.

C. Astragals: BHMA A156.22.

2.9 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated

frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Arrow USA; an ASSA ABLOY Group company.
    b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
    c. DORMA Architectural Hardware; Member of The DORMA Group North America.
    d. Dor-O-Matic; an Ingersoll-Rand company.
    e. LCN Closers; an Ingersoll-Rand company.
    f. Norton Door Controls; an ASSA ABLOY Group company.
    g. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
    h. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
    i. Yale Security Inc.; an ASSA ABLOY Group company.

2.10 CLOSER HOLDER RELEASE DEVICES

A. Closer Holder Release Devices: BHMA A156.15; Grade 1; closer connected with separate or integral releasing and fire- or smoke-detecting devices. Door shall become self-closing on interruption of signal to release device. Automatic release is activated by smoke detection system loss of power.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
    b. DORMA Architectural Hardware; Member of The DORMA Group North America.
    c. LCN Closers; an Ingersoll-Rand company.
    d. Norton Door Controls; an ASSA ABLOY Group company.
    e. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
    f. SARGENT Manufacturing Company; an ASSA ABLOY Group company.

2.11 MECHANICAL STOPS AND HOLDERS

A. Wall- and Floor-Mounted Stops: BHMA A156.16; polished cast brass, bronze, or aluminum base metal.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Architectural Builders Hardware Mfg., Inc.
    b. Baldwin Hardware Corporation.
    c. Hager Companies.
    d. Hiawatha, Inc.
    e. IVES Hardware; an Ingersoll-Rand company.
    f. Rockwood Manufacturing Company.
    g. Stanley Commercial Hardware; Div. of The Stanley Works.
    h. Trimco.

2.12 DOOR GASKETING

A. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Hager Companies.
    b. National Guard Products.
    c. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    d. Reese Enterprises, Inc.
    e. Zero International.

2.13 THRESHOLDS

A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Hager Companies.
    b. National Guard Products.
    c. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    d. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
    e. Sealeze; a unit of Jason Incorporated.
    f. Zero International.

2.14 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch- thick stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Hiawatha, Inc.
    b. IPC Door and Wall Protection Systems, Inc.; Div. of InPro Corporation.
    c. IVES Hardware; an Ingersoll-Rand company.
    d. Pawling Corporation.
    e. Rockwood Manufacturing Company.
    f. Trimco.

2.15 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
2. Fire-Rated Applications:

a. Wood or Machine Screws: For the following:

1) Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors and frames.
2) Strike plates to frames.
3) Closers to doors and frames.

b. Steel Through Bolts: For the following unless door blocking is provided:

1) Surface hinges to doors.
2) Closers to doors and frames.
3) Surface-mounted exit devices.

3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
5. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.16 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

B. Mounting Heights: Mount door hardware units at heights unless otherwise indicated or required to comply with governing regulations.

C. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

D. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

E. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches of door height greater than 90 inches.

F. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as directed by Owner.

G. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

H. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."

I. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

J. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

K. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

L. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

M. Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.2 FIELD QUALITY CONTROL

A. Independent Architectural Hardware Consultant: Owner will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

END OF SECTION 087100

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 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. Solid vinyl floor tile.

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.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.5 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.

1.6 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 For more than 90 deg F. Store floor tiles on flat surfaces.

1.7 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 SOLID VINYL FLOOR TILE

A. Basis of Design: Subject to compliance provide product by manufacturer as indicated on Finish Schedule.

B. Tile Standard: ASTM F 1700.

1. Class: As indicated by product designations.
2. Type: A, smooth surface.

C. Thickness: 0.080 inch.

D. Size, Colors and Patterns: Refer to Finish Schedule.

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.

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 floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to floor tile 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 floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:

    a. Perform anhydrous calcium chloride test according to 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 according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles 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 floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

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 square with room axis.

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 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 protecting 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 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, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.

1. Apply one coat(s).

E. Joint Sealant: Apply sealant to resilient terrazzo floor tile perimeter and around columns, at door frames, and at other joints and penetrations.

F. 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 at1000 lbf.
   b. CISCA Wheel 2: 10,000 passes at800 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 (LF1)

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. Refer to Finish Schedule for Basis of Design floor panel covering.

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 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 099600 - HIGH PERFORMANCE COATINGS

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. Polyurethane - acrylic textured coating.

B. Related Sections:

1. Division 08 Sections for factory priming doors with primers specified in this Section.
2. Division 09 Section “Interior Painting”

1.3 QUALIFICATIONS

A. Installer: A firm with a minimum of 3 years successful experience in the installation of the specified materials and which is approved by the resin matrix flooring manufacturer. Employ only tradesmen experienced with the installation of the materials specified.

1.4 SUBMITTALS

A. Manufacturer's Data: Submit manufacturer's specifications, installation instructions and other data as may be required to show compliance with the Contract Documents.

B. Samples: Submit samples of each type of high performance floor coating specified in colors as selected. Samples shall be 12 inches square on plywood and shall show the various stages of installation.

C. Maintenance Instructions: Submit manufacturer's written instructions for maintenance of each type of high performance floor coating.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's standard unopened packaging, fully identified.

B. Store materials above grade and protected from the weather, soiling or damage. Store in accordance with manufacturer's instructions.

C. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg. F.

1. Maintain containers in clean condition, free of foreign materials and residue.

2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply coatings only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 POLYURETHANE - ACRYLIC COATINGS (DP1)

A. Basis of Design Product: Subject to compliance with requirements, refer to Finish Schedule for Basis of Design product as manufacturer.

B. Manufacturer: General: Provide spray or roll-applied, water-based polyurethane / acrylic textured coating. System components include the following:

1. Primer: Manufacturer recommended primer / sealer.
2. Finish: Manufacturer' base and textured finish coats.

C. Miscellaneous Products: Provide miscellaneous products as specified and as required to fulfill the requirements of the systems to be used on the Project. Provide materials and products best suited for intended use.

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. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

C. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification 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.

C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

3.3 APPLICATION

A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

1. Use applicators and techniques suited for coating and substrate indicated.
2. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.

D. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner will engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.

1. Contractor shall touch up and restore coated surfaces damaged by testing.
2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

END OF SECTION 099600

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 212200 – CLEAN AGENT FIRE SUPPRESSION SYSTEM

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including the "General Conditions", "Special Conditions" and all other applicable requirements of the contract documents shall govern the work of this Section. Consult them in detail for applicable instructions.

1.2 SCOPE OF WORK

A. The work described in this specification consists of all labor, materials, equipment and services necessary and required to complete and test the automatic fire detection and extinguishing system. Any material not specifically mentioned in this specification or not shown on the installation drawings but required for proper performance and operation shall be furnished and installed.

B. This specification describes an automatic clean agent fire suppression and detection system. The features and capacities described in this specification are required as a minimum for this project and shall be furnished by the successful contractor. The fire suppression agent shall be 1,1,1,2,3,3,3-heptafluoropropane, also known as HFC 227ea or Siemens SINORIX.

C. The clean agent fire extinguishing system shall be an engineered system for total flooding of the hazard area. The system shall consist of a single release panel with a release zone and if smoke is detected, the clean agent shall be discharged to flood the zone requiring suppression.

D. The system shall include all required hardware, pipe and fittings, raceways and wiring, firmware, and software to accomplish the requirements of this specification and the contract drawings, whether or not specifically itemized herein. The release control panel shall able to be monitored by the building fire alarm control panel.

E. All equipment furnished shall be new and the latest state of the art products of a single manufacturer, engaged in the manufacturing and sale of analog fire detection devices for over ten years.

F. The system as specified shall be supplied, installed, tested and approved by the local authority having jurisdiction, and turned over to the owner in an operational condition. The system shall be in full compliance with national and local codes.

G. In the interest of job coordination and responsibilities the installing contractor shall contract with a single supplier for fire suppression equipment, engineering, installation, programming, and inspection and tests.

H. All systems approved shall meet all the requirements spelled out in this specification.

1.3 STANDARDS AND CODES

A. The publications listed below form a part of this publication to the extent referenced. The publications are referenced in the text by the basic designation only. The latest version of each listed publication shall be used as a guide unless the authority having jurisdiction has adopted an earlier version.

B. National Fire Protection Association (NFPA) Most Current or Approved Standard

1. NFPA 70 National Electrical Code.
2. NFPA 72 National Fire Alarm Code.

3 NFPA 2001 Standard for Clean Agent Fire Extinguishing Systems.

C. Underwriters Laboratories, Inc. (UL) Appropriate UL equipment standards.

1. UL 864 Control Panels.
2. UL 268 Smoke Detectors.
3. UL 464 Audible Signal Appliances.
4. UL 1971 Visual Signaling Appliances.
5. UL 2166 Halocarbon Clean Agent Extinguishing System Units

D. Building Codes

1. BOCA National Building Code and the BOCA Fire Code.
2. Standard Building Code and the Standard Fire Code.
3. Uniform Building Code and the Uniform Fire Code.
4. International Building Code and the International Fire Code.
5. State and local building codes as adopted and/or amended by the authority having jurisdiction.
6. Americans with Disabilities Act, and/or state and local equivalency standards as adopted by the authority having jurisdiction.

E. Other Approval: US Department of Transportation (DOT)

1.4 QUALIFICATIONS OF INSTALLERS

A. The contractor shall submit copies of all required licenses and bonds as required in the state having jurisdiction.

B. The contractor shall employ on staff a minimum of one NICET level II technician or a professional engineer, registered in the state of New Jersey. If required, contractor shall also provide the services of a factory trained and certified representative or technician, experienced in the installation and operation of the type of system provided.

C. The contractor shall have certifications from the NJDCA, Division of Fire Safety related to Certificates for Fire Alarm Systems and for Special Hazard Fire Suppression Systems.

D. The contractor shall be an authorized Siemens distributor capable of programming the base building system and county WAN NCC fire alarm network to receive the release system output signals. Distributor shall have minimum of five years experience in programming and maintaining a hybrid WAN fire alarm network with a minimum of 20 network nodes. Proof of this experience shall be submitted at time of bid. Programming of these systems shall be performed by the currently contracted county fire alarm vendor only. Call the county representative for details.

E. Contractors unable to comply with the provisions of Qualification of Installers shall present proof of engaging the services of subcontractor(s) qualified to furnish the required services.

1.5 SUBMITTAL:THE CONTRACTOR SHALL INCLUDE THE FOLLOWING INFORMATION IN THE EQUIPMENT

A. The HFC 227ea agent quantity calculations for the hazard. Calculations shall be based on empty volume of hazard, with no deduction for non-permanent contents. Calculations shall be based on a nominal hazard temperature of 70 degrees F.

B. Piping hydraulic calculations for agent storage container or group of manifolded agent storage containers. Calculations shall be performed using agent storage container manufacturer's UL Listed calculation computer program.

C. Supervisory and alarm power requirements for all equipment.

D. Power and battery capacity calculations. Battery size shall be a minimum of 125% of the calculated requirement.

E. Power supply rating justification showing power requirements for each of the system power supplies. Power supplies shall be sized to furnish the total connected load in a worst-case condition plus 25% spare capacity.

F. Voltage drop calculations for wiring runs demonstrating worst-case condition.

G. NAC circuit design incorporating a 15% spare capacity for future expansion.

H. Complete manufacturers catalog data including physical dimensions and finish and mounting requirements along with maintenance data for system components as part of the maintenance manuals.

I. Complete drawings covering the following shall be submitted by the contractor for the proposed system.

1. Piping layouts, including plan, elevation, and isometric views. All changes in direction, tees, and calculation node points shall be clearly identified. Agent storage container location and nozzle placement shall be clearly dimensioned.
2. Floor plans showing all equipment and raceways, marked for size, conductor count with type and size, showing the percentage of allowable National Electric Code fill used.
3. A riser wiring diagram of the power, detection and control portion of the system.
4. A complete sequence of operation of the entire system, including all output functions at each level of alarm, supervisory, and trouble inputs.
5. Drawings shall indicate all required field verified dimensions, weights, loads, required clearances, method of field assembly, components with locations and size of each field connection.

J. Installation, shop, and as-built drawings shall be prepared by an individual experienced with the work specified herein. Field quality-control test reports shall also be included.

K. Incomplete submittals shall be returned without review, unless with prior approval of the Engineer.

1.6 SYSTEM REQUIREMENTS

A. HFC 227ea Suppression System

1. Agent Concentration. The nominal agent concentration shall be 6.25% v/v. The minimum agent concentration shall be 6.25% v/v.
2. Agent Quantity. The agent quantity shall be calculated based on the nominal agent concentration at a hazard temperature of 70 degrees F. An additional 5% by weight of agent shall be provided, over and above the quantity needed to achieve the nominal agent concentration.
3. Discharge Time. The nominal agent discharge time shall be a maximum of 10 seconds and maintain required concentration at 70 degrees F for 10 minute holding time in hazard areas.

B. Detection, Notification, and Control. The system shall be a complete, electrically supervised, microprocessor-based fire detection and notification system, having the following; capabilities, features and capacities:

1. 250 total addressable input devices.
2. Removable terminal blocks for all field connections.
3. 4 notification circuits capable of Style Z (Class A) or Style Y (Class B) operation.
4. LCD display capable of 80 characters and system status.
5. Capable of being programmed from system keypad or external laptop computer.
6. Optional relays or LED drivers for graphic annunciation.

C. Approvals. The system shall be UL Listed as an approved HFC 227ea clean agent fire suppression system. The fire suppression system and the detection and control system shall be compatibility listed by UL for use with each other.

D. Response Time. The system response time from alarm to output shall not exceed four (4) seconds.

1.7 SYSTEM SEQUENCE OF OPERATIONS

A. Operation of one smoke detector shall:

1. Signal pre-alarm at the control panel, illuminating a pre-alarm LED.
2. Activate audible pre-alarm bell device.
3. Activate contact(s) for damper closure, if applicable.
4. Activate intelligent wide area network notification.

B. Operation of a second smoke detector shall:

1. Signal pre-discharge at the control panel, illuminating a pre-discharge LED.
2. Activate audible and visual devices in pulsed mode.
3. Begin preset countdown time delay to agent discharge for a minimum 30 to a maximum 45 seconds, and discharge extinguishing agent. Extinguishing-agent discharge will operate audible alarms and discharge lamps inside and outside the protected area in a steady mode.

C. Expiration of the preset time delay shall:

1. Discharge fire suppression agent.
2. Activate equipment shutdown contact(s), if applicable.

D. Operation of an abort station shall restore the preset time delay to its full time (30 seconds). The countdown will not restart until the abort station button is released. Release of hand pressure on the switch will cause agent discharge if the time delay has expired.

F. Operation of a manual pull station shall:

1. Signal alarm at the control panel.
2. Activate audible devices in steady mode.
3. Activate contact(s) for damper closure, if applicable.
4. Activate intelligent wide area network notification.
5. Discharge fire suppression agent.
6. Activate equipment shutdown contact(s), if applicable.
7. The above will occur even if an abort station is activated.

1.8 QUALITY ASSURANCE

A. 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 clean-agent extinguishing systems that are similar to those indicated for this Project in material, design, and extent.

B. This system shall be designed, installed and tested in accordance with the specifications and the following the latest national codes and standards.

a. National Electrical Code (NEC), Article 760.
b. NFPA Standard No. 72, the National Fire Alarm Code.

c. NFPA Standard No. 2001, Clean Agent Fire Extinguishing Systems.

C. The system including all components shall be listed by Underwriters Laboratories, Inc. or, approved by the Factory Mutual System for use in automatic fire detection and clean-agent fire extinguishing systems.

D. Handicapped accessibility standard:
Provide work conforming to Americans with Disabilities Act (ADA) Accessibility Guideline (ASAAG).

E. Product Options: Drawings indicate size, profiles, and dimensional requirements of clean-agent extinguishing systems.

F. 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.

1.9 EXTRA MATERAIL

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. Deliver extra materials to Owner.

1.10 Detection Devices: Not less than 2 of each type installed.

PART 2 – PRODUCTS

2.1 AGENT

A. The fire suppression agent shall be 1,1,1,2,3,3,3-heptafluoropropane, also known as HFC 227ea. No other suppression agent shall be considered for this application. The manufacturer shall have a regional bulk fill service agency within twenty (20) miles of the project site for emergency refill of cylinders within a 24 hour time frame.

2.2 AGENT TRORAGE CONTAINERS

A. Cylinder(s). The HFC 227ea agent shall be stored in cylindrical agent storage container(s). The containers shall be manufactured, tested, and marked in accordance with U. S. D. O. T. specification 4BA or 4BW. The container(s) shall be super-pressurized with dry nitrogen to a pressure of 360 PSIG (24.8 bar) at 70 degrees F (21 degrees C). The container shall be capable of being filled in one-pound increments of HFC 227ea. Containers designed for agent storage capacity of 250 lbs. or more shall be equipped with integral lifting lugs. Containers designed for agent storage capacity of greater than 560 lbs, up to 1,200 lbs., shall be equipped with an integral metal pallet, allowing ease of movement with a standard pallet jack. Containers shall be designed to pass through standard doorways and elevators, without the removal of door hardware. Containers shall be finished with manufacturer's standard color, enamel or epoxy paint.

B. Valve(s). HFC 227ea agent storage shall be discharged using a pressure differential valve. Valve(s) shall be brass suitable for its intended operation and actuated by electrical means using an electric solenoid. Expendable electro-explosive devices, also known as "gas generators" or "squibs," shall not be permitted. Each valve shall be equipped with a pressure gauge, allowing visual monitoring of container pressure. The HFC 227ea discharge shall be activated by an output directly from the control panel. Container valves shall be provided with an anti-recoil fitting for the valve discharge outlet to prevent rocketing or spinning of the container in the event of inadvertent discharge with the container not connected to system piping.

C. Bracket(s). Agent storage container(s) shall be secured to the structure by bracket(s) as provided by the system manufacturer. Brackets shall consist of steel straps and channels suitable for mounting; suitable for container support, maintenance and tank refilling or replacement.

D. Low Pressure Indicator(s). A low-pressure switch shall be provided as standard equipment on all containers. A decrease in pressure shall cause a trouble condition at the control panel.

E. Liquid Level Measurement Device. A factory-installed liquid level measurement device shall be provided on all agent storage containers of 150 pounds capacity or greater. This device shall provide a reliable means other than physical weighing for determining the agent weight within the storage container during normal routine inspection.

2.3 AGENT DISCHARGE NOZZLES

A. The discharge nozzles shall be aluminum and shall be of the type specified in the system's UL Listing.

B. The nozzles shall be permanently marked with the manufacturer's identifying part number. All system layout drawings shall clearly show the proper nozzle part number, allowing easy verification of proper nozzle installation.

C. The nozzles shall have a standard female pipe thread for attachment to the discharge piping. Nozzles shall be spaced in accordance with the instructions in the installation manual and as required by the UL listing and FM approved.

2.4 PIPING MATERIAL

A. Refer to Part 3 piping applications Article retained for applications of pipe, tube, fitting, and joining materials.

B. Piping, Valves, and Discharge Nozzles: Comply with types and standards listed in NFPA 2001, Section "Distribution," for charging pressure of system.

2.5 PIPING AND FITTINGS

A. Steel Pipe: ASTM A 53/A 53M, Type S, Grade B or ASTM A 106, Grade B; Schedule 40, or Schedule 80, seamless steel pipe.

1. Threaded Fittings:

a. Malleable-Iron Fittings: ASME B16.3, Class 300.
b. Flanges and Flanged Fittings: ASME B16.5, Class 300, unless Class 600 is indicated.
c. Grooved-End Fittings: FMG approved and NRTL listed, ASTM A 47/A 47M malleable iron or ASTM A 536 ductile iron, with dimensions matching steel pipe and ends factory grooved according to AWWA C606.
d. All fittings used shall be 300 pound or 600 pound class in accordance with NFPA Standard 2001.

B. 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.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel.

D. Steel, Keyed Couplings: UL 213, AWWA C606, approved or listed for clean-agent service, and matching steel-pipe dimensions. Include ASTM A 536, ductile-iron housing, rubber gasket, and steel bolts and nuts.

2.6 SYSTEM CONTROL PANEL PROVICE THE FOLLOWING

A. Enclosure. The system enclosure shall be sized to carry all the modules required to meet the specification requirements. System shall be Siemens FC-922.

B. Power Supply. The power supply shall be capable of six (6.5) amps. A maximum of 1.5 amps shall be available for each of the NAC circuits. The power supply/battery charger shall support up to 38AH battery sets. Panel shall provide automatic switchover to standby power at loss of primary power.

C. Initiating Circuit:

1. Up to two hundred fifty two (252) addressable initiating devices.
2. Day/night detector sensitivity mode.

D. Indicating Circuits. Four (4) NAC circuits in either Style Y or Style Z wiring configuration.

E. Programming:

1. Fully field programmable from the local display or by a PC configuration tool, with Windows-based software for ease of configuration.
2. Auto configuration, allowing initiating devices to be supervised and send alarm signals to the control panel.
3. Capable of being programmed for cross-zone initiating device operation.

F. Display. Backlit LCD display with full system control and up to 80 characters available for custom message on display.

G. Testing:

1. Walk test by a single individual in either a silent or audible mode.
2. Maintenance and Technician access levels with password protection.

H. Interfacing:

1. Provide relays/modules for connection to building main fire alarm System. Modify building system program to accept inputs and interface with WAN NCC network.
2. A history log with a minimum of 500 stored events shall be provided.
3. An interface for a printer or computer shall be provided to allow for down loading of the history log or system configuration download/upload.

I. Standby Power:

1. Lead-acid or nickel-cadmium batteries with capacity to operate system for 24 hours and alarm for minimum of 15 minutes. Include automatic battery charger, with varying charging rate between trickle and high depending on battery voltage that is capable of maintaining batteries fully charged.

2.7 INTELLIGENT INITIATING DEVICES

A. Smoke Detectors

1. The smoke detector shall use the photoelectric light scattering principle with a supervised light source and receiver. The detector shall have a high degree of immunity to RFI, EMI and humidity. The detector shall have a microprocessor and EEPROM supporting the detector's programming, error checking, and self-diagnostic capabilities. The detector shall be able to report itself when in trouble to the control panel. The smoke detector shall have a cleanable smoke chamber, and be dust resistant. Provide Siemens model OP921 or approved equal.
2. Detector bases shall be low profile twist lock type with screw clamp terminals and self-wiping contacts. Bases shall be installed on an industry standard, 4" square or octagonal electrical outlet box. Bases shall be supplied with the following features as required for performance to this specification. Provide the appropriate bases as required for design operation.

    a. Siemens standard detector base model DB-11 or approved equal.
    b. Detector relay base with software programmed addressable relay integral to the base. Siemens detector relay base model DB-X11RS or approved equal.

B. Manual Release Stations. The manual release stations shall be dual-action stations specifically designed for use with fire suppression systems. Ordinary fire alarm stations with extra labeling shall not be acceptable. Manual stations shall interface with the control panel's intelligent initiating device circuit through a contact interface device, wired in the backbox behind the manual station. Provide manual station Siemens MH-501 or approved equal and contact monitoring device Siemens HTRI-M or approved equal. Labeling shall consist of "MANUAL RELEASE" caption, and red finish. Unit can manually discharge extinguishing agent with operating device that remains engaged until unlocked.

C. Abort Stations. The abort stations shall provide for aborting the system sequence of operation prior to agent discharge, in accordance with the sequence defined in this specification. The station shall be of the deadman type, requiring continuous operation for continuation of the abort status. Abort stations shall interface with the control panel's intelligent initiating device circuit through a contact interface device, wired in the backbox behind the abort station. Provide abort station Siemens AW-1 or approved equal and contact monitoring device Siemens HTRI-M or approved equal. Labeling shall consist of "ABORT" caption, momentary contact, with green finish.

D. Device Programming Unit. The initiating devices addresses shall be programmed electronically. The device programming unit shall enter the device address and then be capable of testing the device with that address. Use Siemens programming unit model DPU or approved equal.

2.8 NOTIFICATION APPLIANCES:

A. Audible Devices. The horn/strobe appliances as indicated on the drawings shall have a synchronized temporal horn to meet the intended application. The appliance shall be red as indicated on the drawings. Ceiling mounted appliances shall be rated for that application. Provide model AMT-24MCW-FR with MT-SUR-BOX back box or approved equal.

B. Signs and Labeling. All notification appliances shall have engraved red signs with white lettering affixed next to the device indicating the function of the device. Wording for such signs shall be approved by the Engineer prior to installation.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Perform work in accordance with the requirements of NFPA 70, NFPA 72, and NFPA 2001.

B. Fasten equipment to structural members of building or metal supports attached to structure, or to concrete

surfaces.

C. All wiring shall be installed in EMT conduit.

D. If agent storage container(s) are to be installed on raised floors, and the gross weight of the container(s) exceeds the load rating of the raised floor, a suitable angle iron stand to support the agent storage container weight shall be provided and installed.

E. Provide tie down clips at acoustical ceiling tiles in areas adjacent to discharge nozzles.

F. Ensure that all penetrations which are existing or as part of work scope within the room have been properly sealed.

3.2 AGENT DISCHARGE PIPING

A. Drawings indicate general arrangement of piping, fittings and specialties. Install piping adjacent to extinguishing agent containers to allow for service and maintenance.

B. Piping for the dry agent system shall meet the requirements of NFPA 2001 for Clean Agent Extinguishing Systems. The thickness of the pipe shall be calculated in accordance with ANSI B31.1, Power Piping Code. The Fire Suppression Systems Association (FSSA) Pipe Design Handbook for Special Hazard Fire Suppression Systems, Second Edition, shall be used for determining the acceptability of all pipe, fittings, and proposed pipe securing methods.

C. Ferrous pipe conforming to ASTM A-53 or A-106 shall be used. Galvanized pipe shall be used in areas where corrosion could be a concern. Otherwise, black pipe is acceptable.

D. Pipe fittings shall be minimum 300 pound class malleable iron or forged steel. Threaded pipe and fittings are acceptable for all pipe sizes 2 inch and smaller, and where mating to manufacturer-supplied devices that have pipe threads. Cut-groove fittings shall be used on all pipe larger than 2 inch. Where pipe is galvanized, fittings shall be painted or galvanized.

E. Where applicable, all pipe threads shall be NPT. All threads shall be cut or machined. Threads cast or forged on fittings shall not be acceptable. Pipe plugs shall not be acceptable. If necessary to block a fitting port, a nipple and pipe cap shall be used.

F. Where applicable, grooves shall be cut, not rolled, into pipe. Grooves shall conform to the fitting manufacturer's specification.

G. All pipe ends shall be thoroughly reamed to remove burrs. After cutting and reaming, all chips shall be removed. All pipe ends shall be thoroughly reamed after cutting, and all oil and chips shall be removed. Dry air or nitrogen shall be blown through the piping to remove chips or other debris prior to installation of the nozzles. Pipe cutting oil shall be removed with appropriate solvents.

H. All pipe shall be securely fastened per the Fire Suppression Systems Association (FSSA) Pipe Design Handbook for Special Hazard Fire Suppression Systems, Second Edition.

I. Fire suppression piping and containers shall be capable of withstanding the effects of earthquake motions determined based on local seismic codes.

3.3 BOXES, ENCLOSURES, AND WIRING DEVICES

A. Boxes shall be installed plumb and firmly in position.

B. Extension rings with blank covers shall be installed on junction boxes where required.

C. Junction boxes served by concealed conduit shall be flush mounted.

D. Upon initial installation, all wiring outlets, junction, pull and outlet boxes shall have dust covers installed. Dust covers shall not be removed until wiring installation when permanent dust covers or devices are installed.

3.4 CONDUCTORS

A. Connect electrical devices to control panel and to building fire alarm system. Electrical power, wiring, and device types are specified on the drawings.

B. No wiring other than that directly associated with fire alarm detection alarm or auxiliary fire protection functions shall be permitted in fire alarm conduits. All fire alarm conductors shall run continuous from point to point (no splices). Transposing or changing color-coding of wires shall not be permitted. Wire nut-type connections are not acceptable.

C. Each conductor shall be identified as shown on the drawings with wire markers at terminal points. Attach permanent wire markers within 2 inches of wire termination. Marker legends shall be visible.

D. All wiring shall be supplied and installed in compliance with the requirements of the National Electric Code, NFPA 70, Article 760, and that of the manufacturer.

E. Wiring for notification appliance circuits shall be a minimum 14 AWG. Wiring for signaling line circuits shall be a minimum 18 AWG.

F. All splices shall be made using solderless connectors. All connectors shall be installed in conformance with manufacturer recommendations.

G. Crimp-on type spade lugs shall be used for terminations of stranded conductors to binder screw or stud type terminals. Spade lugs shall have upset legs and insulation sleeves sized for the conductors.

H. A consistent color code shall be used for conductors throughout the installation. The installation contractor shall submit for approval, prior to installation of wire, a proposed color code for system conductors to allow rapid identification of circuit types.

3.5 LABELING

A. Install labeling on piping, extinguishing-agent containers, other equipment, and panels according to NFPA 2001 and as previously indicated in Part 2.

B. All conductors in conduit containing more than one wire shall be labeled on each end with “E-Z markers” or equivalent.

C. Install signs at entry doors for protected areas to warn occupants that they are entering a room protected with a clean-agent fire extinguishing system.

D. Install engraved red signs with white lettering at entry doors to advise persons outside the room the meaning of the horns, bells, and strobe lights outside the protected space. Coordinate with Owner on specific mounting locations.

3.6 FIELD QUALITY CONTROL

A. Mechanical Installation

1. All pipe is to be reamed after cutting to remove burrs.
2. All pipe is to be cleaned prior to installation using non-toxic solvent to remove cutting oil.
3. All pipe is to be internally visually examined for obstructions (rags, mill scale, etc.) prior to installation.

B. Electrical Installation

1. All alarm initiating devices shall be observed and logged for correct zone and sensitivity. These devices and their bases shall be tagged with adhesive tags located in an area not visible when installed, showing the initials of the installing technician and date.
2. Wiring runs shall be tested for continuity, short circuits and grounds before system is energized. Resistance, current and voltage readings shall be made as work progresses.
3. The acceptance inspector shall be notified before the start of the required tests. All items found at variance with the drawings or this specification during testing or inspection by the acceptance inspector shall be corrected.
4. Test reports shall be delivered to the acceptance inspector as completed.
5. The installing contractor shall provide all instruments, tools and labor required to conduct the system tests. The following equipment shall be a minimum for conducting the tests:

    a. Ladders and scaffolds as required accessing all installed equipment.
    b. Multi-meter for reading voltage, current and resistance.
    c. Two way radios and flashlights.

3.7 ACCEPTANCE TESTING

A. Mechanical Installation

1. Pipe Flow Test. A pipe flow test shall be conducted in accordance with the requirements of NFPA 2001, 2004 edition, as follows:

    a. All nozzles shall be removed from the piping.
    b. “Telltales” shall be placed at each location where a nozzle has been removed, to indicate that pressure has in fact exited the pipe at that location.
    c. The piping shall be disconnected from the agent storage container(s). All agent storage container(s) shall have anti-recoil caps or plugs installed on the discharge outlet until reconnected to the system piping.
    d. A source of gas pressure, not exceeding 50 PSIG, shall be introduced into the pipe, and all “telltales” observed for gas pressure exit. Under no circumstances shall oxygen or carbon dioxide be used as the gas pressure source. Nitrogen or compressed air are the preferred sources.
    e. The test shall be considered successful if all “telltales” are dislodged from their locations.

B. Electrical Installation:

1. A written acceptance test procedure (ATP) for testing the fire detection and control components and installation shall be prepared by the engineer in accordance with NFPA 72 and this specification. The contractor shall be responsible for the performance of the ATP, demonstrating the function of the system and verifying the correct operation of all system components, circuits, and programming.
2. A program matrix shall be prepared by the installing contractor referencing each alarm input to every output function affected as a result of an alarm condition on that input.
3. Prior to the acceptance test, the installing contractor shall prepare a complete listing of all

device labels.

4. The acceptance inspector shall use the system record drawings in combination with the documents specified in this specification during the testing procedure to verify operation as programmed. In conducting the acceptance test, the acceptance inspector shall request demonstration of any or all input and output functions. The items tested shall include but not be limited to the following:

   a. System wiring shall be tested to demonstrate correct system response and correct subsequent system operation in the event of:
      1. Open, shorted and grounded signal line circuits.
      2. Open, shorted and grounded notification and releasing circuits.
      3. Primary power or battery disconnected.
   b. System notification appliances shall be tested for actuation as programmed.
   c. System indications shall be tested as follows:
      1. Correct message display for each alarm input at the control display.
      2. Correct history logging for all system activity.
   d. System reporting functions shall be tested as follows:
      1. Correct zone transmitted for each alarm input.
      2. Trouble signals received for disconnect.
      3. Signals received at main building panel, and at county WAN NCC fire alarm network computers and all network nodes.

C. Enclosure Integrity. An enclosure integrity test shall be conducted in accordance with the requirements of NFPA 2001, 2004 edition. The test procedure to be followed is that in Annex C of NFPA 2001.

D. Correct malfunctioning equipment then retest to demonstrate compliance. Replace equipment that cannot be corrected or does not perform as specified and indicated, then retest to demonstrate compliance. Repeat procedure until satisfactory results are obtained.

E. Network. Bring system online to County NCC network after satisfactory acceptance testing and demonstrate that system is responding to the network.

3.10 SYSTEM FILLING

A. Verify that piping system installation is completed and cleaned. Check for complete enclosure integrity and operation of ventilation system.

B. Fill extinguishing-agent containers with extinguishing agent and pressurize to indicated charging pressure. Install filled extinguishing-agent containers, energize circuits and adjust operating controls.

3.11 DOCUMENTATION: SYSTEM DOCUMENTATION SHALL BE FURNISHED TO THE OWNER AND SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:

A. System record drawings with piping and wiring details including one set of reproducible masters and drawings on a CD ROM in a DXF format suitable for use in a CAD drafting program.

B. Four (4) sets of system operation, installation and maintenance manuals.

C. System matrix showing interaction of all input signals with output commands.

D. Documentation of system voltage, current and resistance readings taken during the installation and testing phases of the system installation.

E. System program showing system functions, controls and labeling of equipment and devices.

3.12 DEMONSTRATION AND TRAINING

A. The contractor shall notify the Owner 10 days prior to the scheduling of the required acceptance test. The Owner may request that factory mutual and/or the Owner's risk management officer witness the acceptance test. The Contractor shall request that the local fire authority send a representative to witness the test.

B. As a minimum each component of the system shall be tested, in accordance with NFPA standards and a "system certification report", issued to the Owner.

C. All automatic detectors shall be functionally tested and their sensitivity verified per manufacturer's requirements.

D. Conduct a complete "door fan" test in accordance with NFPA standards to verify the "air tightness", of the protected space. Failure of the protected space to maintain proper air density shall be immediately brought to the attention of the Owner. Any construction elements such as conduit, piping, etc. causing a failure of the required "door fan" test, shall be repaired by the Contractor.

E. The Contractor shall provide two (1) 1-hour training session with the Owner's designated staff. Training shall describe in detail system operation, preventative maintenance procedures and system diagnostics.

3.13 CLEAN UP

A. Contractor to properly clean area of all dust, debris and dirt caused by selective work. Clean area using material and equipment conducive to a dust free environment.

3.14 WARRANTY

A. The contractor shall warrant the entire system against mechanical and electrical defects for a period of one (1) year as described in the contract general conditions. This period, shall begin upon completed certification and test of the system or upon first beneficial use of the system, determined by the Engineer, whichever is earlier. The warranty shall include parts, labor, prompt field service, pick-up and delivery.

END OF SECTION 212200

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 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 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"irestopping 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 intervolves.

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 or exposed, round and flat-oval, supply-air duct insulation shall be the following:

1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.

B. Concealed or exposed, round and flat-oval, return-air duct insulation shall be the following:

1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.

C. Concealed or exposed rectangular, supply-air duct insulation shall be the following:

1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.

D. Concealed or exposed, rectangular, return-air duct insulation shall be the following:

1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.

E. Concealed or exposed, outdoor-air plenum insulation shall be the following:

1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-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.
2. Heating hot-water piping, indoors.

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 12 and Smaller: Insulation shall be the following:

a. Mineral-Fiber, Preformed Pipe, Type I: 2 inches thick.

B. Chilled-Water Supply and Return:

1. NPS 12 and Smaller: Insulation shall be the following:

a. Mineral-Fiber, Preformed Pipe, Type I: 2 inches thick.

C. Condensate and Equipment Drain Water below 60 Deg F:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 1-1/2 inches thick.
b. Flexible Elastomeric: 3/4 inch 1 inch thick.
c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1/2 inch.

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.

END OF SECTION 230719

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.

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: 125 psig at 200 deg F.
3. Condensate-Drain Piping: 150 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 bonze 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 ½.
5. Discharge Connection: NPS ¼
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. Chilled-water piping, aboveground, NPS 2 and smaller, shall be any of the following:

1. Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.

2. Schedule 40 steel pipe; Class 125, cast-iron fittings; cast-iron flanges and flange fittings; and threaded joints.

C. Chilled-water piping, aboveground, NPS 2-1/2 and larger, shall be any of 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.
2. Schedule 40 steel pipe; grooved, mechanical joint coupling and fittings; and grooved, mechanical joints.

D. Condensate-Drain Piping: Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.

E. 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 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 1-1/2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
4. NPS 2: Maximum span, 8 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 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. 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.

E. 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.

F. 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 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.
2. Section 271500 "Communications Horizontal Cabling" for cabling used for voice and

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 Crawlspaces: Type THHN-2-THWN-2, single conductors in raceway.

C. Exposed Branch Circuits, Including in Crawlspaces: 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.

F. 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.

B. 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.
9. X-Ray Equipment Circuits: Install insulated equipment grounding conductor in circuits supplying x-ray equipment.

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.

B. Related Sections include the following:

1. Section 260548 "Vibration and Seismic Controls for Electrical Systems" for products and installation requirements necessary for compliance with seismic criteria.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. IMC: Intermediate metal conduit.

C. 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, IMC, 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.

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.

C. IMC: Intermediate metal 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 IMC, 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 nless 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 inchesof enclosures to which attached.

I. Stub-ups to Above Recessed Ceilings:

1. Use EMT, IMC, 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-inchradius 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 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 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 andOwner'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 264113 – LIGHTNING POTECTION FOR STRUCTURES

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 lightning protection for structures.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For air terminals and mounting accessories.

1. Layout of the lightning protection system, along with details of the components to be used in the installation.
2. Include indications for use of raceway, data on how concealment requirements will be met, and calculations required by NFPA 780 for bonding of grounded and isolated metal bodies.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer and manufacturer. Include data on listing or certification by UL.

B. Certification, signed by Contractor, that roof adhesive is approved by manufacturer of roofing material.

C. Field quality-control reports.

D. Comply with recommendations in NFPA 780, Annex D, "Inspection and Maintenance of Lightning Protection Systems," for maintenance of the lightning protection system.

E. Other Informational Submittals: Plans showing dimensioned as-built locations of grounding features, including the following:

1. Ground rods.
2. Ground loop conductor.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Certified by UL, trained and approved for installation of units required for this Project.

B. System Certificate:

1. UL Master Label.
2. LPI System Certificate.
3. UL Master Label Recertification.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 780, "Definitions" Article.

1.6 COORDINATION

A. Coordinate installation of lightning protection with installation of other building systems and components, including electrical wiring, supporting structures and building materials, metal bodies requiring bonding to lightning protection components, and building finishes.

B. Coordinate installation of air terminals attached to roof systems with roofing manufacturer and Installer.

C. Flashings of through-roof assemblies shall comply with roofing manufacturers' specifications.

PART 2 - PRODUCTS

2.1 LIGHTNING PROTECTION SYSTEM COMPONENTS

A. Comply with UL 96 and NFPA 780.

B. Roof-Mounted Air Terminals: NFPA 780, Class I, aluminum unless otherwise indicated.

1. Air Terminals More than 24 Inches Long: With brace attached to the terminal at not less than half the height of the terminal.
2. Single-Membrane, Roof-Mounted Air Terminals: Designed specifically for single-membrane roof system materials. Comply with requirements in roofing Sections.

C. Main and Bonding Conductors: Copper.

D. Ground Loop Conductor: The same size and type as the main conductor except tinned.

E. Ground Rods: Copper-clad steel; 3/4 inch in diameter by 10 feet long.

F. Heavy-Duty, Stack-Mounted, Lightning Protection Components: Solid copper.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install lightning protection components and systems according to UL 96A and NFPA 780.

B. Install conductors with direct paths from air terminals to ground connections. Avoid sharp bends.

C. Conceal the following conductors:

1. System conductors.
2. Down conductors.
3. Interior conductors.
4. Conductors within normal view of exterior locations at grade within 200 feet of building.

D. Cable Connections: Use crimped or bolted connections for all conductor splices and connections between conductors and other components. Use exothermic-welded connections in underground portions of the system.

E. Cable Connections: Use exothermic-welded connections for all conductor splices and connections between conductors and other components.

1. Exception: In single-ply membrane roofing, exothermic-welded connections may be used only below the roof level.

F. Air Terminals on Single-Ply Membrane Roofing: Comply with roofing membrane and adhesive manufacturer's written instructions.

G. Bond extremities of vertical metal bodies exceeding 60 feet in length to lightning protection components.

H. Bond lightning protection components with intermediate-level interconnection loop conductors to grounded metal bodies of building at 60-foot intervals.

3.2 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."

3.3 CORROSION PROTECTION

A. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture unless moisture is permanently excluded from junction of such materials.

B. Use conductors with protective coatings where conditions cause deterioration or corrosion of conductors.

3.4 FIELD QUALITY CONTROL

A. Notify Architect at least 48 hours in advance of inspection before concealing lightning protection components.

B. UL Inspection: Meet requirements to obtain a UL Master Label for system.

END OF SECTION 264113

UNION COUNTY COURTHOUSE

RADIO ROOM (TOWER)

2 BROAD STREET, ELIZABETHTOWN PLAZA
ELIZABETH, NJ 07202

NETTAARCHITECTS
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

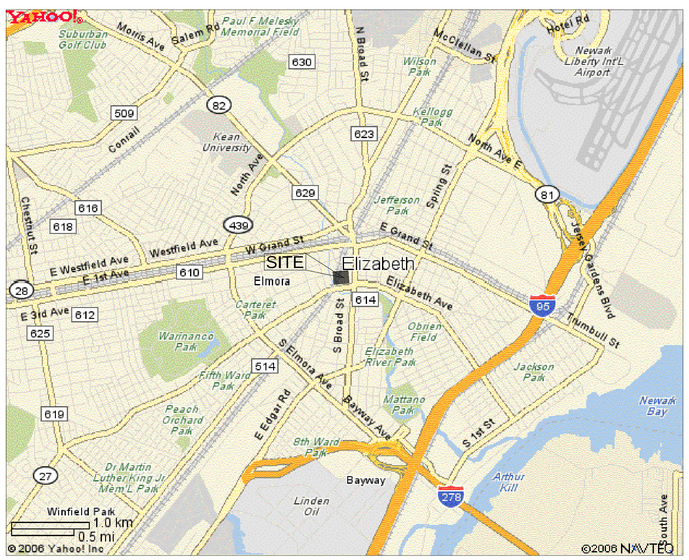
ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2860 FAX: 973-286-2864
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHOIZATION 24GA28094400

ISSUED FOR BID
February 19, 2016

DRAWING INDEX

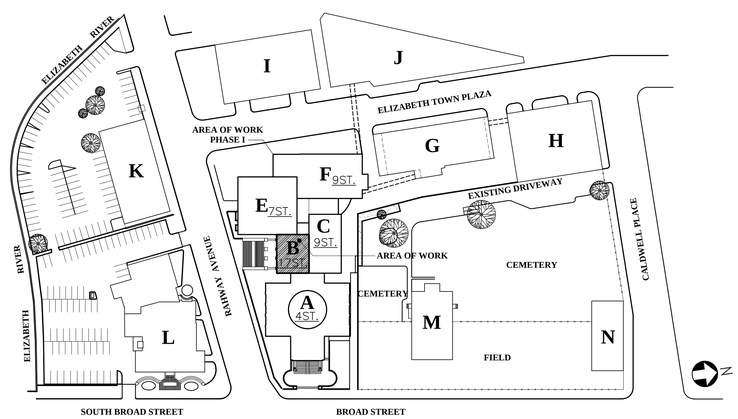
ARCHITECTURAL	
A.000	COVER SHEET
A.001	GENERAL NOTES, ABBREVIATIONS, SYMBOLS & CODES
A.002	SIXTEENTH FLOOR EGRESS PLAN
D.101	SIXTEENTH & SEVENTEENTH FLOOR DEMOLITION PLAN
A.101	SIXTEENTH FLOOR LAYOUT PLAN
A.102	SEVENTEENTH FLOOR LAYOUT PLAN
A.201	PARTIAL BUILDING SECTION & DETAILS
A.301	PARTITION, DOOR TYPES & MISC. DETAILS
A.601	SIXTEENTH FLOOR REFLECTED CEILING PLAN
A.701	SIXTEENTH FLOOR FINISH PLAN
A.901	SIXTEENTH & SEVENTEENTH FLOOR EQUIPMENT LAYOUT PLAN
MECHANICAL	
M.101	MECHANICAL GENERAL NOTES SYMBOLS & ABBREVIATIONS
M.201	MECHANICAL SCHEDULES
DM.401	MECHANICAL–DEMOLITION 16TH FLOOR
M.401	MECHANICAL–HVAC PLAN 16TH FLOOR
M.501	MECHANICAL–PIPING PLAN 16TH FLOOR
M.701	MECHANICAL CONTROL DIAGRAM
M.801	MECHANICAL DETAILS (SHEET 1)
ELECTRICAL	
E.101	ELECTRICAL GENERAL NOTES & ABBREVIATIONS
E.102	ELECTRICAL SYMBOLS AND LEGENDS
E.201	ELECTRICAL ONE LINE DIAGRAMS
E.201.1	ELECTRICAL ONE LINE DIAGRAMS
E.202	ELECTRICAL PANEL SCHEDULES
E.203	ELECTRICAL LIGHTING SCHEDULES
DE.301	ELECTRICAL–DEMOLITION 16TH FLOOR
E.301	ELECTRICAL POWER PLAN 16TH FLOOR
E.301.1	ELECTRICAL M & P POWER PLAN 16TH FLOOR
E.302	ELECTRICAL BASEMENT THRU FIFTH FLOOR PART PLANS
E.303	ELECTRICAL SIXTH THRU TENTH FLR PART PLANS
E.304	ELECTRICAL ELEVENTH THRU SIXTEENTH FLR PART PLANS
E.401	ELECTRICAL LIGHTING PLAN – 16TH FLOOR
E.501	ELECTRICAL FIRE ALARM PLAN – 16TH FLOOR
E.601	ELECTRICAL FIRE ALARM RISER DIAGRAM
E.801	ELECTRICAL DETAILS
E.802	ELECTRICAL DETAILS
FIRE PROTECTION	
FP.101	FIRE PROTECTION GEN. NOTES, SYMBOLS, ABBREV. & DETAILS
FP.301	FIRE PROTECTION PIPING PLAN 16TH FLOOR

LOCATION MAP



NORTH

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.

