

**SPECIFICATIONS
FOR
EMERGENCY GENERATOR INSTALLATION
DEPARTMENT OF PUBLIC WORKS FACILITY
TOWNSHIP OF SCOTCH PLAINS, COUNTY OF UNION, NEW JERSEY
BA#20-2018; UNION COUNTY ENGINEERING PROJECT #2013-028
MARCH 2018**

**UNION COUNTY OFFICIALS
BOARD OF CHOSEN FREEHOLDERS**

Sergio Granados, Chairman
Bette Jane Kowalski, Vice Chairman
Bruce H. Bergen, Freeholder
Linda Carter, Freeholder
Angel G. Estrada, Freeholder
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James E. Pellettiere, RMC

COUNTY MANAGER
Edward T. Oatman

**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:
ALAIMO GROUP
200 High Street
Mount Holly, New Jersey 08060
T: (609) 267-8310
F: (609) 845-0300**

**EMERGENCY GENERATOR INSTALLATION
DEPARTMENT OF PUBLIC WORKS FACILITY
TOWNSHIP OF SCOTCH PLAINS, COUNTY OF UNION, NEW JERSEY
BA#20-2018; Union County Engineering Project #2013-028**

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(Draft form until contract is awarded)

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**COUNTY OF UNION
NOTICE TO BIDDERS**

Sealed bids will be received by the director of the Division of Purchasing, or her designee, at the County of Union, New Jersey on April 12, 2018 at 10:30 a.m., prevailing time, in the 3rd Floor Conference Room, U.C. Administration Building, 10 Elizabethtown Plaza, Elizabeth, New Jersey for:

**EMERGENCY GENERATOR INSTALLATION
DEPARTMENT OF PUBLIC WORKS FACILITY
TOWNSHIP OF SCOTCH PLAINS, COUNTY OF UNION, NEW JERSEY
BA#20-2018; UNION COUNTY ENGINEERING PROJECT #2013-028**

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 \$275.00 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.

Bidders on this project are required to be classified by the State of NJ, Division of Property Management and Construction (DPMC) under classification(s) # C008, C019, C021 and C047 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 in accordance with the New Jersey Local Public Contracts Law.

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.A.C. 17:27.

Laura M. Scutari, QPA, MPA, Director of Purchasing

**UNION COUNTY BOARD
OF CHOSEN FREEHOLDERS**

We're Connected to You!

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

**TITLE OF PROJECT: Emergency Generator Installation
Department of Public Works Facility
Township of Scotch Plains, County of Union, New Jersey
BA#20-2018; Union County Engineering Project #2013-028**

BIDDER: Bidder shall be a single overall contract bidder

**ARCHITECT/ENGINEER: Alaimo Group
200 High Street
Mount Holly, New Jersey**

COUNTY ENGINEER AND/OR CONSTRUCTION MANAGER (as applicable):

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:

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 Contractor's risk. Such payment will only be in the amount agreed to by the parties, in writing in the Change Order(s). See Section 39, Change Orders, of these general specifications for further details.

Refer to Bid Document Submission Checklist for all required documents.

In the event there is a discrepancy between the unit price given and the extended total, the unit price will govern. Any discrepancies will be mathematically adjusted.

Insert applicable alternates, if any have been specified, applicable to the Bidder's Work. All alternates MUST be bid upon. Any Bidder's failure to do so will be deemed a material, non-waivable defect and shall render the bid nonresponsive. The Bidder shall clearly designate whether the change in price is an addition or subtraction, by using either a "+" sign or the word "addition", or in the alternative, a "-" sign or the word "minus". If there is no other change in price, the Bidder shall insert "NC" or "No Charge".

When two or more low bids are equal in all respects, awards will be made according to the provisions of N.J.S.A. 40A:11-6.1(d).

Where unit prices have already been established by the Contract Documents, the Bidder agrees that such unit prices shall prevail. All unit prices, whether filled in by the Bidder or established by the Contract Documents, shall become part of the Contract. No bid will be considered or award made, unless applicable unit prices, as required, are filled in.

The County reserves the right to reject any or all bids and also reserves the right to waive any informality in the bids received so long as said waiver is not of a response which is considered to be material and non-waivable pursuant to law.

The County of Union has the right to reject any and all bids from any bidder that is in, or contemplates bankruptcy of any chapter of nature. Said bidder shall notify the County, in writing, of any condition or knowledge of the same.

Conditional bids will not be accepted. Bids may be withdrawn prior to the advertised time for the opening of bids or authorized postponement thereof or in accordance with the provisions of N.J.S.A. 40A:11-23.3 discussed below. Bids received after the advertised time shall not be considered. Bidders shall be solely responsible for premature opening or late delivery of bids not properly marked, addressed, or directed.

2. WITHDRAWAL OF BID DUE TO MISTAKE

N.J.S.A. 40A:11-23.3 authorizes a bidder to request withdrawal of a public works bid due to a mistake on the part of the bidder. A mistake is defined by N.J.S.A. 40A:11-2(42) as a clerical error that is an **unintentional and substantial computational error or an unintentional omission of a substantial quantity of labor, material, or both, from the final bid computation.**

A bidder claiming a mistake under N.J.S.A. 40A:11-23.3 must submit a request for withdrawal, **in writing**, by certified or registered mail to Laura M. Scutari, QPA, MPA,

Director, Division of Purchasing, County of Union, New Jersey, Union County Administration Building, 10 Elizabethtown Plaza, Elizabeth, New Jersey 07207. The bidder must request withdrawal of a bid due to a mistake, as defined by the law, within five business days after the receipt and opening of the bids. Since the bid withdrawal request shall be effective as of the postmark of the certified or registered mailing, Laura M. Scutari, QPA, Director of the Division of Purchasing or his designee may contact all bidders, after bids are opened, to ascertain if any bidders wish to, or already have exercised a request to withdraw their bid pursuant to N.J.S.A. 40A:11-23.3.

A bidder's request to withdraw the bid **shall** contain evidence, including any pertinent documents, demonstrating that a mistake was made. Such documents and relevant written information shall be reviewed and evaluated by the County's designated staff pursuant to the statutory criteria of N.J.S.A. 40A:11-23.3.

The County will not consider any written request for a bid withdrawal for a mistake, as defined by N.J.S.A. 40A:11-2(42), by a bidder in the preparation of a bid proposal unless the postmark of the certified or registered mailing is within the five business days following the opening of bids.

3. QUALIFICATIONS OF BIDDERS AND REQUIRED SUBMISSIONS

The County may make such investigation as it deems necessary to determine the ability of the Bidders to perform the Work, which includes investigation of any and all subcontractors listed with the bid. The Bidder shall furnish any information and data for this purpose as the County may request.

4. INTERPRETATIONS AND ADDENDA

Any explanation desired by a bidder regarding the meaning or interpretation of the Contract Documents must be requested in writing to the County Engineer 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 N.J.S.A. 40A:11-25 as well as N.J.S.A. 52:35-1 et seq. (See Section 53 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. 34:11-56.25 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 Workforce Development 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).

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 statutes and local ordinances applicable to the Work to be done under the contract.

It is agreed and understood that any contracts and/or orders placed as a result of this proposal will be governed and construed and the rights and obligations of the parties hereto will be determined in accordance with the laws of the State of New Jersey.

Upon completion of the Work, the Contractor will furnish a Certification of Compliance with the New Jersey Prevailing Wage Act. The certificate in a form acceptable to County Counsel is a condition of the final payment. (See form attached)

24. BRAND NAME OR EQUAL

When the Specifications, Forms, and other Contract Documents use “brand name or equivalent” or similar language, the listed brand name shall serve as a reference or point of comparison for the functional or operational characteristic desired for the goods or services being requested. Where a bidder attempts to submit an equivalent product for a brand name, it shall be the responsibility of the bidder to fully describe and document the product to be provided with the bid in order to establish the equivalence claim.

- A. If the Bidder proposes to offer substitute goods as an equal to those specified herein, the bidder shall so indicate with the Bid Proposal. For the purposes of this paragraph, a proposed item shall be considered equal to goods specified herein if:
 - 1. The County, in its sole discretion, determines that: (i) the goods conform substantially, even with deviations, to the brand name goods specified herein; (ii) the goods are equal to or greater than the brand name goods specified herein in terms of quality, durability, functionality, appearance, strength and design; (iii) the goods are capable, at least as well as the brand name goods specified herein, or performing with existing equipment; and (iv) the goods do not cost the County more than the brand name goods specified herein costs the County.
- B. To offer substitute goods as an equal to those specified herein, it is necessary that:

1. The Bidder submits sufficient information with its bid to permit the County to determine that the goods are equivalent to the brand name goods specified herein, including, but not necessarily limited to the brand, catalog number and specifications/data sheets;
 2. The Bidder fully identifies and describes the variations of the goods from the brand name goods specified herein on a separate sheet that is to be submitted with the bid proposal. Bidder's literature WILL NOT suffice in explaining exceptions to these specifications.
 3. The Bidder certifies that the goods (i) are similar in substance to the brand name goods specified, and (ii) are suited to the same use as the item specified;
- C. The County shall be allowed a reasonable time within which to evaluate the Bidder's proposal to offer substitute goods as an equal to those specified herein. The County shall be the sole judge of acceptability. No "or-equal" goods shall be ordered, delivered, assembled, set-up or utilized until the County's evaluation is complete. The County's determination as to equivalency shall be deemed final and absolute.

In the event the Bidder does not provide sufficient supporting documentation with the bid, it will be presumed and required that the brand name goods and services as described in the specifications will be provided.

25. LINES AND GRADES

Normally, horizontal and vertical control points will be provided in the technical specifications. All other surveying will be the responsibility of the Contractor unless otherwise noted.

26. NUMBER OF WORKING DAYS

In accordance with N.J.S.A. 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 N.J.S.A. 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 N.J.S.A. 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 N.J.S.A. 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 N.J.S.A. 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.

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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 Workforce Development 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 39. 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 N.J.S.A. 2A:30A-1 et seq.)

All Applications for Payment shall be accompanied by paid invoices for materials incorporated in the Work and for materials suitably stored at the site, and affidavit(s) by Subcontractors whose Work was included in the next to the last application to the effect such Work and such materials have been paid for.

No payment shall be made without Contractor having provided all submittals set forth in this Section and the approval of same by the County.

For contracts exceeding \$100,000.00, monthly payments will be made on the Work to the extent of 98% of the value of the Work done which is considered to be retainage.

For contracts less than \$100,000.00, monthly payments will be on the Work to the extent of 90% of the value of the Work done. In lieu of the retainage, the Contractor will, at his option, deposit with the County Counsel negotiable bearer bonds of the State of New Jersey or any political subdivision thereof, equal to the amount otherwise withheld as retainage.

When the Project is completed, the final cost of the Project will be based on actual quantities of authorized Work done under each item scheduled in the bidding sheet and approved Change Orders, if any. The money due to the Contractor as determined by said final certificate after deduction of previous monthly payments on account, will be paid to the Contractor in accordance with the terms of the contract dealing with Prompt Payment, providing, however that before such final payment is made, all outstanding claims against the Contractor must be satisfied. Before final payment is released, the Contractor must furnish: **a)** Maintenance Bond (see Section 17 of these general specifications); **b)** Certification of Compliance, New Jersey Prevailing Wage Act (see Sections 23 & 53); and **c)** General Release (see Section 38) in a form satisfactory to County Counsel; **d)** complete set of as-built plans in the latest AutoCad on compact disc; and **e)** a complete set of in-progress photos in jpg, jpeg, or bmp digital format on a compact disc.

43. INSPECTION

The Work must be done in accordance with the plans and specifications, and will be inspected by the County Engineer. An inspector may be placed upon the Work at any time by the County Engineer to see that the plans, specifications, and instructions of the County Engineer are carried out. In connection herewith, bidders are referred to N.J.S.A. 40A:11-17.

44. DAMAGES

The Contractor will be held responsible for all damages that may occur to Work, or to persons or property by reason of the nature of the Work or from the elements, or by reason of inadequate protection of the Work, or from any carelessness or negligence on his part or on the part of his employees. The County will withhold payments on the Work until all suits or claims for damages sustained on, or by reason of, this Work will have been settled by the Contractor.

The construction and final completion of this Work will be guaranteed by the Contractor. Any damages that may be done to the Work or any part thereof, by the elements or otherwise, during its construction, will be made good by the Contractor.

45. LIQUIDATED DAMAGES

If the Project is not completed within the time specified herein or within such further time as may have been granted by the County Engineer, then the Contractor

hereby agrees to pay to the County as liquidated damages, but not as a penalty, \$1,000.00 per day for each and every calendar day that he is in default on time to complete the Work. The said sum will be deducted from moneys due the Contractor and if the damages exceed this amount, then the Contractor or his Surety Company will pay the excess. These damages may be waived at the option of the County.

46. AFFIRMATIVE ACTION REQUIREMENTS

EXHIBIT B (Revised 4/10)

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE N.J.S.A. 10:5-31 et seq. (P.L. 1975, C. 127) N.J.A.C. 17:27

CONSTRUCTION CONTRACTS

During the performance of this contract, the contractor agrees as follows:

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, up-grading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer, pursuant to N.J.S.A. 10:5-31 et seq., as amended and

supplemented from time to time and the Americans with Disabilities Act.

When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by N.J.A.C. 17:27-7.2; provided, however, that the Division may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B and C, as long as the Division is satisfied that the contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Division, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the targeted employment goal established in accordance with N.J.A.C. 17:27-7.2. The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

(A) If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et. seq., as supplemented and amended from time to time and the Americans with Disabilities Act. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the contractor or subcontractor agrees to afford equal employment opportunities minority and women workers directly, consistent with this chapter. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with affording equal employment opportunities as specified in this chapter, the contractor or subcontractor agrees to be prepared to provide such opportunities to minority and women workers directly, consistent with this chapter, by complying with the hiring or scheduling procedures prescribed under (B) below; and the contractor or subcontractor further agrees to take said action immediately if it determines that the union is not referring minority and women workers consistent with the equal employment opportunity goals set forth in this chapter.

(B) If good faith efforts to meet targeted employment goals have not or cannot be met for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions:

(1) To notify the public agency compliance officer, the Division, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;

(2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;

(3) Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;

(4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and non-discrimination standards set forth in this regulation, as well as with applicable Federal and State court decisions;

(6) To adhere to the following procedure when minority and women workers apply or are referred to the contractor or subcontractor:

(i) The contractor or subcontractor shall interview the referred minority or women worker.

(ii) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the contractor or subcontractor shall in good faith determine the qualifications of such individuals. The contractor or subcontractor shall hire or schedule those individuals who satisfy appropriate qualification standards in conformity with the equal employment opportunity and non-discrimination principles set forth in this chapter. However, a contractor or subcontractor shall determine that the individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Division. If necessary, the contractor or subcontractor shall hire or schedule minority and women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (C) below.

(iii) The name of any interested women or minority individual shall be maintained on a waiting list, and shall be considered for employment as described in (i) above, whenever vacancies occur. At the request of the Division, the contractor or subcontractor shall provide evidence of its good faith efforts to employ women and minorities from the list to fill vacancies.

(iv) If, for any reason, said contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its files, and send a copy to the public agency compliance officer and to the Division.

(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Division and submitted promptly to the Division upon request.

(C) The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship

program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of (B) above, it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

After notification of award, but prior to signing a construction contract, the contractor shall submit to the public agency compliance officer and the Division an initial project workforce report (Form AA 201) electronically provided to the public agency by the Division, through its website, for distribution to and completion by the contractor, in accordance with N.J.A.C. 17:27-7. The contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Division and to the public agency compliance officer.

The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and/or off-the-job programs for outreach and training of minorities and women.

(D) The contractor and its subcontractors shall furnish such reports or other documents to the Division of Public Contracts Equal Employment Opportunity Compliance as may be requested by the Division from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Division of Public Contracts Equal Employment Opportunity Compliance for conducting a compliance investigation pursuant to **Subchapter I0 of the Administrative Code (NJAC 17:27)**.

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47. INVESTMENT ACTIVITIES WITH IRAN

Pursuant to P.L. 2012, c.25, codified as N.J.S.A. 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 - (N.J.S.A. 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 Workforce Development and to possess a current certificate by said Department indicating compliance with the Act prior to the time and date that bids are received. Bidders are notified of this requirement of their compliance. Such certificates or applications shall also be provided for each Subcontractor furnishing plumbing and gas fitting, steam and hot water heating and ventilating apparatus, and all kindred work, steam power plants and kindred work, electrical work, structural steel and ornamental iron work, and such other subcontractors as the specifications require relative to prior identification.

49. UTILITIES

Attention of the bidder is directed to the fact that the approximate locations of known utility structures and facilities that may be encountered within and adjacent to the limits of the Work are shown on the plans and described herein. The accuracy and completeness of this information is not guaranteed by the County Engineer and the bidder is advised to ascertain for himself all the facts concerning the location of these and other utilities.

The Contractor will not proceed with his Work until he has made diligent inquiries of all public utility and municipal officials to determine the exact location of all underground structures and pipes within the site of the Project. The Contractor will notify utility owners not less than ten (10) days in advance of the time he proposes to perform any Work that will endanger or affect their facilities in compliance with **New Jersey One-Call**. In excavating in any part of the Work, care must be taken not to remove or damage any gas, water, sewer, or other pipe, conduit, or structure, - public or private - without the concurrence of the owner and the County Engineer. The Contractor will, at his own expense, shore up, secure and maintain a continuous flow in such structures, and will keep them in repair until final acceptance of the Work.

When pipes or other structures are encountered or when the removal, relocation or protection of these utilities are necessary in carrying out the Project as planned, the Contractor will cooperate with the owner of said utilities and will permit the owners or their agents access to the site of the Work in order to relocate or protect their facilities and not hinder or delay unnecessarily the Work of the owners in moving same. No extra allowance of payment will be made to the Contractor for the use of any materials,

equipment, etc., or for the performance of any Work in connection with the moving of said structures unless the Contractor is specifically ordered by the County Engineer to furnish such materials, equipment, or services. If directed by the County Engineer to do any Work or furnish any materials or equipment, payment will be allowed the Contractor in accordance with the unit prices bid for such Work, or, if such items are not scheduled in the proposal, such Work shall be allowed "Supplemental Work" as provided in Section 39 of these general specifications. The corporations, companies, agencies or municipalities owning or controlling the utilities, and the name, and telephone numbers are listed in the beginning of the Technical Specifications.

50. MATERIAL COMPLIANCE AND SHOP DRAWINGS

The Contractor will require the manufacturer or supplier to furnish three (3) copies of Certification of Compliance with each delivery of materials, components and manufactured items for the Project. Two (2) copies will be furnished to the County Engineer; one copy will be retained by the Contractor. Certificates of Compliance will contain the following information:

1. Project to which material is consigned;
2. Name of the Contractor to which the material is supplied;
3. Kind of material supplied;
4. Quantity of material represented by the Certificate;
5. Means of identifying the consignment, such as label marking, seal number, etc.;
6. Date and method of shipment;
7. That the material is in conformity with the pertinent specifications stated in the certificate; and
8. Signature of a person having legal authority to bind the supplier.

The Contractor will submit to the County Engineer for his approval five (5) copies of complete and fully detailed shop or working drawings for those items listed in the beginning of the technical specifications.

Each drawing will identify the name of the job, location and Contractor.

All drawings will be approved in accordance with the standard specifications. Refer to the Technical Specifications for specific items.

All materials or articles used in the Work will be of American manufacture, insofar as same are available, in conformance with N.J.S.A. 40A:11-18.

51. PRECONSTRUCTION

In order to provide full coordination of this Project among the parties concerned, the County Engineer will arrange for a preconstruction meeting between the Contractor, County Engineer and other interested parties as soon as possible after the contract is

executed. At this meeting the Contractor will present his proposed schedule of Work which shall be subject to review and approval of the County through its designated representatives.

52. DISPUTES UNDER THE CONTRACT

A dispute arising under the Contract shall be submitted in writing to the County Engineer with all facts and supporting data. The County Engineer will review the dispute and issue his decision or request additional facts or documentation after which he will render his decision.

In the event the dispute is not then resolved, the matter shall, pursuant to law, be submitted to mediation before being submitted to a court of competent jurisdiction venued in Union County.

The County Engineer will notify the County Counsel when a matter is to be submitted to mediation. The County Counsel will communicate with the parties and inform them of the procedures to be followed in making such a submission.

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**53. ORDINANCE NO. 557-2002 ADOPTED ON SEPTEMBER 5, 2002
BY THE BOARD OF CHOSEN FREEHOLDERS**

Ordinance No. 557-2002 adopted on September 5, 2002 by the Board of Chosen Freeholders on Preclassification of Bidders by the NJDPMC (**if applicable**) pursuant to Ordinance No. 557-2002, the County of Union requires all bidders on projects for the construction, reconstruction, demolition, alteration, repair or maintenance of public buildings to be preclassified by the State of New Jersey, Department of Treasury, Division of Property Management and Construction (“DPMC”).

Bidders must provide proof of classification in the form of a Certificate/Notice of Classification from the DPMC showing a sufficient aggregate rating to cover their bid amount, which is active on the date of receipt of these bids. Further, Bidder must also provide proof of preclassification in the applicable/appropriate trade code necessary for Work on the Project.

AN ORDINANCE IN ACCORDANCE WITH N.J.S.A. 40A:11-25 ESTABLISHING REASONABLE REGULATIONS APPROPRIATE FOR CONTROLLING THE QUALIFICATIONS OF PROSPECTIVE BIDDERS UPON CONTRACTS TO BE AWARDED ON BEHALF OF THE CONTRACTING UNIT, BY THE CLASS OR CATEGORY OF GOODS AND SERVICES TO BE PROVIDED OR PERFORMED AND FIXING THE QUALIFICATIONS REQUIRED ACCORDING TO THE FINANCIAL ABILITY AND EXPERIENCE OF THE BIDDERS AND THE CAPITAL AND EQUIPMENT AVAILABLE TO THEM PERTINENT TO AND REASONABLY RELATED TO THE CLASS AND CATEGORY OF SERVICE TO BE PERFORMED IN THE PERFORMANCE OF ANY SUCH CONTRACT.

WHEREAS, N.J.S.A. 40A:11-25 provides that the governing body of any contracting unit may establish reasonable regulations appropriate for controlling the qualifications of prospective bidders upon contracts to be awarded on behalf of the contracting unit, by the class or category of goods and services to be provided or performed; and

WHEREAS, N.J.S.A. 40A:11-25 also states that the regulations established by the governing body may fix the qualifications required according to the financial ability and experience of the bidders and the capital and equipment available to them pertinent to and reasonably related to the class and category of service to be performed in the performance of any such contract; and

WHEREAS, N.J.S.A. 40A:11-25 also requires that prior to the adoption of any such regulations, a contracting unit shall submit them to a public hearing and notice and a general description of the subject matter shall be published in not less than two newspapers; and

WHEREAS, N.J.S.A. 52:35-1 et seq. and 18A:18A-27 et seq. establish qualifications for the experience and financial abilities of bidders and the capital and equipment available to them relative to the specific services to be performed; and

WHEREAS, currently state officials, under the Department of Treasury, Division of Property Management and Construction, classify all prospective bidders as to the character and amount of public works on which they shall be qualified to submit bids and bids shall be accepted only from persons qualified in accordance with such classifications; and

WHEREAS, application for classification is open to all Contractors, regardless of the size of the business; and

WHEREAS, classification is based on general standards equally applicable to all Contractors; and

WHEREAS, classification is expressed in terms of trade and an aggregate rating determined on the basis of experience, financial ability, equipment and capital; and

WHEREAS, generally aggregate ratings can range from 0 to \$200,000.00; and

WHEREAS, the County of Union will determine the aggregate rating it will require on contracts depending on the size and expense of the Project, but at no time shall the required aggregate rating exceed \$25,000,000.00 for any one project; and

WHEREAS, such provisions are of considerable benefit to the County and to bidders by insuring that such bidders have the requisite experience, expertise and resources necessary to effectively perform the terms and conditions of the contract:

BE IT ORDAINED by the Board of Chosen Freeholders of the County of Union that it formally adopts as **Policy** that all prospective bidders for building construction projects be classified in accordance with the Department of Treasury – Division of Property Management and Construction pursuant to N.J.S.A. 52:35-1 et seq. and N.J.S.A. 18A:18A-27 et seq.

BE IT FURTHER ORDAINED that the Board of Chosen Freeholders of the County of Union hereby adopts the classification of bidders by the New Jersey Department of Treasury, Division of Property Management and Construction as a reasonable regulation for controlling the qualifications of prospective bidders upon contracts to be awarded for construction on behalf of the County of Union.

BE IT FURTHER ORDAINED that the provisions of this ordinance are severable. To the extent any clause, phrase, sentence, paragraph or provision of this ordinance shall be declared invalid, illegal or unconstitutional, the remaining provisions shall continue to be in full force and effect.

BE IT FURTHER ORDAINED that a public hearing shall be held on this ordinance on September 5, 2002 at the meeting of the Board of Freeholders, County Administration Building, Elizabeth, New Jersey.

BE IT FURTHER ORDAINED that the Clerk of the Board of Freeholders of the County is hereby directed to publish and post notice of this ordinance as required by law.

BE IT FURTHER ORDAINED that within 10 days hereof the Clerk of the Board of Freeholders of the County shall forward certified copies of this ordinance to the County Manager, Director of Finance, County Counsel, and Division of Local Government Services.

This ordinance shall take effect twenty (20) days after final adoption and publication in accordance with applicable law.

54. CONTRACTOR BUSINESS REGISTRATION CERTIFICATE New Mandatory Requirement -Effective 1/18/2010

The recently enacted **P.L. 2009, c.315**, requires that effective January 18, 2010; a contracting agency must receive proof of the bidder's business registration prior to the award of a contract. However, the proof must show that the bidder was in fact registered with the State of New Jersey Department of the Treasury, Division of Revenue and obtained the business registration prior to the receipt of bids.

If subcontractors are named on the bid, proof of the business registration for each subcontractor must be provided prior to the award of bid. Similarly to the bidder, the proof must show that each subcontractor was registered with the State of New Jersey Department of the Treasury, Division of Revenue and obtained the business registration prior to the receipt of bids.

Proof of business registration shall be

- A copy of a Business Registration Certificate issued by the Department of the Treasury, Division of Revenue; or
- A copy of the web version provided by the NJ Division of Revenue, or

Register online at <http://www.state.nj.us/treasury/revenue/busregcert.htm>. Click the "online" link and then select "Register for Tax and Employer Purposes or call the Division at 609-292-1730.

Note: A NJ Certificate of Authority is not acceptable.

FAILURE to submit proof of registration of the bidder or any subcontractor named on the bid prior to the award of contract shall be cause to reject the bid.

FAILURE of the bidder or any subcontractor named on the bid to be registered prior to the receipt of bids is cause for a **MANDATORY REJECTION** of bids. (A NON-WAIVABLE DEFECT). This covers construction Work as well as non-construction bids.

IN ADDITION:

N.J.S.A. 52:32-44 imposes the following requirements on Contractors and all subcontractors that knowingly provide goods or perform services for a Contractor fulfilling this contract:

- 1) the Contractor shall provide written notice to its subcontractors and suppliers to submit proof of business registration to the Contractor;
- 2) subcontractors through all tiers of a project must provide written notice to their subcontractors and suppliers to submit proof of business registration and subcontractors shall collect such proofs of business registration and maintain them on file;

- 3) prior to receipt of final payment from a contracting agency, the Contractor must submit to the contacting agency an accurate list of all subcontractors and suppliers or attest that none was used; and,
- 4) during the term of this contract, the Contractor and its affiliates shall collect and remit, and shall notify all subcontractors and their affiliates that they must collect and remit, to the Director, New Jersey Division of Taxation, the use tax due pursuant to the Sales and Use Tax Act, (*N.J.S.A. 54:32B-1 et seq.*) on all sales of tangible personal property delivered into this State.

A Contractor, subcontractor or supplier who fails to provide proof of business registration or provides false business registration information shall be liable to a penalty of \$25 for each day of violation, not to exceed \$50,000 for each business registration copy not properly provided or maintained under a contract with a contracting agency. Information on the law and its requirements are available by calling (609) 292-9292.

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55. 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.

56. 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.

57. 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 N.J.S.A. 19:44A-1 et seq. are NOT REQUIRED to be provided with the bids.

58. STATEMENT OF EQUIPMENT TO BE USED IN CONSTRUCTION

Pursuant to N.J.S.A. 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.

59. 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," (N.J.S.A. 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).

BIDDER'S NAME: _____

EDWARD T. OATMAN
COUNTY MANAGER

LAURA M. SCUTARI, QPA, MPA
DIRECTOR / DIVISION OF PURCHASING

BID DOCUMENT SUBMISSION CHECKLIST

**ALL SIGNATURES AND SEALS SHALL BE ORIGINALS UNLESS OTHERWISE SPECIFIED
BID SHEETS SHOULD NOT BE SUBMITTED DOUBLE SIDED PAGES, (SINGLE SIDE ONLY)**

EACH BIDDER SHOULD COMPLETE THIS FORM AND INITIAL EACH ENTRY.

DATE COMPLETED: _____

**PLEASE SUBMIT BID DOCUMENTS ON SINGLE SIDED PAPER ONLY, WITH THE EXCEPTION OF
THE SURETY AND BID BOND DOCUMENTS.**

**IN ACCORDANCE WITH THE BID SPECIFICATIONS I HAVE REVIEWED, COMPLETED / EXECUTED
AND INCLUDED THE FOLLOWING FORMS:**

_____ Bid Form Page (**Signed, Dated and Bid on all alternatives applicable to the Work**).

_____ Security in the form of:

_____ Bid bond in an amount equal to 10% of the total amount of this bid not to exceed \$20,000.00; or

_____ Certified check or cashier's check in the amount of 10% of this bid not to exceed \$20,000.00

_____ Consent of Surety form signed by a Surety Company if the total amount of your Bid is over \$36,000.00. If your bid is accepted, the Surety Company that provided the Consent shall be required to furnish a Performance, Labor and Materials Bond in the amount of 100% of the award of the contract.

The County of Union has provided its Consent of Surety form for your use. The use of this form by your Surety Company will expedite the bid review process and eliminate the possibility of having your bid rejected. If, however, you should need to use another form, please use language similar to that used on the Union County form and avoid making any additions or deletions to the Union County form language. In lieu of the Consent of Surety you may submit a Certified Check in the full amount of the bid.

_____ STATEMENT OF BIDDER OWNERSHIP. Pursuant to N.J.S.A. 52:25-24.2, which includes **BOTH** of the following documents:

- Bidder Signature Page
- Bidder Disclosure Statement (**Fill out 2 pages completely**)

_____ SUBCONTRACTOR IDENTIFICATION. Pursuant to N.J.S.A. 40A:11-16, which includes **BOTH** of the following documents:

- Subcontractor Identification Statement: List of Subcontractors (**only for certain types of work**)
- Subcontractor Identification Certification

_____ Acknowledgement of Addendum form: (**This form is to be used only when an addendum has been added to the specifications**).

_____ A copy of the State of New Jersey Department of the Treasury, Division of Revenue, **Business Registration Certificate ("BRC")** should be included with the bids as it must be received by the County prior to the award of the contract. The BRC provided must show that the Bidder was registered at the time of receipt of bids or the bid will be rejected.

BIDDER'S NAME: _____

_____ 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 and Workforce and Workforce Development – Public Works Contractor Registration Act. **(Only for certain types of work)**

_____ Federal Attachments **(If applicable)**

_____ NJDPMC Certificate / Notice of Classification **(If applicable)**

_____ Americans with Disabilities Act

_____ Statement of Bidder's Qualifications

_____ Contractor Performance Record

_____ Affidavit Regarding List of Debarred, Suspended or Disqualified Bidders

_____ Prior Negative Experience Questionnaire

_____ Contractor's Certification of Compliance – New Jersey Prevailing Wage Act

_____ Uncompleted Contracts Affidavit **(For Bidder, if applicable) MUST ALSO PROVIDE DPMC FORM 701**

_____ Certificate of Insurance Statement

_____ Collection of Use Tax on Sales to Local Government Statement

_____ Time of Completion

_____ Disclosure of Investment Activities in Iran Certification 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

BIDDER'S NAME: _____

BIDDING DOCUMENTS

The Bidding Documents consist of the following items:

- **ADDENDA, if issued**
- **CLARIFICATIONS, if issued**
- **INSTRUCTION TO BIDDERS**
- **BID FORM**
- **OWNER-CONTRACTOR AGREEMENT (AIA 101) AND GENERAL CONDITIONS (AIA 201)**
- **SPECIFICATIONS:** As outlined in the Table of Contents and included in the Project Manual.
- **DRAWINGS:** As per List of Drawings, indicated on the Project Title Sheet.

BIDDER'S NAME: _____

BID FORM

I/We have carefully examined the plans, specifications, and advertisement for bid for the

**EMERGENCY GENERATOR INSTALLATION
DEPARTMENT OF PUBLIC WORKS BUILDING
TOWNSHIP OF SCOTCH PLAINS, COUNTY OF UNION, NEW JERSEY
BA#20-2018; UNION COUNTY ENGINEERING PROJECT #2013-028**

that is on file in the Union County Division of Engineering. I/We have inspected the site of the work and will contract to do all the work and furnish all materials mentioned in said plans and specifications. Work will be accomplished in the manner prescribed therein.

LUMP SUM BID:

Written

Figures

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

TWENTY-FIVE THOUSAND DOLLARS AND NO CENTS

Written

\$25,000.00

Figures

TOTAL LUMP SUM PLUS BID CONTINGENCY AMOUNT:

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'S NAME: _____

BIDDER SIGNATURE PAGE

THE BIDDER MUST READ THE FOLLOWING INSTRUCTIONS TO COMPLETE THIS PAGE:

1. If doing business under a **trade name, partnership or a sole proprietorship**, you must submit the bid under exact title of the trade name, partnership, or proprietorship, and the bid must be signed by either the **owner**, or a **partner** and **witnessed** by a **notary public**.
2. If a **Corporation**, the bid must be signed by the **President** or **Vice President** and **witnessed** by a **Corporate Secretary** (corporate title must be exact) and **affix corporate seal**. If a Corporate Secretary does not exist, President or Vice President's signature shall be witnessed by a Notary Public.
3. Other persons **authorized** by **corporate resolution** to execute agreements in its behalf may also sign the bid documents (pages). **Copy of a resolution must accompany the bid**.
4. The person who signs this bid form **must also** sign the **Non-Collusion Affidavit**.
5. You **cannot** witness your own signature.

NAME OF BIDDER

ADDRESS OF BIDDER

**ORIGINAL SIGNATURE
CORPORATE SECRETARY**

**PRINT NAME AND TITLE
CORPORATE SECRETARY**

TEL: _____
FAX: _____
E-Mail: _____

BY: _____
ORIGINAL SIGNATURE

Corporate Seal

PRINT OR TYPE NAME AND TITLE

WARNING: IF YOU FAIL TO FULLY, ACCURATELY, AND COMPLETELY SUPPLY THE INFORMATION REQUESTED ON THIS PAGE, YOUR BID MAY BE REJECTED.

BIDDER'S NAME: _____

STATEMENT OF OWNERSHIP DISCLOSURE

N.J.S.A. 52:25-24.2 (P.L. 1977, c.33, as amended by P.L. 2016, c.43)

This statement shall be completed, certified to, and included with all bid and proposal submissions. Failure to submit the required information is cause for automatic rejection of the bid or proposal.

Name of Organization: _____

Organization Address: _____

Part I Check the box that represents the type of business organization:

- Sole Proprietorship (skip Parts II and III, execute certification in Part IV)
- Non-Profit Corporation (skip Parts II and III, execute certification in Part IV)
- For-Profit Corporation (any type) Limited Liability Company (LLC)
- Partnership Limited Partnership Limited Liability Partnership (LLP)
- Other (be specific): _____

Part II

- The list below contains the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be. **(COMPLETE THE LIST BELOW IN THIS SECTION)**

OR

- No one stockholder in the corporation owns 10 percent or more of its stock, of any class, or no individual partner in the partnership owns a 10 percent or greater interest therein, or no member in the limited liability company owns a 10 percent or greater interest therein, as the case may be. **(SKIP TO PART IV)**

(Please attach additional sheets if more space is needed):

BIDDER'S NAME: _____

Name of Individual or Business Entity	Home Address (for Individuals) or Business Address

Part III DISCLOSURE OF 10% OR GREATER OWNERSHIP IN THE STOCKHOLDERS, PARTNERS OR LLC MEMBERS LISTED IN PART II

If a bidder has a direct or indirect parent entity which is publicly traded, and any person holds a 10 percent or greater beneficial interest in the publicly traded parent entity as of the last annual federal Security and Exchange Commission (SEC) or foreign equivalent filing, ownership disclosure can be met by providing links to the website(s) containing the last annual filing(s) with the federal Securities and Exchange Commission (or foreign equivalent) that contain the name and address of each person holding a 10% or greater beneficial interest in the publicly traded parent entity, along with the relevant page numbers of the filing(s) that contain the information on each such person. **Attach additional sheets if more space is needed.**

Website (URL) containing the last annual SEC (or foreign equivalent) filing	Page #'s

Please list the names and addresses of each stockholder, partner or member owning a 10 percent or greater interest in any corresponding corporation, partnership and/or limited liability company (LLC) listed in Part II **other than for any publicly traded parent entities referenced above.** The disclosure shall be continued until names and addresses of every noncorporate stockholder, and individual partner, and member exceeding the 10 percent ownership criteria established pursuant to N.J.S.A. 52:25-24.2 has been listed. **Attach additional sheets if more space is needed.**

BIDDER'S NAME: _____

Stockholder/Partner/Member and Corresponding Entity Listed in Part II	Home Address (for Individuals) or Business Address

Part IV Certification

I, being duly sworn upon my oath, hereby represent that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I acknowledge: that I am authorized to execute this certification on behalf of the bidder/proposer; that the **County of Union** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the completion of any contracts with **County of Union** to notify the **County of Union** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the, permitting the **County of Union** to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

BIDDER'S NAME: _____

SUBCONTRACTOR IDENTIFICATION STATEMENT

LIST OF SUBCONTRACTORS

This form is ONLY required for plumbing and gas fitting, steam and hot water heating and ventilating apparatus, steam power plants, electrical work, structural steel, ornamental iron work, and any other trades required to be identified by the specifications (including, but not limited, to satisfying any DPMC Classification requirements).

CHECK THIS BOX IF NONE OF THE ABOVE LISTED TRADES OR THOSE REQUIRED TO BE IDENTIFIED IN THE SPECIFICATIONS ARE TO BE USED TO PERFORM THE WORK

In compliance with N.J.S.A. 40A:11-16 and the bid specifications, the undersigned hereby lists the name or names of the following subcontractors:

Company Name: _____

Address: _____

Telephone: _____ Subcontract Amount: \$ _____

Specific Scope of Work Subcontracted: _____

License No. _____

Company Name: _____

Address: _____

Telephone: _____ Subcontract Amount: \$ _____

Specific Scope of Work Subcontracted: _____

License No. _____

Company Name: _____

Address: _____

Telephone: _____ Subcontract Amount: \$ _____

Specific Scope of Work Subcontracted: _____

License No. _____

IF MORE THAN THREE SUBCONTRACTORS, PLEASE COPY THIS SHEET AS NECESSARY AND ATTACH TO THE BID PACKAGE.

(Continued on following page)

BIDDER'S NAME: _____

SUBCONTRACTOR IDENTIFICATION CERTIFICATION

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: _____

BIDDER'S NAME: _____

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

DEPARTMENT OF TREASURY
DIVISION OF REVENUE
PO BOX 382
TRENTON, NJ 08646

TAXPAYER NAME: TAX REGISTRATION TEST ACCOUNT
TRADE NAME: CLIENT REGISTRATION
TAXPAYER IDENTIFICATION#: 070-007-382/000
SEQUENCE NUMBER: 0107200
ADDRESS: 847 ROEBLING AVE
TRENTON NJ 08611
ISSUANCE DATE: 07/14/04
EFFECTIVE DATE: 01/01/01

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

BIDDER'S NAME: _____

EXPERIENCE STATEMENT

I hereby certify that my company has performed the following private or public work, which is relevant to this bid. I further certify that my company has never defaulted under any contract. Should you not sign this form due to prior defaults, please provide details on an attached sheet.

Witness

Date

NAME OF BIDDER

ADDRESS

By: _____
ORIGINAL SIGNATURE ONLY

PRINT NAME AND TITLE

YOU MAY ATTACH ADDITIONAL SHEETS, BUT YOU MUST SIGN AND WITNESS THIS SHEET.

BIDDER'S NAME: _____

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 and Workforce and Workforce Development. 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 and Workforce and Workforce Development
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. S12101 et seq.), which prohibits discrimination on the basis of disability by public entities in all services, programs and activities provided or made available by public entities, and the rules and regulations promulgated pursuant thereto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the Owner pursuant to this contract, the contractor agrees that the performance shall be in strict compliance with the Act. In the event the contractor, its agents, servants, employees, or subcontractors violate or are alleged to have violated the Act during the performance of this contract, the contractor shall defend the Owner in any action or administrative proceeding commenced pursuant to this Act. The contractor shall indemnify, protect, and save harmless the Owner, its agents, servants, and employees from and against any and all suits, claims, losses, demands, or damages of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The contractor shall, at its own expense, appear, defend, and pay any and all charges for legal services and any and all costs and other expenses arising from such action or administrative proceeding or incurred in connection therewith. In any and all complaints brought pursuant to the Owner's grievance procedure, the contractor agrees to abide by any decision of the Owner which is rendered pursuant to said grievance procedure. If any action or administrative proceeding results in an award of damages against the Owner, or if the Owner incurs any expense to cure a violation of the ADA which has been brought pursuant to its grievance procedure, the contractor shall satisfy and discharge the same at its own expense.

The Owner shall, as soon as practicable after a claim has been made against it, give written notice thereof to the contractor along with full and complete particulars of the claim. If any action or administrative proceeding is brought against the Owner or any of its agents, servants, and employees, the Owner shall expeditiously forward or have forwarded to the contractor every demand, complaint, notice, summons, pleading, or process received by the Owner or its representatives.

It is expressly agreed and understood that any approval by the Owner of the services provided by the contractor pursuant to this contract will not relieve the contractor of the obligation to comply with the Act and to defend, indemnify, protect, and save harmless the Owner pursuant to this paragraph.

It is further agreed and understood that the Owner assumes no obligation to indemnify or save harmless the contractor, its agents, servants, employees and subcontractors for any claim which may arise out of their performance of this Agreement. Furthermore, the contractor expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the contractor's obligations assumed in this Agreement, nor shall they be construed to relieve the contractor from any liability, nor preclude the Owner from taking any other actions available to it under any other provisions of this Agreement or otherwise at law.

Name _____
(Please print or type)

Signature _____ **Date** _____

BIDDER'S NAME: _____

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. Questions may be answered on separate attached sheets. The Bidder may submit any additional information it desires.

1. _____
(Name of Bidder)

2. _____
(Permanent Main Office Address)

3. _____
(When Organized)

4. _____
(If a Corporation, where incorporated)

5. Number of years your organization has been engaged in construction or contracting business under present firm or trade name? _____

6. How many years of experience in construction work has your organization had (a) as a general contractor? And/or (b) As a subcontractor? _____

7. Contracts on hand: (Attach a list or table showing gross amounts of each Contract and the appropriate dates of completion) _____

8. General character of work performed by you. _____

9. Have you ever failed to complete any work awarded to you? _____

10. Have you ever defaulted on a Contract? _____ If so, complete details, including where and why?

BIDDER'S NAME: _____

STATEMENT OF BIDDER'S QUALIFICATIONS - (continued)

11. Has any officer or partner of your organization ever failed to complete a construction contract handled in its own name? If so, state name of individual, name of owner, location and type of project, and reason for the failure to complete. _____

12. List your major equipment available for this Contract.

13. Experience in the construction work similar in importance to this Project.

14. Have you had any material adverse changes from the trades as listed in NJ Notice of Classification within last five (5) years? _____. If so, list prior classification.

15. Background and experience of the principal members of your organization, including the officers.

Individual's Name	Present Position or Office	Yrs. of Construction Experience	Magnitude & Type of Work	In What Capacity

BIDDER'S NAME: _____

16. Bank Reference. (Name, Address, Phone, Representative) _____

17. Will you, upon request, fill out a detailed financial Statement? _____

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.

19. 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: _____

PRIOR NEGATIVE EXPERIENCE QUESTIONNAIRE

(N.J.S.A. 40A:11-4)

1. Within the past ten (10) years, have you been found, through either court adjudication, arbitration, mediation, or other contractually stipulated alternate dispute resolution mechanism, to have: failed to provide or perform goods or services; or failed to complete a contract in a timely manner; or otherwise performed unsatisfactorily under a prior contract with a public entity?

_____ yes _____ no If yes, please provide full, detailed explanation.

2. Within the past ten (10) years, have you defaulted on a contract, thereby requiring a public entity to utilize the services of another contractor to provide the goods or perform the services or to correct or complete the contract?

_____ yes _____ no If yes, please provide full, detailed explanation.

3. Within the past ten (10) years, have you defaulted on a contract, thereby requiring a public entity to look to your surety for completion of the contract or tender of the costs of completion?

_____ yes _____ no If yes, please provide full, detailed explanation.

4. Within the past ten (10) years, have you been debarred or suspended from contracting with any of the agencies or department of the executive branch of the State of New Jersey at the time of the contract award, where the action was based on failure to perform a contract for goods or services with a public entity?

_____ yes _____ no If yes, please provide full, detailed explanation.

BIDDER'S NAME: _____

PRIOR NEGATIVE EXPERIENCE CERTIFICATION

I hereby certify that the above statements are true and accurate as of this _____
day of _____, 20__.

Name of Contractor

By _____
(Signature of Authorized Representative)

Subscribed and sworn to before me
This _____ day of _____, 20__.

(Seal) Notary Public of New Jersey/
Specify Other State
My Commission Expires _____, 20__.

NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH YOUR PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.

BIDDER'S NAME: _____

TO BE COMPLETED ONLY WHEN FINAL PAYMENT IS REQUESTED

CONTRACTOR'S CERTIFICATION OF COMPLIANCE - NEW JERSEY PREVAILING WAGE ACT

TO: County of Union
Division of Engineering
2325 South Avenue
Scotch Plains, New Jersey 07076

CONTRACT:

PROJECT:

In accordance with the requirements of the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56 et al *, the undersigned contractor on the public work being performed for:

COUNTY OF UNION

hereby certifies that he/she has complied with the contract requirements regarding the payment of the minimum prevailing wages established under "The New Jersey Prevailing Wage Act" N.J.S.A. 34:11-56 et al.

CONTRACTOR: _____
ADDRESS: _____

BY: _____
ORIGINAL SIGNATURE ONLY

STATE OF NEW JERSEY
COUNTY OF _____

Being by me duly sworn according to law, on his oath deposes and says that _____ is _____ of _____ the above named contractor, and that the facts set forth in the above statement are true.

Subscribed and sworn before me
this ____ day of _____, 20____.

Notary Public: _____
My Commission Expires: _____

* N.J.S.A. 34:11-56.33 requires the contractor and subcontractor to file written statements with the public body in form satisfactory to the Commissioner certifying to the amounts then due and owing from such contractor and subcontractor filing such statement to any and all workmen for wages due on account of the public work, setting forth therein the names of the persons whose wages are unpaid and the amount due to each respectively. Union County will withhold the amount so deducted for the benefit of the workmen whose wages are unpaid as shown by the verified statement filed, and will pay directly to any workman the amount shown by such statement to be due to him for such wages. Such payment shall thereby discharge the obligation of the contractor to the person receiving such payment to the extent of the amount thereof.

BIDDER'S NAME: _____

UNCOMPLETED CONTRACTS AFFIDAVIT
(To be submitted with DPMC Form 701)

PURSUANT TO N.J.A.C. 17:19-2.13, BIDDER DECLARES THE FOLLOWING WITH RESPECT TO ITS UNCOMPLETED CONTRACTS, ON ALL WORK, FROM WHATEVER 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 **One Hundred Fifty calendar days (150)** 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

BIDDER'S NAME: _____

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

Solicitation Number: _____

Vendor/Bidder: _____

PART 1

CERTIFICATION

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

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

CHECK THE APPROPRIATE BOX

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

OR

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

PART 2

PLEASE PROVIDE ADDITIONAL INFORMATION RELATED TO INVESTMENT ACTIVITIES IN IRAN

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

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

Attach Additional Sheets If Necessary

CERTIFICATION

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

Signature

Date

Print Name and Title

Revised 10/19/17

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 (AASHTO), 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)

The County Engineer or his designee:
(Name, legal status, address and other information)

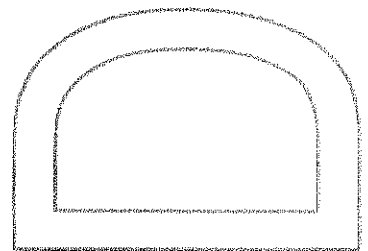
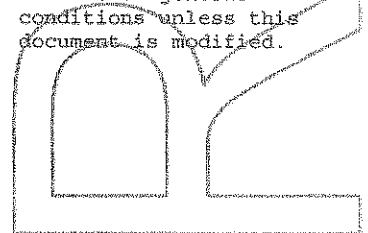
The Owner and Contractor agree as follows.



ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

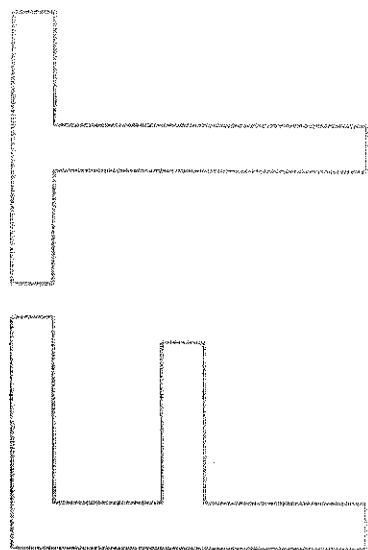
AIA Document A201™-2007, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.



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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

(())

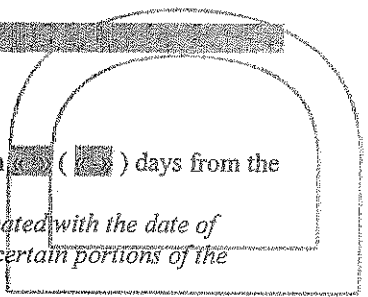
If, prior to the commencement of the Work, the Owner requires time to file mortgages and other security interests, the Owner's time requirement shall be as follows: Not applicable.

(())

§ 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 is certified either in whole or in part, the County Engineer or his designee shall transmit the Certified Payment Application within three (3) calendar days to the Owner for its review and payment. The Owner shall make payment to the Contractor for the Certified Payment Amount by no later than the time period set forth in the New Jersey Prompt Payment Act following receipt of the Certificate for Payment from the County Engineer or his designee. The Owner shall not be obligated to pay any Application for Payment until the Application for Payment is certified by the County Engineer or his designee. Approval of any Application for Payment may be withheld should the Contractor fail to submit Manning Reports in a timely manner.

Pursuant to N.J.S.A. 2A:30A-1 et seq. (the "Prompt Payment Act"), a public or governmental entity that requires the entity's governing body to vote on authorizations for each periodic payment, final payment, or retainage monies, such as the Owner, is excepted from the timing requirements of the Act. Accordingly, the Owner shall not approve the Contractor's Application for Payment until it is certified by the County Engineer or his designee in accordance herewith and shall not approve the Contractor's Certified Payment Application until the next scheduled public meeting of the Owner following the Owner's receipt of the Certified Payment Application from the County Engineer or his designee. The Owner shall not make payment to the Contractor for the Certified Payment Amount until the Owner's subsequent payment cycle following its approval of the Payment Application.

Pursuant to this same Act, if a payment due pursuant to the provisions herein is not made in a timely manner, the Owner shall be liable for the amount of money owed under the contract, plus interest at a rate equal to the prime rate plus one percent (1%), notwithstanding anything to the contrary in the Contract Documents. Interest on amounts due pursuant to the Act shall be paid to the prime contractor for the period beginning on the day after the required payment date and ending on the day on which the check for payment is received by the Contractor.

Pursuant to this same Act, disputes regarding whether a party has failed to make payments required by the Act may be submitted to a process of alternative dispute resolution, notwithstanding anything to the contrary in the contract documents, where the parties agree to same. Alternative dispute resolution permitted by the Act shall not apply to disputes concerning any other matters that may arise under or from this Contract. Any civil action brought to collect payments shall be conducted in Union County, State of New Jersey, and the prevailing party shall be awarded reasonable costs and attorneys' fees.

§5.1.4 The County Engineer or his designee may decide not to certify payment and may withhold a Certificate for Payment, in whole or in part, to the extent reasonably necessary to protect the Owner if, in the County Engineer or his designee's opinion, the representations as described in Section 5.1.5 below cannot be made to the Owner. If the County Engineer or his designee withholds a Certificate for Payment, the County Engineer or his designee will notify the Contractor and Owner as provided in Section 5.1.3 above. If the Contractor and County Engineer or his designee cannot agree on a revised amount, the County Engineer or his designee will issue a Certificate for Payment for the amount for which the County Engineer or his designee is able to make such representations to the Owner as set forth in Section 5.1.3 above. The County Engineer or his designee may also decide to withhold certifying

payment in whole or in part, or, because of subsequently discovered evidence or subsequent observations, to such extent as may be necessary in the County Engineer or his designee's opinion to protect the Owner from loss because of:

- .1 Defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims;
- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials, or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or another contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or Liquidated Damages for the anticipated delay;
- .7 failure to carry out the Work in accordance with the Contract Documents;
- .8 avoidable delay in the progress of the Work;
- .9 deliberate delay in the submission for approval of names of Subcontractors, materialmen, sources of supply, shop drawings, and samples;
- .10 failure to maintain the Project Site in a safe and satisfactory condition in accordance with good construction practices as determined by the County Engineer or his designee; or
- .11 failure to submit updates as required by the General Conditions.

When the foregoing reasons for withholding certification are resolved, certification will be made for amounts previously withheld in the manner set forth in Section 5.1.3 above.

§5.1.5 The issuance of a separate Certificate for Payment will constitute representations made separately by the County Engineer or his designee to the Owner, based on its individual observations at the site and the data comprising the Application for Payment submitted by the Contractor, that the Work has progressed to the point indicated and that, to the best of the County Engineer or his designee's knowledge, information and belief, quality of the Work is in accordance with the Contract Documents.

The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to minor deviations from the Contract Documents correctable prior to completion and to specific qualifications expressed by the County Engineer or his designee. The

issuance of a separate Certificate of Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a separate Certificate for Payment will not be a representation that the County Engineer or his designees has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed the Contractor's construction means, methods, techniques, sequences or procedures; (3) reviewed copies of requisitions received from Subcontractor's and materials suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§5.1.6 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the County Engineer or his designee may require. This schedule, unless objected to by the County Engineer or his designee, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§5.1.7 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.8 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

- .1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of ~~5~~ percent (~~5~~ %). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201™-2007, General Conditions of the Contract for Construction;
- .2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of ~~5~~ percent (~~5~~ %);
- .3 Subtract the aggregate of previous payments made by the Owner; and
- .4 Subtract amounts, if any, for which the County Engineer or his designee has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201-2007.

§5.1.9 The progress payment amount determined in accordance with Section 5.1.8 shall be further modified under the following circumstances:

- .1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to the full amount of the Contract Sum, less such amounts as the County Engineer or his designee shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and
- .2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of AIA Document A201-2007.

§5.1.10 Retainage shall be determined as follows: Pursuant to N.J.S.A. 40A:11-6.1, the Owner will withhold two percent (2%) of the amount due on each partial payment when the outstanding balance of the Contract exceeds One Hundred Thousand Dollars (\$100,000.00).

§5.1.11 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 FINAL PAYMENT

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2.2 of AIA Document A201-2007, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the County Engineer or his designee.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the County Engineer or his designee's final Certificate for Payment, or as follows:

« »

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 INITIAL DECISION MAKER

The County Engineer or his designee will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A201-2007, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the County Engineer or his designee.)

« »
« »
« »
« »

§ 6.2 BINDING DISPUTE RESOLUTION

Except as provided in Section 5.1.3 of the Standard Form of Agreement between the Owner and Contractor, all claims, disputes or other matters in question between the parties to this Contract, arising out of or relating to the Project or to the Contract, or the alleged breach hereof, shall be subject one to mediation, and if not resolved, then same shall be decided in a Court of competent jurisdiction venued in Union County, New Jersey. No party may be compelled to submit any dispute concerning the Project to arbitration. In the event any claim arising from the Project is beyond the jurisdiction of the court, the Contract consents to joinder as a party to such action or alternative dispute proceeding.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201-2007.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201-2007.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201-2007 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 Payments due and unpaid under the Contract shall in no instance bear interest, except as required by law in accordance with Section 5.1.3 hereof.

§ 8.3 The Contractor shall ensure that the Project Site is maintained in a clean and safe condition at all times, based upon Owner's sole discretion. If the Contractor fails to keep the Project Site in a clean and safe condition, said failure shall result in the following:

- .1 all claims resulting from the Contractor's failure shall be the Contractor's responsibility;
- .2 said failure shall constitute an act of default and a substantial breach of the Contract giving the Owner remedies under the contract Documents; and
- .3 the Owner shall have the right to withhold any payments until the Contractor cures its failure.

Failure to do so shall authorize the Owner to withhold any Applications for payment until such time as the Contractor has rectified same. Further, if the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.

§ 8.4 Indemnification – See Indemnification Requirements in Bid Documents.

§ 8.5 The within contract shall be governed by and interpreted pursuant to the law of the State of New Jersey.

§ 8.6 The Contractor shall comply with the anti-discrimination provisions of N.J.S.A. 10:2-1 et seq., the New Jersey Law Against Discrimination, N.J.S.A. 10:5-1 et seq., N.J.A.C. 17:27-1.1 et seq. and shall guarantee to afford equal opportunity in performance of the Work in accordance with an affirmative action program approved by the State Treasurer. (See Page G-21).

§ 8.7 The Contractor shall submit proof of Business Registration for itself and its subcontractors to the Owner and shall provide written notice to its subcontractors and suppliers of the responsibility to submit proof of business registration to the contractor. The requirement of proof of Business Registration extends down through all levels (tiers) of the Project.

The Contractor agrees to comply with the rules and regulations promulgated pursuant to the Contractor Use Tax Collection Legislation.

For the term of the contract, the Contractor, any subcontractor, and each of their affiliates [N.J.S.A. 52:32-44(g)93], shall collect and remit to the New Jersey Director of the Division of Taxation in the Department of Treasury, the use tax due pursuant to the "Sales and Use Tax Act," P.L. 1966, c. 30 (C.54:32B-1 et seq.) on all of their sales of tangible personal property delivered into the State of New Jersey, regardless of whether the tangible personal property is intended for a contract with a contracting agency. For purposes herein, "affiliate" shall mean any entity that: (a)

directly, indirectly or constructively controls another entity; (b) is directly, indirectly, or constructively controlled by another entity; or (c) is subject to the control of a common entity. For purposes of the immediately preceding sentence, an entity controls another entity if it owns, directly or indirectly, more than fifty percent (50%) of the Ownership interest in that entity.

§8.8 This Standard Form of Agreement and the General Conditions set forth in the Bid Documents shall control in the case of conflict between these documents and the Project Specifications, the Project Manual, and any other exhibits incorporated by reference in this Contract.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below, and incorporated herein as if set forth in their entirety.

§ 9.1.1 The Agreement is this executed AIA Document A101-2007, Standard Form of Agreement Between Owner and Contractor.

§ 9.1.2 The General Conditions are AIA Document A201-2007, General Conditions of the Contract for Construction.

§ 9.1.3 The Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

§ 9.1.4 The Specifications:

(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

« See Specifications as referenced by Exhibit B.

Section	Title	Date	Pages

§ 9.1.5 The Drawings:

(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

« See List of Drawings, annexed hereto as Exhibit C.

Number	Title	Date

§ 9.1.6 The Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 9.

§ 9.1.7 Additional documents, if any, forming part of the Contract Documents:

- 1 AIA Document E201™-2007, Digital Data Protocol Exhibit, if completed by the parties, or the following:

■

- 2 Other documents, if any, listed below:

■

ARTICLE 10 INSURANCE AND BONDS

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

(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201-2007.)

Type of insurance or bond

Limit of liability or bond amount (\$0.00)

This Agreement entered into as of the day and year first written above.