GENERAL NOTES

1. 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.
2. 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.
3. 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.
4. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSING OF ALL DEBRIS, DISCARDED 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.
5. THE GENERAL CONTRACTOR SHALL NOT PERMIT THE OVER LOADING OF THE EXISTING STRUCTURE WITH DEBRIS FROM THE DEMOLITION AND NEW CONSTRUCTION MATERIALS.
6. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR A MINIMUM OF TWICE DAILY REMOVAL OF ALL DEMOLITION DEBRIS & A A DAILY GENERAL BROOM CLEANING.
7. DURING CONSTRUCTION/DEMOLITION, THE GENERAL CONTRACTOR SHALL PROVIDE THE NECESSARY BARRIERS TO MINIMIZE DUST, PROTECT THE PUBLIC AND MINIMIZE DAMAGE TO OTHER SURFACES OR ITEMS TO REMAIN. COORDINATE BARRIER LOCATION W/ OWNER AND ARCHITECT SO AS NOT TO INTERRUPT OPERATION OF FACILITY.
8. 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, H.V.A.C., TELEPHONE, FIRE ALARM/DETECTION, ETC.
9. 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 INTERUPTIONS TO UTILITY SERVICES.
10. 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 PLYWOODENCLOSURES AS REQUIRED FOR SAFETY AND SECURITY.
11. SHOULD UNFORSEEN CONDITIONS BE ENCOUNTERED THAT AFFECT DESIGN OR FUNCTION OF PROJECT, INVESTIGATE FULLY & CONTACT THE OWNER AND ARCHITECT. WHILE AWAITING ARCHITECTS RESPONSE, RESCHEDULE OPERATIONS IF NECESSARY TO AVOID DELAY OF OVERALL PROJECT.
12. ANY EXISTING WALL TO BE DEMOLISHED AND FOUND TO CONTAIN STRUCTURAL SUPPORTS, PLUMBING, ELECTRICAL OR OTHER SERVICES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT UPON DISCOVERY FOR DIRECTION.
13. THE CONTRACTOR SHALL VERIFY ALL JOB CONDITIONS, DIMENSIONS AND DETAILS PRIOR TO START OF CONSTRUCTION/DEMOLITION'
14. 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.
15. ALL WORKS SHALL COMPLY WITH APPLICABLE BUILDING CODES AND REGULATORY AGENCIES.
16. EACH TRADE SHALL BE RESPONSIBLE FOR REVIEWING ENTIRE SET OF DOCUMENTS & NOTING HIS WORK AS APPLICABLE & SHALL COORDINATE WITH WORK OF OTHER TRADES FOR A COMPLETE INSTALLATION. ALL WORK SHALL BE COORDINATED THROUGH THE G.C.
17. 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 TO RETUN SURFACES TO THEIR ORIGINAL CONDITION. PROVIDE SHORING & BRACING AS WELL AS PROTECTIVE BARRIERS BASED ON CONDITIONS.
18. 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 POIWER TOOLS DESIGNED FOR SAWING OR GRINDING. CUT HOLES AND SLOTS NEATLY TO SIZE REQUIRED WITH MINIMUM DISTURBANCE OF ADJACENT SURFACES. TEMPORARILY COVER OPENINGS WHEN NOT IN USE. TO AVOID MARRING EXISTING FINISHED SURFACES. 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 SHORRING & BRACING AS ELL AS PROTECTIVE BARRIERS BASED ON CONDITIONS. WET SAWING AND/OR CORING SHALL REQUIRE THE CONTRACTOR TO PROTECT ALL REMAINING SURFACESS AND ROOM AREAS FROM WATER DAMAGE AND/OR PENETRATION THE COST FOR ANY WATER DAMAGE SHALL BE BORN BY THE CONTRACTOR.
19. 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.
20. ALL PENETRATIONS THROUGH FLOOR SLABS, STAIR WALLS OR RATED PARTITIONS SHALL BE SEALED WITH A FIRE RATED SELANT, PER SPECIFICATIONS.
21. ALL NOTES ON DRAWINGS SHALL APPLY TO ENTIRE SET OF DRAWINGS.
22. DRAWINGS ARE NOT TO BE SCALED, DIMENSIONS GOVERN LARGE SCALE DRAWINGS TAKE PRECEDENCE OVER SMALL SCALE DRAWINGS.
23. THE TERMS "CONSTUCTION CONTRACTOR", "GENERAL CONTRACTOR" & "CONTRACTOR" SHALL BE UNDERSTOOD SAME UNLESS SPECIFICALLY NOTED OTHERWISE.
24. TYPICAL DIMENSIONS ARE FINISH SURFACE TO FINISH SURFACE, UNLESS NOTED.
25. 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.
26 ALL WORKS IS TO CONFORM TO DRAWINGS AND SPECIFICATIONS, AND SHALL BE NEW & BEST QUALITY OF THE KINDS SPECIFIED.
27 ALL MANUFACTURED ARTICLES, MATERIALS & EQUIPMENT SHALL BE SUPPLIED, INSTALLED, CONNECTED, ERECTED, USED, CLEANED & CONDITIONED AS DIRECTED BY THE MANUFACTURERS, UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS.
28 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).
29 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 VARIENCE WITH SAID CODES. CONTRACTOR SHALL IMMEDIATELY INFORM OWNER AND ARCHITECT,
30 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.
31 CONTRACTOR SHALL PROVIDE FULL TIME SUPERVISION FOR THE COMPLETION OF THE WORK.
32 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.
33 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.
34 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.
35 CONTACTOR 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.
36 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.
37 BUILDING IS TO REMAIN OCCUFIED 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.
38 ALL DIMENSIONS INDICATED AS PLUS/MINUS (+/-) SHALL BE FIELD VERIFIED.
39 UNO., ALL EXISTING WINDOWS, DOORS, AIR CONDITIONERS AFFECTED BY THIS PROJECT SHALL BE TURNED OVER TO THE OWNER.
40 SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.
41 CONTACTOR SHALL MAINTAIN THE LATEST SET OF DRAWINGS AND CONTRACT DOCUMENTS AT THE JOB SITE AT ALL TIMES.
42 THESE DRAWINGS HAVE BEEN PREPARED FOR A PARTICULAR BUILDING IMPROVEMENT ONLY WITH DISTINCT UNDERSTANDING THAT THEY ARE INSTRUMENTS OF SERVICE AND ARE PROPERTY OF THE ARCHITECT. 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.
43 ANY OR ALL REQUIRED FIRE EXTINGUISERS (SEE PLANS) AND ALARMS SHALL BE LOCATED & CLASSIFIED BY CODE. LOCATIONS SHOWN ON PLANS SHALL BE COORDINATED WITH AND APPROVED BY THE FIRE OFFICIAL.
44 GENERAL CONTRACTOR SHALL REPAIR & PATCH PORTIONS OF EXISTING MISSING CONCRETE ON EXPOSED BEAMS, UNDERSIDE OF SLABS AND WALLS PRIOR TO PAINTING.
46 ALL EXISTING STEAM RADIATORS TO BE REMOVE UNLESS NOTED OTHERWISE. COORDINATE WITH MECHANICAL DRAWINGS.
48 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.
50 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.
51 ANY WALL SWITCHES OR ELECTRICAL OUTLETS IN WAY OF NEW WORK SHALL BE RELOCATED. LOCATION TO BE APPROVED BY ARCHITECT.
52 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.
53 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.
54 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.
55 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 TILES, FINISHES, ETC. SHALL BE REPLACED BY THE GENERAL CONTRACTOR TO MATCH EXISTING CONDITIONS BEFORE WORK WAS DAMAGE.
56 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

A. ALL DAMAGES TO THE EXISTING FACILITY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND ALL DAMAGES TO BE REPAIRED AT HIS OWN EXPENSES.

B. 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.

C. 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.

D. ALL DEMOLITION OPERATIONS SHALL BE COORDINATED WITH APPLICABLE UTILITY COMPANY WHERE REQUIRED.

E. DASHED LINES INDICATE ITEMS TO BE REMOVED. THE LOCATIONS KEYED ON THIS DRAWINGS FOR THESE NOTES 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.

F. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED DEMOLITION PERMITS PRIOR TO BEGINNING ANY WORK.

G. 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.

H. THE CONTRACTOR SHALL KEEP THE SITE FROM 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.

I. 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.

J. 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.

K. 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.

L. 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.

M. 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.

N. PROVIDE WEATHER PROTECTION DURING ALL PHASES OF CONSTRUCTION TO EXISTING BUILDING.

O. ALL EXTERIOR SIGNAGE SHALL REMOVED AND RELOCATED AS REQUIRED BY OWNER.

P. REFER TO MECHANICAL, ELECTRICAL, AND STRUCTURAL DRAWINGS FOR THE DEMOLITION INFORMATION OF RELATED ITEMS.

Q. CONTRACTOR IS TO PROVIDE PROTECTION TO EXISTING TUNNEL SYSTEM BETWEEN OLD JAIL BUILDING & NEW ANNEX BUILDING DURING CONSTRUCTION.

R. 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

DEMO SINGLE DOOR

DEMO DOUBLE DOOR

DEMO WINDOW

DEMO EQUIPMENT

DEMO RAILING

AREA TO BE EXCAVATED

DEMO WALL

DEMOLITION KEYNOTES D1

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 BEEN 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

- M1 — PARTITON TYPE
- A — WINDOW TYPE
- 1 — KEYNOTES
- D1 — DEMOLITION KEYNOTES
- 1 — REVISION TAG
- XXX — DOOR NUMBER
- ELEVATION POINTER / WORK POINT
- # FLOOR / A / # — SIGNAGE
- P2 — WALL FINISH
- WALL FINISH / BASE FIN. / FLOOR FIN. — ROOM FINISHES

Drawing Title — Drawing No. 1 — Sheet No. A.100 — PLAN SCALE — Drawing Scale

Drawing Title — Drawing No. 1 — Sheet No. A.200 — ELEVATION SCALE — Drawing Scale

Drawing Title — Drawing No. 1 — Sheet No. A.200 — SECTION SCALE — Drawing Scale

Drawing Title — Drawing No. 1 — Sheet No. A.200 — DETAIL SCALE — Drawing Scale

A / A.200 — A / A.200 — BUILDING SECTION

A / A.200 — WALL SECTION

1 / A.300 — PLAN DETAIL OR SECTION DETAIL

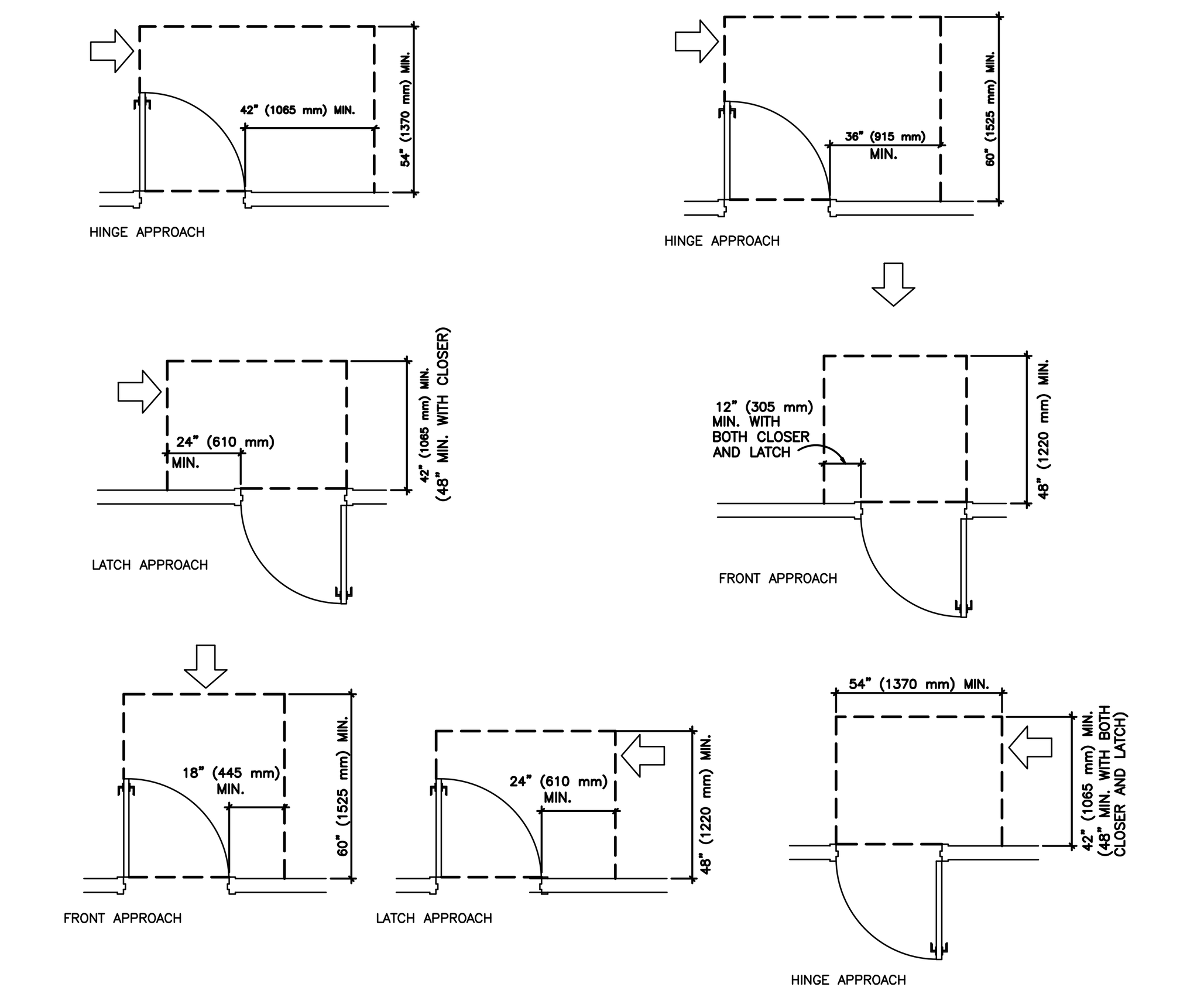
MATERIALS LEGEND

- CONCRETE
- BRICK OR FACEBLOCK
- LIMESTONE/GRANITE
- CMU
- STEEL
- PLYWOOD
- WOOD STUD / WOOD BLOCKING
- RIGID INSULATION
- SHIM
- CARPET
- GYPSUM BOARD
- EARTH
- GRAVEL / POROUS FILL
- BATT INSULATION

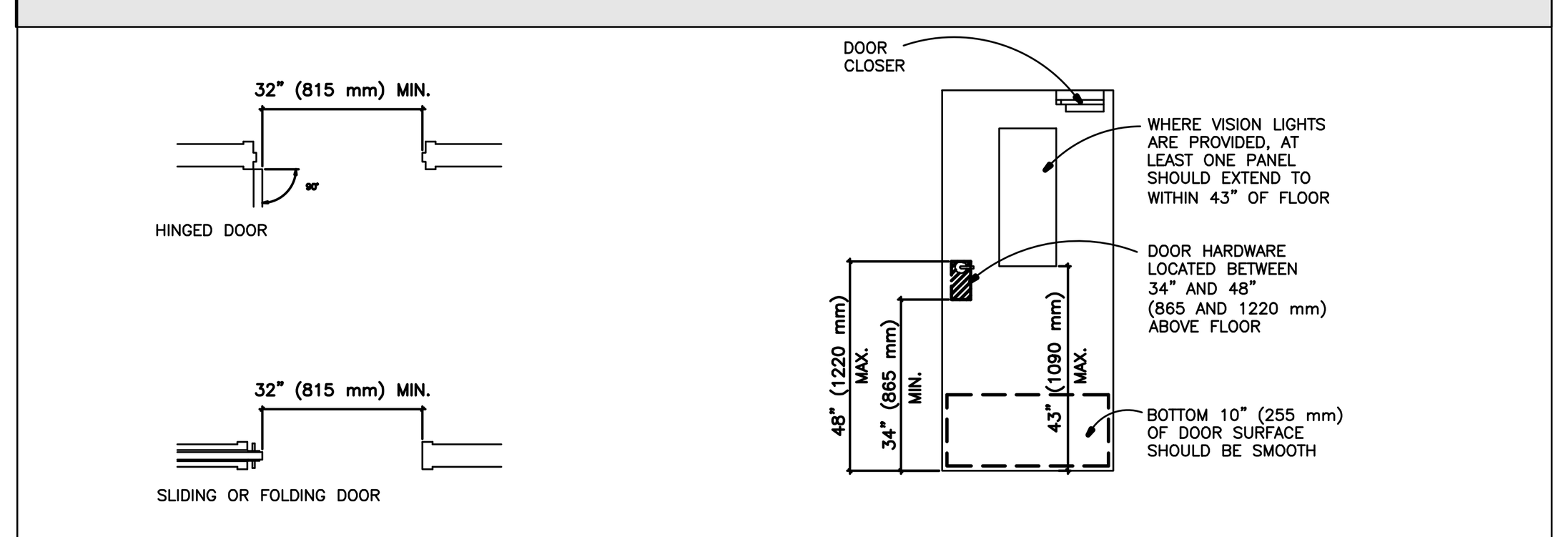
ABBREVIATIONS

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.	COLUMN
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
F.E.	FREIGHT ELEVATOR
FDN.	FOUNDATION
FIN.	FINISH
FL.	FLOOR
FLR.	FLOOR
FLUOR.	FLUORESCENT
FT.	FOOT / FEET
FTG.	FOOTING
GA.	GAUGE
GALV.	GALVANIZED
GL.	GLASS
GWB	GYPSUM WALL BOARD
GYP. BD.	GYPSUM 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
MLDG.	MOLDING
M.O.H.	MIRROR OPPOSITE HAND
MTD.	MOUNTED
MTL	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
O.C.	ON CENTER
OPNG.	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
RE.	REFERENCE
REF.	REFRIGERATOR
REFL.	REFLECTED
REQ'D.	REQUIRED
REINF.	REINFORCING
REV.	REVISION
R.H.	RIGHT HAND
RM.	ROOM
R.O.	ROUGH OPENING
R.O.D.	ROOF OVERFLOW DRAIN
SECT.	SECTION
SHO.	SHOWER
SIM.	SIMILAR
SK	SKETCH
SPECS.	SPECIFICATIONS
SQ.	SQUARE
S/STL.	STAINLESS STEEL
STL.	STEEL
STD.	STANDARD
STRUCT.	STRUCTURE
STRUCT'L	STRUCTURAL
SUSP.	SUSPENDED
T/	TOP OF
T.O.	TOP OF
TEL.	TELEPHONE
TERR.	TERRAZZO
TRANS.	TRANSFORMER
TYP.	TYPICAL
TBD.	TO BE DETERMINED
U.L.	UNDERWRITER'S LABORATORY
UNFIN.	UNFINISHED
U.O.N.	UNLESS OTHERWISE NOTED
UTIL.	UTILITY
V.B.	VINYL BASE
V.C.T.	VINYL COMPOSITION TILE
VERT.	VERTICAL
VEST.	VESTIBULE
V.I.F.	VERIFY IN FIELD
VOL.	VOLUME
VTR	VENT THRU ROOF
W/	WITH
W.C.	WATER CLOSET
WDW.	WINDOW
W.F.	WIDE FLANGE
W.O.	WINDOW OPENING
W.P.	WORKING POINT
W.W.F.	WELDED WIRE FABRIC

ACCESSIBLE CLEARANCE AT SWINGING DOORS



CLEAR WIDTH OF ACCESSIBLE DOORWAY



BUILDING CODE INFORMATION

PROJECT NAME:	UNION COUNTY COURTHOUSE RADIO ROOM (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

	CRITERION / DESIGNATION		IBC REFERENCE
USE AND OCCUPANCY CLASSIFICATION	EXISTING BUSINESS B	ADDITION BUSINESS B	
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)

CONSTRUCTION CLASSIFICATION IA

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 3-HR	EXISTING 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

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:

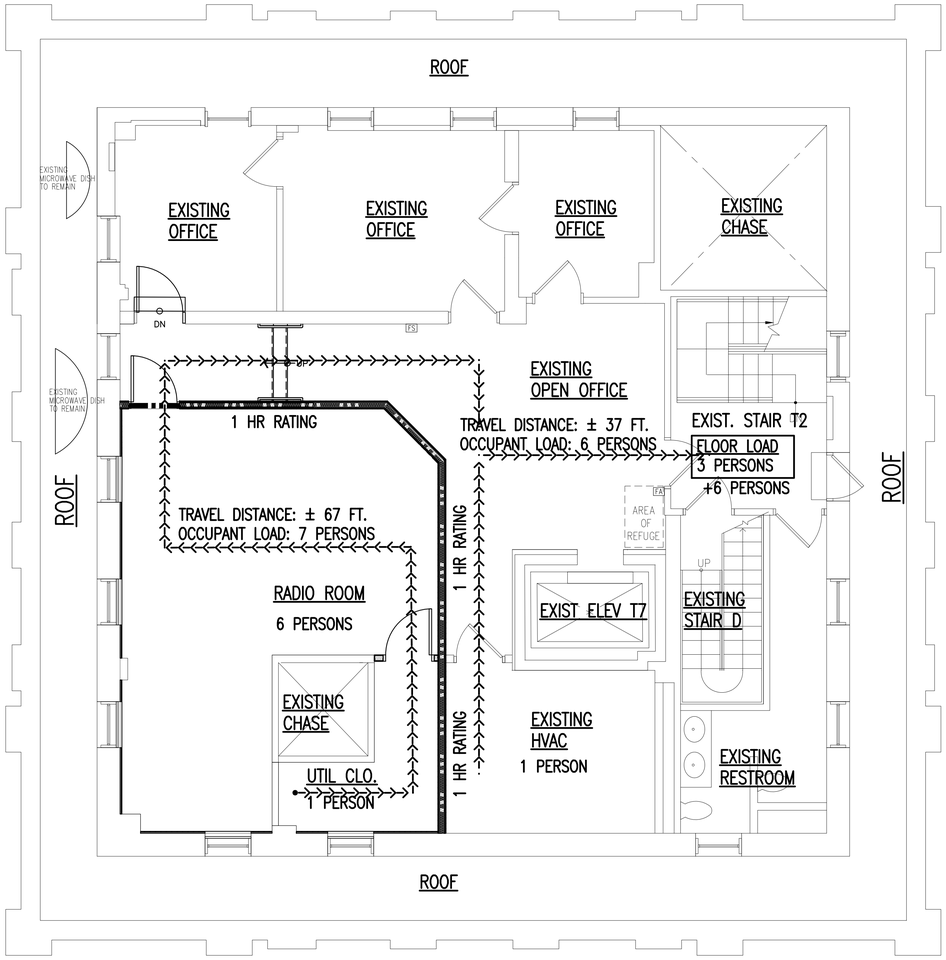
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

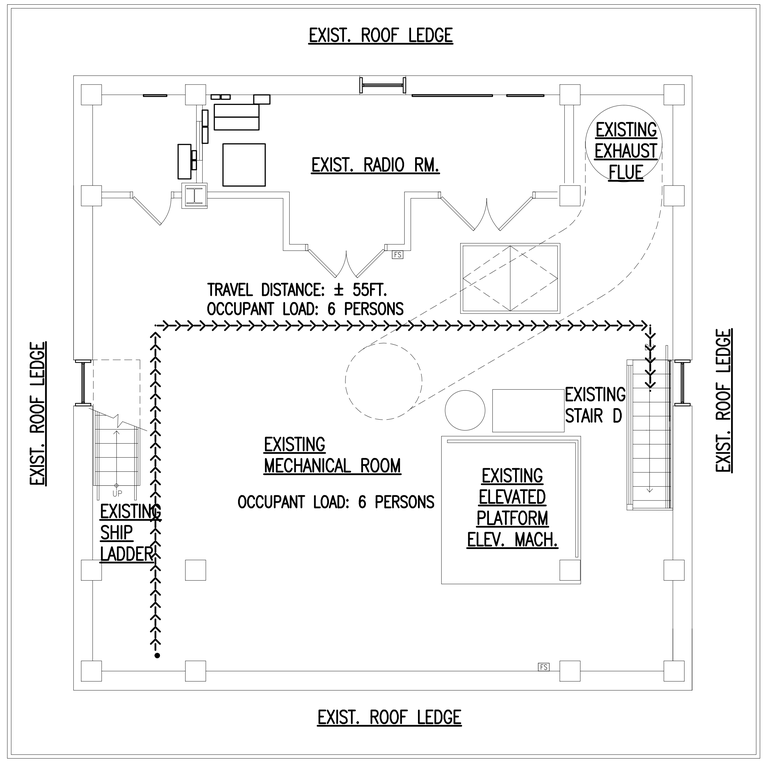
SHEET CONTENTS:

GENERAL , DEMOLITION NOTES & CODE

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	09-15-15
SCALE	AS SHOWN
DRWN BY	BT
CHKD BY	NJN
JOB NO	2151188
SHEET:	2 OF: 35
DWG. NO	A.001





1 A.002 SIXTEENTH FLOOR EGRESS PLAN
SCALE: 1/4"=1'-0"

OCCUPANCY			
OCCUPANCY USE	AREA	FACTOR	OCCUPANTS
BUSINESS	600 SF.	100	6
MECHANICAL	800 SF.	300	3

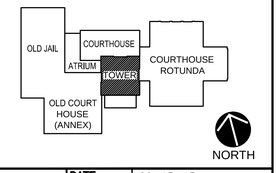
EGRESS ANALYSIS	COURTHOUSE TOWER
TOTAL AREA	1,200 SF.
FLOOR OCCUPANT LOAD:	9 PERSONS
EXISTING EXIT STAIR WIDTH:	36 INCHES
REQUIRED EXIT STAIR WIDTH:	44 INCHES
NEW EXIT STAIR WIDTH:	54 INCHES
MAX. ALLOWED TRAVEL DISTANCE:	250'-0"
ACTUAL TRAVEL DISTANCE:	60'-0"

2 A.002 SEVENTEENTH FLOOR EGRESS PLAN
SCALE: 1/4"=1'-0"

OCCUPANCY			
OCCUPANCY USE	AREA	FACTOR	OCCUPANTS
MECHANICAL	1,614 SF.	300	6

EGRESS ANALYSIS	COURTHOUSE TOWER
TOTAL AREA	1,614 SF.
FLOOR OCCUPANT LOAD:	6 PERSONS
EXISTING EXIT STAIR WIDTH:	36 INCHES
REQUIRED EXIT STAIR WIDTH:	36 INCHES
NEW EXIT STAIR WIDTH:	N/A
MAX. ALLOWED TRAVEL DISTANCE:	75'-0"
ACTUAL TRAVEL DISTANCE:	55'-0"

KEYPLAN



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
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

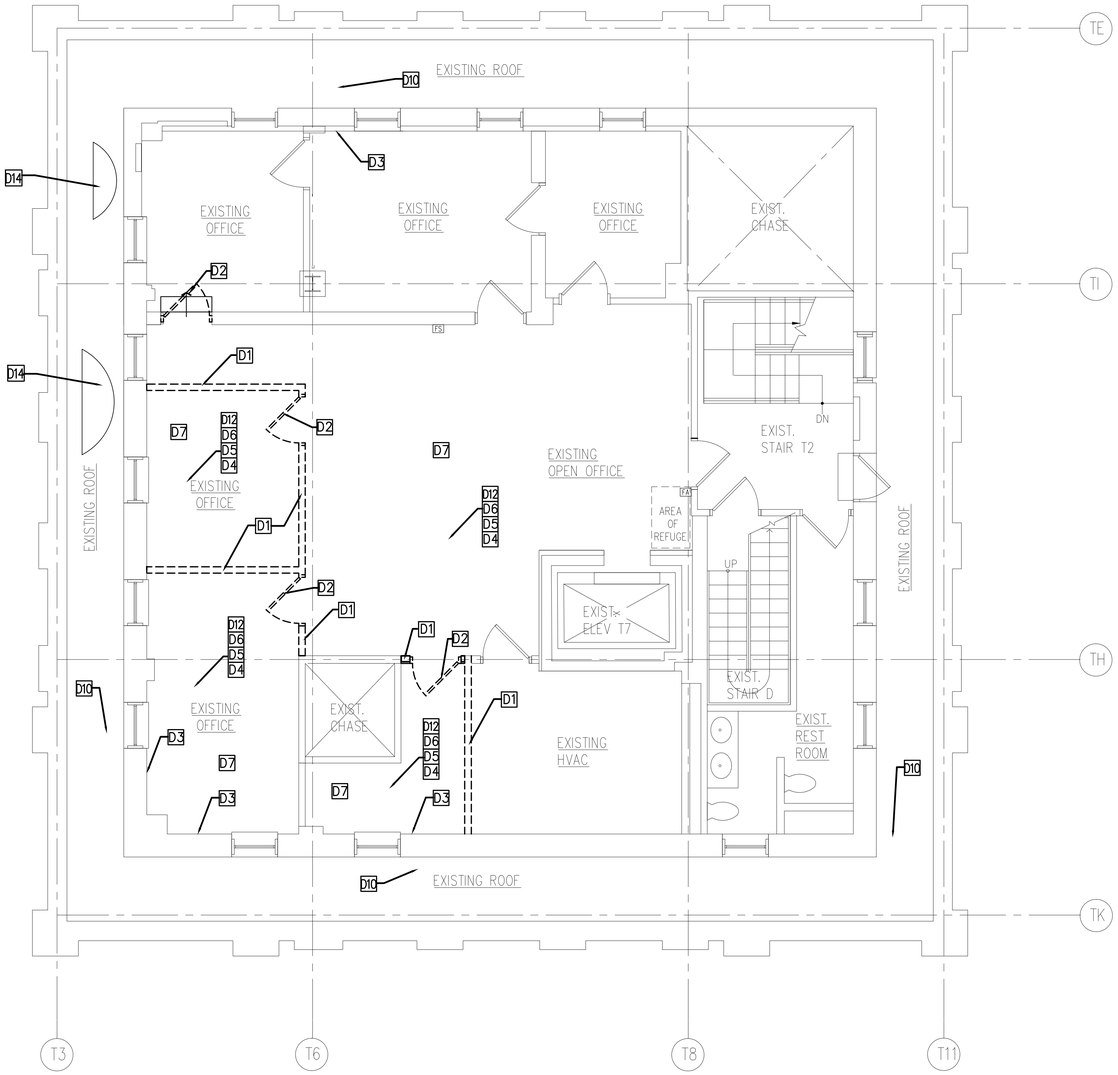
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

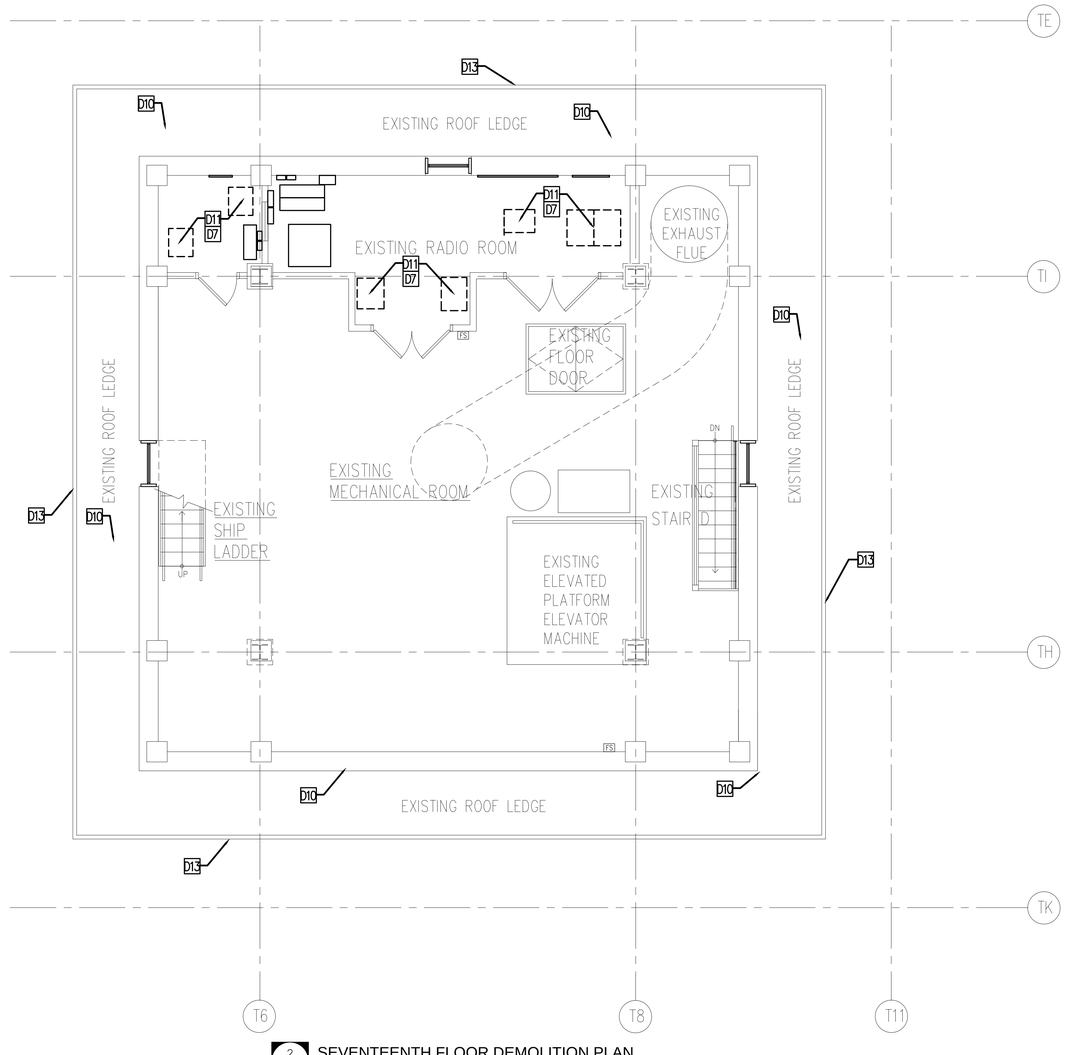
SIXTEENTH & SEVENTEENTH FLOOR EGRESS PLAN

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	09-15-15
SCALE	AS SHOWN
DRWN BY	BT
CHKD BY	NJN
JOB NO	2151188
SHEET:	3 OF: 35
DWG. NO	A.002



1 D.101 SIXTEENTH FLOOR DEMOLITION PLAN
SCALE: 1/4"=1'-0"



2 D.101 SEVENTEENTH FLOOR DEMOLITION PLAN
SCALE: 1/4"=1'-0"

DEMOLITION NOTES:

D1 PORTION OF EXISTING WALL TO BE REMOVED (SHOWN DASHED)

D2 REMOVE EXISTING DOORS AND ITS COMPONENTS FRAMES, JAMBS, SADDLE AND HARDWARES, ETC.

D3 SCRAPE, PATCH, REPAIR AND SEAL LEAKS ON DAMAGE WALL SURFACES.

D4 DEMOLITION SHALL INCLUDE REMOVAL OF CEILING FINISHES AT ANY AREA DESIGNATED TO RECEIVE NEW WORK.

D5 REMOVE LIGHTING FIXTURES AT DESIGNATED AREAS REFER TO REFLECTED CEILING PLAN AND ELECTRICAL DRAWINGS.

D6 REMOVE EXISTING FLOOR FINISH AND GRIND SMOOTH. EXISTING CONCRETE SLAB TO RECEIVE NEW FINISHES.

D7 EXISTING MECH./ELECT. EQUIPMENT TO BE REMOVED OR RELOCATED. REFER TO M.E.P. DRAWINGS FOR INFORMATION.

D8 CONTRACTOR SHALL PROVIDE STUD AND PLYWOOD DUST BARRIER FROM FLOOR TO UNDERSIDE OF STRUCTURE ABOVE. CAULK OR OTHERWISE SEAL PERIMETER IF REQUIRED. PROVIDE 38"X80" ACCESS DOOR WITH HASP AND PADLOCK FOR SECURITY.

D9 NOT USED

D10 REPLACE EXISTING ROOFING SYSTEM ON ENTIRE ROOF.

D11 RELOCATE EXISTING RADIO EQUIPMENTS TO NEW RADIO ROOM LOCATION IN THE 16TH FLOOR.

D12 DEACTIVATE, DISCONNECT AND REMOVED AFFECTED INTERIOR ELECTRICAL OUTLET REFER TO ELECTRICAL DRAWINGS.

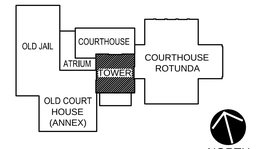
D13 CLEAN, REPAIR, PAINT & REPLACE DAMAGE FASCIA TO MATCH EXISTING AT ROOF LEDGE.

D14 GC TO COORDINATE WITH OWNER'S VENDOR TO TEMPORARY REMOVE MICROWAVE DISH TO ALLOW ROOF REPLACEMENT.

NOTES:

REFER TO DEMOLITION NOTES & GENERAL NOTES ON DRAWING # A.001.
COORDINATE ALL RADIO EQUIPMENT RELOCATION WITH OWNER'S VENDOR.

KEYPLAN



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
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0066 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

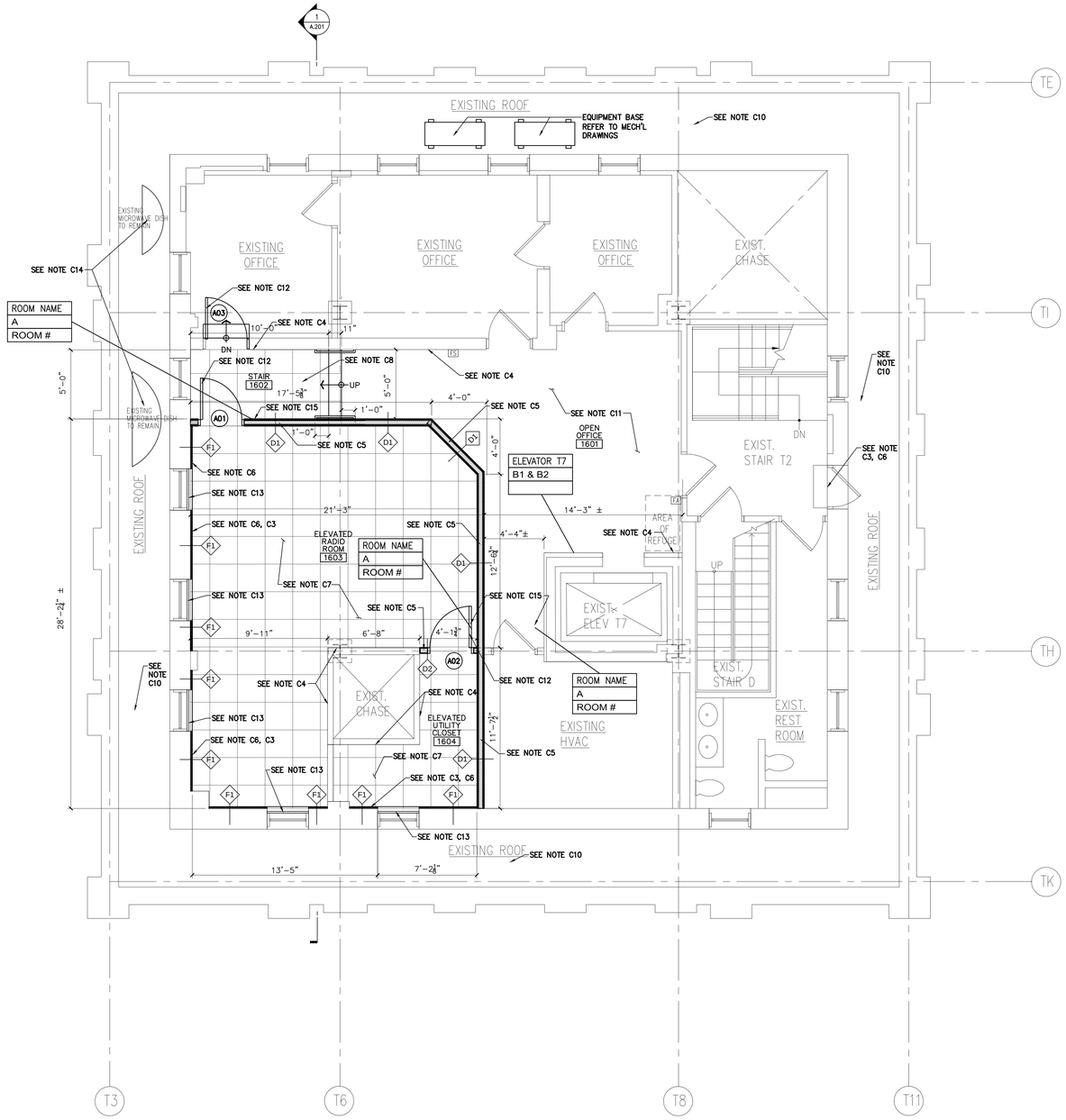
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

SIXTEENTH & SEVENTEENTH FLOOR DEMOLITION PLAN

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	09-15-15
SCALE	AS SHOWN
DRWN BY	BT
CHKD BY	NJN
JOB NO	2151188
SHEET:	4 OF: 35
DWG. NO	D.101



1 A.101 SIXTEENTH FLOOR LAYOUT PLAN
SCALE: 1/4"=1'-0"

CONSTRUCTION NOTES:

C1 REMOVE EXISTING WALL AS REQUIRED (SEE DEMO PLAN) AFTER EXISTING WALLS HAS BEEN DEMOLISHED. PATCH, REPAIR WALL SURFACES TO MATCH EXISTING WALLS.

C2 REMOVE EXISTING DOORS AND ITS COMPONENTS FRAMES, JAMBS, SADDLE AND HARDWARES, ETC.

C3 PATCH, REPAIR AND SEAL LEAKS ON DAMAGE WALL SURFACES.

C4 CONTRACTOR SHALL PATCH, REPAIR AND PAINT OR OTHERWISE FINISH ON ENTIRE WALL SURFACES OF AREAS AFFECTED BY NEW CONSTRUCTION.

C5 PREPARE NEW WALLS (SEE CONSTRUCTION PLAN) ALIGN NEW WALL AND FINISHES SURFACES WITH EXISTING WALLS. PATCH AND PAINT AS REQUIRED FOR A SMOOTH TRANSISTION AND UNIFORM APPEARANCE IN WALLS. ALL STUD BAYS SHALL HAVE 4" SOUND ATTENUATION BATTS. SEE PARTITION TYPES D1/A.301

C6 PROVIDE 5/8" GYP. BOARD & METAL FURRING ON INSIDE OF EXTERIOR WALLS IN RADIO ROOM AREA OR WERE OTHERWISE SPECIFIED. SEE PARTITION TYPE F1/A.301

C7 PROVIDE 14" HIGH ELEVATED ACCESS FLOOR PANELS WITH PEDESTAL @ 24"X24" EACH WAY AT RADIO ROOM, UTILITY CLOSET AND STAIR.