OWNER (Signature)

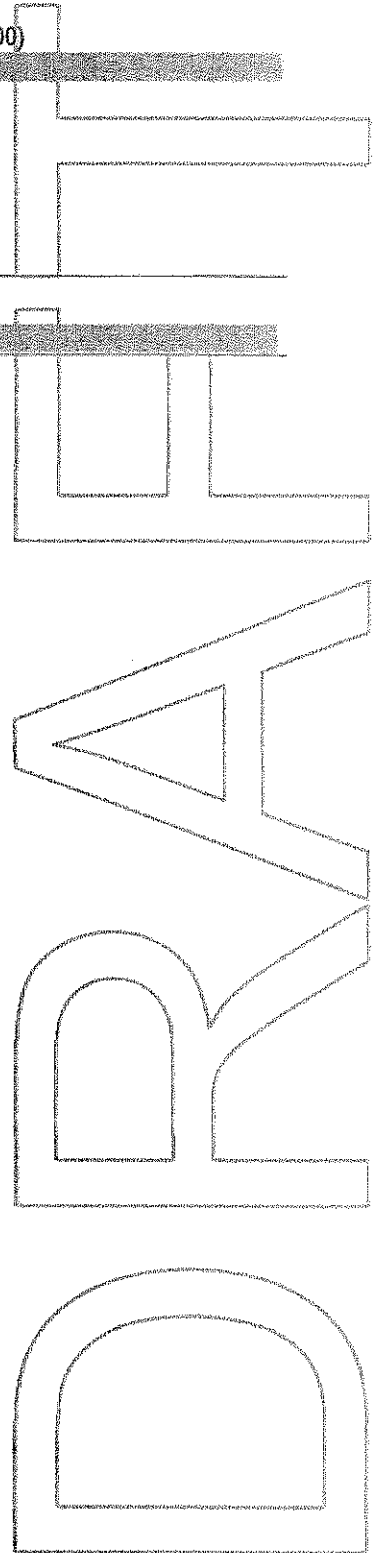
<><><>

(Printed name and title)

CONTRACTOR (Signature)

<><><>

(Printed name and title)



DRAFT AIA Document A201™ - 2007

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

«County of Union»

« »

THE OWNER:

(Name, legal status and address)

« »

« »

THE ENGINEER, OR HIS DESIGNEE :

(Name, legal status and address)

« »

« »

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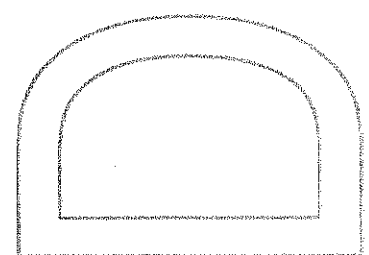
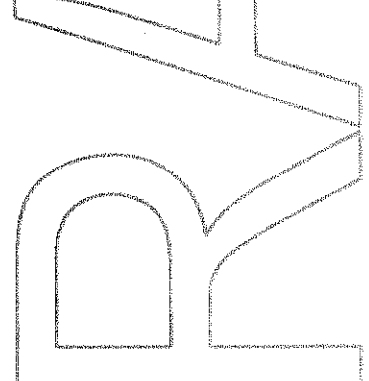
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- 14 TERMINATION OR SUSPENSION OF THE CONTRACT
- 15 CLAIMS AND DISPUTES

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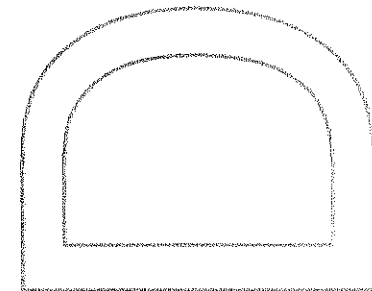
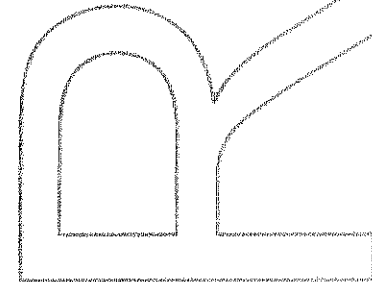
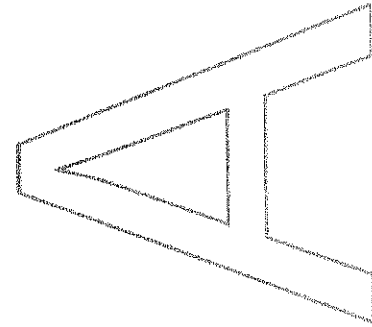
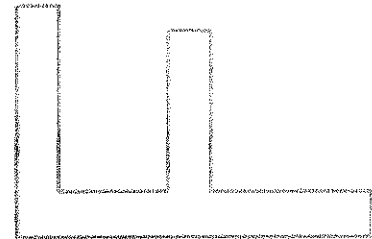
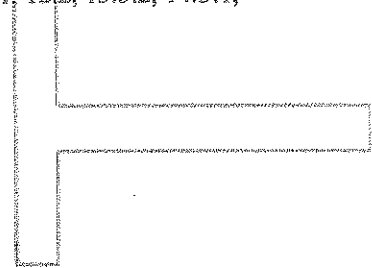
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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect or Engineer. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Engineer, or his designee or the Engineer, or his designee's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Engineer, or his designee or the Engineer, or his designee's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Engineer, or his designee's shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Engineer, or his designee's duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Engineer, or his designee and the Engineer, or his designee's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent

consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Engineer, or his designee s.

§ 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Engineer, or his designee and the Engineer, or his designee 's consultants shall be deemed the authors and Owners of their respective Instruments of Service, including the Drawings and Specifications. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Engineer, or his designee or Engineer, or his designee 's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Engineer, or his designee and the Engineer, or his designee 's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided elsewhere in the Contract Documents, the Engineer, or his designee does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 The Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only in the event that: (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 If readily available, the Owner shall furnish surveys describing physical characteristics and legal limitations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work. The Contractor shall be responsible for requesting and obtaining a utility mark-out.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Article 12 or fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6. Owner shall in no way be responsible for any delays or claims arising from delays for enforcement of this Section.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Engineer, or his designee's additional services made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located and shall maintain as current any approvals or certifications that may be required to perform the Work. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Engineer, or his designee in the Engineer, or his designee's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Engineer, or his designee any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Engineer, or his designee may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a Contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Engineer, or his designee any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Engineer, or his designee may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Engineer, or his designee issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Engineer, or his designee for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Engineer, or his designee and shall not proceed with that portion of the Work without further written instructions from the Engineer, or his designee. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Engineer, or his designee in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after

evaluation by the Engineer, or his designee and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 WARRANTY

The Contractor warrants to the Owner and Engineer, or his designee that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Engineer, or his designee, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Such warranty shall continue for a period of one (1) year from the date of Substantial Completion of the Work. Under this warranty, the Contractor shall remedy at his expense any such failure for the Work to be conforming to the requirement of the Contract, or any other defect appearing in the Work. In addition, the Contractor shall remedy at his own expense, any damage to Owner's owned, controlled, real or personal property, when that damage is the result of the Contractor's failure to provide conforming Work as it relates to the Contract Documents or any other defect of equipment, material, workmanship or design. The Contractor shall also restore any Work damaged in fulfilling its obligations under the terms of this provision. The Contractor's warranty with respect to the Work repaired or replaced hereunder will run for a period of one (1) year from the date of repair or replacement.

§ 3.6 TAXES

The Contractor shall pay use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 **Concealed or Unknown Conditions.** If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Engineer, or his designee before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Engineer, or his designee will promptly investigate such conditions and, if the Engineer, or his designee determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Engineer, or his designee determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Engineer, or his designee shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Engineer, or his designee's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Engineer, or his designee. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2. The unused balance of any allowance shall be deducted from the Contract Sum upon completion and acceptance of the Work by Change Order.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Engineer, or his designee the name and qualifications of a proposed superintendent. The Engineer, or his designee may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Engineer, or his designee has reasonable objection to the proposed superintendent or (2) that the Engineer, or his designee requires additional time to review. Failure of the Engineer, or his designee to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Engineer, or his designee has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Engineer, or his designee's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Engineer, or his designee's approval. The Engineer, or his designee's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Engineer, or his designee reasonable time to review submittals. If the Contractor fails to submit a submittal

schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Engineer, or his designee .

§3.10.4 Should the Contractor responsible for the scheduling requirements of Article 3 herein fail to comply with said scheduling requirements, said failure shall result in the following:

- 1 all claims resulting from the Contractor's failure to prepare or submit a schedule shall be the Contractor's responsibility;
- 2 shall constitute an act of default and a substantial breach of the Contract giving the Owner remedies under the Contract Documents; and
- 3 the Owner shall have the right to withhold any payments until the Contractor complies with the scheduling requirements of Article 3 herein.

§3.10.5 In the event of a Five Prime Contract, the General Contractor shall be responsible for the preparation and submittal of the schedule.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Engineer, or his designee and shall be delivered to the Engineer, or his designee for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Engineer, or his designee is subject to the limitations of Section 4.2.7. Informational submittals upon which the Engineer, or his designee is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Engineer, or his designee without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Engineer, or his designee Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Engineer, or his designee or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Engineer, or his designee that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Engineer, or his designee .

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Engineer or his designee 's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Engineer, or his designee in writing of such deviation at the time of submittal and (1) the Engineer, or his designee has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Engineer, or his designee 's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Engineer, or his designee on previous submittals. In the absence of such written notice, the Engineer, or his designee 's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of Engineer, or his designee ure or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Engineer, or his designee will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Engineer or his designee . The Owner and the Engineer, or his designee shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Engineer, or his designee have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Engineer, or his designee will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Owner before using any portion of the Site.

§ 3.13.3 The Contractor shall store its apparatuses, materials, supplies, and equipment in such orderly fashion at the Site of the Work, if permitted, as will not unduly interfere with the progress of the Work or ongoing operations. The Contractor shall provide protective fencing around the designated storage areas.

§ 3.13.4 The Contractor shall see that stockpiles of materials and storage of equipment are kept to a minimum and neatly stored where directed by the Owner and the Engineer, or his designee .

§ 3.13.5 If the Work is to be executed in areas occupied by the Owner, the Contractor shall inform the Owner in advance of the areas scheduled to be worked on, so that the Owner's personnel may make proper preparations to protect equipment and records.

§3.13.6 The Contractor understands that some or all the Work of the Contract may be performed while the facilities are occupied by personnel, and accordingly shall make all reasonable and necessary provisions to ensure that the contract Work will be of minimal disruption to the environment.

§3.13.7 Materials and equipment that are to be used only directly in the Work, shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project Site. Protection of construction materials and equipment stored at the Project Site from weather, theft, damage and all other adversity is solely the Contractor's responsibility. The Contractor shall bear the responsibility to replace all such materials that may be lost, damaged, or stolen at its expense, whether such materials or equipment have been entirely or partially paid for by the Owner.

§3.13.8 The Contractor and any entity for whom the Contractor is responsibility, shall not erect any sign on the Project Site without the prior written consent of the Owner, which may be withheld in the sole discretion of the Owner.

§3.13.9 Contractor shall ensure that the Work is performed at all times in a manner that affords reasonable access, both vehicular and pedestrian, to the Site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the Site of the Work shall be free from all debris, building materials, and equipment likely to cause hazardous conditions.

§3.13.10 Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project Site, including, without limitation, the lavatories, toilets, entrances, and parking areas, other than those designated by the Owner. Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project Site and the Building, as amended from time to time. The Contractor shall immediately notify the Owner in writing, if during the performance of the Work, the Contractor finds compliance with any portion of such rules and regulations to be impracticable. This notification shall set forth the problems of such compliance and shall suggest alternatives through which the same results intended by such portions of the rules and regulations can be achieved. The Owner may, in the Owner's sole discretion, adopt such suggestions, develop new alternatives or require compliance with the existing requirements of the rules and regulations. The Contractor shall also comply with all insurance requirements and collective bargaining agreements applicable to use and occupancy of the Project Site and the Building.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents. Any costs incurred by the 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 alleged to be caused by the negligent acts, negligent omissions, and/or fault of the Contractor, anyone directly or indirectly employed or retained by the Contractor, or anyone for whose acts the Contractor may be liable regardless of whether caused in part by the negligent act or omission of a party indemnified hereunder provided it is not caused by the sole negligence of a party indemnified hereunder. Contractor shall further indemnify and hold harmless the Owner and the Owner's consultants, agents, representative, and employees from and against any and all claims, damages, losses, costs, and expenses, including, but not limited to attorneys' fees, legal costs and legal expenses, arising out of or resulting from performance of the work, provided that such claims, damage, loss, cost, or expense is attributable to bodily injury, sickness, disease or death, or to injury to destruction of tangible property (other than work itself) caused or alleged to be caused by the negligent acts, negligent omissions, and/or fault of the Owner or the Owner's consultants, agents, representatives, or employees and arises out of this project and provided such claim, damage, loss, cost, or expense is not caused by the sole negligence of a party indemnified hereunder."

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ENGINEER, OR HIS DESIGNEE OR ENGINEER

§ 4.1 GENERAL

§ 4.1.1 The Owner shall retain an Engineer, or his designee lawfully licensed to practice Engineer, or his designee in the jurisdiction where the Project is located. That person or entity is identified as the Engineer, or his designee in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Engineer, or his designee as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Engineer, or his designee. Consent shall not be unreasonably withheld.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Engineer, or his designee will provide administration of the Contract as set forth in its respective Agreements with the Owner and as described in the Contract Documents.

§ 4.2.2 The Engineer, or his designee will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Engineer, or his designee will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Engineer, or his designee about matters arising out of or relating to the Contract. Communications by and with the Engineer, or his designee's consultants shall be through the Engineer, or his designee. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Engineer, or his designee's evaluations of the Contractor's Applications for Payment, the Engineer, or his designee will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Engineer, or his designee has authority to reject Work that does not conform to the Contract Documents. Whenever the Engineer, or his designee considers it necessary or advisable, the Engineer, or his designee will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Engineer, or his designee nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Engineer, or his designee to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Engineer, or his designee will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Engineer, or his designee's action will be taken in accordance with the submittal schedule approved by the Engineer, or his designee or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Engineer, or his designee's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Engineer, or his designee's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Engineer, or his designee's review shall not constitute

approval of safety precautions or, unless otherwise specifically stated by the Engineer, or his designee, of any construction means, methods, techniques, sequences or procedures. The Engineer, or his designee's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Engineer, or his designee will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7. The Engineer, or his designee will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Engineer, or his designee will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Engineer, or his designee agree, the Engineer, or his designee will provide one or more project representatives to assist in carrying out the Engineer, or his designee's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in the Owner's Agreement with the Engineer, or his designee.

§ 4.2.11 The Engineer, or his designee will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Engineer, or his designee's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Engineer, or his designee will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Engineer, or his designee will endeavor to secure faithful performance by both Owner and Contractor and will not show partiality.

§ 4.2.13 The Engineer, or his designee will review and respond to requests for information about the Contract Documents. The Engineer, or his designee's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Engineer, or his designee will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate Contractor or subcontractors of a separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Identification of Subcontractors required by N.J.S.A. 40A:11-16 shall be provided with the bid submission in accordance with the requirements of that statute. Names of persons or entities for any Subcontractor not covered by N.J.S.A. 18A-18 shall be furnished within thirty (30) thirty days of notification of Award of Contract. The Engineer, or his designee will notify the Contractor in writing if the Owner or Engineer, or his designee, after due investigation, has reasonable objection to any such proposed person or entity. The list of proposed Subcontractors shall include a description of the materials and equipment each proposes to furnish and install in the Work. The description shall be insufficient detail to allow the Engineer, or his designee to determine general conformance to Contract requirements. Approval of the submittals as required under this Article shall not relieve the Contractor from conformance to Contract requirements.

§5.2.2 Subcontractors shall comply with the statutory requirements of N.J.S.A. 34:11-56.25 and N.J.S.A. 34:11-56.48. Any subcontractors who fail to comply with those statutory provisions shall be rejected.

§5.2.3 Written confirmation of award of each major subcontract shall be submitted to the Owner by the Contractor, in form subject to his approval, within seven (7) days after receipt of Owner's approval of proposed Subcontractor list as provided under this Article. Every subcontract shall be in writing, shall be submitted to Owner for review and approval prior to execution, and shall specifically provide that the Owner is an intended third (3rd) party beneficiary of such subcontract.

§ 5.2.4 The Contractor shall not contract with a proposed person or entity to whom the Owner or Engineer, or his designee has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.5 If the Owner or Engineer, or his designee has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Engineer, or his designee has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.6 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Engineer, or his designee makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

§5.3.1 By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Engineer, or his designee. Each subcontract agreement shall preserve and protect the rights of the Owner and Engineer, or his designee under the Contract Documents and at law. No Subcontract shall diminish in any way any rights or benefits conferred upon the Owner by these Contract Documents. The Contractor shall make all Contract Documents available to the Subcontractors.

§5.3.2 Where the Contractor sublets portions of the Work, the entire responsibility for the subdividing of Work rests with the Contractor. The Owner and the Engineer, or his designee are not responsible for the manner of the subdivision of the Work, nor will they enter into or settle disagreements or disputes between Contractor and Subcontractors. The Contractor is, and will be held, responsible for the proper execution of the Work of all Subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- 1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing.

§ 5.4.2 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor Contractor or other entity.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site.

§ 6.1.2 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Engineer, or his designee apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.4.1 Should the Contractor cause damage to the Work or property of any separate Contractor on the Project, the Contractor shall promptly settle with such other Contractor by agreement, or otherwise resolve the dispute. If such separate Contractor institutes any legal proceeding against the Owner on account of any damage alleged to have been so sustained, the Contractor shall, indemnify, defend, or bear the cost of defense as the Owner shall in its own discretion determine, and hold the Owner's harmless. Said Indemnification shall be governed by Section 13, Page G7 of the Instructions to Bidders.

§ 6.2.5 The Owner and each separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Engineer, or his designee will allocate the cost among those responsible, which amounts the Owner shall be entitled to reduce the Contract Amounts of the various contracts of those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. Change Orders and Construction Change Directives shall be subject to and processed in accordance with N.J.A.C. 6A:23-7 and N.J.A.C. 6A:26-4.9, where applicable.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Engineer, or his designee; a Construction Change Directive requires a written agreement by the Owner and Engineer, or his designee and may or may not be agreed to by the Contractor; an order for a minor change in the Work which does not extend the Contract Time, increase the Contract Sum or change the Project Scope may be issued by the Engineer, or his designee alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.1.4 In order to facilitate checking of quotations for extras or credits, all proposals shall be accompanied by a complete itemization of costs including labor, materials and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are subcontracts, they shall be itemized also. In no case will a change be approved without such itemization.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Engineer, or his designee and signed by the Owner, Contractor and Engineer, or his designee stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

A Change Order shall not require consent of the Owner if the Owner has provided an allowance for such a change.

§ 7.2.2 Methods used in determining adjustments to the Contract Sum shall be those listed in Section 7.3.3.

§ 7.2.3 Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change, and any and all adjustments to the Contract Sum and the construction schedule. In the event a Change Order increases the Contract Sum, Contractor shall include the Work covered by such Change Orders in Applications for Payment as if such Work were originally part of the Contract Documents.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Engineer, or his designee and signed by the Owner and Engineer, or his designee, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. A Construction Change Directive shall not require the Agreement of the Engineer, or his designee if the Owner specifically waives their consent in writing. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.6.

§ 7.3.4 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Engineer, or his designee of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time. The Contractor's failure to comply with a Construction Change Directive shall constitute an incident of default and cause for termination by the Owner.

§ 7.3.5 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.6 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Engineer, or his designee shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Engineer, or his designee may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.6 shall be limited to the following:

- .1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- .2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others; and
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work.

§ 7.3.7 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Engineer, or his designee. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.8 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Engineer, or his designee will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Engineer, or his designee determines, in the Engineer, or his designee's professional judgment, to be reasonably justified. The Engineer, or his designee's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.9 When the Owner and Contractor agree with a determination made by the Engineer, or his designee concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Engineer, or his designee will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.3.10 In subparagraphs 7.3.3 and 7.3.6, the allowance for overhead and profit combined shall be based upon the following schedule:

- .1 For the Contractor, for work performed by his own forces, 10% of cost.
- .2 For each Subcontractor, for the work performed by his own forces, 10% of cost.
- .3 For the Contractor, for work performed by a subcontractor, 5% of cost.

§ 7.3.11 Lump sum quotations for changes in the Work will not be accepted. Proposals shall be completely itemized and broken down. They shall be accompanied by such supporting data as the Engineer, or his designee may require, such as copies of subcontractor's or vendor's quotations, quantity take-off sheets, or other similar information.

§ 7.4 MINOR CHANGES IN THE WORK

The Engineer, or his designee has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Engineer, or his designee and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work and services as required by the Contract

Documents, Substantial Completion of the Work shall be accomplished within the period of consecutive calendar days (or by the date), as stated in the Agreement, plus any authorized extension(s) of time as approved by written agreement. Final Completion of the Work shall be no later than thirty (30) consecutive calendar days from the date of Substantial Completion of the Work, unless otherwise set forth in Article 3.2 of the Owner/Contractor Agreement.

§ 8.1.2 Intentionally omitted

§ 8.1.3 Intentionally omitted.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work. There will be no bonus or incentives paid, should the Work, or any portion thereof, be completed in advance of the specified activity milestone dates.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 Intentionally omitted

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 Intentionally omitted

§ 8.3.4 No payment, compensation, or adjustment of any kind shall be made to the Contractor by the Owner for damages resulting from hindrances or delays caused by the delays of other contractors, or from foreseeable circumstances not attributable to the Owner's conduct. The Contractor agrees that it will make no claim against the Owner for payment, compensation, damages, mitigation of Liquidated Damages, or adjustment of any kind for such hindrances or delays, and will accept such extensions of time as may be granted by the Owner in the Owner's sole discretion in full satisfaction for any and all alleged claims against the Owner for any and all such hindrances or delays. For purposes of this Agreement, disputes arising between contractors before or during construction, adverse weather conditions, and delays on the part of local authorities issuing permits shall be considered foreseeable circumstances. Notwithstanding the foregoing, nothing herein shall limit the Contractor's remedies for Owner's negligence, bad faith, active interference, tortious conduct, or other reasons un contemplated by the parties that delay expenditures paid by the Owner to the Engineer, or his designee, other individual or entity, or to any inspector or inspectors necessarily employed by it on the Work, for any number of days in excess of the Contract Time, shall be deducted for the Contract Sum.

§ 8.3.5 The provisions of this Article shall not be so interpreted or construed as to preclude or prevent the Contractor from making and prosecuting any claim against any separate Contractor engaged or employed by the Owner for damages alleged to have been caused or occasioned by any such separate Contractor.

§ 8.3.6 To the extent permitted by law, the Owner may suspend the whole or any part of the Work, if it shall deem it for the best interest of the Owner to do so, without compensation to the Contractor for such suspension, other than extending the time for completion of the Work as much as it may have been delayed by such suspension. During such suspension, all materials delivered upon, but not placed in the Work shall be neatly piled by the Contractor so as not to obstruct public travel, or shall be removed from the line of Work at the direction of the Owner and, unless the

materials be moved by the Contractor upon such direction, the materials shall be removed by the Owner and expense thereof will be charged to the Contractor.

§8.4.1 Should the Contractor fail to complete fully, and in conformity with all provisions of the Contract within the Contract Time, the Contractor shall, and hereby agrees to, pay the Owner one thousand dollars (\$1,000.00) per day, for each consecutive calendar day beyond the number of days allowed by the Contract, which sum is agreed upon as reasonable and proper measure of damages that the Owner will sustain per diem by failure of Contractor to complete Work within time as stipulated; it being recognized by Owner and Contractor that the injury to Owner that could result from a failure of the Contractor to complete on schedule, is uncertain and cannot be computed exactly. In no way shall costs of Liquidated Damages be construed as a penalty to the Contractor.

§8.4.2 It is expressly understood and agreed by and between the Contractor and Owner that the Contract Time prescribed herein is a reasonable time for the completion of the Work.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Engineer, or his designee, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Engineer, or his designee may require. This schedule, unless objected to by the Engineer, or his designee, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 See Article 5 of Standard Form of Agreement between Owner/Contractor.

§ 9.3.1.1 Applications for Payment may include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives but not yet included in Change Orders.

§ 9.3.1.2 Such applications may not include requests for payment of amounts the Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason.

§ 9.3.1.3 All applications for payment shall be accompanied by the Application and Certificate of Payment, AIA Document G702, and the Continuation Sheet, AIA Document G703, fully completed as required or such other application for Payment as the Owner's representative shall use.

§9.3.1.4 In cases where the work is awarded on a Single Overall Contract basis, payments shall be made in accordance with applicable State of New Jersey statutes.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§9.3.3.1 All municipal mechanic's liens filed by a lien claimant shall be governed by N.J.S.A. 2A:44-125 et seq. In the event a municipal mechanic's lien is filed, the Owner reserves the right to withhold the full amount of the lien. The Owner may release the funds to the party against whose account the lien is claimed, only after that party files with the Owner's financial officer, a bond in an amount double of all sums claimed ("Double Bond") under the lien, and such bond's form has been approved by the Owner's chief law officer and financial officer, per N.J.S.A. 2A:44-130 or if an acceptable release of liens is filed by the lien claimant.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 See Article 5 of Standard Form of Agreement between Owner and Contractor.

§ 9.4.2 See Article 5 of Standard Form of Agreement between Owner and Contractor

§9.4.3 See Article 5 of Standard Form of Agreement between Owner and Contractor.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 See Article 5 of Standard Form of Agreement between Owner and Contractor

§ 9.5.2 See Article 5 if Standard Form of Agreement between Owner and Contractor.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Engineer, or his designee has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Engineer, or his designee .

§ 9.6.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work and shall certify same to Owner. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Engineer, or his designee will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner and Engineer, or his designee on account of portions of the Work done by such Subcontractor.

§ 9.6.4 Neither the Owner nor Engineer, or his designee shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

§ 9.6.5 Payment to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.7 FAILURE OF PAYMENT

If the Engineer, or his designee does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Engineer, or his designee or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Engineer, or his designee , stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§9.7 REIMBURSEMENT TO OWNER

§9.7.1 If the Owner is entitled to any reimbursement or payment from the Contractor under, or pursuant to, the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to: (1) deduct an amount equal to that which the Owner is entitled from any

payment then, or thereafter, due the Contractor from the Owner; or (2) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use; provided, however, that a condition precedent to Substantial Completion shall be the Owner's receipt of all certificates of occupancy (permanent or temporary) and any other permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the occupancy of the Project. The Owner may withhold a certification of Substantial Completion if temporary installations or temporary construction exists in areas requesting certification, or if certificates of occupancy are temporary or conditional.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Engineer, or his designee shall prepare a comprehensive list of items to be completed or corrected ("Punch List"). The Contractor shall proceed immediately and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of the list, the Engineer, or his designee, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Engineer, or his designee's inspection discloses any item, whether or not included on the list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Engineer, or his designee. The Contractor shall then submit a request for another inspection by the Engineer, or his designee to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Engineer, or his designee will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall establish responsibilities of the Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the List accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Contractor for its written acceptance and to the Owner for its approval and acceptance as required by Section 9.8.1. No Certificate of Substantial Completion shall be deemed effective unless executed by both Owner and Contractor.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, who shall obtain all necessary modifications to its insurance coverage to permit such occupancy or use. In addition, Contractor shall obtain consent of those public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete pursuant to the terms of that Agreement. When the Contractor considers a portion substantially complete, the Engineer, or his designee shall prepare a Punch List as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Engineer, or his designee shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.9.4 The occupancy of any portion of the Work shall not constitute acceptance of any Work, except as hereinafter stated, nor does it waive the Owner's right to Liquidated Damages. Final Acceptance of the Work shall be for the whole Work only and not part.

§ 9.9.5 Occupancy by the Owner shall not be deemed to constitute a waiver of existing claims on behalf of the Owner or Contractor against each other.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon completion of the Work, the Contractor shall forward to the Engineer, or his designee a written notice that the Work is ready for final inspection and acceptance and shall also forward to the Engineer, or his designee a final Contractor's Application for Payment. The Engineer, or his designee will promptly make such inspection. When the Engineer, or his designee finds the Work acceptable under the Contract Documents and the Contract fully performed, the Engineer, or his designee will promptly issue a final Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their observations and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Engineer, or his designee's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor complies with all requirements set forth in Section 6 of the Standard Form of Agreement between Owner and Contractor and the Contractor submits to the Engineer, or his designee (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 Intentionally omitted

§ 9.10.4 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Engineer, or his designee for review and coordination with the safety programs of other Contractors.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.
- .4 Construction or operations by the Owner or other Contractors.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying Owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4, except damage or loss attributable to acts or omissions of the Owner or Engineer, or his designee or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Engineer, or his designee.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Engineer, or his designee in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Engineer, or his designee the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance.

§ 10.3.3 Intentionally omitted

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 Intentionally omitted

§ 10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The County of Union requires all bidders to be able to comply with the following insurance requirements. In the event a bid is accepted by the County, the bidder must accept the applicable insurance requirements, as set forth below, as part of any contract, awarded to it by the County.

1. Automobile Liability Insurance in any amount of not less than \$1,000,000.00 combined single limits for Bodily Injury and Property Damage Liability. A certificate of such current insurance will be provided to the County and will reflect the provision of at least thirty (30) days notice to the County before any major cancellation or major change may be made the policy.

2. Workers Compensation Insurance insuring the obligations of the Contractor and all Subcontractors under the New Jersey Workers Compensation and Occupational Disability Laws as respects to Work performed under the Contract. Insurance will be extended to include any obligations under the United States Longshoremen's and Harbor Workers Act or any maritime act, when applicable.

3. General Liability Insurance will be provided on a Comprehensive General Liability form with a combined single limit of \$3,000,000.00 per occurrence for Bodily Injury Liability and Property Damage Liability and will include the interest of the County with respect to Work emanating from the Contract with the County. The insurance will include the following:

- a) Personal Injury Liability
- b) Blanket Contractual Liability applies to assumption of liability under any written Contract
- c) Coverage for A, X, C, U exposures, relating to excavation, blasting underground damage
- d) Broad Form Property Damage Liability
- e) Products and/or Completed Operations Liability

A Certificate of Insurance will be filed with the County prior to commencement of any Work. This certificate will contain a provision that insurance afforded under the policies will not be canceled without at least (30) days prior written notice being given to the County.

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§ 11.1.2 The insurance required by Section 11.1.1 shall remain in effect for the duration of the project, i.e., from beginning of construction until final payment and closeout.

§ 11.1.3 All insurance required by Section 11.1.1 shall be issued by insurance companies authorized to do business in the State of New Jersey and rated as "A" or better as determined by A.M. Best Company.

§ 11.1.4 The Contractor waives all rights against the Owner for damages caused by fire or other perils to the extent covered by insurance provided under this Article. Any deductibles, co-insurance, or contribution to the loss will be borne solely by the Contractor.

§ 11.1.5 A certificate of insurance evidencing the coverages required by Section 11.1.1 shall be submitted to the Owner's attorney for approval and transmittal to the Owner and Engineer, or his designee prior to the commencement of the Work. The certificate must be submitted on the ACORD form Certificate of Insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least thirty (30) days written notice has been given to the Owner. If requested by the Owner, the Contractor shall provide complete copies of any policies of insurance required by this Contract to be obtained by the Contractor and Subcontractor(s). Information concerning any reduction of coverage shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

§ 11.2 PROPERTY INSURANCE

§ 11.2.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance in the amount of the initial Contract Sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost

basis without voluntary deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurance interest in the property required by this Section 11.2 to be covered, whichever is earlier. This insurance shall include the interest of the Owner, Contractor, Subcontractor(s), and Sub-Contractor(s) in the Work.

§ 11.2.1.1 Property insurance shall be on an "all-risk" policy form and shall be against the perils of fire and extended coverage and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, falsework, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Engineer, or his designee's services and expenses required as a result of such insured loss. Coverage for all other perils shall not be required unless otherwise provided in the Contract Documents.

§ 11.2.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance which will protect the interests of the Contractor, Subcontractor(s) and Sub-subcontractor(s) in the Work. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.2.1.3 If the property insurance requires minimum deductibles, and such deductibles are identified in the Contract Documents, the Contractor shall pay costs not covered because of such deductibles. If the Owner or insurer increases the required minimum deductibles over the amounts so identified or if the Owner elects to purchase this insurance with voluntary deductible amounts, the Owner shall be responsible for payment of the additional costs not covered because of such increased or voluntary deductibles.

§ 11.2.1.4 Unless otherwise provided in the Contract documents, this property insurance shall cover portions of the Work stored off the site after written approval of the Owner at the value established in the approval, and also portions of the Work in transit.

§ 11.2.1.5 A loss insured under Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgage clause and of Section 11.3.10. The Contractor shall pay Subcontractor(s) their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractor(s) to make payments to their Sub-Contractor(s) in a similar manner.

§ 11.2.2 BOILER AND MACHINERY INSURANCE

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds. The Owner as fiduciary shall have the power to adjust and settle a loss with insurers.

§ 11.2.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused.

§ 11.2.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3 PERFORMANCE BOND, PAYMENT BOND AND MAINTENANCE BOND

§ 11.3.1 Contractor, at its sole expense, shall furnish bonds covering faithful performance of the contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract, including material and labor..

§ 11.3.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be made

§ 11.3.3 The Contractor shall file with the Owner, as a condition of final acceptance, a statement from the Surety of its Performance Bond and Payment Bond, that the Surety is satisfied that all claims for labor and material supplied under its contract have been satisfactorily settled.

§ 11.3.4 As a condition of Substantial Completion of the Work, the Contractor shall provide an acceptable Maintenance Bond in accordance with section 16, page G-9 of the Instructions to Bidders.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work uncovered is contrary to the Engineer, or his designee's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Engineer, or his designee, be uncovered for the Engineer, or his designee's examination and be replaced at the Contractor's expense without change in the Contract Time or Contract Sum.

§ 12.1.2 If a portion of the Work has been covered that the Engineer, or his designee has not specifically requested to examine prior to its being covered, the Engineer, or his designee may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate Contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

The Contractor shall promptly correct Work rejected by the Engineer, or his designee or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Engineer, or his designee's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. The Contractor shall give such notice promptly after discovery of the non-conforming work. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after the receipt of notice from the Owner or Engineer, or his designee, the Owner may correct it in accordance with Section 2.4. This obligation under Section 12.2.2 shall survive acceptance of the Work under the Contract and termination of the Contract.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 Intentionally omitted.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged work, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work, nor to any deficient Work discovered after the one-year period that could not have readily been discovered.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work, that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made. However, there shall be no implied or expressed acceptance of Work not in compliance with applicable law. The amount of said reduction will be within the exclusive determination of the Owner as its representative.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

§ 13.1.1 The Contract shall be governed by the laws of the State of New Jersey.

§ 13.1.2 Nothing in the Contract Documents shall be construed to permit deviation from the governing law.

§ 13.1.3 In accordance with N.J.S.A. 40A:11-18, American manufactured products or materials shall be used in the Work, wherever possible.

13.1.4 RATE OF WAGES

Where the Project is not subject to a Project Labor Agreement, wage notes shall be paid pursuant to the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25 et seq, the Contractor and Subcontractor are required to do the following:

§ 13.1.4.1 Pay to all workmen engaged in the performance of services, directly upon a public work, the prevailing rate of wages, which shall be those in effect for the Project site(s) on the Contract Date and such rates shall remain in effect for (2) years, unless superseded by a subsequent determination.

§ 13.1.4.2 Before final payment, furnish Owner with an affidavit stating that all workmen have been paid the prevailing rate of wages specified in the contract.

§ 13.1.4.3 Keep an accurate record showing the name, craft, or trade and actual hourly rate of wages paid to each workman employed by it in connection with any public work. Records shall be preserved for two (2) years from date of payment.

§ 13.1.4.4 Post the prevailing wage rated for each craft and classification involved as determined by the Commissioner of Labor and Industry, including the effective date of any changes thereof in prominent and easily accessible places at the site of the Work, and at such place or places as are used by them to pay workmen their wages.

§ 13.1.4.5 Submit the Owner, certified payroll records for each payroll period within ten (10) days of the date of the payment of wages. A certified payroll record is defined as "a payroll record that is attested by the employer or the Owner of the company doing business as the employer, or a corporate officer of such company, or an authorized agent of the employer". A copy of the certified payroll form for submission of the payroll records may be obtained by contacting the Department of Labor, Division of Workplace Standards at 609.292.2259.

§ 13.1.4.6 In the event the Owner finds that any workers employed by the Contractor or Subcontractor, covered by the said contract, have been paid a rate of wages less than the prevailing wage required to be paid by such contract, the Owner may terminate the Contractor's or Subcontractor's right to proceed with the Work, or such part of the

Work as to where there has been a failure to pay required wages, and to prosecute the Work to completion or otherwise, the Contractor and its sureties shall be liable to the Owner for any excess costs occasioned thereby,

§ 13.1.4.7 a current wage rate determination is on file at the offices of the Owner for inspection and Contractor's use.

§ 13.1.5 SAFETY AND HEALTH REGULATIONS (OSHA)

§ 13.1.5.1 The Contractor shall comply with the laws, rules, regulations and codes dealing with occupational safety and health, including, but not limited to, the latest amendments of the following:

§ 13.1.5.2 Williams – Steiger Occupational Safety and Health Act of 1970, Public Law 91-595

§ 13.1.5.3 Part 1910 – Occupational Safety and Health Standards Chapter XVII of Title 29, Code of Federal Regulations.

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

§ 13.1.5.3 N.J.A.C. 8:59-5.1-5.109 requirements properly label any substances stored in containers) of the Worker and Community Right to Know Act, P.L. 1983, c.315.

§ 13.1.6 ENVIRONMENTAL REGULATIONS

§ 13.1.6.1 The Contractor shall comply with laws, rules, regulations, and codes dealing with the prevention of environmental pollution and the preservation of public natural resources, including but not limited to, the latest amendments of the following:

§ 13.1.6.2 Chapter 251, public Law of 1975 of the State of New Jersey, "soil Erosion and Sediment Control Act."

§ 13.1.7 AFFIRMATION ACTION EMPLOYMENT LAW

Contractor agrees to comply with the terms of the Mandatory Equal Employment Opportunity Language, a copy of which is annexed to the Contract Documents as Exhibit F and incorporated as if set forth herein.

§ 13.1.7.1 Contractor shall submit a copy of the Monthly Project Workforce Report, New Jersey Department of Treasury Form AA-202, to the New Jersey Department of Treasury's Division of Public Contracts Equal Employment Opportunity Compliance and to the Owner

§ 13.1.7.2 Contractor shall complete and submit to the Owner an Initial Project Workforce Report, New Jersey Department of Treasury Form AA 201, upon notification of award and no later than the execution of this Agreement. Failure to submit this completed form may result in this Agreement being terminated.

§ 13.2. SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents, neither party to the Contract shall assign the Contract as a whole without written consent of the other, unless as may be provided for elsewhere in the Contract Documents. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Engineer, or his designee or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Engineer, or his designee timely notice of when and where tests and inspections are to be made so that the Engineer, or his designee may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Engineer, or his designee, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Engineer, or his designee will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Engineer, or his designee of when and where tests and inspections are to be made so that the Engineer, or his designee may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Engineer, or his designee's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Engineer, or his designee.

§ 13.5.5 If the Engineer, or his designee is to observe tests, inspections or approvals required by the Contract Documents, the Engineer, or his designee will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

Except as required by Section 5.1.3 of the Owner Contractor Agreement and notwithstanding anything to the contrary contained in the Contract Documents and related documents, the Owner will pay no interest whatsoever for any payments due.

§ 13.7 TIME LIMITS ON CLAIMS

Intentionally deleted.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;

§ 14.1.2 Intentionally deleted

§ 14.1.3 If one of the reasons described in Section 14.1.1 exists, the Contractor may, upon thirty (30) days' written notice to the Owner and Engineer, or his designee, terminate the Contract

§ 14.1.4 Intentionally deleted.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor after Notice and an opportunity to cure.

- .1 refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 disregards laws, ordinances, rules or regulations, or orders of a public authority having jurisdiction;
- .4 fails to furnish the Owner with assurances satisfactory to the Owner, evidencing the Contractor's ability to complete the Work in compliance with all requirements of the Contract Documents;
- .5 fails after commencement of the Work, to proceed continuously with the construction and completion of the Work, for more than three (3) days, except as permitted by the Contract Documents;
- .6 disregards orders of the Owner or Engineer, or his designee;
- .7 fails to maintain the Site in a clean, safe and orderly manner;
- .8 fails to comply with a Construction Change Directive; or
- .9 otherwise is guilty of any breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. And charge the costs incurred against the Contractor's Contract balance

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished. The Engineer, or his designee's certification issued pursuant to Section 14.2.2 shall be given a presumption of correctness.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Engineer, or his designee's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Engineer, or his designee, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 Intentionally deleted.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;

- 2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- 3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking adjustment or interpretation of Contract terms, payment of money, extension of time, or other relief with respect to the terms of the Contract. Any Contractor Claim seeking the payment of money shall not include consequential damages, which Contractor hereby waives, and shall be calculated in accordance with Section 7.3.6 and Section 7.3.10 hereof.

§ 15.1.2 DECISION OF ENGINEER, OR HIS DESIGNEE

Owner and Contractor agree that the Engineer, or his designee shall be the initial arbiter of all Claims, including those alleging error or omission by the Engineer, or his designee. All claims, shall be referred, initially to the Engineer, or his designee for action as provided in Article 4 and shall be required as a condition precedent to litigation of a Claim between the Contractor and Owner to all such matters arising prior to the date final payment is due, regardless of: (1) whether such matters relate to execution and progress of the Work; or (2) the extent to which the work has been completed. The decision by the Engineer, or his designee in response to a Claim shall not be a condition precedent to litigation in the event: (1) the position of the Engineer, or his designee is vacant; (2) the Engineer, or his designee has not received evidence or has failed to render a decision within agreed time limits; (3) the Engineer, or his designee has failed to take action required under Article 4 within thirty (30) days after the Claim is made; (4) forty-five (45) days have passed after the Claim has been referred to the Engineer, or his designee; or, (5) the claim relates to a mechanic's lien.

§ 15.1.3 TIME LIMITS ON CLAIMS

Claims must be within twenty one (21) calendar days after the occurrence of the event giving rise to the Claim or within twenty-one (21) calendar days after the claimant first becomes aware of the condition giving rise to the Claim, whichever is later. There shall be no time limitation upon any Claims made by the Owner. Claims must be made by written notice to the Engineer, or his designee. An additional Claim made after the initial Claim has been implemented by Change Order will not be considered unless submitted pursuant to the requirements of this Paragraph. Notice shall be deemed effective upon the Engineer, or his designee's receipt of the Notice.

§ 15.1.4 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, unless otherwise agreed in writing, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments to the extent required by the Contract Documents.

§ 15.1.5 CLAIMS FOR CONCEALED OR UNKNOWN CONDITIONS

If conditions are encountered at the Site which are: (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents; or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for the Contract Documents, the Owner and Contractor mutually agree to give written notice to each other; including the Engineer, or his designee and any affected Contractor or subcontractor, upon the observation of the condition within twenty-four (24) hours of first observation of the condition. The Engineer, or his designee will investigate such conditions within seventy-two (72) hours and will diligently process and render a recommendation within twenty-one (21) days unless otherwise agreed in writing. If the Engineer, or his designee determines that the condition at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified the Engineer, or his designee shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in

opposition to such determination must be made within seven (7) days after the Engineer, or his designee has given notice of the decision.

§ 15.1.6 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum written notice as provided herein shall be given before proceeding to execute the Work. All documentation in support of the Contractor's request shall, likewise be provided at the time said written request is made. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.3 or elsewhere in the Contract Documents.

§ 15.2 CLAIMS FOR ADDITIONAL TIME

§ 15.2.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work, , all documentation in support of the Contractor's request shall, likewise be provided at the time said written request is made. In the case of a continuing delay, only one Claim is necessary.

§ 15.2.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. The term "abnormal" as used here shall be construed according to the following formula: average rainfall (or snow, low temperature, etc) for the past five (5) years for the month in question, plus ten percent (10%). Accordingly, weather is not deemed to be abnormal unless it is ten percent (10%) worse than the average for the month over the past five (5) years. Claims relating to weather must be submitted within seven (7) calendar days of the occurrence of any such delays.

§ 15.3 CLAIMS FOR INJURY OR DAMAGE TO PERSON OR PROPERTY. If either Party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, of any of the other party's employees or agents, or of others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party, including the Engineer, or his designee , within a reasonable time not exceeding twenty-one (21) days after first occurrence, unless another time period is required by law. The notice shall provide sufficient detail to enable the other party to investigate the matter. If a Claim for additional cost or time related to this Claim is to be asserted, it shall be filed as provided for in Article 15.

§ 15.3.2 The Owner is not required to institute a claim under this section in order to terminate this Agreement.

§ 15.4 RESOLUTION OF CLAIMS AND DISPUTES

The Engineer, or his designee will review Claims and take one or more of the following preliminary actions with ten (10) days of receipt of a Claim: (1) request additional supporting data from the claimant; (2) reject the Claim in 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 of the work of the Project, such as at job conferences and otherwise at the Site. In such instances, the written minutes, correspondence, shop drawing records, written field orders, and other written data shall govern over personal claims regarding statements made contrary to the written data.

§ 17.1 JOB SITE MEETINGS

§ 17.1.1 Job site meetings, when called by the Engineer, or his designee, shall be held at a location and time convenient to the Owner's representatives, the Engineer, or his designee, and Contractor(s). Each Contractor shall attend such meeting, or be represented by a person in authority who is thoroughly familiar with the Project and who can speak and make decisions for the Contractor. In the instance of a Single Overall Contract, each of the major Subcontractors-Structural Steel, and ornamental iron work, plumbing, gas fitting and all kindered work and steam power plants, steam, and hot water heating and ventilating apparatus and Electrical-shall have a person in authority who is thoroughly familiar with the Project attend the meetings.

§ 18.1 MANDATORY LAW AGAINST DISCRIMINATION LANGUAGE
PROCUREMENT, PROFESSIONAL AND SERVICE CONTRACTS
(N.J.A.C. 13:6-1.3)

§ 18.1.1 The parties of this contract do hereby agree that the provision of N.J.S.A. 10:2-1 through N.J.S.A. 10:2-4 dealing with discrimination in employment on public contracts, and the rules and regulations promulgated pursuant thereto, are hereby made a part of this contract and are binding upon them.

§ 18.1.1 Pursuant to the provision of N.J.S.A. 10:2-1 through N.J.S.A. 10:2-4, during the performance of this contract, the Contractor agrees as follows:

§ 18.2.1.1 In the hiring of persons for the performance of work under this contract or any subcontract hereunder, or for the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under this contract, no Contractor, including without limitation, the Contractor, nor any person acting on behalf of such Contractor or subcontractor, shall by reason of race, creed, color national origin, ancestry, Marital status, gender identity or expression, affectional or sexual orientation, or sex, discriminate against any person who is qualified and available to perform the Work, to which the employment relates;

§ 18.2.1.2 No Contractor, including, without limitation, the Contractor, Subcontractor, nor any person acting on its behalf shall, in any manner, discriminate against or intimidate any employee engaged in the performance of work under this Contract or any subcontract hereunder, or engaged in the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under such Contract, on account of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation, or sex;

§ 18.2.1.3 There may be deducted from the amount payable to the Contractor by the Owner, under the Contract, a penalty of \$50.00 (fifty dollars) for each person for each calendar day during which such person is discriminated against or intimidated in violation of the provisions of the Contract; and

§ 18.2.1.4 This contract may be canceled or terminated by the Owner, and all the money due or to become due hereunder may be forfeited, for any violation of this section of the Contract occurring after notice to the Contractor from the contracting public agency or any prior violation of this section of the Contract.

§ 19.1 CONTRACTOR AND SUBCONTRACTOR COLLECTION OF USE TAX TO LOCAL GOVERNMENTS

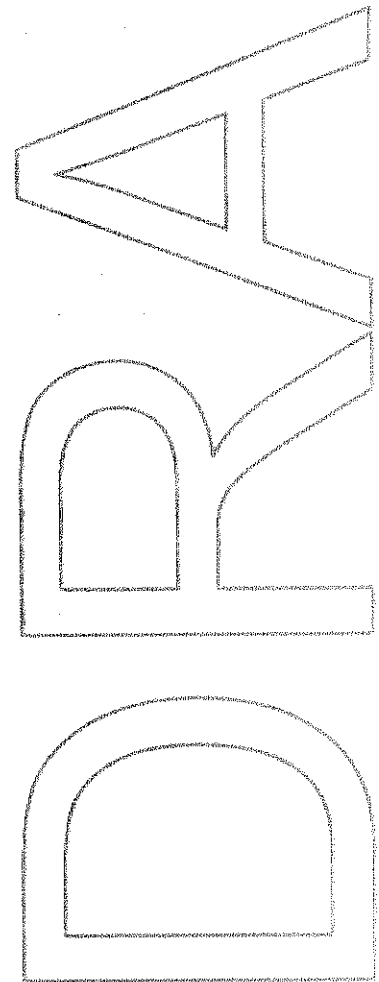
§ 19.1.1 The Contractor acknowledges and agrees that pursuant to P.L. 2004, c. 57, enacted by the State of New Jersey on June 29, 2004, contractors or contractors with subcontractors, or their affiliates, who enter into contracts

with New Jersey local government entities, including without limitation, boards of education, are, effective as of September 1, 2004, required to collect and remit to the New Jersey Director of Taxation in the Department of the Treasury the use tax pursuant to the "sales and Use Tax Act," P.L. 1966, c. 30 (C.54:32B-1 et. seq.) on all their sales of tangible personal property delivered into the State of New Jersey (hereinafter referred to as the "Contractor Use Tax Collection Legislation").

§ 19.2.1 The Contractor hereby covenants and agrees that the Contractor, any subcontractor and each of their affiliates, shall collect and remit to the New Jersey Director of the Division of Taxation in the Department of Treasury, the use tax due pursuant to the "Sales and Use Tax Act," P.L. 1966, c. 30 (C.54:32B-1 et. seq.) on all their sales of tangible personal property delivered into the State of New Jersey. For purposes herein, "affiliate" shall mean any entity that : (a) directly, indirectly or constructively controls another entity; (b) is directly, indirectly, or constructively controlled by another entity; or (c) is subject to the control of a common entity. For purposes of the immediately preceding sentence, an entity controls another entity if it owns, directly or indirectly, more than fifty percent (50%) of the Ownership interest in that entity.

§ 19.3.1 The parties intend that this Article 19 shall comply with the rules and regulations promulgated pursuant to the Contractor Use Tax Collection Legislation and shall be interpreted consistent therewith.

§ 19.4 Notwithstanding anything contained in the Agreement to the contrary, the Contractor hereby agrees to indemnify and hold the Owner harmless from and against any and all fines, taxes, penalties, interest, claims, losses. Costs, expenses, liabilities, or damages arising out of or in connection with the Contractor's failure to comply with the terms and condition of Sections 19.1 and 19.2 to the fullest extent permitted by law and public policy.



**NEW JERSEY DEPARTMENT
OF
LABOR AND WORKFORCE DEVELOPMENT**

WAGE DETERMINATION

UNION COUNTY FREEHOLDERS
Contract No. UC 2013-028

A-0530-0026-000/S2516
March 2018

New Jersey Wage Determination
00 73 46-1



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 not 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 - SOMERSET

Craft: Air Conditioning & Refrigeration - Service and Repair

PREVAILING WAGE RATE

	03/01/17
Journeyman (Mechanic)	W37.48 B22.91 T60.39

Craft: Air Conditioning & Refrigeration - Service and Repair

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
	Mo. 1-3	Mo. 4-12	2nd Year	3rd Year	4th Year	5th Year		Wage = %	of Jnymn	Wage
As Shown										
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 - SOMERSET

Craft: Boilermaker PREVAILING WAGE RATE

	01/01/17
Foreman	W48.70 B41.32 T90.02
General Foreman	W50.70 B42.30 T93.00
Journeyman	W43.70 B39.72 T83.42

Craft: Boilermaker APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
	65%	70%	75%	80%	85%	90%	95%			
1000 Hours										
Benefit =	33.58	34.50	35.38	36.24	37.12	37.49	38.85			

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, holiday 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.

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

County - SOMERSET

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 - SOMERSET

Craft: Boilermaker - Minor Repairs

PREVAILING WAGE RATE

	01/01/17
Foreman	W32.54 B16.17 T48.71
General Foreman	W33.04 B16.17 T49.21
Mechanic	W31.04 B16.17 T47.21

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 \$125,000.00).

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 - SOMERSET

Craft: Bricklayer, Stone Mason

PREVAILING WAGE RATE

	11/01/16	05/01/17	05/01/18
Deputy Foreman	W43.00	W0.00	W0.00
	B30.91	B0.00	B0.00
	T73.91	T76.04	T78.23
Foreman	W46.00	W0.00	W0.00
	B30.91	B0.00	B0.00
	T76.91	T79.04	T81.23
Journeyman	W40.00	W0.00	W0.00
	B30.91	B0.00	B0.00
	T70.91	T73.04	T75.23

Craft: Bricklayer, Stone Mason

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
	40%	50%	55%	60%	65%	70%	75%	80%		
6 Months										
Benefits	3.72	4.65	5.12	5.58	20.48	21.83	23.18	24.52		

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 10%, 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 10%, inclusive of benefits, and the third shift shall receive the regular rate plus 15%, 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 10%, inclusive of benefits, and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 10%, 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.

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

County - SOMERSET

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 - SOMERSET

Craft: Carpenter - Resilient Flooring

PREVAILING WAGE RATE

	11/01/16	05/01/17	11/01/17	05/01/18	11/01/18
Foreman	W53.42	W0.00	W0.00	W0.00	W0.00
	B30.44	B0.00	B0.00	B0.00	B0.00
	T83.86	T85.04	T86.04	T87.29	T88.54
Journeyman	W46.45	W0.00	W0.00	W0.00	W0.00
	B26.48	B0.00	B0.00	B0.00	B0.00
	T72.93	T74.23	T75.23	T76.48	T77.73

Craft: Carpenter - Resilient Flooring

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
	Yearly	40%	55%	65%	80%	90%				
Benefit	57%	of	Appren	tice	Wage	for all	intervals			

Ratio of Apprentices to Journeymen - *

* 1 apprentice shall be allowed to every 2 journeymen or major fraction thereof. 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.

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

County - SOMERSET

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 - SOMERSET

Craft: Cement Mason

PREVAILING WAGE RATE

See " Bricklayer, Stone Mason" Rates

Craft: Cement Mason

COMMENTS/NOTES

***See Bricklayer, Stone Mason" Rates

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

County - SOMERSET

Craft: Dockbuilder PREVAILING WAGE RATE

	11/29/16	05/01/17	11/01/17	05/01/18	11/01/18
Foreman	W51.29 B44.37 T95.66	W0.00 B0.00 T96.79	W0.00 B0.00 T97.99	W0.00 B0.00 T99.24	W0.00 B0.00 T100.49
Foreman (Concrete Form Work)	W50.14 B31.56 T81.70	W0.00 B0.00 T82.90	W0.00 B0.00 T84.10	W0.00 B0.00 T85.35	W0.00 B0.00 T86.60
Journeyman	W44.60 B44.37 T88.97	W0.00 B0.00 T90.17	W0.00 B0.00 T91.37	W0.00 B0.00 T92.62	W0.00 B0.00 T93.87
Journeyman (Concrete Form Work)	W43.60 B31.56 T75.16	W0.00 B0.00 T76.36	W0.00 B0.00 T77.56	W0.00 B0.00 T78.81	W0.00 B0.00 T80.06

Craft: Dockbuilder APPRENTICE RATE SCHEDULE

<u>INTERVAL</u>	<u>PERIOD AND RATES</u>									
Yearly	17.84	22.30	28.99	35.68						
Benefits	29.95	for all	intervals		Concrete	Form Work	only -Ben.	= 21.81	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.

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

County - SOMERSET

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 - SOMERSET

Craft: Drywall Finisher

PREVAILING WAGE RATE

	05/01/16	05/01/17
Foreman	W42.55 B23.10 T65.65	W44.30 B22.60 T66.90
General Foreman	W44.45 B23.10 T67.55	W46.20 B22.60 T68.80
Journeyman	W38.75 B23.10 T61.85	W40.50 B22.60 T63.10

Craft: Drywall Finisher

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
	30%	40%	50%	60%	70%	75%	80%	85%	90%	
4 Months										
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 - SOMERSET

Craft: Electrician

PREVAILING WAGE RATE

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

Craft: Electrician

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
	Yearly	40%	49%	58%	68%	80%		of Jour	neyman	Wage
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.

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

County - SOMERSET

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 - SOMERSET

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

PREVAILING WAGE RATE

	11/01/16
Master Technician/General Foreman	W52.18 B28.69 T80.87
Senior Technician/Lead Foreman (21-30 Workers on Job)	W47.77 B26.26 T74.03
Technician A/Foreman (11-20 Workers on Job)	W45.76 B25.16 T70.92
Technician B/Working Foreman (4-10 Workers on Job)	W43.75 B24.06 T67.81
Technician C/Journeyman (1-3 Workers on Job)	W40.14 B22.07 T62.21

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

APPRENTICE RATE SCHEDULE

<u>INTERVAL</u>	<u>PERIOD AND RATES</u>									
6 months	20.14	21.48	23.72	26.41	29.54	32.23	35.36	38.49		
Benefits	7.85	8.38	9.25	10.29	11.52	12.56	13.79	15.01		

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	17.90	19.25	21.48	24.17	27.30	29.99	33.12	36.26		
Benefits	6.98	7.51	8.38	9.42	10.65	11.69	12.92	14.13		

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.

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

County - SOMERSET

- 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 - SOMERSET

Craft: Electrician - Teledata (16 Instruments & More)

PREVAILING WAGE RATE

See "Electrician" Rates

Craft: Electrician - Teledata (16 Instruments & More)

COMMENTS/NOTES

See ELECTRICIAN Rates

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

County - SOMERSET

Craft: Electrician- Outside Commercial

PREVAILING WAGE RATE

	05/30/16	05/29/17	05/28/18
Cable Splicer	W58.99 B33.46 T92.45	W60.37 B34.24 T94.61	W61.82 B35.06 T96.88
Certified Welder	W56.31 B31.94 T88.25	W57.62 B32.68 T90.30	W59.01 B33.47 T92.48
Equipment Operator	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)	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)	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)	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)	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)	W69.72 B39.54 T109.26	W71.34 B40.46 T111.80	W73.06 B41.44 T114.50
Groundman	W32.18 B18.26 T50.44	W32.93 B18.68 T51.61	W33.72 B19.13 T52.85
Journeyman Lineman/Technician	W53.63 B30.42 T84.05	W54.88 B31.13 T86.01	W56.20 B31.88 T88.08
Sub-Foreman	W60.07 B34.07 T94.14	W61.47 B34.86 T96.33	W62.94 B35.70 T98.64

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

County - SOMERSET

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 - SOMERSET

Craft: Electrician-Utility Work (North)

PREVAILING WAGE RATE

Rates are located in the "Statewide" rate package

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 - SOMERSET

Craft: Electrician-Utility Work (South)

PREVAILING WAGE RATE

Rates are located in the "Statewide" rate package

Craft: Electrician-Utility Work (South)

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
6 Months	27.37	29.65	31.93	34.21	36.49	38.77	41.05			
Benefits	24.01	25.34	26.73	28.09	29.43	30.80	32.18			

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 - SOMERSET

Craft: Elevator Constructor PREVAILING WAGE RATE

	03/17/17	03/17/18
Journeyman	W62.64	W64.48
	B41.56	B43.36
	T104.20	T107.84

Craft: Elevator Constructor APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
	Yearly	27.22	33.53	39.62	45.72					
Benefits	31.75	32.88	34.41	35.93						

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 - SOMERSET

Craft: Elevator Modernization & Service

PREVAILING WAGE RATE

	03/17/17	03/17/18
Journeyman	W49.14	W50.49
	B39.91	B41.66
	T89.05	T92.15

Craft: Elevator Modernization & Service

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
Yearly	27.22	26.35	31.14	35.93						
Benefits	31.68	31.99	33.37	34.74						

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 - SOMERSET

Craft: Glazier PREVAILING WAGE RATE

	06/20/16
Foreman	W47.39 B23.26 T70.65
General Foreman	W49.39 B23.50 T72.89
Journeyman	W43.39 B22.78 T66.17

Craft: Glazier APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
	30%	40%	50%	60%	70%	75%	80%	85%	90%	
4 Months										
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.

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

County - SOMERSET

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 - SOMERSET

Craft: Heat & Frost Insulator

PREVAILING WAGE RATE

	07/01/16
Foreman	W43.02 B31.98 T75.00
Journeyman	W42.02 B31.98 T74.00

Craft: Heat & Frost Insulator

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
Yearly	45%	55%	65%	75%	80%					
Benefit	28.73	for	all	intervals						

Ratio of Apprentices to Journeymen - *

* Ratio = 1:4 on a "company-wide" basis (i.e. the total number of apprentices and journeymen employed by the company). There is no limit to the number of apprentices allowed on any one job, provided there is at least 1 journeyman on the job.

Craft: Heat & Frost Insulator

COMMENTS/NOTES

FOREMAN REQUIREMENTS:

- If there is only 1 Insulator on the job, he must be designated a Foreman.
- If there are 2 to 10 Insulators on the job, 1 must be designated a Foreman.
- If there are 11 or more Insulators on the job, 1 must be designated a General Foreman and receive the following additional pay (% above Journeyman wage rate):
 - 11 - 20 Insulators on site: 10%; 21 - 30 Insulators on site: 15%;
 - 31 - 40 Insulators on site: 20%; 41 - 50 Insulators on site: 25%

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

SHIFT DIFFERENTIALS:

- Shift work must run for a minimum of two (2) consecutive days and a minimum of two (2) shifts per day must be worked. Additionally, no less than two (2) employees may work on any one (1) shift. If these requirements are not met then shift work would not apply and the applicable overtime rate shall be paid.
- 1st Shift (8:00 AM- 4:00 PM).
- 2nd Shift (4:00 PM - 12:00 AM): additional 15% of the regular rate, inclusive of benefits.
- 3rd Shift (12:00 AM - 8:00 AM): additional 20% of the regular rate, inclusive of benefits.

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 regular rate, inclusive of benefits. All hours on Sundays 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, Memorial Day, July 4th, Labor Day, Veterans' Day, Presidential Election Day, Thanksgiving Day, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the

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

County - SOMERSET

following Monday.

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

County - SOMERSET

Craft: Heat & Frost Insulator - Asbestos Worker

PREVAILING WAGE RATE

	07/01/16
Foreman	W43.02 B31.98 T75.00
Journeyman	W42.02 B31.98 T74.00

Craft: Heat & Frost Insulator - Asbestos Worker

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
	SEE	Heat &	Frost	Insulator						

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.

FOREMAN REQUIREMENTS:

- If there is only 1 Asbestos Worker on the job, he must be designated an Abatement Foreman.
- If there are 2 to 10 Asbestos Workers on the job, 1 must be designated an Abatement Foreman.
- If there are 11 or more Asbestos Workers on the job, 1 must be designated a General Foreman and receive the following additional pay (% above Abatement Mechanic wage rate):
 - 11 - 20 Insulators on site: 10%; 21 - 30 Insulators on site: 15%;
 - 31 - 40 Insulators on site: 20%; 41 - 50 Insulators on site: 25%

MECHANIC-TO-APPRENTICE RATIO:

- Maximum of 5 Apprentices for each Abatement Mechanic on the job.

OVERTIME:

- Hours in excess of 8 per day, 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 (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, Memorial Day, July 4th, Labor Day, Veterans' Day, Presidential Election Day, Thanksgiving Day, 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 - SOMERSET

- 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 - SOMERSET

Craft: Laborer - Asbestos & Hazardous Waste Removal

PREVAILING WAGE RATE

	01/26/17
Journeyman (Handler)	W30.88 B21.91 T52.79

Craft: Laborer - Asbestos & Hazardous Waste Removal

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
Yearly	18.53	21.62	24.70	27.79						
Benefits	20.26	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 one (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
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County - SOMERSET

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, 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 - SOMERSET

Craft: Laborer - Heavy & General

PREVAILING WAGE RATE

Rates are located in the
"Statewide" rate package

Craft: Laborer - Heavy & General

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
1000 Hours	60%	70%	80%	90%						
Benefit	19.53	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.

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

County - SOMERSET

Craft: Laborer-Residential and Modular Construction

PREVAILING WAGE RATE

	01/05/17	04/01/17
* Skilled Tradesman (only applies to Modular Construction)	W25.25 B5.45 T30.70	W25.55 B5.45 T31.00
Foreman (person directing crew, regardless of his skill classification)	W25.25 B5.45 T30.70	W25.55 B5.45 T31.00
Laborer	W21.25 B5.45 T26.70	W21.55 B5.45 T27.00
Laborer (for single family and stand-alone duplex owned by single owner)	W16.55 B2.95 T19.50	W17.05 B2.95 T20.00

Craft: Laborer-Residential and Modular Construction

APPRENTICE RATE SCHEDULE

<u>INTERVAL</u>	<u>PERIOD AND RATES</u>									
	As shown	800 hours	600 hours	600 hours						
wage & benefits	70%	80%	90%							

Ratio of Apprentices to Journeymen-

One (1) apprentice shall be allowed for the first journeyman on site and no more than one (1) additional apprentice for each additional three (3) journeymen on site.

Craft: Laborer-Residential and Modular Construction

COMMENTS/NOTES

* SKILLED TRADESMAN- any worker doing work not typically done by a Building Laborer. Some examples are installing interior doors, sheet rock, hooking up appliances, installing light fixtures, installing railing systems, etc. Please note where local building codes require that certain work be performed under the supervision of a licensed tradesman (i.e. Plumber, Electrician, etc.) Laborers shall work under such supervision.

RESIDENTIAL CONSTRUCTION- All residential construction (not commercial), single-family, stand-alone duplex houses, townhouses and multi-family buildings of not more than four (4) floors, including basement levels. Please note the construction must be residential in nature for ALL FLOORS at an elevation of no more than FOUR (4) FLOORS, INCLUDING BASEMENT. In addition, barracks and dormitories are not considered residential projects.

MODULAR RESIDENTIAL CONSTRUCTION- all aspects of modular residential construction (not commercial) at the site of installation of structures of no more than four (4) stories, including all excavation and site preparation, footings and foundation systems whether poured on-site or prefabricated, all underground waterproofing, underground utilities, concrete slabs, sidewalks, driveways, paving, hardscape and landscaping. Please note the construction must be residential in nature for ALL STORIES at an elevation of no more than FOUR (4) STORIES. All work performed by the Set Crew (the crew of workers who set the modular boxes on the foundation), including the rigging, setting, attaching and assembly of all modules and structural members, preparation of the foundation to accept modules, such as sill plates, connection of all in-module and under-module connections including, but not limited to, plumbing, electrical, HVAC, fire suppression, CATS,

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

County - SOMERSET

telephone, television/internet, and fiber optic, the building or installation of any porches or decks regardless of material or method of construction, the on-site installation of, or completion of any roof system, doors, windows and fenestrations, including flashing, gutter and soffit systems, waterproofing, insulation and interior and exterior trim work, and painting. Please note that modular construction does not include on-site stick built construction, tip up construction or panel built construction.

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

OVERTIME:

Hours worked in excess of 8 per day/40 per week, Monday through Saturday, and all hours worked on Sunday and holidays shall be paid at time and one-half the hourly rate.

RECOGNIZED HOILDAYS:

New Year's Day, Martin Luther King Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day.

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

County - SOMERSET

Craft: Millwright PREVAILING WAGE RATE

	11/01/16
Foreman	W53.53 B31.65 T85.18
Journeyman	W46.55 B27.60 T74.15

Craft: Millwright APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
6 Months	40%	45%	50%	55%	60%	65%	70%	75%	85%	95%
Benefits	58% of	Appren	tice	Wage	Rate	for all	intervals	+ \$.60		

Ratio of Apprentices to Journeymen - 1:3

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 - SOMERSET

Craft: Operating Engineer PREVAILING WAGE RATE

Rates are located in the
"Statewide" rate package

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 - SOMERSET

Craft: Operating Engineer - Field Engineer

PREVAILING WAGE RATE

Rates are located in the
"Statewide" rate package

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 - SOMERSET

Craft: Painter - Bridges

PREVAILING WAGE RATE

	05/01/16	05/01/17
Foreman	W57.38 B26.92 T84.30	W61.13 B25.67 T86.80
General Foreman	W59.38 B26.92 T86.30	W63.13 B25.67 T88.80
Journeyman	W52.38 B26.92 T79.30	W56.13 B25.67 T81.80

Craft: Painter - Bridges

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
	40%	50%			60%	70%		80%	90%	
6 Months										
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 - SOMERSET

Craft: Painter - Line Striping

PREVAILING WAGE RATE

	12/29/16
Apprentice (1st year)	W24.45 B10.75 T35.20
Apprentice (2nd year)	W28.45 B16.80 T45.25
Foreman (Charge Person)	W36.60 B17.08 T53.68
Journeyman 1 (at least 1 year of working exp. as a journeyman)	W32.33 B17.08 T49.41
Journeyman 2 (at least 2 years of working exp. as a journeyman)	W36.10 B17.08 T53.18

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 - SOMERSET

Craft: Painter - New Construction

PREVAILING WAGE RATE

	05/01/16	05/01/17
Foreman	W42.26 B22.94 T65.20	W44.39 B22.35 T66.74
General Foreman	W46.10 B23.40 T69.50	W48.43 B22.81 T71.24
Journeyman	W38.42 B22.49 T60.91	W40.36 B21.90 T62.26

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.

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

County - SOMERSET

- 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 - SOMERSET

Craft: Painter- Containment

PREVAILING WAGE RATE

	05/01/16	05/01/17
Journeyman	W33.43 B23.92 T57.35	W37.68 B22.92 T60.60

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..

- 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 - SOMERSET

Craft: Painter-Elevated Water Tanks

PREVAILING WAGE RATE

	05/01/16	05/01/17
Foreman	W47.17 B24.17 T71.34	W50.92 B22.92 T73.84
General Foreman	W49.17 B24.17 T73.34	W52.92 B22.92 T75.84
Journeyman	W42.17 B24.17 T66.34	W45.92 B22.92 T68.84

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 - SOMERSET

Craft: Painter-Structural Steel

PREVAILING WAGE RATE

	05/01/16	05/01/17
Foreman	W46.12 B24.51 T70.63	W49.87 B23.26 T73.13
General Foreman	W48.12 B24.51 T72.63	W51.87 B23.26 T75.13
Journeyman	W41.12 B24.51 T65.63	W44.87 B23.26 T68.13

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 - SOMERSET

Craft: Paperhanger - New Construction

PREVAILING WAGE RATE

	05/01/16	05/01/17
Foreman	W43.25 B22.59 T65.84	W45.32 B21.44 T66.76
Journeyman	W39.32 B22.59 T61.91	W41.20 B22.01 T63.21

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 - SOMERSET

Craft: Paperhanger - Renovation

PREVAILING WAGE RATE

	05/01/16	05/01/17
Foreman	W32.39 B18.96 T51.35	W35.06 B18.53 T53.59
Journeyman	W29.45 B18.96 T48.41	W31.88 B18.53 T50.41

Craft: Paperhanger - Renovation

APPRENTICE RATE SCHEDULE

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

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 - SOMERSET

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 - SOMERSET

Craft: Plasterer

PREVAILING WAGE RATE

See "Cement Mason" Rates

Craft: Plasterer

COMMENTS/NOTES

See CEMENT MASON Rates

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

County - SOMERSET

Craft: Plumber PREVAILING WAGE RATE

	05/04/16
Foreman	W55.52 B32.99 T88.51
General Foreman	W59.12 B32.99 T92.11
Journeyman	W51.41 B32.99 T84.40

Craft: Plumber APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
Yearly	30%	45%	55%	65%	75%					
Benefits	12.77	18.77	20.44	22.13	23.80					

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 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 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 - SOMERSET

Craft: Roofer PREVAILING WAGE RATE

	06/06/16
Foreman	W36.52 B25.03 T61.55
Journeyman	W35.52 B25.03 T60.55

Craft: Roofer APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
6 Months	14.21	17.76	21.31	24.86	28.42	31.97				
Benefits	2.10	2.10	22.28	22.28	22.28	22.28				

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 re-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 - SOMERSET

Craft: Sheet Metal Sign Installation

PREVAILING WAGE RATE

	10/31/16
Foreman	W33.79 B31.82 T65.61
Journeyman	W32.54 B31.82 T64.36

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	10.28	11.73	13.18	14.65	16.47	17.96	19.44	20.93	22.40	23.89

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 through 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 - SOMERSET

Craft: Sprinkler Fitter

PREVAILING WAGE RATE

	01/01/17	07/01/17	01/01/18	07/01/18	01/01/19
Foreman	W62.93 B26.12 T89.05	W64.93 B26.12 T91.05	W64.38 B26.67 T91.05	W66.63 B26.67 T93.30	W66.08 B27.22 T93.30
General Foreman	W65.93 B26.12 T92.05	W67.93 B26.12 T94.05	W69.08 B27.22 T96.30	W69.63 B26.67 T96.30	W0.00 B0.00 T0.00
Journeyman	W58.83 B26.12 T84.95	W60.83 B26.12 T86.95	W60.28 B26.67 T86.95	W62.53 B26.67 T89.20	W61.98 B27.22 T89.20

Craft: Sprinkler Fitter

APPRENTICE RATE SCHEDULE

INTERVAL	PERIOD AND RATES									
	9.50	11.25	50%	55%	60%	65%	70%	75%	80%	85%
Benefits	10.67	10.67	21.22	21.22	21.22	21.22	Intervals	7 to 10	Jourymn	Ben.

Ratio of Apprentices to Journeymen - 1:3

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

INTERVAL	PERIOD AND RATES									
1000 hours	25%	30%	40%	45%	55%	60%	70%	75%	85%	90%
Benefits	10.67	10.67	21.22	21.22	21.22	21.22	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 straight-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 - SOMERSET

Craft: Tile Setter - Ceramic

PREVAILING WAGE RATE

	12/08/16
Finisher	W43.36 B29.09 T72.45
Setter	W56.13 B32.39 T88.52

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 - SOMERSET

Craft: Tile Setter - Marble

PREVAILING WAGE RATE

	01/01/17	07/01/17	01/01/18
Tile Setter	W57.74 B34.26 T92.00	W58.18 B35.27 T93.45	W58.53 B36.37 T94.90

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 - SOMERSET

Craft: Tile Setter - Mosaic & Terrazzo

PREVAILING WAGE RATE

	01/01/17
Grinder or Assistant	W50.86 B34.14 T85.00
Mechanic	W52.46 B34.16 T86.62

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 - SOMERSET

Craft: Truck Driver

PREVAILING WAGE RATE

	11/01/16	05/01/17	11/01/17
Bucket, Utility, Pick-up, Fuel Delivery trucks	W38.75 B30.48 T69.23	W39.50 B30.98 T70.48	W39.90 B31.38 T71.28
Dump truck, Asphalt Distributor, Tack Spreader	W38.75 B30.48 T69.23	W39.50 B30.98 T70.48	W39.90 B31.38 T71.28
Euclid-type vehicles (large off-road equipment)	W38.90 B30.48 T69.38	W39.65 B30.98 T70.63	W40.05 B31.38 T71.43
Helper on Asphalt Distributor truck	W38.75 B30.48 T69.23	W39.50 B30.98 T70.48	W39.90 B31.38 T71.28
Slurry Seal, Seeding/Fertilizing/Mulchi ng truck	W38.75 B30.48 T69.23	W39.50 B30.98 T70.48	W39.90 B31.38 T71.28
Straight 3-axle truck	W38.80 B30.48 T69.28	W39.55 B30.98 T70.53	W39.95 B31.38 T71.33
Tractor-Trailer truck (all types)	W38.90 B30.48 T69.38	W39.65 B30.98 T70.63	W40.05 B31.38 T71.43
Vacuum or Vac-All truck (entire unit)	W38.75 B30.48 T69.23	W39.50 B30.98 T70.48	W39.90 B31.38 T71.28
Winch Trailer Driver	W39.00 B30.48 T69.48	W39.75 B30.98 T70.73	W40.15 B31.38 T71.53

Craft: Truck Driver

COMMENTS/NOTES

Foreman: + \$.75 cents per hour. Overtime rate shall be increased accordingly.

HAZARDOUS WASTE REMOVAL WORK:

- On a hazardous waste site requiring Level A, B, or C personal protection for any worker: + \$3.00 per hour.
- On a hazardous waste site not designated Level A, B, or C: + \$1.00 per hour.

The regular workday consists of 8 hours starting at either 6:00 AM or 8:00 AM.

SHIFT DIFFERENTIAL:

Any shift starting at a time other than 6:00 AM or 8:00 AM shall receive an additional \$2.50 per hour.

BLENDED RATE:

- When a truck driver is performing work on site and also serving as a material delivery driver, the driver shall be paid a

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

County - SOMERSET

"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.

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 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.
- Benefits on overtime shall be paid accordingly: On 9-20-16 (\$35.03), on 11-1-16 (\$35.63), on 5-1-17 (\$36.13), and on 11-1-17 (\$36.73).
- 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 will be observed the following Monday.

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

County - SOMERSET

Craft: Truck Driver-Material Delivery Driver

PREVAILING WAGE RATE

	11/01/16	05/01/17	11/01/17
Driver	W31.04 B30.48 T61.52	W31.64 B30.98 T62.62	W31.96 B31.38 T63.34
New Hires: 1st Year	W31.04 B30.48 T61.52	W31.64 B30.98 T62.62	W31.96 B31.38 T63.34

Craft: Truck Driver-Material Delivery Driver

COMMENTS/NOTES

NOTE: These rates may only be used for the delivery of materials to the jobsite.

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. Benefits on overtime shall be paid accordingly: On 9-20-16 (\$35.03), on 11-1-16 (\$35.63), on 5-1-17 (\$36.13), and on 11-1-17 (\$36.73).

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 will be observed the following Monday.

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

County - SOMERSET

Craft: Welder

PREVAILING WAGE RATE

Welder

Craft: Welder

COMMENTS/NOTES

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

STATEWIDE RATES

OPERATING ENGINEERS **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. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veteran's Day.

On hazardous waste removal work or asbestos removal work, on a state or federally designated hazardous waste site, where the operating engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin, and eye protection, the operating engineer shall receive an additional 20% of the hourly wage, per hour.

OPERATING ENGINEERS Rates Expiration Date : 06/30/2017

Effective Dates:

02/15/2017

Rate	Fringe	Total
47.63	30.63	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:

02/15/2017

Rate	Fringe	Total
47.63	30.63	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:

02/15/2017

Rate	Fringe	Total
45.72	30.63	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 (Hetzl, Rexomatic & similar types)
- Concrete Vibrator

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

Effective Dates:

02/15/2017

Rate	Fringe	Total
45.72	30.63	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:

02/15/2017

Rate	Fringe	Total
45.72	30.63	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

Skimmer Machine (boom type)

Steel Cutting Machine (service & maintenance)

Tamrock Drill

Tractor

Transfer Machines

Tug Captains

Tug Master (Power Boats)

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

Effective Dates:

02/15/2017

Rate	Fringe	Total
45.72	30.63	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:

02/15/2017

Rate	Fringe	Total
42.38	30.63	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:

02/15/2017

Rate	Fringe	Total
39.80	30.63	70.43

CLASSIFICATIONS:

Field Engineer - Rodman or Chainman

TERRITORY
ENTIRE STATE

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

OPERATING ENGINEERS Rates Expiration Date : 06/30/2017

Effective Dates:

02/15/2017

Rate	Fringe	Total
49.96	30.63	80.59

CLASSIFICATIONS:

Lead Engineer, Foreman Engineer, Safety Engineer (minimum)

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

Effective Dates:

02/15/2017

Rate	Fringe	Total
49.22	30.63	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
- Helicopter Co-Pilot
- Helicopter 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:

02/15/2017

Rate	Fringe	Total
49.22	30.63	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:

02/15/2017

Rate	Fringe	Total
44.09	30.63	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:

02/15/2017

Rate	Fringe	Total
44.09	30.63	74.72

CLASSIFICATIONS:

Steam Generator or Boiler

Stone Spreader

Tamping Machine (vibrating ride-on type)

Temporary Heating Plant (Nelson or other type, including propane, natural gas, and flow-type units)

Water or Sprinkler Truck

Welding Machine (gas, diesel, or electric convertor, of any type)

Welding System - Multiple (rectifier transformer type)

Wellpoint Systems (including installation by bull gang and maintenance)

Effective Dates:

02/15/2017

Rate	Fringe	Total
51.04	30.63	81.67

CLASSIFICATIONS:

Helicopter Pilot/Engineer

Effective Dates:

02/15/2017

Rate	Fringe	Total
55.72	30.63	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:

02/15/2017

Rate	Fringe	Total
54.72	30.63	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:

02/15/2017

Rate	Fringe	Total
51.22	30.63	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:

02/15/2017

Rate	Fringe	Total
53.72	30.63	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:

02/15/2017

Rate	Fringe	Total
50.22	30.63	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. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veteran's Day.

On hazardous waste removal work or asbestos removal work, on a state or federally designated hazardous waste site, where the operating engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin, and eye protection, the operating engineer shall receive an additional 20% of the hourly wage, per hour.

Effective Dates:

02/15/2017

Rate	Fringe	Total
52.85	30.63	83.48

CLASSIFICATIONS:

Helicopter Pilot or Engineer

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

Effective Dates:

02/15/2017

Rate	Fringe	Total
48.79	30.63	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:

02/15/2017

Rate	Fringe	Total
46.13	30.63	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:

02/15/2017

Rate	Fringe	Total
44.60	30.63	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:

02/15/2017

Rate	Fringe	Total
42.84	30.63	73.47

CLASSIFICATIONS:

Assistant Engineer/Oiler

Drillers Helper

Field Engineer - Transit/Instrument Man

Maintenance Apprentice (Deckhand)

Maintenance Apprentice (Oiler)

Effective Dates:

02/15/2017

Rate	Fringe	Total
50.41	30.63	81.04

CLASSIFICATIONS:

Lead Engineer, Foreman Engineer, Safety Engineer (Minimum)

Effective Dates:

02/15/2017

Rate	Fringe	Total
39.80	30.63	70.43

CLASSIFICATIONS:

Field Engineer - Rodman or Chainman

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

Effective Dates:

02/15/2017

Rate	Fringe	Total
49.55	30.63	80.18

CLASSIFICATIONS:

Field Engineer-Chief of Party

Effective Dates:

02/15/2017

Rate	Fringe	Total
57.74	30.63	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:

02/15/2017

Rate	Fringe	Total
56.08	30.63	86.71

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms including jib, less than 140 ft. above ground), Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, less than 140 ft. above ground), Pile Drivers (all types), over 100 tons and Tower Crane.

Effective Dates:

02/15/2017

Rate	Fringe	Total
53.24	30.63	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:

02/15/2017

Rate	Fringe	Total
51.58	30.63	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.

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

Effective Dates:

02/15/2017

Rate	Fringe	Total
53.24	30.63	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

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. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veteran's Day.

On hazardous waste removal work or asbestos removal work, on a state or federally designated hazardous waste site, where the operating engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin, and eye protection, the operating engineer shall receive an additional 20% of the hourly wage, per hour.

Effective Dates:

02/15/2017

Rate	Fringe	Total
49.22	30.63	79.85

CLASSIFICATIONS:

Driller

Effective Dates:

02/15/2017

Rate	Fringe	Total
42.38	30.63	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:

03/01/2017

Rate	Fringe	Total
41.50	29.03	70.53

CLASSIFICATIONS:

Walking Boss & Superintendent

Effective Dates:

03/01/2017

Rate	Fringe	Total
41.20	29.03	70.23

CLASSIFICATIONS:

Heading Foreman, Shaft Foreman, Rod Foreman, Electrician Foreman, Rigging Foreman

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
40.70	29.03	69.73

CLASSIFICATIONS:

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
43.20	29.03	72.23

CLASSIFICATIONS:

Blaster

Effective Dates:

03/01/2017

Rate	Fringe	Total
40.15	29.03	69.18

CLASSIFICATIONS:

Top Labor Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.80	29.03	68.83

CLASSIFICATIONS:

Skilled Men (including Caulker, Powder Carrier, all other skilled men)

Skilled Men (including Miner, Drill Runner, Iron Man, Conveyor Man, Manitenance Man, Safety Miner, Rigger, Block Layer, Cement Finisher, Tod Man)

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.65	29.03	68.68

CLASSIFICATIONS:

Semi-Skilled Men (including Bell or Signal Man Top or Bottom, Form Worker & Mover, Concrete Worker, Shaft Man, Tunnel Laborer, Caulker's Helper, all other semi-skilled)

Semi-Skilled Men (including Miner's Helper, Chuck Tender, Track Man, Nipper, Brake Man, Derail Man, Cable Man, Hose Man, Gravel Man, Form Man)

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PREVAILING WAGE RATE DETERMINATION

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.15	29.03	68.18

CLASSIFICATIONS:

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

DRILL FOR GROUND WATER SUPPLY **Rates Expiration Date : 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:

02/15/2017

Rate	Fringe	Total
47.97	30.63	78.60

CLASSIFICATIONS:

Driller

Effective Dates:

02/15/2017

Rate	Fringe	Total
41.13	30.63	71.76

CLASSIFICATIONS:

Driller's Helper

OPERATING ENGINEERS MARINE-DREDGING **Rates Expiration Date : 09/30/2018**

NOTE: Boat crews carrying explosive material (dynamite, pourfex, and other similar materials) shall be paid at 120% of the hourly wage rate for hours engaged in handling of said materials. Employees required to possess a Hazardous Material Certification as a condition of employment shall be compensated at 120% of the hourly wage rate.

OVERTIME:

Hours in excess of 40 per week, and all hours on Saturdays and Sundays, shall be paid at time and one-half the hourly rate. All hours on holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Martin Luther King Day, Good Friday, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

Effective Dates:

10/01/2016			10/01/2017
Rate	Fringe	Total	Total
37.25	13.78	51.03	52.51

CLASSIFICATIONS:

Lead Dredgerman, Operator, Leverman

Licensed Tug Operator (over 1000 HP)

Effective Dates:

10/01/2016			10/01/2017
Rate	Fringe	Total	Total
32.22	13.38	45.60	46.95

CLASSIFICATIONS:

Derrick Operator, Spider/Spill Barge Operator

Engineer, Electrician, Chief Welder, Chief Mate

Fill Placer, Operator II

Licensed Boat Operator

Maintenance Engineer

Effective Dates:

10/01/2016			10/01/2017
Rate	Fringe	Total	Total
30.33	13.23	43.56	44.86

CLASSIFICATIONS:

Certified Welder

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OPERATING ENGINEERS MARINE-DREDGING **Rates Expiration Date : 09/30/2018**

Effective Dates:

10/01/2016			10/01/2017
Rate	Fringe	Total	Total
29.50	12.86	42.36	43.64

CLASSIFICATIONS:

Mate, Drag Barge Operator, Steward, Assistant Fill Placer

Welder

Effective Dates:

10/01/2016			10/01/2017
Rate	Fringe	Total	Total
28.54	12.78	41.32	42.58

CLASSIFICATIONS:

Boat Operator

Effective Dates:

10/01/2016			10/01/2017
Rate	Fringe	Total	Total
23.71	12.10	35.81	36.92

CLASSIFICATIONS:

Shoreman, Deckhand, Rodman, Scowman

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

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem

IN ALL OTHER COUNTIES use the Heavy and General Laborers - North "Slurry Seal Laborer" rates.

SHIFT DIFFERENTIALS:

Any shift starting at 3:30 PM or later shall receive an additional \$0.35/hr

OVERTIME:

Hours in excess of 8 per day or 40 per week shall be paid at time and one-half the hourly rate. All hours on holidays shall be paid at double the hourly rate.

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
36.50	21.27	57.77

CLASSIFICATIONS:

Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
33.80	21.27	55.07

CLASSIFICATIONS:

Box man

Effective Dates:

03/01/2017

Rate	Fringe	Total
31.75	21.27	53.02

CLASSIFICATIONS:

Microsurface/Slurry Preparation

Effective Dates:

03/01/2017

Rate	Fringe	Total
31.75	21.27	53.02

CLASSIFICATIONS:

Squeegee man

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
30.30	21.27	51.57

CLASSIFICATIONS:

Cleaner, Taper

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

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

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$2.50 per hour.

OVERTIME:

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

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

Effective Dates:

03/01/2017

Rate	Fringe	Total
41.00	29.03	70.03

CLASSIFICATIONS:

Paving Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.55	29.03	68.58

CLASSIFICATIONS:

Head Raker

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.40	29.03	68.43

CLASSIFICATIONS:

Raker, Screedman, Luteman

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.15	29.03	68.18

CLASSIFICATIONS:

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.25	29.03	68.28

CLASSIFICATIONS:

Milling Controller

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.45	29.03	68.48

CLASSIFICATIONS:

Traffic Control Coordinator

TEST BORING PRELIMINARY TO CONSTRUCTION-NORTH **Rates Expiration Date : 10/16/2018**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Bergen, Essex, Hudson, Middlesex, Morris, Passaic, Somerset, Union

SHIFT DIFFERENTIAL:

Employees on a shift other than between the hours of 8:00 AM and 5:00 PM shall receive an additional \$1.00 per hour.

OVERTIME:

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

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

Hazardous Waste Pay (for Levels A, B, and C): an additional 10% of the hourly rate, per hour.

A newly hired Helper with no experience in the industry shall be paid as follows:

- 1st year on the job - 70% of Helper wage rate
- 2nd year on the job - 80% of Helper wage rate
- 3rd year on the job - 90% of Helper wage rate
- All helpers receive full fringe benefit rate.

Effective Dates:

11/01/2016			10/17/2017
Rate	Fringe	Total	Total
30.96	24.76	55.72	57.17

CLASSIFICATIONS:

Helper (4th year helper)

Effective Dates:

11/01/2016			10/17/2017
Rate	Fringe	Total	Total
38.82	24.76	63.58	65.24

CLASSIFICATIONS:

Driller

Effective Dates:

11/01/2016			10/17/2017
Rate	Fringe	Total	Total
44.64	24.76	69.40	71.28

CLASSIFICATIONS:

Foreman

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

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, Warren

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$2.50 per hour.

OVERTIME:

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

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

Effective Dates:

03/01/2017

Rate	Fringe	Total
38.75	29.03	67.78

CLASSIFICATIONS:

"D" Rate:

basic, landscape, asphalt, slurry seal, or railroad track laborer; utility meter installer; traffic director/flagman; salamander tender; pitman; dumpman; rakers or tampers on cold patch work; wrappers or coaters of pipe; waterproofer; timberman; wagon drill or drill master helper; powder carrier; magazine tender; signal man; power buggy operator; tree cutter; operator of basic power tools

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.45	29.03	68.48

CLASSIFICATIONS:

"C" Rate:

pipe layer; laser man; conduit or duct line layer; operator of jack hammer, chipping hammer, pavement breaker, concrete cutter, asphalt cutter, sheet hammer, or walk-behind saw cutter; sandblaster; acetylene cutting or burning; wagon drill, directional drill, or hydraulic drill operator; drill master; core driller; traffic control coordinator; asphalt raker or lute man

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.70	29.03	68.73

CLASSIFICATIONS:

"B" Rate:

concrete finisher; setter of brick or stone pavers; stone cutter; form setter; manhole, catch basin, or inlet builder; asphalt screedman; rammer; hardscaping; gunite nozzle man

Effective Dates:

03/01/2017

Rate	Fringe	Total
43.25	29.03	72.28

CLASSIFICATIONS:

"A" Rate:

blaster

Effective Dates:

03/01/2017

Rate	Fringe	Total
41.00	29.03	70.03

CLASSIFICATIONS:

"FOREMAN" Rate:

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
42.00	29.03	71.03

CLASSIFICATIONS:

"GENERAL FOREMAN" Rate

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

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$2.50 per hour.

OVERTIME:

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

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

Effective Dates:

03/01/2017

Rate	Fringe	Total
38.75	29.03	67.78

CLASSIFICATIONS:

basic, landscape, or railroad track laborer; utility meter installer; traffic director/flagman; salamander tender; pitman; dumpman; rakers or tampers on cold patch work; wrappers or coaters of pipe; waterproofers

tree cutter, timberman

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.45	29.03	68.48

CLASSIFICATIONS:

wagon drill or drill master helper; powder carrier; magazine tender; signal man

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.45	29.03	68.48

CLASSIFICATIONS:

pipe layer; laser man; conduit or duct line layer; operator of jack hammer, chipping hammer, pavement breaker, concrete cutter, asphalt cutter, sheet hammer, or walk-behind saw cutter; sandblaster; acetylene cutting or burning

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.45	29.03	68.48

CLASSIFICATIONS:

wagon or directional drill operator; drill master

Effective Dates:

03/01/2017

Rate	Fringe	Total
43.25	29.03	72.28

CLASSIFICATIONS:

blaster

Effective Dates:

03/01/2017

Rate	Fringe	Total
41.00	29.03	70.03

CLASSIFICATIONS:

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
42.00	29.03	71.03

CLASSIFICATIONS:

general foreman

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

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.70	29.03	68.73

CLASSIFICATIONS:

concrete finisher; setter of brick or stone pavers; stone cutter; form setter; manhole, catch basin, or inlet builder; rammer; gunite nozzle man

PIPELINE - MAINLINE TRANSMISSION Rates Expiration Date : 06/04/2017

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:

06/01/2016

Rate	Fringe	Total
54.56	26.59	81.15

CLASSIFICATIONS:

Pipeline Journeyman Welder

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PIPELINE - MAINLINE TRANSMISSION Rates Expiration Date : 06/04/2017

Effective Dates:

06/01/2016

Rate	Fringe	Total
54.56	26.59	81.15

CLASSIFICATIONS:

Pipeline Journeyman

Effective Dates:

06/01/2016

Rate	Fringe	Total
32.99	18.73	51.72

CLASSIFICATIONS:

Pipeline Helper

PIPELINE - GAS DISTRIBUTION **Rates Expiration Date : 10/31/2017**

These rates apply to the following: welding on gas line distribution systems (that portion of the gas distribution system placed in streets, roads, subways, tunnels, viaducts, highways and easements which serves the users of gas).

SHIFT DIFFERENTIALS:

An "irregular" shift may start any time from 5:00 PM to 12:00 AM, Monday through Friday, and shall receive an additional 15% of the regular rate per hour, inclusive of benefits.

OVERTIME:

Hours in excess of forty per week, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

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

Effective Dates:

11/01/2016

Rate	Fringe	Total
57.58	21.55	79.13

CLASSIFICATIONS:

Pipeline Journeyman Welder

Effective Dates:

11/01/2016

Rate	Fringe	Total
57.58	21.55	79.13

CLASSIFICATIONS:

Pipeline Journeyman

Effective Dates:

11/01/2016

Rate	Fringe	Total
37.16	15.74	52.90

CLASSIFICATIONS:

Pipeline Helper

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

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, Warren

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$2.50 per hour.

OVERTIME:

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

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

Effective Dates:

03/01/2017

Rate	Fringe	Total
41.00	29.03	70.03

CLASSIFICATIONS:

Asphalt Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.70	29.03	68.73

CLASSIFICATIONS:

Asphalt Screedman

Effective Dates:

03/01/2017

Rate	Fringe	Total
39.45	29.03	68.48

CLASSIFICATIONS:

Asphalt Raker or Lute Man

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

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

Effective Dates:

03/01/2017

Rate	Fringe	Total
38.75	29.03	67.78

CLASSIFICATIONS:

Asphalt Laborer

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

Electrician-Utility Work (North)

(For apprentice rates refer to Electrician-Utility Work (North) in any county rate package).

These rates apply to work contracted for by the following utility companies:

Public Service Electric & Gas Co. of NJ, GPU Energy, Borough of Madison Electric Department, Sussex Rural Electric Cooperative, Rockland Utilities, and Butler Municipal Electric Co.

These rates do not apply to work on substations or switching stations.

For Utility work contracted for by a utility company other than those listed above or those listed under "Electrician-Utility Work (South), see the "Outside Commercial Rates" for the county in which the jobsite is located.

* FOR OUTSIDE COMMERCIAL RATES PLEASE SEE COUNTY RATES

The regular workday is 8 hours, between 6:00 AM and 6:00 PM.

FOR EMERGENCY WORK ONLY: (emergency work is defined as work caused by storm, catastrophe, act of god, and circumstances beyond the control of the employer)-all hours of work shall be paid at double the hourly rate.

SHIFT DIFFERENTIALS:

Shift work must run for a minimum of 5 consecutive workdays.

2nd shift (between the hours of 4:30 PM and 1:00 AM): 8 hours of work + 17.3% of the regular rate, inclusive of benefits.

3rd shift (between the hours of 12:30 AM and 9:00 AM): 8 hours of work + 31.4% of the regular rate per hour, inclusive of benefits.

OVERTIME:

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

Four 10-hour days may worked, at straight time, between 7:00 AM and 6:30 PM, Monday through Thursday.

RECOGNIZED HOLIDAYS:

New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day and Christmas Day, or day on which they are legally observed.

Effective Dates:

12/04/2016

Rate	Fringe	Total
52.26	35.01	87.27

CLASSIFICATIONS:

Chief Lineman

Effective Dates:

12/04/2016

Rate	Fringe	Total
49.31	33.03	82.34

CLASSIFICATIONS:

Journeyman Lineman

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

Effective Dates:

12/04/2016

Rate	Fringe	Total
49.31	33.03	82.34

CLASSIFICATIONS:

Special License Operator

Effective Dates:

12/04/2016

Rate	Fringe	Total
48.81	32.70	81.51

CLASSIFICATIONS:

Transit Man

Effective Dates:

12/04/2016

Rate	Fringe	Total
47.33	31.71	79.04

CLASSIFICATIONS:

Line Equipment Operator

Effective Dates:

12/04/2016

Rate	Fringe	Total
41.42	27.75	69.17

CLASSIFICATIONS:

Dynamite Man

Effective Dates:

12/04/2016

Rate	Fringe	Total
58.18	38.98	97.16

CLASSIFICATIONS:

General Foreman

Effective Dates:

12/04/2016

Rate	Fringe	Total
56.70	37.98	94.68

CLASSIFICATIONS:

Assistant General Foreman

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

Effective Dates:

12/04/2016

Rate	Fringe	Total
55.22	36.99	92.21

CLASSIFICATIONS:

Line Foreman

Effective Dates:

12/04/2016

Rate	Fringe	Total
39.94	26.75	66.69

CLASSIFICATIONS:

Straight Light Mechanical Leader

Effective Dates:

12/04/2016

Rate	Fringe	Total
37.97	25.43	63.40

CLASSIFICATIONS:

Groundman Winch Operator

Effective Dates:

12/04/2016

Rate	Fringe	Total
37.97	25.43	63.40

CLASSIFICATIONS:

Groundman Truck Operator

Effective Dates:

12/04/2016

Rate	Fringe	Total
37.47	25.10	62.57

CLASSIFICATIONS:

Straight Light Mechanic

Effective Dates:

12/04/2016

Rate	Fringe	Total
37.47	25.10	62.57

CLASSIFICATIONS:

Line Equipment Mechanic

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

Effective Dates:

12/04/2016

Rate	Fringe	Total
32.05	21.47	53.52

CLASSIFICATIONS:

Groundman 2nd Year

Effective Dates:

12/04/2016

Rate	Fringe	Total
29.58	19.81	49.39

CLASSIFICATIONS:

Groundman 1st Year

Effective Dates:

12/04/2016

Rate	Fringe	Total
48.81	32.70	81.51

CLASSIFICATIONS:

Line Equipment Foreman

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date : 12/02/2017**

Electrician-Utility Work (South)

(For apprentice rates refer to Electrician-Utility Work (South) in any county rate package).

These rates apply to work contracted for by the following utility company:

Atlantic City Electric.

These rates do not apply to work on substations or switching stations.

For utility work contracted for by a utility company other than the one listed above or those listed under "Electrician-Utility Work (North)", see the "Outside Commercial Rates" for the county in which the jobsite is located.

* FOR OUTSIDE COMMERCIAL RATES PLEASE SEE COUNTY RATES

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

FOR EMERGENCY WORK ONLY: (emergency work is defined as work caused by storm, catastrophe, act of god, and circumstances beyond the control of the employer)- all hours of work shall be paid at double the hourly rate.

SHIFT DIFFERENTIALS:

Shift work must run for a minimum of 5 consecutive workdays.

When two (2) or three (3) shifts are worked the following shall apply:

1st shift (between the hours of 8:00 AM and 4:30 PM)

2nd shift (between the hours of 4:30 PM and 12:30 AM): 8 hours of work + 10% of the regular rate of pay for 7.5 hours worked.

3rd shift (between the hours of 12:30 AM and 8:00 AM): 8 hours of work + 15% of the regular rate of pay for 7 hours worked.

OVERTIME:

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

Four 10-hour days may be worked, at straight time, between 6:00 AM and 6:00 PM, Monday through Thursday with Friday used as a make-up day.

RECOGNIZED HOLIDAYS:

New Year's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day or on days celebrated.

WORKING RULES:

There shall be a Foreman in charge of each work crew. No crews are to exceed twelve (12) men, including Foremen.

There shall be a General Foreman designated for transmission work when three (3) or more crews are on the same job and for distribution work where there are more than twenty (20) employees on site.

A small job crew shall consist of five (5) or less employees, one (1) of the Journeyman Linemen in the crew shall be designated as a Small Job Foreman.

Work performed from ladders and/or mechanical lift equipment shall be the work of Linemen and/or Apprentices.

On new construction, fitting and framing poles, towers or structures may be done by Journeymen and/or Apprentices. Groundmen may assist, but may not perform any work which would be performed by Linemen if assembled in the air.

There shall be a Journeyman Lineman in each pole setting, erection, grounding, wire and cable-pulling crew of more than three (3) men.

Effective Dates:

12/04/2016

Rate	Fringe	Total
58.38	45.19	103.57

CLASSIFICATIONS:

General Foreman

ELECTRICIAN- UTILITY WORK (SOUTH) Rates Expiration Date : 12/02/2017

Effective Dates:

12/04/2016

Rate	Fringe	Total
52.00	41.37	93.37

CLASSIFICATIONS:

Foreman

Effective Dates:

12/04/2016

Rate	Fringe	Total
49.26	39.74	89.00

CLASSIFICATIONS:

Small Job Foreman

Effective Dates:

12/04/2016

Rate	Fringe	Total
45.61	37.54	83.15

CLASSIFICATIONS:

Heavy Equipment Operator

Effective Dates:

12/04/2016

Rate	Fringe	Total
45.61	37.54	83.15

CLASSIFICATIONS:

Cable Splicer

Effective Dates:

12/04/2016

Rate	Fringe	Total
45.61	37.54	83.15

CLASSIFICATIONS:

Journeyman Lineman

Effective Dates:

12/04/2016

Rate	Fringe	Total
45.61	37.54	83.15

CLASSIFICATIONS:

Journeyman Welder

ELECTRICIAN- UTILITY WORK (SOUTH) Rates Expiration Date : 12/02/2017

Effective Dates:

12/04/2016

Rate	Fringe	Total
45.61	37.54	83.15

CLASSIFICATIONS:

Journeyman Painter

Effective Dates:

12/04/2016

Rate	Fringe	Total
36.49	32.08	68.57

CLASSIFICATIONS:

Light Equipment Operator

Effective Dates:

12/04/2016

Rate	Fringe	Total
31.93	29.37	61.30

CLASSIFICATIONS:

Groundman Truck Driver

Effective Dates:

12/04/2016

Rate	Fringe	Total
29.65	27.99	57.64

CLASSIFICATIONS:

Groundman 3rd Year

Effective Dates:

12/04/2016

Rate	Fringe	Total
27.37	26.66	54.03

CLASSIFICATIONS:

Groundman 2nd Year

Effective Dates:

12/04/2016

Rate	Fringe	Total
25.09	25.29	50.38

CLASSIFICATIONS:

Groundman 1st Year

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

ELECTRICIAN- UTILITY WORK (SOUTH) Rates Expiration Date : 12/02/2017

Effective Dates:

12/04/2016

Rate	Fringe	Total
20.07	22.27	42.34

CLASSIFICATIONS:

Flagman

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS Rates Expiration Date : 08/31/2017

****THESE RATES APPLY TO CONSTRUCTION ON NEW TRANS HUDSON TUNNELS ONLY****

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$2.50 per hour.

OVERTIME:

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

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

Effective Dates:

03/01/2017

Rate	Fringe	Total
62.25	29.03	91.28

CLASSIFICATIONS:

Walking Boss & Superintendent

Effective Dates:

03/01/2017

Rate	Fringe	Total
61.80	29.03	90.83

CLASSIFICATIONS:

Heading Foreman, Shaft Foreman, Rod Foreman, Electrical Foreman, Rigging Foreman

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS **Rates Expiration Date : 08/31/2017**

Effective Dates:

03/01/2017

Rate	Fringe	Total
61.05	29.03	90.08

CLASSIFICATIONS:

Iron Foreman, Caulking Foreman, Form Foreman, Cement Finishing Foreman, Concrete Foreman, Track Foreman, Clean-up Foreman, Grout Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
64.80	29.03	93.83

CLASSIFICATIONS:

Blaster

Effective Dates:

03/01/2017

Rate	Fringe	Total
60.23	29.03	89.26

CLASSIFICATIONS:

Top Labor Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
59.70	29.03	88.73

CLASSIFICATIONS:

Skilled Men (including Caulker, Powder Carrier, all other skilled men)

Skilled Men (including Miner, Drill Runner, Iron Man, Conveyor Man, Maintenance Man, Safety Miner, Rigger, Block Layer, Cement Finisher, Rod Man)

Effective Dates:

03/01/2017

Rate	Fringe	Total
59.48	29.03	88.51

CLASSIFICATIONS:

Semi-Skilled Men (including Bell or Signal Man top or bottom, Form Worker & Mover, Concrete Worker, Shaft Man, Tunnel Laborer, Caulker's Helper, all other semi-skilled)

Semi-Skilled Men (including Miner's Helper, Chuck Tender, Track Man, Nipper, Brake Man, Derail Man, Cable Man, Hose Man, Gravel Man, Form Man)

TERRITORY
ENTIRE STATE

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

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS Rates Expiration Date : 08/31/2017

Effective Dates:

03/01/2017

Rate	Fringe	Total
58.73	29.03	87.76

CLASSIFICATIONS:

All others (including Powder Watchman, Change House Attendant, Top Laborer, Job Steward)

SECTION 01 11 00
(01010)
STATEMENT OF WORK

UNION COUNTY BOARD OF FREEHOLDERS
DEPARTMENT OF PUBLIC WORKS GENERATOR SET
CONTRACT NO. UC 2013-028

1.01 IN GENERAL, the work of this project consists of demolition of existing stand-by components and furnish and install new standby generator to the existing DPW Garage Facility site located in Union County, New Jersey complete as specified within these Contract Documents and shown on the Drawings entitled, "Department of Public Works Generator Set, Contract No. UC 2013-028" prepared by the Alaimo Group, and consisting of four (4) drawings as listed at the end of this Statement of Work. The Drawings are appended to these Specifications.

1.02 DESCRIPTION OF WORK

A. The work for this project includes, but is not limited to, the following items:

1. Demolition of existing equipment as shown on the plan documents.
2. Construction of new cast-in-place concrete generator foundations, generator platform, bollards and extend exhaust stack.
3. Furnish and install new 130 kW generator set, modifications to electrical service and all required electrical work and testing as needed.

1.03 COORDINATION

A. Contractor shall coordinate his operations with those of other Contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractors, including their subcontractors, shall keep informed of the progress and the detail work of other Contractors and Subcontractors, and shall notify the *ENGINEER* immediately of lack of progress or defective workmanship on the part of others. Failure of a Contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with his own work.

- B. All prime Contractors shall coordinate their work with adjacent work and with other trades so as to facilitate general progress of the work and assure correctness.
- C. Each Contractor shall lay out and install his work at such time or times and in such manner as to facilitate general progress of the project.
- D. Coordinate all work as further described in the General Conditions of the *Contract Documents*.

1.04 DRAWINGS

- A. The following Drawings prepared by the Alaimo Group are appended hereto and are a part of these Contract Documents:

- G1 Title Sheet
- E1 Electrical Site Plan
- E2 Electrical Block Diagram and Schedules
- S1 Structural Site Plan

- 1.05 The above Statement of Work outlines the general items and distribution of work, and should not be construed as being all-inclusive.

****END OF STATEMENT OF WORK****

SECTION 01 22 00
(01025)
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Requirements for determining measurement and payment of work specified on Unit basis or Lump Sum basis.
2. Requirements for a Schedule of Values.
3. Mobilization.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 00 41 00: Proposal*

1.02 DESCRIPTION

A. Unit price items:

1. Measurement of units of work for which payment will be made by unit prices are defined herein.
2. Payment for the units of work will be determined by multiplying the unit prices stated within the bid, times the quantity of the unit of work as determined by the measurement provisions stated herein. Payment for the units of work shall fully compensate the *CONTRACTOR* for furnishing all materials, labor, equipment, services, tools and all else incidental and necessary to complete the work.

B. Lump sum items:

1. Measurement of quantities of work will be estimated based on the accepted schedule of values as specified herein.

2. Payment for the quantities of work indicated in the accepted schedule of values will be at the prices stated in the accepted schedule of values, not to exceed the lump sum stated within the bid. Payment for the work to be performed under the lump sum shall fully compensate the *CONTRACTOR* for furnishing all material, labor, equipment, services, tools and all else incidental and necessary to complete the work.
- C. No specific measurement and payment will be made herein for work having no separate payment, but the costs thereof shall be included in the prices bid for the various other items of related work listed herein and in the *PROPOSAL*.

1.03 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Schedule of values:
1. Submit a Schedule of Values for the work at the Pre-Construction Conference. Schedule shall reflect the specified construction stages if any, and the component parts of each stage.
 2. Upon request, support the values with data, which will substantiate their correctness.
 3. The Schedule of Values, unless objected to by the *ENGINEER*, shall be used only as the basis for the Contractor's Applications for Payments.
- C. Form and content of Schedule of Values:
1. Type Schedule on 8½ x 11 in. white paper *CONTRACTOR'S* standard forms and automated printout will be considered for approval by *ENGINEER* upon *CONTRACTORS* request. Identify schedule with:
 - a. Title of project and location.
 - b. *ENGINEER* and project number.
 - c. Name and address of *CONTRACTOR*.
 - d. Contract designation.
 - e. Item designation as listed in the *PROPOSAL*.

- f. Date of submission.
- D. Schedule shall list the installed value of each of the items listed in the Proposal for all of the work in sufficient detail to serve as a basis for computing values for progress payments during construction.
- E. In the case of Lump Sum items, each item shall be divided into its component parts and be shown on a subschedule.
- F. Follow the 48 Division Construction Specification Institute (CSI) format for listing component items of each payment item listed in the *PROPOSAL*.
- G. The sum of all values listed in the schedule shall equal the total Contract Price.

PART 2 - PAYMENT

2.01 GENERAL

- A. The *CONTRACTOR* shall receive and accept the compensation provided for in the Contract as full payment for furnishing all labor, materials, tools, equipment and incidentals necessary to the completed work, and for performing all work contemplated and embraced under the Contract in a complete and acceptable manner; also, except where specifically provided elsewhere in the *Contract Documents*, for all risk, loss, damage, or expense of whatever character arising out of the nature of the work or the prosecution thereof, or for the action of the elements, or for any unforeseen difficulties which may be encountered during the prosecution of the work until acceptance by the *OWNER*: also, except where specifically provided elsewhere in the *Contract Documents*, for all expenses incurred in consequence of the suspension or discontinuance of the work as provided in the Contract.
- B. If the payment clause relates to any unit price in the *PROPOSAL* and requires that the said unit price cover and be considered compensation for certain work or material essential to the item, this same work or material will not also be measured or paid for under any other Pay Item which may appear elsewhere in the *Contract Documents*.
- C. The *CONTRACTOR* shall receive payments in accordance with the completion of work as identified by the *Construction Schedules, Section 01 32 16*.

2.02 MOBILIZATION

- A. Mobilization shall consist of the cost of initiating the Contract and include such portions of the following as are required at the beginning of the Project: setting up the *CONTRACTOR'S* general plant, offices, shops, storage areas, sanitary and other temporary utilities, including but not limited to water, sewer, gas and electric including connections and appropriate metering from local utility and other facilities as required by the *Specifications*, by local or State law or by regulation; providing access to the Project site; obtaining necessary permits, grants and licenses, and payment of fees; protecting existing utilities; lighting work areas; providing shop drawings; sampling and testing of materials; but not including providing the required insurance and bonds. Payment for mobilization will be made at the lump sum price bid for this item in the *PROPOSAL*, which price shall include the cost of initiating the Contract.

- B. The provisions for payment for the item mobilization supersede any provisions elsewhere in the *Specifications* for including the cost of these initial services and facilities in the prices bid for the various items scheduled in the *PROPOSAL*. The lump sum price bid for mobilization shall be payable to the *CONTRACTOR* whenever he shall have completed 10 percent of the work of the Contract. For the purposes of this item, 10 percent of the work shall be considered completed when the total of payments earned, exclusive of the amount bid for this item, shown on the monthly certificates of the approximate quantities of work done, shall exceed 10 percent of the total price bid for the Contract.

- C. The lump sum price bid for mobilization is limited to the following maximum amounts:

Contract From More Than =====	Amount To and Including =====	Maximum Amount for Item of Mobilization =====
0	\$ 100,000	\$ 3,000
100,000	500,000	15,000
500,000	1,000,000	30,000
1,000,000	2,000,000	60,000
2,000,000	3,000,000	90,000
3,000,000	4,000,000	120,000
4,000,000	5,000,000	125,000
5,000,000	6,000,000	150,000
6,000,000	7,000,000	175,000
7,000,000	10,000,000	200,000
10,000,000	2.5% of amount bid	

- D. Payment for mobilization as hereinbefore specified will be made for the lump sum price bid therefore, regardless of the fact that the *CONTRACTOR* may have, for any reason, shut down his work on the project or moved equipment away from the project and back again.
- E. In the event the amount bid for the item “Mobilization” exceeds the limits specified above, the portion exceeding the limits specified above will be paid after all the work has been completed and accepted.

2.03 LIQUIDATED DAMAGES

- A. The *OWNER* will suffer significant financial loss if the project, or each stage thereof, is not substantially complete on the date(s) set forth in the *Contract Documents*. The *CONTRACTOR* and his surety shall be liable for and shall pay to the *OWNER* the sum stipulated, as fixed and agreed, as liquidated damages for each calendar day of delay until the project, or each stage thereof, is substantially complete.
- B. Liquidated damages in the amounts specified in the *PROPOSAL* will be assessed as required by the General Provisions and the Contract and collected through Current Estimate/Voucher deduct items implemented at completion of the various stages of construction specified.

****END OF SECTION****

SECTION 01 25 13
(01640)
SUBSTITUTIONS

1.01 GENERAL

- A. Work included:
 - 1. Procedures for requesting use of products, materials or methods in place of those specified.
- B. Related requirements:
 - 1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
 - 2. *Section 01 33 23: Shop Drawings, Product Data and Samples*

1.02 SUBSTITUTIONS

- A. After Notice to Proceed, *ENGINEER* will consider formal request from *CONTRACTOR* for products, materials or methods in place of those specified.
- B. Submit six (6) copies of Request for Substitution together with Submittal Transmittal Form contained in *Section 01 33 23*. Include in request as applicable:
 - 1. Complete data substantiating compliance of proposed substitution with *Contract Documents*.
 - 2. For products:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer literature:
 - (1) Product description.
 - (2) Performance and test data.
 - (3) Reference standards.
 - c. Samples.

- d. Name and address of similar projects on which product was used, and date of installation.
 3. For construction methods:
 - a. Detailed description of proposed method.
 - b. Drawings illustrating methods.
 4. Itemized comparison of proposed substitution with product or method specified.
 5. Names of facilities at which the substitute material or product has been successfully used in a similar situation.
 6. Relation to separate contracts.
- C. In making requests for substitution, *CONTRACTOR* represents:
 1. He has personally investigated proposed product or method, and determined that it is equal or superior in all respects to that specified.
 2. He will provide the same guarantee for substitution as for product or method specified.
 3. He will coordinate installation of accepted substitution into work making such changes as may be required for work to be completed in all respects.
 4. In the event the *CONTRACTOR* chooses to furnish and install a system or item of equipment of different arrangement from that shown or specified, and receives approval to do so, he shall furnish and install any additional wiring, conduit or other materials required by the system at no additional cost to the *OWNER*.
 5. He waives all claims for additional costs related to substitutions which consequently become apparent.
 6. Cost data is complete and includes all related costs under this contract.
 7. Redesign due to *CONTRACTOR'S* substitution shall be accomplished by a registered professional engineer in the State of New Jersey and will be subject to review and approval by the *ENGINEER* before implementation. Whether or not the *ENGINEER* accepts a proposed substitute, *CONTRACTOR* shall be responsible for all costs incurred for any redesign required as a result of any requested substitution. *ENGINEER* shall record

time required for review of *CONTRACTOR'S* submitted redesign and *OWNER* will deduct from *CONTRACTOR'S* payments all costs of the *OWNER's ENGINEER* in performing said review. *ENGINEER* shall bill the *OWNER* at the billing rates current at the time of review.

- D. Substitutions will not be considered if:
1. They are indicated or implied on shop drawings of product data submittals without formal request submitted in accordance with Paragraph 1.02.
 2. Acceptance will require substantial revision of *Contract Documents*.
 3. *OWNER* or *ENGINEER* determines that the substitutions will cause operational issues.
- E. If accepted, the *ENGINEER* will approve the substitution in writing.

****END OF SECTION****

SECTION 01 31 13
(01040)
PROJECT COORDINATION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. Administrative and supervisory requirements necessary for coordination of the Project.

B. Related work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 01 31 19: Project Meetings*
3. *Section 01 32 16: Construction Schedules*
4. *Section 01 33 23: Shop Drawings, Product Data and Samples*

C. Payment:

1. Unless otherwise noted in the Proposal Section, no separate payment shall be made for this item.
2. Include all costs for *PROJECT COORDINATION* in the prices bid for the various related items of work as designated in the Proposal.

1.02 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Submit Coordination drawings.

1.03 GENERAL COMMUNICATION

- A. The *ENGINEER* shall act as the Owner's Representative for this project.
- B. In case of an EMERGENCY, dial 9-1-1

1.04 CORRESPONDENCE

- A. Address all correspondence to *ENGINEER*.
- B. All correspondence to and from Contractor will be routed through the Owner's Representative.
- C. Format: Number correspondence sequentially beginning with Serial Number #1. Include project title and Contract number.

1.05 REQUEST FOR INFORMATION (RFI)

- A. When field conditions or Contract Document contents require clarification by the *ENGINEER*, a written RFI is to be submitted.
- B. Each RFI shall identify the nature and location of each clarification or verification; provide as a minimum the following information:
 - 1. Project name and number;
 - 2. Date;
 - 3. Date response required by;
 - 4. RFI number;
 - 5. Subject;
 - 6. Initiator of the question;
 - 7. Indication of costs, if known or anticipated;
 - 8. Indication of schedule impact;
 - 9. Location on site;
 - 10. Contract drawing reference;
 - 11. Contract specification section and paragraph reference;
 - 12. Descriptive text;
 - 13. Recommended solution(s); and
 - 14. Space for reply on same page as questions.
- C. Route RFI's in same manner as correspondence
- D. The Contractor shall be responsible for development and weekly maintenance of an RFI log.

1.06 COORDINATION

- A. Contractor shall coordinate its construction activities with those of its subcontractors and other entities involved to assure efficient and orderly installation of each part of the Work. The Contractor shall coordinate requirements included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.
1. Where installation of one part of the work is dependent on installation of other components, either before or after its own installation, Contractor shall schedule construction activities in the sequence required to obtain the best results.
 2. Where sleeves, cutouts, chases, and similar provisions are required for the Work of a particular trade, the Contractor shall coordinate the furnishing and placing of sleeves and other such required components.
 3. Where availability of space is limited, Contractor shall coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
 4. Contractor shall make adequate provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include items such as required notices, reports, and attendance at meetings.
- C. Construction Schedules:
1. Provide schedule in accordance with *Section 01 32 16*.
 2. Monitor schedules as work progresses.
 - a. Identify potential variances between scheduled and probable completion dates for each phase.
 - b. Recommend to Contractors adjustment in schedule to meet required completion dates.
 - c. Adjust schedules of contractors or subcontractors as required.
 - d. Document changes in schedule and submit to other involved contractors.

3. Monitor compliance with schedule.
 - a. Verify that labor and equipment are adequate for the work and the schedule.
 - b. Verify that product procurement schedules are adequate and transmitted to the *OWNER*.
 - c. Verify that product deliveries are adequate to maintain schedule.
 - d. Report noncompliance to *OWNER*. Present program to reestablish compliance with schedules.

- B. Process Shop Drawings, Product Data and Samples:
 1. Comply with requirements of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
 2. Prior to submittal to *ENGINEER* review for compliance with contract documents.
 - a. Field dimensions and clearance dimensions.
 - b. Relation to available space.
 - c. Relation to other contracts and to other trades.
 - d. Effect of any changes on the work of any other contracts or other trades.

- C. Provide coordination drawings as required to resolve conflicts and to assure coordination of the work of, or affected by, mechanical and electrical trades, or by special equipment requirements.
 1. Layout Drawings:
 - a. Layout drawings shall be provided for all mechanical rooms, pipe galleries, process rooms, reflected ceilings, kitchens, chemical feed rooms and other spaces where conflicts may occur.
 - b. Contractor shall prepare composite layout drawings of all equipment, process piping, duct work, fire sprinkler piping, and plumbing piping at a scale of not less than 1/4" per foot. The building may be divided into area segments for development of the layout drawings. The building systems will be constructed in the

sequence of area layout drawing submissions. An overall drawing showing all the various layout area segments and showing the dates when each segment will be completed by the Contractor or his Subcontractor shall be prepared and submitted to the *ENGINEER* before any work is started that is the subject of the layout drawings.

- c. These drawings shall show equipment, valves, fittings, couplings, registers, grilles, diffusers and similar features, as well as locations of all valve dampers, operators, instrumentation, electrical connections and other items for service, operation and maintenance. The drawings shall also show structural beams, girders, columns, ceiling heights, walls, floor-to-floor Architectural and Structural features as shown on the Contract Drawings. Particular attention shall be given to the locations, size clearance dimensions of equipment items, shafts and similar features. Elevations and Sections shall be developed as needed to define the space needed for the various systems to fit around, near and between each other; to determine the construction installation sequence for each system and to show any conflicts.
- d. Any conflicts identified shall be immediately brought to the attention of the *ENGINEER*.
- e. CAD Requirements:
 - (1) Contractor shall prepare coordinated drawings using a CAD system that is compatible with or can be translated to AutoCAD, 2015 or later, which is the *ENGINEER*'s standard. Background drawings (CAD) will be made available by, the *ENGINEER* subject to the Contractor executing whatever Release/Waiver the *ENGINEER* may require. The Contractor will be responsible for including all disciplines on a final set of coordinated drawings (CAD) representing As-Built conditions for turnover to the *ENGINEER*.
 - (2) The Contractor shall comply with the *ENGINEER*'s Standards and all layering requirements contained therein. Contractor shall obtain copies of and comply with the CADD Standards.

f. Coordination Meetings:

- (1) Contractor shall schedule coordination meetings at the jobsite attended by a representative from each of the subcontractors involved in the coordination process. At these meetings, the subcontractors shall indicate where conflicts exist and resolve the problems through mutual agreement. Should an impasse occur, the *ENGINEER* shall decide the resolution. When all conflicts are resolved, the subcontractors shall indicate their agreement by signing the coordination drawings. Each subcontractor shall be issued copies of the finished drawings from which they can make final refinements on their shop drawings before submission to the *ENGINEER* for approval.
- (2) By signing off the composite drawings, each of the subcontractors shall be indicating their awareness of and agreement with the indicated routings and layouts and their interrelationship with the adjoining or contiguous work of all other subcontractors.
- (3) Thereafter, no unauthorized deviations shall be permitted, and if made without knowledge or agreement of the *ENGINEER*, this unauthorized work shall be subject to removal and correction at no additional cost to the Owner.

2. Composite Drawings:

- a. In preparing the composite drawings, minor changes in duct, pipe or conduit routings that do not affect the intended function may be made as required to avoid space conflicts, when mutually agreed, but items may not be resized nor exposed items relocated without the *ENGINEER's* written acceptance. No changes shall be made in wall or chase locations, ceiling heights, door swings or locations, window or other openings, or other features affecting the function or esthetic effect of the building. If conflicts or interferences cannot be satisfactorily resolved the *ENGINEER* shall be notified and his decision obtained.
- b. After the final composite drawings have been agreed upon and signed by the Contractor and all subcontractors, the Contractor shall provide and distribute four (4) prints to each subcontractor, the *ENGINEER* and to the *OWNER* for reference and record purposes. All subcontractors desiring additional prints of such

drawings, beyond the basic distribution indicated above, shall arrange for and pay the cost of same.

- c. The record copies of final composite drawings shall be retained by, the *ENGINEER* and each subcontractor as working reference. All shop drawings, prior to their submittal to the *ENGINEER*, shall be compared with the composite drawings and developed accordingly by the subcontractor responsible. Any revision to the composite drawings that becomes necessary during the progress of the work shall be noted by all subcontractors and shall be neatly and accurately recorded on the record copies. Each subcontractor shall be responsible for up-to-date maintenance of his record copies of the composite drawings and keep one (1) copy available at the site. The composite drawings and any subsequent changes thereto shall be utilized by, the Contractor and each subcontractor, in the development of his “as-built” drawings.
- d. The drawings need not be submitted as a whole but shall be sequenced as required by the Contractor in ample time to avoid construction delay. The coordination drawings may lack complete data in certain instances pending receipt of shop drawings, but sufficient space shall be allotted for the items affected. When final information is received, such data shall be promptly inserted on the composite.
- e. No additional payment will be made for relocating any duct, pipe, conduit, or other material that has been installed without proper coordination between all subcontractors or trades involved. Any improperly coordinated work or work installed that is not in accordance with the approved composite coordination drawings shall be corrected at no additional cost to the *OWNER*.
- f. All changes in the scope of work due to revisions formally issued and approved shall be shown on the composite drawings.
- g. All work on the coordination composite drawings shall be performed by competent draftsmen and shall be clear and fully legible. The *ENGINEER* shall be the sole judge of the acceptability of the drawings.

D. Safety:

- 1. Enforce compliance with all current OSHA, State and local regulations.

- E. Inspection and testing:
1. Inspect Work to assure performance in accord with requirements of Contract Documents.
 2. Administer special testing and inspections of suspect Work. Submit results and summary to *OWNER*.
 3. Reject Work that does not comply with requirements of Contract Documents.
 4. Coordinate Testing Laboratory Services:
 - a. The Contractor shall at all times make his work safely accessible for inspection and testing as specified in the Contract Documents.
 5. Report noncompliance with Contract Documents to the *ENGINEER* and *OWNER*. Submit data and summarize.
- F. Monitor the use of temporary utilities:
1. Verify that adequate services are provided and maintained in a safe manner.
 2. Provide alternate service with backup capabilities when critical work is involved.
- G. Arrange for delivery of products furnished by *OWNER* and others:
1. Inspect for condition at delivery.
 2. Submit in advance, complete schedule requirements for items furnished by others. Update on monthly basis showing material received to date and requirements for balance.