C8 PROVIDE STEEL STAIR WITH ACCESS FLOOR PANEL MATERIAL. COMPLETE WITH WALL MOUNTED RAILINGS,

C9 CONTRACTOR TO REMOVE DAMAGE EXISTING ACOUSTICAL TILES AND GRID SUPPORT REFER TO MECHANICAL AND ELECTRICAL DRAWINGS.

C10 PROVIDE NEW ROOFING SYSTEM & WATERPROOFING MEMBRANE ON ENTIRE ROOF & WALL SURFACES.

C11 REMOVE EXISTING FLOOR FINISH AND GRIND SMOOTH. CONCRETE SLAB TO RECEIVE NEW FINISHES.

C12 PROVIDE NEW DOOR, FRAMES, HARDWARE & ETC. REFER TO DOOR SCHEDULE.

C13 PROVIDE ROLL-UP VINYL BLINDS COVER OVER WINDOW TYPICAL.

C14 EXISTING MICROWAVE DISH & SELECTED RADIO EQUIPMENT TO REMAIN.

C15 PROVIDE ROOM ID SIGN REFER TO A.301 FOR SIGNAGE DETAIL.

C16 CLEAN, REPAIR, PAINT & REPLACE DAMAGE FASCIA TO MATCH EXISTING AT ROOF LEDGE.

LEGEND:

NEW STUD WALL OR INFILL

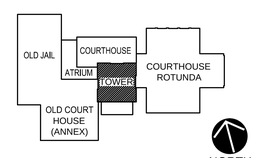
EXISTING STUD WALL OR MASONRY WALL

NEW DOOR

EXISTING DOOR

ELEVATED ACCESS PANEL

KEYPLAN



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
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

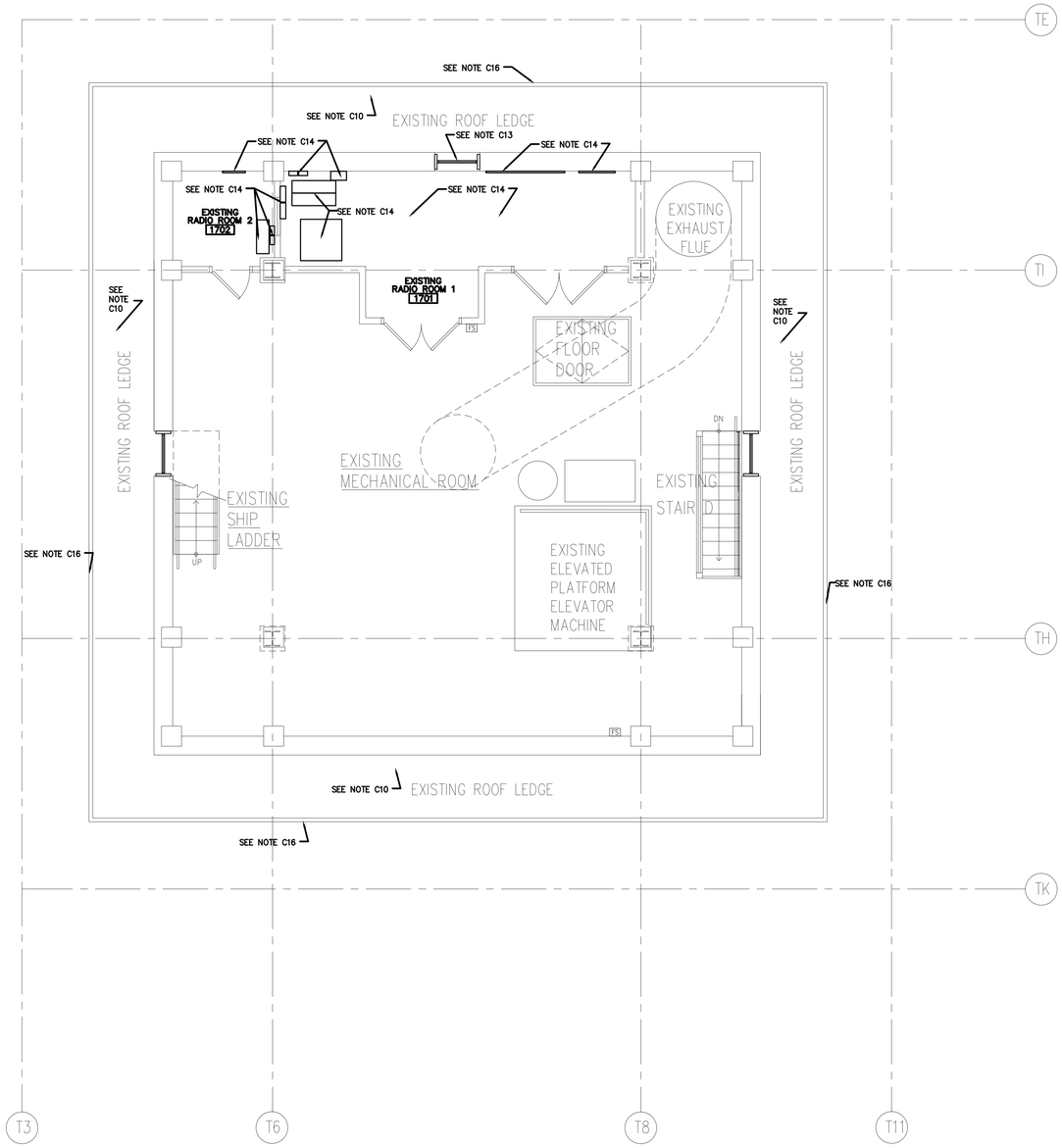
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

SIXTEENTH FLOOR LAYOUT PLAN

SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					
10.30.15	95% CD UPDATE	KD	FM					
02.19.16	ISSUED FOR BID	KD	FM					

DATE	09-15-15
SCALE	AS SHOWN
DRWN BY	BT
CHKD BY	NJN
JOB NO	2151188
SHEET:	5 OF: 35
DWG. NO	A.101



1 A.102 SEVENTEENTH FLOOR LAYOUT PLAN
SCALE: 1/4"=1'-0"

CONSTRUCTION NOTES:

C1 REMOVE EXISTING WALL AS REQUIRED (SEE DEMO PLAN) AFTER EXISTING WALLS HAS BEEN DEMOLISHED. PATCH, REPAIR WALL SURFACES TO MATCH EXISTING WALLS.

C2 REMOVE EXISTING DOORS AND ITS COMPONENTS FRAMES, JAMBS, SADDLE AND HARDWARES, ETC.

C3 PATCH, REPAIR AND SEAL LEAKS ON DAMAGE WALL SURFACES.

C4 CONTRACTOR SHALL PATCH, REPAIR AND PAINT OR OTHERWISE FINISH ON ENTIRE WALL SURFACES OF AREAS AFFECTED BY NEW CONSTRUCTION.

C5 PREPARE NEW WALLS (SEE CONSTRUCTION PLAN) ALIGN NEW WALL AND FINISHES SURFACES WITH EXISTING WALLS. PATCH AND PAINT AS REQUIRED FOR A SMOOTH TRANSISTION AND UNIFORM APPEARANCE IN WALLS. ALL STUD BAYS SHALL HAVE 4" SOUND ATTENUATION BATTS.

C6 PROVIDE 5/8" GYP. BOARD & METAL FURRING ON INSIDE OF EXTERIOR WALLS IN RADIO ROOM AREA OR WERE OTHERWISE SPECIFIED.

C7 PROVIDE 14" HIGH ELEVATED ACCESS FLOOR PANELS WITH PEDESTAL @ 24"X24" EACH WAY AT RADIO ROOM, UTILITY CLOSET AND STAIR.

C8 PROVIDE STEEL STAIR WITH ACCESS FLOOR PANEL MATERIAL. COMPLETE WITH WALL MOUNTED RAILINGS,

C9 CONTRACTOR TO REMOVE DAMAGE EXISTING ACOUSTICAL TILES AND GRID SUPPORT REFER TO MECHANICAL AND ELECTRICAL DRAWINGS.

C10 PROVIDE NEW ROOFING SYSTEM & WATERPROOFING MEMBRANE ON ENTIRE ROOF & WALL SURFACES.

C11 REMOVE EXISTING FLOOR FINISH AND GRIND SMOOTH. CONCRETE SLAB TO RECEIVE NEW FINISHES.

C12 PROVIDE NEW DOOR, FRAMES, HARDWARE & ETC. REFER TO DOOR SCHEDULE.

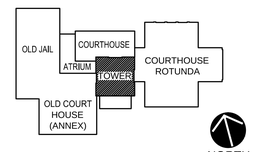
C13 PROVIDE ROLL-UP VINYL BLINDS COVER OVER WINDOW TYPICAL.

C14 EXISTING MICROWAVE DISH & SELECTED RADIO EQUIPMENT TO REMAIN.

C15 PROVIDE ROOM ID SIGN REFER TO A.301 FOR SIGNAGE DETAIL.

C16 CLEAN, REPAIR, PAINT & REPLACE DAMAGE FASCIA TO MATCH EXISTING AT ROOF LEDGE.

KEYPLAN



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
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0098 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

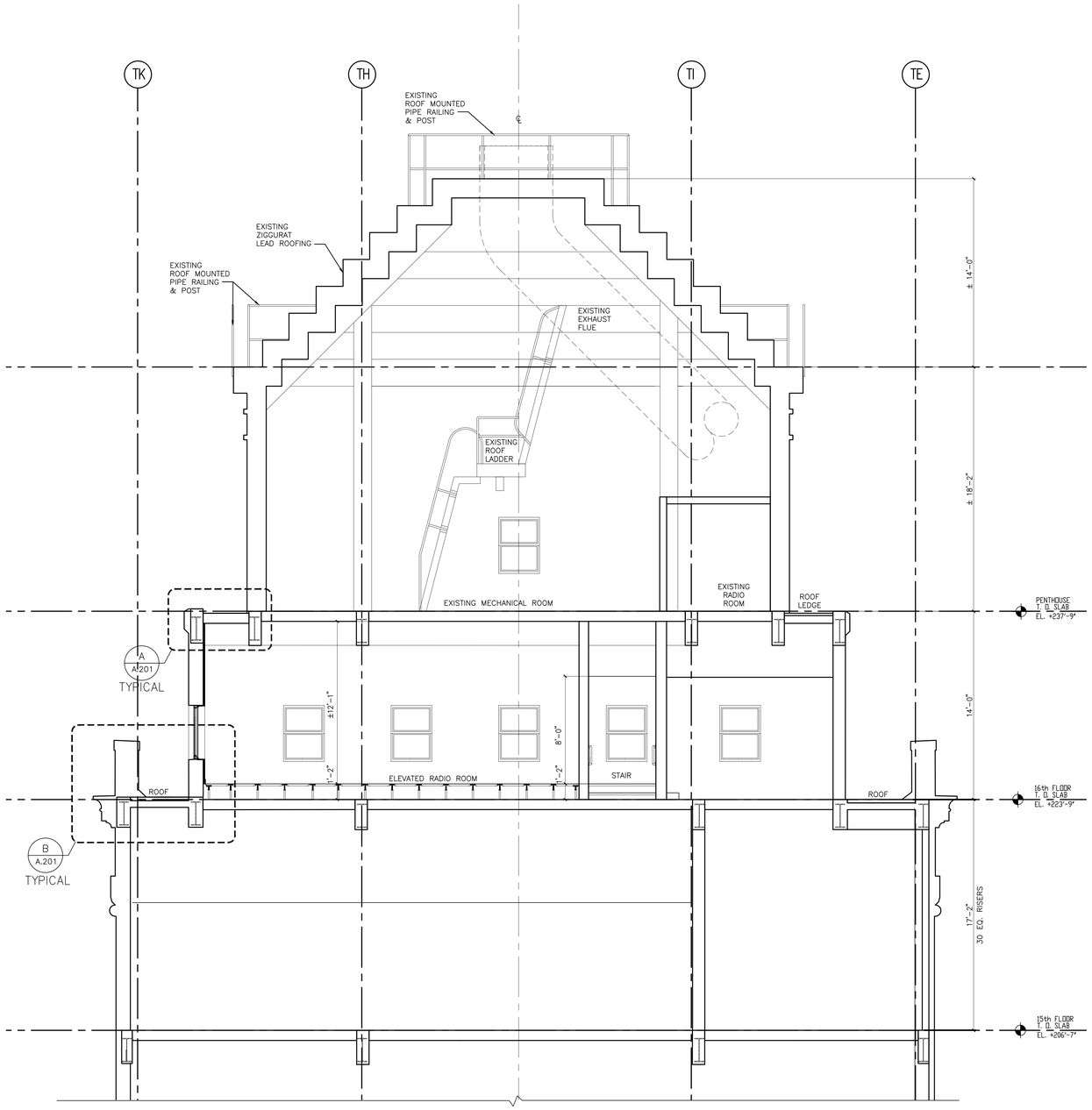
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

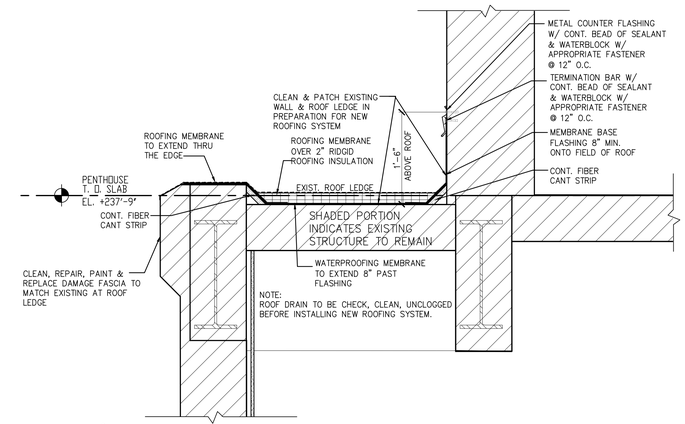
SEVENTEENTH FLOOR LAYOUT PLAN

SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					
10.30.15	95% CD UPDATE	KD	FM					
02.19.16	ISSUED FOR BID	KD	FM					

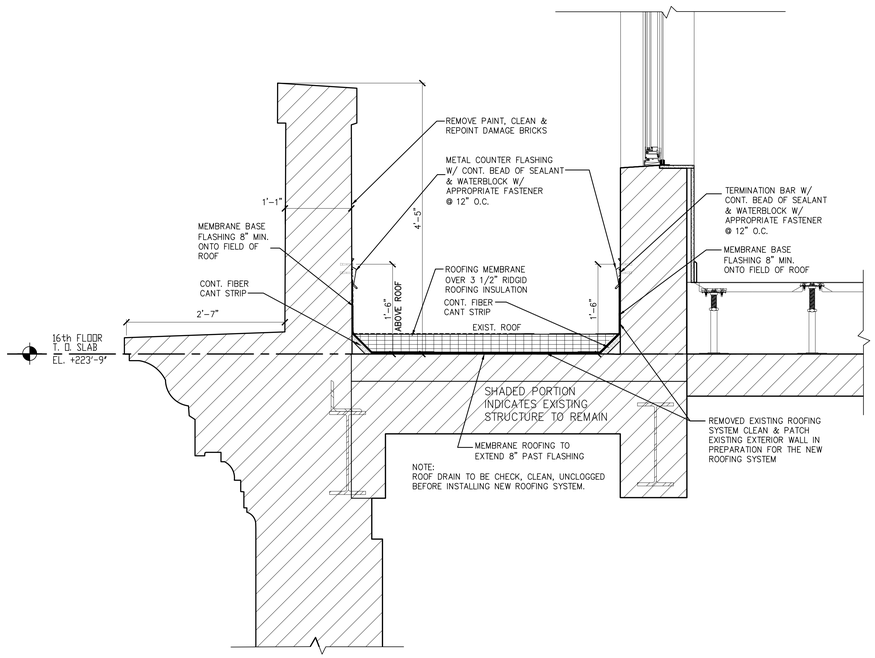
DATE	09-15-15
SCALE	AS SHOWN
DRWN BY	BT
CHKD BY	NJN
JOB NO	2151188
SHEET:	6 OF: 35
DWG. NO	A.102



1 A.201 PARTIAL BUILDING SECTION
SCALE: 1/4"=1'-0"



A A.201 DETAIL SECTION OF ROOF LEDGE @ PENTHOUSE FLOOR
SCALE: 1"=1'-0"



B A.201 DETAIL SECTION OF ROOF @ 16TH FLOOR
SCALE: 1"=1'-0"

PROGRESS PRINT NOT FOR CONSTRUCTION

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
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

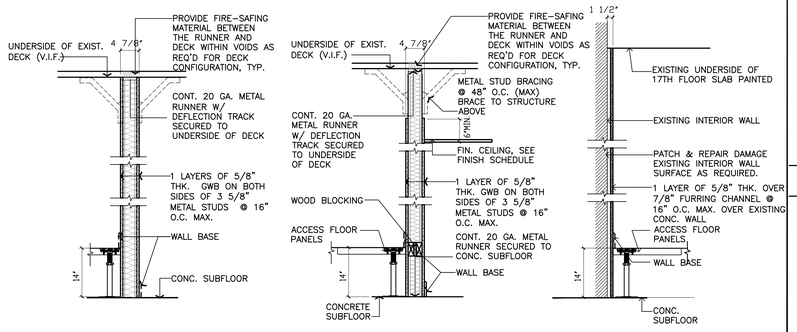
PARTIAL BUILDING SECTION & DETAILS

SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	

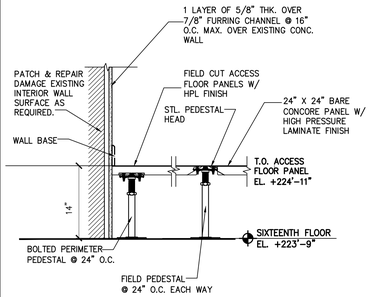
DATE	07-14-15
SCALE	AS SHOWN
DRWN BY	
CHKD BY	NJN
JOB NO	2151188
SHEET:	7 OF:
DWG. NO	A.201

PARTITION TYPES

SCALE: 3/4" = 1'-0"

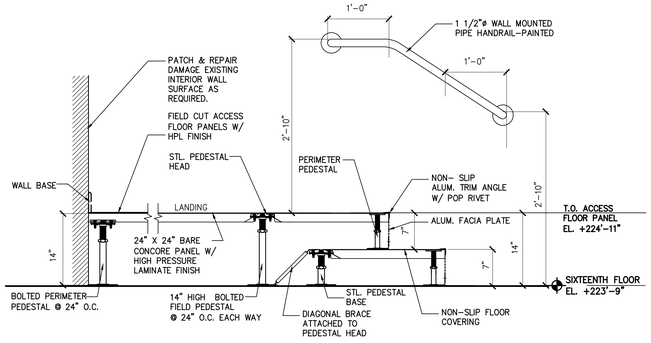


	DRY WALL PARTITION TYPE		DRYWALL PARTITION TYPE		FURRED-OUT PARTITION
D1	1 HR FIRE RATED (UL-495) PARTITION	D2	NON-RATED PARTITION	F1	7/8" FURRING CHANNEL @ 16" O.C.
	WITH SOUND ATTENUATION BLANKET		WITH SOUND ATTENUATION BLANKET		



1 / A.301 TYP. SECTION DETAIL OF ACCESS FLOOR

SCALE: 1"=1'-0"

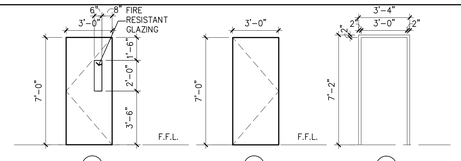


2 / A.301 DETAIL SECTION OF STAIR

SCALE: 1"=1'-0"

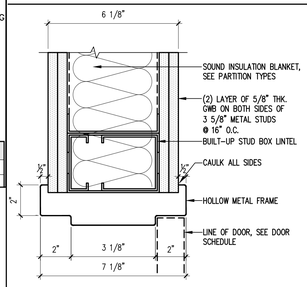
DOOR TYPE

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

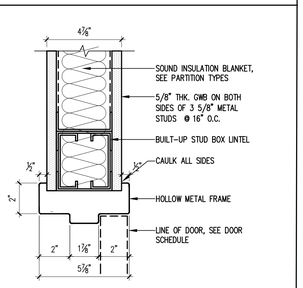


DOOR DETAILS

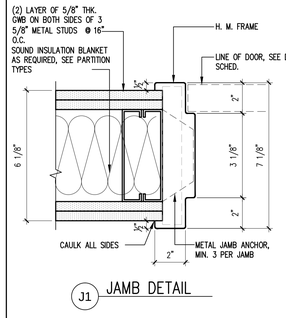
SCALE: 3" = 1'-0"



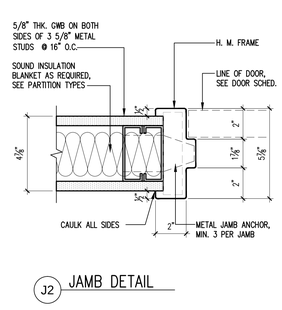
H1 HEAD DETAIL



H2 HEAD DETAIL



J1 JAMB DETAIL



J2 JAMB DETAIL

DOOR AND FRAME SCHEDULE

DOOR NO.	DOOR LOCATION FROM	DOOR LOCATION TO	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	DOOR SIZE THICKNESS	DOOR MATERIAL	DOOR FINISH	DOOR TYPE	DOOR GLAZING	FRAME MATERIAL	FRAME FINISH	FRAME DETAILS TYPE	FRAME DETAILS JAMB	FRAME DETAILS HEAD	SILL TYPE	SILL MATERIAL	FIRE-RATING LABEL	HARDWARE SET	REMARKS
	SIXTEENTH FLOOR																		
A01	STAIR	ELEV. RADIO ROOM	3'-0"	7'-0"	1 3/4"	H.M.	PTD.	A	T	H.M.	PTD.	1	J1	H1	–	–	45 MIN.	1	VACUUM SEALED DOOR, DPS & CARD ACCESS READER
A02	ELEV. RADIO ROOM	ELEV. UTILITY CLO.	3'-0"	7'-0"	1 3/4"	H.M.	PTD	A2	–	H.M.	PTD.	1	J2	H2	–	–	–	2	
A03	EXISTING OFFICE	ELEVATED PLATFORM	3'-0"	7'-0"	1 3/4"	H.M.	PTD	A2	–	H.M.	PTD.	1	J2	H2	–	–	–	3	

NOTE:

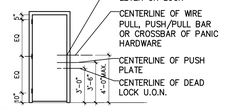
FIELD VERIFY ALL OPENING DIMENSIONS.

LEGEND:

H.M. HOLLOW METAL DOOR
AL. ALUMINUM
T. TEMPERED GLASS

NOTE:

1. SEE PLAN FOR DOOR SWING



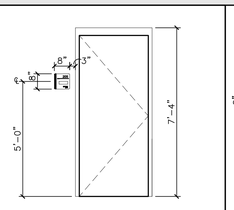
HARDWARE NOTES:

1. REFER TO HARDWARE SCHEDULE FOR NUMBER OF HINGES REQUIRED.
2. ALL HARDWARE MOUNTING SHALL MEET APPLICABLE HANDICAPPED ACCESS CODES. COORDINATE AND VERIFY ALL MOUNTING HEIGHTS WITH LOCAL CODE JURISDICTIONS, HANDICAPPED CODES AND PROJECT DESIGN REQUIREMENTS.
3. FOR DOORS (HOLLOW OR SOLID CORE), COORDINATE CONCEALED HARDWARE WITH THE MINIMUM STILE AND RAIL DIMENSIONS AND DOOR AND HARDWARE SPECIFICATIONS. ALLOW DEPTH OF THE HARDWARE PLUS THE MINIMUM REQUIRED RAIL OR STILE AS SPECIFIED BY AWI.
4. ALL HARWARE, LEVERS, CLOSERS, SADDLES, ETC. TO MEET A.D.A. ACCESSIBILITY REQUIREMENTS.

HARDWARE SETS:

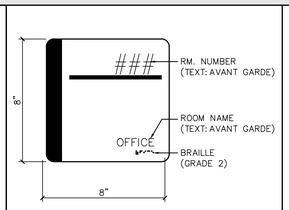
SET #1	3 HINGES	3CB1HW 4.5x4.5-NRP	652	IV
	1 ELECTRIFIED LOCK	ML59-334-EU-LXL-L6 LESS CYL	626	CAT
	1 MORTISE CYLINDER	MATCH EXISTING	626	CR
	1 CLOSER	4111	689	LCN
	1 FLOOR STOP	FS17	626	IV
	1 POWER TRANSFER	PT1000	US28	ABH
	1 CARD READER			BY
	1 POWER SUPPLY	PS902		VD
	1 KICK PLATE	8400-10"-B4E-CSK-2"LDW	630	IV
	1 THRESHOLD	2145SS	32D	RS
	NOTE 1: VALID CARD ALLOWS UNLOCKING OF ELECTRIFIED LOCK. NOTE 2: THIS DOOR IS TO BE A VACUUM SEALED DOOR SIMILAR TO OVERLY #509599 AND SHOULD HAVE A LOCKSET BACKSET OF 3 ¾".			
SET #2	3 HINGES	3CB1HW 4.5x4.5-NRP	652	IV
	1 LOCK	L9080-06A LESS CYL	626	SC
	1 MORTISE CYLINDER	MATCH EXISTING	626	CR
	1 WALL STOP	WS407CVX	626	IV
	1 FLOOR STOP	FS17	626	IV
	3 SILENCERS	SR64	GR	IV
SET #3	3 HINGES	3CB1HW 4.5x4.5-NRP	652	IV
	1 LOCK	L9080-06A LESS CYL	626	SC
	1 MORTISE CYLINDER	MATCH EXISTING	626	CR
	1 CLOSER	4011	689	LCN
	1 WALL STOP	WS407CVX	626	IV
	1 SET SEALS	638CH HEAD & JAMBS	CH	RS
	1 SWEEP	967C	AL	RS
	NOTE: REFER TO SPECIFICATIONS			

SIGNAGE DETAILS



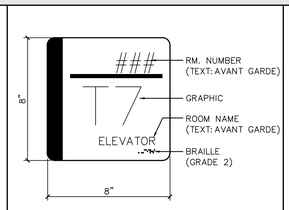
1 TYP. SIGN MTD. TO WALL

WITH OR WITHOUT WINDOW SCALE: 3/8" = 1'-0"



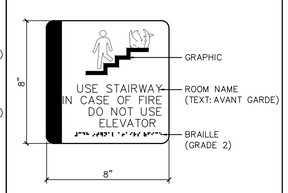
A ROOM ID SIGN

SCALE : 3" = 1'-0"



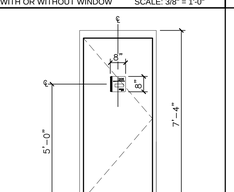
B1 TYP. ELEVATOR ID SIGN

SCALE : 3" = 1'-0"



B2 TYP. ELEVATOR ID SIGN

SCALE : 3" = 1'-0"



2 TYP. SIGN MTD. TO DOOR

WITH OR WITHOUT WINDOW SCALE: 3/8" = 1'-0"

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 14364

NETTAARCHITECTS
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
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

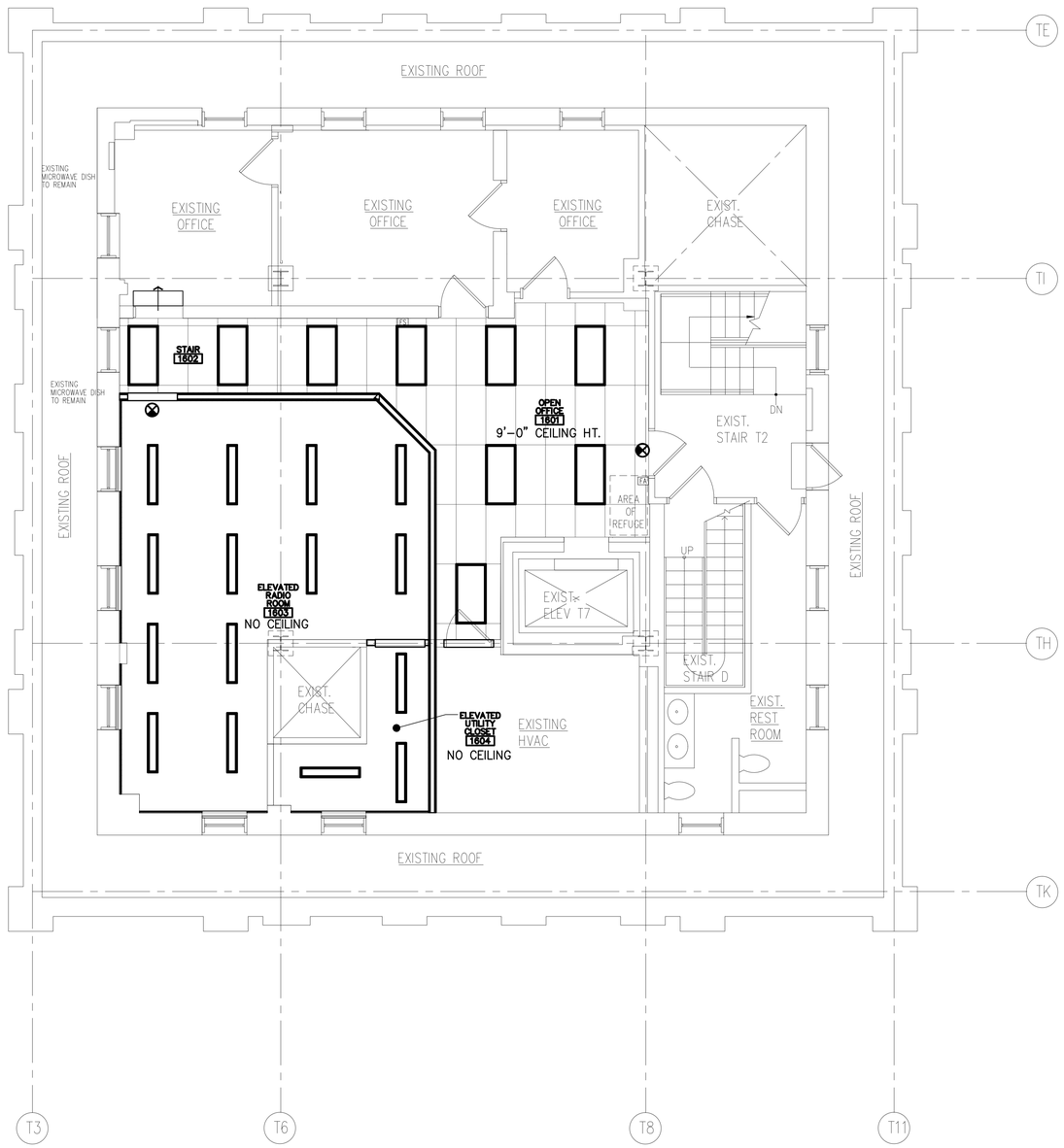
SHEET CONTENTS:

PARTITION, DOOR TYPES & MISC. DETAILS

SUBMISSIONS DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM
10.30.15	95% CD UPDATE	KD	FM
02.19.16	ISSUED FOR BID	KD	FM

REVISIONS DATE	DESCRIPTION	BY	CHKD

DATE	09-15-15
SCALE	AS SHOWN
DRWN BY	BT
CHKD BY	NJN
JOB NO	2151188
SHEET:	8 OF: 35
DWG. NO	A.301

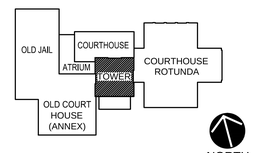


LEGEND:

- 2'x4' CEILING GRID
- 2X4 LIGHT FIXTURE
- PENDANT LIGHT FIXTURE
- MECH. SUPPLY DIFFUSER
- MECH. RETURN DIFFUSER
- WALL MOUNTED LIGHTED EXIT SIGNS

1 / A.601 SIXTEENTH FLOOR REFLECTED CEILING PLAN
SCALE: 1/4"=1'-0"

KEYPLAN



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
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

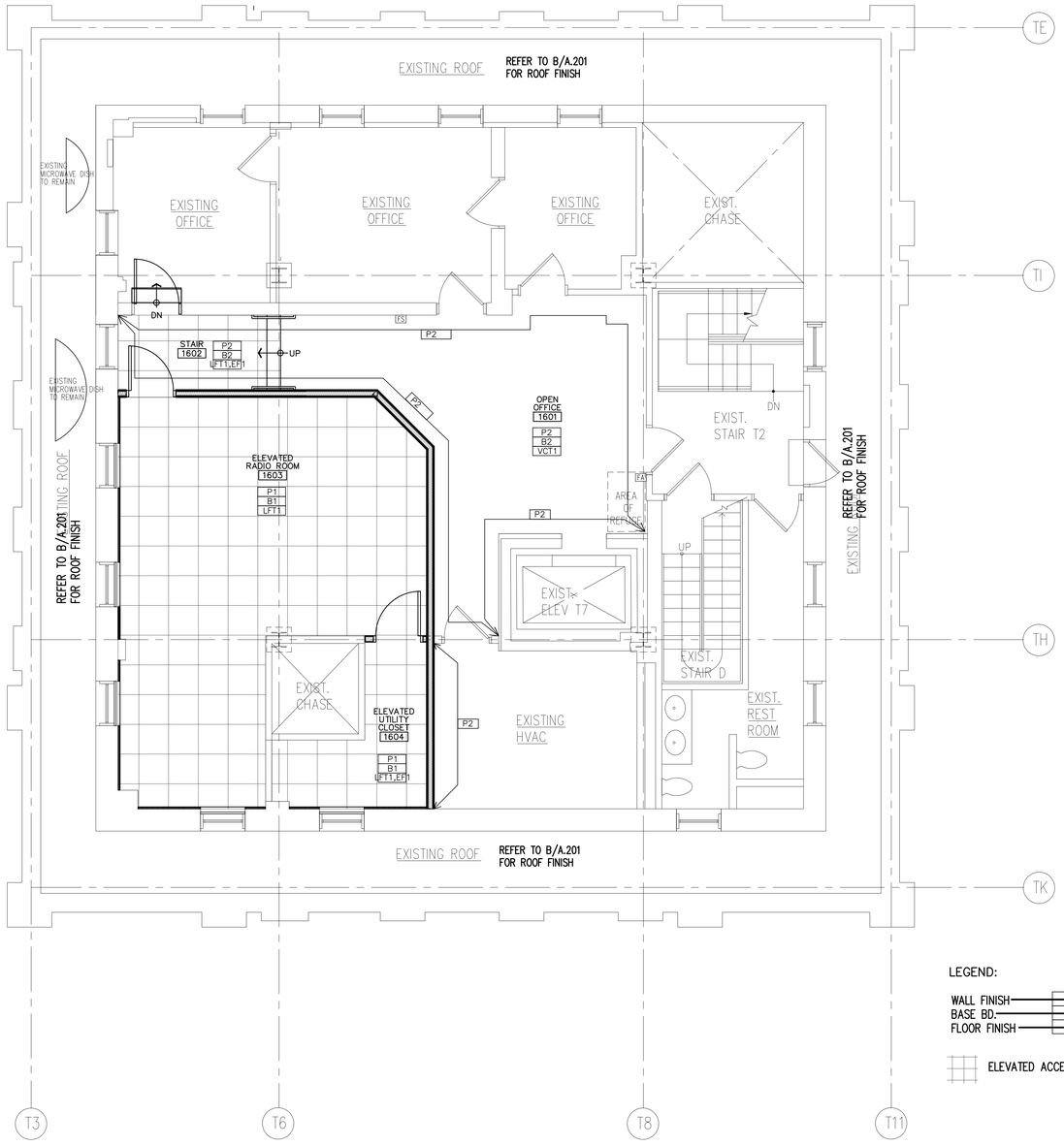
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

SIXTEENTH FLOOR REFLECTED CEILING PLAN

SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					
10.30.15	95% CD UPDATE	KD	FM					
02.19.16	ISSUED FOR BID	KD	FM					

DATE	09-15-15
SCALE	AS SHOWN
DRWN BY	BT
CHKD BY	NJN
JOB NO	2151188
SHEET:	9 OF: 35
DWG. NO	A.601



LEGEND:

WALL FINISH
BASE BD.
FLOOR FINISH

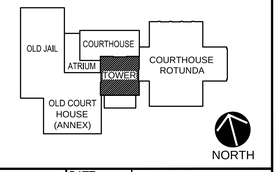
ELEVATED ACCESS PANEL

FINISH SCHEDULE

	MATERIAL	TYPE	DESCRIPTION	MANUFACTURER	CONTACT	REMARKS
FLOOR	HIGH PRESSURE LAMINATED FLOOR PANEL	LF1	HIGH PRESSURE LAMINATED FLOOR PANEL, 35 LBS, 8.75 PSF. COLOR: 1787 GRAY DUST	TATE ACCESS FLOORS, INC.	ARI PRODUCTS INC. TEL. 973-773-2777	RADIO ROOM, UTILITY/CLO. & ELEVATED STAIR. REMOVE EXIST. FLOOR FINISH & GRIND SMOOTH & CLEAN.
	VCT	VCT1	12"X12" VCT FLOORING STYLE: STANDARD EXCELON IMPERIAL TEXTURE COLOR: 519089 PEWTER	ARMSTRONG		OPEN OFFICES
BASE	RUBBER	B1	4" RUBBER WALL BASE COLOR: BLACK 6201	NORA	TOM CARROLL TEL: 973.571.9642	RADIO ROOM, ELEVATED STAIR & OPEN OFFICE
	RUBBER	B2	4" RUBBER WALL BASE COLOR: IRON SIDE GREY 6203	NORA	TOM CARROLL TEL: 973.571.9642	UTILITY CLOSET
WALL	PAINT	P1	INTERIOR ACRYLIC LATEX PAINT PROGREEN 200 EGSHELL FINISH COLOR: SW7647 CRUSHED ICE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	RADIO ROOM & UTILITY/CLO.
	PAINT	P2	INTERIOR ACRYLIC LATEX PAINT PROGREEN 200 EGSHELL FINISH COLOR: SW7653 SILVER POINTE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	OPEN OFFICES & HVAC
CEILING	ACOUSTIC CEILING PANEL	ACT1	24" X 48" X 7/8" ULTIMA HIGH-NRC 9/16" BEVELED TEGULAR ITEM No. 1945 COLOR: WHITE	ARMSTRONG	KATE WALSH TEL.: 609.240.6936	OPEN OFFICES
	PAINT	CP1	INTERIOR ACRYLIC LATEX PAINT PROGREEN 200 FLAT FINISH COLOR: CEILING WHITE	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	RADIO ROOM & UTILITY/CLO.
DOOR DOOR FRAME	METAL DOOR	DP1	INTERIOR ACRYLIC LATEX PAINT PROMAR 200 SEMIGLOSS FINISH. COLOR: TBD	SHERWIN WILLIAMS	DAVID HALL TEL: 908.309.8709	
	METAL DOOR FRAME HIGH PERFORMANCE COATINGS	DF1	SCUFF MASTER AMBIENT METALLIC MULTI-TONE PAINT FINISH SYSTEM COLOR: #AM9629	MASTER COATING TECHNOLOGIES		

1 A.701 SIXTEENTH FLOOR FINISH PLAN
SCALE: 1/4"=1'-0"

KEYPLAN



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
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

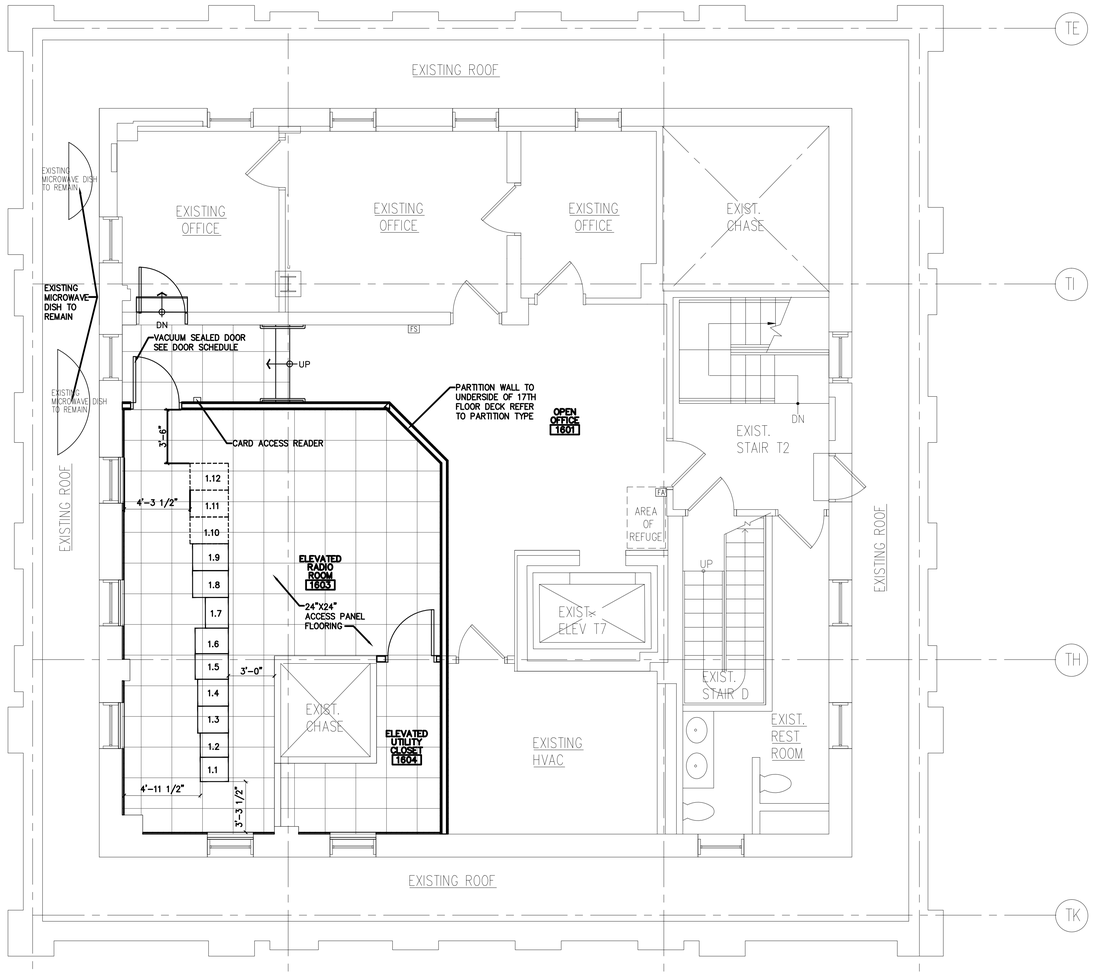
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

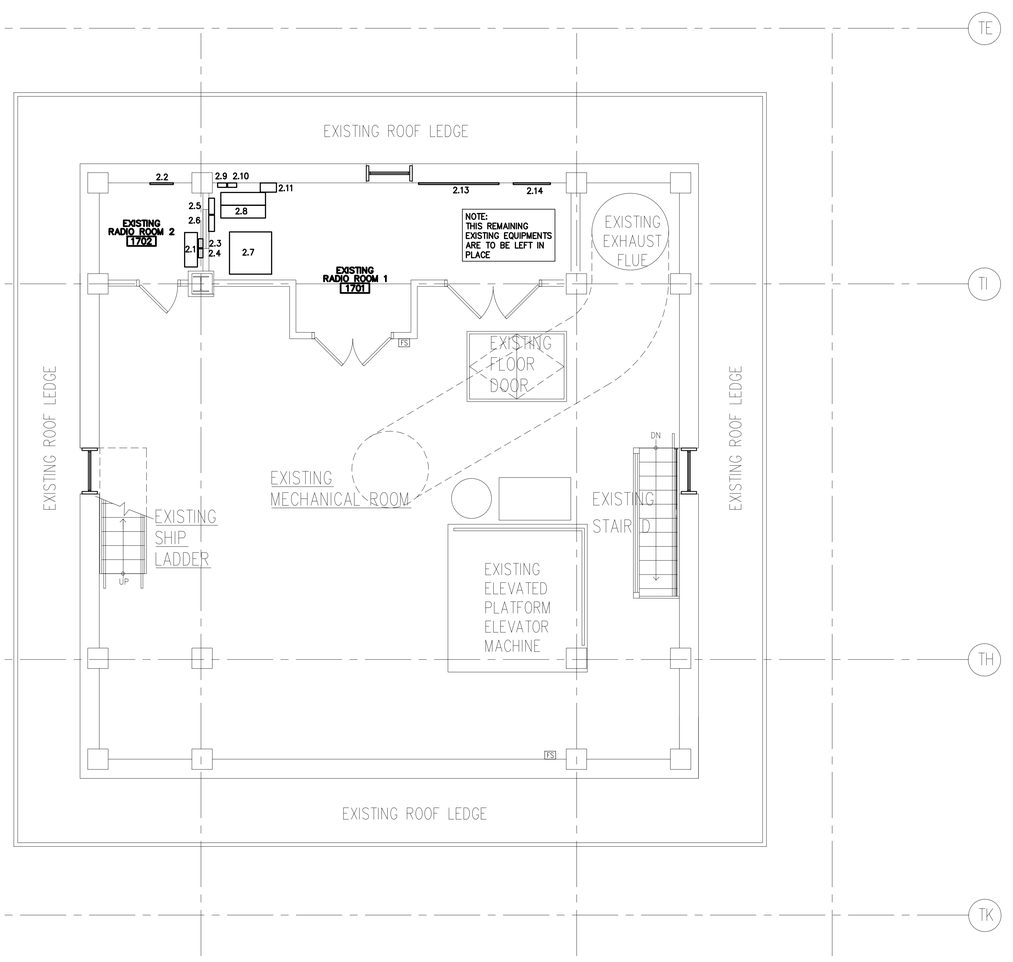
SHEET CONTENTS:

SIXTEENTH FLOOR FINISH PLAN

SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					DATE 09-15-15
10.30.15	95% CD UPDATE	KD	FM					SCALE AS SHOWN
02.19.16	ISSUED FOR BID	KD	FM					DRWN BY BT
								CHKD BY NJN
								JOB NO 2151188
								SHEET: 10 OF: 35
								DWG. NO

A.701





EQUIPMENT LEGEND:

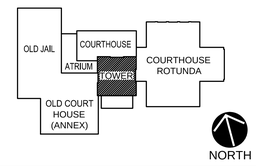
1.1 ELIZABETH FIRE BACK–UP
1.2 ELIZABETH B.O.E.
1.3 STATE & COUNTY MICROWAVE 1
1.4 STATE & COUNTY MICROWAVE 2
1.5 STATE POLICE TRUNKING 700 MHZ 1
1.6 STATE POLICE TRUNKING 700 MHZ 2
1.7 VERIZON FIBER RACK
1.8 UNION COUNTY, UHF
1.9 UNION COUNTY, UHF
1.10 SPARE
1.11 SPARE
1.12 SPARE

2.1 UPS
2.2 TELCO BOARD
2.3 FIRE/BOE PANEL
2.4 PANEL UPS
2.5 PANEL "UPS FIRE"
2.6 PANEL "EM–1"
2.7 LIEBERT "CHALLENGER 3000"
2.8 EM–1 UPS SYSTEM (2)
2.9 PANEL "UPS–1"
2.10 TRANSFER SWITCH (UPS)
2.11 5 KVA TRANSFORMER
2.12 NOT USED
2.13 VERIZON BOARD
2.14 TELCO "6TH FLOOR"

1 / A.901 SIXTEENTH FLOOR EQUIPMENT LAYOUT PLAN
SCALE: 1/4"=1'–0"

2 / A.901 17TH FLR EXISTING EQUIPMENT LAYOUT PLAN
SCALE: 1/4"=1'–0"

KEYPLAN



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
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

16TH & 17TH FLR EQUIPMENT LAYOUT PLAN

SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					DATE 09–15–15
10.30.15	95% CD UPDATE	KD	FM					SCALE AS SHOWN
02.19.16	ISSUED FOR BID	KD	FM					DRWN BY BT
								CHKD BY NJN
								JOB NO 2151188
								SHEET: 11 OF: 35
								DWG. NO

A.901

GENERAL WORK NOTES:

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE INTERNATIONAL MECHANICAL CODE (IMC), LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. CONTRACTOR SHALL WARRANTY ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
8. 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.
9. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
10. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
11. 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.
12. 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.
13. PROVIDE DUCT TRANSITION TO MATCH HVAC EQUIPMENT ACTUAL OPENINGS. DUCT TRANSITIONS SHALL BE FABRICATED WITH FLAT BOTTOMS UNLESS OTHERWISE NOTED.
14. WHERE TRANSFER DUCTS ARE INDICATED ON THE DRAWINGS, GRILLES SHALL BE PROVIDED ON BOTH SIDES OF THE WALL.
15. LOCATIONS OF ROOM THERMOSTATS/TEMPERATURE SENSOR ARE APPROXIMATE AND FINAL LOCATIONS SHALL BE COORDINATED WITH ENGINEER.
16. 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.
17. PROVIDE VALVED AND CAPPED CONNECTIONS AT ALL LOW POINTS IN PIPING SYSTEMS REQUIRED FOR DRAINING SYSTEM.
18. PROVIDE ALL AUTOMATIC OR MANUAL AIR VENTS AT ALL HIGH POINTS OF PIPING SYSTEM.
19. 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.
20. HVAC CONTRACTOR SHALL PROVIDE ALL CEILING DIFFUSERS, REGISTERS, AND GRILLES. FRAME TYPE TO MATCH CEILING CONSTRUCTION IN WHICH UNITS ARE TO BE INSTALLED.
21. HVAC AND MECHANICAL SYSTEMS/SERVICES SHALL BE MAINTAINED FULLY OPERATIONAL IN AREAS/SPACES OF AREA OF WORK DURING CONSTRUCTION.
22. 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. ALL SUPPLY DUCTWORK SHALL BE PROVIDED WITH 1-1/2", .75 #/SF DUCT WRAP INSULATION.
23. FABRICATION AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE DUCT MANUAL AND SHEET METAL CONSTRUCTION FOR VENTILATION AND AIR CONDITIONING SYSTEMS, SECTION 'LOW VELOCITY SYSTEMS" BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION.
24. FOR EXACT LOCATION AND MOUNTING HEIGHT OF CEILING DIFFUSERS REFER TO ARCHITECTURAL REFLECTED CEILING PLANS.
25. FURNISH ALL ACCESS DOORS AS INDICATED ON DRAWINGS, SPECIFIED OR AS REQUIRED. ACCESS DOORS IN CONSTRUCTION SHALL BE INSTALLED BY THE GENERAL CONTRACTOR. ACCESS DOORS IN SHEET METAL SHALL BE INSTALLED BY THE MECHANICAL CONTRACTOR. ALL ACCESS DOORS IN DUCTWORK HANDLING CONDITIONED AIR SHALL BE OF THE DOUBLE CASE PAN TYPE, FLUSH INTERIOR WITH 1 INCH FIBERGLASS BOARD SET IN BETWEEN EXTERIOR AND INTERIOR CASING. ACCESS DOORS SHALL BE AS MANUFACTURED BY "VENTFABRICS INC." OR APPROVED EQUAL.
26. AFTER THE SYSTEM IS COMPLETED, IT SHALL BE TESTED FOR SATISFACTORY OPERATION, PROPER CONTROL, ETC. TESTS SHALL BE DONE IN THE PRESENCE OF THE OWNER. ALL EQUIPMENT AND DUCTWORK SHALL BE THOROUGHLY CLEANED BEFORE THE AIR HANDLING EQUIPMENT IS PUT INTO OPERATION. AFTER THE EQUIPMENT AND DUCTWORK HAS BEEN CLEANED, THE SYSTEM SHALL BE TESTED FOR PERFORMANCE; FANS FOR RPM, STATIC PRESSURE AND AMPERAGE DRAW.
27. ALL AIR AND WATER SYSTEMS SHALL BE BALANCED TO OWNER REQUIREMENTS AS PER THE LATEST NEBB STANDARDS FOR AIR AND WATER SYSTEMS. ALL DAMPERS SHALL BE ADJUSTED INTO PROPER POSITION AND LOCKED INTO THIS POSITION. ALL REGISTERS AND CEILING OUTLETS SHALL BE ADJUSTED TO THE AIR QUANTITIES INDICATED AND ADJUSTMENTS MADE TO PROVIDE A PROPER DRAFTLESS DISTRIBUTION OF AIR. ALL WATER BALANCING AND CONTROL VALVES SHALL BE SET TO THE PROPER FLOW RATES. THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT IN TRIPLICATE THE FOLLOWING TEST DATA, AFTER ALL ADJUSTMENTS HAVE BEEN MADE TO THE SYSTEM.
    a. EQUIPMENT PERFORMANCE DATA.
    b. CFM READING AT ALL DIFFUSERS AND SUPPLY REGISTERS.
    c. FAN MOTOR AMPERAGE DRAW AND RPM.
    d. WATER FLOW RATES FOR COILS
    e. TEST CAPACITIES OF COILS
28. THE CONTRACTOR SHALL FURNISH IN WRITING TO THE OWNER, AT THE COMPLETION AND ACCEPTANCE OF THE INSTALLATION A GUARANTEE STATING THAT THE SYSTEM HAS BEEN INSTALLED IN FULL CONFORMANCE WITH THE INTENT OF THESE SPECIFICATIONS AND PLANS. THE CONTRACTOR SHALL ALSO GUARANTEE TO REPAIR AND/OR REPLACE ANY PORTION OF THE SYSTEM WHICH MAY PROVE TO BE DEFECTIVE WITHIN A 12 (TWELVE) MONTH PERIOD FROM THE DATE OF ACCEPTANCE BY THE OWNER.
29. CONTROLS: CONTRACTOR SHALL PROVIDE ALL NECESSARY CONTROLS, RELAY, WIRING, PROGRAMMING ETC. TO ARCHIVE THE SEQUENCE OF OPERATION AS SHOWN ON CONSTRUCTION DOCUMENTS. CONTRACT TO PROVIDE A CONTROLS SUBMITTAL FOR APPROVAL.

HVAC DEMOLITION GENERAL NOTES:

1. CONTRACTOR SHALL REMOVE ALL EXISTING HVAC SYSTEMS, DUCTWORK, DIFFUSERS, PIPING, CONTROL SYSTEMS, AND SUPPORTS AS INDICATED ON THE PROJECT DRAWINGS. ALL DEMOLISHED EQUIPMENT SHALL BE REMOVED OFFSITE AND DISPOSED OF IN A SAFE AND LAWFUL MANNER.
2. 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.
3. 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.
4. CONTRACTOR SHALL CAP EXISTING PIPES AND DUCTS NOT TO BE DEMOLISHED FLUSH WITH EXISTING SURFACES. SEAL OPENING AIR TIGHT.
5. 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
		EXHAUST AIR
		SUPPLY AIR DUCT OR FRESH AIR DUCT
		RETURN AIR DUCT OR EXHAUST AIR DUCT
		SUPPLY DUCT UP
		DUCT DOWN
		RETURN DUCT UP
		RETURN DOWN
		LINEAR DIFFUSER
SIZE, SERVICE (CFM)	SIZE, SERVICE (CFM)	CEILING DIFFUSER
	SIZE, TYPE (CFM)	CEILING GRILLE
		CEILING DIFFUSERS MOUNTED ON BOTTOM OF DUCT
		SUPPLY TOP REGISTER OR GRILLE
		EXHAUST OR RETURN TOP REGISTER OR GRILLE
SIZE&SERVICE (CFM)		EXHAUST CEILING REGISTER OR GRILLE
		EXHAUST FAN
10x8	10x8	NEW DUCT - WIDTH x DEPTH
	FC	FLEXIBLE CONNECTION
	UP	INCLINED RISE, IN DIRECTION OF AIR FLOW
	DN	INCLINED DROP, IN DIRECTION OF AIR FLOW
		FLEXIBLE DUCTWORK
		FLEXIBLE CONNECTION
VD	VD	VOLUME DAMPER
FD	FD	FIRE DAMPER
M	M	MOTORIZED DAMPER
		VANED ELBOW. PROVIDE ALL ELBOWS WITH VANES EVEN IF SYMBOL MISSING
		VANED ELBOW (SHORT RADIUS)
		STANDARD RADIUS ELBOW
	SD	SPLITTER DAMPER
VD	VD	TAKE OFF COLLAR
		LOUVERED DOOR
		REDUCER
	SD	DUCT SMOKE DETECTOR
	T	TEMPERATURE SENSOR (STRAP ON)
	T	TEMPERATURE SENSOR (WELL)
	FS	FLOW SWITCH
	A	AQUASTAT
	S	SPACE TEMPERATURE SENSOR
	T	SPACE THERMOSTAT

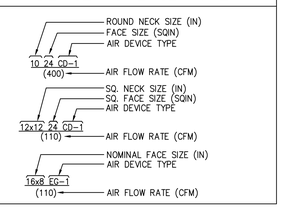
PIPING SYMBOLS

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	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
FT-A 4'-0"	FINNED-TUBE RADIATION- TYPE A EFFECTIVE HEATING ELEMENT LENGTH LINEAR FEET
	BREAK
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	HOSE BIBB
FM	FLOW METER
	VACUUM BREAKER
	AUTO AIR VENT
BFP	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)
1	REVISION NUMBER
	SECTION CUT
	SECTION LINE
# TITLE SCALE: NONE	DRAWING/DETAIL TITLE
####	ROOM NAME/NUMBER
	BREAK LINE

AIR DEVICE NOMENCLATURE



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
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
NIC	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

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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2800 FAX: 973-286-2864
WWW.ATIENGINEERING.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL
GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	02-04-16
SCALE	NONE
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	M.101

AIR DEVICE SCHEDULE

DESIGNATION	TYPE	MANUFACTURER	MODEL	FINISH	MOUNTING	MATERIAL	NOTES
FG-1	FLOOR GRILLE	TATE	GRATEAIRE-24	WHITE	IN FLOOR	ALUMINUM	1,2,3
SR-1	SUPPLY REGISTER	PRICE	LPB 15B	WHITE	WALL	ALUMINUM	3

NOTES:

1. PART OF TATE ACCESS FLOORING SYSTEM, COORDINATE WITH ARCHITECT AND MANUFACTURER.
2. PROVIDE WITH OPPOSED BLADE DAMPER.
3. ARCHITECT TO SELECT FINAL FINISH COLOR.

SPLIT SYSTEM AIR CONDITIONING SCHEDULE

GENERAL INFORMATION					SYSTEM PERFORMANCE			COOLING CAPACITY				REHEAT		HUMIDIFIER		ELECTRICAL						
UNIT DESIGNATION	LOCATION	SERVES	MANUFACTURER	MODEL	CFM	OA CFM	ESP (IN.)	TOTAL BTUH	SENSIBLE BTUH	EDB/EWB (F)	LDB/LWB (F)	kW	EAT/LAT (F)	LBS/HR	Kw	VOLT/PH/HZ	MCA	MFS	WEIGHT (LBS)	SUPPORT	DRAIN CONN	NOTES
AC-1	RADIO ROOM	RADIO ROOM	LIEBERT	BF060	3000	0	0.3	59,300	59,300	75/61	61/56	15	60/75	11	4.8	460/3/60	28.9	40	550	12" HIIGH FLOOR STAND	3/4"	1
ACCU-1	ROOF	AC-1	LIEBERT	PFH067A	-	-	-	-	-	-		-		-	-	460/3/60	14.2	20	351	EQUIPMENT RAILS	-	-
AC-2	RADIO ROOM	RADIO ROOM	LIEBERT	BF060	3000	0	0.3	59,300	59,300	75/61	61/56	15	60/75	11	4.8	460/3/60	28.9	40	550	12" HIIGH FLOOR STAND	3/4"	1
ACCU-2	ROOF	AC-2	LIEBERT	PFH067A	-	-	-	-	-	-		-		-	-	460/3/60	14.2	20	351	EQUIPMENT RAILS	-	-

NOTES

1. PROVIDE WITH DISCONNECT SWITCH, ELECTRIC REHEAT, INTEGRAL HUMIDIFIER, CONDENSATE PUMP, EMERGENCY DRAIN PAN WITH LEAK DETECTION KIT, FILTERS, AND LIEBERT vNSA8-ICOM NETWORK SWITCH/CONTROL PANEL.

EXISTING VAV BOX SCHEDULE

VAV SECTION						NOTES
UNIT NO	MANUFACTUERER	MODEL	INLET SIZE	MAX COOLING (CFM)	MIN COOLING (CFM)	
VAV-16-1	EXISTING	EXISTING	7	300	100	1
VAV-16-2	EXISTING	EXISTING	10	600	200	1
VAV-16-3	EXISTING	EXISTING	10	850	250	1

NOTES:

1. EXISTING VAV BOX SHALL BE RE-BALANCED TO CFM ON THIS SCHEDULE.

VENTILATION INDEX SCHEDULE

ROOM NAME	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
OPEN OFFICE 1601	290	4	0.06	5	37	150	ASHRAE 62.1
RADIO ROOM 1603	425	2	0.06	5	36	38	ASHRAE 62.1
CLOSET 1604	73	0	0.12	0	9	75	ASHRAE 62.1
OFFICE 1	90	1	0.06	5	10	75	ASHRAE 62.1
OFFICE 2	90	1	0.06	5	10	75	ASHRAE 62.1

NOTE: BASED ON EXISTING UNIT PROVIDING 25% OUTSIDE AIR AT MAXIMUM SUPPLY AIR CFM. UNIT CONTROLS SHALL INCREASE OUTSIDE AIR AS SUPPLY CFM DECREASES TO MAINTAIN THE MINIMUM OUTSIDE AIR PERCENTAGE.

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 ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-0900 FAX: 973-286-0904
www.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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:

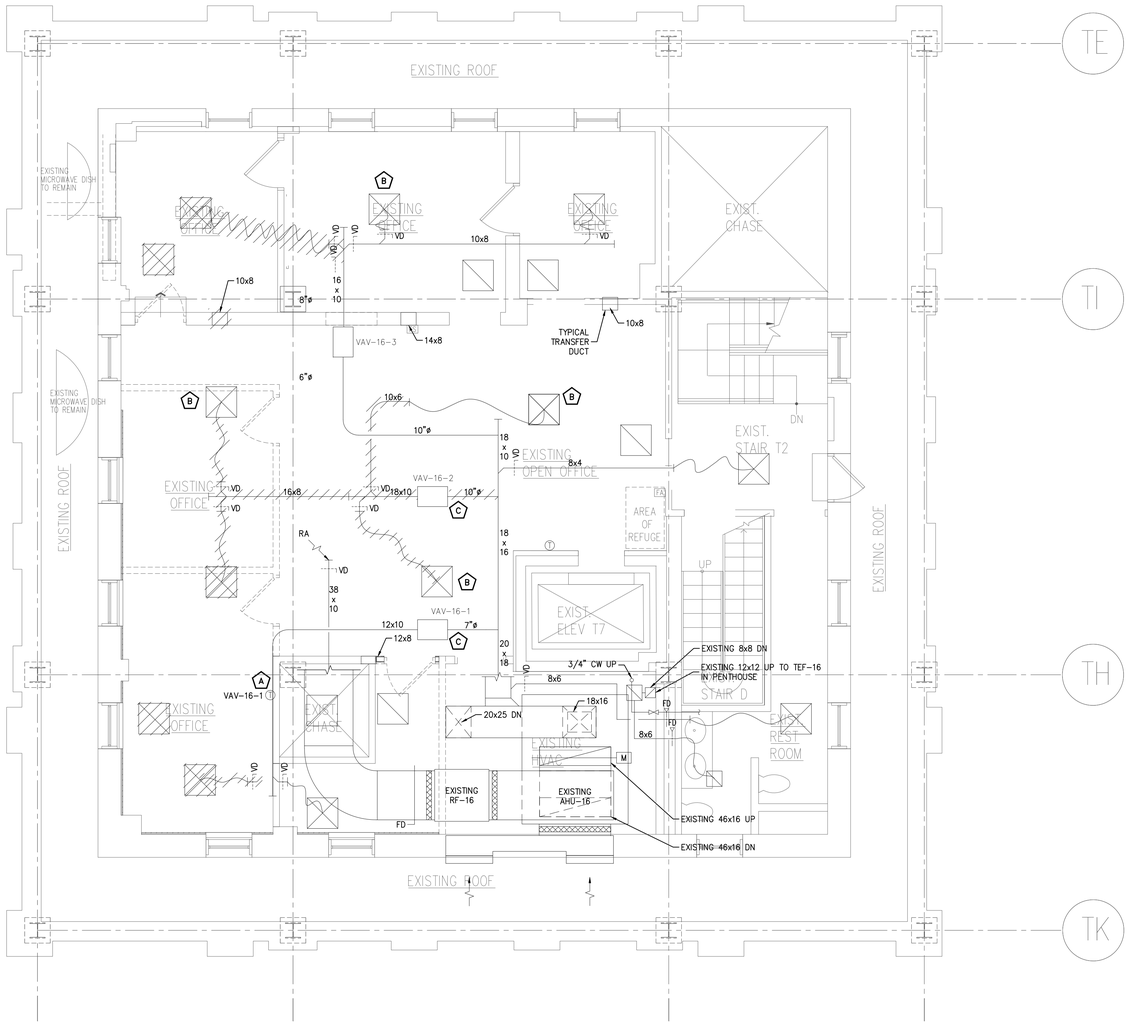
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL
SCHEDULES

SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					DATE 02-04-16
10.30.15	95% CD UPDATE	KD	FM					SCALE NONE
02.19.16	ISSUED FOR BID	KD	FM					DRWN BY RB
								CHKD BY JJH
								JOB NO 2151188
								SHEET: _ OF: 35
								DWG. NO

M.201



SIXTEENTH FLOOR – DEMOLITION PLAN

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

KEYED DEMOLITION WORK NOTES:

A. EXISTING THERMOSTAT TO BE REMOVED AND RELOCATED. SEE NEW WORK PLAN.

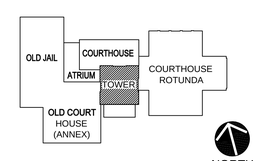
B. EXISTING AIR DEVICE TO BE RELOCATED. SEE NEW WORK PLAN. MODIFY DUCTWORK AS REQUIRED.

C. APPROXIMATE LOCATION OF EXISTING VAV BOX. EXISTING VAV BOX SHALL BE RELOCATED TO ACCOMMODATE NEW ARCHITECTURAL WALL. SEE NEW WORK PLANS.

DRAWING NOTES:

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

KEYPLAN



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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2800 FAX: 973-286-2864
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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:

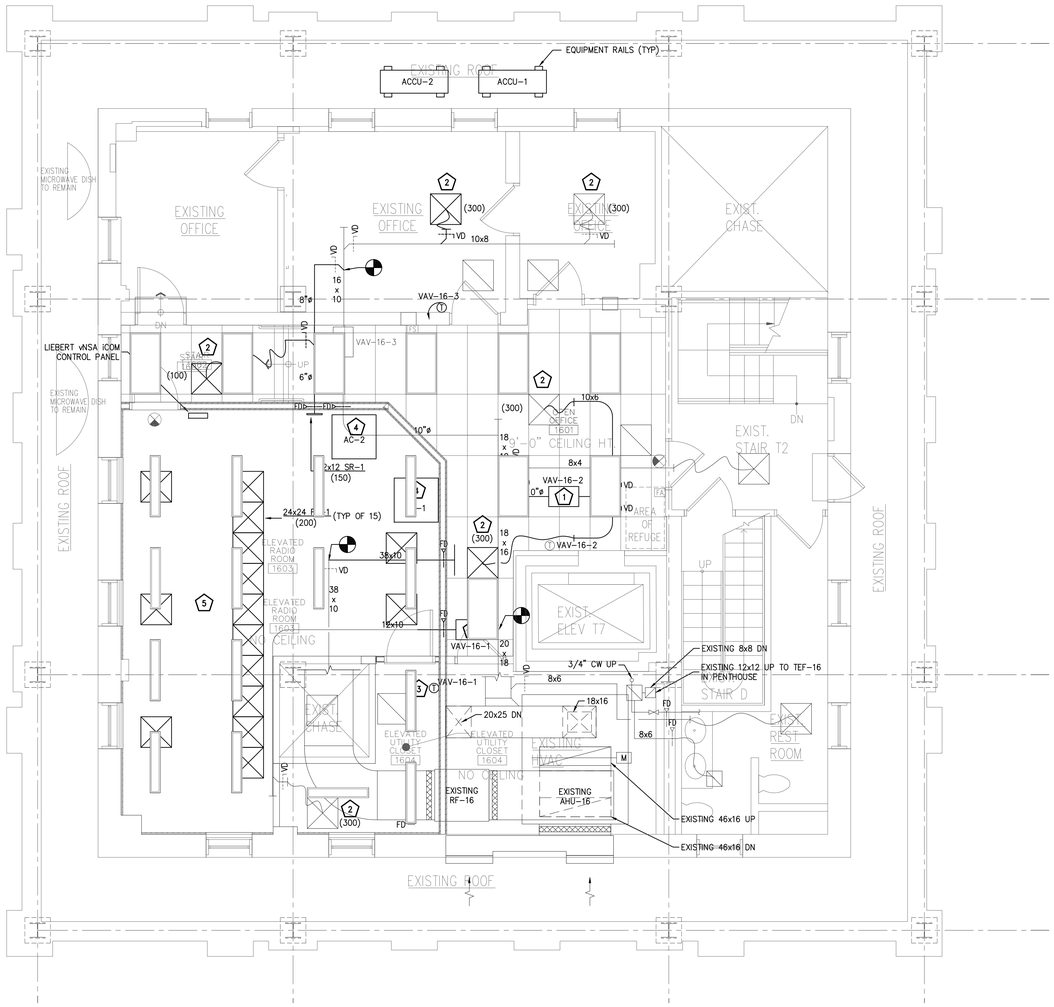
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL - DEMOLITION PLAN
SIXTEENTH FLOOR

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	DM.401



SIXTEENTH FLOOR – HVAC PLAN

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

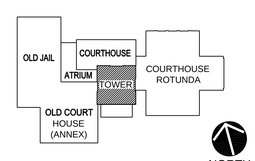
KEYED NEW WORK NOTES:

1. NEW LOCATION OF EXISTING VAV BOX. RECONNECT HOT WATER PIPING, CONTROLS, DUCTWORK, ETC. REBALANCE EXISTING VAV BOX.
2. REBALANCE EXISTING AIR DEVICE TO CFM VALUE SHOWN.
3. RELOCATED EXISTING THERMOSTAT. PROVIDE WIRING FROM THERMOSTAT TO VAV BOX.
4. NEW AC UNIT TO PLACED ON 12" HIGH FLOOR STAND FOR DOWNFLOW CONFIGURATION INTO PRESSURIZED FLOOR PLENUM.
5. PROVIDE ROOM SPACE TEMPERATURE SENSOR COMPATIBLE WITH BUILDING BMS SYSTEM AND INTEGRATE FOR ALARMING ON TEMPERATURE SET-POINT. COORDINATE ALARMING LEVELS WITH MOTOROLA AND UCC MAINTENANCE.

DRAWING NOTES:

1. REFER TO DRAWING M.101 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



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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2800 FAX: 973-286-2864
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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:

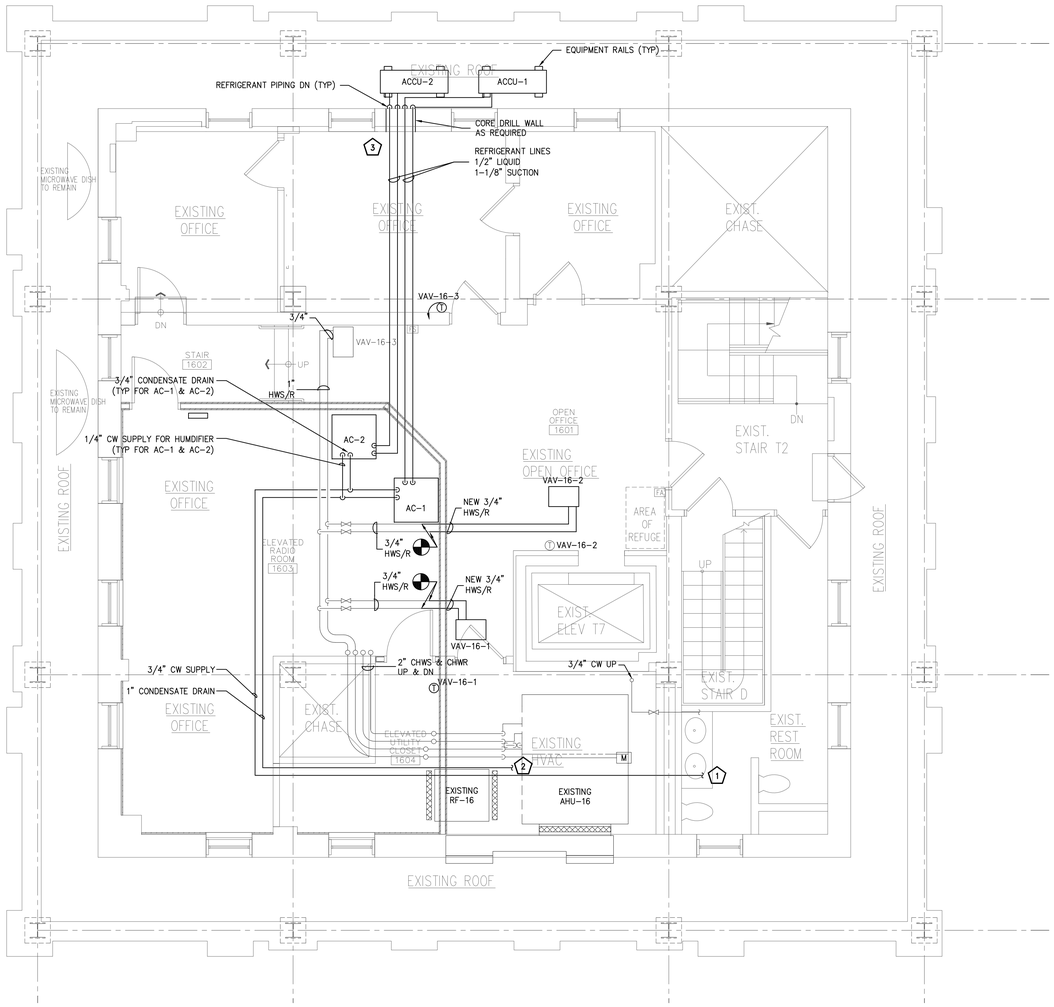
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL - HVAC PLAN
SIXTEENTH FLOOR

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	M.401



SIXTEENTH FLOOR – HVAC PIPING PLAN

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

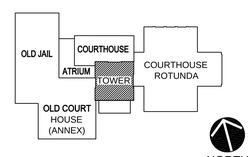
KEYED NEW WORK NOTES:

1. PROVIDE 3/4" CW SUPPLY LINE FOR UNIT HUMIDIFIERS. TIE INTO EXISTING CW LINE IN EXISTING TOILET AREA. PROVIDE WITH WATTS 9D DUAL CHECK VALVE. FIELD VERIFY EXACT LOCATION. PIPING INSTALLATION SHALL BE DONE BY A LICENSED PLUMBING CONTRACTOR.
2. 1" CONDENSATE DRAIN DOWN TO EXISTING FLOOR DRAIN IN MECHANICAL ROOM.
3. INSULATE ALL INTERIOR AND EXTERIOR LINES WITH 1" ARMAFLEX INSULATION. ANCHOR EXTERIOR LINES TO BUILDING AND SEAL INSULATION WITH PVC WEATHER JACKET.

DRAWING NOTES:

1. REFER TO DRAWING M1.01 FOR NOTES, SYMBOLS & ABBREVIATIONS.

KEYPLAN



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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2800 FAX: 973-286-2864
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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:

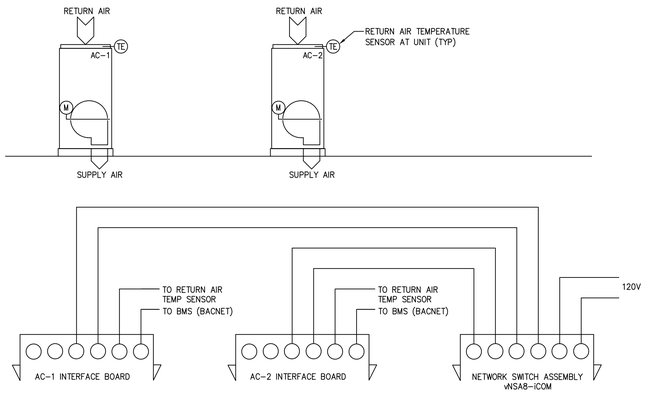
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL - PIPING PLAN
SIXTEENTH FLOOR

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	M.501



SEQUENCE OF OPERATION

AC-1 & AC-2 OPERATE IN A PRIMARY/STANDBY CONFIGURATION. SWITCH OVER SHALL BE DONE THROUGH THE LOCAL LIEBERT iCOM CONTROLLER AUTOMATICALLY WHEN A MALFUNCTION IS DETECTED WITH THE PRIMARY UNIT. UNITS SHALL ALTERNATE ONCE A WEEK BETWEEN PRIMARY AND STANDBY. OWNER SHALL ALSO HAVE THE ABILITY TO MANUALLY SWITCH UNITS FROM STANDBY TO PRIMARY.

DE-ENERGIZED

WHEN THE UNIT IS DE-ENERGIZED THE FAN AND COMPRESSORS SHALL BE DE-ENERGIZED.

TIME SCHEDULE

THE UNIT SHALL OPERATE 24 HOURS/7 DAYS.

OCCUPIED MODE

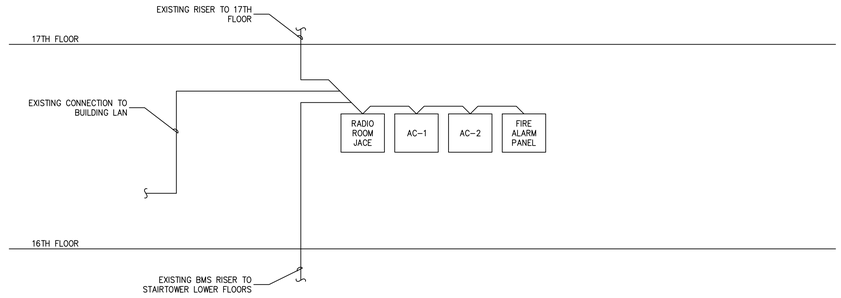
THE INDOOR FAN SHALL START AND RUN CONTINUOUSLY. THE THERMOSTAT SHALL MONITOR THE ROOM TEMPERATURE AND HUMIDITY AND CONTROL THE UNIT ACCORDINGLY.

THE SET POINTS ARE AS FOLLOWS: (COORDINATE WITH OWNER)
- OCCUPIED COOLING 70°F (ADJ.)
- OCCUPIED HEATING 66°F (ADJ.)
- RELATIVE HUMIDITY 40%-55%

iCOM SHALL BE CONFIGURED TO ACTIVATE ALARMS AT:
- TEMPERATURE HIGH LIMIT 75°F
- TEMPERATURE LOW LIMIT 60°F
- HUMIDITY HIGH LIMIT 60%
- HUMIDITY LOW LIMIT 35%

AC-1 AND AC-2 CONTROL DIAGRAM AND SEQUENCE OF OPERATION

SCALE: NONE



CONTROL RISER DIAGRAM

SCALE: NONE

CONTROL DIAGRAM ABBREVIATIONS

SYMBOL	DESCRIPTION
⊠	COMBINATION DISCONNECT MAGNETIC STARTER
—/—	SWITCH
BG	BREAKGLASS STATION
DO	DIGITAL OUTPUT
DI	DIGITAL INPUT
AI	ANALOGUE INPUT
AO	ANALOG OUTPUT
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
LCP	LOCAL CENTRAL PANEL
RC	RECEIVER CONTROLLER
TC	TIME CLOCK
S/S	START/STOP
~~	AVERAGING TUBE
FA	FIRE ALARM SIGNAL SHUTDOWN HARD WIRED BY
SP	SMOKE PURGE PANEL
LS	LEVEL SWITCH
ZS	POSITION SWITCH
CT	CURRENT TRANSDUCER
CE	CURRENT ELEMENT
TE	TEMPERATURE ELEMENT
TS	TEMPERATURE SWITCH WITH AUTO RESET
PE	PRESSURE ELEMENT
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
AL	ALARM
R	RELAY
MC	MOTOR CONTROLLER
OA	OUTSIDE AIR DRY BULB TEMPERATURE
PL	PILOT LIGHT (RED)
FS	FLOW SWITCH

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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRIC CONSULTING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2000 FAX: 973-286-2884
EMAIL:ATI@ATIENGINEERING.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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

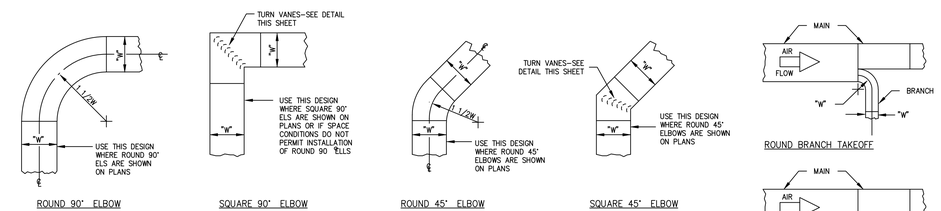
PROJECT:

UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL
CONTROL DIAGRAM

SUBMISSIONS				REVISIONS					
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	DATE	02-04-16
9.15.15	95% CD SUBMIT	KD	FM					SCALE	NONE
10.30.15	95% CD UPDATE	KD	FM					DRWN BY	RB
02.19.16	ISSUED FOR BID	KD	FM					CHKD BY	JJH
								JOB NO	2151188
								SHEET:	_ OF: 35
								DWG. NO	M.701

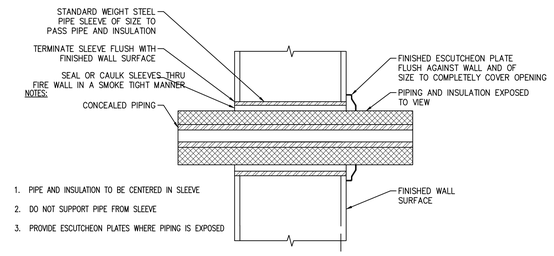


TYPICAL DETAILS OF THE LOW VELOCITY DUCT LAYOUT

SCALE: NONE

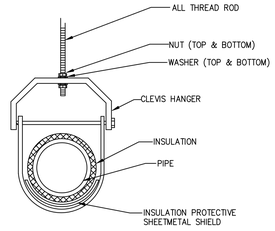
INSTALLATION NOTES

1. ALL DUCTS SHALL BE CONSTRUCTED AND ERECTED IN A NEAT AND WORKMANLIKE MANNER.
2. DUCTS SHALL BE CONSTRUCTED OF THE WEIGHTS, GAGES AND MATERIAL SHOWN IN THE SCHEDULE ON THESE DRAWINGS.
3. THE DIMENSION SHOWN FOR ALL DUCTS SHOWN IN PLAN GIVE THE WIDTH FIRST AND THEN THE HEIGHT.
4. DUCT RISERS SHOULD BE SUPPORTED BY ANGLES AT EVERY FLOOR.
5. AIR TURN SHALL BE INSTALLED IN ALL ABRUPT ELBOWS TO PREVENT TURBULENCE.
6. DUCTS SHALL BE SECURELY ATTACHED TO THE BUILDING CONSTRUCTION IN AN APPROVED MANNER.
7. DIVERGING TRANSITION PIECES SHALL BE MADE AS GRADUAL AS POSSIBLE.
8. INSTALL FIRE DAMPERS IN ACCORDANCE WITH UL 555.
9. ACCESS PANELS SHOULD BE PLACED BEFORE AND/OR AFTER EQUIPMENT INSTALLED IN THE DUCT.
10. DUCT AREA SHOULD NOT BE DECREASED MORE THAN 10 PERCENT WHEN OBSTRUCTIONS CANNOT BE AVOIDED, AND THEN A STREAMLINED FITTING SHOULD BE USED.
11. FLEXIBLE FABRIC CONNECTIONS (OR EQUAL) SHOULD BE USED ON BOTH INLETS AND OUTLETS OF ALL FANS AND AIR HANDLING UNITS.
12. JOINTS AND SEAMS OF SUPPLY DUCTS SHALL BE FASTENED SECURELY AND MADE AIR TIGHT.



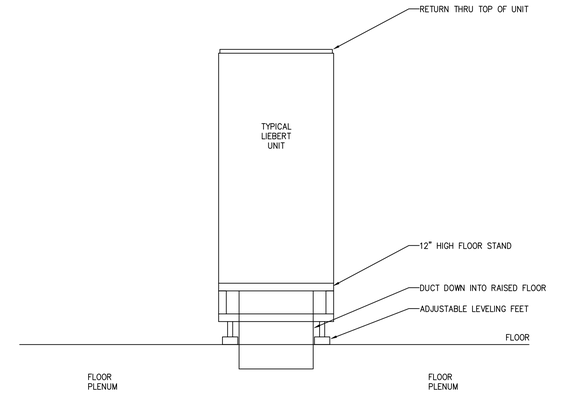
TYPICAL DETAIL
PIPE THROUGH INTERIOR WALL

SCALE: NONE



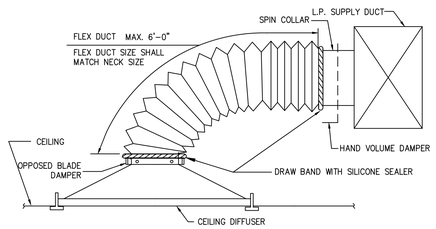
TYPICAL DETAIL
CLEVIS HANGER INSTALLATION

SCALE: NONE



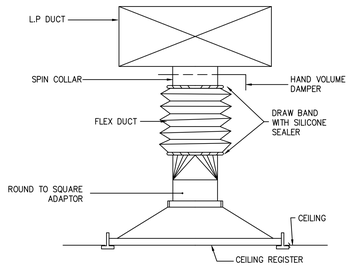
TYPICAL LIEBERT UNIT FLOOR STAND DETAIL

SCALE: NONE



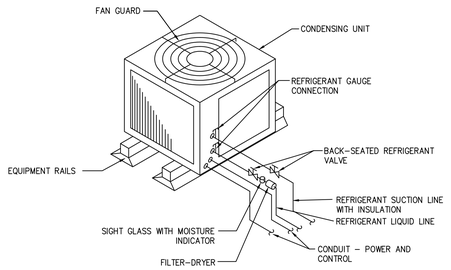
TYPICAL DIFFUSER CONNECTION
(SIDE OF DUCT CONNECTION)

SCALE: NONE



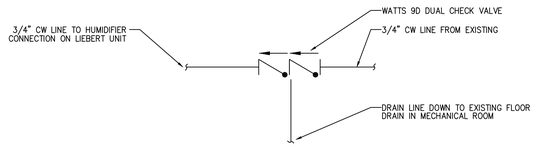
TYPICAL DIFFUSER CONNECTION
(BOTTOM OF DUCT CONNECTION)

SCALE: NONE



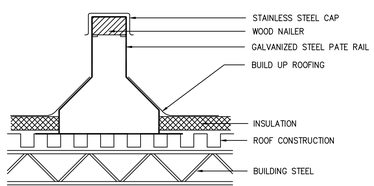
TYPICAL DETAIL
AIR-COOLED CONDENSING UNIT

SCALE: NONE



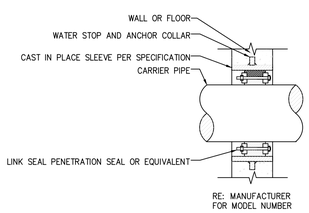
BACKFLOW PREVENTER DETAIL

SCALE: NONE



SUPPORT RAIL DETAIL

SCALE: NONE



NOTES:

1. FIRE WALLS MUST HAVE FIRE RETARDANT CALKING.

TYPICAL DETAIL
PIPE THROUGH EXTERIOR WALL

SCALE: NONE

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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2882 FAX: 973-286-2884
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

MECHANICAL
DETAILS (SHEET 1)

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	02-04-16
SCALE	NONE
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	M.801

ELECTRICAL PROJECT GENERAL NOTES:

1. INSTALL ALL WORK IN ACCORDANCE WITH THE 2011 NEW YORK CITY ELECTRICAL CODE (2008 NATIONAL ELECTRIC CODE WITH NEW YORK CITY AMENDMENTS), NY BUILDING CODE, NYC DEPARTMENT OF BUILDINGS REQUIREMENTS, NEW YORK CITY HOUSING AUTHORITY REQUIREMENTS 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.

2. 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 AUTHORITY'S REPRESENTATIVE 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.

3. AS A MINIMUM, INSTALL WORK IN ACCORDANCE WITH NECA 1-2000 STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION.

4. 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.

5. 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.

6. 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 THE 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.

7. 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.

8. CONTRACTOR'S WORK SHALL COMPLY WITH ALL SAFETY RELATED WORK PRACTICES DETAILED IN THE LATEST EDITION OF NFPA 70E.

9. 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.

10. UNDER NO CIRCUMSTANCES SHALL POWER BE INTERRUPTED TO ANY AREA WITHOUT PRIOR WRITTEN APPROVAL FROM AUTHORITY'S REPRESENTATIVE.

11. THE CONTRACTOR SHALL DEVELOP A CLEAR UNDERSTANDING OF, AND SHALL ABIDE BY, ALL OWNER SITE AND SAFETY REQUIREMENTS/PROTOCOL.

12. THE ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ALL WORK AS SHOWN ON THE PROJECT DRAWINGS AND SPECIFICATIONS WITH THE FOLLOWING STIPULATION:
    a. 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 AUTHORITY'S REPRESENTATIVE SHALL BE CONTACTED TO PROVIDE CLARIFICATION DURING THE BID PHASE.
    b. 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 AUTHORITY'S REPRESENTATIVE.