PART 2 - PRODUCTS - Not Used

PART 3 – EXECUTION – Not Used

*****END OF SECTION*****

SECTION 01 31 19
(01200)
PROJECT MEETINGS

1.01 DESCRIPTION

- A. *CONTRACTOR* shall attend pre-construction meeting, periodic progress meetings, and special meetings called throughout the progress of the work.
- B. Representatives of *CONTRACTORS*, subcontractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. *ENGINEER* may attend meetings to ascertain that work is expedited consistent with *Contract Documents* and the construction schedules.

1.02 PRECONSTRUCTION MEETING

- A. Will be scheduled by the *ENGINEER* within fifteen (15) days after date of Notice to Proceed.
- B. Location: A central site, convenient for all parties.
- C. Attendance:
 - 1. Owner's Representative
 - 2. Representative of local Police Department
 - 3. *ENGINEER* and his professional consultants
 - 4. Resident Project Representative
 - 5. Contractor's Superintendent
 - 6. Major Subcontractors
 - 7. Major Suppliers
 - 8. Others as appropriate.

- D. Suggested agenda:
1. Distribution and discussion of:
 - a. List of major subcontractors and suppliers.
 - b. Projected construction schedules.
 2. Critical work sequencing.
 3. Major equipment deliveries and priorities.
 4. Project coordination: Designation of responsible personnel.
 5. Procedures and processing of:
 - a. Field decisions
 - b. Proposal requests
 - c. Submittals
 - d. Change orders
 - e. Applications for payment, including vouchers and current cost estimates.
 6. Adequacy of distribution of *Contract Documents*.
 7. Procedures for maintaining Record Documents.
 8. Use of premises:
 - a. Office, work and storage areas
 - b. *OWNER'S* requirements.
 9. Construction facilities, controls and construction aids.
 10. Maintenance and Protection of Traffic.
 11. Temporary utilities.
 12. Safety and first-aid procedures.

13. Security procedures.
14. Housekeeping procedures.

1.03 PROGRESS MEETINGS

- A. Will be scheduled on a regular periodic basis, as required, by the *ENGINEER*.
- B. Additional meetings will be held as required by progress of the work.
- C. Location of the meetings: The project field office of the *CONTRACTOR*.
- D. Attendance:
 1. *ENGINEER*, and his professional consultants as needed.
 2. Representative of local Police Department
 3. Contractor's Superintendent.
 4. Subcontractors as appropriate to the agenda.
 5. Suppliers as appropriate to the agenda.
 6. Others.
- E. Suggested agenda:
 1. Review, approval of minutes of previous meetings.
 2. Review of work progress since previous meeting.
 3. Field observations, problems, conflicts, and recommendations.
 4. Problems that impede Construction Schedule.
 5. Review of off-site fabrication, delivery schedules.
 6. Corrective measures and procedures to regain projected schedule.
 7. Revisions to Construction Schedule.
 8. Plan progress, schedule, during succeeding work period.

9. Coordination of schedules.
10. Review submittal schedules, expedite as required.
11. Maintenance of quality standards.
12. Review proposed changes for:
 - a. Effect on Construction Schedule and on completion date.
 - b. Effect on other contracts of the Project.
13. Maintenance and Protection of Traffic.
14. Other business.

****END OF SECTION****

SECTION 01 32 16
(01310)
CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Promptly after award of the contract, the *CONTRACTOR* shall prepare and submit to the *ENGINEER* estimated construction progress schedules for the work, with subschedules of related activities, which are essential to its progress.
2. Submit revised progress schedules monthly.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 01 11 00: Statement of Work*
3. *Section 01 33 23: Shop Drawings, Product Data and Samples*

1.02 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.

1.03 FORM OF SCHEDULES

A. Prepare schedules in the form of a horizontal bar chart.

1. Provide separate horizontal bar for each trade or operation.
2. Horizontal time scale: Identify the first workday of each week.
3. Scale and spacing: To allow space for notation and future revisions.

4. Minimum sheet size: 18-inch by 24-inch.
- B. Format of listings: The chronological order of the start of each item of work.
- C. Identification of listings: By major specification section numbers.

1.04 CONTENT OF SCHEDULES

- A. Construction progress schedule:
 1. Show the complete sequence of construction by activity.
 2. Show the dates for the beginning, and completion of each element of construction.
 3. Show projected percentage of completion for each item, as of the first day of each month.
- B. Provide subschedules to define critical portions of prime schedules.

1.05 PROGRESS REVISIONS

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedule:
 1. Major changes in scope.
 2. Activities modified since previous submission.
 3. Revised projections of progress and completion.
 4. Other identifiable changes.
- C. Provide a narrative report as needed to define:
 1. Problem areas, anticipated delays, and the impact on the schedule.
 2. Corrective action recommended, and its effect.
 3. The effect of changes on schedules of other prime contractors.

1.06 SUBMISSIONS

- A. Submit initial schedules within five (5) days after Notice to Proceed.
 - 1. *ENGINEER* will review schedules and return review copy within ten (10) days after receipt.
 - 2. If required, resubmit within seven (7) days after return of review copy.
- B. Submit revised progress schedules with each application for payment.
- C. Submit one (1) reproducible transparency and one (1) opaque reproduction.

1.07 DISTRIBUTION

- A. Distribute copies of the reviewed schedules to:
 - 1. Job site file.
 - 2. Subcontractors.
 - 3. Other concerned parties.
- B. Instruct recipients to report promptly to the *CONTRACTOR*, in writing, any problems anticipated by the projection shown in the schedules.

PART 4 - PAYMENT

4.01 CONSTRUCTION SCHEDULES

- A. Unless otherwise noted in the *PROPOSAL* Section, no separate payment shall be made for this item.
- B. Include all costs for the *CONSTRUCTION SCHEDULES* in the prices bid for the various related items of work as designated in the *PROPOSAL*.

****END OF SECTION****

SECTION 01 32 33
(01380)
CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 SUMMARY

A. Work included:

1. Provide Preconstruction Photographs prior to beginning of construction activities including site and access clearing.
2. Provide post Construction Photographs.

B. Related Work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 01 32 16: Construction Schedules*
3. *Section 01 33 23: Shop Drawings, Product Data and Samples*

1.02 SUBMITTALS

A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.

B. Samples:

1. Submit three (3) representative samples of photographs to be provided, two of which will be retained by the *ENGINEER*.
2. Except as otherwise directed and paid for submit three (3) prints of each photograph taken.

C. 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 label information as corresponding set of photographs.

- D. Obtain and transfer copyright usage rights from photographer to OWNER for unlimited reproduction of photographic documentation.
- E. Submit name and address of photographer.

1.03 QUALITY ASSURANCE

- A. Secure the services of a professional photographer who is skilled and experienced in construction photography and whose work samples are acceptable to the *ENGINEER*.
- B. Do not replace the photographer without the *ENGINEER'S* written approval.
- C. Acceptable Photographers:
 - 1. JMS Visual Communications
Vincentown, NJ 08088
609-859-8400
<http://jmsco.com>
 - 2. Protec Documentation Services
Rancocas, NJ 08073
609-267-2666
<http://www.protecservices.com>
 - 3. GP Visual
Browns Mills, NJ 08015
856-439-1494
 - 4. Rainbow Photographic Documentation Co.
Coopersburg, PA 18036
215-538-0707
800-538-0909
www.progressphotos.com
 - 5. Or equivalent

PART 2 - PRODUCTS

2.01 PHOTOGRAPHS

- A. All photographs shall be color digital photographs stored on CD-ROM, DVD or approved other media. 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 1600 by 1200 pixels and 400 dpi.

B. Identification:

1. Provide the date the photograph was taken on the face of each photograph in the lower right corner, printed integrally with the photograph during processing.
2. Identify each print with an applied label or stamp on the back with the following:
 - a. Name of Project.
 - b. Orientation of view (Approximate station and direction or provide photo location map).
 - c. Name and address of photographer.
 - d. Name of *ENGINEER*.
 - e. Name of Contractor.
 - f. Date and time of exposure.
 - g. Photographer's numbered identification of exposure.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Prior to the work of this section verify that the work of other trades is complete to the point where this work may properly commence.

3.02 PHOTOGRAPHY

- A. Photography required:
1. Consult with *ENGINEER* prior to photography for instructions concerning views required.
 2. Provide Preconstruction Photos of environmentally critical areas including construction areas within tidal regions. NJAC 7:22-10.11(q)

3. Provide Preconstruction Photos of site.
4. Provide post construction photographs of all work and site and environmentally critical areas at final acceptance of project and prior to final payment.

B. Views:

1. Continuous coverage of existing conditions.
2. Photographs shall particularly address driveways; mailboxes; trees, shrubs, landscaping; existing pavement conditions; existing structures to include curbs, sidewalks, inlets, manholes, utility poles, signs and environmentally critical areas.
3. Photographs shall be labeled by station so that subsequent photographs can be taken from the same control points. [NJAC 7:22-10.11(q)]

C. Technique:

1. Factual presentation.
2. Correct exposure and focus:
 - a. High resolution and sharpness.
 - b. Maximum depth of field.
 - c. Minimum distortion.

D. Negatives:

1. Remain property of photographer.
2. Photographer shall maintain negatives for a period of two (2) years from acceptance of project by *OWNER*.
3. Photographer shall agree to furnish additional prints to *ENGINEER* at commercial rates applicable at time of purchase.

3.03 DELIVERY

- A. Deliver photographs to *ENGINEER* within fourteen (14) calendar days after they are taken.

- B. Digital images shall be provided on CD-ROM labeled to show date, project, contract number and location.

PART 4 - PAYMENT

4.01 CONSTRUCTION PHOTOGRAPHS

- A. Include all costs for construction photographs in the overall contract price.
- B. Parties requiring additional prints will pay photographer directly.

****END OF SECTION****

SECTION 01 33 23
(01340)
SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.01 SUMMARY

A. Work included:

1. Prepare and submit to the *ENGINEER* a Schedule of Submittals showing all submittals required by the Specification sections or the Drawings.
2. Prepare and submit to *ENGINEER* shop drawings, product data and samples required by the Specification sections.
3. Prepare and submit to the *ENGINEER* engineering drawings and calculations for items indicated on the Plans or as otherwise required by the contract specifications.

B. Related Requirements:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 01 25 13: Substitutions*

C. Payment:

1. Unless otherwise noted in the *PROPOSAL* Section, no separate payment shall be made for this item.
2. Include all costs for the *SHOP DRAWINGS, PRODUCT DATA AND SAMPLES* in the prices bid for the various related items of work as designated in the *PROPOSAL*.
3. Shop drawings, product data and samples, engineering drawings and calculations are an integral part of the construction process and are required as part of the construction contract. *CONTRACTOR'S* failure to provide shop drawings, product data and samples, engineering drawings and calculations in a complete and timely manner may affect his payment

and/or completion schedule. No extension of time will be granted due to untimely or incomplete submittals.

1.02 DEFINITIONS

- A. Shop drawings are original drawings, diagrams, schedules and other data specifically prepared for the work by the *CONTRACTOR* or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the work.
- B. Product data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information prepared by the manufacturer and furnished by the *CONTRACTOR* to illustrate materials or equipment for some portion of the work. All such data shall be the manufacturers current materials.
- C. Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the work will be judged.
- D. Engineering drawings and calculations are documents prepared for the work by a properly licensed design professional to assure and demonstrate compliance with specified design and performance criteria.

1.03 SCHEDULING

- A. Schedule submission for shop drawings, product data and samples, engineering drawings and calculations at least twenty-one (21) days before dates reviewed submittals will be needed.
- B. Shop drawings, engineering drawings and calculations for equipment foundations will not be reviewed by the *ENGINEER* until shop drawings for equipment have been submitted and approved.

1.04 PRESENTATION

- A. Present drawings, calculations and product data in a clear and thorough manner.
- B. Drawings, calculations and product data shall be clear, concise, readable and legible.

- C. Second, third, fourth, etc., generation photocopies are frequently illegible and may not be accepted as a required submission.
- D. Drawings, calculations and product data sent via facsimile (fax) machine are frequently illegible and may not be accepted as a required submission.
- E. *ENGINEER* will notify *CONTRACTOR* in the event submittals are illegible. No time extensions shall be allowed as a result of resubmittals due to illegibility.

1.05 SUBMITTALS

A. Schedule of Submittals:

1. Prepare and submit for approval a schedule showing each and every submittal required by the Contract Documents and their initial submittal dates required for coordination of the work.
2. Organize the schedule by the applicable specification Section number.
3. Submit the schedule within fourteen (14) days after Notice to Proceed.
4. The schedule shall reflect the overall job schedule sequence so as to cause no delay in the Work of other Contractors, if any.
4. Revise and resubmit the schedule for approval when requested.
5. Prepare and transmit each submittal sufficiently in advance of scheduled performance to allow for adequate review and processing time, including time for re-submittal if necessary.
6. If processing time for a particular submittal will be critical to progress of the work, so advise on the submittal.
7. No extension of time will be authorized because of the contractor's failure to transmit submittals sufficiently in advance of the work.

B. Shop drawings:

1. Original drawings, prepared by *CONTRACTOR*, subcontractor, supplier or distributor, that illustrate some portion of the work; showing fabrication, layout, setting or erection details.

2. Present drawings in a clear and thorough manner: Details shall be identified by reference to sheet and detail, schedule or room numbers shown on *Contract Drawings*.

3. Minimum sheet size: 11 inches by 17 inches.

C. Product data:

1. Preparation:

- a. Clearly mark each copy to identify pertinent products or models.
- b. Show performance characteristics and capacities.
- c. Show dimensions and clearances required.
- d. Show wiring or piping diagrams and controls.

2. Manufacturer's standard schematic drawings and diagrams:

- a. Modify drawings and diagrams to delete information not applicable to the work.
- b. Supplement standard information to provide information specifically applicable to the work.

3. Manufacturer's catalog sheets, brochures, diagrams, illustrations and other standard descriptive data:

- a. Clearly mark each copy to identify pertinent materials, products or models.
- b. Show dimensions and clearances required.
- c. Show compliance with referenced standards.

D. Color selections:

- 1. All colors for all finished surfaces and materials will be selected or approved by the *OWNER*. The exterior color selections will be made at one time and the interior color selections will be made at one time to provide a complete and coordinated color schedule that, upon acceptance of the *OWNER*, will be provided to the *CONTRACTOR*.

2. The Contractor shall submit all exterior color selections/samples within thirty (30) days and all interior color selections/samples within forty-five (45) days after “Notice to Proceed.”
3. It is imperative that all color information be submitted to, the *ENGINEER* by the *CONTRACTOR* before color selections can be made. If any color selection information is not available when colors are needed to meet the project schedule, the *ENGINEER* will select colors from one of the named manufacturers in the specifications, and the *CONTRACTOR* will be required to exactly match that color. A claim for delay will not be accepted if the color schedule is late due to the failure of the *CONTRACTOR* to provide the *ENGINEER* with all required color information, nor will an adjustment in price be entertained if the selected color is not available from the manufacturer the *CONTRACTOR* intended to use, but neglected to submit.

E. Samples:

1. Office samples will be of sufficient size and quantity to clearly illustrate:
 - a. Functional characteristics of product or material with integrally related parts and attachment devices.
 - b. Full range of color, texture, and pattern.
 - c. After review samples will be retained by *ENGINEER*. Upon completion of the work, *CONTRACTOR* may submit written request for return of samples.

F. Engineering drawings:

1. Engineering drawings shall provide sufficient data regarding member sizes, arrangement, connection and joint details and material properties that fully substantiates the assembly or item involved can safely withstand the specified design loads and/or meet the performance criteria.
2. Engineering drawings shall be done in conformance with the appropriate material code as referenced in the currently adopted International Building Code – New Jersey Edition or, when applicable, the specified industry standard.
3. All engineering drawings shall be done to scale, shall state the design loads and/or performance criteria and shall be signed and sealed by a Professional Engineer licensed in the State of New Jersey.

G. Engineering calculations:

1. Engineering calculations shall, in an orderly and thorough manner, provide sufficient analytical data that fully substantiates that the assembly or items addressed can safely withstand the specified design loads and/or meet the performance criteria.
2. Unless otherwise specified or indicated on the plans, all engineering design shall be done in accordance with the currently adopted Codes and Subcodes adopted and referenced in the Uniform Construction Code of the State of New Jersey; N.J.A.C. 5:23-1 et seq.
3. All engineering calculations shall state the design loads and/or performance criteria and shall be signed and sealed by a Professional Engineer licensed in the State of New Jersey.

1.06 CONTRACTOR'S RESPONSIBILITIES

- A. Review shop drawings, product data, samples, engineering drawings and calculations prior to submission.
- B. Determine and verify:
 1. Field measurements.
 2. Field construction criteria.
 3. Catalog numbers and similar data.
 4. Conformance with specifications.
- C. Coordinate each submittal with requirements of the work and of the *Contract Documents*.
- D. **All copies of all** shop drawings, product data and samples, engineering drawings and calculations shall be accompanied by a transmittal containing Contractor Certification that he has determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and that he has checked and coordinated each item with other related submittals and all other contract requirements. **A copy of the required Submittal Form is included at the end of this specification section.**

- E. *CONTRACTOR'S* responsibility for errors and omissions in submittals is not relieved by *ENGINEER'S* review of submittals.
- F. *CONTRACTOR'S* responsibility for deviations in submittals from requirements of *Contract Documents* is not relieved by *ENGINEER'S* review of submittals, unless *ENGINEER* gives written acceptance of specific deviations.
- G. Notify *ENGINEER*, in writing at time of submission, of deviations in submittals from requirements of *Contract Documents*.
- H. Begin no fabrication or work that requires submittals until return of submittals with *ENGINEER'S* stamp and initials or signature indicating review and that no further submissions are required. Any manufacturing done, shipment made, workmanship performed, or work installed before the required shop drawings, product data, samples, engineering drawings, or engineering calculations are returned indicating that no further submissions are required will be at the sole expense and responsibility of the *CONTRACTOR* and subject to rejection.

1.07 ENGINEERS RESPONSIBILITIES

- A. Engineering duties:
 - 1. Review submittals with reasonable promptness.
 - 2. Review for:
 - a. Design concept of project.
 - b. Information given in *Contract Documents*.
 - 3. Review of separate item does not constitute review of an assembly in which item functions.
 - 4. Affix stamp and initials or signature certifying to review of submittal.
 - 5. Return submittals to *CONTRACTOR* for distribution or resubmission.
- B. The *ENGINEER* shall review all shop drawings, product data, samples, engineering drawings and calculations. The submittal shall be marked as follows:
 - 1. No exceptions taken; no further submission required.
 - 2. Note markings; no further submission required.

3. Note markings; further submission required.
 4. Rejected.
- C. The *ENGINEER* will review the original submittal and one resubmittal at no additional cost to the *CONTRACTOR*.
- D. In the event there are more than two (2) submittals for the given product, the *ENGINEER* shall record the time required for the subsequent reviews. The *ENGINEER* shall deduct the cost of said review(s) from the current estimate, defining amounts due the *CONTRACTOR*. The costs shall be based upon the same rates paid to the *ENGINEER* by the *OWNER* for similar work.
- E. In the event that any submittal is rejected and a new submittal is prepared that must be resubmitted for review by the *CONTRACTOR*, the resubmittal shall be counted as the third submittal for the purposes of determining review costs(s).
- F. When professional certification of performance or design criteria of materials, systems or equipment is required by the Contract Documents, the *ENGINEER* shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

1.08 SUBMISSION REQUIREMENTS

- A. Make submittals so as to cause no delay in the work or in the work of any other *CONTRACTOR*.
- B. Number of submittals required:
1. Shop drawings, engineering drawings and calculations: Submit six (6) opaque reproductions, two (2) copies of which will be retained by *ENGINEER*.
 2. Product data: Submit six (6) copies, two (2) copies of which will be retained by *ENGINEER*.
 3. Samples: Submit number stated in each specification section.
- C. Accompany submittals with Submittal Transmittal Form contained herein, in duplicate containing:
1. Date of submission and dates of any previous submissions.

2. Project title and contract number.
3. *CONTRACTOR'S* name.
4. The number of each shop drawing, product data and sample submitted.
5. Notification of deviations from *Contract Documents*.
6. Other pertinent data.

D. Submittals shall include:

1. Date and revision date.
2. Project title and number.
3. The names of:
 - a. *ENGINEER*
 - b. *CONTRACTOR*
 - c. Subcontractor
 - d. Supplier
 - e. Manufacturer
 - f. Separate details when pertinent.
4. Identification of product or materials.
5. Field dimensions, clearly identified as such.
6. Specification Section number.
7. Relation to adjacent or critical features of the work or materials.
8. Applicable standards, such as ASTM or Federal Specification numbers.
9. Identification of deviations from *Contract Documents*.
10. Identification of revisions on resubmittals.

11. An 8-inch by 3-inch blank space for *CONTRACTOR* and *ENGINEER* stamps.
12. *CONTRACTOR'S* stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of *Contract Documents*.
13. Engineering drawings and calculations must be signed and sealed by a Professional Engineer licensed in the State of New Jersey.

1.09 RESUBMISSION REQUIREMENTS

- A. Make any corrections or changes in the submittals required by the *ENGINEER* and resubmit until no further submissions are required.
- B. Shop drawings, engineering drawings, calculations and product data:
 1. Revise initial drawings, calculations or data, and resubmit as specified for the initial submittal.
 2. Clearly indicate any and all changes made to the submittal.
- C. Samples: Submit new samples as required for initial submittals.

1.10 DISTRIBUTION

- A. Distribute reproductions of shop drawings, engineering drawings, calculations and copies of Product data that carry the *ENGINEER* stamp to:
 1. Subcontractors.
 2. Supplier.
 3. Contractor's file.
- B. Distribute samples that carry the *ENGINEER* stamp as directed by *ENGINEER*.

*****END OF SECTION*****

SECTION 01 56 19
(01564)
NOISE CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Requirements for controlling noise levels resulting from construction activities.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 01 74 00: Cleaning and Restorations*

1.02 SYSTEM DESCRIPTION

- A. The *CONTRACTOR* shall control the noise generated by his construction operations.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 PROJECT CONDITIONS

- A. Noise caused by construction activities shall not exceed the levels permitted by applicable federal, state or local regulations.
- B. All construction equipment powered by an internal combustion engine shall be equipped with a properly maintained muffler.

- C. Air compressors shall be operated in accordance with the manufacturer's instructions for proper noise abatement.
- D. Air-powered equipment shall be fitted with pneumatic exhaust silencers.
- E. Stationary equipment powered by an internal combustion engine shall not be operated within 150 feet of noise sensitive sites without temporary noise barriers placed between the equipment and the noise sensitive sites. Noise sensitive sites shall include residential buildings, motels, hotels, schools, churches, hospitals, nursing homes, libraries and public recreation areas. Temporary noise barrier shall be constructed of plywood or tongue and groove boards with a noise absorbent treatment on the interior surface (facing the equipment).
- F. Unless otherwise permitted, powered construction equipment shall not be operated before 7:00 A.M. or after 6:00 P.M. within 150 feet of a noise sensitive site. [NJAC 7:22-10.11(n)]
- G. No driving, pulling, or other operations entailing the use of vibratory hammers or compactors shall be permitted other than between the hours of 8:00 A.M. and 5:00 P.M. [NJAC 7:22-10.11(n)]
- H. The number of machines in operation at a given time shall be limited to the minimum practicable. [NJAC 7:22-10.11(n)]

PART 4 - PAYMENT

4.01 NOISE CONTROL

- A. Unless otherwise noted in the *PROPOSAL* Section, no separate payment shall be made for this item.
- B. Include all costs for the *NOISE CONTROL* in the prices bid for the various related items of work as designated in the *PROPOSAL*.

****END OF SECTION****

SECTION 01 66 00
(01620)
STORAGE AND PROTECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.
- B. Related work:
 - 1. Additional procedures also may be prescribed in other Sections of these *Specifications*.

1.02 QUALITY ASSURANCE

- A. Include within the *CONTRACTOR'S* quality assurance program such procedures as are required to assure full protection of work and materials.

1.03 MANUFACTURERS' RECOMMENDATIONS

- A. Except as otherwise approved by the *ENGINEER*, determine and comply with manufacturer's recommendations on product handling, storage, and protection.

1.04 PACKAGING

- A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
 - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
 - 2. Promptly remove damaged materials and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the *OWNER*.
 - 3. Leave all plugs and caps in place on equipment and machinery.

- B. The *ENGINEER* may reject as non-complying such material and products that do not bear identification satisfactory to the *ENGINEER* as to manufacturer, grade, quality, and other pertinent information.

1.05 PROTECTION

- A. Protect finished surfaces, including jambs and soffits of openings used as passageways, through which equipment and materials are handled.
- B. Provide protection for finished floor surfaces in traffic areas prior to allowing equipment or materials to be removed over such surfaces.
- C. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the *OWNER*.
- D. During construction, properly cap all pipes and equipment nozzles so as to prevent the entrance of sand, dirt, etc.

1.06 REPAIRS AND REPLACEMENTS

- A. In event of damage, promptly make replacements and repairs to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- B. Additional time required to secure replacement and to make repairs will not be considered by the *ENGINEER* to justify an extension in the Contract Time of Completion.

*****END OF SECTION*****

SECTION 01 74 00
(01710)
CLEANING AND RESTORATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:

1. Maintain premises and public properties free from accumulations of waste, debris and rubbish caused by work operations.
2. At completion of work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials; clean all sight exposed surfaces; leave project clean and ready for occupancy.
3. At completion of work, restore or replace, any public or private property disturbed or damaged by *CONTRACTOR'S* work operations to a condition at least equal to that existing prior to beginning work, or as otherwise specified. Materials, equipment and methods, shall be approved by the *ENGINEER*.
4. In landscaped areas, environmental features shall be replaced or restored to pre-disturbance conditions or better. This includes sodding, replacement of trees, shrubs, fences, drives and other landscape features in-kind. [NJAC 7:22-10.11(e) 5]
5. Final restoration shall be undertaken as soon as an area is no longer needed for construction, stockpiling or access. Excavated material unsuitable for backfill as set forth in NJAC 7:14-2.13 and considered to be solid waste pursuant to NJAC 7:26-1.6 shall be removed from the construction site and disposed of at a sanitary landfill approved and licensed by NJDEP. Excess excavated material which is not considered to be solid waste pursuant to NJAC 7:26-1.6 shall be graded or removed in accordance with NJAC 7:22-10.11(l)3 and *Section 31 23 00, Excavating, Filling and Grading*. When access roads are no longer needed, road fill shall be removed and the access area shall be restored to pre-disturbance conditions. Care shall be taken to avoid damage to adjacent vegetation and to prevent the formation of depressions that would serve as mosquito pools. [NJAC 7:22-10.11(e) 1]

- B. Related work:
1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
 2. General requirements for cleaning and restorations: See the General Conditions.
 3. In addition to standards described in the Section, comply with requirements for cleaning and restorations as described in pertinent other Sections of these *Specifications*.
- C. References:
1. New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction, 2007, and all amendments thereto (Standard Specifications).

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by, the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 MATERIALS

- A. All materials shall comply with the Standard Specifications.
- B. Grass restorations:
1. Topsoil: Conforming to Subsection 917.01.
 2. Grass seed: Conforming to Subsection 917.05, Type A-3.
 3. Sod: Conforming to Subsection 917.09

- C. Pavement restorations:
1. Hot-Mix Asphalt Surface Course: Conforming to Subsection 902.02, Mix 9.5M64.
 2. Hot-Mix Asphalt Base Course: Conforming to Subsection 902.02, Mix 19M64.
- D. Restoration of Concrete structures:
1. Concrete for curbs and islands shall conform to Section 607 of the Standard Specifications and shall be "Class B" as shown in Table 903.03.06-1 (NJDOT 2007).
 2. Concrete for sidewalks, curb ramps, driveways and aprons shall conform to Section 606 of the Standard Specifications and shall be Class "B" as shown in Table 903.03.06-1 (NJDOT 2007).
 3. Concrete for swales and gutters shall conform to the requirements of Section 405, Concrete Surface Course, of the Standard Specifications and shall be Class "B" as shown in Table 903.03.06-1 (NJDOT 2007)
- E. Restoration of other concrete structures: All materials shall comply with the applicable sections of the Standard Specifications.
- F. All other materials: As approved by the *ENGINEER* or authorities having jurisdiction.

PART 3 - EXECUTION

3.01 REQUIREMENTS OF REGULATORY AGENCIES

- A. Dispose of all non-recyclable solid waste materials in permanently established licensed OSWA (Office of Solid Waste Administration, New Jersey Department of Environmental Protection) landfills, or in temporary landfill sites approved by OSWA.
- B. Dispose of all recyclable materials such as concrete, asphalt, wood waste, yard waste and similar materials at a recycling facility properly licensed to accept such waste materials.

- C. Waste materials include, but are not limited to, concrete, blacktop, trees, stumps, lumber and timbers, unacceptable backfill material including heavy clay soils, organic materials, silts and rock.

3.02 SAFETY REQUIREMENTS

- A. Hazards control:
 - 1. Store volatile wastes in covered metal containers, and remove from premises daily.
 - 2. Prevent accumulation of wastes, which create a hazardous condition.
 - 3. Provide adequate ventilation during use of volatile or noxious substances.
- B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws:
 - 1. Do not burn or bury rubbish and waste materials on project site.
 - 2. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm or sanitary drains.
 - 3. Do not dispose of wastes into streams or waterways.

3.03 CLEANING DURING CONSTRUCTION

- A. Execute periodic cleaning to keep the work, the site, and adjacent properties free from accumulations of waste materials, rubbish and windblown debris resulting from construction operations.
- B. Provide on-site containers for the collection of waste materials, debris and rubbish.
- C. Remove waste materials, debris and rubbish from site periodically and legally dispose at location provided by *CONTRACTOR*.

3.04 DUST CONTROL

- A. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.

- B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.
- C. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
- D. Handle waste or surplus materials in a controlled manner with as few handlings as possible; do not drop or throw material from heights.
- E. The *CONTRACTOR* shall employ construction methods and means that will keep flying dust to the minimum. He shall provide for the laying of water on the Project, and on roads, streets and other areas immediately adjacent to the Project limits, wherever traffic, or buildings that are occupied or in use, are affected by such dust caused by his hauling or other operations. The *CONTRACTOR* shall control dust using water. The cost of carrying out the foregoing provisions shall be included in the prices bid for the various items in the Contract.
- F. The *CONTRACTOR* shall provide for prompt removal from existing roadways of all dirt and other materials that have been spilled, washed, tracked or otherwise deposited thereon by his hauling and other operations whenever the accumulation is sufficient to cause the formation of mud, interfere with drainage, damage pavements or create a traffic hazard.
- G. In order to control dust, as often as required during each working day, and particularly prior to the conclusion of each working day, areas under immediate construction (including access roads and other areas affected thereby) shall be swept and wet down with water sufficiently to lay dust. In addition, these areas shall be wet down during non-working hours (including weekends) as often as required to keep the dust under control. The use of calcium chloride or petroleum products or other chemicals for dust control is prohibited. [NJAC 7:22-10.11 (m)]

3.05 FINAL CLEANING

- A. Employ skilled workmen for final cleaning.
- B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
- C. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.
- D. Remove all temporary buildings and structures built by *CONTRACTOR*, all temporary works; tools, machinery or other construction equipment furnished by him.

- E. Clean insides of manholes, valve boxes, inlets or other structures constructed, reconstructed or reset during *CONTRACTOR'S* operations to remove debris, excess mortar or foreign materials.
- F. Prior to final acceptance, *CONTRACTOR* shall conduct an inspection of all work areas to verify that the entire work is clean.

3.06 RESTORATIONS

- A. General:
 - 1. All existing structures, unpaved areas and paved areas disturbed or damaged during the work under this Contract shall be restored or replaced to a condition at least equal to that existing prior to beginning work, or as otherwise specified.
 - 2. The methods of conducting this work shall, as a minimum, conform to the Standard Specifications.
- B. Grass restorations: Seeding shall conform to Section 806.
- C. Pavement restorations: Conform to Section 401.
- D. Restorations of Concrete Curbs & Islands: Conform to Section 607.
- E. Restoration of Sidewalks, Driveways, Curb Ramps and Aprons: Conform to Section 606.
- F. All other restorations: Restore in accordance with applicable Articles of the Standard Specifications, or as approved by the *ENGINEER* or authorities having jurisdiction.

PART 4 - PAYMENT

4.01 CLEANING AND RESTORATIONS

- A. All costs for *CLEANING AND RESTORATIONS* shall be included in prices bid for various items scheduled in the *PROPOSAL*.

****END OF SECTION****

SECTION 01 77 19
(01760)
CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Comply with requirements stated in the *General Conditions* of the Contract and in the specifications for administrative procedures in closing out the work.
- B. Related requirements in other parts of the Project Manual:
 - 1. Fiscal provisions, legal submittals and additional administrative requirements: Conditions of the Contract.
- C. Related requirements specified in other sections:
 - 1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
 - 2. *Section 01 11 00: Statement of Work*
 - 3. *Section 01 74 00: Cleaning and Restorations*
 - 4. *Section 01 78 23: Operating and Maintenance Data*
 - 5. *Section 01 78 36: Guarantees*
 - 6. *Section 01 78 39: Project Record Documents*
 - 7. *Section 01 78 45: Spare Parts and Maintenance Materials*
 - 8. Closeout submittals required of trades: The respective sections of specifications.

1.02 COMPLETION

- A. When Contractor considers the work is complete and ready for acceptance by the *OWNER*, he shall submit to the *ENGINEER*:

1. A written notice that the work or designated portion thereof is complete and ready for acceptance.
 2. Certification that equipment systems have been tested, in the presence of the *OWNER'S* representative and are operational.
 3. Operating and Maintenance Data, Instructions to *OWNER'S* Personnel: to requirements of Section 01 78 23.
 4. Guarantees: to requirement of Section 01 78 36.
 5. Project Record Documents: to requirements of Section 01 78 39.
 6. Contractors Certificate (N.J.S.A. 34:11-56.33): to requirements of Section 00 72 00, paragraph 37E and Section 00 65 01, Contractors' Certificate.
 7. A list of items to be completed or corrected.
- B. Within a reasonable time after receipt of such notice, *ENGINEER* will make or cause an inspection to be made to determine the status of completion.
- C. Should *ENGINEER* determine that the work is not complete:
1. *ENGINEER* will promptly notify the Contractor in writing, giving the reasons therefore.
 2. Contractor shall remedy the deficiencies in the work, and send a second written notice of completion to the *ENGINEER*.
 3. *ENGINEER* will reinspect the work.
- D. When *ENGINEER* concurs that the work is complete, he will:
1. Prepare a Certificate of Completion, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the *ENGINEER*.
 2. Submit the Certificate to *OWNER* and Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

1.03 FINAL INSPECTION

- A. When Contractor considers the work is complete, he shall submit written certification that:

1. Contract documents have been reviewed.
 2. Work has been inspected for compliance with *Contract Documents*.
 3. Work has been completed in accordance with *Contract Documents*.
 4. Work is completed and ready for final inspection.
- B. *ENGINEER* will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
- C. Should *ENGINEER* consider that the work is incomplete or defective:
1. *ENGINEER* will promptly notify the Contractor in writing, listing the incomplete or defective work.
 2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to Construction Manager that the work is complete.
 3. *ENGINEER* will reinspect the work.
- D. When the *ENGINEER* finds that the work is acceptable under the *Contract Documents*, he shall request the Contractor to make closeout submittals.

1.04 REINSPECTION FEES

- A. Should *ENGINEER* perform reinspections due to failure of the work to comply with the claims of status of completion made by the Contractor:
1. *OWNER* will compensate *ENGINEER* for such additional services.
 2. *OWNER* will deduct the amount of such compensation from the final payment to the Contractor.

1.05 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ENGINEER

- A. Evidence of compliance with requirements of governing authorities:
1. Comply with the requirements of N.J.A.C. 5:23-2.23 for the Certificate of Occupancy.
 2. Certificates of Inspection.

- B. Evidence of payment and release of liens: to requirements of General and Supplementary Conditions.
- C. Certificate of Insurance for products and completed operations.

1.06 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to *ENGINEER*.
- B. Statement shall reflect all adjustments to the Contract Sum:
 - 1. The original Contract Sum.
 - 2. Additions and deductions resulting from:
 - a. Previous change orders.
 - b. Allowances.
 - c. Unit prices.
 - d. Deductions for uncorrected work.
 - e. Penalties and bonuses.
 - f. Deductions for liquidated damages.
 - g. Deductions for reinspection payments.
 - h. Other adjustments.
 - 3. Total Contract Sum, as adjusted.
 - 4. Previous payments.
 - 5. Sum remaining due.
- C. *ENGINEER* will prepare a final change order, reflecting approved adjustments to the Contract Sum that were not previously made by change orders.

1.07 PAYMENT

- A. Payment for contract closeout will be made for the Fixed Price stated in the Proposal under the item *CONTRACT CLOSEOUT DOCUMENTATION*, which shall include Contractor's notice that the work is complete and ready for acceptance; certification that equipment and systems have been tested, in the presence of the *OWNER'S* representative and are operational; ADA Compliance and As-Built Certification as specified in *Section 01 11 00 – Statement of Work* and *Section 01 71 23 – Field Engineering*. As-builts and Project Record Documents as specified in *Section 01 78 39*; O & M Data and Instruction of *OWNER'S* Personnel as specified in *Section 01 78 23*; Warranties and Bonds as specified in *Section 01 78 36*; spare parts and maintenance materials required under the various sections in accordance with *Section 01 78 45*; the Contractors Certificate (*Section 00 65 01*) and all other required submittals.

1.08 FINAL APPLICATION FOR PAYMENT

- A. No separate measurement will be made for this work. Contractor shall submit the final application for payment in accordance with procedures and requirements stated in the *General Conditions* of the contract after he has submitted the required Closeout Submittals.

****END OF SECTION****

SECTION 01 78 23
(01730)
OPERATING AND MAINTENANCE DATA

1.01 GENERAL

- A. Compile product data and related information appropriate for *OWNER'S* maintenance and operation of products furnished under the contract.
- B. Prepare operating and maintenance data as specified in this section and as referenced in other pertinent sections of *Specifications*.
- C. Instruct *OWNER'S* personnel in the maintenance of products and in the operation of equipment and systems.

1.02 QUALITY ASSURANCE

- A. Preparation of data shall be done by personnel:
 - 1. Trained and experienced in maintenance and operation of the described products.
 - 2. Completely familiar with requirements of this section.
 - 3. Skilled as a technical writer to the extent required to communicate essential data.
 - 4. Skilled as a draftsman competent to prepare required drawings.

1.03 FORM OF SUBMITTALS

- A. Prepare data in the form of an instructional manual for use by *OWNER'S* personnel.
- B. Format:
 - 1. Size: 8½ inches by 11 inches.
 - 2. Paper: Twenty (20) pound minimum, white, for typed pages.
 - 3. Text: Manufacturer's printed data, or neatly typewritten.

4. Drawings:
 - a. Provide reinforced punch binder tab, bind in with text.
 - b. Fold larger drawings to the size of the text pages.
5. Provide fly-leaf for each separate product, or each piece of operating equipment:
 - a. Provide typed description of product, and major component parts of equipment.
 - b. Provide indexed tabs.
6. Cover: Identify each volume with typed or printed title: "OPERATING AND MAINTENANCE INSTRUCTIONS." List:
 - a. Title of project.
 - b. Identity of separate structure as applicable.
 - c. Identity of general subject matter covered in the manual.

C. Binders:

1. Commercial quality 3-ring binders with durable and cleanable plastic covers.
2. Maximum ring size: 1 inch.
3. When multiple binders are used, correlate the data into related consistent groupings.

1.04 CONTENT OF MANUAL

- A. Neatly typewritten table of contents for each volume, arranged in a systematic order.
1. *CONTRACTOR*, name of responsible principal, address and telephone number.
 2. A list of each product required to be included, indexed to the content of the volume.

3. List, with each product, the name, address and telephone number of:
 - a. Subcontractor or installer.
 - b. Maintenance contractor, as appropriate.
 - c. Identify the area of responsibility of each.
 - d. Local source of supply for parts and replacement.
 4. Identify each product-by-product name and other identifying symbols as set forth in *Contract Documents*.
- B. Product data:
1. Include only those sheets, which are pertinent to the specific product.
 2. Annotate each sheet to:
 - a. Clearly identify the specific product or part installed.
 - b. Clearly identify the data applicable to the installation.
 - c. Delete references to inapplicable information.
- C. Drawings:
1. Supplement product data with drawings as necessary to clearly illustrate:
 - a. Relations of component parts of equipment and systems.
 - b. Control and flow diagrams.
 2. Coordinate drawings with information in project record documents to assure correct illustration of completed installation.
 3. Do not use project record documents as maintenance drawings.
- D. Written text, as required to supplement product data for the particular installation:
1. Organize in a consistent format under separate heading for different procedures.
 2. Provide a logical sequence of instructions for each procedure.

- E. Copy of each warranty, bond and service contract issued.

Provide information sheet for Owner's personnel, give:

- 1. Proper procedures in the event of failure.
- 2. Instances, which might affect the validity of warranties or bonds.

1.05 MANUAL FOR MATERIALS AND FINISHES

- A. Submit two (2) copies of complete manual in final form.
- B. Content, for architectural products, applied materials and finishes:
 - 1. Manufacturer's data, giving full information on products:
 - a. Catalog number, size, and composition.
 - b. Color and texture designations.
 - c. Information required for reordering special manufactured products.
 - 2. Instructions for care and maintenance:
 - a. Manufacturer's recommendation for types of cleaning agents and methods.
 - b. Cautions against cleaning agents and methods, which are detrimental to the product.
 - c. Recommended schedule for cleaning and maintenance.
- C. Content, for moisture-protection and weather-exposed products:
 - 1. Manufacturer's data, giving full information on products:
 - a. Applicable standards.
 - b. Chemical composition.
 - c. Details of installation.
 - 2. Instructions for inspection, maintenance and repair.

- D. Additional requirements for maintenance data: The respective sections of *Specifications*.
- E. Provide complete information for products specified in:
 - 1. *Division 26: Electrical*

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit three (3) copies of complete manual in final form.
- B. Content, for each unit of equipment and system, as appropriate:
 - 1. Description of unit and component parts.
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data and tests.
 - c. Complete nomenclature and commercial number of all replaceable parts.
 - 2. Operating procedures:
 - a. Start-up, break-in, routine, and normal operating instructions.
 - b. Regulation, control, stopping, shutdown and emergency instructions.
 - c. Summer and winter operating instructions.
 - d. Special operating instructions.
 - 3. Maintenance procedures:
 - a. Routine operations.
 - b. Guide to "trouble-shooting."
 - c. Disassembly, repair and reassembly.
 - d. Alignment, adjusting and checking.
 - 4. Servicing and lubrication schedule: List of lubricants required.

5. Manufacturer's printed operating and maintenance instructions.
 6. Description of sequence of operation by control manufacturer.
 7. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.
 - a. Predicted life of parts subject to wear.
 - b. Items recommended to be stocked as spare parts.
 8. As-installed control diagrams by controls manufacturer.
 9. Each Contractor's coordination drawings.
 10. Charts of valve tag numbers, with the location and function of each valve.
 11. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
 12. Other data as required under pertinent sections of *Specifications*.
- C. Content, for each electric and electronic system, as appropriate:
1. Description of system and components parts.
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 2. Circuit directories of panelboards:
 - a. Electrical service.
 - b. Controls.
 - c. Communications.
 3. As-installed color coded wiring diagrams.
 4. Operating procedures:

- a. Routine and normal operating instructions.
 - b. Sequences required.
 - c. Special operating instructions.
5. Maintenance procedures:
- a. Routine operations.
 - b. Guide to "trouble-shooting."
 - c. Disassembly, repair and reassembly.
 - d. Adjustment and checking.
6. Manufacturer's printed operating and maintenance instructions.
7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
8. Other data as required under pertinent sections of *Specifications*.
- D. Prepare and include additional data when the need for such data becomes apparent during instruction of *OWNER'S* personnel.
- E. Additional requirements for operating and maintenance data: The respective sections of *Specifications*.
- F. Provide complete information for products specified in:
1. *Division 26: Electrical*

1.07 SUBMITTAL SCHEDULE

- A. Submit two (2) copies of preliminary draft of proposed formats and outlines of contents prior to start of work.
- ARCHITECT/ENGINEER* will review draft and return one (1) copy with comments.
- B. Submit one (1) copy of completed data in final form thirty (30) days prior to completion and acceptance as defined in the General Conditions.

Copy will be returned with comments.

C. Before Contract closeout, transfer all Operation and Maintenance Data to electronic media. All documents shall be in Portable Document File (pdf) format. Scan all documents in their original size. Electronic media shall be archival quality compact disc (CD), Memorex "Pro Gold™ Archival CD-Rs" or equivalent.

D. At Contract closeout, deliver 4 copies of original O&M data and CDs to the *ENGINEER*.

1. Each CD shall have a high gloss, laser printed label showing the following information:

Title: Project Title
Owner:
Contract #: 20__-__-__
Date:
Contents: Operation & Maintenance Data
Section ___ ___ - (Section Title)
Section ___ ___ - (Section Title)
Section ___ ___ - (Section Title)
Section ___ ___ - (Section Title)

2. Each CD shall contain a "Readme" file describing the contents.

3. All O & M Data relating to a specific specification section or piece of equipment shall be contained as separate files in the same folder.

4. Each CD shall be contained in a Jewel Case with an insert showing the CD contents or a sleeve showing the CD contents.

1.08 INSTRUCTION OF OWNER'S PERSONNEL

A. Prior to final completion and acceptance as previously defined, fully instruct *OWNER'S* designated operating and maintenance personnel in the operation, adjustment and maintenance of all products, equipment and systems.

B. Operating and maintenance manual shall constitute the basis of instruction.

Review contents of manual with personnel in full detail to explain all aspects of operations and maintenance.

****END OF SECTION****

SECTION 01 78 36
(01740)
GUARANTEES

1.01 GENERAL

- A. Compile specified warranties and bonds.
- B. Co-execute submittals.
- C. Review submittals to verify compliance with *Contract Documents*.
- D. Submit to *ENGINEER* for review and transmittal to *OWNER*.
- E. Related requirements in other parts of the *Contract Documents*:
 - 1. Bid or proposal bonds: See the *Instructions to Bidders*.
 - 2. Performance bond and maintenance bond: See the *General Conditions*.

1.02 SUBMITTAL REQUIREMENTS

- A. Assemble warranties and bonds executed by each of the respective manufacturers, suppliers and subcontractors.
- B. Number of original signed copies required: Two (2) each.
- C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.
 - 1. Product or work item.
 - 2. Firm, with name of principal, address and telephone number.
 - 3. Scope.
 - 4. Date of beginning of warranty or bond.
 - 5. Duration of warranty or bond.
 - 6. Provide information for *OWNER'S* personnel:
 - a. Proper procedure in case of failure.

- b. Instances which might affect the validity of warranty or bond.
7. *CONTRACTOR*, name of responsible principal, address and telephone number.

1.03 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.
- B. Format:
 - 1. Size: 8½" by 11", punch sheets for 3-ring binder.

Fold larger sheets to fit into binders.
 - 2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS." List:
 - a. Title of project.
 - b. Name of contractor.
- C. Binders: Commercial quality, 3-ring, D-type, with durable and cleanable plastic covers.

1.04 SUBMITTAL REQUIREMENTS

- A. Submit documents within ten (10) days after inspection and written acceptance by the *ENGINEER*
- B. Submit warranties by the manufacturers of all equipment furnished; or furnished and installed by the *CONTRACTOR*.
 - 1. Manufacturer shall issue warranties in the name of the *CONTRACTOR* and *OWNER*.
 - 2. Warranties shall be valid for a period of two (2) years from the date of acceptance by the *OWNER* of the structures and equipment, unless a longer period is specified.
 - 3. Warranties shall cover all costs for repairing or replacing defective materials and equipment.

- C. Submit warranties, service and maintenance contracts as specified in the respective sections of *Specifications*.
- D. In the event the equipment manufacturer's warranty does not comply with the conditions outlined above or are otherwise unavailable as required above, the *CONTRACTOR* may:
 - 1. Provide a dedicated security deposit in lieu of the specified warranties.
 - 2. Provide either a separate Maintenance Bond or certification of extended warranty coverage under the *CONTRACTOR'S* overall bonding to guarantee *OWNER* for warranty and deficiencies.

1.05 WARRANTY REPAIRS

- A. *CONTRACTOR* shall repair and/or replace as required all equipment which may be defective due to manufacturing errors or faulty installation, at his expense, during the maintenance period.
- B. The *CONTRACTOR* shall be responsible for all costs of the repair work including removal, shipping, reinstallation and start-up during the two (2) year maintenance period. The *OWNER* shall not incur any additional costs as a result of warranted equipment failure.

****END OF SECTION****

SECTION 01 78 39
(01720)
PROJECT RECORD DOCUMENTS

1.01 GENERAL

- A. Maintain for the *OWNER* one (1) record copy of:
1. Drawings.
 2. Specifications.
 3. Addenda.
 4. Change Orders and other modifications to the contract.
 5. Change Orders or written instructions.
 6. Approved shop drawings, product data and samples.
 7. Field test records.
 8. As-built record drawings.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- B. Make documents and samples available at all times for inspection by the *ENGINEER*.

1.03 MARKING DEVICES

- A. Provide felt-tip marking pens for recording information in the color code accepted by the *ENGINEER*.

1.04 RECORDING

- A. Label each document, "PROJECT RECORD" in neat large printed letters.

- B. Mark *CONTRACTOR* prints of working drawings to show the final horizontal and vertical locations of any revisions to the work. Record information concurrently with construction progress on a daily basis.
- C. Do not conceal any work until required information is recorded.
- D. Drawings: Legibly mark to record actual construction:
 - 1. Elevations of various structure elements in relation to finish floor or grade.
 - 2. All underground piping with elevations and dimensions. Changes in piping location. Horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements. Actual installed pipe material, class, etc.
 - 3. Location of internal utilities and appurtenances concealed in the construction referenced to visible and accessible features of the structure.
 - 4. Field changes of dimension and detail.
 - 5. Changes made by Field Order or by Change Order.
 - 6. Details not on original Contract Drawings.
 - 7. Equipment and piping relocations.
 - 8. Intersection details: Provide at least three ties to every valve and fitting, blow-off, fire hydrant and air release.
 - 9. Services based on distance from main line pipe and property lines.
 - 10. Backflow preventer assemblies locations with ties to physical features.
- E. All horizontal locations, if not in the right-of-way, must relate to easement.
- F. All elevations shall be in feet and tenths, referenced to NGVD 29.
- G. Specifications and Addenda; legibly mark each Section to record:
 - 1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
 - 2. Changes made by Field Order or by Change Order.

1.05 SUBMITTAL

- A. Before Contract closeout, transfer all record documents to electronic media. Drawings shall be provided in Tagged Image File (tif) format. All other documents shall be in Portable Document File (pdf) format. Scan all record documents in their original size. Electronic media shall be archival quality compact disc (CD), Memorex “Pro Gold™ Archival CD-Rs” or equivalent.
- B. At Contract closeout, deliver original marked-up record documents and four (4) copies of the record documents on electronic media to the *ENGINEER*.
 - 1. Each CD shall have a high gloss, laser printed label showing the following information:
 - Title: Project Title
 - Owner:
 - Contract #: 20__-__
 - Date:
 - Contents: Contract Drawings #____ thru #____
Project Manual and Specifications
Change Order #__ thru #____
Submittals #____ thru #____
Field Test Reports
Inspection Certificates
 - 2. Each CD shall contain a “Readme” file describing the contents.
 - 3. All shop drawings, product data, test reports, inspection certificates and similar documents relating to a specific specification section or piece of equipment shall be contained as separate files in the same folder.
 - 4. Each CD shall be contained in a Jewel Case with an insert showing the CD contents or a sleeve showing the CD contents.

****END OF SECTION****

SECTION 01 79 00
(01790)
DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. Demonstration of the operation of systems, subsystems, and equipment.
2. Training in the operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training transcripts and videos (DVDs).

B. Related work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 01 77 19: Contract Closeout*
3. *Section 01 78 23: Operation and Maintenance Manuals*
4. *Section 01 78 39: Project Record Documents*
5. *Section 01 91 00: Equipment Testing and Facility Startup*
6. Division 2 through 48 Sections for specific requirements for demonstration and training products and equipment in those sections.

C. Separate payment:

1. Separate payment will be made for this item. Include all costs for *DEMONSTRATION AND TRAINING* as indicated under the specific proposal item.
2. The cost for this item shall include all materials, equipment, labor, and training aids necessary and shall include those items that are considered to be an integral part of this work that may be specified elsewhere in these specifications.

1.02 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Instruction Program: Submit two copies of an outline of the instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training session. Include learning objective and outline for each training session.
 - 1. At completion of training, submit two (2) complete training manual(s) for Owner's use. Each manual shall include a copy of the demonstration and training videos (DVDs).
- C. Submit qualification data for facilitator and instructor.

1.03 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section "Quality Requirements", experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced in recording construction projects and demonstration and training programs.

1.04 COORDINATION

- A. Coordinate instruction schedule with *OWNER'S* operations. Adjust schedule as required to minimize disrupting *OWNER'S* operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training sessions with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by *ENGINEER*.

PART 2 - PRODUCTS

2.01 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training sessions for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
1. Diesel Generator Systems
- B. Training Sessions: Develop a learning objective and syllabus for each session. Include a description of specific skills and knowledge that participant is expected to master. For each session, include instruction for the following:
1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project Record Documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
 3. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.

- f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
4. Adjustments: Include the following:
- a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
5. Troubleshooting: Include the following:
- a. Diagnostic instructions.
 - b. Test and inspection procedures.
6. Maintenance: Include the following:
- a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.

2.02 TRAINING AIDS AND MATERIALS

- A. Provide all training aids, materials, tools, appliances, devices, mock-ups, flip charts, markers, overhead projectors, and other equipment in sufficient quantities for training OWNERS personnel. Such materials shall become the property of the OWNER when no longer needed.

2.03 OTHER MATERIALS

- A. All other materials, not specifically described but required for complete and proper demonstration and training shall be new, first quality of their respective

kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training session. Assemble training sessions into a combined training manual.
- B. Set up instructional equipment at instruction location.

3.02 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between *CONTRACTOR* and *OWNER* for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct *OWNER'S* personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. *ENGINEER* will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. *OWNER* will furnish an instructor to describe *OWNER'S* operational philosophy.
 - 3. *OWNER* will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with *OWNER* with at least fourteen (14) days advance notice.

3.03 REPRODUCTION OF TRAINING MATERIALS

- A. The *OWNER* reserves the right to reproduce all training syllabuses, materials, videos, DVDs, and other such items for his own use in training his present or future personnel.

****END OF SECTION****

SECTION 02 41 19
(02070)
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Work included:

1. Demolishing designated building equipment and fixtures.
2. Cutting and alterations for completion of the Work.
3. Protecting items designated to remain.
4. Removing demolished materials.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 01 73 29: Cutting and Patching*

1.02 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.

1.03 SCHEDULING

- A. Schedule Work to coincide with new construction.
- B. Cooperate with *OWNER* in scheduling noisy operations and waste removal that may impact Owners operation and in adjoining spaces.
- C. Perform noisy, dusty work:
1. On following days: Monday through Friday.

- D. Coordinate utility and building service interruptions with *OWNER*.
 - 1. Do not disable or disrupt building fire or life safety systems without five (5) days prior written notice to *OWNER*.
 - 2. Schedule tie-ins to existing systems to minimize disruption.
 - 3. Coordinate Work to ensure fire sprinklers, fire alarms, smoke detectors, emergency lighting, exit signs and other life safety systems remain in full operation in occupied areas.

1.04 QUALITY ASSURANCE

- A. Qualifications of workmen:
 - 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 - 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the method and materials to be used.
- B. Comply with the requirements of the Uniform Construction Code of the State of New Jersey.

1.05 PROJECT CONDITIONS

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Cease operations immediately if structure appears to be in danger and notify *ARCHITECT/ENGINEER*. Do not resume operations until directed.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

3.01 EXISTING CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 ASBESTOS ABATEMENT

- A. Inspect building and test as required for the presence of Asbestos Containing Material (ACM) in floor tile, roofing materials and elsewhere as required.
- B. Remove and dispose of Asbestos Containing Material (ACM) in accordance with N.J.A.C. 5:23-8, if and when directed.
- C. Before parts of a structure can be demolished or removed, the *CONTRACTOR* shall document that the requirements of USEPA 40 CFR 61 Subpart M have been or shall be met. A permit to demolish or remove the structure shall not be issued until *CONTRACTOR* notifies the enforcing agency that all friable asbestos or asbestos-containing material that will become friable during demolition or removal has been or will be properly abated prior to demolition. [N.J.A.C. 5:23-2.17(e)]

3.03 PREPARATION

- A. Notify affected utility companies before starting work and comply with their requirements.
- B. Mark location and termination of utilities.
- C. Erect, and maintain temporary barriers and security devices, including warning signs and lights, and similar measures, for protection of the *OWNER* and existing improvements indicated to remain.
- D. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise to permit continued *OWNER* occupancy.
- E. Prevent movement of structure; provide temporary bracing and shoring required to ensure safety of existing structure.
- F. Provide appropriate temporary signage including signage for exit or building egress.

- G. Do not close or obstruct building egress path.
- H. Do not disable or disrupt building fire, building electric, or life safety systems without five (5) days prior written notice to *OWNER*.

3.04 SALVAGE REQUIREMENTS

- A. Coordinate with *OWNER* to identify building components and equipment required to be removed and delivered to *OWNER*.
- B. Tag components and equipment *OWNER* designates for salvage.
- C. Protect designated salvage items from demolition operations until items can be removed.
- D. Carefully remove building components and equipment indicated to be salvaged.
- E. Disassemble as required to permit removal from building.
- F. Package small and loose parts to avoid loss.
- G. Mark equipment and packaged parts to permit identification and consolidation of components of each salvaged item.
- H. Prepare assembly instructions consistent with disassembled parts. Package assembly instructions in protective envelope and securely attach to each disassembled salvaged item.
- I. Deliver salvaged items to *OWNER*. Obtain signed receipt from *OWNER*.

3.05 DEMOLITION - GENERAL

- A. By careful study of the *Contract Documents*, determine the location and extent of selective demolition to be performed.
- B. In company with the *ENGINEER*, visit the site and verify the extent and location of selective demolition required.
 - 1. Carefully identify limits of selective demolition.
 - 2. Mark interface surfaces as required to, enable workmen also to identify items to be removed and items to be left in place intact.
- C. Prepare and follow an organized plan for demolition and removal of items.

- D. Conduct demolition to minimize interference with adjacent and occupied building areas. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- E. Maintain protected egress from and access to adjacent existing buildings at all times.
- F. Do not close or obstruct roadways without permits.
- G. Cease operations immediately when structure appears to be in danger and notify *ENGINEER*.
- H. Disconnect and remove designated utilities within demolition areas.
- I. Cap and identify abandoned utilities at termination points when utility is not completely removed. Annotate Record Drawings indicating location and type of service for capped utilities remaining after demolition.
- J. Demolish in orderly and careful manner. Protect existing improvements, supporting structural members.
- K. Carefully remove building components indicated to be reused.
 - 1. Disassemble components as required to permit removal.
 - 2. Package small and loose parts to avoid loss.
 - 3. Mark components and packaged parts to permit reinstallation.
 - 4. Store components, protected from construction operations, until reinstalled.
- L. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.
- M. Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.
- N. Remove temporary Work.

3.06 DEMOLITION - ELECTRICAL WORK

- A. Remove, relocate, and extend existing installations to accommodate new construction.

- B. Remove abandoned wiring to source of supply.
- C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
- E. Disconnect and remove abandoned panelboards and distribution equipment.
- F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- G. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
- H. Disconnect and remove existing service equipment. Coordinate removal with the utility company. Do not enter the transformer yard until all utility-owned equipment has been de-energized and removed.
- I. Maintain access to existing electrical installations that remain active. Modify installation or provide access to panel as appropriate.
- J. Patch all abandoned wall openings using materials and finishes to match existing construction.

3.07 REPLACEMENTS

- A. In the event of demolition of items not so indicated to be demolished, promptly replace such items to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.

PART 4 - PAYMENT

4.05 SELECTIVE DEMOLITION

- A. Unless otherwise noted in the Proposal Section, no separate payment shall be made for this item.

- B. Include all costs for *SELECTIVE DEMOLITION* in the prices bid for the various related items of work as designated in the Proposal.

****END OF SECTION****

SECTION 03 01 30.71
(03730)
CONCRETE REPAIRS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. At locations designated by *ENGINEER*, remove all loose, unsound concrete and patch with concrete repair material.
2. A technical representative of the manufacturer shall be present on the site to provide guidance in the preparation and placement of repair products for prevailing weather and job site conditions the first time these products are used at the job site. The representative shall be present at least one complete cycle of the repair procedures.

B. Related work:

2. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
3. *Section 03 64 23: Concrete Crack Repair By Epoxy Injection*

C. Payment:

1. Unless otherwise noted in the Proposal section, no separate payment shall be made for this item.
2. Include all costs for *CONCRET REPAIRS* for the various related items of work as designated in the Proposal.
3. Concrete surfaces repaired by the Contractor without the approval of the *ENGINEER* will not be paid for.

1.02 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples.*

- B. Manufacturer's product data:
 - 1. Complete materials list of all materials proposed to be furnished and installed under this section.
 - 2. Specifications and other data required to demonstrate compliance with the specified requirements.
- C. Manufacturer's recommended installation procedures.

1.03 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 - 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
 - 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 - 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the method and materials to be used.
 - 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- C. Basis of acceptance:
 - 1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.

- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

1.05 WARRANTY AND WARRANTY REPAIRS

- A. Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B. The *CONTRACTOR* and/or product manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the maintenance period.
- C. The *CONTRACTOR* and/or product manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the warranty period.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.
- C. All repair products shall be by a single manufacturer.

2.02 CLEANER/DEGREASER

- A. Acceptable Manufacturers:
 - 1. Super-Krete International
1290 North Johnson Avenue, Suite 101
El Cajon, CA 92020
Tel: 619-401-8282
Tel: 800-995-1716
 - 2. Or equivalent.
- B. Concrete Cleaner/Degreaser: “Super-Krete Heavy Duty Degreaser,” or equivalent.

2.03 CONCRETE REPAIR MATERIAL

- A. Acceptable Manufacturers:
 - 1. Sika Corporation
201 Polito Ave.
Lyndhurst, NJ 07071
800-933-7452
 - 2. Or equivalent.
- B. Hand applied to horizontal surfaces: Unless noted otherwise, use “SikaTop 122 Plus,” or equivalent.
- C. Hand applied to overhead and vertical repairs: Unless noted otherwise, use “SikaTop 123 Plus,” or equivalent.
- D. Machine applied to all surfaces: Unless noted otherwise, use “Sika Repair 224,” or equivalent.
- E. Formed to all surfaces: Unless noted otherwise, use “SikaTop 111 Plus,” or equivalent.

2.04 THREADED ROD ANCHORS

- A. Shall be $\frac{3}{8}$ " diameter threaded rod anchor installed in the concrete using the Hilti HIT HY200 Dowelling system manufactured by Hilti Corporation of Tulsa, Oklahoma, or equivalent.

2.05 REINFORCEMENT

- A. Shall be Grade 60 billet steel reinforcing bars; minimum size shall be #4 bars.

2.06 BONDING AGENTS

- A. Concrete or reinforcing steel: Sika "Armatec 110 EpoCem," or equivalent.

2.07 AGGREGATE

- A. A $\frac{3}{8}$ " course aggregate, clean, well graded, low absorption and high density complying with ASTM C33, size number 8, per Table 2.
- B. Aggregate shall comply with either ASTM C1260, C227 or C289 for non-reactivity.
- C. Aggregate shall not contain limestone.

2.08 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXISTING CONDITIONS

- A. Inspection: Verify that the work of this section may be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.
- B. Discrepancies:
1. In the event of discrepancy, immediately notify the *ENGINEER*.
 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 PREPARATION

- A. Prior to any construction the *ENGINEER* shall physically mark out in the field the extent of loose, and spalled concrete required to be repaired.
- B. Removal of Unsound Concrete:
1. Removal of unsound concrete shall be accomplished with any combination of hammer and chisel, chippers, bush hammers, hydro removal, pneumatic scabblers, rotary milling machine, or other suitable means to achieve the surface profile required by the concrete repair material instructions.
 2. All unsound concrete shall be removed to a minimum depth of 1". No feather-edges will be acceptable.
 3. If the Contractor discovers additional unsound concrete as the work progresses, he shall notify the *ENGINEER* for inspection. If directed by the *ENGINEER*, the Contractor shall then remove and replace this additional concrete. Removal of any concrete without the approval of the *ENGINEER* shall be replaced in accordance with these Specifications by the Contractor at no additional cost to the *OWNER*.
- C. Supplemental Reinforcing:
1. Install supplemental reinforcing with anchors into sound concrete as indicated on contract drawings.
- D. Cleaning:
1. Remove rust from exposed reinforcing bars by any combination of needle scalers, high pressure water cleaning, abrasive blast cleaning, power wire brush, and wire brush. Ensure the back side of the reinforcing is cleaned of rust.
 2. The concrete surfaces which are to receive the repair mortar shall be sound, free from laitance, oil, grease, dust, loose aggregate, paint and foreign matter.
 3. Cleaner/degreaser shall be used to remove any oil or grease deposits or stains before blasting or washing.
 4. Cleaning of concrete shall be accomplished by means of abrasive, hydro or shot blasting, scabblers, steam cleaning, hammer and chisel, vacuuming or a combination of methods.

5. After cleaning, the substrate shall be rinsed with clean water.
6. The substrate shall be cleaned to the satisfaction of the *ENGINEER*. The surface must have an open pore structure free from clogs of dust, slurry water or foreign material.
7. The manner of accomplishing the cleaning shall be such as to protect surfaces not to be coated from staining or other damage.

3.03 CONCRETE REPAIR INSTALLATION

- A. Mix concrete repair material in accordance with manufacturer's instruction (add aggregate to the mortar where permitted).
- B. Dampen substrate with water (saturated surface dry, but free of standing water).
- C. Prime surface with bonding agent.
- D. Immediately install concrete repair material to wet bonding agent as directed by the manufacturer's instructions (in lifts as depth required).
- E. Tool and finish with screed or trowel to match adjacent surfaces.
- F. Moist cure and protect surface immediately from direct sunlight, wind, rain and frost after finishing.

3.04 CLEANING

- A. Clean exposed surface of all grease, dirt and other foreign materials.
- B. Touch up all marred or abraded surfaces as specified herein.

****END OF SECTION****

SECTION 03 11 00
(03110)
CONCRETE FORMWORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. Formwork for cast-in-place concrete, with shoring, bracing, and anchorage.
2. Openings for other affected Work.
3. Form accessories.
4. Stripping forms.
5. Sample panel.

B. Related work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 03 20 00: Concrete Reinforcement*
3. *Section 03 30 00: Concrete*
4. *Section 31 23 00: Excavating, Filling and Grading*

C. Payment:

1. Unless otherwise noted in the Proposal Section, no separate payment shall be made for this item.
2. Include all costs for *CONCRETE FORMWORK* in the prices bid for the various related items of work as designated in the Proposal.

1.02 SYSTEM DESCRIPTION

A. Design Requirements:

UNION COUNTY FREEHOLDERS
Contract No. UC 2013-028

A-0530-0026-000/S2516
March 2018

Concrete Formwork
03 11 00-1

1. Design and construction of all forms and form supports, shoring and bracing methods, and their adequacy shall rest with the Subcontractor.
2. Design formwork so it will safely support vertical and lateral loads that might be applied, until such loads can be supported by the concrete structure with a minimum factor of safety of 2.0 and maximum deflection shall not exceed a clear span length $L/400$ minimum.
3. Carry vertical and lateral loads to ground by formwork system and in-place construction that has attained adequate strength for that purpose.
4. Design forms and falsework to include assumed values of live load, dead load, weight of moving equipment operated on the formwork, concrete mix, height of concrete drop, vibrator frequency, ambient temperature, foundation pressures, stresses, lateral stability, and other factors pertinent to safety of the structure during construction.
5. Provide shop drawings that have been signed and sealed by a qualified Professional Engineer in accordance with *Section 01 33 23, Shop Drawings, Product Data and Samples*.

B. Performance Requirements:

1. Tolerances for construction of formwork shall be as necessary to provide completed concrete structures within the concrete tolerances specified in *Section 03 30 00, Concrete*.
2. Provide positive means of adjustment to maintain tolerances before and during concrete placement.

1.03 SUBMITTALS

A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.

B. Manufacturer's product data:

1. Complete materials list of all materials proposed to be furnished and installed under this section.
2. Specifications and other data required to demonstrate compliance with the specified requirements.

C. Shop drawings showing precise dimensions of the work of this section, and all

other data needed to ensure proper and adequate provisions in construction to accommodate the work of this section.

1. Show the forms to be used indicating form construction, type and location of form ties, reveal strips, chamfer, drip, groove, and method of sealing forms against grout leakage. Lay out form ties in regular, symmetrical patterns.

1.04 QUALITY ASSURANCE

A. Qualifications of manufacturer:

1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.

B. Qualifications of workmen:

1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the method and materials to be used.
3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.

C. Basis of acceptance:

1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

D. Perform the work of this Section in accordance with the following standards as modified and supplemented herein:

1. ACI 301; Specifications for Structural Concrete for Buildings
2. ACI 347; Recommended Practice for Concrete Formwork

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 FORM MATERIALS

- A. Plywood, lumber, steel, fiberglass reinforced plastic, or any material that will produce concrete with the required finish and within the specified tolerances.
- B. Except for metal forms, use new materials. Materials may be reused during progress of the work, provided they are completely cleaned and reconditioned, recoated for each use, and capable of producing formwork of the required quality.
- C. For footings and foundations, use boards or planks secured to wood or steel stakes, substantially constructed to shapes indicated and to support the required loads.

- D. For studs, wales, and supports, use standard grade or better lumber, dimensions as required to support the loads but not less than 2" x 4".
- E. Porous form materials shall be sealed to prevent absorption of water from the concrete.
- F. Use of aluminum form materials in contact with concrete is prohibited.
- G. Wall forms:
 - 1. Exposed concrete surfaces:
 - a. Minimum for surfaces indicated to receive smooth form finish or any rubbed finish:
 - (1) BB plyform, Class 1, conforming to U.S. Product Standard PS-1; 3/4-inch minimum thickness; free of raised grain, torn surfaces, worn edges, patches, or other defects which would impair the appearance of the concrete surface;
 - (2) Wood form materials shall be new at the start of the work and may be reused subject to the approval of the *ENGINEER*.
 - b. Seal edges and coat both faces with colorless coating, which will not affect application of applied finishes.
 - 2. Unexposed concrete surfaces:
 - a. Use 1" x 6" shiplap Douglas Fir boards, surfaced one side and two edges, or 3/4" minimum thickness BB plyform, Class I or II, conforming to U.S. Product Standard PS-1, sanded both sides, mill-oiled.
- H. Column forms, if required:
 - 1. For square or rectangular columns, use 2" thick Douglas Fir planks or joists, surfaced one side and two edges, or use metal forms.
 - 2. For round columns, use metal forms or patented paper tube forms approved by the *ENGINEER*.
 - 3. Construct column forms with tight joints and securely clamped together with steel clamps.

2.03 FORM TIES

- A. Hold inner and outer forms for vertical concrete together with combination steel ties and spreaders approved by the *ENGINEER*.
 - 1. Space ties symmetrically in tiers and rows, each tier plumb from top to bottom and each row level.
 - 2. At horizontal pour lines, locate ties not more than 6" below the pour lines. Tighten after concrete has set and before the next pour is made.
 - 3. For exposed concrete surfaces, provide form ties of removable type with she-bolts equipped with permanent plugs and a system approved by the *ENGINEER* for fixing the plugs in place.

2.04 EARTH FORMS

- A. Side forms for footings may be omitted, and concrete may be placed directly against excavation, only when requested by the Contractor and approved by the *ENGINEER*.
- B. When omission of forms is accepted, provide additional concrete 1" on each side of the minimum design profiles and dimensions shown on the Drawings.

2.05 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.

- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 FORM CONSTRUCTION

A. General:

1. Construct forms complying with ACI 347 to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, and level and plumb work in the finished structure.
2. Provide for openings, offsets, keyways, recesses, moldings, reglets, chamfers, blocking, screeds, bulkheads, anchorages, inserts, and other features as required.
3. Tolerances shall be in accordance with Section 3.3.1 of ACI 347.
4. Erect, support, brace, and maintain formwork so it will safely support vertical and lateral loads that might be applied, until such loads can be supported by the concrete structure.
5. Carry vertical and lateral loads to ground by formwork system and in-place construction that has attained adequate strength for that purpose.
6. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position.
7. Provide shores and struts with positive means of adjustment capable of taking up formwork settlement during concrete placing operations, using wedges or jacks or a combination thereof.
8. Provide trussed supports when adequate foundations for shores and struts cannot be secured.
9. Support form materials by structural members spaced sufficiently close to prevent objectionable deflection.
10. Fit forms placed in successive units for continuous surfaces to accurate alignment, free from irregularities, and within the allowable tolerances.
11. Provide formwork sufficiently tight to prevent leakage of cement paste during concrete placement. Solidly butt joints, and provide backup material at joints as required to prevent leakage and prevent fins.

12. Provide camber in formwork as required for anticipated deflections due to weight and pressures of fresh concrete and construction loads.
- B. Fabrication:
1. Fabricate forms for easy removal without hammering or prying against concrete surfaces.
 2. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.
 3. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and assure ease of removal.
 4. Provide top forms for inclined surfaces where so directed by the *ENGINEER*.
- C. Forms for exposed concrete:
1. Drill forms to suit ties being used, and to prevent leakage of cement paste around tie holes. Do not splinter forms by driving ties through improperly prepared holes.
 2. Provide sharp, clean corners at intersecting planes, without visible edges or offsets. Back the joints with extra studs or girts to maintain true, square intersections.
 3. Use extra studs, wales, and bracing to prevent objectionable bowing of forms between studs, and to avoid bowed appearance in concrete. Do not use narrow strips of form material, which will produce bow.
- D. Corner treatment:
1. Unless shown otherwise, form chamfers with 1" x 1" strips, accurately formed and surfaced to produce uniformly straight lines and tight edges.
 2. Extend terminal edges to required limit, and miter the chamfer strips at changes in direction.
- E. Locate control joints as indicated on the Drawings and, where required but not shown on the Drawings, as approved by the *ENGINEER*.
- F. Provisions for other trades:

1. Provide openings in concrete formwork to accommodate work of other trades.
2. Verify size and location of openings, recesses, and chases with the trade requiring such items.
3. Accurately place and securely support items to be built into the concrete.

3.03 FORM COATINGS

- A. Coat form contact surfaces with form coating compound before reinforcement is placed.
1. Do not allow excess form coating material to accumulate in the forms or to come in contact with surfaces, which will bond to fresh concrete.
 2. Apply the form coating material in strict accordance with its manufacturer's recommendations.

3.04 REMOVAL OF FORMS

- A. General:
1. Do not disturb or remove forms until the concrete has hardened sufficiently to permit form removal with complete safety.
 2. Do not remove shoring until the member has acquired sufficient strength to support its own weight, the load upon it, and the added load of construction, but no sooner than seven (7) days.
 3. Do not strip floor slabs in less than two(2) days.
 4. Do not strip wall concrete in less than 24 hours. Do not backfill until concrete has cured seven (7) days.
 5. When stripping time is less than specified curing time, measures shall be taken to provide adequate curing and thermal protection of the stripped concrete.
- B. Finished surfaces:

1. Exercise care in removing forms from finished concrete surfaces so that surfaces are not marred or gouged, and that corners are true, sharp, and unbroken.
2. Release sleeve nuts or clamps, and pull the form ties neatly.
3. Do not permit steel spreaders, form ties, or other metal to project from, or be visible on, any concrete surface except where so shown on the Drawings.
4. Solidly pack form tie holes, rod holes, and similar holes in the concrete. For packing, use the cement grout specified in *Section 03 30 00, Concrete* of these Specifications, flushing the holes with water before packing, screeding off flush, and grinding to match adjacent surfaces.

3.05 FIELD QUALITY CONTROL

- A. Inspect and check complete formwork, falsework, shoring and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties and parts are secure.
- B. Contact *ENGINEER* when formwork is complete and has been cleaned.
- C. For all exposed concrete surfaces do not re-use wood type formwork more than three (3) times. Do not patch formwork.

****END OF SECTION****

SECTION 03 20 00
(03200)
CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work included: Provide concrete reinforcement where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
 2. *Section 03 11 00: Concrete Formwork*
 3. *Section 03 30 00: Concrete*
- C. Payment:
1. Unless otherwise noted in the Proposal Section, no separate payment shall be made for this item.
 2. Include all costs for *CONCRETE REINFORCEMENT* in the prices bid for the various related items of work as designated in the Proposal.

1.02 REFERENCE STANDARDS

- A. American Concrete Institute
1. ACI-301, Specifications for Structural Concrete for Buildings.
 2. ACI-315, Details and Detailing of Concrete Reinforcement.
 3. ACI-318, Building Code Requirements for Reinforced Concrete Structures.
- B. Concrete Reinforcing Steel Institute:
1. Manual of Standard Practice.

- C. American Society for Testing and Materials:
1. ASTM A-185; Specification for Steel Welded Wire Reinforcement, Plain, for Concrete Reinforcement.
 2. ASTM A-615; Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 3. ASTM A-82; Specification for Steel Wire, Plain, for Concrete Reinforcing

1.03 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Comply with pertinent provisions of the following codes and standards, except as modified herein. Where there is a conflict, the more stringent code or standard shall govern.
1. ACI-301, Specifications for Structural Concrete for Buildings.
 2. ACI-315, Details and Detailing of Concrete Reinforcement.
 3. ACI-318, Building Code Requirements for Reinforced Concrete Structures.
 4. ICC, International Building Code, 2015, as modified by the Uniform Construction Code of the State of New Jersey.

1.04 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Manufacturer's product data:
1. Complete materials list of all materials proposed to be furnished and installed under this section.
 2. Specifications and other data required to demonstrate compliance with the specified requirements.

3. Submit copies of mill test reports for shipments of reinforcing steel prior to placing reinforcement into the work.
- C. Shop Drawings showing details of bars, anchors, and other items, if any, provided under this Section.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage:
1. Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use.
 2. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.
 3. Store in a manner to prevent excessive rusting and fouling with dirt, grease, and other bond-breaking coatings.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 REINFORCEMENT MATERIALS AND ACCESSORIES

A. Bars:

1. Provide deformed billet steel bars complying with ASTM A615, using grades shown on the Drawings.
2. Where grades are not shown on the Drawings, use Grade 60.

B. Steel wire:

1. Comply with ASTM A82.
2. For tie wire, comply with Fed Spec QQ-W-461, annealed steel, black, 16 gage minimum (use coated wire for coated bars).

C. Welded wire reinforcement:

1. Provide plain welded steel, complying with ASTM A185.

D. Synthetic Fiber Reinforcement:

1. Acceptable Manufacturers:
 - a. Propex Concrete Systems Corp., 6025 Lee Highway, Suite 425, Chattanooga, Tennessee 37427. Toll Free (800) 621-1273. Phone (423) 892-8080. Fax (423) 892-0157.
 - b. Or equivalent.
2. Synthetic fiber reinforcement: Fibermesh 150.
 - a. Material: 100 percent virgin homopolymer polypropylene multifilament fibers, containing no reprocessed olefin materials.
 - b. Conformance: ASTM C 1116, Type III.
 - c. Fire classifications:
 - (1) UL Report File No. R8534-11.
 - (2) Southwest Certification Services (SWCS), Omega Point Laboratories No. 8662-1.
 - d. Fiber length: Graded.

- e. Alkali resistance: Alkali proof.
 - f. Absorption: Nil.
 - g. Specific gravity: 0.91.
 - h. Melt point: 324 degrees F (162 degrees C).
- E. Welding electrodes: Comply with AWS A5.1, low hydrogen, E70 series.
- F. Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement in place:
- 1. Use wire bar type supports complying with CRSI recommendations, unless otherwise shown on the Drawings.
 - 2. Do not use wood, brick, or other non-complying material.
 - 3. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 4. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with either hot-dip galvanized or plastic-protected legs.

2.03 FABRICATION

A. General:

- 1. Fabricate reinforcing bars to conform to the required shapes and dimensions, with fabrication tolerances complying with the CRSI Manual.
- 2. In case of fabricating errors, do not straighten or re-bend reinforcement in a manner that will weaken or injure the material.
- 3. Reinforcement with any of the following defects will not be acceptable.
 - a. Bar lengths, depths, and/or bends exceeding the specified fabrication tolerances;
 - b. Bends or kinks not shown on the Drawings;
 - c. Bars with reduced cross-section due to excessive rusting or other cause.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. General:

1. Comply with the specified standards for detail and method of placing reinforcement and supports, except as may be modified herein.
2. Clean reinforcement to remove loose rust and mill scale, earth, and other materials, which reduce or destroy bond with concrete.
3. Position, support, and secure reinforcement against displacement by formwork, construction, and concrete placing operations.
4. Locate and support reinforcement by metal chairs, runners, bolsters, spacers, and hangers, as required.
5. Place reinforcement to obtain minimum coverages for concrete protection.
6. Arrange, space, and securely tie bars and bar supports together with the specified tie wire.
7. Set wire ties so twisted ends are directed away from exposed concrete surfaces.

B. Welded Wire Fabric:

1. Install welded wire fabric in as long lengths as practical, lapping adjoining pieces. Laps of adjoining pieces shall be not less than one spacing of the cross wires plus two inches and in no case less than six inches whichever is greater.

C. Synthetic Fiber Reinforcing:

1. Add synthetic fiber reinforcement to concrete mixture in accordance with manufacturer's instructions.

2. Add synthetic fiber reinforcement into concrete mixer before, during, or after batching other concrete materials.
 3. Application Rate: Add synthetic fiber reinforcement at standard application rate of 1.5 pounds per cubic yard (0.90 kg/m³) of concrete.
 4. Mix synthetic fiber reinforcement in concrete mixer in accordance with mixing time and speed of ASTM C 94 to ensure uniform distribution and random orientation of fibers throughout concrete.
- F. Provide sufficient numbers of supports, and of strength to carry the reinforcement.
- G. Do not place reinforcing bars more than 2" beyond last leg of any continuous bar support.
- H. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.

3.03 SPLICES

- A. Lap splices: Tie securely with the specified wire to prevent displacement of splices during placement of concrete.
- B. Splice devices:
1. Obtain the *ENGINEER'S* approval prior to using splice devices.
 2. Install in accordance with manufacturer's written instructions.
 3. Splice in a manner developing at least the full tensile strength of the bar.
- C. Welding: Do not weld reinforcing bars without written permission from *ENGINEER*. If welding is permitted, perform in accordance with AWS D1.4.79.
- D. Do not splice bars except at locations shown on the Drawings, except as otherwise specifically approved by the *ENGINEER*.

3.04 TESTING

- A. Samples:
1. Samples for physical tests of reinforcement will consist of at least two pieces, each 18" long, of each size of reinforcement steel, selected by the

testing agency from material at the building site or at the fabricator's or supplier's yard.

2. Material to be sampled at the building site shall have been delivered thereto at least 72 hours before it is needed.

B. Tests:

1. Where samples are taken from bundles as delivered from the mill, with the bundles identified as to heat number, and provided mill analyses accompany the report, then one tensile test and one bend test will be made from a specimen of each ten tons or fraction thereof of each size of reinforcement steel.
2. Where positive identification of the heat number cannot be made, or where random samples are taken, then one series of tests will be made from each 2½ tons or fraction thereof of each size of reinforcement steel.
3. Payment for testing is described in *Section 01 45 29, Testing Laboratory Services* of these Specifications.

****END OF SECTION****

SECTION 03 30 00
(03300)
CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide all plain and reinforced cast-in-place concrete, complete in place, as indicated on the Plans, specified herein, and needed for complete and proper installation. This work includes, but is not limited to the following:
1. Fiber-reinforced structural and miscellaneous concrete.
 2. Fiber-reinforced footings and foundations.
 - a. Foundations shall include all concrete, formwork, concrete finishing, grout, anchor bolts and subgrade preparation required to support and transfer all design loads to the soil in accordance with the specified design criteria.
 3. Fiber-reinforced slabs.
 4. Sidewalks and curbs.
 5. Fiber- reinforced concrete where shown on the Drawings.
- B. Related work specified elsewhere:
1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
 2. *Section 01 45 29; Testing Laboratory Services*
 3. *Section 03 11 00: Concrete Formwork*
 4. *Section 03 20 00: Concrete Reinforcement*
 5. *Section 03 35 00: Concrete Finishing and Curing*
 6. *Section 31 23 00: Excavating, Filling and Grading*

C. Payment:

1. Unless otherwise noted in the Proposal Section, no separate payment shall be made for this item.
2. Include all costs for *CONCRETE* in the prices bid for the various related items of work as designated in the Proposal.

1.02 REFERENCES

A. American Concrete Institute (ACI):

1. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavy-Weight and Mass Concrete.
2. ACI 223 - Standard Practice for use of Shrinkage Compensating Concrete.
3. ACI 301 - Specification for Structural Concrete.
4. ACI 305R - Hot Weather Concreting.
5. ACI 306.1 - Cold Weather Concreting.
6. ACI 309R - Guide to Consolidation of Concrete.
7. ACI 315 - Details and Detailing of Concrete Reinforcement.
8. ACI 318 - Building Code Requirements for Reinforced Concrete.
9. ACI 350 - Environmental Engineering Concrete Structures.

B. American Society for Testing and Materials (ASTM):

1. ASTM C31 - Test Methods for Making and Curing Concrete Test Specimens in the Field.
2. ASTM C33 - Specification for Concrete Aggregate.
3. ASTM C94 - Specification for Ready Mixed Concrete.
4. ASTM C109 - Test Method for Compressive Strength of Hydraulic Cement Mortars.
5. ASTM C143 - Test Method for Slump of Portland Cement Concrete.

6. ASTM C150 - Specification for Portland Cement.
 7. ASTM C260 - Specification for Air-Entraining Admixtures for Concrete.
 8. ASTM C494 - Specification for Chemical Admixtures for Concrete.
 9. ASTM C920 - Specification for Elastomeric Joint Sealants.
 10. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
 11. ASTM C1621 - Test Method for Compressive Properties of Rigid Cellular Plastic.
 12. ASTM D1751 - Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.
 13. ASTM D1752 - Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
 14. ASTM E329 - Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
- C. U.S. Army Corps of Engineers:
1. CRD C48 - Method of Test for Water Permeability of Concrete
 2. CRD-C572 - Corps of Engineers Specifications for Polyvinylchloride Waterstops.

1.03 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples.*
- B. Provide specific submittals specified in ACI-301.
- C. Submit name and address of *CONTRACTOR's* testing laboratory.
- D. Submit sample concrete delivery slip.
- E. Manufacturer's product data:

1. Complete materials list of all materials proposed to be furnished and installed under this section including but not limited to:
 - a. Concrete Accessories
 - b. Admixtures
 - c. Joint systems and fillers
 - d. Waterstops
2. National Sanitation Foundation (NSF) certification for materials to be used in contact with potable water.
3. Specifications and other data required that demonstrate compliance with the specified requirements.

F. Mixes:

1. The Contractor shall furnish for approval mix proportions prepared by a testing laboratory approved by the *ENGINEER*.
2. Submit mixture proportions and related data for each concrete mixture.
3. Provide chemical analysis of cement and gradation of aggregate.

G. Concrete delivery slips:

1. Submit 2 legible copies of the delivery slip for each load of concrete to the *ENGINEER* or his representative.
2. All deliveries of concrete shall be accompanied by delivery slips conforming to ASTM C-94 and shall show:
 - a. Name of ready-mix batch plant,
 - b. Serial number of ticket,
 - c. Date,
 - d. Truck number,
 - e. Name of purchaser,
 - f. Specific designation of job (name and location),

- g. Specific class or designation of the concrete in conformance with that employed in job,
- h. Amount of concrete in cubic yards,
- i. Time loaded or of first mixing of cement and aggregates,
- j. Water added by receiver of concrete and his initials,
- k. Type and brand, and amount of cement,
- l. Type and brand, and amount of admixtures,
- m. Information necessary to calculate the total mixing water added by the producer. Total mixing water includes free water on the aggregates, water, and ice batched at the plant, and water added by the truck operator from the mixer tank.
- n. Maximum size of aggregate,
- o. Weights of fine and coarse aggregate,
- p. Ingredients certified as being previously approved,
- q. Signature or initials of ready-mix representative.
- r. The batch plant shall indicate the amount of water that may be added at the jobsite without altering the water/cement ratio by adding the following statement to each batch ticket and filling in the blanks:

*“No more than __ . __ Gals/CY
of water may be added at the site.”*

- 3. Record on each delivery slip the location where placed in the work and the time of placement.

H. Quality Control Submittals:

- 1. Submit two (2) copies of all quality control test results for approval by the *ENGINEER*.

1.04 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.

- B. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:
 - 1. American Concrete Institute:
 - a. ACI-301, "Specification for Structural Concrete".
 - b. ACI-318, "Building Code Requirements for Structural Concrete".
 - 2. Concrete Reinforcing Steel Institute (CRSI):
 - a. "Manual of Standard Practice".

- C. Concrete Testing Service:
 - 1. Employ a testing agency acceptable to *ENGINEER* to perform material evaluation tests and to design concrete mixes.
 - 2. Concrete testing shall be performed in accordance with *Section 01 45 29* by an approved laboratory and inspection service experienced in sampling and testing concrete. Testing agency shall meet the requirements of ASTM E329.

- D. Quality control:
 - 1. Concrete Sampling and Testing:
 - a. Testing by the Contractor shall include sampling and testing concrete materials proposed for use in the work and testing the design mix for each class of concrete.
 - b. Quality control testing during construction shall also be performed by the Contractor.
 - 2. The testing services described in Section 1.6.3, 1.6.4, 1.6.5, 1.6.7, 1.6.8, 1.7.4, and 1.7.5 of ACI-301 which include compressive strength, air-

content, slump and temperature tests shall be accomplished by the Contractor as further detailed in *Section 01 45 29* and test results submitted to the *ENGINEER* for approval.

3. The testing for the amount of expansion of shrinkage compensating concrete shall be accomplished by the Contractor in accordance with ASTM C878.
4. The *ENGINEER* shall have the right to make check tests of aggregates and concrete, using the same materials, and to order changes as may be necessary to meet the specified requirements. Cylinders made in the field shall be made and cured in accordance with ASTM C-31; Standard Practice for Making and Curing Concrete Test Specimens in the Field. Laboratory tests and laboratory made cylinders shall conform to the appropriate tests and procedures specified above for testing aggregates and for determining the relation between water content and compressive strength.
5. If concrete of the required characteristics is not being produced, as the work progresses, the *ENGINEER* may order such changes in proportions of material as may be necessary to secure concrete of the specified quality. The Contractor shall make such changes at his own expense and no extra compensation will be allowed because of such change.

E. Field acceptance of concrete:

1. Air content: Concrete not within the limits of air-entrainment indicated in paragraph 2.03 and tested in accordance with paragraph 1.04D2 shall not be used in the Work.
2. Slump: Concrete not within the slump limits of paragraph 2.03 at the point of placement shall not be used in the Work.
3. Temperature: Concrete not within temperature limits of paragraph 1.05D shall not be used in the Work.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Comply with the requirements specified in ACI-301.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the work and materials of all other trades.

- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Concrete temperature:
1. When the average of the highest and lowest temperature during the period from midnight to midnight is expected to drop below 40° F for more than three successive days, deliver concrete to meet the following minimum temperatures immediately after placement:
 - a. 55° F for sections less than 12 in. in the least dimension;
 - b. 50° F for sections 12 to 36 in. in the least dimension;
 - c. 45° F for sections 36 to 72 in. in the least dimension; and
 - d. 40° F for sections greater than 72 in. in the least dimension.
 2. The temperature of concrete as placed shall not exceed these values by more than 20° F. These minimum requirements may be terminated when temperatures above 50° F occur during more than half of any 24 hour duration.
 3. Unless otherwise specified or permitted, the temperature of concrete as delivered shall not exceed 90 °F.

1.06 PROJECT CONDITIONS

- A. Do not commence placement of concrete until mix designs have been reviewed and approved by the *ENGINEER* and all governmental agencies having jurisdiction, and until copies are at the job site, the batch plant, and the building department.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style,

type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.

- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.
- C. All concrete shall meet the requirements of ASTM C94, Option C.
- D. All concrete shall be Class “E” unless otherwise specified or noted on the Contract Drawings.

2.02 MATERIALS

A. Cement:

- 1. Portland cement or blended cement:
 - a. Class E concrete: ASTM C150, Type I.
 - b. Class F & T: ASTM C595, Type IP (MS), IS (MS), or ASTM C150, Type II.
 - c. Class G concrete: ASTM C150, Type V.
 - d. When ASTM C595 blended cement is used, the maximum weight of fly ash, natural pozzolans, silicon fume, or ground blast furnace slug that is included in the concrete shall not exceed the percentages of total weight of cementitious materials shown in the table below.

Requirements for Concrete Exposed to Deicing Chemicals	
Cementitious Materials	Maximum Percent of Total Cementitious Materials by Weight*
Fly ash or other pozzolans conforming to ASTM C 618	25
Slag conforming to ASTM C 989	50
Silica fume conforming to ASTM C 1240	10
Total of fly ash or other pozzolans, slag, and silica fume	50†
Total of fly ash or other pozzolans and silica	35†

fume	
<p>*Total cementitious material also includes ASTM C 150, C 595, and C845 cement. The maximum percentages above shall include:</p> <p>a) Fly ash or other pozzolans present in Type IP or I(PM) blended cement, ASTM C 595;</p> <p>b) Slag used in manufacture of an IS or I(SM) blended cement, ASTM C 595; and</p> <p>c) Silica fume, ASTM C 1240, present in blended cement.</p> <p>†Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10%, respectively, of the total weight of cementitious materials.</p>	

2. Use one brand of cement throughout Project unless otherwise approved by the *ENGINEER*.

B. Aggregate:

1. General:

- a. Provide hardrock aggregate complying with ASTM C33, with additional attributes as specified herein.
- b. Provide aggregates from a single source for exposed concrete.

2. Fine aggregate:

- a. Provide washed natural sand having strong, hard, durable particles, and containing not more than 2% by weight of deleterious matter such as clay lumps, mica, shale, or schist.

3. Coarse aggregate:

- a. Provide coarse aggregate consisting of clean, hard, fine grained, sound crushed rock or washed gravel, or a combination of both, containing not more than 5% by weight of flat, chip-like, thin, elongated, friable, or laminated pieces, nor more than 2% by weight of shale or cherty material.
- b. Maximum size of coarse aggregate shall be 1", size #57.
- c. Maximum size of coarse aggregate for pea gravel concrete fill shall be 3/8 inch, size #8.

- C. Water: Mixing water shall be potable, except that non-potable water may be used if mortar made with the water in question has 7- and 28- day strengths equal to at

least 90 percent of the strength of similar specimens made with potable water, when tested in accordance with ASTM C109.

D. Admixtures:

1. All admixtures used in structures in contact with potable water shall be certified as meeting NSF/ANSI-61, Drinking Water System Components – Health Effects.
2. Air entraining:
 - a. Air entraining admixture conforming to ASTM C260 shall be used. Air entraining cement shall not be used.
 - b. Measure air content in accordance with ASTM C138, C173 or C231.
3. Calcium chloride and admixtures containing calcium chloride shall not be used.
4. Water reducing admixture:
 - a. The *CONTRACTOR* may at his option use a water reducing admixture.
 - b. This admixture shall conform to the requirements of ASTM C494, Type “A”, Normal Setting or Type “F”, High Range and meet the following supplementary requirements:
 - (1) Concrete made using the proposed admixture shall have a Relative Durability Factor of one hundred percent (100%). Admixture shall be chloride free.
 - (2) Test data shall be furnished to substantiate compliance with these requirements.
5. Waterproofing Admixture:
 - a. Waterproofing chemical admixture will be required for waterproof concrete. The chemicals in this admixture shall react with the moisture in fresh concrete and with the by-products of cement hydration to cause a catalytic reaction that generates a non-soluble crystalline formation throughout the pores and capillary tracts of the concrete and thus causes the concrete to become permanently sealed against the penetration of water or liquids from any

direction. This waterproofing chemical admixture shall cause the waterproof concrete to have the following properties:

- (1) Permeability: Treated samples shall show no measurable leakage when pressure tested to 150psi in accordance with U.S. Army Corps of Engineers CRD-C48,"Permeability of Concrete."
- (2) Compressive Strength: Treated samples shall exhibit a minimum of 10% increase in compressive strength at 28 days over control samples when tested according to ASTM C39, "Compressive Strength of Cylindrical Concrete Specimens".
- (3) When subjected to 300 freeze/thaw cycles (ASTM C 666 "Freeze/Thaw Durability), waterproof concrete samples shall have 94% relative durability.

b. Waterproofing admix shall be Xypex C-500, C-1000 or C-2000 as manufactured by Xypex Chemical Corporation, 13731 Mayfield Place, Richmond, B.C., Canada (Tel: 800 961.4477) or equal as recommended by manufacturer's based on mix design.

6. No other admixtures shall be used without the written consent of the *ENGINEER*.

E. Chloride Content:

1. The maximum water-soluble chloride content, expressed as a percent of cement, contributed from all ingredients of the concrete mix, including water, aggregates, cementitious materials and admixtures shall not exceed 0.10 percent when tested in accordance with ASTM C1218.

F. Premolded joint filler:

1. Structures and surfaces containing liquids, sludge or compost:
 - a. Closed cell sponge rubber conforming to ASTM D1752, Type I.
 - b. Cork conforming to ASTM D1752, Type II.
2. All other concrete structures:
 - a. Pre-molded joint filler shall be fiber expansion joint filler conforming to ASTM D1751.

3. Joint filler shall be of the thickness shown on the Plans, except when no thickness is shown use ½-inch thick material.
- G. Joint sealer: Conforming to *Section 07 92 13, Sealants and Caulking*.
- H. Mastic joint filler for contraction joints:
1. Type 2, 0.95 to 0.155 inch thick Protection Course as manufactured by W.R. Meadows, Inc., Elgin, IL, or equivalent.
- I. Waterstops:
1. Conforming to CRD C572.
 2. Waterstops shall be as manufactured by Vinylex Corporation, Knoxville, Tennessee, or equivalent.
 3. PVC multirib, 6" wide x 3/8" thick (Catalog No. R6-38). At those locations specifically noted on the Plans where the walls have been designed to be free moving, the waterstop shall be 3/8" thick, 6" wide, center bulb (Catalog No. RB6-38H).
- J. Reinforcing: Conforming to *Section 03 20 00, Concrete Reinforcement*.
- K. Vapor Retarder:
1. Provide 10 mil polyethylene Class A vapor retarder meeting ASTM E-1745 and that is resistant to deterioration from organisms and substances in contacting soil when tested according to ASTM E154.
 2. Acceptable products:
 - a. Perminator™ 10 mil by W.R. Meadows.
 - b. Stego-Wrap 10 mil by Stego Industries.
 - c. Or equal.

2.03 MIXES

A. General:

1. Provide a mix design prepared by the approved testing agency, based on strengths of the approved materials, and meeting the requirements specified herein or shown on drawings.
2. Secure the *ENGINEER* approval of each mix design, including new mix designs required to the prepared should there occur a change in materials being used.
3. All materials used should be so proportioned as to produce a well-graded mixture of high density and maximum workability, with a specified 28-day compressive strength of 4,000 psi.
4. The concrete shall be proportioned in accordance with ACI-211, subject to the following special requirements:

a. Maximum water-cement ratio: 0.45 by weight.

b. Minimum cement content:

<u>Coarse Aggregate No.</u>	<u>lb. Per Cubic Yard</u>
57 (1" maximum)	536

c. Slump (as determined in accordance with ASTM C143):

(1) Before any ASTM C494, Type F admixture is added.

(a) 1 inch minimum.

(b) 3 inch maximum for footings, caissons, substructure walls.

(c) 4 inch maximum for slabs, beams, reinforced walls, columns.

(2) After water reducing admixtures added maximum slump is 8".

B. Class T concrete:

1. General:

a. Concrete for structures that must be watertight and have moderate sulfate resistance. For example; structures that will come in contact with water, sewage, chemicals, or effluent.

- b. Concrete shall conform to the general requirements and to the following additional requirements.
- 2. Cement:
 - a. See paragraph 2.02A.
 - b. Where Type II cement is used the C₃A content of the portland cement should be less than eight percent (8%) in all concrete in direct contact with sewage or effluent.
- 3. Air entrained:
 - a. 5% ± 1½ air content.
 - b. 6% ± 1½ when fly ash used.
- 4. Waterproofing admixture: See paragraph 2.02D.5.
- 5. Aggregates:
 - a. Fine aggregates shall conform to the provisions of ASTM C33 except Section 3.2 therein, which does not apply. For sanitary engineering structures in which density and watertightness are of prime importance, natural rather than manufactured fine aggregates shall be used.
 - b. Coarse aggregates shall be size No. 57, as described in ASTM C33, and shall conform to all quality requirements noted therein, and the following limitations shall apply:
 - (1) Soft particles: 2.0 percent.
 - (2) Chert as soft impurity (defined in Table 3 of ASTM C33): 1.0 percent.
 - (3) Total of soft particles and chert as a soft impurity: 2.0 percent.
 - (4) Flat and elongated particles (long dimension more than 5 times short dimension): 15.0 percent.
 - c. The nominal maximum size of coarse aggregate shall be as previously specified.

C. Class E Concrete:

1. General:

- a. Concrete for curb, gutter, sidewalk, exterior concrete pads, exterior concrete paving, or footings, grade walls, thrust blocks where concrete is expected to be exposed to deicing salts and moderate sulfate resistance not desired.
- b. Concrete shall conform to the general requirements and the following additional requirements.

2. Cement:

- a. See paragraph 2.02A.

3. Air entrained: 6% ± 1½ air content.

E. Class F Concrete:

1. General:

- a. Concrete for interior floors where moderate sulfate resistance is desired and deicing salts are not to be used.
- b. Concrete shall conform to the general requirements and to the following additional requirements.

2. Cement:

- a. See paragraph 2.02A.

3. Non-air entrained: Less than or equal 3% air content.

F. Class G Concrete:

1. General:

- a. Concrete for structures that require severe sulfate resistance and must be watertight such as tanks, manholes and other wastewater structures containing sewage.
- b. Concrete shall conform to the general requirements and the following additional requirements.

2. Cement:
 - a. See paragraph 2.02A.
3. Air entrained: 5% ± 1½ air content.
4. Waterproofing admixture: See paragraph 2.02D.5.

2.04 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXISTING CONDITIONS

- A. Inspection:
 1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
 2. Verify that the work of this Section may be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.
- B. Discrepancies:
 1. In the event of discrepancy, immediately notify the *ENGINEER*.
 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 CONCRETE MIXING

- A. Concrete for minor work, when approved by the *ENGINEER*, may be mixed at the site in a power mixer when the mixer has a capacity not less than one full sack batch.

- B. Unless otherwise approved by the *ENGINEER*, use ready mixed concrete complying with ASTM C94, except as may be modified by the following:
1. Mixing:
 - a. Mix each batch of concrete not less than 15 minutes, five minutes of which shall be at the site.
 - b. Rotate the drum at the rate specified by the manufacturer of the mixer as "mixing speed".
 - c. Whenever there is a delay in unloading, rotate the drum at intervals to prevent incipient set of concrete.
- C. Concrete consistency:
1. Use the amount of water established by the approved mix design.
 - a. Do not exceed the minimum quantity specified for the grade of concrete.
 - b. Use the minimum amount of water necessary to produce concrete of the workability required by the *ENGINEER*.
 - c. Do not supplement the predetermined amount of water with additional water for any reason.
 2. Measure concrete consistency by ASTM C143 method.
 - a. As part of the routine testing and inspecting, test twice each day or partial day's run of the mixer.
 - b. Maintain a complete and accurate record of tests.
 3. Provide maximum concrete slumps as specified in Article 2.03B.
- D. Miscellaneous provisions:
1. Provide strengths of concrete as shown on the Drawings or specified herein.
 2. Provide concrete dense and free from honeycomb and other defects.
 3. Place and finish members to conform to the shapes and dimensions indicated, with all surface true to line, plumb, and level.

3.03 INSERTS, ANCHORS AND EMBEDDED ITEMS

A. Powder driven concrete fasteners:

1. In addition to their use where the pins are loaded in shear, powder driven concrete fasteners may be used in tension for support of light loads such as acoustical ceilings, ductwork, conduit, pipes, and similar items when such loads are limited to less than 75 lbs.
2. Testing:
 - a. Secure pre-qualification of operator, tool and fastener by an approved testing agency, who shall observe testing of the first ten fastener installations.
 - b. Apply a test "pull-out" load of not less than twice the design load or 150 lbs. whichever is the greater, to the pin in such a manner as not to resist the spalling tendency of the concrete surrounding the pin.
 - c. Thereafter, secure random tests by the approved testing agency of approximately one in ten pins; except that when the design load exceeds 75 lbs., test one-half of the pins.
 - d. Should failure occur on any pin tested, test all installations under observation of the approved testing agency, and replace all unqualifying pins at no additional cost to the *OWNER*.
 - e. Where Hilti "Kwik Bolts" or similar types of concrete anchor bolts are used for significant gravity loads or seismic anchorage, test in the presence of the approved testing agency:
 - (1) Proof test 50% of the bolts (alternate bolts in any group arrangement) to twice the allowable load;
 - (2) If there are any failures, also test the immediately adjacent bolt.
3. Where hanger rods, bolts, wire, or similar items are used to suspend construction items, place in the concrete as required and/or indicated.
4. Where suspended ceilings with metal carrying systems are called for on the Drawings:

- a. Provide hanger wires in the slab, as shown on the Drawings or otherwise required, of sufficient length to extend 12" below the line of the finish ceiling;
- b. Place the hanger wires in line to receive runner channels, beginning 6" from the walls parallel to the runners.

B. Reglets and rebates:

1. Form reglets and rebates as required to receive frames, flashing, and other equipment.
2. Verify the dimensions and positions of required reglets and rebates with trades whose work is related to or contingent upon such dimensions and positions.
3. If concrete slabs on earth join a wall or other perpendicular concrete surface, form a reglet in the wall to receive and carry the horizontal concrete work.
 - a. Provide reglet full thickness of the slab and 3/4" deep, unless otherwise shown on the Drawings.
 - b. Exterior walks need not be provided for in this way except where so detailed on the Drawings.

C. Embedded piping and rough hardware:

1. Coordinate the various trades who are required to fasten work to the structure, or are required to insert therein any sleeve, box, bolt, anchor, insert, or other rough hardware.
2. Provide every facility for setting all required items accurately in the forms.
3. Be responsible for changes in position of such items after they have been set.
4. Provide in the forms for all sleeves, boxes, bolts, anchors, inserts, strap anchors for frames, and other rough hardware required for the work, and which are shown or required to be embedded in the concrete.
5. Conduits and sleeves:
 - a. Locate so as not to reduce the strength of construction. Do not place pipes, except conduits, in a slab of less than 3½" thickness.

- b. In supported concrete slabs, do not bury conduit having an outside diameter greater than 33% of the thickness of the slab. Increase slab thickness locally to meet this requirement.
 - c. Do not place conduit between the bottom of reinforcing steel and the bottom of supported slab.
 - d. In placing conduits at slabs on earth, place below the reinforcement, and encase in concrete by increasing thickness of the slab locally to at least 3" of concrete around the conduit on all sides.
- D. Where openings in floors and walls are required by the various trades, but are not detailed on the Drawings, reinforce as directed by the *ENGINEER*.
- E. Waterstops:
- 1. All construction, expansion and contraction (control) joints in structures containing liquids or placed below ground shall have continuous waterstops placed as shown on the Plans.
 - 2. Waterstops shall be installed as follows:
 - a. Center bulb or middle of the waterstop shall be placed exactly in the middle of the joint, unless otherwise shown on the Drawings.
 - b. Concrete around waterstop to be thoroughly vibrated. All voids or honeycombs to be eliminated to assure complete bonding of concrete to waterstop ribs.
 - c. For second pour, place copperclad steel anchors as far as possible into the waterstop and then secure to the forms and/or reinforcing bars using No. 16 gauge tie-wire. Space ties on centers suitable to maintain proper positioning under placement of concrete.
 - d. Splicing: All straight run, connecting and intersecting joints to be securely spliced in accordance with manufacturers recommendations. Splices joints to provide bond equal to strength of waterstop section. All field spliced shall be heat fused.
- F. Vapor Retarders:
- 1. Installation shall be in accordance with manufacturer's instructions and ASTM E 1643.

2. Unroll vapor retarder with the longest dimension parallel with the direction of the pour.
3. Lap Vapor Retarder over footings and seal to foundation walls.
4. Overlap joints 6 inches and seal with Vapor Bond Tape or other 4" wide pressure sensitive tape.
5. Seal all penetrations (including pipes) with manufacturer's pipe boot.
6. No penetration of the Vapor Retarder is allowed except for reinforcing steel and permanent utilities.
7. Repair damaged areas by cutting patches of Vapor Retarder, overlapping damaged area 6 inches and taping all four sides with Vapor Bond Tape or other 4" wide pressure sensitive tape.

3.04 CONTRACTOR FIELD ACCEPTANCE OF CONCRETE

- A. Review and accept concrete only with a completed delivery slip.
- B. Review and accept concrete only if it meets the requirements of paragraph 2.03, Mixes and 1.04, Final Acceptance of Concrete.

3.05 CONVEYING AND PLACING CONCRETE

- A. General:
 1. All concrete work shall comply with ACI-301 and ACI-318 except as modified by the Supplemental Requirements herein.
- B. Cold-Weather Placement: Comply with provisions of ACI-306 and as follows.
 1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
- C. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.

1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- D. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete in compliance with ACI-305R and as specified.
1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90 deg F (32 deg C). Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
 3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
 4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, only when approved by the *ENGINEER*.
- E. Concreting under water will not be permitted.
- F. Before placing concrete, thoroughly clean forms, wash out with water, and make tight.
1. Do not place concrete until reinforcement, conduits, outlet boxes, anchors, sleeves, hangers, bolts, and other embedded materials are securely and properly fastened in their correct positions.
 2. Secure the *ENGINEER's* approval of reinforcement before commencing placement of concrete.
- G. Preparation:
1. Before new concrete is deposited upon or against concrete that has taken its initial set or has hardened, remove all incrustations from forms and reinforcement.

2. Remove all laitance, oil, and loose particles from concrete and concrete surfaces, and thoroughly clean the forms with water under stiff pressure.
3. Remove laitance after concrete has hardened partially (not less than two hours nor more than four hours after placing) by brushing with stiff bristles, or by directing a stream of water from a 1/4" nozzle, or by other method approved by the *ENGINEER*, to expose the clean to surface of the coarse aggregate.
4. Where cleaning is not satisfactory to the *ENGINEER*, sandblast the surface and then wash again.

H. Method of placing:

1. Place concrete only under the degree of inspection described elsewhere in these Specifications, and as required by governmental agencies having jurisdiction.
2. Do not place concrete outside of regular working hours unless required inspection authorities have been notified properly and are present.
3. Spouts, pipes, troughs, belts, chain buckets, and other equipment may be used in conveying concrete, but the manner and method used shall be only as approved by the *ENGINEER*.
4. Do not permit concrete to free drop more than 5'-0".
5. Deposit concrete directly into conveyances, and direct from conveyances to final points of repose, except where troughs, buckets, or the like are used, in which case dump concrete into hoppers and then into the conveyances.
6. Where tremies are used, or where the free drop is 5'-0" or more, and through reinforcement, use a dumping box or board, moving the concrete therefrom by shovels or hoes.
7. Deposit concrete so that the surface is kept level throughout, a minimum being permitted to flow from one position to another, and place as rapidly as practicable after mixing.
8. Do not use in this Work any concrete not placed within 30 minutes after leaving the mixer.

I. Tamping and conveying:

1. Consolidation: All concrete shall be consolidated by vibration, spading, rodding or forking so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness. Internal vibrators used shall be the largest size and the most powerful that can be used properly in the work, as described in Table 5.1.5 of ACI 309R. They shall be operated by competent workmen. Use of vibrators to transport concrete within form shall not be allowed. Vibrators shall be inserted and withdrawn at points approximately eighteen inches (18") apart. At each insertion, the duration shall be sufficient to consolidate the concrete but not sufficient to cause segregation, generally from 5 to 15 seconds. A spare vibrator shall be kept on the job site during all concrete placing operations. Where the concrete is to have an as-cast finish, a full surface of mortar shall be brought against the form by the vibration process, supplemented if necessary by spading to work the coarse aggregate back from the formed surface.
2. Completely compact with tamping poles and by tapping forms until the concrete is thoroughly compact and without voids. Determine the number of tampers needed by the amount and method of placing concrete.
3. Exercise care to tamp concrete vigorously and thoroughly to obtain maximum density.
4. Use manual tampers as well as mechanical vibrators.
 - a. Exercise care to direct the quick handling of vibrators from one position to another.
 - b. Do not over-vibrate concrete.
 - c. Do not move concrete by use of vibrator.

J. Stoppages:

1. Stop concrete placing only when and where approved by the *ENGINEER*.
2. Maintain flow surfaces of freshly placed concrete as level whenever a pour is stopped, providing tight dams to accomplish this.
3. Make construction joints only where unavoidable, and then only at points determined by the *ENGINEER*.

4. Make horizontal construction joints only where shown on the Drawings or specifically approved by the *ENGINEER*.
5. Provide keys and dowels at construction joints where indicated on the Drawings, and where concrete placement is interrupted.

K. Bonding:

1. When specified, the surface of joints shall be prepared in accordance with the methods specified in Section 5.3.2.6 of ACI-301.
2. The hardened concrete of construction joints and of joints between footings and walls or columns, between walls or columns and beams or floors they support, joints in unexposed walls and all others not mentioned below shall be dampened (but not saturated) immediately prior to placing of fresh concrete.
3. The hardened concrete of horizontal construction joints in exposed work; horizontal construction joints in the middle of beams, girders, joists, and slabs; and horizontal construction joints in work designed to contain liquids shall be dampened (but not saturated) and then thoroughly covered with a coat of cement grout of similar proportions to the mortar in the concrete. The fresh concrete shall be placed before the grout has attained its initial set.
4. Joints receiving an adhesive shall have been prepared and adhesive applied in accordance with the manufacturer's recommendations prior to placing of fresh concrete.

3.06 STEPS, SLABS, WALKS, AND PAVING ON EARTH

A. Preparation for slabs on earth:

1. Prepare the subgrade as specified in other Sections.
2. Dampen the subgrade for exterior slabs and paving prior to placing concrete, but do not dampen subgrade at interior floor slabs.
3. Provide the vapor retarder with bedding and covering shown on the Drawings, beneath floor slabs on grade.
 - a. Place the membrane in as large sheets as practicable, lapping 12", with the top lap placed in the direction concrete will be spread.

- b. Carefully cut, fit, and seal the membrane to all pipes and conduits projecting through the membrane, using small sheets, where necessary, and pressure-sensitive tape.
- c. Make necessary repairs to the membrane, and secure the *ENGINEER'S* approval before placing concrete.
- d. Do not permit membrane to be punctured except at screed stakes and utility risers.

B. Placing and finishing:

1. Tamp the freshly placed concrete, except slabs to receive separate topping finish or mortar setting bed, using a heavy tamper, until at least 3/8" or mortar is brought to the surface.
2. Use tampers having a face consisting essentially of a grid of parallel metal bars.
3. Tamp with a light tamper, and screed with a heavy straightedge, until depressions and irregularities are worked out and the surface is true to finish grades and elevations.
4. Remove excess water and debris worked to the surface in compacting and screening.
5. At slabs to receive separate topping finish or mortar setting beds, do not continue tamping to raise the mortar described in subparagraph 3.05.B.1 above.
6. Remove laitance as described in subparagraph 3.05.G.3 above.
7. When concrete has hardened sufficiently, float to compact and smooth surface.
8. Provide the finish surfaces shown on the Drawings or otherwise directed by the *ENGINEER*.

3.07 SODA AND ACID WASH

- A. At concrete surfaces to receive plaster, paint, or other finish, and which have been formed by oil-coated forms, scrub with a solution of 1½ lbs. caustic soda to one gallon of water.

- B. On surfaces where smooth wood or waste molds have been used, scrub with a solution of 20% muriatic acid or hydrochloric acid.
- C. After the surfaces have been scrubbed, wash with clean water as soon as possible.

3.08 DEFECTIVE CONCRETE

- A. The following concrete will be deemed to be defective and shall be removed promptly from the job site.
 - 1. Concrete, which is not formed as indicated, is not true to intended alignment, is not plumb or level where so intended, is not true to intended grades and levels;
 - 2. Has voids or honeycomb that have been cut, resurfaces, or filled, unless with the approval of the *ENGINEER*;
 - 3. Has sawdust, shavings, wood, or embedded debris;
 - 4. Does not conform fully to provisions of the *Contract Documents*.
- B. Repairs and replacements:
 - 1. Where defective concrete is found after removal of the forms, cut out the defective concrete, if necessary, and make the surfaces match adjacent surfaces.
 - 2. Work uneven surfaces and angles of concrete to a surface matching adjacent concrete surfaces.

3.09 GROUTING AND CEMENT POINTING

- A. After steel columns have been installed and leveled, drypack the space between the bottom of the plate and concrete, using cement grout driven in to completely fill the space and forming solid bearing for the column base plate.

3.10 MISCELLANEOUS CONCRETE ITEMS

- A. Walls and curbs:
 - 1. Construct header walls and curbs as shown on the Drawings.

2. Trowel exposed concrete surfaces smooth.
- B. Leave openings in floor slabs for foundations for machines, equipment and platforms in dimensions and arrangements required for the approved machines, equipment and platforms.

****END OF SECTION****

SECTION 03 35 00
(03345)
CONCRETE FINISHING AND CURING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Finishing and curing of cast-in-place concrete as needed for a complete and proper installation.

B. Related work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 03 30 00: Concrete*
3. *Section 03 11 00: Concrete Formwork*

C. Payment:

1. Unless otherwise noted in the Proposal Section, no separate payment shall be made for this item.
2. Include all costs for *CONCRETE FINISHING AND CURING* in the prices bid for the various related items of work as designated in the Proposal.

1.02 SUBMITTALS

A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.

B. Manufacturer's product data:

1. Complete materials list of all materials proposed to be furnished and installed under this section.
2. Specifications and other data required that demonstrate compliance with the specified requirements.

1.03 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- B. Except as may be modified herein or otherwise directed by the Engineer, comply with ACI 301, "Specifications for Structural Concrete for Buildings."

1.04 PRODUCT HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacement necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Deliver materials in manufacturer's original unopened packaging with all tags and labels intact and legible of time of use.
- E. Store and handle material in strict accordance with manufacturers directions and in such a manner as to avoid damage; store at site under cover.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 MATERIALS

- A. General:
1. Carefully study the *Contract Documents* and determine the location, extent, and type of required concrete finishes.
 2. As required for the work, provide the following materials, or equivalents approved in advance by the *ENGINEER*.
- B. Concrete materials: Comply with pertinent provisions of Section 03300, except as may be modified herein.
- C. Liquid bonding agent: “Weld-Crete,” manufactured by the Larsen Products Corporation, or equal.
- D. Curing and protection paper:
1. Approved products:
 - a. “Sisalkraft, Orange Label”;
 - b. Equal products complying with ASTM C171.
 2. Where concrete will be exposed and will be subjected to abrasion, such as floor slabs, use non-staining paper such as “Sisalkraft, Seekure 896,” or equal paper faced with polyethylene film.
 3. 6 mil, white polyethylene sheeting.
- E. Liquid curing compound:
1. Concrete sealer: “VOCOMP-30” acrylic concrete curing and sealing material by W.R. Meadows or equivalent.
- F. Slip-resistant abrasive aggregate:
1. Provide aluminum oxide, 14/36 grading.
 2. Acceptable manufacturers:
 - a. Carborundum Company
 - b. Norton Company

c. L.M. Scofield Company

2.03 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 REQUIRED FINISHES

- A. Formed Surfaces:
1. Formed surfaces of concrete which will be exposed to view and which will not be painted shall receive a grout cleaned finish.
 2. Formed surfaces of concrete that will be painted shall receive a smooth form finish. Surfaces designated for immersion service shall not be "Bagged."
 3. Formed surfaces of concrete that will not be exposed to view but which will receive waterproofing shall be given a smooth form finish.
 4. Formed surfaces of concrete that will not be exposed to view and which are not scheduled to receive paint and/or waterproofing shall be given a rough form finish.
 5. Unspecified finish: If the finish of formed surfaces is not specified herein, provide the following finishes as applicable.

- a. Rough form finish:
 - (1) For all concrete surfaces not exposed to public view.
 - b. Smooth form finish:
 - (1) For all concrete surfaces exposed to public view.
- B. Slabs:
- 1. Tanks and other structures containing water and/or sewage.
 - a. Surfaces of foundation slabs beneath tank walls that are not anchored to the slab (free floating) shall receive a steel troweled finish.
 - b. Surfaces of foundation slabs designated to receive a grout topping shall receive a scratched finish.
 - c. All other surfaces of foundation slabs, floor slabs, and unformed surfaces of footings that will be exposed to view when the structure is empty shall receive a troweled finish except that hand troweling subsequent to power troweling will not be required. One additional pass with a power trowel using steel trowel blades may be substituted for hand troweling. Hand troweling will only be required in areas that are not accessible to a power trowel.
 - 2. Floor slabs of buildings including stair landings and miscellaneous areas and garage floors shall receive a troweled finish. Floor slabs that will not receive tile, carpet or paint shall also receive floor sealer as specified herein.
 - 3. Unformed surfaces of equipment foundations shall receive a floated finish.
 - 4. Sidewalks, ramps and all exterior slabs on grade that are intended as walking surfaces shall receive a broom finish.
 - 5. Exterior platforms, steps and landings and exterior and interior pedestrian ramps shall receive a non-slip finish.
 - 6. Unspecified finish: If the finish of slab surfaces is not specified herein, provide the following finishes as applicable:
 - a. Scratched finish:

- (1) For surfaces scheduled to receive bond-applied cementitious applications and slate or stone paving.
- b. Floated finish:
 - (1) For surfaces intended to receive roofing.
- c. Troweled finish:
 - (1) For floors intended as walking surfaces.
 - (2) Floors scheduled to receive floor coverings or waterproof membrane.
- d. Broom finish:
 - (1) Exterior pedestrian ramps.
- e. Non-slip finish:
 - (1) Platforms, steps, and landings;
 - (2) Exterior or interior walkways near process equipment.

3.03 FINISHING OF FORMED SURFACES

A. General:

- 1. After removal of forms, give the concrete surfaces one or more of the finishes specified below.
- 2. Patch all bug holes, voids and cracks.
- 3. Revise the finishes as needed to secure the approval of the *ENGINEER*.

B. As-cast finish:

- 1. Rough form finish (below grade surfaces only):
 - a. Leave surfaces with the texture imparted by forms, except patch tie holes and defects.
 - b. Remove fins exceeding 1/4" in height.

2. Smooth form finish:
 - a. Coordinate as necessary to secure form construction using smooth, hard, uniform surfaces, with number of seams kept to a practical minimum and in a uniform and orderly pattern.
 - b. Patch tie holes and defects.
 - c. Remove fins completely.

- C. Rubbed finishes:
 1. Provide these finishes only on a “smooth form finish” base as described above.
 2. Smooth rubbed finish:
 - a. Produce on newly hardened concrete no later than the day following form removal.
 - b. Wet the surfaces, and rub with carborundum brick or other abrasive until uniform color and texture are produced.
 - c. Do not use a cement grout other than the cement paste drawn from the concrete itself by the rubbing process.
 3. Grout cleaned finish:
 - a. Do not start cleaning operations until all contiguous surfaces to be cleaned are completed and accessible.
 - b. Do not permit cleaning as the work progresses.
 - c. Mix one part portland cement and 1½ parts fine sand with sufficient water to produce a grout having the consistency of thick paint.
 - d. Substitute white portland cement for part of the gray portland cement as required to produce a color matching the color of surrounding concrete, as determined by a trial patch.
 - e. Wet the surface of the concrete sufficiently to prevent absorption of water from the grout, and apply the grout uniformly with brushes or spray gun.

- f. Immediately after applying the grout, scrub the surface vigorously with a cork float or stone to coat the surface and fill all air bubbles and holes.
- g. While the grout is still plastic, remove all excess grout by working the surface with a rubber float, sack, or other means.
- h. After the surface whites from drying (about 30 minutes at normal temperatures) rub vigorously with clean burlap.
- i. Keep the surface damp for at least 36 hours after final rubbing.

3.04 FINISHING SLABS

A. Definition of finishing tolerances:

- 1. "Class A": True plane within 1/8" in ten feet as determined by a ten foot straightedge placed anywhere on the slab in any direction.
- 2. "Class B": True plane within 1/4" in ten feet as determined by a ten foot straightedge placed anywhere on the slab in any direction.
- 3. "Class C" True plane within 1/4" in two feet as determined by a two foot straightedge placed anywhere on the slab in any direction.