13. THE ARCHITECTURAL 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 CONTRACTOR AS REQUIRED.

14. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY. BASE BID ACCORDINGLY.

15. REFER TO PLUMBING EQUIPMENT SCHEDULES FOR NAMEPLATE INFORMATION PERTAINING TO ANY PLUMBING EQUIPMENT REQUIRING ELECTRICAL PROVISIONS. CONTRACTOR SHALL COORDINATE ALL SUCH PROVISIONS WITH PLUMBING DRAWINGS AS REQUIRED. BASE BID ACCORDINGLY.

16. 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.

17. 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.

18. 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.

19. 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.

20. 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.

21. 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.

22. CONTRACTOR SHALL INSTALL ALL EQUIPMENT WITH WORKING AND DEDICATED EQUIPMENT SPACES PER NEC 110.

23. WIRING METHODS SHALL CONFORM WITH NEC 300.

24. 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.

25. 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.

26. 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.

27. 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.

28. ALL ISOLATED GROUND CIRCUITS SHALL HAVE A DEDICATED ISOLATED GROUND CONDUCTOR INSTALLED IN ADDITION TO THE EQUIPMENT GROUND CONDUCTOR.

29. 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. OUTLET, DEVICE, PULL, AND JUNCTION BOXES; CONDUIT BODIES; FITTINGS AND HANDHOLE ENCLOSURES SHALL BE SIZED, SUPPLIED AND INSTALLED PER NEC 314.

30. ANY AND ALL TEMPORARY FACILITIES SHALL BE SUPPLIED AND INSTALLED PER NEC 590 UNDER ALL CIRCUMSTANCES.

31. 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.

32. ALL NEW WIRE SHALL BE COPPER, 600 VAC, THHN/THWN. UNLESS OTHERWISE INDICATED. ALL EQUIPMENT GROUND WIRES SHALL HAVE GREEN INSULATION.

33. 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 AUTHORITY'S REPRESENTATIVE. BASE BID ACCORDINGLY.

34. 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.

35. 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.

36. 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:

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.	

37. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING BRANCH CIRCUITS, HOME RUNS AND DEVICE TO DEVICE CONDUIT RUNS. THE CONTRACTOR SHALL BE PERMITTED TO OPTIMIZE CONDUIT RUN AND FILL CAPACITIES AT HIS OWN DISCRETION, AND ONLY IN STRICT ACCORDANCE WITH NEC CONDUIT FILL AND WIRE DERATING REQUIREMENTS.

38. UNLESS OTHERWISE SHOWN, INDICATED OR SPECIFIED, ALL CONDUIT INSTALLED INDOORS SHALL BE EMT. ALL CONDUIT INSTALLED OUTDOORS OR IN HAZARDOUS LOCATIONS SHALL BE RMC GALVANIZED STEEL. ALL CONDUIT SHALL BE INSTALLED AND SUPPORTED PER NEC 358 AND 344. ALL CONDUIT SHALL BE PROTECTED FROM CORROSION PER NEC 300.6. CONDUCTORS IN VERTICAL RACEWAYS SHALL BE SUPPORTED PER NEC 300.19. 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.

39. THERE SHALL BE ABSOLUTELY NO SHARING OF NEUTRAL CONDUCTORS UNLESS SPECIFICALLY INDICATED OTHERWISE.

40. ELECTRICAL CONTRACTOR TO BE RESPONSIBLE FOR ANY AND ALL CORE DRILLING THAT MAY BE REQUIRED FOR CONDUIT ROUTING AND INSTALLATION.

41. 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 AUTHORITY'S REPRESENTATIVE FOR THE PURPOSE OF COORDINATING THE STRUCTURAL INTEGRITY, FIRE RESISTANCE INTEGRITY, AND SPACE UTILIZATION OF NEW AND EXISTING FACILITIES.

42. UNLESS OTHERWISE DIRECTED ON THE PLANS, NO CONDUIT SHALL BE RUN EMBEDDED IN ANY FLOOR, OR RUN IN CONTACT WITH THE EARTH.

43. 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..

44. 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.

45. 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.

46. 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.

47. 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.

48. PROVIDE INSULATING BUSHINGS FOR CONDUCTOR PROTECTION AT ALL CONDUIT TERMINATIONS.

49. PROVIDE ANY AND ALL ROOF PENETRATIONS IN A MANNER APPLICABLE FOR THE ROOFING SYSTEM, AND IN A MANNER THAT MAINTAINS ANY EXISTING ROOF WARRANTY.

50. 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 CAULKING MANUFACTURER'S INSTRUCTIONS TO MAINTAIN THE MAXIMUM FIRE RESISTANCE RATINGS.

51. THE MEANS AND METHODS OF CONSTRUCTION SHALL INCLUDE ALL MISCELLANEOUS JUNCTION BOXES, CONDUIT, AND/OR RACEWAY EXTENSIONS AND APPURTENANCES REQUIRED 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.

52. 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.

53. ALL EXTERIOR, 120V, CONVENIENCE POWER RECEPTACLES SHALL BE GFCI-PROTECTED AND MOUNTED IN AN IN-USE WEATHERPROOF ENCLOSURE AS REQUIRED.

54. 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.

55. 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.

56. 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, GENERAL TRADES, 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.

57. THE CONTRACTOR SHALL DISPOSE OF ALL DEMOLISHED EQUIPMENT AND CONSTRUCTION DEBRIS OFFSITE UNLESS OTHERWISE DIRECTED BY THE OWNER OR AUTHORITY'S REPRESENTATIVE.

58. CONTRACTOR SHALL COORDINATE STORAGE OF MATERIAL, DUMPSTERS, AND PARKING WITH THE OWNER PRIOR TO MOBILIZATION.

59. 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.

60. 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.

61. PRIOR TO THE COMMENCEMENT OF WORK, ELECTRICAL POWER SHALL BE DISCONNECTED AND/OR SAFED 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.

62. 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.

63. THE CONTRACTOR SHALL PATCH ALL DISTURBED AREAS OF EXISTING FACILITIES TO A CONDITION EQUAL TO OR BETTER THAN SIMILAR ADJACENT AREAS.

64. 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.

65. 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.

66. 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.

67. 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.

68. 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 AUTHORITY'S REPRESENTATIVE.

69. UNLESS OTHERWISE INDICATED OR SPECIFIED, THE CONTRACTOR SHALL WARRANTY ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A MINIMUM PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.

ELECTRICAL PROJECT DEMOLITION NOTES:

A. 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 BASE HIS BID 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.

B. CONTRACTOR'S WORK SHALL COMPLY WITH ALL SAFETY RELATED WORK PRACTICES DETAILED IN THE LATEST EDITION OF NFPA 70E.

C. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL ELECTRICAL FACILITIES RENDERED INACTIVE OR OBSOLETE BY THE SCOPE OF THE ARCHITECTURAL 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, ELECTRICAL, AND PLUMBING DRAWINGS, AND COORDINATE WITH THE GENERAL AND PLUMBING CONTRACTOR(S), AND INCLUDE ALL ELECTRICAL DEMOLITION WORK INCLUDING, HOWEVER NOT NECESSARILY 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.

D. THE INTENT OF THE DEMOLITION WORK REQUIREMENTS INCLUDE ALL LABOR AND EQUIPMENT REQUIRED TO ATTAIN THE FINAL CONDITIONS AS SHOWN ON THE ARCHITECTURAL, PLUMBING, STRUCTURAL, CONTROL, AND ELECTRICAL NEW WORK PLANS. THE CONTRACTOR SHALL REVIEW ALL OTHER TRADE DRAWINGS, AND COORDINATE WILL ALL OTHER TRADE CONTRACTORS, AND BASE HIS BID ACCORDINGLY.

E. WHERE THE REMOVAL OF EXISTING FACILITIES RESULT IN THE DEENERGIZATION OF EXISTING REMAINING FACILITIES, THE CONTRACTOR SHALL INSTALL JUNCTION BOXES AND/OR OTHER DEVICES, PROVIDE BYPASS CONNECTIONS NECESSARY TO MAKE THE AFFECTED CIRCUITS CONTINUOUS AND READY FOR OPERATION OR AS OTHERWISE INDICATED OR INTENDED.

F. THE CONTRACTOR SHALL REMOVE AND/OR RELOCATE ALL EXISTING ELECTRICAL FACILITIES THAT INTERFERE WITH THE ARCHITECTURAL, PLUMBING, STRUCTURAL, AND ELECTRICAL LAYOUTS AND SCHEMES. REFER TO THE ARCHITECTURAL, MECHANICAL, PLUMBING AND STRUCTURAL DRAWINGS, AND COORDINATE WITH THE GENERAL, PLUMBING CONTROL CONTRACTORS.

G. PRIOR TO THE COMMENCEMENT OF WORK, ELECTRICAL POWER SHALL BE DISCONNECTED AND/OR SAFED 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 AUTHORITY'S REPRESENTATIVE.

H. TEMPORARY LIGHT STREAMERS, WHERE SPLICED, ARE TO EMPLOY COMPRESSION-TYPE FITTINGS OR SOLDERED CONNECTIONS, AND MADE UP NEATLY AND SAFELY AS REQUIRED.

I. 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.

J. 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.

K. 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 AUTHORITY'S REPRESENTATIVE PRIOR TO THE COMMENCEMENT OF WORK.

L. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL TRACE EXISTING CIRCUITS AND CONFIRM OR IDENTIFY TYPE AND LOCATION OF LOAD SERVED.

M. 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.

N. 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.

O. 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 SYSTEM WHERE APPLICABLE) INTEGRITY SHALL BE MAINTAINED AT ALL TIMES BEFORE, DURING AND AFTER DEMOLITION.

P. CONTRACTOR SHALL PERFORM THE FOLLOWING PRIOR TO THE START OF ANY TRADES DEMOLITION:
   a. 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.)
   b. 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.
   c. REVIEW LOCATIONS, CONFIGURATION AND SERVICE AREAS OF ALL FEEDER AND BRANCH CIRCUIT POWER SOURCES WITH 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.
   d. COORDINATE ALL WORK WITH AUTHORITY'S REPRESENTATIVE.

Q. EXISTING ELECTRICAL EQUIPMENT/FACILITIES WHEN REUSED, SHALL BE THOROUGHLY CLEANED AND REFURBISHED PRIOR TO REUSE. ANY AND ALL EXISTING REUSED SETSCREW-TYPE CONDUIT CONNECTORS SHALL BE THOROUGHLY TIGHTENED.

ABBREVIATIONS

ABBREV.	DESCRIPTION
A, AMPS	AMPERE
AC	ALTERNATING CURRENT
AC-1	AIR CONDITIONING UNIT #1
ACCU-1	AIR-COOLED CONDENSING UNIT 1
A/C	AIR CONDITIONING
AHC	ABOVE HUNG CEILING
AHU-1	AIR HANDLING UNIT #1
AIC	AMPERE INTERRUPTING CAPACITY
AF/AT	AMPERE FRAME/AMPERE TRIP
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AP	ANNUNCIATOR PANEL
ARCH	ARCHITECTURAL
AS/AF	AMPERE SWITCH/AMPERE FUSE
ATM	AUTOMATED TELLER MACHINE
AV	AUDIO/VISUAL
AVPS	AUDIO/VISUAL POWER STRIP
AWG	AMERICAN WIRE GAUGE
BG	BREAK GLASS
BO	BY OTHERS
C	CONDUIT/COIL
CAB	CABINET
CAM	CAMERA
CAT	CATEGORY
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CH	COUNTER HEIGHT
CKT(S)	CIRCUIT(S)
CL	CLOSET
CLG	CEILING
CM	CONSTRUCTION MANAGER / CONTROL MODULE
CONST	CONSTRUCTION
CO	CERTIFICATE OF OCCUPANCY / COMPANY / CONDUIT ONLY
COL	COLUMN
COMP/CPT	COMPUTER
CONF	CONFERENCE
CORR	CORRIDOR
CP	CONTROL PANEL/COMPUTER PANELBOARD
CP1-A	(CP) COMP. PNL, (1) 1ST FL, (-A) SCT A
CR	CONTROL RELAY
CRS	COLD ROLLED STEEL
CS	CONTROL STATION
C/T, CT	CURRENT TRANSFORMER
CT-1	COOLING TOWER #1
CU	COPPER
CUH	CABINET UNIT HEATER
CWP-1	CONDENSATE WATER PUMP #1
DE	DEMO EXISTING
DH	DOOR HOLDER
DISC	DISCONNECT
DIST	DISTRIBUTION
DP	DISTRIBUTION PANEL
DP1-B	(DP) DIST. PNL, (1) 1ST FL, (-B) SCT B
DPG	(DP) DISTRIBUTION PANEL, (G) GENERATOR
D/S, DS	DISTRIBUTION SECTION
DWH-1	DOMESTIC WATER HEATER #1
DWG	DRAWING
E	EXISTING
EC	ELECTRICAL CONTRACTOR / EMPTY CONDUIT
ECUH	ELECTRIC CABINET UNIT HEATER
EDPB	(EDP) EM. DIST. PNL, (B) BASEMENT
EF-1	EXHAUST FAN #1
EG	EQUIPMENT GROUND
EH	ELECTRIC HEAT
ELEC	ELECTRIC
EM	EMERGENCY
EMT	ELECTRIC METALLIC TUBING
EP	EMERGENCY PANEL

ABBREV.	DESCRIPTION
EP1-A	(EP) EM. PNL, (1) 1ST FL, (-A) SCT A
ER	EXISTING RELOCATED
ETB	EQUIPMENT TERMINAL BLOCK/BOX
ETR	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
EXH	EXHAUST
EXIST	EXISTING
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FAU	FAUCET
FBO	FURNISHED BY OTHERS
FL	FLOOR
FMC	FLEXIBLE METALLIC CONDUIT
FS	FILE SERVER
G	GROUND / GROUND
GA	GAUGE
GAL	GALLON
GAVL	GALVANIZED
GEN	GENERATOR
GFI, GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GI	GREASE INTERCEPTOR
GND	GROUND
H	HEIGHT
HP	HORSEPOWER
HWCP	HOT WATER CIRCULATING PUMP
HWH	HOT WATER HEATER
IC	INTERRUPTING CAPACITY
IDF	INTERMEDIATE DISTRIBUTION FR
IG	ISOLATED GROUND
I/L	INTERLOCKED
JB	JUNCTION BOX
KHU	KITCHEN HOOD UNIT
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWH	KILOWATT HOUR
L	LENGTH
LC	LIGHTING CONTACTOR
LP	LIGHTING PANELBOARD
LP1-A	(LP) LTG. PNL, (1) 1ST FL, (-A) SCT A
LFMC	LIQUID FLEXIBLE METALLIC COND.
LTG	LIGHTING
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MC	MECHANICAL CONTRACTOR
MCM	THOUSAND CIRCULAR MILLS
MD	MOTORIZED DAMPER
MDP	MAIN DISTRIBUTION PANELBOARD
MDF	MAIN DISTRIBUTION FRAME
MECH	MECHANICAL
MGCV	MASTER GAS CONTROL VALVE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MP	MECHANICAL PANEL
MM	MONITOR MODULE
MP1-A	(MP) MEC. PNL, (1) 1ST FL, (-A) SCT A
MDS	MAIN DISTRIBUTION SWITCHBOARD
MS	METER SOCKET
MSD	METER SERVICE DISCONNECT
MTD	MOUNTED
MW	MICROWAVE OVEN
N	NEW
N, NEU	NEUTRAL
NA N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NDB	NIGHT DEPOSIT BOX
NEC	NATIONAL ELECTRICAL CODE
NFPA	NATIONAL FIRE PROTECTION ASS.
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN

ABBREV.	DESCRIPTION
NTS	NOT TO SCALE
OC	ON CENTER
P	POLE
OCPD	OVERCURRENT PROTECTION DEV.
PB	PULL BOX
PNL	PANEL
PP	POWER PANELBOARD
PT	POTENTIAL TRANSFORMER / PNEUMATIC TUBE SYSTEM
PTR	PRINTER
RA	RANGE
RC	RICE COOKER
RE	RELOCATE EXISTING
REC	RECEPTACLE
REF, REFRIG	REFRIGERATOR
RGS	RIGID GALVANIZED STEEL
RM	ROOM
RMC	RIGID METALLIC CONDUIT
RNC	RIGID NON-METALLIC CONDUIT
RP	RECEPTACLE PANEL
RP1-A	(RP) REC. PNL, (1) 1ST FL, (-A) SCT A
RTU	ROOF-TOP UNIT
SAC-1	SPLIT AIR CONDITIONING UNIT #1
SCH	SCHEDULE
SEC	SECURITY
SHD	SHUT DOWN
SP	SPARE
SPD	SURGE PROTECTION DEVICE
SS	STAINLESS STEEL
SSB	SOLID STATE BALLAST
STD	STANDARD
SW	SWITCH
SWBD	SWITCHBOARD
TC	TIME CLOCK
TCO	TEMPORARY CERT. OF OCC.
TELCO	TELEPHONE COMPANY
TELE	TELEPHONE
TR	TAMPER RESISTANT
TS	TAMPER SWITCH
TV	TELEVISION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TX-1	TOILET EXHAUST FAN #1
TYP	TYPICAL
UC	UNDERCOUNTER
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES
UM	UTILITY METER
UON	UNLESS OTHERWISE NOTED
UTP	UNSHIELDED TWISTED PAIR
V	VOLT
VA	VOLT-AMPERE
W	WIRE / WIDTH / WALL-MOUNTED
WC	WATER COOLER
WF	WATER FOUNTAIN
W/	WITH
WP	WEATHERPROOF
WT	WIRE TROUGH
ø	PHASE

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

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

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL
GENERAL NOTES & ABBREVIATIONS

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	02-04-16
SCALE	NONE
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.101

SYMBOL LEGEND

POWER AND LIGHTING

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. CN – INDICATES CIRCUIT NUMBER(S) XA – WHEN USED DENOTED OVERCURRENT DEVICE AMPERE TRIP RATING YP – WHEN USED DENOTES NUMBER OF OVERCURRENT DEVICE POLES ZV – WHEN USED DENOTES SUPPLY SYSTEM VOLTAGE VA – WHEN USED DENOTES VOLT–AMPERE LOAD LOC – WHEN USED DENOTES HOMERUN'S FINAL DESTINATION "IG" – WHEN USED DENOTES ISOLATED GROUND REQUIRED
	INTERMEDIATE BRANCH CIRCUIT WIRING WHERE SHOWN, NUMBER OF TIC MARKS INDICATES THE QUANTITY OF CURRENT CARRYING CONDUCTORS.
	SINGLE WALL POWER RECEPTACLE
	SINGLE WALL POWER RECEPTACLE – ABOVE COUNTER
	SINGLE FLOOR POWER RECEPTACLE
	SINGLE CEILING POWER RECEPTACLE
	DUPLEX WALL POWER RECEPTACLE
	DUPLEX WALL POWER RECEPTACLE – ABOVE COUNTER
	DUPLEX FLOOR POWER RECEPTACLE
	DUPLEX CEILING POWER RECEPTACLE
	DUPLEX POWER RECEPTACLE – MOUNTED WITHIN SURFACE RACEWAY
	QUAD WALL POWER RECEPTACLE
	QUAD WALL POWER RECEPTACLE – ABOVE COUNTER
	QUAD FLOOR POWER RECEPTACLE
	QUAD CEILING POWER RECEPTACLE
	QUAD POWER RECEPTACLE – MOUNTED WITHIN SURFACE RACEWAY
	QUAD WALL POWER RECEPTACLE – SPLIT WIRED
	QUAD WALL POWER RECEPTACLE – SPLIT WIRED – ABOVE COUNTER
	QUAD POWER RECEPTACLE – SPLIT WIRED – MOUNTED WITHIN SURFACE RACEWAY
	STRAIGHT BLADE, 2–POLE, 3–WIRE, 15/20 AMP (PER BRANCH CIRCUIT AMPACITY), 125–VOLT, NEMA 5–20R. SUBSCRIPT "WP" – INDICATES WEATHERPROOF ENCLOSURE W/ WEATHERPROOF LIFT COVER PLATE. SUBSCRIPT "GFI" – INDICATES WITH CLASS 'A' GROUND FAULT CIRCUIT INTERRUPTER. SUBSCRIPT "HG" – INDICATES UNIT SHALL BE LISTED AS HOSPITAL GRADE. SUBSCRIPT "TR" – INDICATES UNIT SHALL BE LISTED AS TAMPER RESISTANT. SUBSCRIPT "XP" – INDICATES EXPLOSION–PROOF. SUBSCRIPT "FM" – INDICATES FURNITURE MOUNTED (COORDINATE WITH FURNITURE VENDOR). SUBSCRIPT "IG" – INDICATES ISOLATED GROUND. SUBSCRIPT "DED" – INDICATES DEDICATED CIRCUIT. SUBSCRIPT "CPT" – 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. SUBSCRIPT "TV" – INDICATES FOR TV MONITOR MOUNTED AT 7'–6" AFF. # SUBSCRIPT – WHEN USED DENOTES PANEL AND/OR CIRCUIT NUMBER.
NEMA XX	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.
	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.
	MULTI–SERVICE CEILING BOX – SEPARATE POWER AND DATA COMPARTMENTS, WITH POWER AND DATA RECEPTACLES AS SHOWN ON THE DRAWINGS OR AS OTHERWISE REQUIRED.
PP	MULTI–SERVICE POWER POLE – SEPARATE POWER AND DATA COMPARTMENTS, WITH POWER AND DATA RECEPTACLES AS SHOWN ON THE DRAWINGS OR AS OTHERWISE REQUIRED.
(N)	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.
(N)	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.
J XX	JUNCTION BOX – WALL MOUNTED – "WP" INDICATES WEATHERPROOF ENCLOSURE W/ WEATHERPROOF LIFT COVER PLATE. SUBSCRIPT "CLG" DENOTES CEILING MOUNTED. SUBSCRIPT "FLR" DENOTED FLOOR MOUNTED. SUBSCRIPT "XP" INDICATES EXPLOSION–PROOF. # SUBSCRIPT WHEN USED DENOTES PANEL AND/OR CIRCUIT NUMBER.
ETB XX XX	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.
	SURFACE RACEWAY – ABOVE COUNTER.
	SURFACE RACEWAY – BELOW COUNTER.
T 30/3	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.
30/3	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.
30/30/3	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.

POWER AND LIGHTING (CONTINUED)

SYMBOL	DESCRIPTION
A/S 30/30/3	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 GFCI SERVICE RECEPTACLE. INSTALLED IN NEMA–1 ENCLOSURE UNLESS OTHERWISE NOTED. SUBSCRIPT 'WP' INDICATES WEATHERPROOF (NEMA–3R ENCLOUSURE).
	MAGNETIC CONTACTOR RATED AND AS SHOWN ON THE DRAWINGS.
J 30/3	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. 30/3 INDICATES 30–AMP SWITCH, 3–POLE). 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).
J 30/3	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).
X AF X AT MANUF MOD KAIC	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
X AS	NON–FUSIBLE DISCONNECT SWITCH 3 POLE UNLESS OTHERWISE NOTED X AS – INDICATES SWITCH AMPERE RATING
X AS X AF	FUSIBLE DISCONNECT SWITCH 3 POLE UNLESS OTHERWISE NOTED X AS – INDICATES SWITCH AMPERE RATING X AF – INDICATES FUSE AMPERE RATING
30AF	FUSE RATED AS SHOWN ON DRAWINGS (EG. 30AF INDICATES 30 –AMP FUSE AMPERE RATING)
	WIRE TROUGH/SPLICE BOX. SIZE AS REQUIRED TO MEET CODE REGULATIONS
T1 T1	DISTRIBUTION TRANSFORMER. RATING AS NOTED IN DRAWINGS. SUBSCRIPT INDICATES TRANSFORMER DESIGNATION
	3–PHASE SECONDARY WYE–CONNECTION (GROUNDED)
	GROUND ELECTRODE
3	CURRENT TRANSFORMER. SUBSCRIP DENOTES QUANTITY
M UM	KILOWATT HOUR METER. 'UM' DENOTES UTILITY METER, 'SM' DENOTES SUBMETER.
	GROUNDING BUS
2	UTILIZATION EQUIPMENT MOTOR, NUMBER INDICATES HORSE POWER RATING.
$S_1^{(a)}$	SINGLE POLE AC TOGGLE SWITCH – (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. SUBSCRIPT "K" WHEN USED DENOTES KEY–TYPE SWITCH.
$S_3^{(a)}$	THREE WAY AC TOGGLE SWITCH – (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. SUBSCRIPT "K" WHEN USED DENOTES KEY–TYPE SWITCH.
$S_4^{(a)}$	FOUR WAY AC TOGGLE SWITCH – (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. SUBSCRIPT "K" WHEN USED DENOTES KEY–TYPE SWITCH.
$S_{SP}^{(a)}$	SPECIAL PURPOSE SWITCH – FLUSH MOUNTED, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED. SUBSCRIPT "K" WHEN USED DENOTES KEY–TYPE SWITCH. AS SPECIFIED OR INDICATED ON THE DRAWINGS.
$S_1^{(a)}$	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. FINISHES AS SELECTED BY THE ARCHITECT.
$S_3^{(a)}$	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. FINISHES AS SELECTED BY THE ARCHITECT.
$D_{1\,F}^{(R)(a)}$	SINGLE POLE DIMMER – FLUORESCENT – MINIMUM VOLTAGE PER CIRCUIT CHARACTERISTICS – SLIDE–TO–OFF DIMMER, (R) DENOTES CAPACITY RATING, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED.
$D_{1\,I}^{(R)(a)}$	SINGLE POLE DIMMER – INCANDESCENT – MINIMUM VOLTAGE PER CIRCUIT CHARACTERISTICS – SLIDE–TO–OFF DIMMER, (R) DENOTES CAPACITY RATING, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED.
$D_{3\,F}^{(R)(a)}$	THREE WAY DIMMER – FLUORESCENT – MINIMUM VOLTAGE PER CIRCUIT CHARACTERISTICS – SLIDE–TO–OFF DIMMER, (R) DENOTES CAPACITY RATING, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED.
$D_{3\,I}^{(R)(a)}$	THREE WAY DIMMER – INCANDESCENT – MINIMUM VOLTAGE PER CIRCUIT CHARACTERISTICS – SLIDE–TO–OFF DIMMER, (R) DENOTES CAPACITY RATING, (a) SUBSCRIPT INDICATES LIGHTING FIXTURES TO BE CONTROLLED, SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED.
$OS^{(a)}$ (XX)	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. SUBMIT FINISHES TO ARCHITECT FOR SELECTION, AS SPECIFIED OR SCHEDULED.
DCS	DIMMING CONTROL STATION, SUBSCRIPT "M" WHEN USED DENOTES MASTER UNIT, SUBSCRIPT "R" WHEN USED DENOTES REMOTE UNIT
M	MOTORIZED ACTUATOR
PB	PUSH BUTTON SWITCH
LVT	LOW VOLTAGE TRANSFORMER

POWER AND LIGHTING (CONTINUED)

SYMBOL	DESCRIPTION
BT	BELL TRANSFORMER
C	DOOR CHIME
O 60"	DOOR CHIME PUSHBUTTON, INCHES INDICATES HEIGHT ABOVE FINISHED GRADE TO THE CENTER OF THE DEVICE.
T	THERMOSTAT
PP	FLUSH MOUNTED PANELBOARD RATED AS SHOWN IN DRAWINGS. SUBSCRIPT INDICATES PANEL DESIGNATION.
PP	SURFACE MOUNTED PANELBOARD RATED AS SHOWN ON DRAWINGS. SUBSCRIPT INDICATES PANEL DESIGNATION. DASHED LINE IN FRONT OF PANEL REPRESENT THE WORKING CLEARANCES AS PER NEC–2002, ARTICLE 110.26. TYPICAL FOR ALL ELECTRICAL EQUIPMENT.

FIRE DETECTION AND ALARM SYSTEM

SYMBOL	DESCRIPTION
FACP	FIRE ALARM CONTROL PANEL
DACT	DIGITAL ALARM COMMUNICATOR TRANSMITTER
RPS	REMOTE POWER SUPPLY
RAS	REMOTE/SIGNALING/TEST STATION
RAP	REMOTE FIRE ALARM SYSTEM ANNUNCIATOR
FCO	FUSE CUTOUT PANEL
F	MANUAL PULL STATION WITH INTEGRAL ADDRESSABLE MODULE.
H_Y	ADA COMPLIANT AUDIBLE ALARM NOTIFICATION APPLIANCE. (Y – MIN. UL dBA RATINGS)
V_X	ADA COMPLIANT VISUAL ALARM NOTIFICATION APPLIANCE. (X – MIN. UL CANDELA RATINGS)
$F_{X\,Y}$	ADA COMPLIANT COMBINATION AUDIBLE AND VISUAL ALARM NOTIFICATION APPLIANCE. (X – MIN. UL CANDELA RATINGS) (Y – MIN. UL dBA RATINGS)
$S_{B/A}$	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.
$H_{B/A}$	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.
$S/H_{B/A}$	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.
SDD S,R	PHOTOELECTRIC TYPE ADDRESSABLE (OR WITH ADDRESSABLE MODULE) DUCT SMOKE DETECTOR (S – SUPPLY, R – RETURN, X – SERVING EQUIPMENT, Y – CONTROL VOLTAGE)
SFD S,R	COMBINATION SMOKE/FIRE DAMPER (S – SUPPLY, R – RETURN, X – SERVING EQUIPMENT, Y – CONTROL VOLTAGE)
SD S,R	SMOKE DAMPER (S – SUPPLY, R – RETURN, X – SERVING EQUIPMENT, Y – CONTROL VOLTAGE)
TS	FIRE PROTECTION SYSTEM TAMPER SWITCH (PROVIDED BY OTHERS)
FS	FIRE PROTECTION SYSTEM FLOW SWITCH (PROVIDED BY OTHERS)
IM	ADDRESSABLE INTERFACE MODULE
CM	ADDRESSABLE CONTROL MODULE
RM	ADDRESSABLE RELAY MODULE

MISCELLANEOUS

SYMBOL	DESCRIPTION
SP	CEILING MOUNTED JUNCTION BOX FOR SPEAKER. PROVIDE 1" CONDUIT FROM EACH SPEAKER LOCATION TO SPEAKER CONTROL PANEL.
▷	DATA OUTLET WITH 1" EMPTY CONDUIT TO ABOVE HUNG CEILING OR TO UNDER RAISED FLOOR AS NOTED AND TERMINATE WITH BUSHING U.O.N.
▶	TELEPHONE OUTLET WITH 1" EMPTY CONDUIT TO ABOVE HUNG CEILING OR TO UNDER RAISED FLOOR AS NOTED AND TERMINATE WITH BUSHING U.O.N. F DENOTES FURNITURE MOUNTED. "W" DENOTES WALL PHONE.
▶	COMBINATION TEL/DATA OUTLET WITH 1" EMPTY CONDUIT TO ABOVE HUNG CEILING OR TO UNDER RAISED FLOOR AS NOTED AND TERMINATE WITH BUSHING U.O.N.
	TELE/DATA OUTLET – MOUNTED WITHIN SURFACE RACEWAY, TELE/DATA JACK(S) AND WIRING BY OTHERS.
TC	TIME CLOCK AS REQUIRED.
PC	DUSK TO DAWN PHOTOCELL AS REQUIRED.
LCS	LIGHTING CONTROL SYSTEM EQUIPMENT AS REQUIRED.
OLCS	OUTDOOR LIGHTING CONTROL SYSTEM EQUIPMENT AS REQUIRED.
CR	CARD READER (BY OTHERS). PROVIDE 3/4"C TO JBOX IN AN ACCESSIBLE LOCATION AHC. HOOKUP TO DOOR CONTROL EQUIPMENT BY E.C. & DOOR VENDOR.
ML	MAGNETIC DOOR LOCK (BY OTHERS). PROVIDE 3/4"C TO JBOX IN AN ACCESSIBLE LOCATION AHC. HOOKUP TO DOOR CONTROL EQUIPMENT BY OTHERS.
ES	ELECTRIC DOOR STRIKE (BY ELECTRICAL CONTRACTOR), VENDOR "ADAMS RITE" OR APPROVED EQUAL. PROVIDE 3/4"C TO JBOX IN AN ACCESSIBLE LOCATION AHC. HOOKUP TO DOOR CONTROL EQUIPMENT BY E.C. & DOOR VENDOR.
DS	DOOR CONTACT (BY OTHERS). PROVIDE 3/4"C TO JBOX IN AN ACCESSIBLE LOCATION AHC. HOOKUP TO DOOR CONTROL EQUIPMENT BY E.C. & DOOR VENDOR.

MISCELLANEOUS (CONTINUED)

SYMBOL	DESCRIPTION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION EQUIPMENT AS REQUIRED.
LC X	LIGHTING CONTACTOR. (X – CONTACTOR REFERENCE)
ELCD (X)	EMERGENCY LIGHTING CONTROL DEVICE. ((X) – SWITCHING DESIGNATION)
INV	EMERGENCY LIGHTING INVERTER
SC	SECURITY CAMERA. PROVIDE JUNCTION BOX AND 3/4"C TO ACCESSIBLE LOCATION AHC.
H	SECURITY HOLD–UP ALARM BUTTON (BY OTHERS). FOR INFORMATIONAL PURPOSES ONLY.
S	SECURITY SENSOR (BY OTHERS) FOR INFORMATIONAL PURPOSES ONLY
IR	INFRARED SECURITY SENSOR (BY OTHERS). FOR INFORMATIONAL PURPOSES ONLY.
KP	SECURITY KEY PAD (BY OTHERS). FOR INFORMATIONAL PURPOSES ONLY.
AL	ALARM LAMP (BY OTHERS). FOR INFORMATIONAL PURPOSES ONLY.
AP	ALARM PULL STATION (BY OTHERS). FOR INFORMATIONAL PURPOSES ONLY.
SPK XX	SPEAKER – SUBSCRIPT "CLG" DENOTES CEILING MOUNTED. FOR INFORMATIONAL PURPOSES ONLY. REFER TO ELECTRICAL DETAILS FOR FURTHER INFORMATION.
VC	VOLUME CONTROL, FOR INFORMATIONAL PURPOSES ONLY. REFER TO ELECTRICAL DETAILS FOR FURTHER INFORMATION.
RAS	RADIO RECEIVER, FOR INFORMATIONAL PURPOSES ONLY. REFER TO ELECTRICAL DETAILS FOR FURTHER INFORMATION.
	EMERGENCY EXIT SIGN
X1	EMERGENCY LIGHTS

GENERAL SYMBOLS

SYMBOL	DESCRIPTION
	CENTER LINE
	EXISTING CONSTRUCTION & EQUIPMENT
	EXISTING TO BE REMOVED
	NEW WORK
	BREAK
	END CAP
	CONNECT TO EXISTING
	REMOVE FROM EXISTING
	PIPE/CONDUT PITCH
	DIRECTION OF FLOW
	PIPE/CONDUIT BREAK DOUBLE LINE
#	WORK NOTE
	REVISION CLOUD (AREA OF CHANGE)
	REVISION NUMBER
	SECTION CUT
	SECTION LINE
TITLE SCALE: NONE	DRAWING/DETAIL TITLE
Ø	DIAMETER

SYMBOL LEGEND NOTES:

SUBSCRIPT "CLG" – 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.

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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL, ELECTRICAL, PLUMBING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973–286–2800 FAX: 973–286–2864
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.378.0008 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

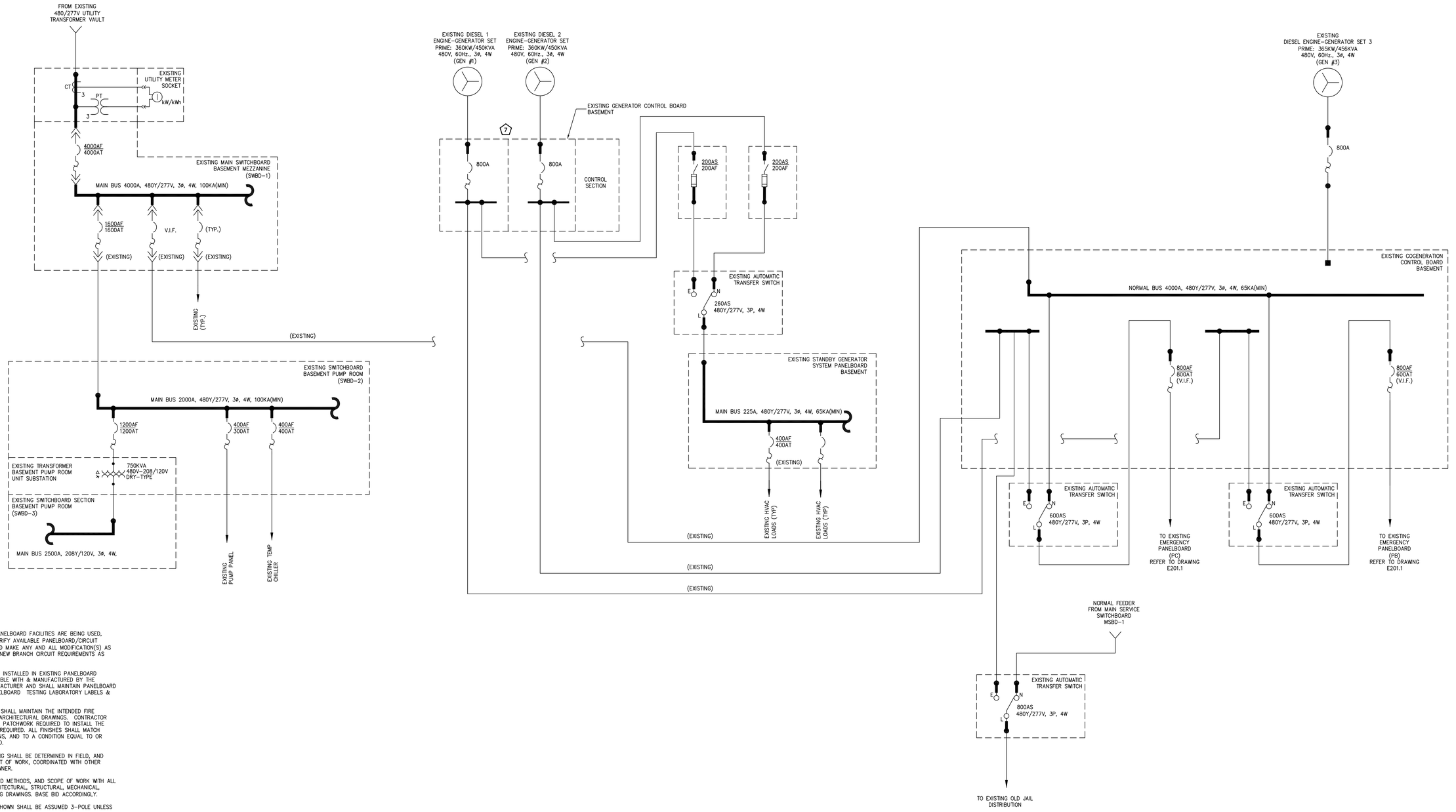
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL
SYMBOL LEGENDS

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	02–04–16
SCALE	NONE
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.102



DRAWING NOTES:

1. IN CASES WHERE EXISTING PANELBOARD FACILITIES ARE BEING USED, CONTRACTOR SHALL FIELD VERIFY AVAILABLE PANELBOARD/CIRCUIT BREAKER SPACE/SPARES, AND MAKE ANY AND ALL MODIFICATION(S) AS REQUIRED TO ACCOMMODATE NEW BRANCH CIRCUIT REQUIREMENTS AS INTENDED.
2. ALL NEW CIRCUIT BREAKER(S) INSTALLED IN EXISTING PANELBOARD FACILITIES SHALL BE COMPATIBLE WITH & MANUFACTURED BY THE EXISTING PANELBOARD MANUFACTURER AND SHALL MAINTAIN PANELBOARD KAIC RATINGS, AND ALL PANELBOARD TESTING LABORATORY LABELS & LISTINGS.
3. 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.
4. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND OWNER.
5. 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.
6. ALL OVERCURRENT DEVICES SHOWN SHALL BE ASSUMED 3-POLE UNLESS OTHERWISE INDICATED.
7. ALL CONDUCTORS SHALL BE COPPER, UNLESS OTHERWISE INDICATED OR SHOWN.
8. PROVIDE ARC FLASH WARNING SIGNAGE AT ALL NEW ELECTRICAL DISTRIBUTION EQUIPMENT FACILITIES AS PER NEC 110.16.
9. PRIOR TO PREPARING FINAL TYPED PANELBOARD CIRCUIT DIRECTORIES, CONTRACTOR SHALL MEASURE PHASE LOADS (TRUE RMS) OF NEW AND EXISTING PANEL BOARDS UTILIZED TO COMPLETE THE CONTRACT WORK, AND BALANCE NEW LOAD AS REQUIRED.
10. PROVIDE NEW TYPED CIRCUIT DIRECTORIES OF THE "AS-BUILT" CIRCUITING CONDITIONS FOR ALL NEW AND EXISTING PANELBOARDS.
11. REFER TO ALL APPLICABLE PANEL AND EQUIPMENT SCHEDULES FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
12. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
13. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES AND ABBREVIATIONS.
14. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

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 ENGINEERS
24 COMMERCIAL BLVD. SUITE 100 NOVATO, CALIFORNIA 94949
VOICE: 415-382-1880 FAX: 415-382-1884
EMAIL@ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENGERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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:

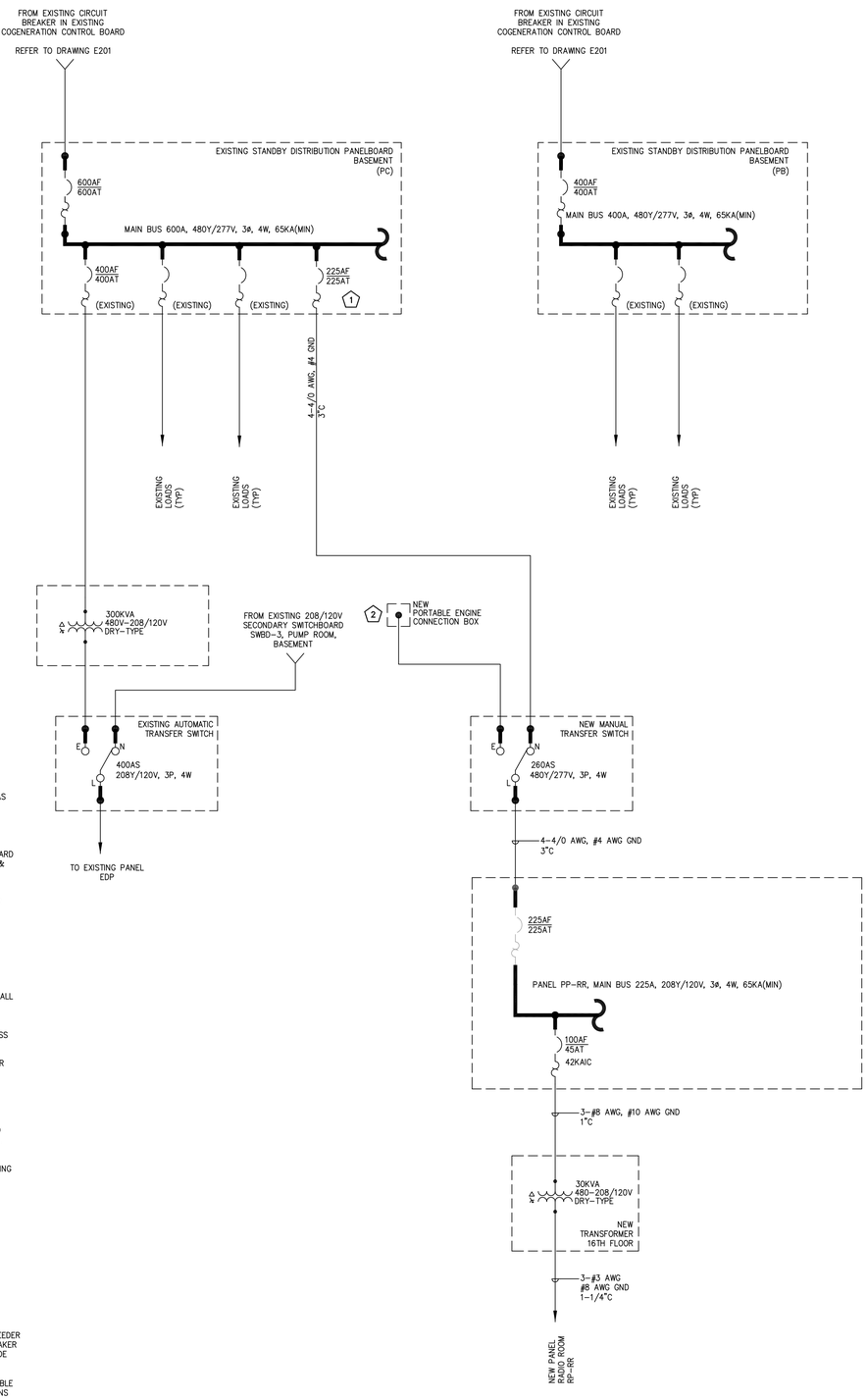
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL
ONE LINE DIAGRAMS

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	02-04-16
SCALE	NONE
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.201



DRAWING NOTES:

1. IN CASES WHERE EXISTING PANELBOARD FACILITIES ARE BEING USED, CONTRACTOR SHALL FIELD VERIFY AVAILABLE PANELBOARD/CIRCUIT BREAKER SPACE/SPARES, AND MAKE ANY AND ALL MODIFICATION(S) AS REQUIRED TO ACCOMMODATE NEW BRANCH CIRCUIT REQUIREMENTS AS INTENDED.
2. ALL NEW CIRCUIT BREAKER(S) INSTALLED IN EXISTING PANELBOARD FACILITIES SHALL BE COMPATIBLE WITH & MANUFACTURED BY THE EXISTING PANELBOARD MANUFACTURER AND SHALL MAINTAIN PANELBOARD KAIC RATINGS, AND ALL PANELBOARD TESTING LABORATORY LABELS & LISTINGS.
3. 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.
4. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND OWNER.
5. 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.
6. ALL OVERCURRENT DEVICES SHOWN SHALL BE ASSUMED 3-POLE UNLESS OTHERWISE INDICATED.
7. ALL CONDUCTORS SHALL BE COPPER, UNLESS OTHERWISE INDICATED OR SHOWN.
8. PROVIDE ARC FLASH WARNING SIGNAGE AT ALL NEW ELECTRICAL DISTRIBUTION EQUIPMENT FACILITIES AS PER NEC 110.16.
9. PRIOR TO PREPARING FINAL TYPED PANELBOARD CIRCUIT DIRECTORIES, CONTRACTOR SHALL MEASURE PHASE LOADS (TRUE RMS) OF NEW AND EXISTING PANEL BOARDS UTILIZED TO COMPLETE THE CONTRACT WORK, AND BALANCE NEW LOAD AS REQUIRED.
10. PROVIDE NEW TYPED CIRCUIT DIRECTORIES OF THE "AS-BUILT" CIRCUITING CONDITIONS FOR ALL NEW AND EXISTING PANELBOARDS.
11. REFER TO ALL APPLICABLE PANEL AND EQUIPMENT SCHEDULES FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
12. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
13. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES AND ABBREVIATIONS.
14. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

KEYED ONE LINE NOTES:

1. CONTRACTOR SHALL PROVIDE NEW BRANCH CIRCUIT BREAKER AND FEEDER FROM EXISTING EMERGENCY PANEL-BOARD AS INDICATED. NEW BREAKER SHALL MAINTAIN EXISTING PANEL-BOARD RATINGS AND SHALL INCLUDE ALL ACCESSORIES (BUS FINGERS, EXTENSIONS, ETC).
2. CONTRACTOR SHALL PROVIDE OUTDOOR TYPE, WEATHERPROOF PORTABLE ENGINE CONNECTION BOX. ENCLOSURE SHALL HAVE BUS CONNECTIONS WITH MECHANICAL CONNECTORS FOR PHASE, NEUTRAL, AND GROUND CONDUCTORS FROM PORTABLE ENGINE. ENCLOSURE SHALL HAVE GROMMETED OPENING IN BOTTOM FOR ROUTING OF CABLES SO THAT DOOR CAN BE CLOSED. PROVIDE HINGED DOUBLE DOOR ON FRONT OF ENCLOSURE WITH INDICATION WHEN EACH BUS IS ENERGIZED. AS WELL ENCLOSURE SHALL HAVE PROVISIONS FOR LOCKING.