B. Scratched finish: After the concrete has been placed, consolidated, struck off, and leveled to a Class C tolerance, roughen the surface with stiff brushes or rakes before the final set.

C. Floated finish:

- 1. After the concrete has been placed, consolidated, struck off, and leveled, do not work the concrete further until ready for floating.
- 2. Begin floating when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation.
- 3. During or after the first floating, check the planeness of the surface with a ten-foot straightedge applied at not less than two different angles.
- 4. Cut down high spots and fill low spots, and produce a surface with a Class B tolerance throughout.
- 5. Refloat the slab immediately to a uniform sandy texture.

D. Troweled finish:

1. Provide a floated finish as described above, followed by a power troweling and then a hand troweling.
 - a. Produce an initial surface which is relatively free from defects, but which still may show some trowel marks.
 - b. Provide hand troweling when a ringing sound is produced as the trowel is moved over the surface.
 - c. Thoroughly consolidate the surface by hand troweling.
2. Provide a finished surface essentially free from trowel marks, uniform in texture and appearance, and in a plane of Class A tolerance.
 - a. On surfaces intended to support floor coverings, use fringing or other means as necessary and remove all defects in such magnitude as would show through the covering.

E. Broom finish:

1. Provide a floated finish as described above.
2. While the surface is still plastic, provide a textured finish by drawing a fiber bristle broom uniformly over the surface.
3. Unless otherwise directed by the *ENGINEER*, provide the texturing in one direction only.
4. Provide "light," "medium," or "coarse" texturing as directed by the *ENGINEER* or otherwise called for on the Drawings.

3.05 CURING, SEALING AND PROTECTION

- A. Beginning immediately after placement, protect concrete from premature drying, excessively hot and cold temperatures and mechanical injury.
- B. Where application of specified finish materials will be inhibited by use of curing or sealing agents, cure the surface by water only; do not use chemical cure. Do not use curing or sealing compound on surfaces to receive tile or crystalline waterproofing.

- C. Liquid curing or sealing compounds shall not be used on any surface against which additional concrete or other material is to be bonded unless it is proven that the curing compound will not prevent or reduce bond, or unless positive measures are taken to remove it completely from such areas.
- D. Preservation of moisture:
1. Unless otherwise directed by the *ENGINEER*, apply one of the following procedures to concrete not in contact with forms, immediately after completion of placement and finishing.
 - a. Ponding or continuous sprinkling.
 - b. Application of absorptive mats or fabric kept continuously wet.
 - c. Application of sand kept continuously wet.
 - d. Continuous application of steam (not exceeding 150°F) or mist spray.
 - e. Application of waterproof sheet materials specified in Part 2 of this section.
 - f. Application of other moisture retaining covering as approved by the *ENGINEER*.
 - g. Application of the curing agent specified in Part 2 of this section or elsewhere in the contract Documents.
 - (1) Apply curing compound when the surface water has disappeared and walking workmen will not mar the concrete surface.
 - (2) Apply at the rate of 1/10 of a gallon per minute. Spray on in a fine, fog pattern without spurts and dribbles to form a thin, continuous film. Avoid puddling in low areas. Brush or roll out all puddles.
 2. Where forms are exposed to the sun, minimize moisture loss by keeping the forms wet until they can be removed safely.
 3. Cure concrete by preserving moisture as specified above for at least seven days.

E. Sealing:

1. Apply specified sealing compound to concrete curbs, sidewalks, driveways and aprons, designated floors and exterior flat work not designated to receive other finishes. Material may be used as a curing compound on these surfaces in accordance with manufactures directions.

F. Temperature, wind, and humidity:

1. Cold weather:

- a. When the mean daily temperature outdoors is less than 40°F, maintain the temperature of the concrete between 50°F and 70°F for the required curing period.
- b. When necessary, provide proper and adequate heating system capable of maintaining the required heat without injury due to concentration of heat.
- c. Do not use combustion heaters during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases, which contain carbon dioxide.

2. Hot weather: When necessary, provide wind breaks, fog spraying, shading, sprinkling, ponding, or wet covering with a light colored material, applying as quickly as concrete hardening and finishing operations will allow.

3. Rate of temperature change: Keep the temperature of the air immediately adjacent to the concrete during and immediately following the curing period as uniform as possible and not exceeding a change of 5°F in any one hour period, of 50°F in any 24-hour period.

G. Protection from mechanical injury:

1. During the curing period, protect the concrete from damaging mechanical disturbances such as heavy shock, load stresses, and excessive vibration.
2. Protect finished concrete surfaces from damage from construction equipment, materials, and methods, by application of curing procedures, and by rain and running water.
3. Do not load self-supporting structures in such a way as to overstress the concrete.

****END OF SECTION****

SECTION 03 62 00
(03600)
NONSHRINK CEMENT GROUT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Grouting of equipment and column baseplates, setting precast concrete and anchor bolts.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. Cement-based grouting as indicated in Specifications, equipment manufacturer's specifications and on drawings shall comply with this section.
3. *Section 05 12 00: Structural Steel*
4. *Section 05 50 00: Metal Fabrications*

C. References:

1. ASTM C 109 Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
2. ASTM C 191 Standard Test Method for Time of Set of Hydraulic Cement by Vicat Needle
3. ASTM C 827 Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures
4. CRD C 621 Corps of Engineers Specification for Nonshrink Grout
5. ASTM C 1090 Standard Test Method for Measuring Changes in Height of Cylindrical Specimens from Hydraulic Cement Grout

6. ASTM C 1107 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (nonshrink)

1.02 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Manufacturer's product data:
 1. Complete materials list of all materials proposed to be furnished and installed under this section.
 2. Specifications and other data required that demonstrate compliance with the specified requirements.
 3. The Contractor must submit, prior to installation, for approval, manufacturer's literature and certified test data that material complies with specified requirements.
- C. Manufacturer's recommended installation procedures.

1.03 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
 2. All material suppliers shall be approved suppliers under NRC regulation 10 CFR 50, Appendix B Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.
- B. Qualifications of workmen:
 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.

2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the methods and materials to be used.
 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- C. Basis of acceptance:
1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. All cement-based grouts shall be preblended, prepackaged materials requiring only the addition of water. They shall be delivered to the job site in original, unopened packages, clearly labeled with the manufacturer's identification and printed instructions. All cement-based materials shall be stored and handled in accordance with the recommendations of the manufacturer and the American Concrete Institute.

1.05 ENVIRONMENTAL CONDITIONS

- A. Refer to the manufacturer's literature for any physical or environmental limitations or contact the manufacturer directly.

1.06 WARRANTY AND WARRANTY REPAIRS

1. Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
2. The material manufacturer shall warrant that the non-shrink grout shall never go below its initial placement volume when tested in accordance with ASTM C827.

3. The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the warranty period.

PART 2 - PRODUCT

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 PRODUCTS

- A. Grout shall be as specified herein and as manufactured by Five Star Products, Inc., Fairfield, Connecticut (203) 336-7900 or equivalent.
- B. Grouts:
 1. Five Star Grout: General Purpose
 2. Five Star Instant Grout:
 - a. Grouting of heavy equipment where start-up will occur in four (4) hours.
 - b. Rapid anchoring.
 3. Five Star Special Grout 110: Pumpable
 4. Five Star Special Grout 150: Areas subject to Sulfate attack.
 5. Five Star Special Grout 550: Hot weather grouting at temperatures to 115°F.

2.03 MATERIALS

- A. Cement-based grouts shall have a history of successful use and meet the following performance requirements at maximum water. They shall not contain expansive cement or metallic particles such as aluminum powder or iron filings.
1. Plastic Volume Change: The grout shall show no shrinkage (0.0%) and a maximum 4.0% expansion from time of placement until final set when tested according to ASTM C 827.
 2. Hardened Volume Change: The grout shall show no shrinkage (0.0%) and a maximum 0.2% expansion in the hardened state when tested according to C1090.
 3. Compressive Strength: The grout shall show a minimum 28-day compressive strength of 5,000 psi when tested according to ASTM C 109, restrained.
 4. Working Time: The grout shall show a consistency greater than 125% for a minimum 45 minutes when tested according to applicable consistency sections of ASTM C 827 at 15-minute intervals.
 5. Tests: The Cylinder Plate Test shall be run on all field shipments.
 6. Meet all requirements of ASTM C1107 for a Grade "C" Grout.

2.04 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Inspect concrete surfaces to receive grout and verify that they are free of ice, frost, dirt, grease, oil, curing compounds, paints, impregnations and all loose material or foreign matter likely to affect the bond or performance of the grout.
- E. Newly placed concrete shall have been placed and cured sufficiently to attain its design strength.
- F. Inspect baseplates for rust, oil, and other deleterious substances.

3.02 PREPARATION

- A. In order to ensure proper bond to the baseplate and the concrete, all grease, oil, dirt, curing compounds, laitance rust and other deleterious materials must be completely removed from the concrete and bottom of baseplate.
- B. Roughen the surfaces by chipping, sandblasting or other mechanical means to assure bond of the grout to the existing concrete. Loose or broken concrete shall be removed.
- C. After concrete surfaces have been washed clean, they shall then be saturated with water for 24 hours prior to placement of cement-based grout.
- D. Upon completion of saturation period excess water shall be removed with clean compressed air prior to grouting.
- E. Forms to be built as needed.

3.03 INSTALLATION

- A. Carefully read and understand the manufacturer's instructions as printed on the unit.
- B. Mixing: A mortar mixer is recommended. Pre-wet the mixer, empty excess water. Add pre-measured amount of potable water to mixer then add grout. Mix for at least 3, but not more than 5 minutes, then place.
- C. Placing: Grout may be drypacked, flowed, vibrated or pumped into place. All grouting shall take place from one side of a plate to the other to avoid trapping air.

- D. Cutback: Just before the grout has reached its final set, the grout must be cutback to the lower edge of the plate. A 45 degree angle or vertical cutback is recommended.
- E. Curing: The grout shall be kept moist for a minimum of three days. The method needed to protect the grout will depend on temperature, humidity and wind. Wet burlap, a soaker hose, sun shading, ponding and in extreme conditions a combination of methods shall be employed.
- F. Clean-up: Upon completion of placement, equipment and tools shall be cleaned in such a manner as recommended by manufacturer.

****END OF SECTION****

SECTION 05 12 00
(05120)
STRUCTURAL STEEL

PART 1 - GENERAL

1.01 SUMMARY

A. Work included:

1. Furnish, erect, and fasten all the structural steel required under this contract including all base, wall, or other plates, expansion bolts, anchor bolts, rivets, bolts and nuts, etc., and all welding required for fabrication or erection.
2. Unless otherwise indicated on the drawings, paint all structural steel and supports in accordance with *Section 09 90 00, Painting*.

B. Related Work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 03 30 00: Concrete*
3. *Section 05 50 00: Metal Fabrications*
4. *Section 09 90 00: Painting*

C. Payment:

1. Unless otherwise noted in the *Proposal* Section, no separate payment shall be made for this item.
2. Include all costs for *STRUCTURAL STEEL* in the prices bid for the various related items of work as designated in the *Proposal*.

1.02 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.

- B. Manufacturer's product data:
1. Complete materials list of all materials proposed to be furnished and installed under this section.
 2. Specifications and other data required that demonstrate compliance with the specified requirements.
- C. Shop drawings:
1. Before any of the materials of this section are delivered to the job site, submit complete shop drawings to the *ARCHITECT/ENGINEER* in accordance with the provisions of *Section 01 33 23* of these specifications and the AISC Manual of Steel Construction (ASD), Part 5, Section M1 entitled "Shop Drawings", show all details of:
 - a. Structural steel framing and bracing for all structures and for equipment.
 - b. Miscellaneous steel framing, including clips, angles, plates, and frames.
 - c. Roof purlins, wall girts, and sag rods.
 - d. Base plates for columns including setting and shimming at the required elevations.
 - e. Bolts, washers, nuts, and direct tension indicators, where applicable, for all shop and field connections.
 - f. Welding filler metal for shop and field connections.
 - g. Shop coating and galvanizing where specified herein, and field touch-up of shop coated and galvanized items.
 2. Shop drawings (including erection plans) shall show fabrication details in english units, bolted and welded connections (including grooves and backup bars) for both shop and field welds, copes, blocking and shop notes.
 3. Shop drawings shall be furnished progressively as completed and all such drawings and bolt/material lists shall bear *OWNER's* job number and the name (or item number) of the structure to which they apply. Weight of shipments shall be based on AISC Code of Standard Practice, (AISC Manual of Steel Construction, current edition). The *CONTRACTOR* shall

furnish *OWNER's* site representative with a copy of the packing lists for validation of progress payments.

4. All shop detail and erection drawings, including calculations for special connections (where appropriate) shall be prepared under the supervision of a registered professional *ENGINEER*, checked before submittal and approved by the *CONTRACTOR* and *ENGINEER* before fabrication commences.

D. Manufacturer's current recommended installation procedures.

E. Samples:

1. If required by the *ENGINEER*, the *CONTRACTOR* shall furnish for testing, samples of the materials he proposes to use.

F. Submit warranties as Specified in *Section 01 78 36, Guarantees*.

1.03 QUALITY ASSURANCE

A. Qualifications of manufacturer:

1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.

B. Qualifications of installers:

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

C. Basis of acceptance:

1. The manufacturer's recommended installation procedures, when approved by the *ENGINEER*, will become the basis for inspecting and accepting or rejecting actual installation procedures used on this work.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Comply with provisions of *Section 01 66 00, Storage and Protection*.

- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Deliver materials in manufacturer's original packaging with all tags and labels intact and legible.
- E. Storage:
 - 1. Store structural steel off the ground on skids, platforms, or other supports.
 - 2. Store undercover in a well ventilated area.
 - 3. Store other materials in a dry, weathertight location until required for use in the work.
 - 4. Store packaged materials in original containers with all tags and labels intact.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 DESIGN, MATERIALS AND WORKMANSHIP

- A. Unless otherwise specified or required, the design, materials, workmanship, and erection shall conform to the requirements of the AISC Manual of Steel Construction - Allowable Stress Design, Thirteenth Edition. The *CONTRACTOR*

shall be solely responsible for the correctness of all shop and field fabrication and fittings.

- B. Unless otherwise noted on the drawings, steel plates, bars and structural shapes shall have a minimum yield stress of 36 ksi and conform to ASTM A36, Standard Specification for Structural Steel.
- C. Unless otherwise noted on the drawings, all wide flanges shall have a minimum yield stress of 50 ksi and conform to ASTM A992, Specification for Steel for Structural Shapes for Use in Building Framing.
- D. Unless otherwise noted on the drawings, structural tubes shall have a minimum yield stress of 46 ksi and conform to ASTM A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- E. Unless otherwise noted on the drawings, pipe columns or posts shall have a minimum yield stress of 35 ksi and conform to the above specification for structural tubing or to ASTM A53, Standard Specification for Seamless and Welded Steel Pipe, Grade B.

2.03 DESIGN OF CONNECTIONS

- A. All connections shall be developed in accordance with the AISC Specification and the AISC Manual.
- B. Shop connections shall be either welded or high strength bolted with ASTM A325 bolts. Field connections shall be high strength bolted unless otherwise specified on the ENGINEER'S Drawings. Unless otherwise indicated on the ENGINEER'S Drawings, connections may be made with bolts tightened to the snug-tight condition.
- C. Connections with reversible or axial loads shall be slip critical, Class A Connections. Connections without axial or reversible loads shall be bearing type connections with bolt threads excluded from the shear plane, unless otherwise shown on the Drawings.
- D. Connections with specific end reactions indicated on the ENGINEER'S Drawings shall be designed to meet or exceed the requirements for the standard connections described below. Connections without specific end reactions shall be standard connections as described below.

- E. Standard connections shall develop half the uniform load capacity of the beam shown in the AISC Tables for Allowable Uniform Load for beams laterally supported, for the given beam, span and grade of steel specified (Type 2 framing).
- F. Connections, other than slip critical, shall be supplied as 3/4" diameter ASTM A325-X bolts (threads excluded) however the design values shall be based on 3/4" diameter A325-N bolts (threads included). Connections designated as slip critical may be supplied with the bolt threads included in the shear plane and shall be designed as A325-SC (slip critical). Minimum connection shall be two bolts. Full depth connections shall be provided where called out on the Drawings.
- G. Where connections are to be field welded, holes for erection bolts shall be placed in the end connections and the members to which they are to be connected, and erection bolts shall be furnished.
- H. Machine bolts shall conform to ASTM A307. Anchor bolts shall be as shown on the Drawings and as specified in Section 05500.
- I. Bolts, connecting angles, supports and braces for stair stringers, equipment, apparatus and similar miscellaneous work shall be provided where indicated or required.
- J. Provide masonry anchors on all columns adjacent to masonry walls.
- K. Shop assembly: Where shop assembly of field connections is deemed necessary by the Contractor the unmatched holes shall be reamed and the pieces match-marked before disassembly. The interchange of matching parts will not be permitted.

2.04 HIGH STRENGTH BOLTS

- A. High strength bolts shall be corrosion resistant and shall conform to ASTM A325, Type 3. Bolts conforming to ASTM A490 shall not be used. Nuts shall conform to ASTM A 563, Grade C3 or Grade DH3. Washers shall conform to ASTM A436. Bolts shall not be galvanized or plated. Direct tension indicators shall be Coronet load indicators, mechanically galvanized, as manufactured by Copper-Turner, Inc., or approved equal.
- B. Use:
 - 1. The use of high-strength bolts shall conform to the RCSC Specifications unless otherwise noted herein. A minimum of one hardened washer per bolt shall be placed under part turned when tightening A325 or A490 bolts.

2. All bolts in any connection shall be installed with all nuts on the same side unless interferences will not permit. Field connections in other than a vertical plane shall be installed with nuts on the lower side, except where space restrictions make this impossible.

C. Inspection:

1. The inspection of high strength bolts shall conform to all provisions of Section 9 of the RCSC Specification.
2. Inspection wrenches, calibrating devices and all labor required to perform the testing shall be furnished. A certified calibration chart shall be furnished showing the calibration of each gauge. The gauge shall be calibrated prior to use on the project by a laboratory, and the laboratory report shall include a calibration curve showing actual bolt tension vs. gauge reading. The laboratory check shall be repeated whenever the calibration gauge shows any sign of damage, or when erratic readings are noticed.
3. Inspection of bolts installed with direct tension indicators shall be accomplished by checking the average gap of the indicator to determine that it is equal to, or less than, the required gap.
4. Bolts tightened by the turn-of-the-nut method shall be inspected using the inspection arbitration procedure described in Section 9(b) of the RCSC Specification.
5. High strength bolts specifically indicated as snug tight need not be inspected for bolt tension other than to ensure that the plies of the connected elements have been brought into snug contact.

2.05 WELDING

- A. All welding, welding procedures and qualifications, welder qualifications, weld filler material and weld filler metal control shall be in accordance with AWS D1.1 and the additional requirements herein. Welding procedures and qualifications shall be maintained and readily accessible in the shop where welding is being performed.
- B. Welders shall be qualified in accordance with AWS D1.1 for the work to be performed.

- C. Only low-hydrogen type covered electrodes shall be used as weld filler metal if shielded metal arc welding (SMAW) is the welding process selected for production.
- D. In addition to the requirements of AWS D1.1, all welding materials shall be stored in a controlled access, clean, dry area that is weathertight and is maintained at a temperature between 40EF and 140EF.
- E. When welding painted or galvanized steel, the zinc or paint coating shall be removed to bare metal at least 1" to 4" (2.5-10 cm) from either side of the intended weld zone and on both sides of the pieces.
- F. Inspection, Tests and Repair of Welds: All welds shall be visually inspected to the requirements of AWS D1.1.
- G. The weld inspection shall be performed by, an AWS Certified Inspector, or Assistant Welding Inspector(s), under the supervision of the AWS Certified Inspector. Alternatively, a program for self-certification of welding inspectors may be implemented provided the program is written and supervised by an AWS Certified Inspector in compliance with the requirements of AWS D1.1. The Weld Inspection Program, including the Inspector's certification records, shall be maintained and readily accessible in the shop where welding is being performed.
- H. Complete penetration groove welds in the following locations shall be tested by radiographic or ultrasonic methods after completion:
 - 1. All flange splices of beams, girders, and columns, or chord splices of trusses, and all splices subject to stress reversal.
 - 2. Web splices of beams, girders, and columns one-sixth of the depth of the web beginning at the point or points of maximum tension, and 25 percent of the remainder of the web depth.
 - 3. Any additional locations shown on the ENGINEER'S Drawings.
- I. Progressive magnetic particle testing may be used instead of radiographic or ultrasonic testing when approved by the *ENGINEER*. Tests shall be made after the initial pass, at the midpoint, and after the final pass in accordance with the following requirements:
 - 1. For welds accessible from both sides, the magnetic particle examination of the weld root shall be performed after back gouging the root pass and prior to welding the second side.

2. For welds accessible from one side only, the magnetic particle examination of the weld root shall be performed after a ¼ inch weld root buildup has been completed.
 3. Intermediate magnetic particle examination at random intervals as determined by the SSR shall be included in addition to the predetermined and specified examination points.
- J. All locations requiring the testing stated above shall be noted on the Shop Drawings.
- K. For welded plate girders, fillet welds and partial penetration groove welds occurring at the intersection of webs and flanges, webs and bearing stiffeners, or used for attaching cover plates to flanges, shall be tested by the magnetic particle method after completion. At least one foot of every 10 feet of accumulated weld length of each size shall be tested.
- L. All welds found deficient shall be repaired in accordance with AWS D1.1.

2.06 IDENTIFICATION OF HIGH-STRENGTH STEEL

- A. Shop Drawings shall identify each structural member that is to be made of steel other than ASTM A36 material (i.e., high-strength steel). The ASTM number and the color code shall be marked on the original pieces, transferred to subdivisions thereof, and maintained until after application of piece marks on the members.
- B. Plates or shapes which are killed and normalized shall be identified at the mill as being heat treated by painting serial codes or other mill identification so that the material can be easily identified during fabrication.

2.07 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXISTING CONDITIONS

- A. Inspection:

UNION COUNTY FREEHOLDERS
Contract No. UC 2013-028

A-0530-0026-000/S2516
March 2018

Structural Steel
05 12 00-9

1. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
 2. Verify that the work of this section may be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.
- B. Discrepancies:
1. In the event of discrepancy, immediately notify the *ENGINEER*.
 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 INSTALLATION AND ERECTION

- A. Workmanship: The recommendations and procedures prescribed under Section 7, Erection, of the AISC code shall govern the erection work unless otherwise specified herein
- B. Anchor bolts: Prior to erecting steel, anchor bolts shall be checked to assure that they are correctly aligned and that elevations are correct. Any deviation from the intended line and grade shall be brought to the attention of the *ENGINEER* when discovered. The implementation of the required correction action is necessary before the commencement of erection operations.
- C. Erection tolerances:
1. The erection tolerances as listed in the AISC Code shall apply unless otherwise specified herein or indicated on the *ENGINEER'S* Drawings. Crane columns and those adjacent to an elevator hoistway shall be erected so that the deviation of the center line, in a direction normal to the building line, is not greater than 1/2" from the theoretical column center line.
 2. Shims may be added in slip critical connections. For bearing-type connections, shims 1/4" or thicker shall be welded all around to the supporting member using the minimum weld in accordance with AWS D1.1. All shims shall be at least the same size as the connection contact area and may be any thickness up to 1 1/2". All shims shall conform to ASTM A36.

D. Erection alignment of structures:

1. When all the columns, beams, bracing, and struts of a tier within a given erection sequence have been set in place, the joints shall be made secure by the insertion of a number of erection bolts equal to at least 30 percent of the total number of bolts in the connection. A minimum of two bolts shall be installed in every connection. The structure shall be plumbed and the connection holes faired up with enough driftpins to maintain dimensions and plumbness.
2. After all of the members in a tier have been aligned and the columns plumbed, all main connections and bracing connections shall be tightened with high-strength fasteners.
3. Each tier shall be secured in the foregoing manner.
4. Anchor bolts shall be snug tightened as soon as columns are set and shall be fully tightened requiring the full effort of a man using an ordinary spud wrench, after the first tier is plumbed. All baseplates within a given erection sequence will be grouted promptly after setting, or before the second tier is erected, unless otherwise approved by the ENGINEER.
5. Shim packs adequately sized to support the weight of the first tier shall be used if the base plate is not grouted prior to erection of the first tier. Shim packs shall not be placed near the edge of shear keys. Base plate leveling bolts shown on the ENGINEER'S Drawings shall not be used for support.

E. Bracing:

1. The bracing shown on the ENGINEER'S Drawings has been designed to provide a stable structure upon the completion of erection.
2. The Contractor shall design and install all additional temporary bracing or guying required to meet loading imposed during erection, consistent with the erection sequence used, or required at the end of any work period to ensure safe and stable conditions. Additional temporary bracing of this nature shall not relieve the Contractor from full responsibility for the stability of the structure during erection.

F. Deferred erection:

1. The ENGINEER'S Drawings may indicate certain members, the erection of which will be deferred to facilitate erection of mechanical equipment or components. If this equipment is erected by others while the Contractor is still at the site, the Contractor shall install those members as soon as

possible after the equipment is in place. If the equipment is to be erected after the Contractor has left the site, the Contractor shall unload and store the steel members and adequate fasteners at no additional cost to the Purchaser under the direction of the SSR and they will be erected by others at a later date. The Contractor shall provide the SSR with a complete inventory of stored steel and fasteners before leaving the site.

3.03 SHOP PAINTING

A. General:

1. All steel furnished under this section, excluding machined surfaces and surfaces to be bonded to concrete, shall be cleaned and finish painted in accordance with *Section 09 90 00, Painting*.
2. Piece marking shall be by Die-Stamping.

B. Shop painting:

1. Before shipment or exposure to weather, all steel shall be cleaned and receive the prime coat, intermediate coat, and finish coat in accordance with *Section 09 90 00*.
2. Contact surfaces of slip critical connections incorporating high strength bolts shall be masked.
3. Joint surfaces to be field welded, included 4" beyond the edges of the joint surfaces, shall not be coated but shall be masked. Subsequent to welding, such surfaces shall be prepared and coated as specified in *Section 09900*.
4. Shop contact surfaces, such as the faying surfaces between connection angles and beam webs for bolted connections, shall be coated before assembly. Coatings applied to contact surfaces shall be allowed to cure overnight before the connection is made up. Inaccessible surfaces, the perimeters of which are continuously seal welded, need not be primed.
5. Shop contact surfaces for welded connections, including the crevices formed at the end of the beam web which is set back from the face of the outstanding leg of clip angles, shall be prepared in accordance with SSPC-SP6 and before assembly. Steel surfaces not in direct contact, that will be inaccessible after assembly, shall be coated before assembly.
6. Milled surfaces shall be coated with a rust-preventive material similar to Tectyl 506C, manufactured by Ashland Petroleum Company, Ashland,

KY or approved equal. Coating shall be applied after inspection and prior to being placed outdoors. Where later removal of this coating is required, SSPC SP1 cleaning methods and recommendations shall be followed.

7. Touch-up painting;
 - a. After erection coat all damaged areas, masked surfaces and other previously uncoated surfaces including welded and bolted connections.
 - b. Surface preparation shall conform to *Section 09 90 00*.
8. Coating and surface preparation shall conform to *Section 09 90 00*.

C. Protective coating:

1. Before being encased in masonry, all structural steel in exterior walls shall be coated in accordance with *Section 09 90 00*.
2. Before erection, surfaces of structural steel not to be encased in masonry but which will be inaccessible for painting after erection shall be painted as specified under *Section 09 90 00, Painting*.

3.04 CONNECTIONS

A. High Strength Bolts:

1. General: All connections shall be bolted or welded in accordance with the latest AISC Specifications.
2. Shop connections shall be either welded or high strength bolted. Field connections shall be high strength bolted unless otherwise specified on the *Contract Drawings*. Only where indicated on the *Contract Drawings* may high strength bolts be tightened to the snug-tight condition.
3. Minimum bolt size shall be ¾" diameter minimum.
4. Connections that are indicated on the *Contract Drawings* as slip critical shall conform to ASTM A325 and shall be installed in accordance with the requirements of the AISC Specifications for slip critical connections. All other connections shall conform to ASTM A325 and shall be installed in accordance with the requirements of the AISC Specifications for bearing Type N connections.

5. Beams shall have a minimum of two (2) bolts and end connections shall be designed for a minimum of ½ the maximum uniform load.
 6. Beams shall have a minimum edge distance of 1¾". Beams with copes shall have a minimum edge distance of 1½". Connection angles shall be d" thick with an edge distance of 1.25". Bolt pitch shall be three inch (3").
 7. Standard welded connections for shop connections shall be Weld A from Table III - Framed Beam Connections of the AISC manual. Connection angles shall be d" thick. Connection angle length shall correspond to the equivalent number of fasteners provided in the standard bolted connection. Minimum weld size shall meet the minimum weld size per AWS D1.1.
 8. Where connections are to be field welded, holes for erection bolts shall be placed in the end connections and the members to which they are to be attached, and erection bolts shall be furnished.
- B. Machine bolts and anchor bolts shall conform to ASTM A307 unless otherwise stipulated on the *Contract Drawings*.
- C. Bolts, connecting angles, supports and braces for stair stringers, equipment, apparatus and similar miscellaneous work shall be provided where indicated or required.
- D. Provide masonry anchors on all columns and beams adjacent to or embedded into masonry walls. See plans for size, spacing and details.
- E. Shop assembly: Where shop assembly of field connections is deemed necessary by the *CONTRACTOR*, the unmatched holes shall be reamed and the pieces match-marked before disassembly. The interchange of matching parts will not be permitted.
- F. Welding:
1. Where specified or required, steelwork shall be welded in conformance with the latest "Code for Arc and Gas Welding in Building Construction" of the American Welding Society. No welding shall be done except under inspection and by qualified welders and such work shall not be painted until inspection is completed and the work approved.
 2. Welds deficient in dimensions but not in quality may be enlarged by additional welding. Welds deficient in quality shall be removed and remade.

- G. Removing defective rivets: Loose, burned, or otherwise defective rivets shall be cut out and replaced in a manner which will not injure the surrounding metal.

****END OF SECTION****

SECTION 05 51 34
(05512)
ALTERNATING TREAD STAIRS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. Prefabricated aluminum stairs with integral handrails.

B. Related work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 05 50 00: Metal Fabrications*
3. *Section 09 90 00: Painting (General)*

C. Payment:

1. Unless otherwise noted in the Proposal Section, no separate payment shall be made for this item.
2. Include all costs for *ALTERNATING TREAD STAIRS* in the prices bid for the various related items of work as designated in the Proposal.

1.02 DESIGN REQUIREMENTS

- A. Alternating Tread Stair Treads shall be capable of withstanding a single concentrated 1000 pound load without permanent deformation; or 100 pounds per square foot or 300 pounds on an area of 4 square inches without exceeding the allowable working stress of the material.
- B. Alternating Tread Stair Guard and Handrail shall be capable of withstanding a single concentrated load of 200 pounds or a uniform load of 50 pounds per linear foot applied in any direction at any point on the rail without exceeding the allowable working stress of the material.

- C. Alternating Tread Stair Stringers shall be capable of withstanding a single concentrated load of 1000 pounds at any point on the stair without permanent deformation; or a uniform live loading of 100 pounds per square foot applied in a downward direction to all tread surfaces or a 300 pound load on an area of 4 square inches without exceeding the allowable working stress of the material.

1.03. REFERENCES

- A. NAAMM, STANDARD AMP 510 Metal Stairs Manual 5th Edition.

1.04 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Manufacturer's product data:
 - 1. Complete materials list of all materials proposed to be furnished and installed under this section.
 - 2. Specifications and other data required that demonstrate compliance with the specified requirements.
- C. Shop drawings: Submit dimensional prints showing critical dimensions, jointing and connections, and fasteners provided by manufacturer.
- D. Manufacturer's recommended installation procedures.

1.05 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 - 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
 - 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for

their execution, and who shall direct all work performed under this section.

2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the method and materials to be used.
 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- C. Basis of acceptance:
1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

1.07 WARRANTY AND WARRANTY REPAIRS

- A. Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B. The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the warranty period.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Acceptable Manufacturers:
1. Lapeyre Stair, Inc.
5117 Toler Street
Harahan, LA 70123
Tel: (504) 733-6009
Fax: (504) 733-4393
 2. Vestil Manufacturing Corp.
2999 North Wayne Street
Angola, IN 46703
Tel: (800) 348-0868
 3. Or equivalent.

2.02 PRODUCTS

- A. Alternating Tread Stairs: Alternating treads with center stringer.
1. Material: Aluminum, natural finish.
 2. Stair treads: Capable of withstanding a concentrated 1,000 pound load without deformation.
 3. Risers spaced equally to within 3/16 inch for adjacent risers and to within 3/8-inch for any two non-adjacent risers.
 4. Handrail: Capable of withstanding the maximum of 50 pounds per linear foot or a load of 200 pounds applied in any direction at any point on the rail.
 5. Handrails contoured for body guidance and underarm support.
 6. Aluminum stair angle: Angle from horizontal as shown.
 7. Vertical Drop: Distance between upper finished floor surface where top landing will be attached and lower finished floor surface as indicated on Drawings.

- B. Aluminum Landings, Treads, and Foot Castings: Aluminum alloy F356F.
- C. Aluminum Stringer: Aluminum alloy 6063-T52, box shape, 1¾ inch by 4 inch by ⅛ inch.
- D. Aluminum Handrails: Aluminum alloy 6063-T4 tube, 1½ inches OD by ⅛ inch.
- E. Aluminum Platforms: Aluminum alloy 5086 (H112 or equivalent), ¼ inch diamond safety plate.
- F. Aluminum Platform Handrail Clamps: Cast aluminum (F356F).
- G. Miscellaneous Materials:
 - 1. Rubber spine: Hollow neoprene.
 - 2. Rubber foot divider: Santoprene (Type 101-73).
 - 3. Bolts: ASTM A-307.
 - 4. Nuts: ASTM A-563.

2.03 FABRICATION

- A. Fabricate components to comply with performance and design requirements specified and in accordance with approved shop drawings. Fabricate to minimize field assembly.
- B. Aluminum Stairs: Provide all welded construction, using gas metal arc welding or gas tungsten arc welding. Fabricate using cast aluminum treads and cast aluminum mounting plates; shop weld handrails to stair assembly.
- C. Platforms: Provide cut, formed, and punched platforms with mounting brackets and kickplates, configured and sized as indicated on Drawings.
 - 1. Aluminum construction: Fabricate using gas tungsten arc welding or gas metal arc welding.
 - 2. Handrails: Provide bolt-on handrails of same material as platform construction.
- D. Finishes: Natural finish.

2.04 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Verify that dimensions are correct and substrate is in proper condition for installation of metal stair components. Do not proceed with installation until unsatisfactory conditions have been corrected.
- D. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Prepare mounting holes, using drawings supplied by stair manufacturer.

3.03 INSTALLATION

- A. General: Install the work of this section in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.
- B. Position stair units with top tread at same elevation as finished floor or roof surface.
- C. Verify that stairs are properly aligned with building construction, at correct angle, and free from distortion. Secure in position using no fewer than two (2) bolts or studs at top and two (2) at bottom.

- D. Install crossover or landing platform with stair, securing with two (2) bolts and handrail clamps. Bolt handrails in place.
- E. Do not field cut or alter members.
- F. Clean work area of debris associated with installation of alternating tread metal stairs.

3.04 CLEANING

- A. Comply with requirements of *Section 01 74 14, Cleaning. (Section 01 74 00, Cleaning and Restorations.)*
- B. Remove and dispose of all debris.

****END OF SECTION****

SECTION 05 52 14
(05522)
ARCHITECTURAL ALUMINUM PIPE RAILINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Provide and install architectural aluminum pipe railing for building access where shown.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 03 30 00: Concrete.*
3. *Section 05 50 00: Metal Fabrications (Concrete Anchors)*

C. Payment:

1. Unless otherwise noted in the *PROPOSAL* Section, no separate payment shall be made for this item.
2. Include all costs for *ARCHITECTURAL PIPE RAILINGS* in the prices bid for the various related items of work as designated in the *PROPOSAL*.

1.02 DESIGN REQUIREMENTS

A. Loads:

1. Handrail assemblies and guardrail systems shall be designed to resist a load of 50 lb/ft (pound-force per linear foot) (0.73 kN/m) applied in any direction at the top and to transfer this load through the supports to the structure. For one- and two-family dwellings, the minimum load shall be 20 lb/ft (0.29 kN/m).
2. All handrail assemblies and guardrail systems shall be able to resist a single concentrated load of 200 lb (0.89 kN), applied in any direction at

any point along the top, and have attachment devices and supporting structure to transfer this loading to appropriate structural elements of the building. This load need not be assumed to act concurrently with the loads specified in the preceding paragraph.

3. Intermediate rails (all those except the handrail), balusters, and panel fillers shall be designed to withstand a horizontally applied normal load of 50 lb (0.22 kN) on an area not to exceed 1 square ft (305 mm²) including openings and space between rails. Reactions due to this loading are not required to be superimposed with those of either preceding paragraph.
- B. Shall submit calculations to the *ENGINEER* for approval. Testing of base castings or base extrusions by an independent lab (meeting the requirements of the Aluminum Association) will be an acceptable substitute for calculations. Calculations will be required for approval of all other design aspects. Calculations and test results must be signed and sealed by a Professional Engineer licensed in the State of New Jersey.
 - C. Post spacing shall be a maximum of 5'-0". The handrail manufacturer shall provide posts of a schedule that provides adequate strength to meet the loading requirements. If the manufacturer's posts alone are not of adequate strength, the manufacturer shall add reinforcing dowels as base anchorages to meet loading requirements.
 - D. Samples of all components, bases, toe plate and pipe must be submitted for approval. Expansion and contraction shall be accommodated by means of internal joint splices spaced at a maximum of twenty-four feet (24') intervals. Where required, locate within 6" of posts.
 - E. Posts shall not interrupt the continuation of the top rail at any point along the railing, including corners and end terminations (OSHA 1910.23). The top surface of the top railing shall be smooth and shall not be interrupted by projecting fittings.
 - F. The top rail and bottom rail at a corner return shall be able to withstand a 200# load without loosening. The manufacturer is to determine the maximum post offset dimension for their system. Provide physical tests from a laboratory to confirm compliance.

1.03 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples.*

- B. Manufacturer's product data:
1. Complete materials list of all materials proposed to be furnished and installed under this section.
 2. *Specifications* and other data required that demonstrate compliance with the specified requirements.
 3. Submit for *ENGINEER* review the manufacturer's assembly and installation instructions.
- C. Shop Drawings:
1. Shop drawings: Indicate sizes, shapes, configuration, sections, locations, fabrication and installation details. Indicate fabricated sizes. Certify that railings and guardrails meet code requirements for vertical and horizontal loading.
 2. Indicate all required field measurements.
- D. Calculations:
1. Submit calculations that verify that the pipe rail system including rails, posts, base plates and anchor bolts meet the requirements for strength as described in these *Specifications*. Calculations shall be signed and sealed by a Professional Engineer registered in New Jersey.
- E. Samples:
1. Color and finish samples: Indicating each color and finish to be expected in completed work.
 2. Railings: Submit 2'-0" long sample of each type railing with post and rails indicating construction, welded joints, rail end cap closure and finish.
- F. Manufacturer's current recommended installation procedures.
- G. Maintenance instructions: Submit for finished aluminum components including cleaning materials, methods and precautions.

1.04 QUALITY ASSURANCE

- A. Qualifications of manufacturer:

1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.

B. Qualifications of workmen:

1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the methods and materials to be used.
3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.

C. Basis of acceptance:

1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

D. Requirements of regulatory agencies: All design and installations shall be in compliance with the International Building Code, as modified by the New Jersey Uniform Construction Code, Local Ordinances, and the Occupational Safety and Health Administration (OSHA), 29 CFR1910.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Comply with provisions of *Section 01 66 00, Storage and Protection*.

B. Protection:

1. Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
2. Protection: Maintain protective covering on pipe until installation is complete.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.

D. Delivery and storage:

1. Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use.
2. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.
3. Store all materials in clean, dry location, away from uncured concrete and masonry.
4. Cover with waterproof paper, tarpaulin or polyethylene sheeting.

1.06 WARRANTY AND WARRANTY REPAIRS

- A. Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B. Manufacturer shall warrant the railing against defects in materials and workmanship for a period of twenty years from date of installation. Finishes shall be guaranteed against chalking, yellowing, peeling, cracking, pitting, corroding, non-uniformity of color or gloss deterioration for a period of ten years.
- C. The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the maintenance period.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 MATERIALS

A. Post and rails:

1. All rails and posts shall be extruded aluminum alloy 6061-T6 with a clear anodized finish. Posts and rails shall be a minimum diameter of 1½" (1.90" O.D.).

B. Fittings:

1. Type: Pressure fit.
2. Aluminum: Cast, ASTM B26.

C. Handrail brackets:

1. Metal: Aluminum
2. Type: Cast
3. Style: As indicated on Plans.

D. Finish: (PICK one or more from below or specify another)

1. Powder Coat Paint Meeting AAMA 2605, *Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.*
2. U.V. resistance and scratch & mar resistance formula shall consist of super durable TGIC polyester resin system with flocked and color stable full pigmentation.
3. Chemical pretreatment:
 - a. Alkaline cleaner applied at 160 degrees F. for duration of 3 to 5 minutes.
 - b. D.I. water rinse.
 - c. Conversion phosphate coating applied at 140 degrees F. for 3 to 5 minutes.
 - d. D.I. water rinse.

- e. Application on non-chromate, chrome sealer amorphous chromium phosphate that meets or exceeds ASTM D1730, Type B, Method 5.
- f. D.I. water rinse, and dry in place.
- 4. Coating Application:
 - a. Electrostatic application of super TGIC system powder with a minimum dry film thickness of 3.5 to 5.5 mils cured coating.
- 5. Color shall be White.
- E. Dissimilar materials: Aluminum surfaces in contact with concrete, grout or dissimilar metals will be protected with a coat of bituminous paint, zinc chromate primer, mylar isolators or other approved material.
- F. Strength:
 - 1. The rail system shall be designed and constructed in accordance with the criteria set forth in Section 1607.7.1 of the 2009 International Building Code as modified by the New Jersey Uniform Construction Code, unless otherwise specified in this section.
- G. Expansion and contraction:
 - 1. Allow for expansion and contraction in top rail by means of an internal expanding splice at a maximum of twenty-four foot (24') intervals.
- H. Miscellaneous:
 - 1. All other aluminum parts and/or fittings shall be fabricated from 6061-T6 aluminum.

2.03 FABRICATION

- A. Form rail-to-end post connections and all changes in rail direction by radius bends or by approved fittings.
- B. Remove burrs from all exposed cut edges with no chamfer.
- C. Form elbow bends and wall returns to uniform radius, free from buckles and twists, with smooth finished surfaces, or use prefabricated bends.

- D. Locate intermediate rails midway between top rail and finish floor or center line of tread.
- E. Close aluminum pipe ends by using prefabricated fittings.
- F. On posts set on stair stringers, weld $\frac{5}{8}$ " thick plate to bottom, for field welding or bolting to top flange of stringer.
- G. Welding:
 - 1. Accurately miter and cope intersections of posts and rails and weld all around.
 - 2. Thoroughly fuse without undercutting or overlap.
 - 3. Remove spatter, grind exposed welds where necessary for blending and contour surfaces to match those adjacent.
 - 4. Discoloration of finished surfaces will not be acceptable.
- H. Provide pressure relief holes at closed ends of pipe or tube.
- I. Fabricate joints which will be exposed to the weather so as to exclude water, or provide weep holes where water may accumulate.
- J. Blend in color discrepancies on anodized aluminum areas, due to welding, exposed fasteners, etc., using approved lacquer.
- K. Workmanship - All pipe cuts shall be square and accurate for minimum joint-gap. Cuts shall be clean and straight, free of "chamfer" from deburring, burrs, and nicks. All holes shall be drilled and countersunk the proper size, as required for a tight, flush fit. Where protection is applied for prevention of dissimilar materials electrolysis, care shall be taken that none of the protective material is visible when assembly is completed.

2.04 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

B. Concrete anchors:

1. Anchors shall be provided in accordance with the requirements of *Section 05 50 00* of these *Specifications*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Drill holes of proper size and depth for adhesive anchors. Clean all holes in accordance with printed instructions furnished by Anchor Manufacturer.
- B. Protection of dissimilar materials - Surfaces of aluminum components in contact with other metals and concrete surfaces shall be painted as directed in paragraph 2.01E of these Specifications to prevent contact between the two surfaces.
- C. Set posts plumb and aligned to within 1/8" in 12'.
- D. Set rails horizontal or parallel to rake of steps or ramp to within 1/8" in 12'.
- E. Assemble and install in accordance with printed instructions of the manufacturer.
- F. Fitted assembly:
 1. Assemble tubes with pressure-fit fittings at joints and drive together to provide tight joints.
 2. Use wood blocks and padding to prevent damage to tube and fittings.
 3. Seal recessed holes of exposed locking screws using plastic filler cement colored to match finish of pipe.

- G. Drill holes of proper size for screws and countersink to a flush fit.
- H. Expansion joints:
 - 1. Provide at intervals of not more than twenty-four feet (24').
 - 2. Provide slip joint with internal sleeve extending 2" beyond joint each side.
 - 3. Fasten internal sleeve securely to one side.
 - 4. Locate joints within 6" of posts.
- I. Support wall handrails on brackets spaced not more than 5' on centers.

3.03 CLEANING

- A. As installation is completed, wash thoroughly, using clean water and soap; rinse with clean water.
- B. Do not use acid solution, steel wool or other harsh abrasives.
- C. If stain remains after washing, remove finish and restore in accordance with fabricator's recommendations.

3.04 REPAIR OF DEFECTIVE WORK

- A. Remove stained or otherwise defective work and replace with material that meets Specification requirements.

****END OF SECTION****

SECTION 05 53 00
(05530)
GRATING

PART 1 - GENERAL

1.01 SUMMARY

A. Work included:

1. Provide aluminum and fiberglass grating where shown or as specified in the various specification sections.

B. Related work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 05 12 00: Structural Steel*
3. *Section 05 50 00: Metal Fabrications*

C. Payment:

1. Unless otherwise noted in the *Proposal* Section, no separate payment shall be made for this item.
2. Include all costs for *GRATING* in the prices bid for the various related items of work as designated in the *Proposal*.

1.02 SUBMITTALS

A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.

B. Manufacturer's product data:

1. Complete materials list of all materials proposed to be furnished and installed under this section.
2. Specifications and other data required to demonstrate compliance with the specified requirements.

- C. Shop drawings: Show fabrication and installation details for gratings. Include plans, elevations, sections, and details of connections. Show anchorage and accessory items. Provide templates for anchors and bolts.
- D. Manufacturer's current recommended installation procedures.

1.03 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 - 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
 - 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 - 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the methods and materials to be used.
 - 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- C. Basis of acceptance:
 - 1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.

- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Deliver materials in manufacturer's original packaging with all tags and labels intact and legible.
- E. Store and handle material in such a manner as to avoid damage; store at site under cover.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.
- C. Acceptable manufacturers:
 - 1. “Fibergrate” “Chemgrate”
Fibergrate Composite Structures, Inc..
Addison, Texas 75001
(800) 527-4043
 - 2. IKG Industries
P. O. Box 512
29 Vanderburg Road
Marlboro, NJ 07746
Tel: (800) 428-9127
Fax: (732) 845-3086
 - 3. McNicols Company, Inc.
2 Home News Row
New Brunswick, NJ 08901-3602
Tel: (732) 846-8333
Fax: (732) 846-5555

4. Brown-Campbell Headquarters
11800 Investment Drive
Shelby Township, MI 48315
1-800-472-8464
Tel: (586) 884-2180
Fax: (586) 88402181
5. Or equivalent.

2.02 MATERIALS - FIBERGLASS GRATING

A. General:

1. All FRP items furnished under this Section shall be composed of fiberglass reinforcement and resin in qualities, quantities, properties, arrangements and dimensions as necessary to meet the design requirements and dimensions as specified in the *Contract Documents*.
2. Fiberglass reinforcement shall be continuous roving in sufficient quantities as needed by the application and/or physical properties required.
3. Resin shall be chemical grade polyester, with chemical formulations as necessary to provide the corrosion resistance, strength and other physical properties as required.
4. All finished surfaces of FRP items and fabrications shall be smooth, resin-rich, free of voids and without dry spots, cracks, crazes or unreinforced areas. All glass fibers shall be well covered with resin to protect against their exposure due to wear or weathering.
5. All grating products shall be non-fire retardant.
6. Color shall be selected from manufacturers' standards.
7. All mechanical grating clips and fasteners shall be manufactured of Type 316SS stainless steel.

B. Molded FRP Grating:

1. Manufacture:
 - a. Grating shall be of a one piece molded construction with tops and bottoms of bearing bars and cross bars in the same plane. Grating shall have a square mesh pattern providing bidirectional strength or

a rectangular mesh pattern providing unidirectional strength. Grating shall be reinforced with continuous rovings of equal number of layers in each direction. The top layer of reinforcement shall be no more than 3/16" below the top surface of the grating so as to provide maximum stiffness and prevent resin chipping of unreinforced surfaces. Percentage of glass by weight shall not exceed 35% so as to achieve maximum corrosion resistance and as required to maintain the structural requirements.

- b. After molding, no dry glass fibers shall be visible on any surface of bearing bars or cross bars. All bars shall be smooth and uniform with no evidence of fiber orientation irregularities, interlaminar voids, porosity, resin rich or resin starved areas.
2. Non-slip surfacing: Grating shall be manufactured with an integral grit molded into the panels during the manufacturing process, with the top surface not exceeding 3/16". A concave profile on the top of each bar shall also be allowed for VE-25 and FS-25 resins.
3. Depth: 1/2" with a tolerance of plus or minus 1/16".
4. Mesh configuration: 1/2" x 1/2" mesh centerline to centerline.
5. Unless noted otherwise on the *Contract Drawings*, bearing bars shall be 1/2" high by 1/4" wide on 1/2" centers; cross bars shall be 1/2" high by 1/4" wide on 1/2" centers. Grating shall be suitable for a uniform load of 5872 pounds sq. ft. with 1% deflection when supported at 12" centers.

C. Grating Fabrication:

1. Measurements: Grating supplied shall meet the dimensional requirements and tolerances as shown or specified. The Contractor shall provide and/or verify measurements in field for work fabricated to fit field conditions as required by grating manufacturer to complete the work. When field dimensions are not required, Contractor shall determine correct size and locations of required holes or cutouts from field dimensions before grating fabrication.
2. Layout: Each grating section shall be readily removable, except where indicated on drawings. Manufacturer to provide openings and holes where located on the *Contract Drawings*. Grating openings which fit around protrusions (pipes, cables, machinery, etc.) shall be discontinuous at approximately the centerline of opening so each section of grating is readily removable. Gratings shall be fabricated free from warp, twist, or other defects, which affect appearance and serviceability.

3. Sealing: All shop fabricated grating cuts shall be coated with vinyl ester resin to provide maximum corrosion resistance. All field fabricated grating cuts shall be coated similarly by the Contractor in accordance with the manufacturer's instructions.
4. Hardware: Type 316 stainless steel hold-down clips shall be provided and spaced at a maximum of four feet apart with a minimum of four per piece of grating, or as recommended by the manufacturer.
5. Stair treads shall be manufactured of specified grating with skid proof nosing.

2.03 MATERIALS - ALUMINUM GRATING

- A. Grating shall be rectangular bar aluminum grating or equivalent.
- B. Grating and its connections shall be sufficient to resist both a 300 lb. concentrated load and a 100 PSF uniform load for the span shown unless otherwise specified. The deflection due to the 100 PSF uniform load shall not exceed 1/4".
- C. Grating shall be McNicols Co. Aluminum Type SGAL constructed of straight, parallel bearing bars placed edgewise and joined by straight cross bars. Size and spacing of bars as follows unless otherwise shown on the *Contract Drawings*.
 1. Bearing bars shall be plain and shall be on 15/16" centers.
 2. Cross bars on 4" centers.
- D. Bearing bars shall be punched to receive the cross bars. Notching, slotting, or cutting the top or bottom edges of bearing bars to receive cross bars will not be permitted.
- E. Cross bars shall be secured to the main bars by a swagging process to prevent turning, twisting or coming loose.
- F. Ends of cross bars are to be trimmed flush with outside face of each outside bearing bar. On stock width panels with 3/16" main bars, each outside bearing bar shall be punched with "detent" holes to form a permanent lock. On stock width panels with 1/8" main bars, and all ripped panels, the outside bearing bars shall be permanently locked in place by welding flush to cross bars.
- G. Stair tread grating to be same pattern as floor grating and have anti-slip corrugated angle nosing.

- H. Material shall be as follows:
 - 1. Bearing bars - Aluminum alloy 6063-T6.
 - 2. Cross bars - Aluminum alloy 6063-T5.
- I. Fasteners shall be aluminum or stainless steel as provided by the grating manufacturer.
- J. Finish shall be Standard Mill as fabricated.

2.04 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Inspection:
 - 1. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
 - 2. Verify that the work of this section may be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.
- B. Discrepancies:
 - 1. In the event of discrepancy, immediately notify the *ENGINEER*.
 - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 INSTALLATION

- A. Install the work of this section in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

- B. Clearances:
1. Standard installation clearances and tolerances shall conform to the requirements of the current Metal Bar Grating Manual published by the National Association of Architectural Metal Manufacturers.
 2. Cutouts for circular obstructions are to be at least 2" larger in diameter than the obstruction. Cutouts for all piping 2" in diameter or less shall be made in the field. Band all ends of metal grating.
- C. All clips, nuts, bolts, washers, etc. shall be installed as required or recommended by the manufacturer.
- D. Install clamps or clips to anchor the grating securely to supports. A minimum of four (4) fasteners per panel shall be provided, unless otherwise shown on the drawings. Clips shall not protrude above the top of the grating.
- E. Coat all field cuts or drill holes in fiberglass grating with catalyzed resin as recommended by the manufacturer.
- F. Paint all aluminum surfaces in contact with concrete or dissimilar metals with a shop coat of bituminous paint.

3.03 ADJUSTING

- A. Upon completion of this portion of the work, and prior to its acceptance by the *OWNER*, make all required adjustments. Secure all approvals from agencies having jurisdiction.

3.04 CLEANING

- A. Clean exposed surface of all grease, dirt and other foreign materials.
- B. Touch up all marred or abraded surfaces as specified herein.

****END OF SECTION****

SECTION 06 74 13
(05530)
FIBERGLASS REINFORCED GRATING

PART 1 - GENERAL

1.01 SUMMARY

- A. Work included:
 - 1. Fiberglass grating and accessories.
- B. Related work:
 - 1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
 - 2. *Section 05 50 00: Metal Fabrications*
- C. Payment:
 - 1. Unless otherwise noted in the *Proposal* Section, no separate payment shall be made for this item.
 - 2. Include all costs for *GRATING* in the prices bid for the various related items of work as designated in the *Proposal*.

1.02 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Manufacturer's product data:
 - 1. Complete materials list of all materials proposed to be furnished and installed under this section.
 - 2. Specifications and other data required that demonstrate compliance with the specified requirements.

- C. Shop drawings: Show fabrication and installation details for gratings. Include plans, elevations, sections, and details of connections. Show anchorage and accessory items. Provide templates for anchors and bolts.
- D. Manufacturer's current recommended installation procedures.

1.03 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 - 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
 - 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 - 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the methods and materials to be used.
 - 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- C. Basis of acceptance:
 - 1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.

- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Deliver materials in manufacturer's original packaging with all tags and labels intact and legible.
- E. Store and handle material in such a manner as to avoid damage; store at site under cover.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.
- C. Acceptable manufacturers:
 - 1. Fibergrate Composite Structures, Inc.
Dallas, Texas 75254
Tel: (800) 527-4043
 - 2. Seasafe Inc.,
Lafayette LA
Tel: (800) 326-8842
 - 4. Or equivalent.

2.02 MATERIALS

- A. General:
 - 1. All FRP items shall be composed of fiberglass reinforcement and resin in qualities, quantities, properties, arrangements and dimensions as necessary to meet the design requirements and dimensions as specified in the *Contract Documents*.

2. Fiberglass reinforcement shall be continuous roving in sufficient quantities as needed by the application and/or physical properties required.
3. Resin shall be isophthalic polyester, with chemical formulations as necessary to provide the corrosion resistance, strength and other physical properties as required.
4. All finished surfaces of FRP items and fabrications shall be smooth, resin-rich, free of voids and without dry spots, cracks, crazes or unreinforced areas. All glass fibers shall be well covered with resin to protect against their exposure due to wear or weathering.
5. All grating products shall have a tested flame spread rating of 25 or less per ASTM E-84 Tunnel Test. Gratings shall also have tested burn time of less than 30 seconds and an extent of burn rate of less than or equal to 10 millimeters per ASTM D635.
6. Color shall be selected from manufacturers' standards.
7. All mechanical grating clips and fasteners shall be manufactured of Type 316SS stainless steel.

B. Molded FRP Grating:

1. Manufacture:
 - a. Grating shall be of a one piece molded construction with tops and bottoms of bearing bars and cross bars in the same plane. Grating shall have a square mesh pattern providing bidirectional strength or a rectangular mesh pattern providing unidirectional strength. Grating shall be reinforced with continuous rovings of equal number of layers in each direction. The top layer of reinforcement shall be no more than 3/16" below the top surface of the grating so as to provide maximum stiffness and prevent resin chipping of unreinforced surfaces. Percentage of glass by weight shall not exceed 35% so as to achieve maximum corrosion resistance and as required to maintain the structural requirements.
 - b. After molding, no dry glass fibers shall be visible on any surface of bearing bars or cross bars. All bars shall be smooth and uniform with no evidence of fiber orientation irregularities, interlaminar voids, porosity, resin rich or resin starved areas.
2. Non-slip surfacing: Grating shall be manufactured with an integral grit molded into the panels during the manufacturing process, with the top

surface not exceeding 3/16". A concave profile on the top of each bar shall also be allowed for VO-CORR and Corvex resins.

3. Depth: 1/2" with a tolerance of plus or minus 1/16".
4. Mesh configuration: 1/2" x 1/2" mesh centerline to centerline.
5. Unless noted otherwise on the *Contract Drawings*, bearing bars shall be 1/2" high by 1/4" wide on 1/2" centers; cross bars shall be 1/2" high by 1/4" wide on 1/2" centers. Grating shall be suitable for a uniform load of 125 pounds sq. ft. with 1% deflection when supported at 12" centers.

C. Grating Fabrication:

1. Measurements: Grating supplied shall meet the dimensional requirements and tolerances as shown or specified. The Contractor shall provide and/or verify measurements in field for work fabricated to fit field conditions as required by grating manufacturer to complete the work. When field dimensions are not required, Contractor shall determine correct size and locations of required holes or cutouts from field dimensions before grating fabrication.
2. Layout: Each grating section shall be readily removable, except where indicated on drawings. Manufacturer to provide openings and holes where located on the *Contract Drawings*. Grating openings which fit around protrusions (pipes, cables, machinery, etc.) shall be discontinuous at approximately the centerline of opening so each section of grating is readily removable. Gratings shall be fabricated free from warp, twist, or other defects, which affect appearance and serviceability.
3. Sealing: All shop fabricated grating cuts shall be coated with vinyl ester resin to provide maximum corrosion resistance. All field fabricated grating cuts shall be coated similarly by the Contractor in accordance with the manufacturer's instructions.
4. Hardware: Type 316 stainless steel hold-down clips shall be provided and spaced at a maximum of four feet apart with a minimum of four per piece of grating, or as recommended by the manufacturer.
5. Stair treads shall be manufactured of specified grating with skid proof nosing.

2.03 FRP EMBED FRAMES

- A. All FRP embed angle frames shall be sized to match the depth of the grating.
- B. Provide leg or strap for embedding and anchoring into concrete.
- C. FRP embed angles shall be Vinylester.

2.04 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Inspection:
 - 1. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
 - 2. Verify that the work of this section may be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.
- B. Discrepancies:
 - 1. In the event of discrepancy, immediately notify the *ENGINEER*.
 - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 INSTALLATION

- A. Install the work of this section in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

- B. Clearances:
1. Standard installation clearances and tolerances shall conform to the requirements of the current Metal Bar Grating Manual published by the National Association of Architectural Metal Manufacturers.
 2. Cutouts for circular obstructions are to be at least 2" larger in diameter than the obstruction. Cutouts for all piping 2" in diameter or less shall be made in the field. Band all ends of metal grating.
- C. All clips, nuts, bolts, washers, etc. shall be installed as required or recommended by the manufacturer.
- D. Install clamps or clips to anchor the grating securely to supports. A minimum of four (4) fasteners per panel shall be provided, unless otherwise shown on the drawings. Clips shall not protrude above the top of the grating.
- E. Coat all field cuts or drill holes in fiberglass grating with catalyzed resin as recommended by the manufacturer.
- F. Paint all aluminum surfaces in contact with concrete or dissimilar metals with a shop coat of bituminous paint.

3.03 ADJUSTING

- A. Upon completion of this portion of the work, and prior to its acceptance by the *OWNER*, make all required adjustments. Secure all approvals from agencies having jurisdiction.

3.04 CLEANING

- A. Clean exposed surface of all grease, dirt and other foreign materials.
- B. Touch up all marred or abraded surfaces as specified herein.

****END OF SECTION****

SECTION 06 82 00

FIBERGLASS REINFORCED PLASTIC FABRICATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Work included:

1. FRP Embed Frames
2. FRP Structural Fabrications
3. FRP Stairs
4. FRP Handrails
5. FRP Ladders and Cages
6. Anchorages and Inserts.

B. Related work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 05 50 00: Metal Fabrications*

C. Payment:

1. Unless otherwise noted in the *Proposal* Section, no separate payment shall be made for this item.
2. Include all costs for *FIBERGLASS REINFORCED PLASTIC FABRICATIONS* in the prices bid for the various related items of work as designated in the *Proposal*.

1.02 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):

1. ASTM D3917: Standard Specifications for Dimensional Tolerances of Thermosetting Glass Reinforced Plastic Pultruded Shapes.
 2. ASTM E84: Test Method for Surface Burning Characteristics of Building Materials.
- B. American National Standards Institute (ANSI):
1. ANSI A14.3, Safety Requirements for Fixed Ladders.
- C. Occupational Safety and Health Administration (OSHA):
1. 29 CFR 1910, OSHA Safety and Health Standards for General Industry.
- D. International Building Code, 2009.
- E. Uniform Construction Code of the State of New Jersey.

1.03 DESIGN REQUIREMENTS

- A. All fiberglass reinforced plastic fabrications, shall be designed by a registered Professional Engineer licensed in the State of New Jersey.
- B. Comply with OSHA – 29 CFR 1910 as it pertains to worker safety and walking-working surfaces for stairs, ladders, handrail, and platforms.
- C. Handrails and Guard Rails:
1. Handrail and guardrails shall be designed to resist a load of 50 lb/ft (pound-force per linear foot) (0.73 kN/m) applied in any direction at the top and to transfer this load through the supports to the structure.
 2. All handrail and guardrails shall be able to resist a single concentrated load of 200 lb (0.89 kN), applied in any direction at any point along the top, and have attachment devices and supporting structure to transfer this loading to appropriate structural elements. This load need not be assumed to act concurrently with the loads specified in the preceding paragraph.
 3. Intermediate rails (all those except the handrail), balusters, and panel fillers shall be designed to withstand a horizontally applied normal load of 50 lb (0.22 kN) on an area not to exceed 1 square foot (305 mm²) including openings and space between rails. Reactions due to this loading, are not required to be superimposed with those of either preceding paragraph.

- D. Stair treads and walking surfaces:
 - 1. Design Live (Pedestrian) Load: Uniform load of 125 lb/sq ft minimum; concentrated load of force 2000 lb. with 1% deflection when supported at 12" centers.
 - 2. Maximum Spacing Between Bars: To restrict pedestrian shoe heels, 3/8 inch.
- E. Ladders shall be designed to meet the loading requirements of OSHA 1910.27, "Fixed Ladders". The ladders shall be designed to meet the OSHA minimum live load requirement of a 200 lb concentrated load at the mid-point of the rung with a safety factor of 4.0.

1.04 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Manufacturer's product data:
 - 1. Complete materials list of all materials proposed to be furnished and installed under this section.
 - 2. Specifications and other data required that demonstrate compliance with the specified requirements.
- C. Shop drawings:
 - 1. Show part numbers, dimensions, adjacent construction, materials, thickness', fabrications details, required clearances, field jointing, tolerances, colors, finishes, methods of support, integration of components and anchorages.
 - 2. Drawings shall be prepared by, or under direct supervision of a Registered Professional Engineer, licensed to practice in the State of New Jersey. All drawings shall bear the *ENGINEER'S* seal.
- D. Product Samples:
 - 1. Submit 8" x 8" sample of grating in specified color, texture and finish.
 - 2. Submit 8" long sample of railing in specified color, texture and finish.

- E. Submit manufacturer's warranty.

1.05 QUALITY ASSURANCE

- A. Qualifications of manufacturer:

- 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.

- B. Qualifications of workmen:

- 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 - 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the methods and materials to be used.
 - 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
 - 4. Perform shop and/or field welding required in connection with the work of this Section in strict accordance with pertinent recommendations of the American Welding Society.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.

- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.

- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.

D. Delivery and storage:

1. Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use.
2. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.
3. All material and equipment necessary for the fabrication and installation of the fiber reinforced polymer composite products will be stored before, during, and after shipment in a manner to prevent cracking, twisting, bending, breaking, chipping or damage of any kind to the material, or equipment, including ultraviolet damage. Any material, which in the opinion of the *ENGINEER*, becomes damaged as to be unfit for use, will be promptly removed from work site, and the Contractor will receive no compensation for the damaged material or its removal

1.07 WARRANTY

- A. Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B. The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the maintenance period.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.
- C. Acceptable Manufacturers:
 1. Grating and solid sheet material:

- a. International Grating Inc.
 - b. IKG Industries
 - c. Fibergrate Composite Structures Inc.
 - d. Strongwell
 - e. Seasafe, Inc.
2. Interlocking FRP Decking
- a. Strongwell (Safplank)
 - b. Fibergrate Composite Structures Inc. (Dynadeck)
3. Railings:
- a. International Grating, Inc.
 - b. Fibergrate Composite Structures, Inc.
 - c. Seasafe, Inc.
 - d. IKG Industries
 - e. Strongwell
4. Stairs:
- a. IKG Industries
 - b. Fibergrate Composite Structures, Inc.
 - c. Seasafe, Inc.
 - d. Strongwell
5. Ladders:
- a. Fibergrate Composite Structures Inc.
 - b. IKG Industries
 - c. Seasafe, Inc.
 - d. Strongwell
6. Structural members:
- a. Strongwell
 - b. Bedford Reinforced Plastics, Inc.
 - c. Creative Pultrusions, Inc.
 - d. Fibergrate Composite Structures Inc.
7. Or equivalent.

2.02 MATERIALS

- A. Gratings and Solid Sheet Material, Decking, Railings, Stairs, Ladders, Structural Members, Modular Framing System:
 - 1. Vinyl ester resin with flame retardant, ultraviolet (UV) inhibitor additives and fiberglass reinforcing.
 - 2. Flame spread rating of 25 or less and smoke developed index of 450 or less in accordance with ASTM E-84.
 - 3. Meeting the self-extinguishing requirements of ASTM D-635.
 - 4. Color: To be selected by *ENGINEER* when more than one color is available for any one component.
- B. Fasteners, Clips, Saddles, and Miscellaneous Components:
 - 1. Fasteners and clips: Stainless steel Type 316.
 - 2. Saddles, etc.: Fiberglass
- C. Adhesive as recommended by fiberglass material manufacturer/supplier.
- D. Skid-resistant surfacing shall be manufacturer-applied abrasive grit coating.

2.03 FIBERGLASS STUDS AND NUTS

- A. Fiberglass studs shall be of pultruded, machined, fiberglass reinforced vinyl ester.
- B. Nuts shall be hex shaped of thermoplastic material as supplied by the stud manufacturer.
- C. The studs and nuts shall contain UV inhibitors to provide resistance to ultraviolet degradation and corrosion.
- D. Fiberglass studs and nuts shall be FIBREBOLT® as manufactured by Strongwell or equivalent.
- E. Fiberglass studs shall have the following properties:

Properties	Test Method	3/8" 16 UNC	1/2" 13 UNC	5/8" 11 UNC	3/4" 10 UNC	1" 8 UNC
Ultimate thread shear using Strongwell fiberglass nut (lb.) (1) (2)		1,350	2,400	3,790	5,150	9,600
Max ultimate tensile load using Strongwell fiberglass nut (lb.) (2)		1,050	2,000	3,100	4,500	6,500
Max ultimate tensile load using two (2) Strongwell fiberglass nuts (lb.) (2)		1,470	2,800	4,340	6,300	9,700
Transverse shear on threaded rod double shear (min. load lb.) (3)	ASTM-B565	3,000	5,000	7,500	12,000	22,000
Transverse shear on threaded rod single shear (min. load lb.) (3)		1,600	2,600	3,800	6,200	15,000
Compressive strength – longitudinal (3) (min. psi)	ASTM-D695	60,000	60,000	60,000	60,000	60,000
Flexural strength (min. psi) (3)	ASTM-D790	50,000	50,000	50,000	50,000	50,000
Flexural modulus (min. psi x 10 ⁶) (3)	ASTM-D790	2.0	2.0	2.0	2.50	2.75
Recommended max installation torque strength using Strongwell fiberglass nut lubricated with SAE 10W30 motor oil (ft-lbs) (2)		4	8	16	24	50
Dielectric strength ASTM-D149 (kv/in.)		35	35	35	35	35
Water absorption 24 hr immersion – threaded	ASTM-D570	1%	1%	1%	1%	1%
Coefficient of thermal expansion longitudinal (in/in/°F)		5 x 10 ⁻⁶	5 x 10 ⁻⁶	5 x 10 ⁻⁶	5 x 10 ⁻⁶	5 x 10 ⁻⁶
Max recommended operation temp based on 50% retention of ultimate thread shear strength °C (°F)		95°C (203°F)	95°C (203°F)	95°C (203°F)	95°C (203°F)	95°C (203°F)
Flammability	ASTM-D635	Self-Extinguishing on All				
Stud weight (lb./ft.)		0.07	0.12	0.18	0.28	0.50
Thickness of nut and washer in inches		3/4"	7/8"	1 1/8"	1 1/4"	1 5/8"
Diameter of washer in inches		1"	1 1/8"	1 1/4"	1 1/2"	2"

<p>(1) Ultimate strength values are averages obtained in design testing.</p> <p>(2) New property categories added to better clarify stud thread shear properties.</p> <p>(3) Strength values are minimums derived from multiple production sample testings.</p>	<p>NOTE</p> <ul style="list-style-type: none"> • All test results are for bolts with single nuts only • Appropriate safety factors must be applied. • Properties above do not apply when fiberglass stud is used with metal nut. No data has been generated for metal nuts. If metal nuts are used, strengths will be reduced because of less thread engagement. If metal nuts are used, extreme care should be taken to assure that the threads match and that a snug fit is achieved.
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2.04 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

2.05 FABRICATION

A. General:

1. Verify field conditions and dimensions prior to fabrication.
2. Pre-assemble items in shop to greatest extent possible.
3. All components shall be treated with UV inhibitor.
4. Drill or punch holes with smooth edges.
5. Fabricate with accurate angles and surfaces that are true to the required lines and levels, forming exposed connections with hair-line joints, and using concealed fasteners wherever possible.
6. The dimensional tolerances of pultruded shapes shall be as specified in ASTM D3917.
7. All FRP members that are cut or drilled shall have those affected surfaces sealed with catalyzed resin sealant. The resin and other materials used shall be the same as the base resin used.
8. Fabrication of all pultruded shapes shall be done in such a way as to prevent attack from corrosive agents. Prevent damage to the pultruded

sections. Scratches, gouges, cut edges and drilled holes shall be resin sealed. The resin and other materials used shall be the same as the base resin used. Drilled holes may be oversized a maximum of 1/16 inch.

B. Railings:

1. Custom fabricate handrail and guardrail to profiles and dimensions indicated on Drawings.
2. Where not indicated on Drawings, set intermediate horizontal rails to requirements of building code.
3. Minimum 2" sq x 0.156" tube.
4. Kickplate: 4" x ½" solid bar or 4" x ⅛" corrugated pultruded fiberglass shape.
 - a. Provide at all elevated platforms and where required by OSHA.
5. Provide handrail supports at 4 ft maximum spacing for wall brackets and 4 ft maximum spacing for posts.
 - a. Provide vertical supports at 4 ft maximum spacing on all inclined rail sections.
 - b. Provide brackets that provide a 1½" projection from finish wall surface or guardrail to wall or guardrail side of rail.
6. Fit exposed ends of guardrails and handrails with solid terminations.
 - a. Return ends of handrail to wall but do not attach end to wall.
 - b. Where guardrail terminates at a wall or other obstruction, provide a vertical support post located 4" off wall or obstruction to center of post.
7. Design railing and anchorage system to resist loading specified herein or as required by the Building Code, which ever is more stringent.
8. Form exposed connections with flush, smooth, hairline joints.
 - a. Top rail splices and expansion joints shall be located within 8" of support.

9. Fabricate items free of blemishes, seam marks, roller marks, rolled trade names and roughness.
10. Provide removable railing where indicated.
11. Install weeps to drain moisture from hollow railing sections.
 - a. Drill ¼" weep hole in railing 1" above walkway surface at bottom of posts set in concrete or otherwise closed at bottom, and at other low points where moisture can collect.

C. Grating:

1. Design live load:
 - a. 100 psf uniform live load unless noted otherwise.
 - b. 300 LBS concentrated load.
 - c. Maximum deflection of 1/300 of span under a superimposed live load of 50 psf.
 - d. Design for the most severe loading condition noted above.
2. Minimum grating depth: 1½".
3. Bar span: Maximum of 1½" center to center.
4. Walking surface: Manufacturer's standard applied abrasive grit coating.
5. Bearing bars and crossbars to be fabricated at the same time creating a one-piece type construction.

D. Interlocking Decking:

1. Design live load:
 - a. 100 psf uniform live load unless noted otherwise.
 - b. 300 LBS concentrated load.
 - c. Maximum deflection of 1/300 of span under a superimposed live load of 50 psf.
 - d. Design for the most severe loading condition noted above.

2. Minimum depth: 2".
 3. Walking surface: Manufacturer's standard applied abrasive grit coating.
- E. Embedded Grating Supports:
1. Fiberglass.
 2. Size to suit depth of grating.
 3. Provide leg or strap for embedding and anchoring into concrete.
 4. Duradek Fiberglass Curb Angle by Strongwell, or equivalent.
- F. Stairs:
1. Fabricated to profiles indicated.
 2. Treads:
 - a. Skid resistant solid sheet material with integral 1" skid-resistant nosing.
 - b. Provide center reinforcing for treads over 36" wide.
 3. Closed riser:
 - a. Solid sheet material without skid resistant abrasive coating.
 4. Landings:
 - a. Grating with manufacturer's standard applied skid-resistant abrasive grit coating.
 - (1) Provide skid-resistant nosing on leading edge of stairs.
 - b. Provide intermediate support as required to meet loading requirements.
 5. Design and fabricate stair, platforms and landings, and all connections to support a 100 psf uniform live load plus a 300 psf concentrated load.
 6. Provide railing as specified.

G. Ladders:

1. Design in accordance with ANSI A14.3, OSHA 29 CFR 1910.27 and International Building Code requirements unless noted otherwise.
2. Ladders shall be designed to support a minimum 300 lb concentrated vertical load with 150 lb concentrated horizontal load without failure or permanent set. Maximum lateral deflection: Side rail span/300.
3. Rungs:
 - a. 1" square or round solid bar with skid-resistant surface on all sides.
 - e. Uniform maximum spacing of 12".
 - f. Top rung level with top of platform.
 - g. Rungs shall not extend beyond the outside face of the ladder side rail.
4. Rails:
 - a. 2" Sq tube, minimum 0.156" thick.
 - b. Provide minimum ½" x 2½" x length required standoff brackets on each side rail with punched holes for ¾" anchors. Maximum vertical spacing of 5 ft OC.
 - c. The side rails of through ladder extensions shall extend 42" above the top rung or landing and shall flare out on each side to provide a clearance of 24" between the rails.
5. Minimum distance from centerline of rungs to wall or obstruction shall be 7".

H. Modular Framing System:

1. Material: Heavy-duty pultruded vinyl ester resin.
2. Shapes as required for condition.
3. Fasteners: Stainless steel or fiberglass.
4. Provide end caps for all exposed terminations.

- I. Structural Members:
 - 1. Provide structural members having the same resin composition as the item being supported.
 - 2. Factory fabricate with all required connection holes and holes for work of other trades.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Observe field conditions and verify that substrates are ready for installation of fiberglass fabrications.
- D. Check field dimensions affecting the installation of fiberglass fabrications.
- E. Verify that bearing surfaces are true and level.
- F. Verify that support framing has been constructed to allow accurate placement, alignment and connection of fabrication to structure.
- G. Do not proceed until unsatisfactory conditions are corrected.

3.02 COORDINATION

- A. Coordination as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

3.03 INSTALLATION

- A. General:

1. Install products in accordance with manufacturers recommendations.
 2. Anchor firmly into position.
 3. Provide control joints at not more than 35 feet on center if not indicated on drawings.
 4. Provide expansion joints where moving joints in substrate occur.
- B. Set work accurately in location, alignment and elevation, plumb, level, true, and free from rack. Measure from established lines and levels. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry or similar construction.
1. Tolerances:
 - a. Maximum variation from plumb: 1/8" in 3'.
 - b. Maximum variation from level: 1/4" in 20'.
 - c. Maximum variation from plan location: 1/4" in 20'.
- C. Railings:
1. Adjust railings prior to securing in place to ensure proper matching at butting joints and correct alignment throughout their length. Plumb posts in each direction.
 2. Provide posts with floor flange, attached to post and with predrilled holes for bolting to stringer, floor or beam.
 3. Anchor handrails to walls or guardrails with brackets designed for condition.
 - a. For concrete and solid masonry anchorage, use stainless steel adhesive anchors with stainless steel or fiberglass bolts with hex nuts.
 - b. Anchor size and embedment to be designed by component fabricator. Provide minimum of 1/2" anchor bolts.
- D. Fasten railings to beams and stair stringers with stainless steel or fiberglass bolts, nuts and washers. Provide two washers for each bolt.

- E. Attach grating to each end and intermediate support clip or saddle with bolts, nuts and washers.
 - 1. Maximum spacing: 2' OC with minimum of two per side.
 - 2. Attach clips or saddles to bearing bars only.
 - 3. Reinforce all field-cut openings in accordance with manufacturer's recommendations.
- F. Attach stair treads at ends to stair stringer with hold-down clips, bolts, nuts, and washers. Provide a minimum of two clips per end.
- G. Attached closed riser panel in manner that does not create obstruction on tread side of panel.
- H. File cut ends of all fiberglass to a 1/32" radius.
- I. Seal cut ends of all items with catalyzed resin as recommended by manufacturer. Provide same resin used in fabrication of item as a minimum.
- J. Provide all modular framing components as required to suit condition. Install in accordance with manufacturer's recommendations.
- D. In order to prevent secondary stresses, do not force members into position. Plan erection sequences accordingly.
- E. Provide temporary bracing and supports as required to ensure frame stability during erection.
- F. Completed installation shall comply with approved erection tolerances and shop drawing requirements.

3.04 CLEANING

- A. Comply with requirements of *Section 01 74 00, Cleaning and Restorations*.
- B. Remove and dispose of all debris.

****END OF SECTION****

SECTION 07 62 00
(07601)
FLASHING AND SHEET METAL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Provide flashing and sheet metal not specifically described in other Sections of these Specifications but required to prevent penetration of water through the exterior shell of the building.

B. Related work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 07 52 16: Modified Bitumen Roofing*
3. *Section 07 71 00: Roof Specialties*
4. *Section 07 53 23: Single-Ply Membrane Roofing*
5. *Section 22 14 00: Facility Storm Drainage*

C. Payment:

1. Unless otherwise noted in the Proposal Section, no separate payment shall be made for this item.
2. Include all costs for the *FLASHING AND SHEET METAL* in the prices bid for the various related items of work as designated in the Proposal.

1.02 PERFORMANCE REQUIREMENTS

- A. Metal edge securement for low-slope membrane roof systems, except gutters, shall be designed and installed for wind loads in accordance with Chapter 16 of the International Building Code and tested for resistance in accordance with ANSI/SPRI ES-1, except the basic wind speed shall be determined from Figure 1609 of the IBC. (Paragraph 1504.5 of the IBC)

1.03 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Manufacturer's product data:
 - 1. Complete materials list of all materials proposed to be furnished and installed under this section.
 - 2. Specifications and other data required that demonstrate compliance with the specified requirements.
- C. Shop drawings showing precise dimensions of the work of this section, and all other data needed to ensure proper and adequate provision in conformance with the SMACNA Architectural Sheet Metal Manual.
- D. Manufacturer's recommended installation procedures.

1.04 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 - 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
 - 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 - 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the methods and materials to be used.
 - 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.

- C. Basis of acceptance:
 - 1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.
- D. In addition to complying with pertinent codes and regulations, comply with pertinent recommendations contained in current edition of "Architectural Sheet Metal Manual" published by the Sheet Metal and Air Conditioning Contractors National Association (SMACNA).
- E. Standard commercial items may be used for flashing, trim, reglets, and similar purposes provided such items meet or exceed the quality standards specified.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 MATERIALS AND GAGES

- A. Where sheet metal is required, and no material or gage is indicated provide the highest quality and gage commensurate with the referenced standards.

2.03 ALUMINUM

- A. Fed. Spec. QQ-A-250D, alloy 3003-H14 or ASTM B209.
- B. Alclad 3003, Alclad 3004 or Alclad 3005 shall be clad on one side.
- C. Aluminum alloy, extruded shapes: ASTM B221.
- D. Gage/thickness
 - 1. Scuppers: 0.032
 - 2. Valley Flashing: 0.032
 - 3. Base Flashing (Step Flashing): 0.032
 - 4. Hip & Ridge Flashing: 0.032
 - 5. Apron Flashing: 0.032
 - 6. Ledge Flashing: 0.032
 - 7. Expansion Joints: 0.032:
- D. Finish: Clear anodized: AA-M12C22A41.
- E. All scuppers and scupper boxes shall be not less than 0.032".

2.04 COPPER

- A. Fed. Spec. QQ-C576b or ASTM B370, cold rolled temper, 16 oz, 20 oz., 24 oz., or 32 oz. per square foot as indicated or required. Where copper weights are not indicated, provide 16 oz. Gutters and downspouts shall be fabricated from 24 oz. copper. Cleats shall be 32 oz. copper.

2.05 STAINLESS STEEL

- A. Zinc-Tin Alloy-Coated Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, dead-soft, fully annealed stainless-steel sheet, coated on both sides with a zinc-tin alloy (50 percent zinc, 50 percent tin).
 - 1. Built-in Gutters: Stainless Steel, 0.0156 (min.), dead soft.
 - 2. Scuppers: 0.0188 Stainless Steel

3. Valley Flashing: 0.0250 Stainless Steel
4. Base Flashing (Step Flashing): 0.0188 Stainless Steel
5. Hip & Ridge Flashing: 0.0188 Stainless Steel
6. Apron Flashing: 0.0188 Stainless Steel
7. Crickets at Chimneys: 0.0188 Stainless Steel
8. Ledge Flashing: 0.0188 Stainless Steel
9. Expansion Joints: 0.0188 Stainless Steel
10. Roof penetration Flashing: 0.0188 Stainless Steel
11. Pipe Flashing: 0.0188 Stainless Steel (dead soft).
12. Rain Collars: 0.0188 Stainless Steel

2.06 LEAD

- A. Fed. Spec. QQ-L-201, grade B.
- B. Drain flashing: 4 lbs./SF min.
- C. Stack flashing: 2½ lbs./SF min.

2.07 SOLDER

- A. Fed. Spec. QQ-S-571 or ASTM B32.
- B. Use 50/50 for all applicable work unless otherwise specified.

2.08 SOLDERING FLUX

- A. Fed. Spec. O-F-506, type best suited for specified metal.

2.09 BUILDING PAPER

- A. Rosin sized, unsaturated paper: 6 lbs./100sf; Fed. Spec. UU-B-790, Type I, Grade A.

2.10 SEALANT

- A. Approved type of silicone, polysulfide, butyl or urethane.

2.11 ROOFING FELT

- A. Type IV, conforming to ASTM D2178.

2.12 NAILS, RIVETS, FASTENER

- A. Type and form of metal fastener same as or compatible with base material and support structure.
- B. All fasteners exposed to the weather shall be hot dip galvanized or stainless steel.

2.13 DRAW BANDS, CLAMPS

- A. Worm gear clamps meeting military specification WWC-440 with manufacturers name clearly embossed thereon and having a 7/16" wide (min) 300 series stainless steel band and housing and type 305 stainless steel screw.

2.14 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 WORKMANSHIP

- A. General:

1. Form sheet metal accurately and to the dimensions and shapes required, finishing molded and broken surfaces with true, sharp, and straight lines and angles and, where intercepting other members, coping to an accurate fit and soldering securely.
 2. Unless otherwise specifically permitted by the *ARCHITECT*, turn exposed edges back 1/2".
- B. Form, fabricate, and install sheet metal so as to adequately provide for expansion and contraction in the finished Work.
- C. Weatherproofing:
1. Finish watertight and weathertight where so required.
 2. Make lock seam work flat and true to line, sweating full of solder.
 3. Make lock seams and lap seams, when soldered, at least 1/2" wide.
 4. Where lap seams are not soldered, lap according to pitch, but in no case less than 3".
 5. Make flat and lap seams in the direction of flow.
 6. All seams in aluminum scuppers and scupper boxes shall be welded.
 7. All seams in copper scuppers and scupper boxes shall be soldered.
- D. Joints:
1. Join parts with rivets or sheet metal screws where necessary for strength and stiffness.
 2. Provide suitable watertight expansion joints for runs of more than 20'-0", except where closer spacing is indicated on the Drawings or required for proper installation.
- E. Nailing:
1. Whenever possible, secure metal by means of clips or cleats, without nailing through the exterior metal.
 2. In general, space nails, rivets, and screws not more than 8" apart and, where exposed to the weather, use lead washers.

3. For nailing into wood, use barbed roofing nails 1¼" long by 11 gage.
4. For nailing into concrete, use drilled plugholes and plugs.

3.03 EMBEDMENT

- A. Embed metal in connection with roofs in a solid bed of sealant.

3.04 SOLDERING

- A. General:

1. Thoroughly clean and tin the joint materials prior to soldering.
2. Perform soldering slowly, with a well heated copper, in order to heat the seams thoroughly and to completely fill them with solder.
3. Perform soldering with a heavy soldering copper of blunt design, properly tinned for use.
4. Make exposed soldering on finished surfaces neat, full flowing, and smooth.

- B. After soldering, thoroughly wash acid flux with a soda solution.

3.05 FIELD QUALITY CONTROL

- A. Tests: Upon request of the *ARCHITECT*, demonstrate by hose or standing water that the flashing and sheet metal are completely watertight.

3.06 CLEANING

- A. Clean exposed surface of all grease, dirt and other foreign materials.
- B. Touch up all marred or abraded surfaces in accordance with manufacturer's directions.

****END OF SECTION****

SECTION 07 92 13
(07920)
SEALANTS AND CAULKING

PART 1 - GENERAL

1.01 SUMMARY

A. Work included:

1. Throughout the work, seal and caulk joints where shown on the Drawings and elsewhere as required to provide a positive barrier against passage of moisture, air and water.
2. The work of this section includes preparation of substrate surfaces, backing material and sealant.

B. Related work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 09 90 00: Painting*

C. Payment:

1. Unless otherwise noted in the Proposal Section, no separate payment shall be made for this item.
2. Include all costs for the *SEALANTS AND CAULKING* in the prices bid for the various items of related work designated in the Proposal.

1.02 REFERENCES

A. American Society for Testing and Materials:

1. ASTM C790: Standard Practices for use of Latex Sealing Compounds.
2. ASTM C804: Standard Practice for use of Solvent-Release type Sealants.
3. ASTM C834: Standard Specification for Latex Sealing Compounds.

4. ASTM C919: Standard Practice for use of Sealants in Acoustical Applications.
5. ASTM C920: Standard Specification for Elastomeric Joint Sealants.
6. ASTM C1330: Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.

1.03 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Manufacturer's product data:
 1. Complete materials list of all materials proposed to be furnished and installed under this section.
 2. Specifications and other data required to demonstrate compliance with the specified requirements.
- C. Shop drawings showing precise dimensions of the work of this section, and all other data needed to ensure proper and adequate provision in concrete forming, reinforcement, and placement to accommodate the work of this section.
- D. Manufacturer's recommended installation procedures.
- E. Samples: Upon request of the *ENGINEER*, submit Samples of each sealant, each backing material, each primer, and each bond breaker proposed to be used.

1.04 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for

their execution, and who shall direct all work performed under this section.

2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the methods and materials to be used.
 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- C. Basis of acceptance:
1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.
- E. Do not retain at the job site material, which has exceeded the shelf life recommended by its manufacturer.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Do not install solvent curing sealants in enclosed building spaces.
- B. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Proprietary Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.
- C. Acceptable manufacturers:
1. Polymeric Systems, Inc. (PSI)
Phoenixville, PA
(800) 228-5548
 2. Bostik
Middleton, MA
(8088) 603-8558
 3. Sika Corporation
Lyndhurst, NJ
(800) 933-7452
 4. ChemRex, Inc. (Sonneborn)
Shakoppe, MN
(800) 433-9517
 5. Pecora Corporation
Harleysville, PA
(800) 523-6688
 6. Tremco
Beachwood, OH
(800) 321-7906
 7. G. E. Silicones
Wilton, CT
(800) 255-8886
 8. Dow Corning Corporation
Midland, MI

(517) 496-6000

9. W. R. Meadows, Inc
Hampshire, IL
Phone: (847) 214-2100
10. Or equivalent.

2.02 SEALANTS

A. Provide the following sealants where specified, called for on the Drawings, or otherwise required for a complete and proper installation.

1. Sealant Type "A":

- a. Self leveling, complying with ASTM C920, Type M, Grade P, Class 25, use T, A and M.
- b. Acceptable products:
 - (1) Bostik "Chem-Calk 550"
 - (2) Vulkem 245
 - (3) Pecora NR-200
 - (4) Tremco THC-900
 - (5) Sonneborn "Sonalastic SL-2"
 - (6) Or equal.

2. Sealant Type "B":

- a. Non-sag, complying with ASTM C920, Type S, Grade NS, Class 25, use NT, M, A and O.
- b. Acceptable products:
 - (1) Vulkem 116
 - (2) Tremco Dymonic
 - (3) Bostik "Chem-Calk 900"
 - (4) Sika Sikaflex 1A
 - (5) Sonneborn "Sonolastie NP1"
 - (6) Or equal.

3. Sealant Type "C":

- a. Non-sag, fungicidal silicone complying with ASTM C920, Type S, Grade NS, Class 25, use NT, G, A and O.
- b. Acceptable products:
 - (1) Rhodorsil 6B sanitary white
 - (2) Bostik silicone rubber bathroom caulk
 - (3) GE sanitary 1700
 - (4) Dow Corning 786
 - (5) Or equal

4. Sealant Type “D”:

- a. Acoustical sealant:
 - (1) Non-hardening, gunnable (not-exposed):
 - (a) PTI 808
 - (b) Tremco acoustical sealant
 - (c) Or equal.
 - (2) Paintable, non-staining, gunnable (exposed):
 - (a) Pecora AC-20
 - (b) Tremco Acrylic Latex 834
 - (c) Red Devil Acrylic Latex 15 yr. Caulk
 - (d) Or equal.

5. Sealant Type “E”:

- a. Conforming to ASTM C920, Type M, Grade P or NS, Class 25 and specifically suitable and NSF certified for Immersion Service in Potable Water Service.
- b. Acceptable Products:
 - (1) PSI RC-270 (gun grade) (urethane)
 - (2) PSI RC-270 SL (self leveling) (urethane)
 - (3) Or equal.

6. Sealant Type “F”:

- a. Conforming to ASTM C-920, Type M or S, Grade P or NS, Class 25 and specifically suitable for Immersion Service in Wastewater Treatment Facilities.
- b. Acceptable Products:
 - (1) Sonolastic "Polysulfide" (gun grade)
 - (2) Pecora "GC-2" (2 part polysulfide)
 - (3) PSI RC-270 (gun grade) (urethane)
 - (4) PSI RC-270 SL (self leveling) (urethane)
 - (5) W.R. Meadows Deck-O-Seal 785 (2 part polysulfide)
 - (6) Or equal.
- B. For other services, provide products especially formulated for the proposed use and approved in advance by the *ENGINEER*.
- C. Colors:
 - 1. Colors for each sealant installation will be selected by the *ENGINEER* from standard colors normally available from the specified manufacturer.
 - 2. Should such standard color not be available from an approved substitute manufacturer except at additional charge, provide such colors at no additional cost to the *OWNER*.
 - 3. In concealed installations, and in partially or fully exposed installations where so approved by the *ENGINEER*, use standard gray or black sealant.

2.03 PRIMERS

- A. Use only those primers that have been tested for durability on the surfaces to be sealed and are specifically recommended for this installation by the manufacturer of the sealant used.

2.04 BACKUP MATERIALS

- A. Use only those backup materials that are non-absorbent, non-staining, and specifically recommended for this installation by the manufacturer of the sealant used.
- B. Cylindrical Sealant Backings: ASTM C 1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
 - 1. Type C: Closed-cell material for exterior, horizontal applications only.
 - 2. Type O: Open-cell material for all applications including hot poured sealants to 500 °F and chemical sealant products except exterior, horizontal applications.
 - 3. Type B: Bi-cellular material for vertical and horizontal joints, or where joints are more irregular, and to fill air-gap spaces in general construction. NOT for hot poured or chemical sealant applications unless specifically recommended otherwise by the manufacturer.
- C. 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.

2.05 MASKING TAPE

- A. For masking tape around joints, provide an appropriate masking tape that will effectively prevent application of sealant on surfaces not scheduled to receive it, and that is removable without damage to substrate.

2.06 OTHER MATERIALS

- A. 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 with joint substrates.
- B. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. General:
 - 1. Clean and prime joints in accordance with manufacturer's instructions.
 - 2. Remove loose materials and foreign matter, which might impair adhesion of sealant.
 - 3. Verify that joint backing and release tapes are compatible with sealant.
 - 4. Perform preparation in accordance with ASTM C804 for solvent release sealants and ASTM C790 for latex base sealants.
 - 5. Protect elements surrounding the work of this Section from damage or disfiguration.
- B. Concrete surfaces:
 - 1. Install only on surfaces, which are dry, sound, and well brushed, wiping free from dust.
 - 2. At open joints, remove dust by mechanically blown compressed air if so required.
 - 3. To remove oil and grease, use sandblasting or solvent cleaning and wire brushing.

4. Where surfaces have been treated, remove the surface treatment by sandblasting or wire brushing.

5. Remove laitance and mortar from joint cavities.

C. Steel surfaces:

1. Steel surfaces in contact with sealant:

a. Sandblast as required to achieve acceptable surface for bond.

b. If sandblasting is not practical, or would damage adjacent finish, scrape the metal or wire brush to remove mill scale and rust.

c. Use solvent to remove oil and grease, wiping the surfaces with clean white rags only.

2. Remove protective coatings on steel by sandblasting or by using a solvent which leaves no residue.

D. Aluminum surfaces:

1. Aluminum surfaces in contact with sealant:

a. Remove temporary protective coatings, dirt, oil, and grease.

b. When masking tape is used for protective cover, remove the tape just prior to applying the sealant.

2. Use only such solvents to remove protective coatings as are recommended for that purpose by the manufacturer of the aluminum work, and which are non-staining.

3.03 INSTALLATION OF BACKUP MATERIAL

A. Backup material shall be used when and where recommended by the manufacturer of the sealant.

B. When using backup of tube or rod stock, avoid lengthwise stretching of the material. Do not twist or braid hose or rod backup stock.

C. Measure joint dimensions and size material to achieve required width/depth ratios.

- D. Install joint backing to achieve a neck dimension no greater than 1/3 the joint width.
- E. Install bond breaker where joint backing is not used or where required.
- F. Installation tool:
 - 1. For installation of backup material, provide a blunt-surfaced tool of wood or plastic, having shoulders designed to ride on the adjacent finished surface and a protrusion of the required dimensions to assure uniform depth of backup material below the sealant.
 - 2. Do not, under any circumstance, use a screwdriver or similar tool for this purpose.
 - 3. Using the approved tool, smoothly and uniformly place the backup material to the depth indicated on the Drawings or otherwise required, compressing the backup material 25% to 50% and securing a positive fit.

3.04 PRIMING

- A. Use only the primer approved by the manufacturer for the particular installation, applying in strict accordance with the manufacturer's recommendations as approved by the Architect.

3.05 INSTALLATION OF SEALANTS

- A. Prior to start of installation in each joint, verify the joint type according to details on the Drawings, or as otherwise directed by the Architect, and verify that the required proportion of width of joint to depth of joint has been secured.
- B. Equipment:
 - 1. Apply sealant under pressure with power-actuated hand gun or manually-operated hand gun, or by other appropriate means.
 - 2. Use guns with nozzle of proper size, and providing sufficient pressure to completely fill the joints as designed.
- C. Thoroughly and completely mask joints where the appearance of primer or sealant on adjacent surfaces would be objectionable.

- D. Install the sealant in strict accordance with the manufacturer's recommendations, thoroughly filling joints to the recommended depth.
- E. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Tool joints to the profile shown on the Drawings, or as otherwise required if such profiles are not shown on the Drawings.
 - 1. Provide uniformly smooth joints with slightly concave surface.
 - 2. Do not use tooling agent unless specifically so recommended in writing by the manufacturer of the sealant.

3.06 CLEANING UP

- A. Remove masking tape immediately after joints have been tooled.
- B. Clean adjacent surfaces free from sealant as the installation progresses, using solvent or cleaning agent recommended by the manufacturer of the sealant used.
- C. Upon completion of the work of this Section, promptly remove from the job site all debris, empty containers, and surplus material derived from this portion of the work.
- D. Repair or replace defaced or disfigured finishes caused by work of this Section.

3.07 PROTECTION OF FINISHED WORK

- A. Protect sealants until cured.
- B. Repair or replace disfigured or damaged sealants where necessary or required to provide finished appearance.

3.08 SCHEDULE

- A. The following schedule of sealant locations is provided as a guide only and is not all inclusive or limiting as to the quantity of work specified herein.
- B. Sealant schedule:

<u>LOCATION</u>	<u>SEALANT TYPE</u>
1. Interior & Exterior Traffic Bearing Joints.	Type A
2. Perimeter of Interior & Exterior Frames; Coping Joints; Coping to Facade Joints; Cornice & Wash (Horizontal) Joints; Interior and Exterior Control Joints; around Entrances, Store Fronts and Windows; Interior and Exterior Electrical and Mechanical Fixtures, Flashing.	Type B
3. Showers, Restroom Fixtures, Restrooms.	Type C
4. For Sound Transmission Reduction	Type D
5. Immersion Service and splash zones in potable water facilities.	Type E
6. Immersion Service and splash zones in Wastewater Treatment Facilities	Type F

****END OF SECTION****

SECTION 09 90 00
(09900)
PAINTING
(GENERAL)

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Surface preparation and painting of interior walls, (concrete floors), ceilings, sills, molding, trim, shelving, doors, frames and windows, and appurtenances.
2. Surface preparation and painting of exterior doors, frames, windows, trim, and appurtenances.
3. Surface preparation and painting of all exposed new and existing piping, valves and fittings except non-ferrous metals and stainless steel. This shall include all piping that will be enclosed in insulation.
4. Surface preparation and painting of all equipment and machinery that is not factory painted, including foundations.
5. Surface preparation and painting of all structural steel, bar joists, metal desk, miscellaneous metal and supports.
6. Surface preparation and painting of all process equipment that is not factory painted.
7. Surface preparation and painting of all interior and exterior, above and below grade surfaces of process tanks.
8. Surface preparation and painting of all exterior exposed electrical cabinets, boxes, hangers, apparatus, etc. that are not factory painted.
9. Surface preparation and painting of floors and all exposed surfaces of equipment pads in chemical containment areas including walls to a height of 4" above highest point on floor surface.
10. Restore or repaint areas damaged.

B. Related work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 01 74 00: Cleaning and Restorations*
3. *Section 03 30 00: Concrete*
4. *Section 05 12 00: Structural Steelwork*
5. *Section 05 50 00: Metal Fabrications*
6. *Section 07 92 13: Sealants and Caulking*
7. *Section 26 05 00: Basic Electrical Requirements*
8. *Section 31 23 00: Excavating, Filling and Grading*

C. Payment:

1. Unless otherwise noted in the *PROPOSAL* Section, no separate payment shall be made for this item.
2. Include all costs for *PAINTING* in the prices bid for the various related items of work as designated in the *PROPOSAL*.

1.02 REFERENCE STANDARDS

A. Steel Structures Painting Council:

- | | | |
|-----|------------|---|
| 1. | SSPC-SP1 | Solvent Cleaning |
| 2. | SSPC-SP2 | Hand Tool Cleaning |
| 3. | SSPC-SP3 | Power Tool Cleaning |
| 4. | SSPC-SP5 | White Metal Blast Cleaning |
| 5. | SSPC-SP6 | Commercial Blast Cleaning |
| 6. | SSPC-SP7 | Brush-Off Blast Cleaning |
| 7. | SSPC-SP10 | Near-White Blast Cleaning |
| 8. | SSPC-SP11 | Power Tool Cleaning to Bare Metal |
| 9. | SSPC-SP12 | High & Ultrahigh-Pressure Water Jetting |
| 10. | SSPC-SP13 | Surface Preparation of Concrete |
| 11. | SSPC-TR3 | Dehumidification & Temperature Control |
| 12. | SSPC-Vis 1 | Pictorial Surface Preparation Standards |
| 13. | SSPC-Vis 3 | Visual Std. for Power and Hand tool Cleaned Steel |

- 14. SSPC-PA 1 Shop, Field and Maintenance Painting
- 15. SSPC-PA2 Measurement of Dry Paint Thickness

1.03 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Manufacturer's literature:
 - 1. Manufacturer's descriptive literature to include color charts, and recommend method of application for paints and related materials.
 - 2. Manufacturer's standard and custom color charts and decks showing full range of colors available.
- C. Upon completion of high performance coating application, provide certification from paint material supplier indicating that quantity of each coating material purchased was sufficient to properly coat all surfaces. Such certification shall list the square footage figure for all areas coated and the number of gallons of each material used as provided by *CONTRACTOR*.

1.04 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 - 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Applicator qualifications:
 - 1. Completion of minimum of five (5) equal applications for each coating system specified.
 - 2. Provide listing of experience as outlined in *PROPOSAL*.
 - 3. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.

4. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the methods and materials to be used.
 5. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- B. Labels: Include the following information on each paint material container label:
1. Manufacturer's name.
 2. Distinctive product name.
 3. Manufacturer's stock number and lot number.
- C. Product information:
1. Manufacturer shall include the following on paint material label, or submit on accompanying instruction sheet for *CONTRACTOR'S* use.
 2. Submit detailed information as specified in AWWA D102, Section 4.
 - a. Mixing instructions
 - b. Percent solids
 - c. Spreading rate
 - d. Weight
 - e. Drying time
 - f. Pot life
 - g. Thinning instructions
 - h. Safety precautions
 3. Provide Material Safety Data Sheets (MSDS) for all materials delivered to site.
- D. Requirements of regulatory agencies:
1. Comply with all Local, State, and Federal safety regulations, laws and ordinances.

2. Federal:

a. Worker protection:

- (1) 29 CFR 1910.94, Ventilation
- (2) 29 CFR 1910.95(a-p), Occupational Noise Exposure
- (3) 29 CFR 1910.97, Non-Ionizing Radiation
- (4) 29 CFR 1910.134, Respiratory Protection Standard
- (5) 29 CFR 1910.146, Permit-Required Confined Spaces
- (6) 29 CFR 1926.20, General Safety and Health Provisions
- (7) 29 CFR 1926.353, Protection in Welding, Cutting and Heating
- (8) 29 CFR 1926.55, Gases, Vapors, Fumes, Dusts and Mists
- (9) 29 CFR 1926.57, Ventilation
- (10) 29 CFR 1926.59, Hazard Communication Program
- (11) 29 USC 654, Section 5(a)(1) General Duty Clause of the 1970 OSH Act, which requires employers to provide safe work conditions for their employees.

b. Ambient air quality:

- (1) 40 CFR 50.6, National Primary and Secondary Ambient Air Quality Standards for Particulate Matter.

c. Water quality:

- (1) 40 CFR 122, Administered Permit Programs: The National Pollutant Discharge Elimination System
- (2) 40 CFR, Parts 141, 142 and 143; Federal Safe Drinking Water Act

d. Hazardous waste:

- (1) 40 CFR 261, Identification and Listing of Hazardous Waste
- (2) 40 CFR 262, Standards Applicable to Generators of Hazardous Waste
- (3) 40 CFR 263, Standards Applicable to Transporters of Hazardous Waste

3. State of New Jersey:

a. NJAC 7:10-1 et. seq.; New Jersey Safe Drinking Water Regulations.

b. NJAC 7:27-16; Misc. Metal Parts and Products Rule.

- c. NJAC 7:27-23; Architectural Coatings Rule.
 - d. NJAC 8:59-5.1, et. seq.; New Jersey Worker and Community Right to Know Act.
4. All other Federal, State and local regulations applicable to the work.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.
- E. Deliver sealed containers with labels legible and intact.
- F. Storage of materials:
 - 1. Store only acceptable project materials on project site.
 - 2. Store in suitable location. Comply with manufacturer's storage recommendations.
 - 3. Restrict storage to paint materials and related equipment.
 - 4. Comply with health and fire regulations.
 - 5. Storage of materials shall be subject to approval of *ENGINEER*.
 - 6. All paint cans, opened and unopened, shall remain on job site for inspection by *ENGINEER*. Do not discard until directed to do so by *ENGINEER*.

1.06 JOB CONDITIONS

- A. Sequencing, scheduling: Do not begin painting until environmental conditions meet the requirements of these Specifications.
- B. Environmental requirements:
1. Do not blast when relative humidity exceeds 85 percent (85%), and/or surface temperature of steel is less than 5° F. above the dew point.
 2. Comply with paint supplier's recommendations as to environmental conditions under which coatings and coating systems can be applied. The following shall be considered as general requirements, and shall not be exceeded unless recommended by paint supplier and approved by *ENGINEER*.
 - a. Interior coating systems:
 - (1) Do not apply when surrounding air temperature, as measured in shade, is below 50° F. and when temperature of surface to be painted is below 50° F.
 - (2) Do not apply paint to wet or damp surfaces during periods of rain, snow, fog, or mist, or when relative humidity exceeds 85 percent. If dew or condensation is present, delay painting until mid-morning or as required to insure that surfaces to be painted are dry.
 - (3) Do not apply paint when it is expected that air temperature in shade will drop below 50° F., or that relative humidity will exceed 85 percent within 18 hours after application of paint. Complete days painting to allow minimum of 6 hours drying time prior to time of day when condensation will occur.
 - b. Exterior coating systems:
 - (1) Same general environmental requirements as specified for interior coating system.
 - (2) Do not apply paint when wind velocity exceeds 15 m.p.h.
- C. Protection:
1. Cover or otherwise protect surfaces not being painted concurrently.

2. *CONTRACTOR* shall promptly remedy all paint damage to existing structures and other property at site or adjacent thereto not designated for painting under this Contract. See paragraph 9 of General Conditions, as amended by Supplementary Conditions.

D. Safety precautions:

1. Comply with all OSHA regulations.
2. Provide adequate air exhaust equipment to eject blast dust and solvent fumes from tank interiors or confined spaces; and to prevent accumulation of solvent fumes that will retard curing of the paint or create an explosion or fire hazard.
3. During blasting operations, provide nozzle men with air-supplied helmets and other persons exposed to blasting dust with filter-type respirators and safety goggles.
4. When applying coatings inside of tanks or confined spaces, all persons exposed to toxic vapors shall wear air-supplied masks.
5. Provide access facilities, ventilation, grounding, lighting, protective clothing; and handle paint and solvent as specified in AWWA D102, Section 7. Comply with paint supplier's safety precautions.

1.07 WARRANTY AND WARRANTY REPAIRS

- A. Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B. The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including surface preparation, recoating, removal and reinstallation of equipment and re-start-up during the warranty period.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style,

type, character and quality of material, serviceability and other described essential characteristics.

B. Substitutions:

1. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.
2. No request for substitution will be considered that decreases the film thickness specified and/or number of coats to be applied; or that offers a change from the generic type of coating specified.
3. Submit additional information for substitutions as specified below:
 - a. Certification that coating meets regulatory requirements.
 - b. List at least five (5) equivalent applications where each coating material has been used and rendered satisfactory service.

C. Acceptable manufacturers:

1. Tnemec Company, Inc.
Kansas City, MO
816- 474-3400
2. Carboline Company
St. Louis, MO
314- 644-1000
3. Sherwin-Williams Company
Malvern, PA
Jim Criss – Cell: 609-577-4034
4. ICI Devoe Coatings
Sykesville, MD
410- 795-3234
5. Finnaren & Haley
Conshohocken, PA
800- 843-9800
6. Benjamin Moore & Co.
Montvale, NJ
201-573-9600

7. NSP Specialty Products
Pinehurst, NC 28374
800-248-8907
910-235-0468
8. International Paint
Union, NJ 07083
908-686-1300
9. Or equivalent.

2.02 MATERIALS

- A. Paint:
 1. Materials are specified in the Painting Schedule.
 2. Use manufacturer's standard colors or custom colors as selected by the *ENGINEER* from the manufacturers full range of standard and custom colors.
- B. Primers and undercoats: As specified in Painting Schedule or as recommended by paint manufacturer and approved by *ENGINEER*.
- C. Sealer for interior woodwork: White pigmented Shellac or urethane wood sealer.
- D. All coatings shall be in compliance with NJAC 7:27-23 and NJSA 7:27-16.
- E. All coatings shall be lead free.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Inspection:
 1. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

2. Verify that the work of this section may be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.
3. Verify that the specified coatings are compatible with the surface and service for which they are to be used.
4. Examine surfaces scheduled to receive paint for conditions that will adversely affect execution, permanence or quality of work and that cannot be put into acceptable condition through preparatory work specified below. *CONTRACTOR* shall be solely responsible for providing a surface acceptable to the application of coatings utilizing the indicated cleaning methods as a minimum.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the *ENGINEER*.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 PREPARATION

A. General:

1. Before painting, remove hardware, accessories, plates, lighting fixtures and similar items or provide ample protection of such items.
2. Upon completion of each space, replace above items.
3. Use only skilled mechanics for removing and replacing above items.
4. All welding, burning, etc., shall be completed prior to the blasting operation. All flux, spatter, slag or other laminations left from welding must be chipped or ground off. Rough welds and other sharp projections shall be ground smooth.
5. Clean surfaces shall be coated with the specified coating system during the same day as blasted and prior to sundown of that day.
6. Blasting media shall be fresh, with sharp angular surfaces to insure fast, positive cleaning action with a minimum of dust.

7. Blasting media shall be confined as closely as possible to the area being blasted. If necessary, shields of sheeting or other such barriers shall be erected to confine the media to the blast area. Rotating equipment near blasting operations shall have a tent placed over it to protect it from drifting, spent media.
8. Nameplates, valve stems, rotating equipment, etc., shall be protected from blasting and coating by suitable masking materials.
9. Dials, gauges, and indicators on operating equipment shall be covered with clear material so as to afford visual access.

B. Preparation of surfaces:

1. Wood:
 - a. Sandpaper to smooth and even surface, then dust off.
 - b. Touch up knots, pitch streaks, sap spots and similar blemishes with sealer before priming.
2. Wallboard and plaster shall be thoroughly cleaned of all dust, dirt and efflorescence by stiff broom or brush cleaning.
3. Block: Thoroughly clean of all dust, dirt, loose mortar and efflorescence by brushing down with stiff brooms or scraping tools, producing a clean surface for painting. All surface contaminants shall be removed.
4. Concrete:
 - a. Concrete shall be permitted to age at least 28 days prior to applying coating system.
 - b. The *CONTRACTOR* may elect to use a paintable curing compound to permit coating in seven (7) days.
 - c. All surface contaminants shall be removed and there shall be no evidence of laitance on the surface prior to painting. Hardeners and sealers shall be removed. Surface shall be acid etched or brush blasted.
 - d. Patch all bug holes, voids and cracks.
 - e. Surfaces to be used for immersion service shall not be “bagged”.

5. Iron and steel surfaces:
 - a. All sharp edges and welds shall be ground smooth to a rounded contour and all weld splatter shall be removed prior to blast cleaning.
 - b. Iron and steel shall be prepared in accordance with SSPC-SP6 unless otherwise specified and prime coated the same day whether shop primed or field painted.
 - c. Primed iron and steel shall be cleaned of all construction debris and hand tool cleaned in accordance with SSPC SP2 prior to touch-up and field painting.
 - d. Surface profile for blasted surfaces shall be between 20 and 30 percent of the total dry film thickness of the complete system.
 - e. Compressed air for blasting shall be clean, dry and oil free. Place oil and water separators in air hose as close as possible to blast cleaning equipment. Water shall be continuously bled from moisture traps.
 - f. After blasting, remove all dust and grit with vacuum cleaner or compressed air (clean and dry).
 - g. Coat blasted surfaces before they become contaminated with rust, oil, grease, dust or other foreign matter.
 - h. If blast cleaned surfaces become contaminated by rust, oil, grease, hand-prints or other foreign matter, solvent clean and reblast to original specifications to insure same degree of cleanliness.
 - i. Blasted surfaces shall be prime coated the same day.
 - j. Feather edges of sound paint during spot-blasting operations.

6. Galvanized steel:

- a. New Galvanized Metal: Remove grease, oil, dirt, soil, drawing compounds, and other contaminants by use of solvents, emulsions, cleaning compounds or steam cleaning per SSPC-SP1. If galvanized metal has not weathered for at least 6 months or if the metal has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a paint test patch (minimum area of 2 sq ft) and allow the paint to dry for at least one week before

testing adhesion. If adhesion is unacceptable, Brush-Off Blast per SSPC-SP7 or NACE 4 to remove these treatments.

- b. Old Galvanized Metal: If metal is covered with a white powder (white rust) and there is little or no rusting, solvent clean per SSPC-SP1.
7. Aluminum:
- a. Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning SSPC-SP1.
 - b. Aluminum surfaces in contact with concrete shall be coated with a bituminous barrier coat prior to installation.
8. Below grade exterior surfaces of concrete or steel process tanks.
- a. Below grade exterior surfaces shall be prepared and coated as specified.
 - b. Excavate adjacent to tank down to top of foundation and expose all exterior wall surfaces.
 - c. Prepare and coat exterior tank surfaces as specified and allow to fully cure prior to backfilling.
 - d. After coating has fully cured, backfill adjacent to tank with excavated material unless otherwise specified.
 - e. All excavation, backfilling and grading shall conform to *Section 31 23 00, Excavating, Filling and Grading*.
 - f. All restorations shall conform to *Section 01 74 00, Cleaning and Restorations*.

3.03 APPLICATION

- A. Prior to painting, meet with *ENGINEER* to review all aspects of surface preparation and application.
 - 1. Do not apply coatings until air temperature, surface temperature, relative humidity, and surface moisture content are within specified limitations.

2. Check temperature and humidity using pyrometers and hygrometers, or similar equipment.
- B. Sequencing:
1. Sequence painting to allow coating of surfaces that may be inaccessible after fixtures, partitions, or other facilities are installed and so that minimum damage to finish coatings will result.
 2. All structural steel shall be finish painted.
- C. Prepare surfaces to be painted and apply all paint and other materials in accordance with paint manufacturer's recommendations unless otherwise specified as approved by the *ENGINEER*.
- D. Each coat of paint shall be slightly darker than preceding coat unless otherwise directed. Undercoats shall be tinted similar to finish coats.
- E. Surfaces to be painted shall be clean, dry, smooth and adequately protected from dampness.
1. Each coat of paint shall be well brushed on, worked out evenly and allowed to dry before a subsequent coat is applied.
 2. Use rollers or airless spray except that sharp corners, inside angles, welds, and rivets shall be brushed and allowed to dry before remaining surfaces are rolled or sprayed.
 3. Rate of application shall not exceed that recommended by paint manufacturer.
 4. Keep brushes, rollers, and spraying equipment clean, dry, free from contamination. Use equipment suitable for the finish desired.
 5. Comply with recommendation of product manufacturer for drying time between succeeding coats.
- F. Mixing, thinning, pot life, application procedure, equipment, coverage, curing, recoating, storage, and number of coats shall be in accordance with coating manufacturer's instructions or these specifications, whichever are more stringent.
- G. Avoid contamination of blasted surfaces and avoid between coat contamination. Surface contamination shall be removed before applying next coat.

H. Striping of Irregular Surfaces:

1. Stripe paint all edges, corners, crevices, rivets, bolts, welds, sharp edges and similar surface irregularities with the priming paint before the steel receives its first full prime coat of paint. The stripe coat shall be applied by brush or spray to thoroughly work the coating into or on the irregular surfaces and shall extend onto the surrounding steel a minimum of 1 in. in all directions.
 2. The full prime coat can be applied first to protect the steel after blasting followed by the stripe coat after the prime coat has dried. Stripe coat shall be tinted to differentiate it from the prime coat.
 3. The stripe coat can also be applied as part of the application of the prime coat unless prohibited by the coating manufacturer. If applied as part of the application process of the prime coat, the stripe coat shall be allowed to dry for a minimum of ten (10) minutes in order to allow *ENGINEER* to verify that the coat was applied. If a wet-on-wet stripe coat is prohibited by the coating manufacturer or brush or roller application of the full coat pulls the underlying stripe coat, the stripe coat shall be permitted dry according to the manufacturers' recommendations prior to the application of the full coat.
- I. Spraying techniques that result in a uniform, wet pattern shall be used and dry spraying shall be avoided. Dry spray shall be removed prior to sound coating being applied.
- J. Coated surfaces shall be allowed to cure prior to allowing traffic or other work to proceed that might damage coating.
- K. No coating shall be applied over scale, oil, grit or other foreign material. All grit shall be removed by brush, airblast or vacuum type cleaner prior to applying coating system. Care shall be taken to assure that blast cleaned surfaces are not contaminated with foreign material prior to applying primer.
- L. Regulators and gauges in good working order shall be provided on both air and material lines. Operating pressures in accordance with those required for the particular coating will be used.
- M. Temperature of the surface to be painted shall not be less than 50° F (10° C) or greater than 120° F (49° C) unless approved otherwise by the *ENGINEER*.
- N. The coating system shall not be applied closer than 6 inches to a non-blasted area. Any subsequent blasting operation shall not result in sand or grit particles being embedded in the paint film.

- O. Spray guns must be held perpendicular to the surface being painted and handled and adjusted in such a manner that dry overspray is kept to a minimum.
- P. The final dry film thickness of the applied coating system shall be within the range of thicknesses specified per coat, and the thicknesses of the totals of each coat for a coating system as specified in the "Coating Schedule".
- Q. All spray equipment to be used for the application of a particular coating will be available for inspection by *ENGINEERS* representative before application is begun.
- R. The air source must be sufficient to provide a continuous volume of 20 cfm air at each spray gun nozzle at 80 pounds per square inch pressure for applying coatings by conventional spray technique. When coatings are applied by airless spray, the input pressures to the pump shall be such that a uniform spray pattern is developed for application.
- S. Drop cloths shall be used to protect all previously painted surfaces and all surfaces not to be coated.
- T. All zinc rich primers shall be applied under continuous agitation.
- U. Runs or sags shall be brushed out immediately or the coating shall be removed from the surface.
- V. Finished work shall be uniform, of approved color, smooth and free from runs, sags, defective brushing, clogging, mud cracking or excessive flooding. Make edges of paint adjoining other materials or colors sharp and clean without overlapping.
- W. At completion, touch up and restore finish where damaged and leave in good condition.
- X. All methods of application shall be in accordance with paint manufacturer's recommendations as approved by *ENGINEER*.

3.04 CLEANING

- A. Touch up and restore finish where damaged.
- B. Remove spilled, splashed or splattered paint from all surfaces.
- C. Do not mar surface finish of item being cleaned.

D. Refer to *Section 01 74 00, Cleaning and Restorations*.

3.05 FIELD QUALITY CONTROL

- A. Tests by CONTRACTOR: Check wet film thickness steel surfaces during paint application using a Nordson Wet Film Gauge or similar approved instrument. Take 1 wet film thickness measurement for each 100 square feet of surface painted.
- B. All surfaces, preparation, and paint applications are subject to inspection by the *ENGINEER* Representative.
- C. Painted exterior and interior surfaces shall be rejected if any of the following defects are apparent to the *ENGINEER*.
1. Brush/roller marks, streaks, laps, runs, sags, drips, stippling, mud cracking, blistering, blushing, checking, cratering, flaking, orange peel, over spray, wrinkling, pinholes, hiding or shadowing by inefficient application methods, skipped or missed areas, and foreign materials in paint coatings.
 2. Evidence of poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, corners and re-entrant angles.
 3. Damage due to touching before paint is sufficiently dry or any other contributory cause.
 4. Damage due to application on moist surfaces or caused by inadequate protection from the weather.
 5. Damage and/or contamination of paint due to blown contaminants (dust, spray paint, etc.).
 6. Insufficient film thickness.
 7. Insufficient surface profile on blasted steel surfaces.
 8. The final coat on any surface exhibits a lack of uniformity of color, sheen, texture, and hiding across full surface area.
- D. Painted surfaces rejected by the *ENGINEER* shall be repaired or replaced at the Contractors expense.

1. Correct deficiencies in film thickness by application of additional coat(s) of paint.
2. Correct defective work or work not meeting specifications by removal and recoating.

3.06 INSPECTION PRIOR TO RELEASE OF MAINTENANCE BOND

- A. General: Within two (2) years time from acceptance of work by *ENGINEER*, the surfaces coated under this Contract shall be inspected by representatives of *OWNER*, *ENGINEER* and *CONTRACTOR* to determine if any repair work is necessary.
- B. Arrangements:
1. *OWNER* will establish date for the inspection and will notify *CONTRACTOR* at least thirty (30) days in advance.
 2. *OWNER* will drain tank (if required). *CONTRACTOR* shall provide suitable interior lighting and ventilation for the tank inspection.
- C. Remedial work:
1. Any location where coats of paint have peeled off, bubbled, or cracked and any location where rusting is evident shall be considered failure of paint system.
 2. *CONTRACTOR* shall make repairs at all points where failures are observed by removing deteriorated coating, cleaning surface, and recoating with same paint system. If area of failure exceeds 25 percent of the area of a portion of a surface, then for that portion, remove and repaint the entire paint system.
 3. For purposes of determining need for complete repainting of a tank, the outside roof, shell, floor, riser, and tank supporting structure consisting of columns, rods, struts, and other members; and inside roof, shell, floor and riser shall be considered separately.
- D. Inspection Report: *OWNER* will have prepared, by an independent inspection agency, an inspection report covering the inspection describing the number and types of failures observed, the percentage of surface area where failure has occurred, and names of persons making the inspection. The report will include color photographs illustrating each type of failure.

- E. All work relating to the inspection shall conform to the requirements of Paragraph 36 of General Conditions entitled, "Approval and Acceptance of Work".