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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCIAL BLVD. SUITE 100 NOVATO, CALIFORNIA 94949
VOICE: 973-285-1260 FAX: 973-285-2604
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENGERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL
ONE LINE DIAGRAMS

SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					
10.30.15	95% CD UPDATE	KD	FM					
02.19.16	ISSUED FOR BID	KD	FM					

DATE	02-04-16
SCALE	NONE
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.201.1

PANELBOARD CIRCUITING SCHEDULE

PANELBOARD NAME: RP-RR — **PANELBOARD LOCATION: 16TH FLR RADIO ROOM**

CKT NO.	DESCRIPTION	LOAD (VA)	CIRCUIT BREAKER FRAME (A)	CIRCUIT BREAKER TRIP (A)	CIRCUIT BREAKER POLES	NOTES	WIRE AND RACEWAY	POLE	LINE	POLE	WIRE AND RACEWAY	NOTES	CIRCUIT BREAKER FRAME (A)	CIRCUIT BREAKER TRIP (A)	CIRCUIT BREAKER POLES	LOAD (VA)	DESCRIPTION	CKT NO.
1	ESS RACK UPS	1,992	100	20	1	1,2,3,7	2-#12AWG,#12AWG G,3/4"C	1	L1	2	2-#10AWG,#10AWG G,3/4"C	1,2,3,7	100	30	1	1400	MW RACK RECTIFIER	2
3	ESS RACK UPS	1,992	100	20	1	1,2,3,7	2-#12AWG,#12AWG G,3/4"C	3	L2	4	2-#10AWG,#10AWG G,3/4"C	1,2,3,7	100	30	1	1400	MW RACK RECTIFIER	4
5	ESS RACK UPS	1,992	100	20	1	1,2,3,7	2-#12AWG,#12AWG G,3/4"C	5	L3	6	2-#12AWG,#12AWG G,3/4"C	1,2,3,7	100	20	1	429	ELIZABETH RACK 1 TRACK	6
7	ESS RACK UPS	1,992	100	20	1	1,2,3,7	2-#12AWG,#12AWG G,3/4"C	7	L1	8	2-#12AWG,#12AWG G,3/4"C	1,2,3,7	100	20	1	816	ELIZABETH RACK 2 TRACK	8
9	ESS RACK UPS	1,992	100	20	1	1,2,3,7	2-#12AWG,#12AWG G,3/4"C	9	L2	10	2-#12AWG,#12AWG G,3/4"C	1,2,3,7	100	20	1	900	GENERAL RECEPTACLES	10
11	ESS RACK UPS	1,992	100	20	1	1,2,3,7	2-#12AWG,#12AWG G,3/4"C	11	L3	12	2-#12AWG,#12AWG G,3/4"C	1,2,3,7	100	20	1	500	MECHANICAL CONTROL POWER	12
13	MW RACK TRACK	300	100	20	1	1,2,3,7	2-#12AWG,#12AWG G,3/4"C	13	L1	14	2-#12AWG,#12AWG G,3/4"C	1,2,3,7	100	20	1	500	BMS PANEL	14
15	MW RACK RECTIFIER	1,400	100	30	1	1,2,3,7	2-#10AWG,#10AWG G,3/4"C	15	L2	16	2-#12AWG,#12AWG G,3/4"C	1,2,3,6,7	100	20	1	500	FIRE ALARM PANEL	16
17	MW RACK RECTIFIER	1,400	100	30	1	1,2,3,7	2-#10AWG,#10AWG G,3/4"C	17	L3	18	-	-	100	20	1	0	SPARE	18
19	MW RACK TRACK	300	100	20	1	1,2,3,7	2-#12AWG,#12AWG G,3/4"C	19	L1	20	-	-	100	20	1	0	SPARE	20
21	SPARE	0	100	20	1	-	-	21	L2	22	-	-	100	20	1	0	SPARE	22
23	SPARE	0	100	20	1	-	-	23	L3	24	-	-	100	20	1	0	SPARE	24
25	SPARE	0	100	20	1	-	-	25	L1	26	-	-	100	20	1	0	SPARE	26
27	SPARE	0	100	20	1	-	-	27	L2	28	-	-	100	20	1	0	SPARE	28
29	SPARE	0	100	20	1	-	-	29	L3	30	-	-	100	20	1	0	SPARE	30
31	SPARE	0	100	20	1	-	-	31	L1	32	-	-	100	20	1	0	SPARE	32
33	SPARE	0	100	20	1	-	-	33	L2	34	-	-	100	20	1	0	SPARE	34
35	SPARE	0	100	20	1	-	-	35	L3	36	-	-	100	20	1	0	SPARE	36
37	SPARE	0	100	20	1	-	-	37	L1	38	-	-	100	20	1	0	SPARE	38
39	SPARE	0	100	20	1	-	-	39	L2	40	-	-	100	20	1	0	SPARE	40
41	SPARE	0	100	20	1	-	-	41	L3	42	-	-	100	20	1	0	SPARE	42

CONNECTED LOAD SUMMARY		
PHASE	VA	AMPS
L1	7,300	#VALUE!
L2	8,184	#VALUE!
L3	6,313	#VALUE!
THREE-PHASE CONNECTED LOAD	21,797	#VALUE!

PANEL CONSTRUCTION:
INCOMING SERVICE: 208V/120V VOLTS, 3-PHASE, 4-WIRE
FEEDER SIZE: REFER TO THE ONE LINE DIAGRAM
MAIN BUS: 100A
MAIN LUGS: N/A
MAIN BREAKER: 100A
BRANCH BREAKER RATINGS AS INDICATED ABOVE
ASSEMBLY WITHSTAND/INTERRUPTING RATING: 22KAIC SYM.
MOUNTING: SURFACE

PANELBOARD SPECIFICATIONS

42 CKT, 42 1-POLE SPACES, 24" (W) X 80"(H) X 7.75"(D), NEMA TYPE 1, BOTTOM FED, FLUSH-MTD WITH DOOR-IN-DOOR PANEL WITH LOCKING/LATCHING DOOR, COPPER BUS, SOLID NEUTRAL WITH REMOVABLE BONDING STRAP, CIRCUIT DIRECTORY PER AS-BUILT, PANEL IDENTIFICATION NAME PLATE. 75°C DEVICE TERMINALS. CONTINUOUSLY RATED DEVICES AT 40°C AMBIENT, BRANCH CIRCUIT BREAKERS AS REQUIRED. PROVIDE W/ LUGS FOR TVSS UNIT CONNECTION. PROVIDE REQUIRED MARKINGS PER NEC 110.22 AND 240.86 AS REQUIRED. FULLY-RATED. PER SIEMENS P3-SERIES PANELBOARD OR APPROVED EQUAL.

SCHEDULE NOTES:

1.) 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.
2.) PRIOR TO COMMENCEMENT OF WORK, COORDINATE FINAL BRANCH CIRCUIT EQUIPMENT AND DEVICE LOCATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, AND APPROVED MILLWORK SHOP DRAWINGS.
3.) CONTRACTOR SHALL PROVIDE BRANCH CIRCUIT BREAKER AS REQUIRED.
4.) CONTROLLED CIRCUIT OPERATION REQUIRED. PROVIDE CONTROLLABLE BRANCH CIRCUIT BREAKER AS REQUIRED.
5.) THIS CIRCUIT SERVES A PATIENT CARE AREA. THEREFORE, ALL BRANCH CIRCUIT WIRING METHODS SHALL EMPLOY TWO-PART, REDUNDANT GROUNDING PROVISIONS PER NEC 517.13(A) AND 517.13(B).
6.) PROVIDE A LISTED BREAKER BLOCKING DEVICE IN ORDER TO PREVENT INADVERTENT BREAKER OPERATION, WHILE MAINTAINING PROPER TRIPPING FUNCTIONS.
7.) 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 CIRCUITING SCHEDULE

PANELBOARD NAME: PP-RR — **PANELBOARD LOCATION: 16TH FLOOR RADIO ROOM**

CKT NO.	DESCRIPTION	LOAD (VA)	CIRCUIT BREAKER FRAME (A)	CIRCUIT BREAKER TRIP (A)	CIRCUIT BREAKER POLES	NOTES	WIRE AND RACEWAY	POLE	LINE	POLE	WIRE AND RACEWAY	NOTES	CIRCUIT BREAKER FRAME (A)	CIRCUIT BREAKER TRIP (A)	CIRCUIT BREAKER POLES	LOAD (VA)	DESCRIPTION	CKT NO.
1	AC-1	7,675	100	40	3	1,2,3,7	4-#8AWG,#10AWG G,3/4"C	1	L1	2	4-#8AWG,#10AWG G,3/4"C	1,2,3,7	100	40	3	7675	AC-2	2
								3	L2	4								
								5	L3	6								
3	ACCU-1	3,771	100	20	3	1,2,3,7	4-#12AWG,#12AWG G,3/4"C	7	L1	8	4-#12AWG,#12AWG G,3/4"C	1,2,3,7	100	20	3	3771	ACCU-2	4
								9	L2	10								
								11	L3	12								
5	RP-RR (THROUGH 30 KVA TRANSFORMER)	0	100	45	3	1,2,3,7	3-#8AWG,#10AWG G,3/4"C	13	L1	14	2-#12AWG,#12AWG G,3/4"C	-	100	20	1	1275	GENERAL LIGHTING	6
								15	L2	16	-	-	100	20	1	0	SPARE	8
								17	L3	18	-	-	100	20	1	0	SPARE	10
7	SPARE	0	100	20	1	-	-	19	L1	20	-	-	100	20	1	0	SPARE	12
9	SPARE	0	100	20	1	-	-	21	L2	22	-	-	100	20	1	0	SPARE	14
11	SPARE	0	100	20	1	-	-	23	L3	24	-	-	100	20	1	0	SPARE	16
13	SPARE	0	100	20	1	-	-	25	L1	26	-	-	100	20	1	0	SPARE	18
15	SPARE	0	100	20	1	-	-	27	L2	28	-	-	100	20	1	0	SPARE	20
17	SPARE	0	100	20	1	-	-	29	L3	30	-	-	100	20	1	0	SPARE	22
19	SPARE	0	100	20	1	-	-	31	L1	32	-	-	100	20	1	0	SPARE	24
21	SPARE	0	100	20	1	-	-	33	L2	34	-	-	100	20	1	0	SPARE	26
23	SPARE	0	100	20	1	-	-	35	L3	36	-	-	100	20	1	0	SPARE	28
25	SPARE	0	100	20	1	-	-	37	L1	38	-	-	100	20	1	0	SPARE	30
27	SPARE	0	100	20	1	-	-	39	L2	40	-	-	100	20	1	0	SPARE	32
29	SPARE	0	100	20	1	-	-	41	L3	42	-	-	100	20	1	0	SPARE	34

CONNECTED LOAD SUMMARY		
PHASE	VA	AMPS
L1	24,167	87
L2	0	0
L3	0	0
THREE-PHASE CONNECTED LOAD	24,167	29

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: 22 SYM.
MOUNTING: SURFACE

PANELBOARD SPECIFICATIONS

42 CKT, 42 1-POLE SPACES, 24" (W) X 80"(H) X 7.75"(D), NEMA TYPE 1, BOTTOM FED, FLUSH-MTD WITH DOOR-IN-DOOR PANEL WITH LOCKING/LATCHING DOOR, COPPER BUS, SOLID NEUTRAL WITH REMOVABLE BONDING STRAP, CIRCUIT DIRECTORY PER AS-BUILT, PANEL IDENTIFICATION NAME PLATE. 75°C DEVICE TERMINALS. CONTINUOUSLY RATED DEVICES AT 40°C AMBIENT, BRANCH CIRCUIT BREAKERS AS REQUIRED. PROVIDE W/ LUGS FOR TVSS UNIT CONNECTION. PROVIDE REQUIRED MARKINGS PER NEC 110.22 AND 240.86 AS REQUIRED. FULLY-RATED. PER SIEMENS P3-SERIES PANELBOARD OR APPROVED EQUAL.

SCHEDULE NOTES:

1.) 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.
2.) PRIOR TO COMMENCEMENT OF WORK, COORDINATE FINAL BRANCH CIRCUIT EQUIPMENT AND DEVICE LOCATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, AND APPROVED MILLWORK SHOP DRAWINGS.
3.) CONTRACTOR SHALL PROVIDE BRANCH CIRCUIT BREAKER AS REQUIRED.
4.) CONTROLLED CIRCUIT OPERATION REQUIRED. PROVIDE CONTROLLABLE BRANCH CIRCUIT BREAKER AS REQUIRED.
5.) THIS CIRCUIT SERVES A PATIENT CARE AREA. THEREFORE, ALL BRANCH CIRCUIT WIRING METHODS SHALL EMPLOY TWO-PART, REDUNDANT GROUNDING PROVISIONS PER NEC 517.13(A) AND 517.13(B).
6.) PROVIDE A LISTED BREAKER BLOCKING DEVICE IN ORDER TO PREVENT INADVERTENT BREAKER OPERATION, WHILE MAINTAINING PROPER TRIPPING FUNCTIONS.
7.) 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.

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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL, ELECTRICAL, PLUMBING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2800 FAX: 973-286-2884
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.378.0008 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL
PANEL SCHEDULES

SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					DATE 02-04-16
10.30.15	95% CD UPDATE	KD	FM					SCALE NONE
02.19.16	ISSUED FOR BID	KD	FM					DRWN BY RB
								CHKD BY JJH
								JOB NO 2151188
								SHEET: _ OF: 35
								DWG. NO

E.202

LUMINAIRE SCHEDULE

TYPE	SYMBOL	DESCRIPTION	LAMPING	BALLAST	MOUNTING	MANUFACTURER	MODEL	VOLTS	MAX INPUT WATTS	KEY NOTES	REMARKS
A	Y (z)	6.8"(W) x 4.3"(D) x 51.8" (W) PENDANT, WET LOCATION, PENDANT HUNG, LINEAR LED FIXTURE, 3500K, NTEGRAL HIGH EFFICIENCY POWER SUPPLY, FIELD REPLACEMENT LED BOARD AND HEAT SINK, 90+ CRI MAINTAINED FOR LIFE OF LUMINAIRE, 3500K RATED TO 50,000 HOURS TO LM-79, STANDARD 0-10V DIMMING TO 10%, 10 YEAR LIMITED WARRANTY.	LED PER MANUFACTURER	ELECTRONIC <10% THD	RECESSED/CLG HARD CLG	PEERLESS	LIGHTLINE RECESSED WALL-WASH LWRSI-1-54TSHO-HOL-U4-120-GEB10-C200	120	57	1,2,4,5	"Y" DENOTES FIXTURE CALLOUT. "(Z)" WHEN USED DENOTES CIRCUIT SWITCHING DESIGNATION.
B	Y (z)	2x4 RECESSED TROFFER, GRID, .125 THICK ACRYLIC DIFFUSER, STATIC, 2-LAMP FLUORESCENT 3500K, SINGLE NORMAL BALLAST, SINGLE CIRCUIT.	(2) PHILIPS 32W - F32T8/TL835/ALTO.	ELECTRONIC <10% THD	RECESSED/ CLG GRID	LITHONIA	SPR SERIES 2SPR-G-2-32-RW-A12125-MVOLT-GEB10IS	120	58	1,2,4,5	"Y" DENOTES FIXTURE CALLOUT. "(Z)" WHEN USED DENOTES CIRCUIT SWITCHING DESIGNATION. VERIFY GRID TYPE WITH ARCHITECTURAL PLANS.
X	Y	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/CLG-WALL VERIFY IN FIELD	LITHONIA	ED-G/R-W-R-EL	120	5	1,2,3,4,5	"Y" DENOTES FIXTURE CALLOUT.

GENERAL SCHEDULE NOTES:

1. THE ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ALL NEW LIGHTING FIXTURES AND LAMPS AS REQUIRED.
2. "/NL" WHEN SHOWN ON THE PLANS DENOTES 24HR, 7DAY/WEEK NIGHT LIGHT OPERATION AS REQUIRED. REFER TO ELECTRICAL DETAILS FOR FURTHER REQUIREMENTS.
3. ALL EMERGENCY BALLASTS CONTAINED IN MULTI-LAMP FIXTURES SHALL SERVE TWO (2) LAMPS MINIMUM.
4. 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.
5. CONFIRM ALL FIXTURE LOCATIONS, MOUNTING HEIGHTS, AND ANY LAYOUT/COORDINATION SHOP DRAWING REQUIREMENTS WITH ARCHITECTURAL DRAWINGS.
6. ALL LUMINAIRES, LUMINAIRE COMPONENTS, AND APPURTENANCES SHALL BE SUPPLIED AND INSTALLED PER MANUFACTURERS INSTRUCTIONS.
7. 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 (G).
8. RECESSED, LAY-IN FIXTURES WHERE APPLICABLE SHALL BE COMPATIBLE WITH THE FOLLOWING HUNG CEILING SYSTEM: USG, DONN CORPORATION, FINELINE, NARROW 9/16" FACE WITH 1/4" REVEAL.

SCHEDULE KEY NOTES:

1. PRIOR TO ORDERING FIXTURES, CONTRACTOR SHALL CONFIRM CEILING TYPE, AND FINAL MOUNTING METHOD(S), WITH ARCHITECTURAL DRAWINGS.
2. CONTRACTOR SHALL REFER TO ARCHITECTURAL DRAWINGS FOR FINAL MOUNTING CONDITIONS.
3. CONTRACTOR SHALL COORDINATE ANCHORING LOCATIONS, AND ANCHORING METHOD(S), WITH ARCHITECTURAL DRAWINGS.
4. FINAL FIXTURE MAKE, MODEL AND LAMPING AS APPROVED BY THE ARCHITECT.
5. 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.
6. 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.
7. EMERGENCY UNIT SHALL BE WIRED TO THE EMERGENCY LIGHTING INVERTER SYSTEM.

AUTOMATIC LIGHTING CONTROL EQUIPMENT SCHEDULE

TYPE	SYMBOL	DESCRIPTION	MODEL	KEY NOTES	REMARKS
OS-1	(Y) (S) (z)	DUAL TECHNOLOGY LINE-VOLTAGE CEILING SENSOR, 360°, 1000 SQ. FT.	WATT STOPPER DT-355	1	(Y) DENOTES DEVICE CALLOUT. (z) DENOTES CIRCUIT SWITCHING DESIGNATION. SUPPLY AND INSTALL MOUNTING AND INSTALLATION APPURTENANCES AS REQUIRED.

GENERAL SCHEDULE NOTES:

1. OCCUPANCY SENSOR LOCATIONS SHOWN ARE APPROXIMATE. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS PRIOR TO INSTALLATION. RELOCATE OCCUPANCY SENSORS AS REQUIRED TO SUIT FIELD CONDITIONS PER MANUFACTURER'S INSTRUCTIONS.
2. OCCUPANCY SENSOR WIRING AND INSTALLATION DETAILS ARE PROVIDED FOR REFERENCE ONLY. PROVIDE ALL NECESSARY POWER PACKS, RELAYS, INTERWIRING, ETC. IN ORDER TO PROVIDE A COMPLETE SYSTEM WITH THE OPERATION INTENT AS REQUIRED. ADDITIONAL RELAY PACKS MAY BE REQUIRED TO SWITCH ADDITIONAL LOADS (I.E. VENTILATION FANS). REFER TO ALL PERTINENT LIGHTING PLANS AND DETAILS. ALL ANCILLARY EQUIPMENT, APPURTENANCES AND WIRING SHALL BE SUPPLIED AND INSTALLED PER MANUFACTURER'S INSTRUCTIONS AND/OR RECOMMENDATIONS AS REQUIRED BASED ACCORDINGLY.
3. CONTRACTOR SHALL AIM AND ADJUST ALL OCCUPANCY SENSORS AS REQUIRED BY THE OWNER. FINAL ADJUSTMENTS MAY NOT BE POSSIBLE UNTIL AFTER THE BUILDING IS FULLY OCCUPIED. SET OFF DELAY FOR OCCUPANCY SENSORS TO 30 MINUTES UNLESS SPECIFIED OTHERWISE.
4. PROVIDE ALL REQUIRED COVER PLATES AND/OR MOUNTING HARDWARE AS REQUIRED. FINISHES SHALL BE LIKE-IN-KIND WITH OTHER SPECIFIED WIRING DEVICES.
5. ALL CONTROL WIRING FOR OCCUPANCY SENSORS SHALL BE PLENUM RATED.
6. ALL LIGHTING FIXTURES, LIGHTING CONTROLS, AND THEIR INSTALLATION SHALL MEET THE REQUIREMENTS OF THE NEC AND ALL STATE AND LOCAL CODE REQUIREMENTS.

SCHEDULE KEY NOTES:

1. UNIT SHALL BE APPROVED AND LABELED FOR USE IN NEW YORK CITY.

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, PLUMBING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2800 FAX: 973-286-2864
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.378.0008 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

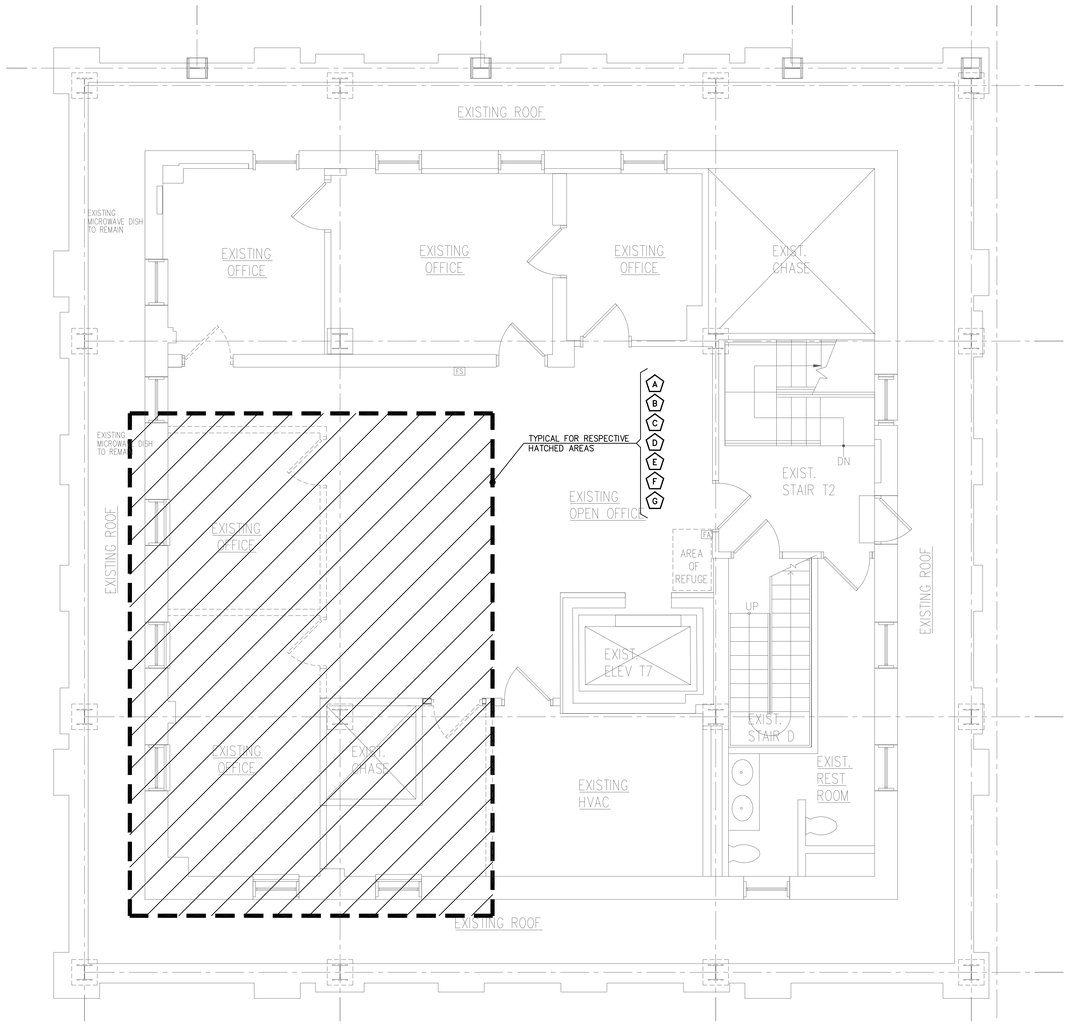
PROJECT:

UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL
LIGHTING SCHEDULES

SUBMISSIONS				REVISIONS					
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	DATE	02-04-16
9.15.15	95% CD SUBMIT	KD	FM					SCALE	NONE
10.30.15	95% CD UPDATE	KD	FM					DRWN BY	RB
02.19.16	ISSUED FOR BID	KD	FM					CHKD BY	JJH
								JOB NO	2151188
								SHEET:	_ OF: 35
								DWG. NO	E.203



DEMOLITION PLAN – 16TH FLOOR

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

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 E1.01 FOR ELECTRICAL PROJECT NOTES & ABBREVIATIONS.
9. REFER TO DRAWING E1.02 FOR ELECTRICAL SYMBOLS.

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. (TYPICAL FOR APPLICABLE HATCHED AREAS)

(B) DISCONNECT AND REMOVE ALL EXISTING POWER OUTLETS, RECEPTACLES 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. (TYPICAL FOR APPLICABLE HATCHED AREAS)

(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. (TYPICAL FOR APPLICABLE HATCHED AREAS)

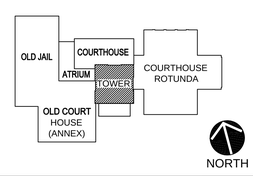
(D) REMOVE EXISTING TELE/DATA WIRING AND EQUIPMENT IN ITS ENTIRETY INCLUDING ANY AND ALL ASSOCIATED EQUIPMENT AND APPURTENANCES. EXACT EQUIPMENT LOCATIONS ARE NOT EXPLICITLY SHOWN. CONTRACTOR SHALL FIELD-VERIFY EXISTING EQUIPMENT LOCATIONS, AND BASE HIS BID ACCORDINGLY. (TYPICAL FOR APPLICABLE HATCHED AREAS)

(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. (TYPICAL FOR APPLICABLE HATCHED AREAS)

(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. (TYPICAL FOR APPLICABLE HATCHED AREAS)

(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.

KEYPLAN



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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE ST., SUITE 1000, NEWARK, NEW JERSEY 07102
PHONE: 973-286-1700 FAX: 973-286-1701
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - DEMOLITION PLAN
SIXTEENTH FLOOR

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

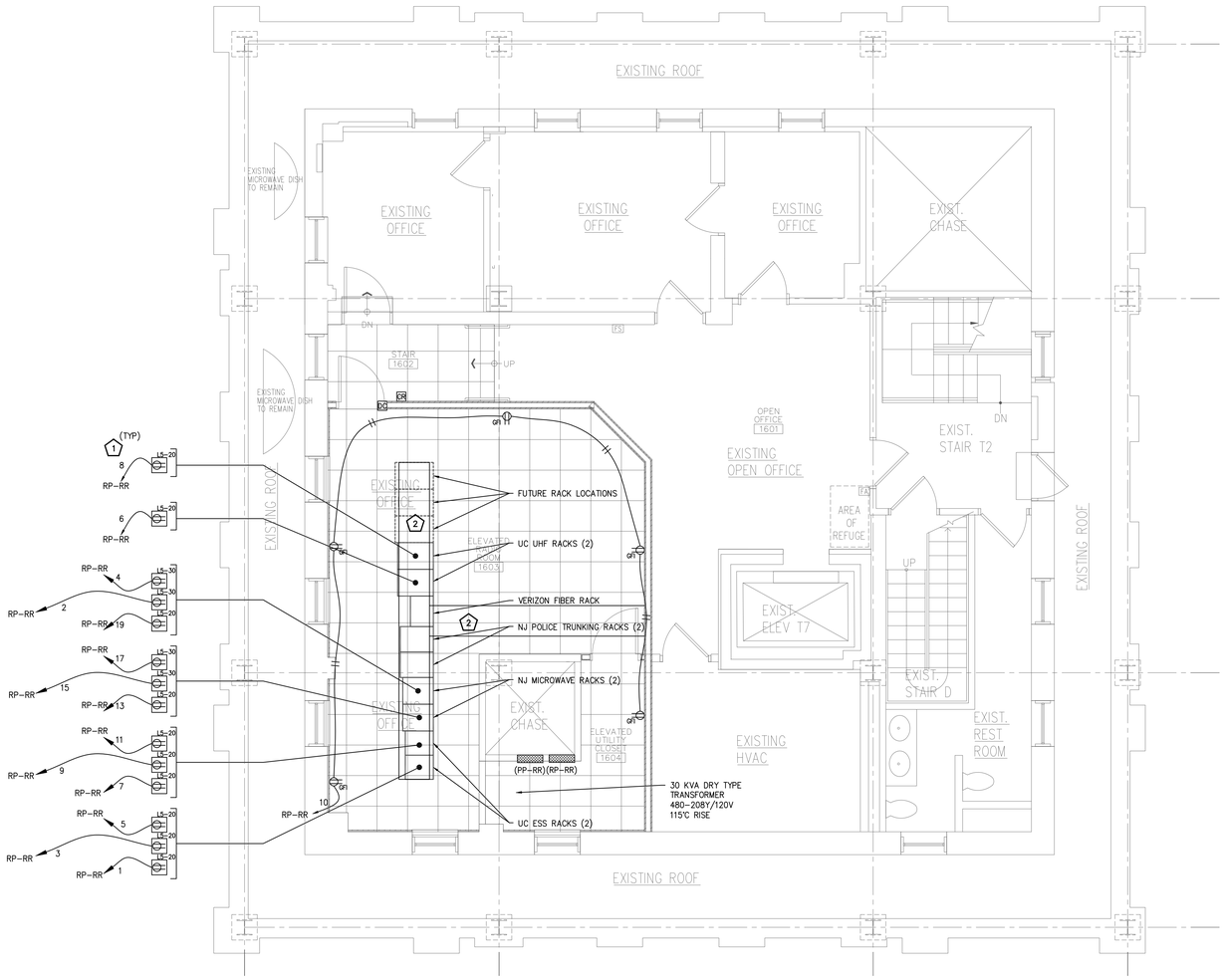
DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	DE.301

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. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
17. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES & ABBREVIATIONS.
18. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

KEYED WORK NOTES:

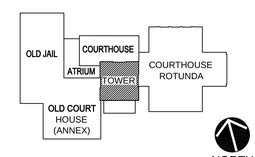
1. PROVIDE FLOOR MOUNTED RECEPTACLES AS REQUIRED. COORDINATE MOUNTING REQUIREMENTS WITH RAISED FLOOR VENDOR TO PROVIDE ANY SPECIFIC FRAMING OR MOUNTS REQUIRED TO MAINTAIN FLOORING INTEGRITY.
2. PROVIDE 24" WIDE LADDER TYPE CABLE TRAY (OR AS OTHERWISE REQUIRED BY MOTOROLA VENDOR) OVER COMPLETE LINEUP OF RACKS AS WELL AS FROM RACK LINEUPS TO EAST WALL. PROVIDE 2-4" CONDUIT SLEEVES THROUGH RADIO ROOM WALL FOR EXITING CABLES.



POWER PLAN – SIXTEENTH FLOOR

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

KEYPLAN



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 ENGINEERS
1 EXECUTIVE DRIVE, SUITE 320, SOMERSET, NJ 08873
PHONE: 973-286-2100 FAX: 973-286-2101
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 23 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0006 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - POWER PLAN
SIXTEENTH FLOOR

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

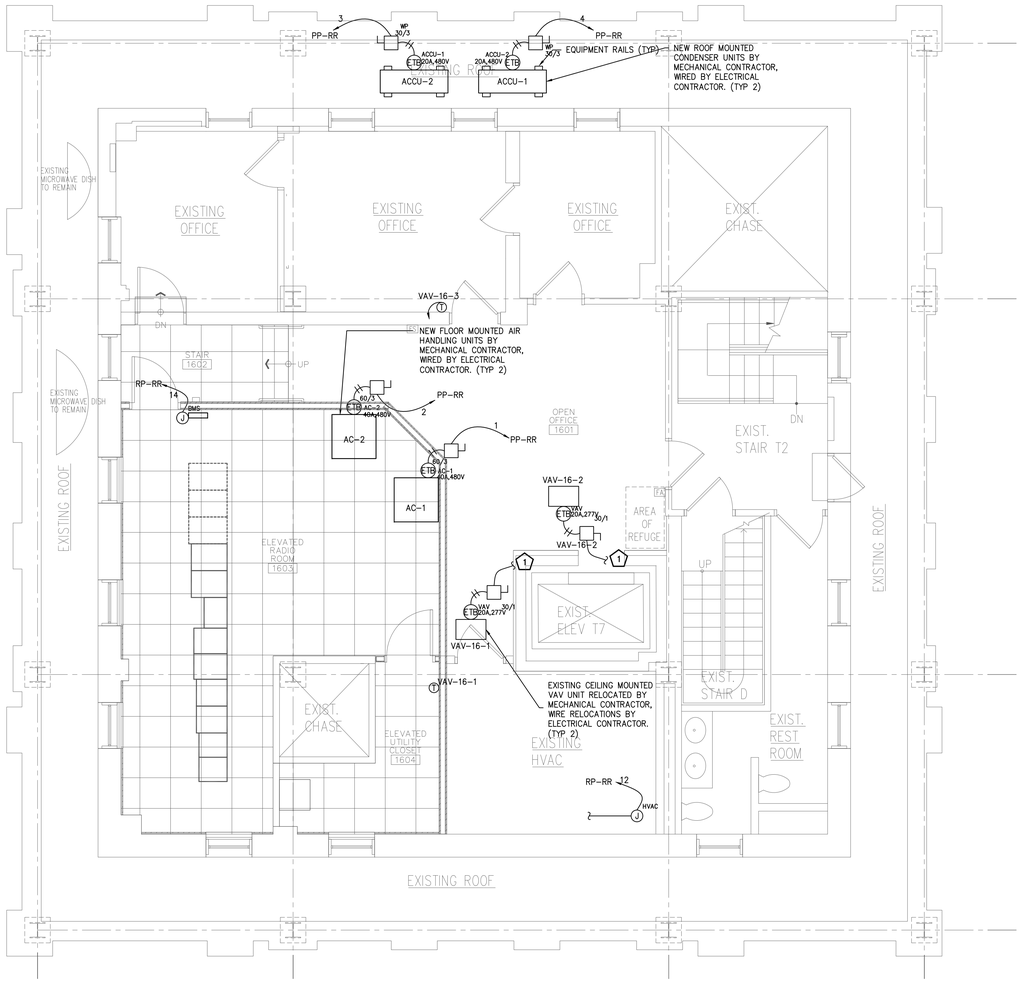
DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.301

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. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
17. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES & ABBREVIATIONS.
18. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

KEYED WORK NOTES:

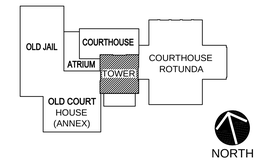
(1) DISCONNECT POWER AND RE-CONNECT AS REQUIRED. EXISTING CIRCUIT TO BE RE-UTILIZED. CONTRACTOR TO PROVIDE NEW SINGLE POLE DISCONNECT SWITCH AND RE-TERMINATE.



M&P POWER PLAN – SIXTEENTH FLOOR

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

KEYPLAN



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 ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-0900 FAX: 973-286-0904
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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

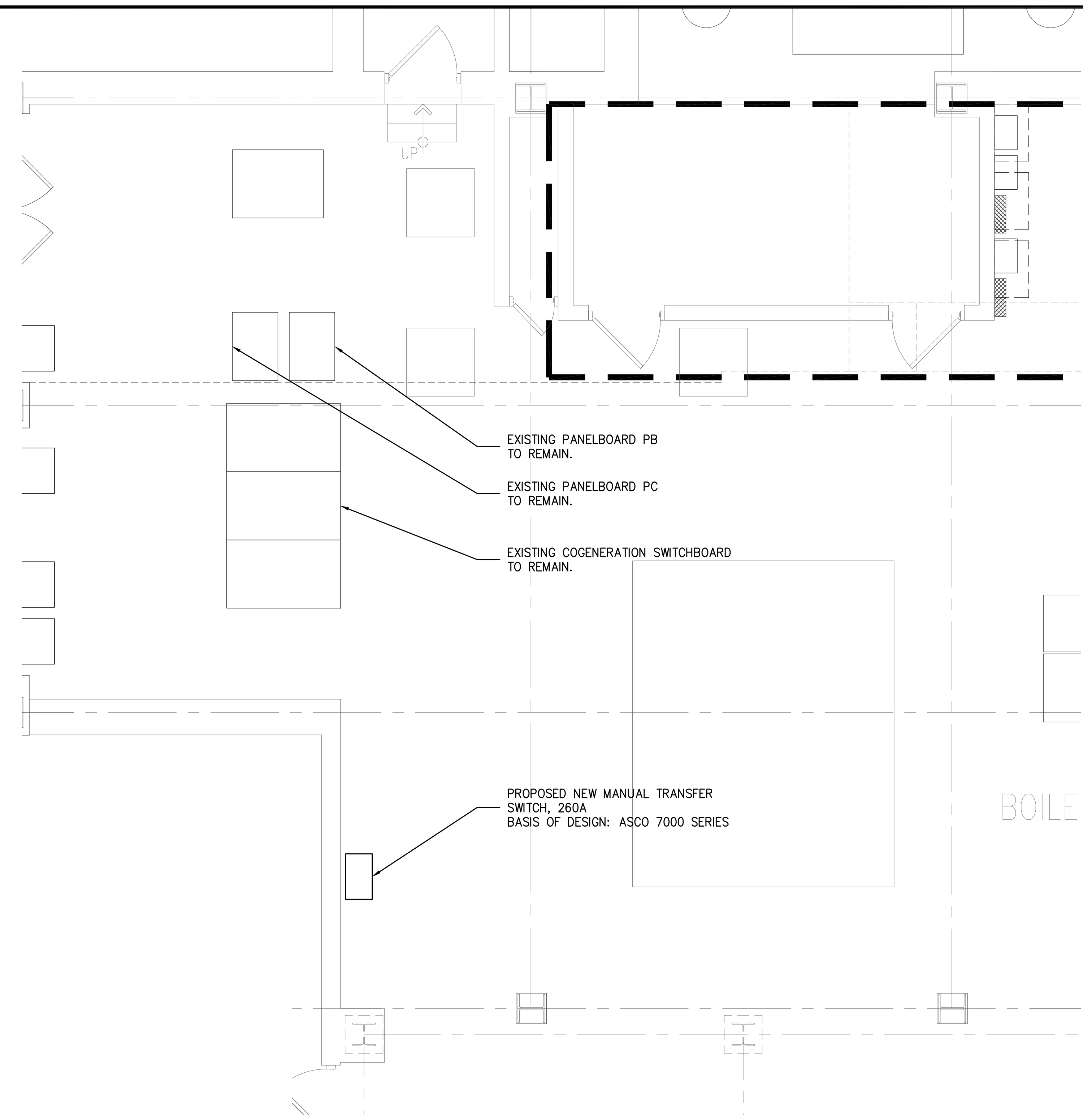
PROJECT:

UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

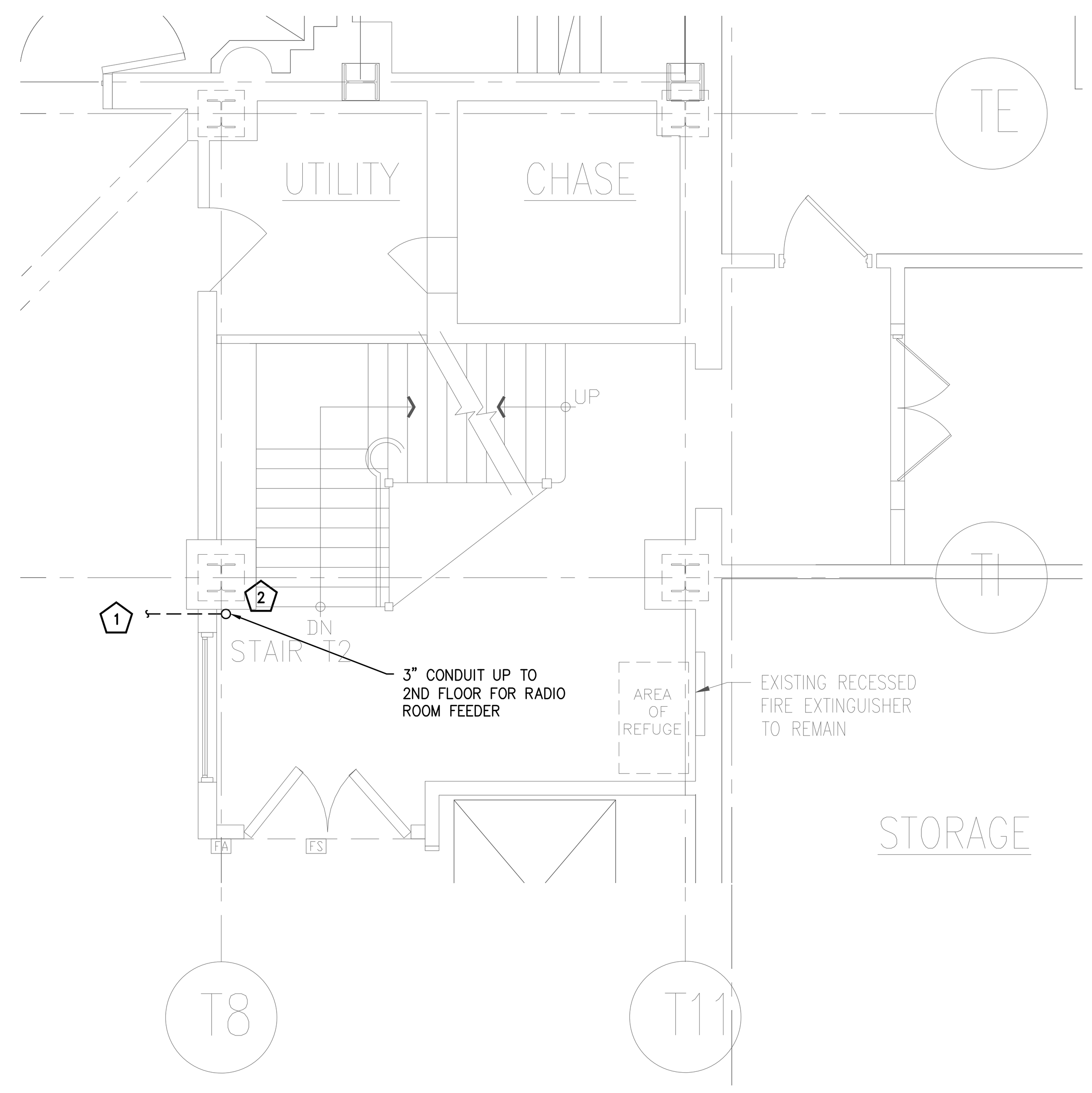
SHEET CONTENTS:

ELECTRICAL - M&P POWER PLAN
SIXTEENTH FLOOR

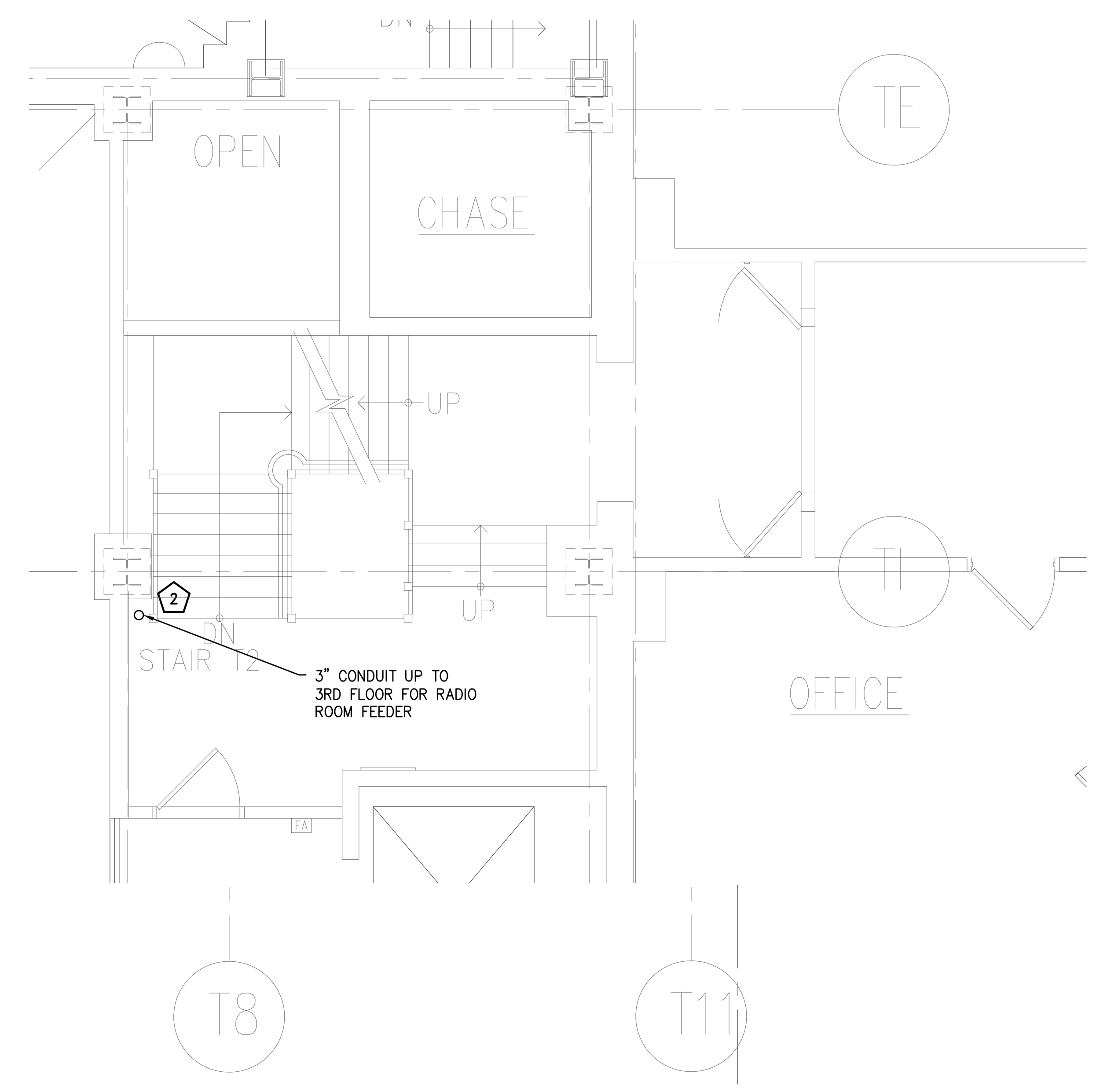
SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					DATE 02-04-16
10.30.15	95% CD UPDATE	KD	FM					SCALE AS SHOWN
02.19.16	ISSUED FOR BID	KD	FM					DRWN BY RB
								CHKD BY JJH
								JOB NO 2151188
								SHEET: _ OF: 35
								DWG. NO E.301.1



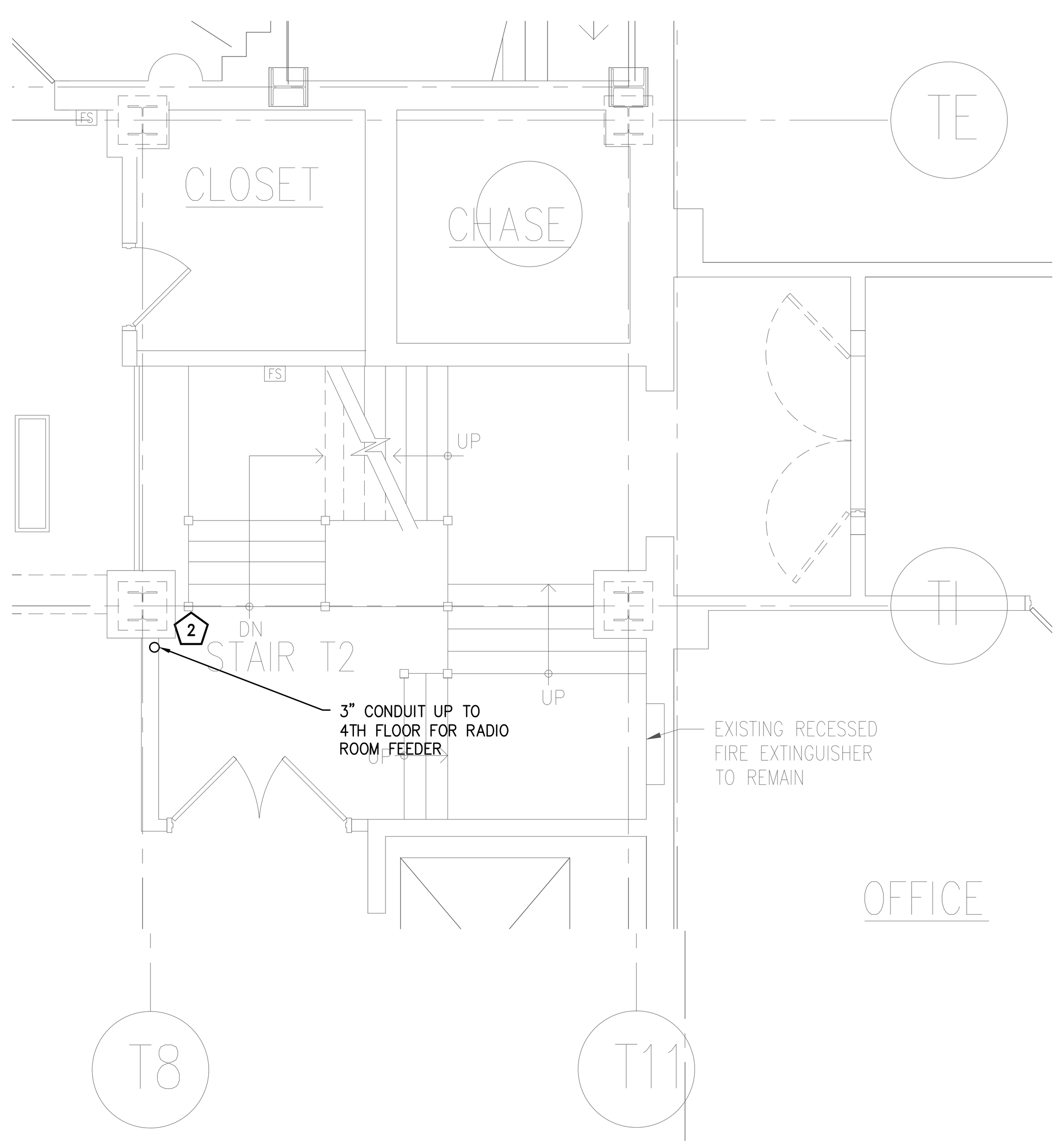
POWER PLAN – BASEMENT
SCALE: 1/4"=1'-0"



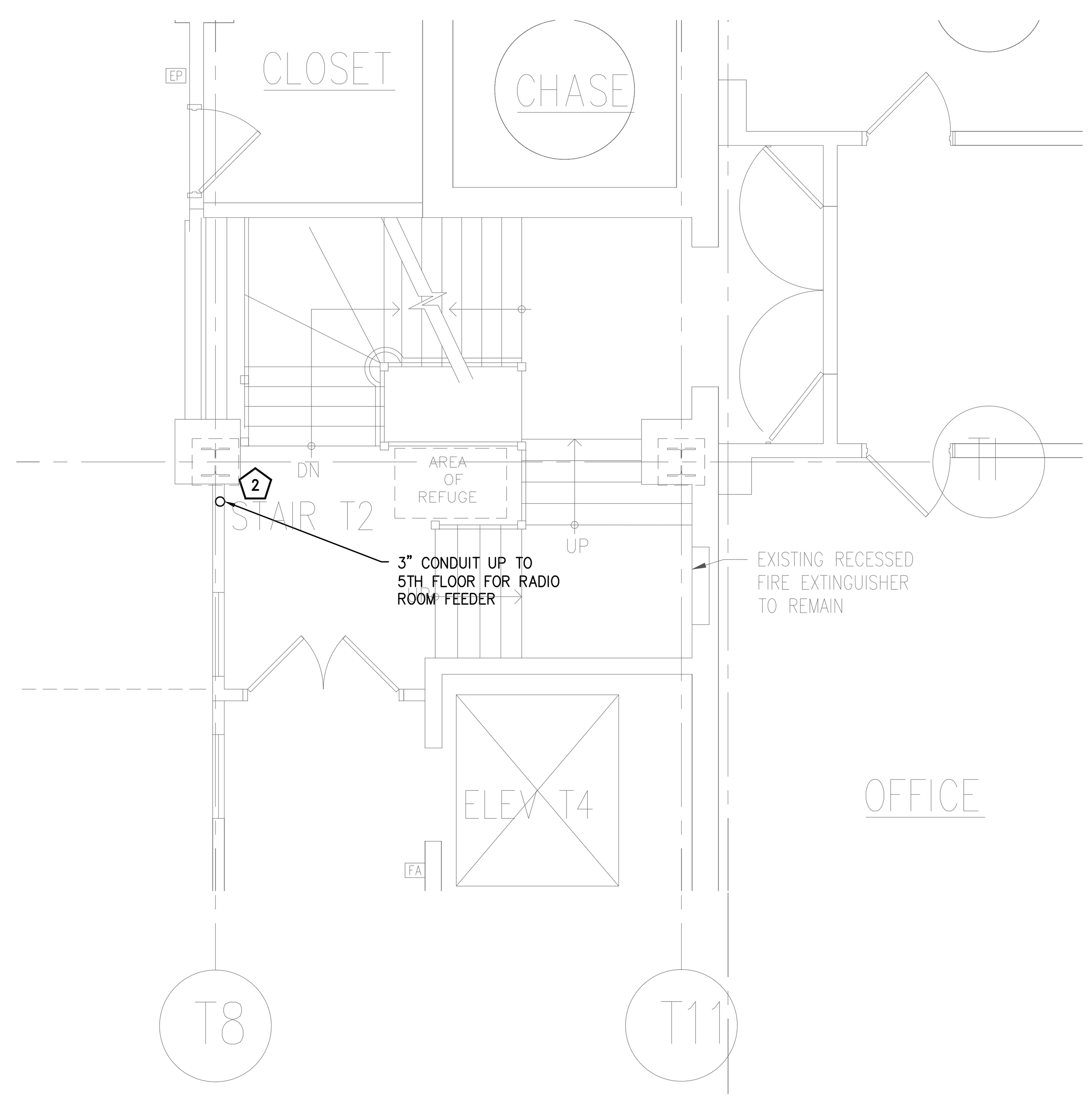
POWER PLAN – FIRST FLOOR
SCALE: 1/4"=1'-0"



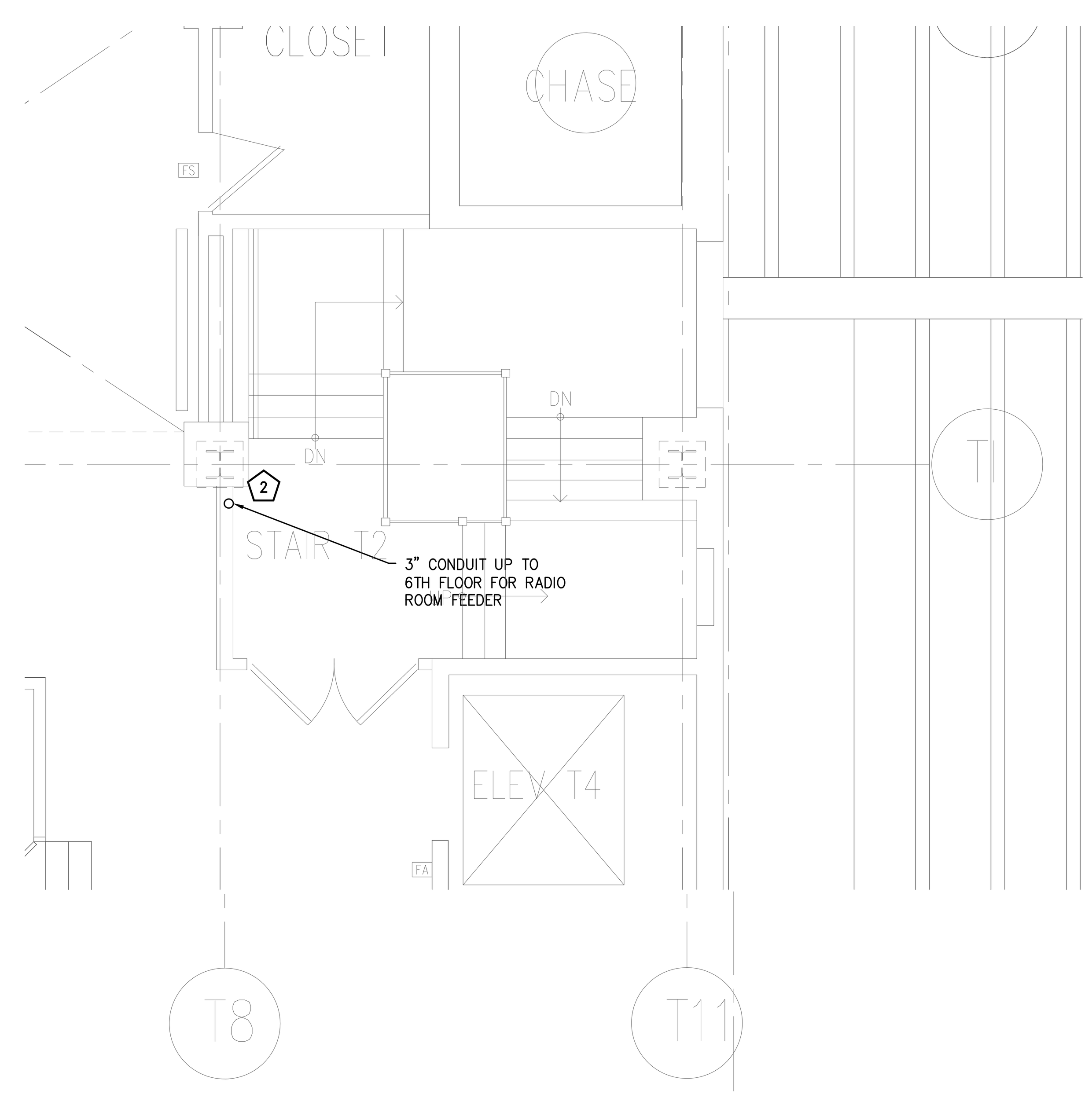
POWER PLAN – SECOND FLOOR
SCALE: 1/4"=1'-0"



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



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



POWER PLAN – FIFTH FLOOR
SCALE: 1/4"=1'-0"

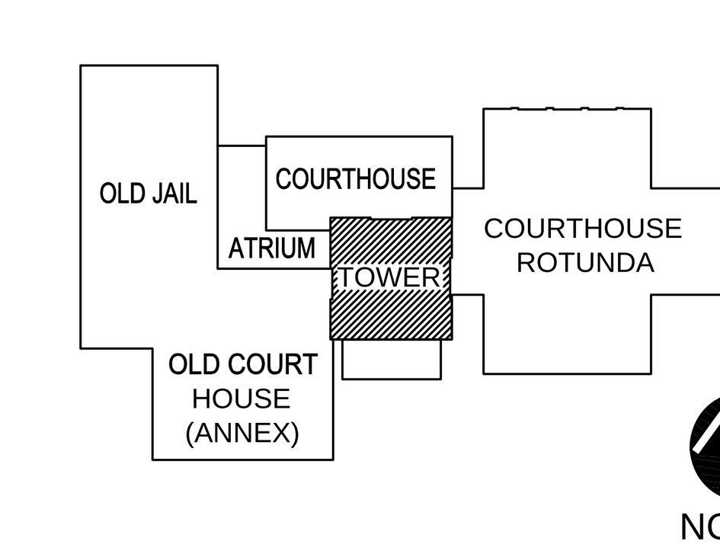
KEYED NEW WORK NOTES:

1. PROVIDE NEW FEEDER FROM NEW BREAKER IN EXISTING PANEL PC AS INDICATED ON ONE LINE DIAGRAM.
2. FOR EACH PENETRATION, PROVIDE NEW CORE DRILLS AND SUPPORT CONDUITS WITH RISER CLAMPS. FIRE STOP EACH PENETRATION IN ACCORDANCE WITH DETAILS. PROVIDE FLOOR MOUNTED JUNCTION BOX FOR CABLE PULLING EVERY 3RD FLOOR.

DRAWING NOTES:

1. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
2. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH–IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
3. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
4. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN–FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
5. REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
6. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.12 AND AS REQUIRED.
7. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
8. 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.
9. 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.
10. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
11. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
12. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES AND ABBREVIATIONS.
13. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

KEYPLAN



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

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

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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:

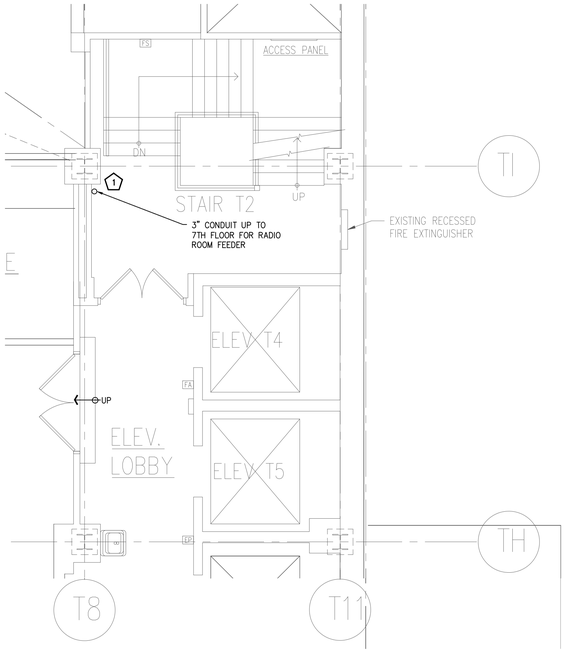
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - BASEMENT THRU FIFTH FLOOR PART PLANS

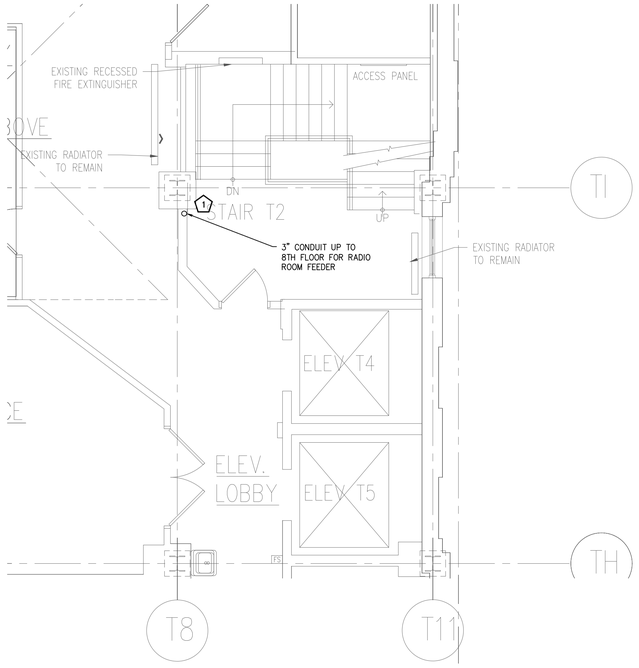
SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.302



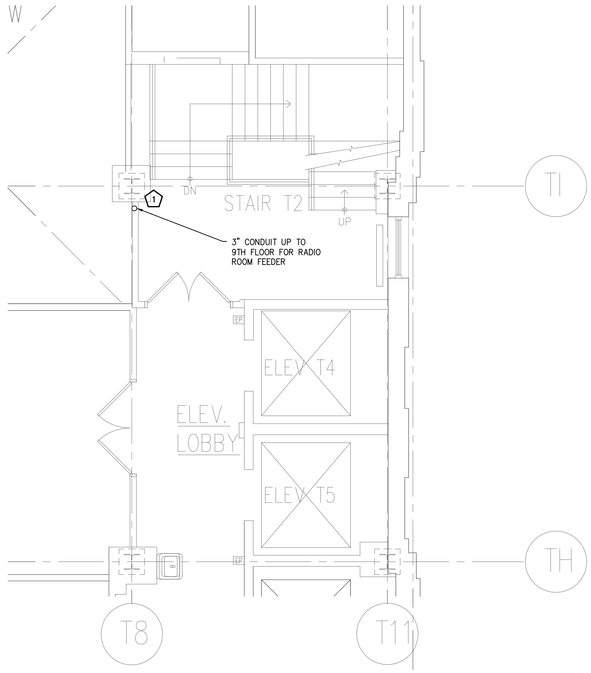
POWER PLAN – SIXTH FLOOR

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



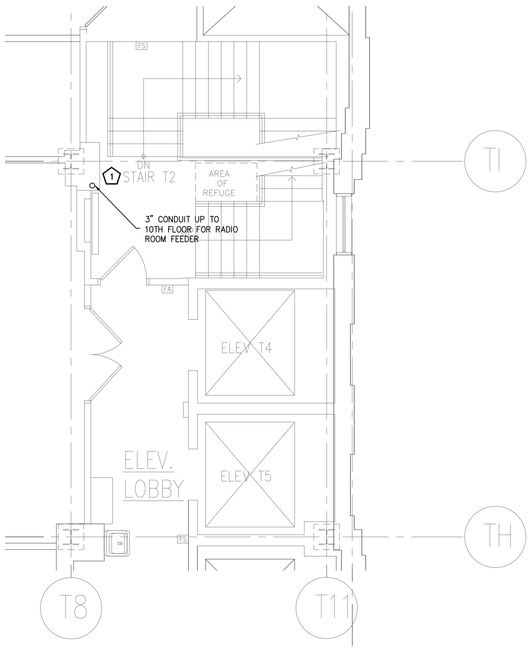
POWER PLAN – SEVENTH FLOOR

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



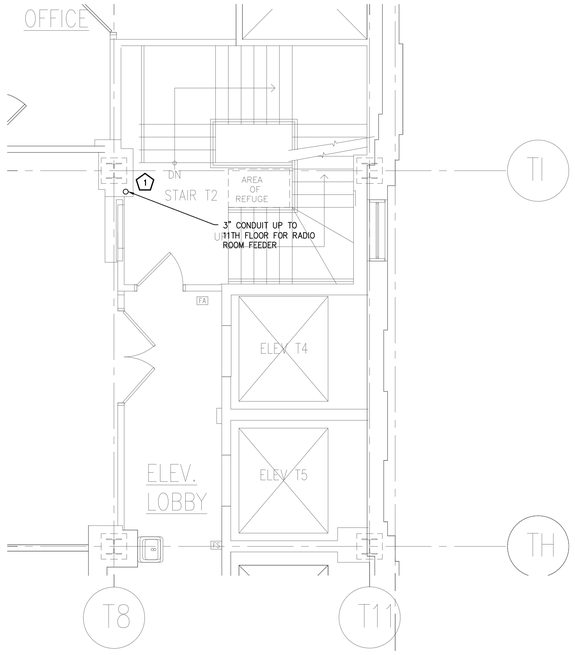
POWER PLAN – EIGHTH FLOOR

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



POWER PLAN – NINTH FLOOR

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



POWER PLAN – TENTH FLOOR

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

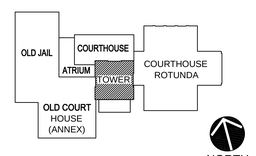
KEYED NEW WORK NOTES:

1. FOR EACH PENETRATION, PROVIDE NEW CORE DRILLS AND SUPPORT CONDUITS WITH RISER CLAMPS. FIRE STOP EACH PENETRATION IN ACCORDANCE WITH DETAILS. PROVIDE FLOOR MOUNTED JUNCTION BOX FOR CABLE PULLING EVERY 3RD FLOOR.

DRAWING NOTES:

1. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
2. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
3. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
4. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
5. REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
6. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.12 AND AS REQUIRED.
7. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
8. 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.
9. 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.
10. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
11. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
12. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES AND ABBREVIATIONS..
13. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

KEYPLAN



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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-8000 FAX: 973-286-8001 WEB: ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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:

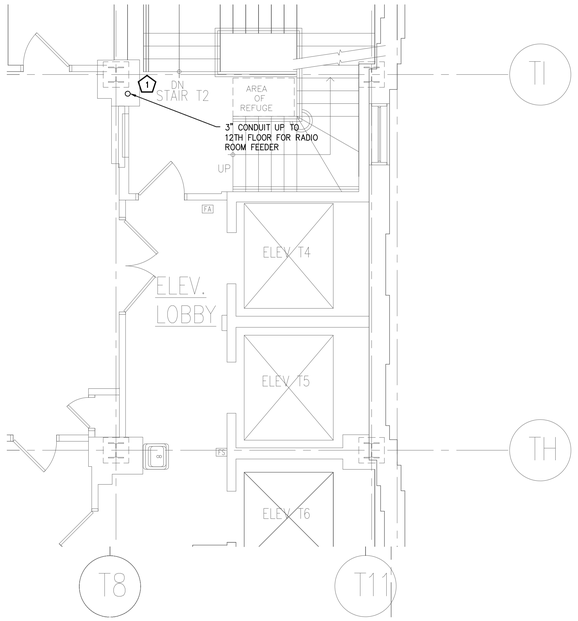
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - SIXTH THRU TENTH FLOOR PART PLANS

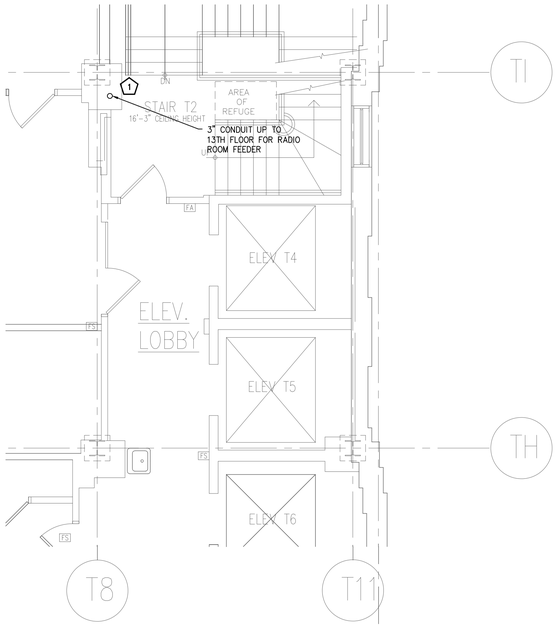
SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					
10.30.15	95% CD UPDATE	KD	FM					
02.19.16	ISSUED FOR BID	KD	FM					

DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.303



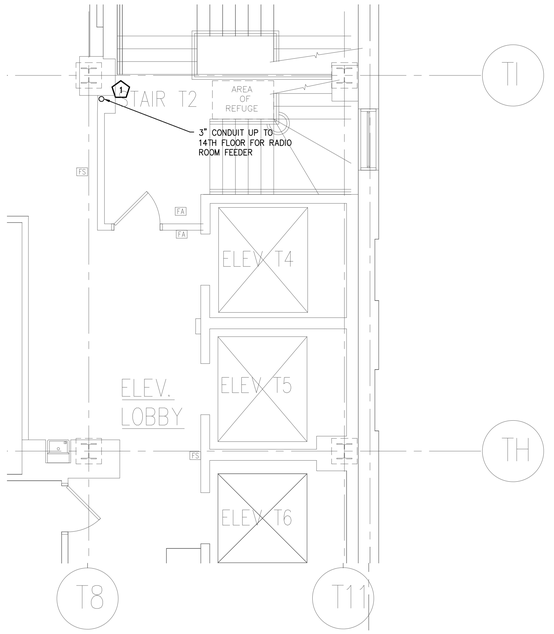
POWER PLAN – ELEVENTH FLOOR

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



POWER PLAN – TWELFTH FLOOR

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



POWER PLAN – THIRTEENTH FLOOR

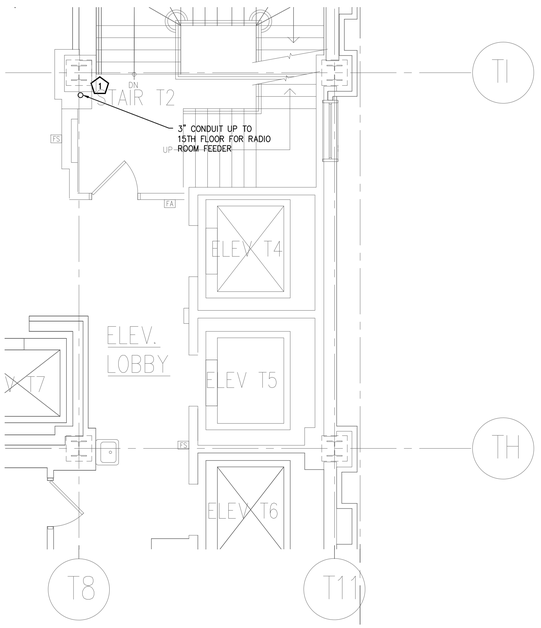
SCALE: 1/4"=1'-0"

KEYED NEW WORK NOTES:

1. FOR EACH PENETRATION, PROVIDE NEW CORE DRILLS AND SUPPORT CONDUITS WITH RISER CLAMPS. FIRE STOP EACH PENETRATION IN ACCORDANCE WITH DETAILS. PROVIDE FLOOR MOUNTED JUNCTION BOX FOR CABLE PULLING EVERY 3RD FLOOR.

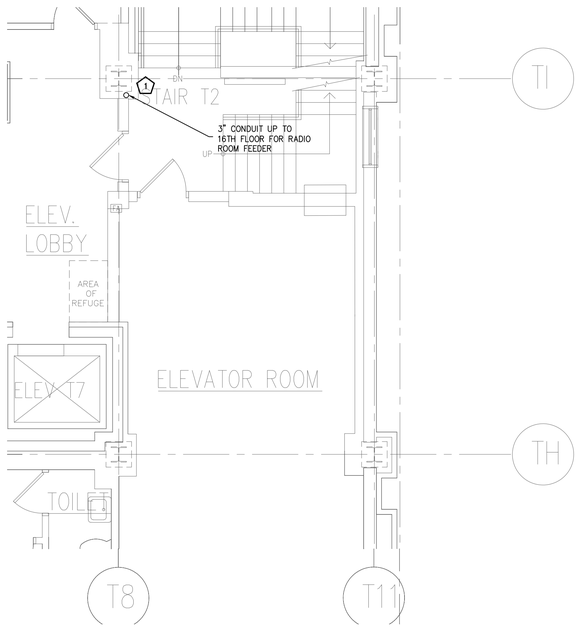
DRAWING NOTES:

1. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
2. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
3. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
4. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
5. REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
6. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.12 AND AS REQUIRED.
7. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
8. 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.
9. 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.
10. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS.
11. SUBSCRIPT RR DENOTED ON THE PLANS IS RADIO ROOM.
12. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES AND ABBREVIATIONS..
13. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.



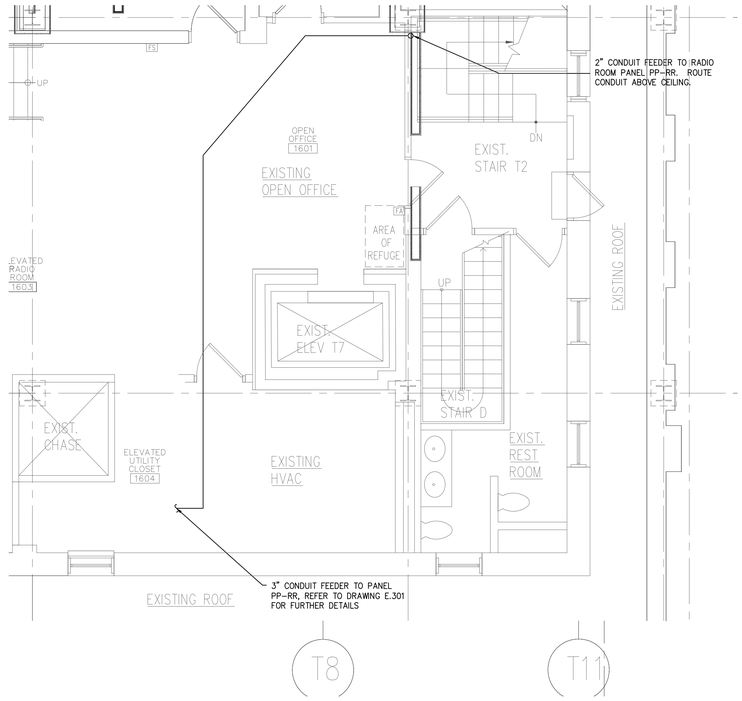
POWER PLAN – FOURTEENTH FLOOR

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



POWER PLAN – FIFTEENTH FLOOR

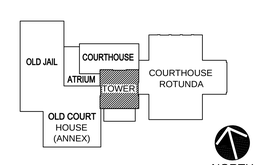
SCALE: 1/4"=1'-0"



POWER PLAN – SIXTEENTH FLOOR

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

KEYPLAN



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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2882 FAX: 973-286-2884
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - ELEVENTH THRU SIXTEENTH FLOOR PART PLANS

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

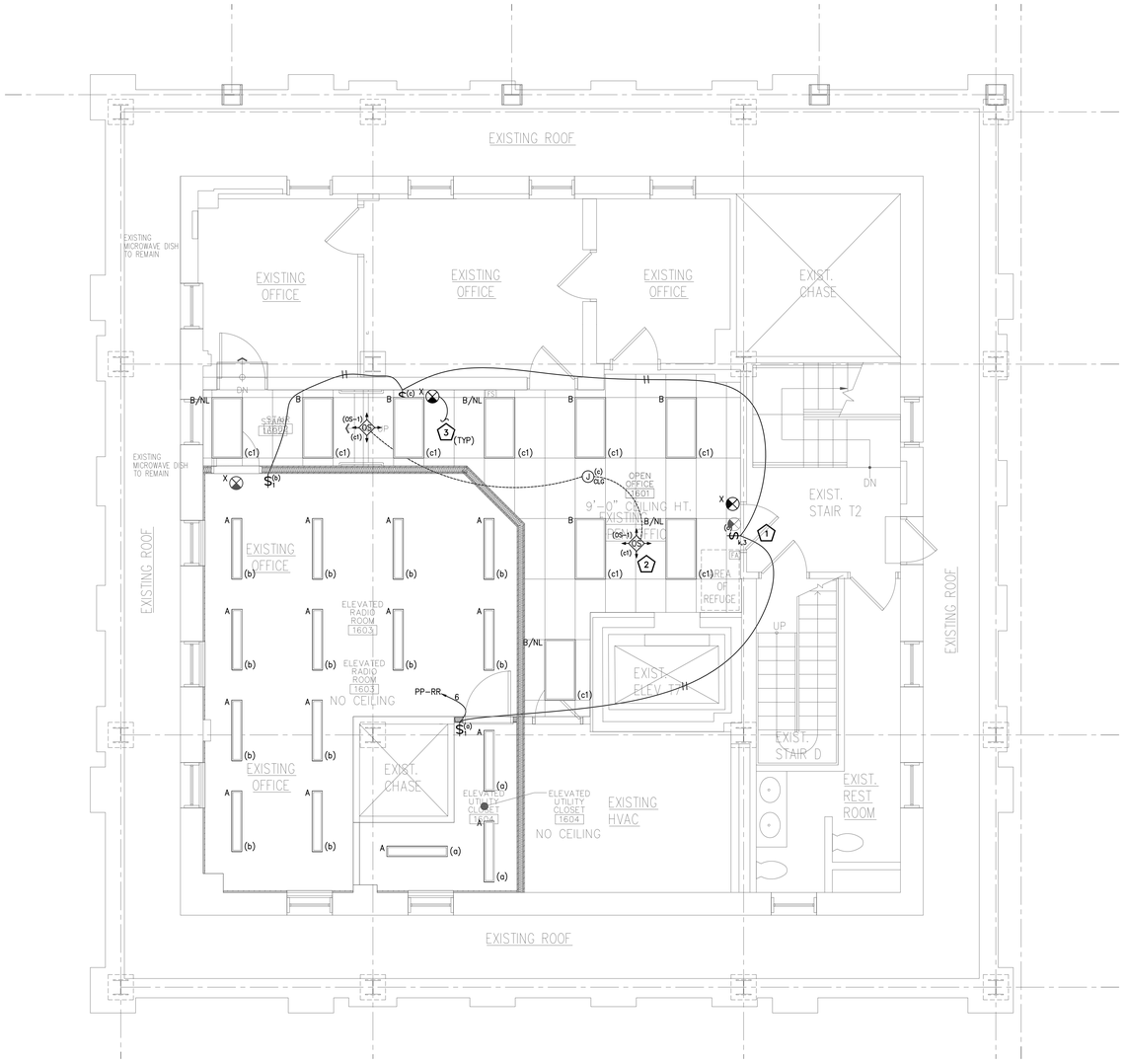
DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.304

DRAWING NOTES:

1. REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
2. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.12 AND AS REQUIRED.
3. REFER TO ONE LINE DIAGRAM, PANELBOARD SCHEDULES, ELECTRICAL SCHEDULES, ELECTRICAL DETAILS, AND LEGENDS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
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 344.22 AND 352.22 RESPECTIVELY.
5. SUBMIT COLOR OPTIONS FOR ALL LIGHTING FIXTURES AND CONTROL DEVICES FOR SELECTION BY ARCHITECT.
6. 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.
7. 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.
8. 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.
9. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LUMINARIES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.
10. PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTORS FOR ALL LIGHTING FIXTURES AS REQUIRED. GROUND CONDUCTORS MAY NOT BE EXPLICITLY SHOWN ON CERTAIN WIRING DESIGNATIONS.
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.
12. 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.
13. DASHED LINES USED TO DENOTE OCCUPANCY SENOR CONTROL WIRING.
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. 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.
16. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE TENANT.
17. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LIGHTING FIXTURE AND CONTROL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
18. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR FINAL LOCATIONS OF NEW MECHANICAL AND PLUMBING EQUIPMENT.
19. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
20. CONTRACTOR SHALL CONDUCT ALL NECESSARY EMERGENCY LIGHTING TEST(S) FOR THE AUTHORITY HAVING JURISDICTION.
21. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES & ABBREVIATIONS.
22. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS.

KEYED WORK NOTES:

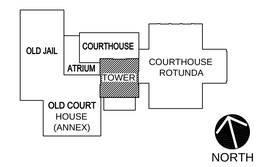
1. FOR ALL KEY-TYPE LIGHTING CONTROL SWITCHES, PROVIDE A PERMANENTLY IDENTIFIED SWITCH COVER PLATE THAT IDENTIFIES LIGHTS SERVED AND IS INDICATIVE OF ON/OFF STATUS.
2. WIRE NEW OCCUPANCY SENSOR IN SERIES WITH LOCAL MANUAL LIGHTING CONTROL SWITCH. OCCUPANCY SENSOR SHUTOFF SHALL OVERRIDE LOCAL LIGHTING CONTROL SWITCH.
3. WIRE NEW EXIT SIGN FROM GENERAL LIGHTING CIRCUIT. FIXTURES SHALL BE FED FROM UPSTREAM OF ANY CONTROL DEVICES.



LIGHTING PLAN – SIXTEENTH FLOOR

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

KEYPLAN



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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-8000 FAX: 973-286-8001
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - LIGHTING PLAN
SIXTEENTH FLOOR

SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					DATE 02-04-16
10.30.15	95% CD UPDATE	KD	FM					SCALE AS SHOWN
02.19.16	ISSUED FOR BID	KD	FM					DRWN BY RB
								CHKD BY JJH
								JOB NO 2151188
								SHEET: _ OF: 35
								DWG. NO

E.401

KEYED WORK NOTES:

1. NEW EXTINGUISHING AGENT SYSTEM CONTROL PANEL SUPPLIED & INSTALLED BY THE FIRE SUPPRESSION VENDOR, WIRED BY THE CONTRACTOR AS REQUIRED. INSTALL AND CONNECT ALL ANCILLARY DEVICES PROVIDED WITH THE PANEL INCLUDING ALL DETECTORS, MANUAL RELEASE STATIONS, ABORT STATIONS, WARNING HORN/STROBES TO THE CONTROL PANEL AS REQUIRED. REFER TO RISER DIAGRAM FOR DETAILS AND ADDITIONAL INFORMATION.

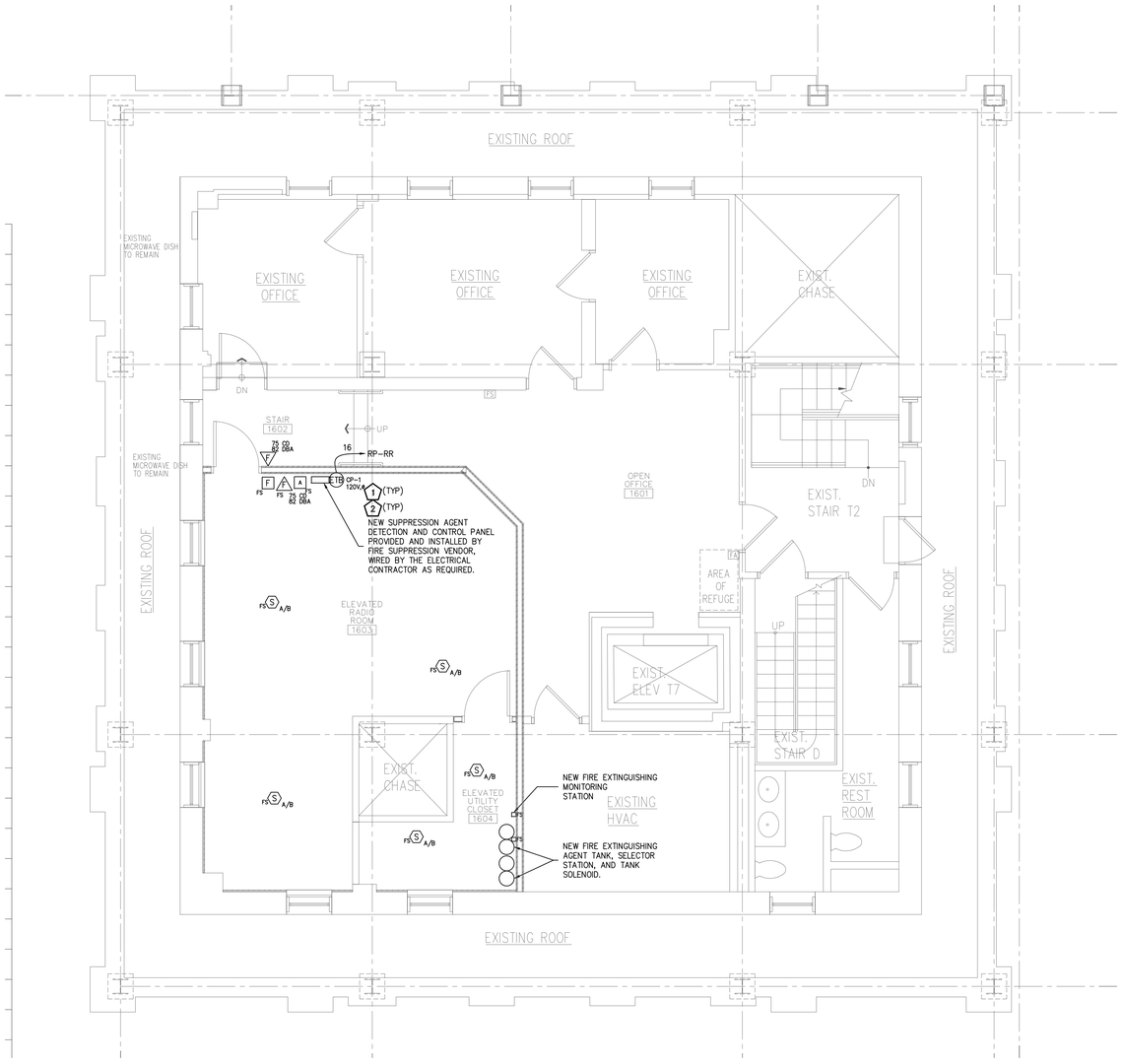
2. COORDINATE THE EXACT POWER & CONTROL WIRING REQUIREMENTS WITH THE FIRE SUPPRESSION VENDOR.

DRAWING NOTES:

1. COORDINATE FINAL MEANS AND METHODS, AND SCOPE OF WORK WITH THE ARCHITECTURAL, MECHANICAL AND PLUMBING DRAWINGS. BASE BID ACCORDINGLY.
2. COORDINATE ALL WORK WITH ALL INVOLVED TRADE CONTRACTORS, EQUIPMENT VENDORS, UTILITIES, AND THE OWNER AS REQUIRED. BASE BID ACCORDINGLY.
3. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN-FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATED WITH OTHER TRADE CONTRACTORS AND THE OWNER.
4. PROVIDE ALL FIRE ALARM APPLIANCE ROUGH-IN FACILITIES AS REQUIRED.
5. ALL NEW EXTINGUISHING AGENT ALARM APPLIANCES SHALL BE WIRED TO THE NEW SUPPRESSION AGENT CONTROL PANEL AND SHALL BE PROGRAMMED AND COMMISSIONED AS REQUIRED.
6. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
7. 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.
8. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ELECTRICAL ROUGH-IN EQUIPMENT AND APPURTENANCES PER NEC (MIN).
9. REFER TO NEC TABLE 310.16 FOR AMPACITIES OF CONDUCTORS. 75°C TERMINALS, 40°C AMBIENT TEMPERATURE.
10. ALL WIRING SHALL BE PROPERLY IDENTIFIED PER NEC 310.12 AND AS REQUIRED.
11. REFER TO MECHANICAL PLANS FOR FINAL LOCATIONS AND REQUIREMENTS OF ALL MECHANICAL UTILIZATION EQUIPMENT THAT REQUIRES ELECTRICAL SERVICE.
12. REFER TO FIRE PROTECTION PLANS FOR FINAL LOCATIONS AND REQUIREMENTS OF ALL FIRE PROTECTION EQUIPMENT THAT REQUIRES ELECTRICAL SERVICE.
13. 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.
14. 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.
15. 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.
16. 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.
17. IN CASES WHERE EXISTING BRANCH CIRCUIT FACILITIES ARE BEING USED, CONTRACTOR SHALL FIELD VERIFY THE EXISTING FACILITIES AND MAKE ANY AND ALL MODIFICATION(S) AS REQUIRED TO ACCOMMODATE NEW BRANCH CIRCUIT REQUIREMENTS AS INTENDED.
18. CONTRACTOR SHALL MEASURE PHASE LOADS (TRUE RMS) OF NEW AND EXISTING PANEL BOARDS UTILIZED TO COMPLETE THE CONTRACT WORK, AND BALANCE NEW LOAD AS REQUIRED.
19. REFER TO ELECTRICAL DETAILS, AND LEGENDS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
20. REFER TO ELECTRICAL DETAILS FOR ADDITIONAL REQUIREMENTS THAT MAY APPLY.
21. REFER TO DRAWING E.101 FOR ELECTRICAL PROJECT NOTES.
22. REFER TO DRAWING E.102 FOR ELECTRICAL PROJECT SYMBOLS AND ELECTRICAL ABBREVIATIONS.

* NOTE *

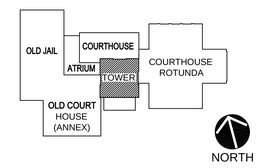
SUBSCRIPT "FS" INDICATES DEVICE IS A FIRE SUPPRESSION SYSTEM COMPONENT DEVICE



FIRE ALARM PLAN – SIXTEENTH FLOOR

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

KEYPLAN



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 ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-0900 FAX: 973-286-0904
www.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0066 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

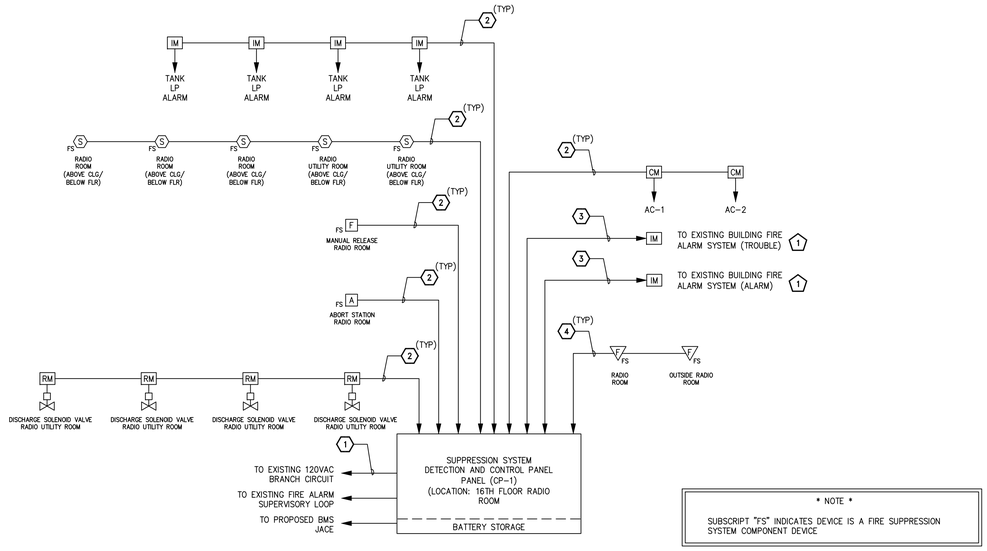
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL - FIRE ALARM PLAN
SIXTEENTH FLOOR

SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					DATE 02-04-16
10.30.15	95% CD UPDATE	KD	FM					SCALE AS SHOWN
02.19.16	ISSUED FOR BID	KD	FM					DRWN BY RB
								CHKD BY JJH
								JOB NO 2151188
								SHEET: _ OF: 35
								DWG. NO

E.501



FIRE SUPPRESSION SYSTEM
POWER, CONTROL ALARM WIRING DIAGRAM
SCALE: NONE

KEYED WORK NOTES:

1. 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 SUPPRESSION SYSTEM INTO THE BUILDING FIRE ALARM SYSTEM AS REQUIRED.

CABLE AND CONDUIT:

1. 2-#12AWG, #12AWG. GND., 3/4"C.
2. 2-#16AWG TWISTED PAIR, 3/4"C
3. 2-#16AWG TWISTED, SHIELDED PAIR, 3/4"C.
4. 6-#16AWG, 3/4"C.

FIRE SUPPRESSION SYSTEM - SCOPE OF WORK:

INSTALLATION WORK:

1. PROVIDE (FURNISH AND INSTALL) A NEW FIRE SUPPRESSION SYSTEM AS REQUIRED AND SPECIFIED. REFER TO PROJECT SPECIFICATIONS FOR COMPLETE REQUIREMENTS.
2. THE CONTRACTOR SHALL PROVIDE A NEW SPRINKLER SUPERVISORY SYSTEM FOR THE APPLICABLE FACILITY AS INDICATED. THE CONTRACTOR'S MINIMUM SCOPE OF WORK SHALL INCLUDE, HOWEVER SHALL NOT BE LIMITED TO THE FOLLOWING:
   - A. PROVIDE CONTROL PANEL AS REQUIRED. PROVIDE ZONES, CONTACTS, RELAYS, POWER SUPPLIES AND ALL OTHER ACCESSORIES FOR A COMPLETE AND OPERATIONAL SYSTEM.
   - B. PROVIDE ALL ALARMING DEVICES AND DEVICE CABLING AS REQUIRED.
   - C. PROVIDE SUPPRESSION AGENT TANK, PIPING AND DISCHARGE EQUIPMENT/DEVICES
   - D. PROVIDE MANUAL PULL STATIONS AS REQUIRED.
   - E. PROVIDE MANUAL ABORT STATIONS.
   - F. PROVIDE BATTERY BACKUP AS REQUIRED. PER NFPA 72.
   - G. PROVIDE ALL NECESSARY RELAYS, WIRING, ALARMING DEVICES, PROGRAMMING, ETC FOR A FULLY FUNCTIONAL SYSTEM.
   - H. PROVIDE ALL NECESSARY RELAYS & INTERLOCKS WITH THE NEW/EXISTING FIRE PROTECTION SYSTEM FACILITIES, AND/OR BUILDING FACILITIES AS REQUIRED.
   - I. PROVIDE ALL DEVICE & POWER TERMINATION WORK.
   - J. PROVIDE ALL POWER WIRING, FACILITIES AND APPURTENANCES PER NEC 760, 770 & 800 WHERE APPLICABLE.
   - K. PROVIDE ALL TESTING & COMMISSIONING REQUIRED FOR RECEIVING FINAL APPROVAL(S) BY THE LOCAL AUTHORITY OF JURISDICTION.
   - L. PROVIDE A 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 MATERIAL, A COORDINATED EQUIPMENT LOCATION PLAN, STORAGE BATTERY CALCULATIONS, VOLTAGE DROP CALCULATIONS, AND A COORDINATED DEVICE INTERCONNECTION DIAGRAM.
3. PRIOR TO THE COMMENCEMENT OF WORK, AND PRIOR TO THE ORDERING OF ANY EQUIPMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SHOP DRAWING SUBMITTAL PACKAGE TO THE LOCAL AUTHORITY HAVING JURISDICTION FOR REVIEW, APPROVAL AND PERMIT AS REQUIRED. REFER TO TO PROJECT SPECIFICATIONS FOR ADDITIONAL SUBMITTAL REQUIREMENTS THAT MAY APPLY. THE SUBMITTAL PACKAGE SHALL HAVE ENOUGH CONTENT TO CONVEY THE COMPLETE SCOPE OF SERVICES AND EQUIPMENT PROVISIONS BEING FURNISHED AND INSTALLED BY THE CONTRACTOR. THE CONTRACTOR'S SUBMITTAL PACKAGE SHALL INCLUDE, HOWEVER NOT NECESSARILY BE LIMITED TO THE FOLLOWING:
   - A. FLOOR PLAN WITH THE LOCATIONS OF ALL ALARM-INITIATING AND NOTIFICATION APPLIANCES, AND ALL MAJOR EQUIPMENT FACILITIES.
   - B. SUPPRESSION SYSTEM PIPING DIAGRAM AND LAYOUT.
   - 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 EQUIPMENT, DEVICES AND MATERIALS.
   - H. INTERFACE OF FIRE SAFETY AND CONTROL FUNCTIONS.
4. ALL INITIATING AND NOTIFICATION APPLIANCES SHALL BE LOCATED AND PROVIDED PER STATE AND LOCAL CODES AND STANDARDS.
5. REFER TO MECHANICAL DWGS. FOR QUANTITIES AND LOCATIONS OF ALL FIRE ALARM DEVICES ASSOCIATED WITH MECHANICAL AND FIRE PROTECTION SYSTEMS AND MAKE CONNECTIONS AS REQUIRED, INCLUDING FIRE/SMOKE DAMPERS, AIR HANDLING EQUIPMENT SHUTDOWN AND DAMPER OPERATION, ETC.
6. 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.
7. THE SYSTEM SHALL BE CAPABLE OF FUTURE EXPANSION FOR FULL USE OF THE BUILDING AS INTENDED.
8. PRIOR TO FINAL PAYMENT, THE CONTRACTOR SHALL SUBMIT FINAL "AS-BUILT" SYSTEM DRAWINGS TO THE OWNER.
9. REFER TO THIS DRAWING FOR ADDITIONAL SYSTEM REQUIREMENTS THAT MAY APPLY.

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.

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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
24 COMMERCIAL BLVD. SUITE 100 NOVATO, CALIFORNIA 94949 27702
VOICE: 973-285-1260 FAX: 973-285-2864
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

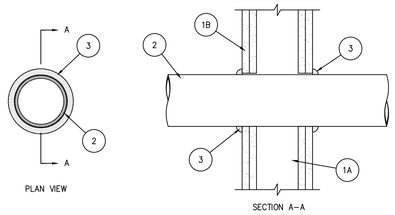
SHEET CONTENTS:

ELECTRICAL - FIRE ALARM
RISER DIAGRAM

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	02-04-16
SCALE	NONE
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.601

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



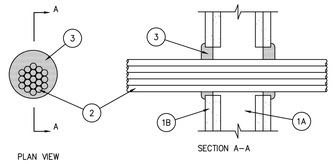
DETAIL NOTES:

1. 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 AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS – WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2"x4" (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.
   B. 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.
2. 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 SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
   A. COPPER TUBING – NOM 4" (102 MM) DIA. (OR SMALLER) TYPE M (OR HEAVIER) COPPER TUBING.
   B. COPPER PIPE – NOM 4" (102 MM) DIA. (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
   C. STEEL PIPE – NOM 4" (102 MM) DIA. (OR SMALLER) SCHEDULE 5 (OR HEAVIER) STEEL PIPE.
   D. CONDUIT – NOM 4" (102 MM) DIA. (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR RIGID STEEL CONDUIT.
   E. IRON PIPE – NOM 4" (102 MM) DIA. (OR SMALLER) CAST OR DUCTILE IRON PIPE.
3. FILL, VOID OR CAVITY MATERIALS* – SEALANT OR PUTTY – MI 1/2" (13 MM) DIAMETER BEAD OF SEALANT OR PUTTY APPLIED CONTINUOUSLY AROUND THE PENETRANT ON THE WALL SURFACES ON BOTH SIDES OF THE WALL.

SPECIFIED TECHNOLOGIES INC. – SPECSEAL PUTTY, SPECSEAL 100, 101, 102, 105, 120 OR 129 SEALANT, SPECSEAL LCI SEALANT
*BEARING THE UL CLASSIFICATION MARK

TYPICAL DETAIL
FIRESTOPPING – CONDUIT THROUGH GYPSUM WALL
SCALE: NONE

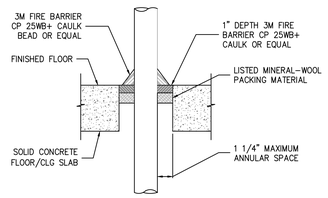
SPECIFIED TECHNOLOGIES INC.
SYSTEM NO. W-L-3135
F RATINGS – 1 AND 2 HR (SEE ITEM 1)
T RATING – 0 HR



DETAIL NOTES:

1. 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 INCLUDED THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS – WALL FRAMING SHALL CONSIST OF EITHER WOOD STUDS OF STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2"x4" LUMBER SPACED 16" OC. STEEL STUDS TO BE MIN 3-5/8" WIDE AND SPACED 24" OC.
   B. 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
2. 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 SIDES OF THE WALL. ANY COMBINATION OF THE FOLLOWING TYPES AND SIZES OF CABLES MAY BE USED:
   A. MAX 200 PAIR NO. 24 AWG (OR SMALLER) COPPER CONDUCTOR CABLE WITH POLYVINYL CHLORIDE (PVC) JACKETING AND INSULATION AND JACKET.
   B. MAX 3/C NO. 2/0 AWG (OR SMALLER) ALUMINUM OR COPPER CONDUCTOR SERVICES ENTRANCE CABLE WITH PVC INSULATION AND JACKET.
   C. MAX 3/C NO. 8 AWG (OR SMALLER) NONMETALLIC SHEATHED (ROMEX) CABLE WITH COPPER CONDUCTORS, PVC INSULATION AND JACKET.
   D. MAX 7/C NO. 2.0 AWG (OR SMALLER) MULTICONDUCTOR POWER AND CONTROL CABLES WITH XLPE OR PVC INSULATION AND XLPE OR PVC JACKET.
   E. MAX RG59/U (OR SMALLER) COAXIAL CABLE WITH FLUORINATED ETHYLENE INSULATION AND JACKETING.
   F. MAX 62.5/48 FIBER OPTIC CABLE WITH PVC INSULATION AND JACKETING.
   G. MAX 4 PAIR NO. 24 AWG (OR SMALLER) COPPER CONDUCTOR CATEGORY 5 CABLE WITH HALYARD INSULATION AND JACKETING.
3. FILL, VOID OR CAVITY MATERIAL* – 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 SIDES OF THE WALL. SPECIFIED TECHNOLOGIES INC. – SPECSEAL PUTTY *BEARING THE UL CLASSIFICATION MARKING.

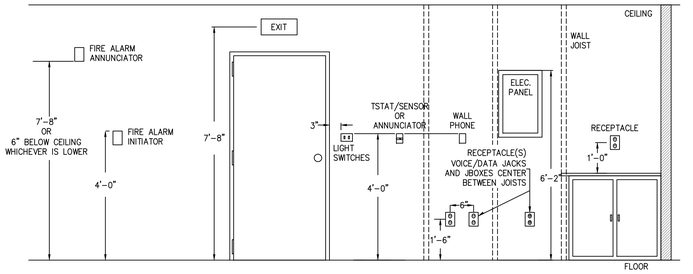
TYPICAL DETAIL
FIRESTOPPING – CABLE(S) THROUGH GYPSUM WALL
SCALE: NONE



DETAIL NOTES:

1. COORDINATE WITH ARCHITECTURAL PLANS TO CONFIRM FINAL FIRE RATINGS REQUIREMENTS. REQUIREMENTS SHOWN ON ARCHITECTURAL PLANS SHALL SUPERSEDE THIS DETAIL.

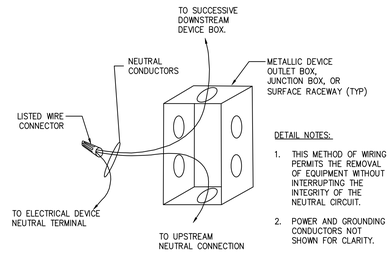
TYPICAL DETAIL
FIRESTOPPING – CONDUIT THROUGH MASONRY FLR/WALL
SCALE: NONE



DETAIL NOTES:

1. COORDINATE ALL LOCATIONS OF ELECTRICAL EQUIPMENT WITH ARCHITECTURAL DRAWINGS.
2. USE THESE DEVICE MOUNTING HEIGHTS UNLESS OTHERWISE INDICATED ON ARCHITECTURAL DRAWINGS.
3. DEVICE HEIGHTS SHOWN FOR INFORMATIONAL PURPOSES ONLY. HEIGHTS APPLY FOR INSTALLED DEVICES AND EQUIPMENT.

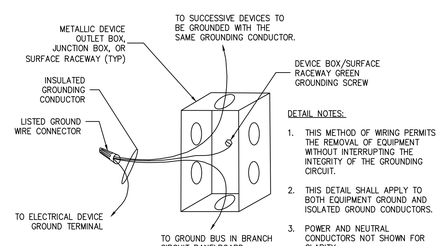
TYPICAL DETAIL
EQUIPMENT MOUNTING HEIGHTS
SCALE: NONE



DETAIL NOTES:

1. THIS METHOD OF WIRING PERMITS THE REMOVAL OF EQUIPMENT WITHOUT INTERRUPTING THE INTEGRITY OF THE NEUTRAL CIRCUIT.
2. POWER AND GROUNDING CONDUCTORS NOT SHOWN FOR CLARITY.

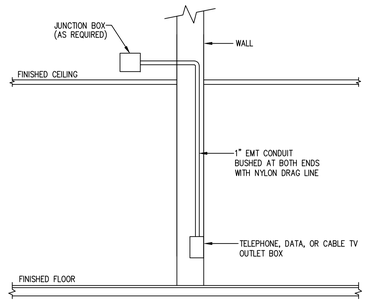
TYPICAL DETAIL
NEUTRAL TERMINATION FOR MUTLI-WIRE CIRCUITS
SCALE: NONE



DETAIL NOTES:

1. THIS METHOD OF WIRING PERMITS THE REMOVAL OF EQUIPMENT WITHOUT INTERRUPTING THE INTEGRITY OF THE GROUNDING CIRCUIT.
2. THIS DETAIL SHALL APPLY TO BOTH EQUIPMENT GROUND AND ISOLATED GROUND CONDUCTORS.
3. POWER AND NEUTRAL CONDUCTORS NOT SHOWN FOR CLARITY.

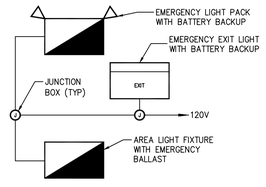
TYPICAL DETAIL
DEVICE GROUNDING CONNECTION
SCALE: NONE



DETAIL NOTES:

1. CONTRACTOR SHALL PROVIDE ALL CONDUIT, WIREWAY AND APPURTENANCES AS REQUIRED.
2. CONTRACTOR SHALL ROUGH-IN ALL FLUSH-MOUNTED JUNCTION BOXES AS REQUIRED. COORDINATE FINAL EQUIPMENT LOCATIONS WITH ARCHITECTURAL DRAWINGS, AND FURNITURE EQUIPMENT SHOP DRAWINGS.

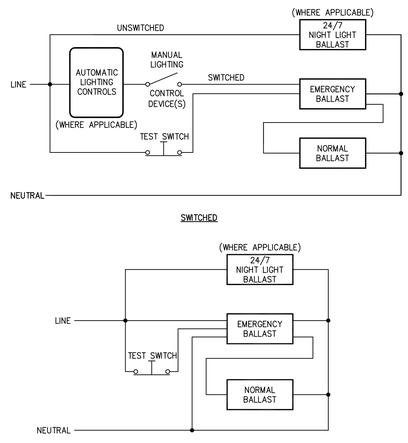
TYPICAL DETAIL
CONDUIT STUB FOR TELEPHONE/DATA/CABLE SERVICES
SCALE: NONE



DETAIL NOTES:

1. CONNECT TO 120/277V LOCAL LIGHTING CICUIT (AHEAD OF ANY SWITCHING AND/OR AUTOMATIC CONTROLS) FOR CHARGING AND AREA PROTECTION IN ACCORDANCE WITH NEC 700-12.
2. 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.
3. WHERE SEPARATE POWER CIRCUITS ARE EMPLOYED, PROVIDE A LISTED CIRCUIT BREAKER BLOCKING DEVICE THAT PROHIBITS INADVERTENT CIRCUIT BREAKER OPERATION.

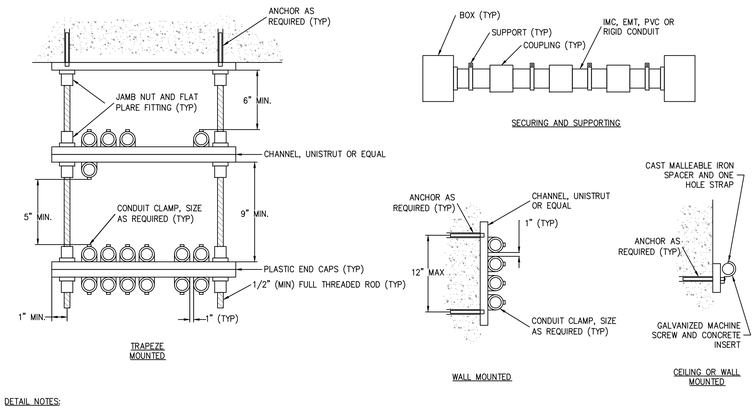
TYPICAL DETAIL
EMERGENCY LIGHTING CONNECTIONS
SCALE: NONE



DETAIL NOTES:

1. ONLY PRIMARY CIRCUITS SHOWN. LAMP LEADS NOT SHOWN.
2. EMERGENCY BALLASTS SHALL SERVE TWO FIXTURE LAMPS MINIMUM, UNLESS OTHERWISE INDICATED ON THE PLANS.
3. FINAL WIRING AND INSTALLATION PROVISIONS SHALL BE PER MANUFACTURER'S INSTRUCTIONS.
4. PROVIDE EMERGENCY BALLASTS PER BODINE B33 (2500 LUMENS MIN), OR FIXTURE MANUFACTURER APPROVED EQUIVALENT.
5. PROVIDE NIGHT LIGHT BALLAST ONLY WHERE APPLICABLE, AND PER FIXTURE MANUFACTURER INSTRUCTIONS.

TYPICAL DETAIL
EMERGENCY BALLAST WIRING SCHEMATICS
SCALE: NONE



DETAIL NOTES:

1. CONDUIT SECURING AND SUPPORTING SHALL BE PER NEC 342-30 (IMC), 344-30 (RMC), 352-30 (RNC) AND/OR 358-30 (EMT). EXPANSION FITTINGS FOR RNC PER NEC 352.44.

TYPICAL DETAIL
CONDUIT MOUNTING AND INSTALLATION
SCALE: NONE

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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NEW JERSEY 07102
VOICE: 973-286-2882 FAX: 973-286-2884
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENGERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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:

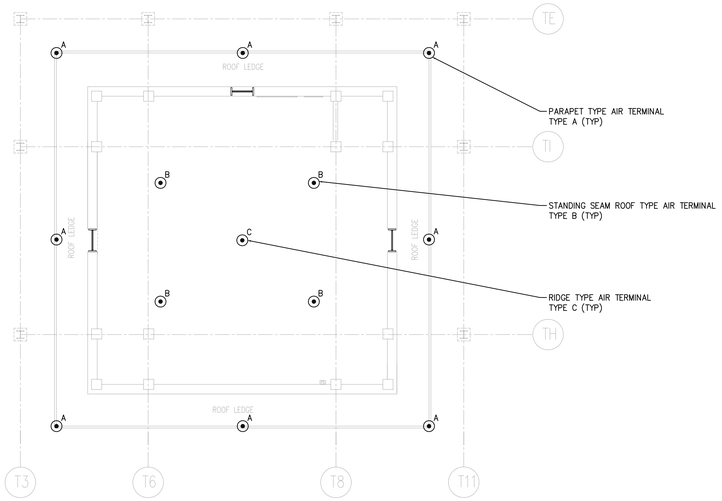
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL DETAILS

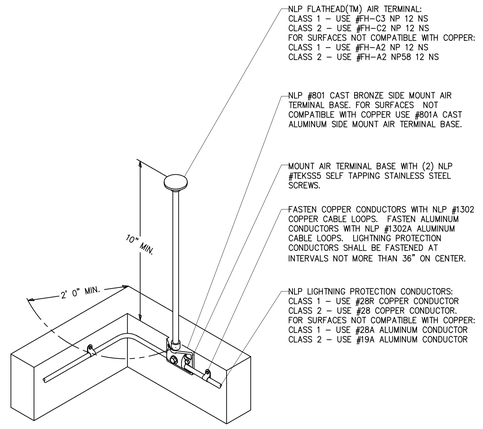
SUBMISSIONS				REVISIONS				
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD	
9.15.15	95% CD SUBMIT	KD	FM					
10.30.15	95% CD UPDATE	KD	FM					
02.19.16	ISSUED FOR BID	KD	FM					

DATE	02-04-16
SCALE	NONE
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.801



PARTIAL PLAN – TOWER ROOF
LIGHTNING PROTECTION DEVICE PLAN

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

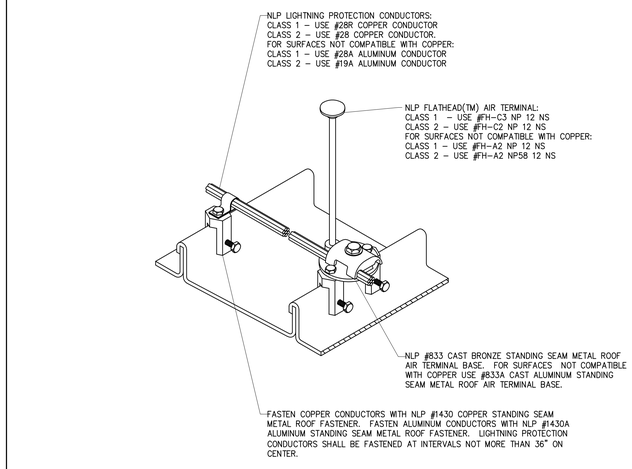


NOTES:

1. AIR TERMINAL SPACING SHALL CONFORM TO NFPA 780 & UL 96A REQUIREMENTS.
2. MATERIAL COMPATIBILITY SHALL CONFORM TO NFPA 780 & 96A REQUIREMENTS.
3. MATERIAL CLASS SHALL CONFORM TO NFPA 780 & UL 96A REQUIREMNTS.
4. AIR TERMINALS SHALL BE UL LISTED & CAL-OSHA APPROVED.

TYPICAL DETAIL
PARAPET AIR TERMINAL

SCALE: NONE

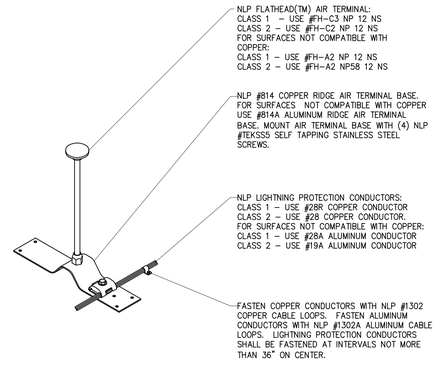


NOTES:

1. AIR TERMINAL SPACING SHALL CONFORM TO NFPA 780 & UL 96A REQUIREMENTS.
2. MATERIAL COMPATIBILITY SHALL CONFORM TO NFPA 780 & 96A REQUIREMENTS.
3. MATERIAL CLASS SHALL CONFORM TO NFPA 780 & UL 96A REQUIREMENTS.
4. AIR TERMINALS SHALL BE UL LISTED & CAL-OSHA APPROVED.

TYPICAL DETAIL
STANDING SEAM ROOF AIR TERMINAL

SCALE: NONE



NOTES:

1. AIR TERMINAL SPACING SHALL CONFORM TO NFPA 780 & UL 96A REQUIREMENTS.
2. MATERIAL COMPATIBILITY SHALL CONFORM TO NFPA 780 & 96A REQUIREMENTS.
3. MATERIAL CLASS SHALL CONFORM TO NFPA 780 & UL 96A REQUIREMENTS.
4. AIR TERMINALS SHALL BE UL LISTED & CAL-OSHA APPROVED.

TYPICAL DETAIL
RIDGE AIR TERMINAL

SCALE: NONE

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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL & ELECTRICAL CONSULTING ENGINEERS
1 N. BROADWAY, SUITE 1300, WHITE PLAINS, NEW YORK 10601
VOICE: 972-286-2060 FAX: 972-286-2064
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
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
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

ELECTRICAL DETAILS

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
2.04.16	95% CD SUBMIT	KD	FM				

DATE	02-04-16
SCALE	
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	E.802

GENERAL FIRE PROTECTION NOTES:

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE INTERNATIONAL FIRE CODE (IFC), LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
2. 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.
3. 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.
4. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
5. CONTRACTOR SHALL SUPPORT EQUIPMENT AND MATERIAL FROM BEAMS. IF NECESSARY, CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT STEEL ON METAL TO ATTACH TO BEAMS.
6. 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 AIRTIGHT.
7. 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.
8. CONTRACTOR SHALL WARRANTY ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
9. 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.
10. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
11. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
12. 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.
13. FURNISH AND INSTALL CLEAN AGENT FIRE SUPPRESSION SYSTEM IN ACCORDANCE WITH PLANS AND SPECIFICATIONS.
14. THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL EQUIPMENT PRESSURE SWITCHES AND ALARM DEVICES. 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.
15. IN GENERAL THE CLEAN AGENT FIRE PROTECTION SYSTEM WILL CONSIST OF A COMPLETE AND APPROVED INSTALLATION OF OVERHEAD PIPING, NOZZLES, DETECTORS, PULL STATIONS, ABORT STATION AND DRY AGENT CYLINDER.

ABBREVIATIONS & SYMBOLS

SYMBOL	MFR	DESCRIPTION	INSTALLATION
FSCP	SIEMENS	FC922 FIRE SUPRESSION CONTROL PANEL	MOUNTED AND WIRED BY ELECTRICAL CONT'R
HTRI-D	SIEMENS	HTRI-S MONITOR TRANSPONDER DUAL MONITOR MODULES	MOUNTED AND WIRED BY ELECTRICAL CONT'R
HTRI-R	SIEMENS	HTRI-S MONITOR TRANSPONDER ADDRESSABLE RELAY MODULE	MOUNTED AND WIRED BY ELECTRICAL CONT'R
F	SIEMENS	MH-501 MANUAL AGENT RELEASE STATION	MOUNTED AND WIRED BY ELECTRICAL CONT'R
A	SIEMENS	AW-1 & HTRI-M AGENT RELEASE ABORT STATION	MOUNTED AND WIRED BY ELECTRICAL CONT'R
S	SIEMENS	OP921 WITH DB-11 BASE ADDRESSABLE SMOKE DETECTOR	MOUNTED AND WIRED BY ELECTRICAL CONT'R
S	SIEMENS	CPY-24 AGENT TANK SOLENOID	INSTALLED BY SPRINKLER CONT'R & WIRED BY ELECTRICAL CONT'R
R	SIEMENS	CPY-MRS MAIN/RESERVE SELECTOR	INSTALLED BY SPRINKLER CONT'R & WIRED BY ELECTRICAL CONT'R
H	SIEMENS	AMT-24MCW-FR MULTI-TONE HORN & STROBE LIGHT	MOUNTED AND WIRED BY ELECTRICAL CONT'R
■	SIEMENS	REL-EOL RELEASING END LINE	MOUNTED AND WIRED BY ELECTRICAL CONT'R
•	SIEMENS	CPENY 180° AGENT-NOZZEL	INSTALLED AND PIPED BY SPRINKLER CONT'R
A	SIEMENS	CPY-150 SINOREX BELOW FLOOR AGENT TANK – 150 LBS	INSTALLED AND PIPED BY SPRINKLER CONT'R
B	SIEMENS	CYP-250 SINOREX ABOVE FLOOR AGENT TANK – 250 LBS	INSTALLED AND PIPED BY SPRINKLER CONT'R

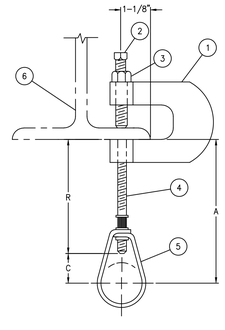
AGENT DESIGN DATA:

ROOM VOLUME ABOVE RAISED FLOOR: 4927 CU. FT
AGENT REQUIRED: 170 LBS
AGENT DESIGN: 250 LBS

ROOM VOLUME BELOW RAISED FLOOR: 350 CU. FT
AGENT REQUIRED: 35 LBS
AGENT DESIGN: 150 LBS

DESIGN DATA FOR C-CLAMP HANGER

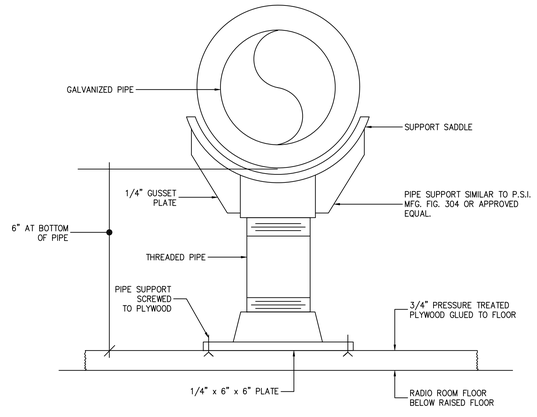
NOMINAL PIPE SIZE	MINIMUM A DIMENSION INCHES	HANGER TAKEOUT INCHES	ROD DIAMETER INCHES
1/2	3-1/2	1-1/4	3/8
3/4	3-1/2	1-1/4	3/8
1	3-1/2	1-1/4	3/8
1-1/4	3-3/4	1-1/2	3/8
2	3-3/4	1-1/2	3/8



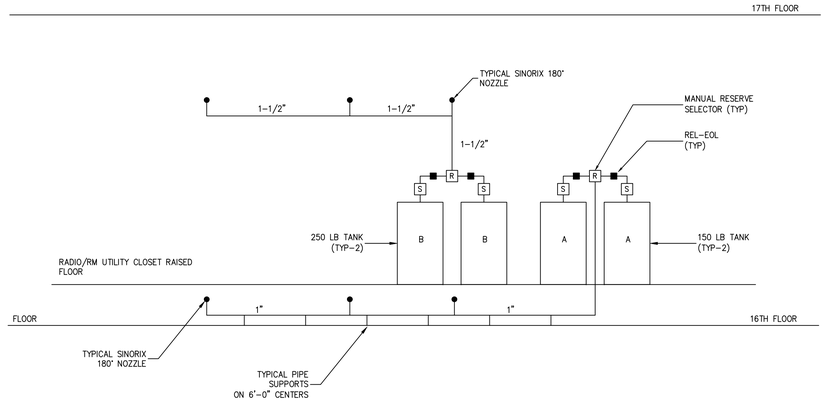
COMPONENTS:

1. C-CLAMP
2. SET SCREW
3. LOCK NUT
4. HANGER ROD
5. ADJUSTABLE HANGER RING
6. STEEL BEAM OR BAR JOIST

TYPICAL STANDARD C-CLAMP PIPE HANGER DETAIL
SCALE: NONE



PIPE SUPPORT DETAIL
SCALE: NONE



RISER DIAGRAM
SCALE: NONE

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

ATI
ASSOCIATED TECHNOLOGY, INC.
MECHANICAL, ELECTRICAL, PLUMBING ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2800 FAX: 973-286-2864
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28094400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.378.0008 FAX: 973-379-1061
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

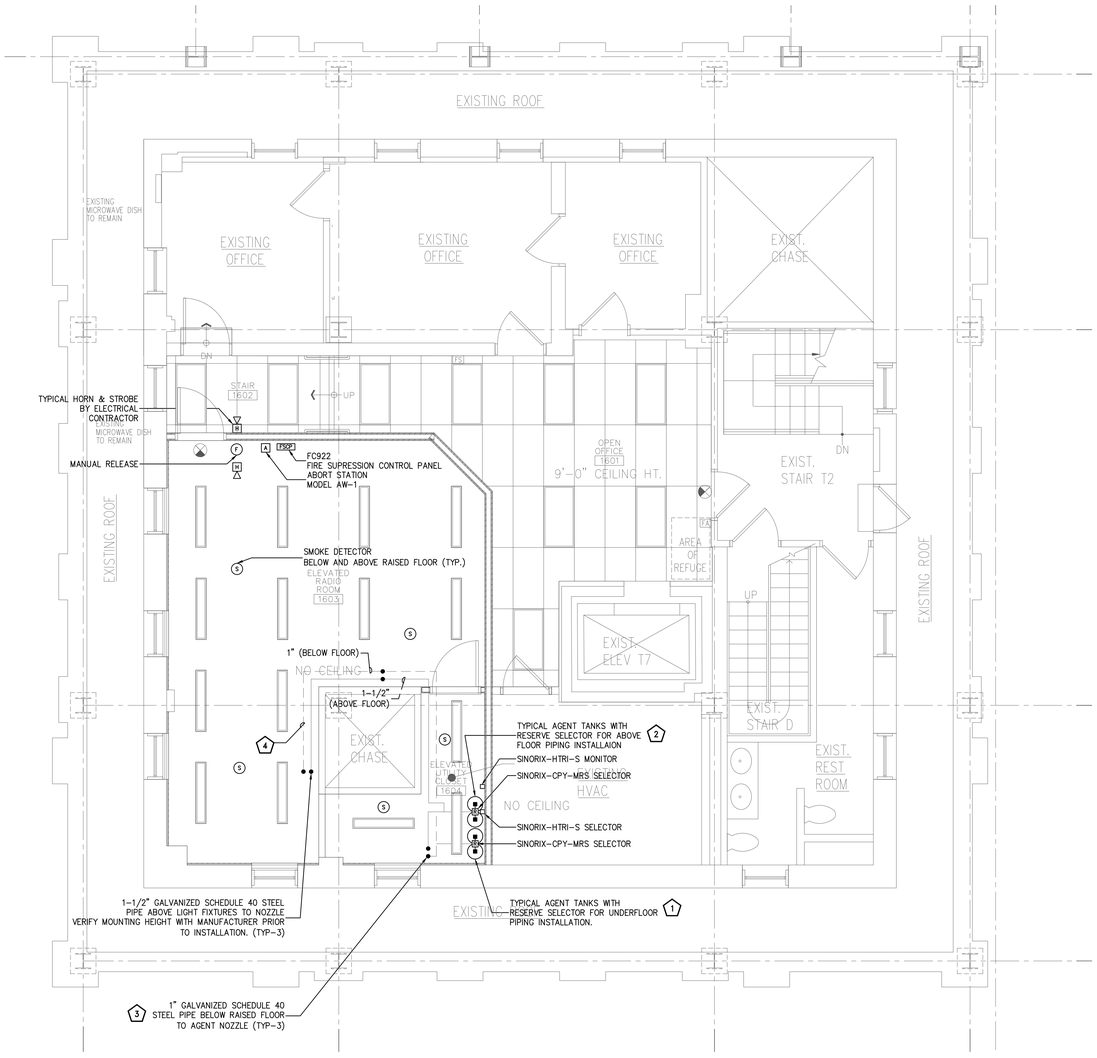
UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

FIRE PROTECTION
GENERAL NOTES, SYMBOLS, ABBREVIATIONS & DETAILS

SUBMISSIONS DATE	DESCRIPTION	BY	CHKD	REVISIONS DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	02-04-16
SCALE	NONE
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	FP.101



SIXTEENTH FLOOR PIPING PLAN

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

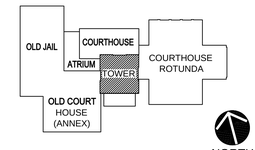
KEYED NEW WORK NOTES:

1. SINORIX-CPY-150 AGENT TANK - 150 LBS (BELOW FLOOR)
2. SINORIX-CPY-250 AGENT TANK - 250 LBS (ABOVE FLOOR)
3. SINORIX-CPENY AGENT NOZZLE
4. SUPPORT PIPING BELOW RAISED FLOOR ON 6'-0" CENTERS.

DRAWING NOTES:

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

KEYPLAN



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 ENGINEERS
24 COMMERCE STREET, SUITE 1200, NEWARK, NJ 07102
VOICE: 973-286-2000 FAX: 973-286-2864
WWW.ATIENGINEERS.COM
CERTIFICATE OF AUTHORIZATION 24GA28084400

JOSEPH J. HENDERSHOT, PE
NJ PE NO. GE43857

NETTAARCHITECTS
ARCHITECTURE - PLANNING - INTERIOR DESIGN
1084 ROUTE 22 WEST, MOUNTAINSIDE, NEW JERSEY 07092
TEL: 973.379.0008 FAX: 973-379-1081
CERTIFICATE OF AUTHORIZATION AC-438

PROJECT:

UC COURTHOUSE
RADIO ROOM (TOWER)
2 Broad Street, Elizabeth New Jersey

SHEET CONTENTS:

FIRE PROTECTION PIPING PLAN
SIXTEENTH FLOOR

SUBMISSIONS				REVISIONS			
DATE	DESCRIPTION	BY	CHKD	DATE	DESCRIPTION	BY	CHKD
9.15.15	95% CD SUBMIT	KD	FM				
10.30.15	95% CD UPDATE	KD	FM				
02.19.16	ISSUED FOR BID	KD	FM				

DATE	02-04-16
SCALE	AS SHOWN
DRWN BY	RB
CHKD BY	JJH
JOB NO	2151188
SHEET:	_ OF: 35
DWG. NO	FP.301