3.07 PAINING SCHEDULES

A. GENERAL ENVIRONMENT – INTERIOR:

1. Concrete floors:
 - a. Surface preparation: SSPC-SP13, Detergent wash and dry abrasive blasting.
 - b. Sherwin-Williams:
1 coat "Armorseal 33 Primer" (8 mils DFT)
1 coat "Armorseal 650 SL/RC Epoxy, (20–25 mils DFT/coat)
 - c. PPG/Amercoat
1 coat "Megaseal HSPC 90-127 Primer" (6-10 mils/DFT)
1 coat "Megaseal SL 90-126 Series" (20-25 mils DFT)
 - d. Carboline:
1 coat "Carbogard 1340" (4 mils DFT)
1 coat "Sanitile 945SL" (20-25 mils DFT)
2. Concrete and masonry walls:
 - a. Surface preparation: SSPC-SP13/NACE6 or ICRI No. 310.2R, CSP3-5.
 - b. Sherwin Williams:
1 coat "Kem Cati-Coat HS" Epoxy Block Filler
2 coats "Pro Industrial Acrylic Coating – Semi-Gloss Finish.
 - c. PPG/Amercoat:
1 coat "Amerlock 400BF" Epoxy Block Filler
2 coats "Pitt-Tech DTM Acrylic Coating"
 - d. Carboline:
1 coat "Sanitile 500" Epoxy Block Filler
1 coat "Sanitile 155" Acrylic Coating

3. Wood surfaces:
 - a. Surface preparation: Sand bare wood to a fresh surface and following manufacturer instructions.
 - b. Sherwin Williams:
 - 1 coat "Premium Wall & Wood Primer," B28W8111
 - 2 coats: "Pro Industrial Acrylic Coating Semi-Gloss Finish.", B66-650 Series
 - c. Carboline:
 - 1 coat "Sanitile 120" Primer/Sealer
 - 1 coat "Sanitile 155" Acrylic Coating
 - d. PPG/Americoat:
 - 1 coat "Seal Grip Acrylic Primer Sealer"
 - 2 coats "Manor Hall 70-101"

4. Ferrous Metal:
(including metal doors, frames, trim, equipment and miscellaneous metal):
 - a. Surface preparation: SSPC-SP2, Hand-tool.
 - b. Sherwin-Williams:
 - 1 coat "DTM Acrylic Primer/Finish (2-5 mils DFT/coat) on bare metal
 - 2 coats "Pro Industrial Acrylic Coating", B66-650 Series (2-5 mils DFT/coat) Semi-Gloss
 - c. Carboline:
 - 1 coat "Carbocrylic 120" Primer/Sealer (1-2 mils DFT)
 - 1 coat "Sanitile 155" Acrylic Coating (2-3 mils DFT)
 - d. PPG/Americoat:
 - 2 coats "Pitt-Tech DTM" Acrylic Coating

5. Galvanized Ferrous Metal:
 - a. Surface Preparation SSPC-SP1, Solvent-Clean.
 - b. Sherwin Williams:
 - 1 coat "Pro Industrial Pro-Cryl Universal Primer" (3-4.5 mils DFT)
 - 2 coats "Pro Industrial Acrylic Coating" Semi-Gloss Finish. B660650 Series" (2.5-4 mils DFT/coat)

- d. Carboline:
 - 1 coat “Galoseal”
 - 2 coats “Sanitile 155”
 - e. PPG/Americoat:
 - 1 coat “6-209 Epoxy Ester Primer”
 - 2 coats “Pitt-Tech DTM Acrylic Primer”
 - f. Or approved equivalent.
6. Overhead Ferrous Metal:
(including steel bar joists, steel beams, steel deck):
- a. Surface preparation: SSPC-SP2
 - b. Sherwin Williams:
 - 1 coat “Kem Bond HS” (2.0 – 5.0 mils)
 - 2 coats “Dry Fall Flat White” (3.0 – 5.0 mils)
 - c. PPG/Americoat:
 - 1 coat “6-209 Epoxy Ester Primer”
 - 2 coats “Pitt-Tech DTM Acrylic Primer”
 - d. Or approved equivalent.
7. Overhead Galvanized Metal:
(including steel bar joists, steel beams, steel deck):
- a. Surface preparation: SSPC-SP1, Solvent Clean
 - b. Sherwin Williams:
 - 1 coat “DTM Wash Primer”
 - 2 coats “Dry Fall Flat White”
 - c. PPG/Americoat:
 - 1 coat “6-209 Epoxy Ester Primer”
 - 2 coats “Pitt-Tech DTM Acrylic Primer”
 - d. Or approved equivalent.
8. Wallboard and plaster:
- a. Surface preparation: Provide Finish per Specification 09 21 16, Gypsum Wallboard and then follow manufacturer’s recommendations.

- b. Sherwin Williams:
1 coat "ProMar 200 Zero VOC Latex Primer," B28W2600
2 coats "ProMar 200 Zero VOC Latex," Flat Finish.
- c. Carboline:
1 coat "Carbocrylic 120" Primer/Sealer
1 coat "Carocrylic 3359" Acrylic Coating

B. PROCESS ENVIRONMENT - INTERIOR:

- 1. Concrete floors (see General Environment – Interior):
- 2. Concrete and masonry walls:
 - a. Surface preparation: SSPC-SP13/NACE 6 or ICRI No. 310.2R, CSP 3-5.
 - b. Sherwin Williams:
1 coat "Kem Cati-Coat HS" Epoxy Block Filler
2 coats "Macropoxy 646 fast Cure Epoxy" (4-8 mils DFT/coat)
 - c. Carboline:
1 coat "Sanitile 500" Epoxy Block Filler
1 coat "Carboguard 60" Epoxy Coating (4-6 mils DFT)
 - d. PPG/Amercoat:
1 coat "Amerlock 400BF" Epoxy Block Filler
1 coat "Amercoat 385" Multi-Purpose Epoxy
- 3. Wood surfaces (see General Environment – Interior):
- 4. Ferrous Metal: Lighter Duty – One Component
(including metal doors, frames, trim, equipment and miscellaneous metals, and structural steel):
 - a. Surface preparation: SSPC-SP2, Hand-tool.
 - b. Sherwin-Williams:
1 coat "Kem Bond HS Universal Primer" (2.5-3.5 mils DFT)
2 coats "Industrial Enamel HS" (2-4 mils DFT/coat)
 - c. Carboline:
1 coat "Carbocoat 150 Universal Primer" (2-3 mils DFT)
2 coats "Carbocoat 45 Silicone Alkyd" (2-3 mils DFT)

- d. PPG/Amercoat:
1 coat "Amercoat 185H Universal Primer" (2-3 mils DFT)
2 coats "Amercoat 5450" (1.5-2.5 mils DFT)
5. Ferrous Metal: [Heavy Duty – Two Components]:
- a. Surface preparation: SSPC-SP6, Commercial Blast.
First coat or shop coat must be specified epoxy below.
 - b. Sherwin-Williams:
2 coats "Macropoxy 646 – FC Epoxy" (5-10 mils DFT/coat)
 - c. Carboline:
2 coats "Carboguard 60" (4-6 mils total DFT/coat)
 - d. PPG/Amercoat:
2 coats "Amercoat 385" (4-6 mils DFT)
6. Galvanized and Nonferrous Metal:
- a. Surface Preparation SSPC-SP1, Solvent-Clean
 - b. Sherwin Williams:
1 coat "Pro-Cryl Universal Primer" (3-4.5 mils DFT)
2 coats "Industrial Enamel HS" (2-4 mils DFT/coat)
 - c. Carboline:
1 coat "Galoseal" (0.5 – 1.0 mils DFT)
1 coat "Carbocoat 45" Silicone Alkyd (2-3 mils DFT)
 - d. PPG/Amercoat:
1 coat "6-209 Epoxy Ester Primer" (2.0 mils DFT)
2 coats "Amercoat 5450" (1.5-2.5 mils DFT)
7. Crane Rails:
- a. Surface preparation: SSPC-SP6, Commercial blast.
 - b. Sherwin Williams:
1 coat "Macropoxy 646-C Epoxy" (4-6 mils DFT)
1 coat "Hi-Solids Polyurethane" (3-4 mils DFT)
 - c. Carboline:
1 coat "Carboguard 60" (4–6 mils total DFT)
1 coat "Carbothane 133 Series" (3-5 mils DFT)

- d. PPG/Amercoat:
 - 1 coat "Amercoat 385" (4-12 mils DFT)
 - 1 coat "Amercoat 450H" (2-5 mils DFT)

8. Wallboard and plaster: (Same as for General Environment – Interior).

C. **EXTERIOR EXPOSURE:**

(Exposure to weather, freezing and/or ultraviolet)

- 1. Ferrous metal: Lighter Duty
(including metal doors and trim, interior face of exterior doors, frame, exposed electrical equipment, and other miscellaneous metal):
 - a. Surface preparation: SSPC-SP2, Hand-tool.
 - b. Sherwin-Williams:
 - 2 coats "DTM Acrylic Primer/Finish" (2-5 mils DFT/coat)
 - c. Carboline:
 - 1 coat "Carbocrylic 120" Primer/Sealer (1-2 mils DFT)
 - 1 coat "Carbocrylic 3359" Acrylic Coating (2-3 mils DFT)
 - d. PPG/Amercoat:
 - 2 coats "DTM Acrylic Primer/Finish" (2-5 mils DFT/coat)
- 2. Ferrous Metal: Heavy Duty – Above Grade:
(including exterior surface of tanks – not Potable, Non-Immersion)
 - a. Surface preparation: Blast to SSPC-SP10, Near White. (First coat must be specified epoxy, see below.)
 - b. Sherwin-Williams:
 - 1 coat "Macropoxy 646- FC Epoxy" (4-6 mils DFT)
 - 2 coats "Hi-Solids Polyurethane" (3-5 mils DFT)
 - c. Carboline:
 - 1 coat "Carboguard 60" 94-6 mils total DFT)
 - 1 coat "Carbothane 133 Series" (3-5 mils DFT)
 - e. PPG/Amercoat:
 - 1 coat "Amercoat 385" (4-12 mils DFT)
 - 1 coat "Amercoat 450H" (3-4 mils DFT)

3. Ferrous Metal: – Heavy Duty – Below Grade:
(Not Potable, Non-Immersion)
 - a. Blast to SSPC-SP10, Near White. (First coat must be specified Epoxy. See below.)
 - b. Sherwin-Williams:
2 coats “Macropoxy 646- FC Epoxy” (5-6 mils DFT/coat)
 - c. Carboline:
2 coats “Carboguard 890” (4-6 mils total DFT/coat)
 - d. PPG/Amercoat:
2 coats “Amercoat 385” (4-12 mils DFT)
4. Galvanized (and Nonferrous) Metal:
(including metal doors and trim, interior face of exterior doors, frames, exposed electrical equipment, and other miscellaneous metal):
 - a. Surface Preparation SSPC-SP1, Solvent-Clean.
 - b. Sherwin Williams:
1 coat “Pro Industrial Pro-Cryl Universal Primer” (3-4.5 mils DFT)
2 coats “Pro Industrial Acrylic Coating” B66-650 Series
(2.5-4 mils DFT/coat)
 - c. Carboline:
1 coat “Galoseal” (0.5 – 1.0 mils DFT)
2 coats “Carbocrylic 3359” Acrylic Coating (2-3 mils DFT)
 - d. PPG/AmerCoat:
1 coat “6-209 Epoxy Ester Primer” (2.0 mils DFT)
2 coats “Pitt-Tech DTM Acrylic Finish” (2.0 mils DFT/coat)
5. Masonry:
 - a. Surface preparation: SSPC-SP13/NACE-6, or ICRI No. 310.2R, CSP 3-5.
 - b. Sherwin Williams:
1 coat “Kem Cati-Coat HS” Epoxy Block Filler
2 coats “Macropoxy 646 Fast Cure Epoxy” (5-10 mils DFT/coat)

- c. Carboline:
 - 1 coat "Sanitile 500" Epoxy Block Filler
 - 1 coat "Carboguard 60" Epoxy Coating (4-6 mils DFT)
 - d. PPG/Amercoat:
 - 1 coat "Amerlock 400BF" Epoxy Block Filler
 - 1 coat "Amercoat 385" Multi-Purpose Epoxy
6. Stucco:
- a. Surface Preparation: Allow new concrete, masonry or stucco to cure in accordance with coating manufacturer's directions. Remove all old paint, mildew and other contaminants in accordance with coating manufacturer's directions. Patch all cracks with manufacturers recommended gun grade or knife grade acrylic latex (silicone free) patching compound in accordance with manufacturer's directions.
2 coats Sherwin-Williams "Conflex XL Smooth Elastomeric High Build," (A5-400), (6.0 – 7.5 mils DFT/coat).
 - b. Sherwin Williams:
 - 1 coat Sherwin-Williams "Loxon Concrete and Masonry Primer" (A24W300), (3-4 mils DFT).
Patch all cracks with manufacturers recommended gun grade or knife grade acrylic latex (silicone free) patching compound in accordance with manufacturer's directions.
2 coats Sherwin-Williams "Conflex XL Smooth Elastomeric High Build," (A5-400), (6.0 – 7.5 mils DFT/coat).
 - c. Carboline:
 - 1 coat "Sanitile 120 Waterborne Acrylic" (1-2 mils DFT).
 - 2 coats "Flexxide Elastomer," Elastomeric Finish Coat (10 –12 mils DFT/coat)
 - d. Or equivalent.
7. Wood:
(See Finish Schedule for Satin or Gloss):
- a. Surface preparation: Caulk, clean and/or wash, scrape, sand and seal stains according to manufacturer's requirements.
 - b. Sherwin Williams:
 - 1 coat "Exterior Latex Wood Primer," (B42W8041)(1.4 mils DFT)

2 coats "A100 Exterior Latex Satin," (A82 Series)(1.4 mils DFT/coat)

- c. PPG/Americoat:
1 coat "Grip-Seal 100% Acrylic Primer/Sealer," (1.5 mils DFT)
2 coats "Manor Hall 70-101 series" (1.5 mils DFT/coat)
- d. Benjamin-Moore:
2 coats "Regal Select Exterior High Build" Low Luster (2.3 mils DFT/coat)

8. Crane rails: Same as Process Environment - Interior.

D. **IMMERSION**

(including splash zones, pipes and tank interior surfaces):

- 1. Concrete – Sanitary Sewage Only:
(Interior and Exterior above and below grade)
 - a. Surface preparation: SSPC-SP7, Brush-off blast.
- 2. Concrete – Exterior Exposure and Above Grade:
 - a. Surface Preparation: SSPC-SP7, Brush-Off.
 - a. Sherwin Williams:
1 coat "Macropoxy 646- FC Epoxy" (4-6 mils DFT)
2 coats "Hi-Solids Polyurethane" (3-5 mils DFT)
 - b. Carboline:
1 coat "Carboguard 60" (4-6 mils total DFT)
1 coat "Carbothane 133 Series" (3-5 mils DFT)
 - c. PPG/Americoat:
1 coat "Americoat 385 Multi-Purpose Epoxy" (4-6 mils/DFT)
1 coat "Americoat 450H Polyurethane" (3-4 mils/DFT)
- 3. Steel – Existing, Pitted:
 - a. Surface Preparation: SSPC-SP5 White Metal
 - b. Carboline:
2 coats "Phenoline Tank Shield" (15-20 mils/DFT)

E. **PIPING**
(interior/exterior):

1. Ferrous metal:

- a. Surface preparation: SSPC-SP2, Hand-tool.
- b. Sherwin-Williams:
2 coats "DTM Acrylic Primer/Finish" (2-5 mils DFT/coat)
- c. Carboline:
1 coat "Carbocrylic 120" Primer/Sealer (1-2 mils DFT)
1 coat "Carbocrylic 3359" Acrylic Coating (2-3 mils DFT)
- d. PPG/Amercoat:
2 coats "DTM Acrylic Primer/Finish" (2-5 mils DFT/coat)

2. Galvanized and nonferrous metal:

- a. Surface Preparation SSPC-SP1, Solvent-Clean.
- b. Sherwin Williams:
1 coat "Pro Industrial Pro-Cryl Universal Primer" (3-4.5 mils DFT)
2 coats "Pro Industrial Acrylic Coating" B66-650 S/G Series (2.5-4 mils DFT/coat)
- c. Carboline:
1 coat "Galoseal" (0.5 – 1.0 mils DFT)
2 coats "Carbocrylic 3359" Acrylic Coating (2-3 mils DFT)
- d. PPG/AmerCoat:
1 coat "6-230 Epoxy Ester Primer" (2.0 mils DFT)
2 coats "Pitt-Tech DTM Acrylic Finish" (2-5 mils DFT/coat)

3.08 **COLOR AND FINISH SCHEDULE**

- A. Required surfaces to be painted are listed under Paragraph 1.01 A., above.
- B. Colors shall be selected by the *ENGINEER* from the manufacturer's full range of standard and custom color selections.

****END OF SECTION****

SECTION 23 05 48

SEISMIC RESTRAINT FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. Design, location, layout, construction and installation of seismic restraints for process piping systems and equipment in accordance with the requirements of this section in order to maintain the integrity of HVAC systems and equipment so that they remain safe and functional in case of a seismic event.
2. Inspection and certification of installation of seismic restraints for HVAC systems and equipment.

B. Related work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 03 30 00: Concrete*
3. *Section 05 50 00: Metal Fabrications*
4. *Section 23 05 29: Hangers and Supports for HVAC Piping and Equipment*

C. Payment:

1. Unless otherwise noted in the Proposal Section, no separate payment shall be made for this item.
2. Include all costs for *SEISMIC RESTRAINT FOR HVAC EQUIPMENT* in the prices bid for the various related items of work as designated in the Proposal.

1.02 REFERENCES

- A. The Publications listed below (including amendments, addenda, revisions, supplements and errata) form a part of this specification to the extent referenced. The publications are referenced in text by basic designation only.
- B. State Of New Jersey:
 - 1. Uniform Construction Code, N.J.A.C. 5:23-1 et seq.
- C. International Code Council, Inc (ICC):
 - 1. International Building Code (IBC), New Jersey Edition.
- D. American Society of Civil Engineers:
 - 1. ASCE 7-10: Minimum Design Loads for Buildings and Other Structures (including Supplement #1).

1.03 DEFINITIONS

- A. Non-structural building components are components, systems or elements that are permanently attached to the structure but are not part of the building's structural system whether inside or outside, above or below grade.

1.04 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Provide seismic restraint systems to meet total design lateral force requirements for support and restraint of non-structural building process piping systems and components where required by the International Building Code, New Jersey Edition, as amended.
 - 2. Seismic restraints shall be designed by, or under direct supervision of a Registered Professional Engineer, licensed to practice in the State of New Jersey with all drawings and calculations bearing the Engineer's seal.
 - 3. See Contract Drawings for Structural Design Criteria.
- B. Arrangement:
 - 1. All restraints shall be arranged and constructed so as not to obstruct egress paths from the building, nor to impede maintenance access to equipment or operations of the facility.

2. Restraint components shall not breach the water tightness of the walls, foundations and/or structural floor slabs.
- C. Deflections:
1. The allowable deflection of all restraint framing members shall not exceed $L/240$, where L equals the member length, unless a more stringent limit is recommended by the equipment manufacturer.
 2. Allowance shall be made for restraint deflections by avoiding inadvertent load transfer from the supports to the adjacent building.
- D. Bracing: Restraint bracing members shall have an L/r ratio of not more than 200, where L is the distance in inches between connections and r is the least radius of gyration of the bracing member. Where cross-bracing members are connected at their point of intersection, the L distance shall be taken as the distance in inches between connection at the point of intersection of the bracing members and the connections at the end of the members.
- E. Friction from gravity loads shall not be considered adequate resistance to resultant seismic forces.
- F. Attachment to the main building structure:
1. All attachments of restraints to the main building structure, including its superstructure framing, roof, walls, floor slab or foundations, shall be specifically approved by the *ENGINEER*. All attachments shall be reviewed individually by the *ENGINEER*. The general basis for acceptance shall be as specified herein.
 2. Maximum reactions: Unless specifically approved by the *ENGINEER*, the maximum loads imposed by restraints upon the structure shall be in accordance with the referenced standards.
 3. Manner of attachment:
 - a. All connections to either main building frame steel, concrete structures, or masonry walls shall be “pinned” and shall offer no moment restraint. Cantilevers, braced framing or any connection arrangement that causes a couple or torsion in either main building framing steel, concrete structures, or masonry walls shall not be permitted unless specifically approved by the *ENGINEER*.

- b. All restraint framing base plates attaching to concrete structures or masonry walls shall be installed on a one inch (1") minimum thick bed of non-shrink grout.
- c. Where restraint framing spans across an expansion joint in the main building frame steel, allowance shall be made for a movement of 4"± at one end of the support framing span. Where restraint framing spans across an expansion joint in a concrete structure or masonry wall, allowance shall be made for a movement of 2"± at one end of the restraint framing span.

1.05 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Manufacturer's product data:
 - 1. Complete materials list of all materials proposed to be furnished and installed under this section.
 - 2. Specifications and other data required that demonstrate compliance with the specified requirements.
- C. Shop drawings and design calculations:
 - 1. Shop drawings of seismic restraints and design calculations shall be prepared by, or under direct supervision of a Registered Professional Engineer, licensed to practice in the State of New Jersey with all drawings and calculations bearing Engineer's seal.
 - 2. Submit design tables and information used for the design-force levels, stamped and signed by a professional structural engineer registered in the State where project is located.
 - 3. Submit a coordinated set of equipment and system anchorage drawings prior to installation including:
 - a. Description, layout, and location of items to be anchored or braced with anchorage or brace points noted and dimensioned.
 - b. Details of anchorage or bracing at large scale with all members, parts brackets shown, together with all connections, bolts, welds etc. clearly identified and specified.

- c. Numerical value of design seismic brace loads.
 - d. For expansion bolts, include design load and capacity if different from those specified.
 - 4. Submit, prior to installation, bracing drawings for seismic protection of process piping and equipment, including:
 - a. Details illustrating all support and bracing components, locations, methods of connection, and specific anchors to be used.
 - b. Numerical value of applied gravity and seismic loads and seismic loads acting on support and bracing components.
 - c. Maximum spacing of hangers and bracing.
 - d. Seal of registered structural engineer responsible for design.
 - 5. Submit for concrete anchors, the appropriate ICBO evaluation reports or lab test reports verifying compliance the specified requirements.
- D. Manufacturer's recommended installation procedures.
- E. Submit certification, signed and sealed by a Professional Engineer licensed in the State of New Jersey that the supports and restraints were constructed and installed in accordance with the approved shop drawings.

1.06 QUALITY ASSURANCE

- A. Qualifications of designer:
 - 1. Acceptable designers:
 - a. Seismic Control and Isolation Inc
11188 Downs Road
Pineville, NC 28134
Tel: (704) 504-8780
Fax:(704) 504-9573
 - b. SGMEC Group Inc
1324 Jericho Tpke
New Hyde Park, NY
Tel: (516) 775-1085

- c. Or equivalent.
- B. Qualifications of manufacturer:
 - 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- C. Qualifications of workmen:
 - 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 - 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the method and materials to be used.
 - 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- D. Basis of acceptance:
 - 1. The registered professional engineer that performed the design of the seismic restraints shall inspect and certify that the restraints were fabricated and installed in accordance with the approved shop drawings. This certification will be the basis for acceptance.
 - 2. Certification that the seismic restraints were constructed and installed shall be signed and sealed by the seismic restraint design engineer and submitted to the *ENGINEER*.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.

- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

1.08 WARRANTY AND WARRANTY REPAIRS

- A. Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B. The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the warranty period.

1.09 OPERATION AND MAINTENANCE MANUALS

- A. Operation and maintenance manuals shall be provided in accordance with *Section 01 78 23, Operation and Maintenance Data*.
- B. Manuals in final form shall be available a minimum of five (5) working days prior to the instruction of the *OWNER'S* personnel.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 STEEL

- A. Structural Steel: ASTM A36 or A992.
- B. Structural Tubing: ASTM A500, Grade B.

- C. Structural Tubing: ASTM A501.
- D. Steel Pipe: ASTM A53, Grade B.
- E. Bolts & Nuts: ASTM A307, A325 or A490.

2.03 CAST-IN-PLACE CONCRETE

- A. Concrete: 28 day strength, $f'c = 4,000$ psi.
- B. Reinforcing Steel: ASTM A615 or ASTM A996, deformed.

2.04 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 CONSTRUCTION, GENERAL

- A. Provide equipment supports and anchoring devices to withstand the seismic design forces, so that when seismic design forces are applied, the equipment cannot displace, overturn, or become inoperable.
- B. Provide anchorages in conformance with recommendations of the equipment manufacturer and as shown on approved shop drawings and calculations.

- C. Construct seismic restraints and anchorage to allow for thermal expansion.
- D. Testing Before Final Inspection:
 - 1. Test ten-percent (10%) of anchors in masonry and concrete per ASTM E488 to determine that they meet the required load capacity. If any anchor fails to meet the required load, test the next twenty (20) consecutive anchors, which are required to have zero failure, before resuming the ten-percent (10%) testing frequency.
 - 2. Before scheduling Final Inspection, submit a report on this testing indicating the number and location of testing, and what anchor-loads were obtained.

3.03 CLEANING

- A. Comply with requirements of *Section 01 74 00, Cleaning and Restorations*.
- B. Remove and dispose of all debris.

****END OF SECTION****

SECTION 26 05 00
(16010)
BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Basic Electrical Requirements specifically applicable to Division 26 sections, in addition to Division 1 - General Requirements.

1.02 REFERENCES/STANDARDS

- A. American National Standards Institute (ANSI)
- B. National Fire Protection Association (NFPA)
- C. National Electrical Code (NEC) (NFPA-70)
- D. Life Safety Code (NFPA-101)
- E. American Society for Testing and Materials (ASTM)
- F. Illuminating Engineering Society (IES)
- G. Institute of Electrical and Electronics Engineers (IEEE)
- H. Insulated Cable Engineers Association (ICEA)
- I. National Electrical Manufacturers Association (NEMA)
- J. National Electrical Safety Code (NESC) (ANSI-C2)
- K. Standard for Electrical Safety in the Workplace (NFPA-70E)
- L. National Electrical Testing Association (NETA)
- M. Occupational Safety and Health Administration (OSHA)
- N. Underwriters Laboratories (UL)

1.03 SUBMITTALS

- A. Submit under provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Submit shop drawings and product data grouped to include complete submittals of related systems, products, and accessories in a single submittal.
- C. Mark dimensions and values in units to match those specified.

1.04 REGULATORY REQUIREMENTS

- A. Conform to the Uniform Construction Code for the State of New Jersey and NJAC 5:23-3.16 et. seq. as applicable.
- B. Conform to applicable References and Standards as listed in Section 1.02.
- C. Obtain permits, and request inspections from Authority having jurisdiction.
- D. All work shall be performed by a State of New Jersey licensed electrician.
- E. Comply with Local, County, State and Federal Regulations and Codes in effect as of date of purchase.

1.05 CONTRACT DRAWINGS

- A. The Contractor shall furnish all labor and material necessary and shall install, complete to be ready for use, the electrical power systems, including the installation and wiring of miscellaneous electrical power equipment, panels, and other electrical equipment as indicated on the Drawings and as herein specified.
- B. The Contract Drawings, which constitute an integral part of this Contract, are for engineering and general arrangement purposes only. They indicate the general layout of the electrical power system, arrangement of switchgear, substation equipment, conduits and other work. Raceway locations shown in details and in the plan on the Contract Drawings indicate the approximate location and routing of all raceways.
- C. Electrical devices and material shall comply with the standards of NEMA and shall be listed and/or labeled by the Underwriters' Laboratories, Inc. Where Underwriters' Laboratories listing is not available for equipment, the Contractor shall submit certified test reports of an adequately equipped, recognized, independent testing laboratory, approved by the local inspecting authority, indicating that the equipment is in conformance with the local code requirements or any other applicable requirements. In lieu of the independent test reports, written approval of the equipment by the local electrical inspecting authority will be acceptable. The Contractor shall pay all cost of tests and/or inspections necessary for approval of the equipment.
- D. All work shall be systematically, carefully and neatly performed in a workmanlike manner, and shall comply with all applicable current standards and practices of the latest National Electric Code (NEC), the latest National Electrical Safety Code (NESC), National Fire Code (NFC), the Institute of Electrical and Electronic Engineers, Inc. (IEEE), Occupational Safety and Health Administration (OSHA),

and any local codes or standards which may govern the work being performed or equipment furnished under this Contract.

- E. All manufacturers published data including installation and operation recommendations shall be part of the specifications for this Contract. All equipment shall be installed and connected as recommended by its manufacturer, as specified in these specifications and as shown on the Contract Drawings.
- F. All programmable devices which include but are not limited to circuit breakers, ground faults, timers, generators, transfer switches, variable frequency drives and control panels shall be programmed by the Contractor. All settings shall be programmed based on the end user owner requirements, final field installed components, and per the devices manufacturer recommendations. Contractor shall provide and perform all calculations, system reports and electrical system studies required for these programmable parameters based on manufacturer requirements and shall be included within their final bid at no additional cost to the OWNER and with no assistance from the Design Engineer. All devices shall be fully programmed and commissioned and all systems and subsystems shall be demonstrated to be fully operational. All settings, calculations and system studies required shall be included within the submittal packages and final operations and maintenance manuals. Approval of devices without these documents being submitted does not alleviate the Contractor of these requirements.
- G. In case of interference with other work or erroneous locations with respect to equipment or structures, the Contractor shall furnish all labor and materials necessary to complete the work in an acceptable manner without additional cost to the Owner.
- H. The plans, as drawn, show conditions as accurately as it is possible to indicate them in scale. Plans are diagrammatical and do not necessarily show all the fittings, etc., necessary to suit the building conditions. Locations of outlets, equipment, etc. are approximate. The Contractor shall be responsible for the proper location in order to make them fit with the site details to the satisfaction of the Engineer.

1.06 PROJECT/SITE CONDITIONS

- A. The Contractor is responsible for field verification of all scale dimension on drawings. Actual locations, distances and levels will be governed by actual field conditions. Dimensional changes required due to differing site conditions shall be made at no additional cost.
- B. The Contractor shall check structural, mechanical, equipment, and site plans, shop drawings and equipment wiring diagrams, to avert possible installation conflicts.

Should drastic changes from original plans be necessary to resolve such conflicts, the Contractor shall notify the Engineer and secure written approval and agreement on necessary adjustments before installation is started.

- C. The Contractor shall promptly, and before such conditions are disturbed, notify the Engineer or Construction Manager in writing of subsurface, latent or unknown physical conditions at the site of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract. The Engineer shall promptly investigate the conditions, and if such conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the work under this Contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made, and the Contract modified accordingly.
- D. The Contractor represents that he has carefully examined all of the Contract Documents and the construction site and has satisfied himself as to the character, quality and quantity of work to be performed, the materials, equipment and other items to be furnished, and all other requirements of this Contract, as well as conditions that will be encountered at the site or otherwise may affect the cost of performing the work or providing the equipment required for this Contract.
- E. The Contractor shall provide to the Owner at the completion of the contract, certificates of approval for compliance with the National Electric Code and any other authority having jurisdiction.

1.07 ELECTRICAL WORKING DRAWINGS/RECORD DOCUMENTS

- A. The Contract Drawings are not intended to serve as working or installation drawings. These drawings are for engineering and general arrangement purposes only. The Contractor shall prepare and submit to the Engineer for approval of his own working and installation drawings based on the Contract Drawings, but showing all details of construction, such as equipment dimensions, as-built circuit information, conduit plan views/sections, junction box wiring tables, interconnection wiring tables (showing each wire/cable installed), motor mounting details and dimensions, pad and vault details and transformer mounting details, interconnection wiring diagrams, wire label tables and similar drawings depicting the construction and installation work to be performed.
- B. The working drawings shall be prepared based on certified manufacturer's shop drawing of equipment furnished under this and other contracts. It shall be the responsibility of the Contractor to obtain all required shop drawings and wiring diagrams from manufacturers and other contractors, and other related drawings to

properly coordinate all electrical installations and to fulfill the intent of these specifications.

- C. Installation of any electrical equipment, conduit, or wire prior to the approval of these working drawings will be the contractor's responsibility and any modification of the electrical work necessary to meet the equipment requirements or changes made by the Engineer shall be made without additional cost to the Owner.
- D. The interconnection wiring diagrams shall show all connections between the control panels or starters and any field device.
- E. During the course of work, the Contractor shall maintain a record set of as-built drawings on-site (available for the resident Engineer's use) on which the actual physical location of all equipment will be noted with dimensions as well as wiring numbers and/or connection diagrams. The Contractor shall bring these as-built drawings to each monthly job meeting for inspection by the Engineer.
- F. At the completion of the project, the Contractor shall obtain a copy of the O&M manuals and shop drawings from each manufacturer. The Contractor shall mark all as-built records on these drawings and shall correct/change his own working drawings and shall supply any other as-built wiring diagrams, schematics, interconnection tables or layout drawings that differ in any way from the approved shop drawings, working drawings and the Contract Drawings.
- G. Submission and approval of these as-built drawings/tracings shall be made before any final payment of non-retainer money owed to the Contractor. The Contractor may choose to submit as-built drawings by building/area as he completes such an area to the satisfaction of the Engineer.

1.08 SEQUENCING AND SCHEDULING

- A. Construct work in sequence as required.
- B. Description of work:
 - 1. Work required for Electrical Service, including furnishing and installing buried primary conduit, buried secondary conduit and cable and terminations; transformer cabinet and the installation of the meter enclosure and utility-supplied CT's.
 - 2. Distribution switchboards and distribution system.
 - 3. Power and lighting branch circuit distribution system.

4. Stand-by generator, transfer switch and auxiliary equipment.
5. Grounding and bonding as required by the National Electrical Code (NEC).
6. Cutting and patching associated with Electrical work.
7. Furnishing and setting of all sleeves through floors and walls, including waterproof and fireproof sealing and cap flashing. Restore integrity of fire barriers by sealing all electrical openings through fire-rated walls and floors.
8. Hardware, such as inserts, bolts, etc., associated with concrete housekeeping pads and/or for mounting and securing electrical equipment.
9. Perform all tests, setup, adjustments, and furnish all certificates of approval.
10. Provide all work of every description detailed in these specifications or shown on the Drawings, including connections for all equipment, and all other labor and material as may be needed to make the work of this section complete and acceptable to the *OWNER*.
11. Provide instructions and training for *OWNER'S* personnel.
12. Coordinate scheduled outages with the *OWNER*.
13. Pay all relevant fees.
14. Excavation and backfill for electrical work (inside and outside). All concrete work required for pads (including housekeeping pads), underground conduits and conduit bases.
15. Prime and finish painting, where required, for new and relocated electrical equipment and installation of components.
16. Demolition work as described in these specifications and as shown on the Drawings.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

****END OF SECTION****

SECTION 26 05 03
(16180)
EQUIPMENT WIRING SYSTEMS

PART I - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Electrical connections to equipment specified under other Sections or furnished by *OWNER*.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 26 05 19: Wire and Cable*
3. *Section 26 05 26: Grounding and Bonding for Electrical Systems*
4. *Section 26 05 33: Raceway and Boxes for Electrical Systems*
5. *Section 26 27 26: Wiring Devices*
6. *Section 26 28 16: Enclosed Circuit Breakers*
7. *Section 33 71 73: Electric Utility Services*

C. References:

1. NEMA WD 1 - General Purpose Wiring Devices
2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.02 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.

- B. Manufacturer's product data:
 - 1. Complete list of all materials proposed to be furnished and installed under this section.
 - 2. Specifications and other data required that demonstrate compliance with the specified requirements.
- C. Manufacturer's recommended installation procedures.

1.03 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 - 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
 - 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 - 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the method and materials to be used.
 - 3. In acceptance or rejection of the work of this section the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- C. Basis of acceptance:
 - 1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.

- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

1.05 COORDINATION

- A. Comply with requirements of *Section 01 31 13, Project Coordination*.
- B. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
- C. Determine connection locations and requirements.
- D. Sequence rough-in of electrical connections to coordinate with installation of equipment.
- E. Sequence electrical connections to coordinate with start-up of equipment.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other essential characteristics inherent in the named product.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Review equipment submittals prior to installation and electrical rough-in. Verify location, size, and type of connections. Coordinate details of equipment connections with supplier and installer.

3.03 DEMOLITION OF EXISTING WORK

- A. Remove exposed abandoned equipment wiring connections.
- B. Disconnect abandoned utilization equipment and remove wiring connections. Remove abandoned components when connected raceway is abandoned and removed. Install blank cover for abandoned boxes and enclosures not removed.
- C. Extend existing equipment connections using materials and methods compatible with existing electrical installations, or as specified.

3.04 INSTALLATION

- A. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

- B. Make conduit connections to equipment using flexible conduit. Use liquid-tight flexible conduit with watertight connectors in damp or wet locations.
- C. Install pre-finished cord set where connection with attachment plug is indicated or specified, or provide cable and attachment plug with suitable strain-relief clamps.
- D. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
- E. Install receptacle outlet to accommodate connection with attachment plug.
- F. Make wiring connections in control panel or in wiring compartment or pre-wired equipment in accordance with manufacturer's instructions. Provide interconnecting wiring as indicated or required.
- G. Install disconnect switches, controllers, control stations, and control devices such as limit switches and temperature switches as indicated or as required by vendors of equipment furnished in other Specification sections. Connect with conduit and wiring as indicated or required.

3.05 ADJUSTING

- A. Cooperate with utilization equipment installers and field service personnel during checkout and starting of equipment to allow testing and balancing and other startup operations. Provide personnel to operate electrical system and checkout wiring connection components and configurations.

3.06 CLEANING

- A. Comply with requirements of *Section 01 74 00, Cleaning and Restorations*.
- B. Remove and dispose of all debris.

PART 4 - PAYMENT

4.01 EQUIPMENT WIRING SYSTEMS

- A. Quantity and Payment: No separate payment shall be made for this item. Include all costs for *EQUIPMENT WIRING SYSTEMS* in the prices bid for the various related items of work as designated in the Proposal.

*****END OF SECTION*****

SECTION 26 05 19
(16120)
WIRE AND CABLE

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Building wire.
2. Cable.
3. Wiring connections and terminations.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 26 05 26: Grounding and Bonding for Electrical Systems*
3. *Section 26 05 33: Raceways and Boxes for Electrical Systems*
4. *Section 26 05 53: Electrical Identification*
5. *Section 33 71 33: Electric Utility Services*

C. References:

1. NEMA WC 70/ICEA S-95-658-1999 – Standard for Non-shielded Power Cable Rated 2000 Volts or Less for Distribution of Electrical Energy.

1.02 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.

- B. Manufacturer's product data:
 - 1. Complete list of all materials proposed to be furnished and installed under this section.
 - 2. Specifications and other data required to demonstrate compliance with the specified requirements.
- C. Shop drawings showing precise dimensions of the work of this section, and all other data needed to ensure proper and adequate provisions in construction to accommodate the work of this section.
- D. Manufacturer's recommended installation procedures.

1.03 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 - 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
 - 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 - 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the method and materials to be used.
 - 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- C. Basis of acceptance:
 - 1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

1.05 WARRANTY AND WARRANTY REPAIRS

- A. Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B. The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the maintenance period.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other essential characteristics inherent in the named product.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.
- C. Acceptable manufacturers:

1. Belden Cable Company

2. General Cable Company
3. Okonite Cable Company
4. Triangle - PWC Inc.
5. Or equivalent.

2.02 BUILDING WIRE

A. Single conductor power cable:

1. Power cable 500 KCMIL to #4 AWG:
 - a. Conductor: Soft drawn copper conductor 98% conductivity, Class B stranding.
 - b. Insulation: Crosslinked polyethylene, 600 volt rated 90EC dry, 75EC wet.
 - c. Jacket: None
 - d. UL Type: XHHW-2 or USE.
 - e. Identification (minimum): Conductor size, voltage rating, UL listing, and manufacturer.
 - f. Application: Power feeders, including ground conductors, from switchboards, motor control centers, motor starters and panelboards to motors and power utilization appliances, via underground and exposed conduits.
2. Single conductor power cable #12 AWG to #6 AWG:
 - a. Conductor: Soft drawn copper. #12 through #6 Class B stranding.
 - b. Insulation: Cross linked polyethylene, 600 volt, 90EC dry, 75EC wet.
 - c. Jacket: None.
 - d. UL Type: XHHW-2.

- e. Identification (minimum): Conductor size, voltage rating, UL type, and manufacturer.

2.03 SPLICES AND TERMINALS

A. Twist-on wire connectors:

1. Wire connectors shall have an insulated case and a fixed square wire spring to assure gripping action on conductors.
2. Connectors shall be rated 600 volts.

B. Mechanical split bolt connectors shall be Bundy Type KS Service or equal manufactured from high strength copper alloy.

C. Compression type sleeve connectors:

1. Wire sizes #22 AWG to #8 AWG. Sleeves shall be T&B STA-KON or equal nylon insulated butt type splices with insulation support. Splices shall be manufactured from high conductivity electrolytic copper and shall be color coded by wire size.
2. Wires sizes #6 AWG and larger. Sleeves shall be T&B or equal compression sleeves manufactured from high conductivity wrought copper with electro tin plate finish.
3. Compression type splices are to be used on stranded wire only.

D. Compression type terminals:

1. Wire sizes #16 to #8 AWG. Terminals shall be T&B STA-KON or equal nylon insulated ring tongue terminals with insulation support.
2. Wire sizes #6 AWG and larger. Terminals shall be T&B or equal compression type terminals with a one-hole tongue manufactured from high conductivity wrought copper with electro tin plate finish.
3. Compression type terminals are to be used on stranded wire only.

E. Heat-shrink splice materials:

1. Heat-shrink materials shall be used for both insulating splices and for maintaining moisture and flame resistance of power cables. Material shall

be Raychem Type WCSF or equal, sized to match conductors being spliced.

2.04 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. General wiring methods:
 - 1. Use no wire smaller than #12 AWG for power and lighting circuits, and no wire smaller than #14 AWG for control circuits.
 - 2. Use #10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 75 feet, and for 20 ampere, 277 volt branch circuit home runs longer than 200 feet.
 - 3. Place an equal number of conductors for each phase of a circuit in same raceway or cable.
 - 4. Splice only in junction or outlet boxes.
 - 5. Neatly train and lace wiring inside boxes, equipment, and panelboards.
 - 6. Make conductor lengths equal for parallel circuits.

B. Wiring installation in raceways:

1. Pull all conductors into a raceway at the same time. Use UL listed wire-pulling lubricant for pulling #4 AWG and larger wires.
2. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.
3. Completely and thoroughly swab new raceway systems before installing conductors.

C. Cable installation:

1. Provide protection for exposed cables where subject to damage.
2. Support cables above accessible ceilings; do not rest on ceiling tiles. Use spring metal clips or plastic cable ties to support cables from structure. Include bridle rings or drive rings.
3. Use suitable cable fittings and connectors.
4. Install cable per manufacturer's instructions.

D. Wiring connections and terminations:

1. Splice only in accessible junction boxes, and only when unavoidable.
2. Splices shall be made in accordance with manufacturer's instructions.
3. Use solderless pressure connectors with insulating covers for solid copper wire splices and taps, #10 AWG and smaller. Tape connector in wet areas.
4. Use split-bolt connectors for copper wire taps, #8 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor.
5. Use butt-type compression sleeve connectors for in-line splices of stranded wire. Tape connector in wet areas.
6. Thoroughly clean wires before installing lugs and connectors.
7. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.

8. Terminate spare conductors with electrical tape.
9. Splices in underground cables and splices installed in underground manholes shall be avoided. If unavoidable, splices shall be made with long barrel compression type butt splices. Each splice shall be insulated using a Raychem WCSF, or equal, heat-shrink sleeve. All splices shall be supported and not allowed to lay in the bottom of handholes and manholes. Splices shall not be allowed in conduits or ducts.
10. Use insulated butt-type splices for stranded wires #22 AWG to #8 AWG. Use long barrel type two way compression connectors for butt splices of #6 AWG and larger cables. Insulate each splice with 600 volt rated heat-shrink tubing, or tape splice with electrical tape to 150 percent of the insulation value of conductor. Provide heat-shrink tubing for cables with overall jacket to maintain jacket integrity.
11. Use compression type one-hole terminals for connection to motors for stranded wire #12 AWG and larger. Connect the terminals of the motor to the cable terminals of the feeder cable using stainless steel nuts, bolts and lockwashers. Insulate the connection using 600 volt heat-shrink sleeves or tape to 150% of conductor insulation value. Use two-hole terminals for larger cable sizes if two-hole terminals are provided with the motor leads.

3.03 CLEANING

- A. Comply with requirements of *Section 01 74 00, Cleaning and Restorations*.
- B. Remove and dispose of all construction debris.

3.04 FIELD QUALITY CONTROL

- A. Upon completion of this portion of the work and prior to acceptance by the *OWNER*, make all required tests and adjustments for free and smooth operation.
- B. Secure all approvals from agencies having jurisdiction.
- C. Field inspection and testing will be performed under provisions of this specification.
- D. Inspect wire and cable for physical damage and proper connection.
- E. Torque test conductor connections and terminations to manufacturer's recommended values.

- F. Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.

PART 4 - PAYMENT

4.01 WIRE AND CABLE

- A. Quantity and Payment: No separate payment shall be made for this item. Include all costs for *WIRE AND CABLE* in the prices bid for the various related items of work as designated in the Proposal.

****END OF SECTION****

SECTION 26 05 26
(16450)
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Power system grounding.
2. Electrical equipment and raceway grounding and bonding.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 26 05 19: Wire and Cable*
3. *Section 26 05 33: Raceways and Boxes for Electrical Systems*
4. *Section 33 71 73: Electric Utility Services*

C. References:

1. ANSI/NFPA 70 National Electrical Code Article 250 "Grounding".

1.02 SYSTEM DESCRIPTION

- A. Ground the electrical service system neutral at service entrance equipment to the facility ground system. Maintain the integrity and continuity of the existing grounding system throughout the construction period.
- B. Ground each separately-derived system neutral to facility ground system.
- C. Ground each electrical component ground connection point to the facility grounding system.

- D. Bond together system and equipment neutrals, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, ground rods and plumbing systems. Bond transformer secondary neutral to transformer enclosure.

1.03 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Manufacturer's product data:
 - 1. Complete list of all materials proposed to be furnished and installed under this section.
 - 2. Specifications and other data required to demonstrate compliance with the specified requirements.
- C. Shop drawings:
 - 1. Show precise dimensions of the work of this section, and all other data needed to ensure proper and adequate provisions in construction to accommodate the work of this section.
 - 2. Indicate location of system grounding electrode connections, and routing of grounding electrode conductor.

1.04 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 - 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
 - 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for

their execution, and who shall direct all work performed under this section.

2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the method and materials to be used.
 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- C. Basis of acceptance:
1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

1.06 WARRANTY AND WARRANTY REPAIRS

- A. Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B. The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the maintenance period.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other essential characteristics inherent in the named product.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 MATERIALS

- A. Ground rods: Copper-encased steel, ¾-inch diameter, minimum length 10 feet.
- B. Ground wire: Soft drawn copper, Class B stranding, green colored PVC insulation. Buried ground wires shall be uninsulated.
- C. Grounding clamps: Ground rods and grounding clamps shall be cast, high-copper content bronze alloy.

2.03 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.

- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Provide a separate, insulated equipment grounding conductor in feeder and branch circuits. Terminate each end on a grounding lug, bus, or bushing.
- B. Connect equipment grounding conductors to existing ground loop using exothermal welds. Verify the integrity of the ground loop or grounding conductor connections to the ground rods. Where loose, corroded or otherwise high-resistance or faulty connections are detected, repair or replace connections to restore integrity of grounding system. Existing ground system.
- C. Provide grounding and bonding at Utility Company's metering equipment.
- D. Size grounding conductors in accordance with the National Electrical Code.
- E. Connections to reinforcing steel, structural steel and buried ground conductors shall be made using exothermal welds.
- F. Ground instrumentation in accordance with manufacturers recommendations.

3.03 CLEANING

- A. Comply with requirements of *Section 01 74 00, Cleaning and Restorations*.
- B. Remove and dispose of all debris.

3.04 TESTS

- A. Upon completion of this portion of the work and prior to acceptance by the *OWNER*, make all required tests and adjustments for free and smooth operation.
- B. Secure all approvals from agencies having jurisdiction.
- C. Field quality control:
 - 1. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

2. Measure ground resistance from system neutral connection at service entrance to convenient ground reference point using suitable ground testing equipment. Resistance shall not exceed 5 ohms.

PART 4 - PAYMENT

4.01 GROUNDING & BONDING FOR ELECTRICAL SYSTEMS

- A. Quantity and Payment: No separate payment shall be made for this item. Include all costs for *GROUNDING & BONDING FOR ELECTRICAL SYSTEMS* in the prices bid for the various related items of work as designated in the Proposal.

****END OF SECTION****

SECTION 26 05 29
(16190)
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Conduit and equipment supports.
2. Fastening hardware.
3. Electrical equipment backboards.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 26 05 33: Raceways and Boxes for Electrical Systems*

C. References:

1. MFMA-1 - Metal Framing Manufacturers Association Standard

1.02 SUBMITTALS

A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.

B. Manufacturer's product data:

1. Complete list of all materials proposed to be furnished and installed under this section.
2. Specifications and other data required to demonstrate compliance with the specified requirements.

- C. Shop drawings showing precise dimensions of the work of this section, and all other data needed to ensure proper and adequate provisions in construction to accommodate the work of this section.
- D. Manufacturer's recommended installation procedures.

1.03 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 - 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
 - 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 - 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the method and materials to be used.
 - 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- C. Basis of acceptance:
 - 1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.

- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

1.05 WARRANTY AND WARRANTY REPAIRS

- A. Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B. The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the maintenance period.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other essential characteristics inherent in the named product.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.
- C. Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

2.02 ELECTRICAL MOUNTING CHANNEL SYSTEMS

- A. Stainless steel: Stainless steel channel and accessories shall be of AISI Type 304 or Type 316 stainless steel.

- B. Dimensions: Metal framing channel shall be cold formed from 12-gauge steel. All channels shall have a nominal overall width of 1 $\frac{5}{8}$ " and have a $\frac{7}{8}$ " slot face opening. Standard lengths are to be 10 and 20 foot. All testing and tolerancing shall be in accordance with the latest MFMA-1 Standard.
- C. Hardware: Corrosion resistant. Stainless steel in accordance with ASTM A153.

2.03 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Coordinate size, shape and location of concrete pads with *Section 03 30 00, Concrete*.
- B. Load capability of the supporting system shall be determined by the Contractor for present and future, if indicated, equipment and the system shall be designed to accommodate determined loads. However, as a minimum, the support channels shall be minimum 12-gauge with a minimum section width of 1 $\frac{5}{8}$ inches deep.
- C. Provide all anchor bolts, steel bracing, and accessories required for a sound installation that shall withstand the stresses of the environment, wind loading, and equipment operation and maintenance.

- D. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using expansion anchors, beam clamps or spring steel clips as appropriate.
- E. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchors on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.
- F. Do not fasten supports to piping, ductwork, mechanical equipment, or conduit.
- G. Do not use powder-actuated anchors.
- H. Do not drill structural steel members.
- I. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.
- J. In wet locations install free-standing electrical equipment on concrete housekeeping pads.
- K. Install surface-mounted cabinets, panelboards, motor control enclosures and disconnect switches with a minimum of four anchors each.
- L. Bridge studs top and bottom with channels to support flush-mounted cabinets and panelboard in stud walls.
- M. Use stainless steel unistrut for all locations.

3.03 CLEANING

- A. Comply with requirements of *Section 01 74 00, Cleaning and Restorations*.
- B. Remove and dispose of all debris.

PART 4 - PAYMENT

4.01 SUPPORTING DEVICES

- A. Quantity and Payment: No separate payment shall be made for this item. Include all costs for *SUPPORTING DEVICES* in the prices bid for the various related items of work as designated in the Proposal.

****END OF SECTION****

SECTION 26 05 33
(16111)
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Rigid metal conduit and fittings.
2. Electrical metallic tubing and fittings.
3. Liquid-tight flexible metal conduit and fittings.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 26 05 03: Equipment Wiring Systems*
3. *Section 26 05 19: Wire and Cable*
4. *Section 26 05 26: Grounding and Bonding for Electrical Systems*
5. *Section 26 05 29: Hangers and Supports for Electrical Systems*
6. *Section 26 05 53: Electrical Identification*
7. *Section 31 23 00: Excavating, Filling and Grading*

C. References:

1. ANSI C80.1 - Rigid Steel Conduit, Zinc-Coated.
2. ANSI C80.3 - Electrical Metallic Tubing, Zinc-Coated.
3. ANSI C80.5 – Rigid Aluminum Conduit.

4. ANSI/NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.
5. NEMA RN 1 - PVC Externally-Coated Galvanized Rigid Steel Conduit and Electrical Metallic Tubing.
6. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Electrical Plastic Conduit (EPC-40 and EPC-80).
7. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.02 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Manufacturer's product data:
 1. Complete list of all materials proposed to be furnished and installed under this section.
 2. Specifications and other data required to demonstrate compliance with the specified requirements.

1.03 QUALITY ASSURANCE

- A. Qualifications of Workmen:
 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the method and materials to be used.
 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

1.05 WARRANTY AND WARRANTY REPAIRS

- A. Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B. The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the maintenance period.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other essential characteristics inherent in the named product.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 RIGID METAL CONDUIT

- A. Manufacturers:
 - 1. Wheatland Tube Company
 - 2. Allied Tube Conduit
 - 3. Republic Conduit
 - 4. Or equivalent.
- B. Rigid Steel Conduit: ANSI C80.1.
- C. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.

2.03 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Manufacturers:
 - 1. Anaconda “Seal Tite”
 - 2. Delikon
 - 3. Liquid Tuff by AFC Cable Systems
 - 4. Or equivalent.
- B. Product Description: Interlocked steel construction with PVC jacket.
- C. Fittings: NEMA FB 1.

2.04 ELECTRICAL METALLIC TUBING (EMT)

- A. Manufacturers:
 - 1. Wheatland Tube Company
 - 2. Allied Tube and Conduit
 - 3. Republic Conduit
 - 4. Or equivalent
- B. Product Description: ANSI C80.3; galvanized tubing.
- C. Fittings and Conduit Bodies: NEMA FB 1; steel compression type.

2.05 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 EXISTING CONDITIONS

- A. Remove exposed abandoned raceway. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods compatible with existing electrical installations, or as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.

3.03 CONDUIT SIZING, ARRANGEMENT, AND SUPPORT

- A. Size conduit in accordance with the latest issue of the National Electrical Code unless a larger size is shown on the drawings. Use ¾-inch minimum size where exposed and 1" minimum size where buried below grade or in concrete slab.
- B. Arrange conduit to maintain working clearance in compliance with National Electrical Code, Paragraphs 110.26 through 110.34, and to present a neat appearance.
- C. Route exposed conduit parallel or perpendicular to walls, building lines and/or adjacent piping.
- D. Maintain a minimum 6-inch clearance between conduit and piping. Maintain 12-inch clearance between conduit and heat sources such as flues, steam pipes, or heating appliances.
- E. Arrange conduit supports to prevent distortion of conduit alignment by wire-pulling operations. Fasten conduit using galvanized straps, lay-in adjustable hangers, clevis hangers, or bolted split stamped galvanized hangers.
- F. Group conduit in parallel runs where practical and provide conduit rack constructed of stainless steel channel "Unistrut" in accordance with *Section 26 05 29, Hangers and Supports for Electrical Systems*.
- G. Do not fasten conduit with wire or perforated pipe straps. Remove all wire used for temporary conduit support during construction, before conductors are pulled.
- H. Support conduit at a maximum of 8 feet on center.
- I. Provide a short length (approximately 36") of flexible liquid-tight metal conduit at motors or other equipment as required to accommodate vibration, for ease of adjustment and future maintenance.
- J. Conduits shall be supported independently of electrical enclosures. Physical stresses caused by vibration or thermal expansion shall not be transmitted to or from electrical enclosures or rotating equipment.
- K. Where conduits are utilized to carry/enclose cables exiting a cable-tray, each conduit shall be rigidly and permanently attached to the top of the cable-tray side rail, and a suitable bending radius provided. Conduit connections through the bottom or side rails of the cable tray are unacceptable.

- L. Conduits shall enter field equipment enclosures through the back, side or bottom (not top) via weatherproof hubs. Conduit entry shall be near the wiring terminal point and not obstruct access to, or removal of, components. Top entry of conduit is permitted with prior written approval, and only if a vapor seal is provided directly above the weatherproof hub.
- M. Conduits may enter pull or terminal boxes at any location except through a removable cover. Provide adequate protection against moisture accumulation and dripping on exposed terminals.
- N. Each end of all conduit runs terminating in a NEMA 1 general purposed or NEMA 3R raintite sheet-metal box or cabinet shall be provided with a galvanized or sherardized lock nut inside and outside of the box and with an approved insulated bushing. Where grounding requirements dictate, provide a grounding bushing inside of the box or cabinet.
- O. Each end of all conduit runs terminating in a NEMA 4, NEMA 12 or NEMA 13 sheet metal box or cabinet shall be provided with a watertight hub.

3.04 CONDUIT INSTALLATION

- A. Cut each conduit square using a saw or pipe-cutter; ream conduit to de-burr cut ends. Field-cut threads shall be of the same type and length as factory-cut threads. No “running threads” shall be permitted. For galvanized conduit, apply a zinc-base paint on the threads prior to assembly.
- B. Bring conduit to the shoulder of fittings and couplings and fasten securely. All conduit connections shall be arranged and installed to be electrically continuous, and to provide a positive electrical ground.
- C. Use conduit hubs for fastening conduit to cast boxes, and for fastening conduit to sheet-metal boxes in damp or wet locations.
- D. Install no more than the equivalent of three 90-degree bends in any run of conduit. Where more bends would be required, provide a pull box. In long conduit runs, pull boxes or expansion fittings with ground straps shall be provided every 125 feet.
- E. Use conduit bodies to make sharp changes in direction, such as around beams.
- F. Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 2-inch. Where possible, conduit bends shall be of the long radius type, machine made, without kinks, flattening, or crushing. Field bends shall be made

only where unavoidable. Field bends shall be made by means of mechanical benders designed to produce radii required by the National Electrical Code.

- G. Avoid moisture traps where possible. Where unavoidable, provide a junction box with a drain fitting at each conduit low point. Slope all conduit toward conduit system low point for complete drainage.
- H. Each complete run of conduit shall be thoroughly cleaned, and no cable or wire shall be pulled until the run is completely free of water and other foreign matter. After cleaning, each conduit shall be sealed and capped with a galvanized or brass fitting and conduit bushing, or by means of plastic caps or other approved methods until wire or cable is to be pulled. The intent is to protect installed conduit against the entrance of dirt or moisture during construction. Permanently cap all spare conduits.
- I. Provide #12 AWG insulated conductor or suitable pull string in each empty conduit, except for sleeves and nipples.
- J. Install expansion fittings with grounding jumper where conduit crosses building expansion joints. Also, install expansion fittings in straight runs of 125 feet or more and at 125-foot intervals in runs exceeding 250 feet in unheated areas.
- K. Where conduit penetrates fire-rated walls or floors, seal the opening around each conduit with UL listed foamed silicone elastomer compound. Seal the conduit openings to prevent vapors from entering the building via the conduit.
- L. Route conduit through roof openings for piping and ductwork where possible; otherwise, route through roof jack in accordance with Drawing details.
- M. Use PVC-coated rigid steel factory elbows for bends in PVC conduit runs longer than 100 feet, or in PVC conduit runs, which have more than two bends regardless of length.
- N. Wipe PVC conduit clean and dry before joining. Apply full even coat of cement to entire area that will be inserted into fitting. Let joint cure for 20 minutes minimum before applying stress to the joint.
- O. Repair nicks, scratches, abrasions and/or other damage to PVC-coated conduit using appropriate products offered by the conduit manufacturer for the intended purpose.
- P. Where corrosive or potentially hazardous vapors are present, provide approved cable seals in all conduits entering panels, control stations and all other electrical equipment to prevent migration of detrimental vapors into electrical enclosures.

- Q. Fittings or boxes shall be installed where necessary for pulling, even though not shown on the drawings. Conduit systems shall have a sufficient number of supports to provide a rigid installation. Conduits may be bolted or clamped to building members or structural framework. Welding of conduits or conduit fittings directly to structural steel shall not be permitted. Any galvanizing or paint on conduit, conduit fittings, or boxes damaged during installation shall be repaired by the Contractor.

3.05 CLEANING

- A. Comply with requirements of *Section 01 74 00, Cleaning and Restorations*.
- B. Remove and dispose of all debris.

PART 4 - PAYMENT

4.01 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

- A. Quantity and Payment: No separate payment shall be made for this item. Include all costs for *RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS* in the prices bid for the various related items of work as designated in the Proposal.

****END OF SECTION****

SECTION 26 05 53
(16195)
ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Wire and cable markers.
2. Conduit labels.
3. Nameplates and labels.
4. Buried markers.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 26 05 03: Equipment Wiring Systems*
3. *Section 26 05 19: Wire and Cable*
4. *Section 26 05 33: Raceways and Boxes for Electrical Systems*

1.02 SUBMITTALS

A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.

B. Manufacturer's product data:

1. Complete list of all materials proposed to be furnished and installed under this section.
2. Specifications and other data required to demonstrate compliance with the specified requirements.

- C. Include schedule for nameplates and tape labels.
- D. Manufacturer's recommended installation procedures.

1.03 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
 - 1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
 - 1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 - 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the method and materials to be used.
 - 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- C. Basis of acceptance:
 - 1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.

- D. Delivery and storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.

1.05 WARRANTY AND WARRANTY REPAIRS

- A Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the maintenance period.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other essential characteristics inherent in the named product.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.
- C. Manufacturers:
1. 3M Products
 2. W. H. Brady
 3. Or equivalent

2.02 WIRE AND CABLE MARKERS

- A. The alpha-numeric coding on both ends of each individual 600 Volt conductor size #6 AWG and smaller (including neutrals) shall be made using 3M printable markers catalog number PLP-WHT Series with vinyl flexible overlap or equivalent, in addition to color coding.

- B. The alpha-numeric coding on both ends of each individual 600 Volt conductor size #4 through #1/0 AWG shall be made using W. H. Brady Series 3420 wire markers or equivalent (minimum six characters) in addition to color coding “A”, “B”, and “C” Phase throughout.
- C. The alpha-numeric coding on both ends of each individual 600 Volt conductor size #2/0 through #500 MCM shall be made using W. H. Brady Series 3430 wire markers or equivalent (minimum six characters) in addition to color coding “A”, “B”, and “C” Phase.
- D. All 5 kV power wires shall be color-coded on both ends with orange electrical tape. Each phase shall be marked with one, two, or three bands of orange tape (Phase A, B, C) and with W. H. Brady Series 3430 wire markers or equivalent (minimum six characters).
- E. All 15 kV power wires shall be color-coded on both ends with yellow electrical tape. Each phase shall be marked with one, two, or three bands of yellow tape (Phase A, B, C) and with W. H. Brady Series 3440 wire markers or equivalent (minimum six characters).
- F. All 35 kV cables shall be color-coded on both ends with red electrical tape. Each phase shall be marked with one, two, or three bands of red tape (Phase A, B, C.) and with W. H. Brady Series 3440 wire markers or equivalent.

2.03 CONDUIT/LABELS

- A. All raceways labels shall be multiple part chemical resistant, non-adhesive, tags as manufactured by ALMETEK INDUSTRIES, INC., “MINI-TAGS” Catalog #SV-5. Tag holders shall be black polyvinyl chloride (PVC). Tag characters shall be yellow medium density, polyethylene with black characters. Tag holders shall be vertical style and fastened to each raceway using two (2) black, ultra-violet (UV) protected, self-locking, nylon ties as manufactured by Thomas and Betts, “TYRAP”, or equivalent.

2.04 NAMEPLATES AND LABELS

- A. Nameplates shall be made of laminated sheet plastic, 1/16-inch thick, engraved to provide black letters on a white background. The nameplates shall be made of laminated sheet plastic, 1/16-inch thick, engraved to provide black letters on a white background. The nameplates shall be fastened in place with stainless steel screws and adhesive backing. Nameplate information shall be as called out on the Contract Drawings specified herein and approved by the Engineer. The

Contractor shall provide a sample and submit for approval a list of legends for nameplates he proposes to use.

- B. Panel voltage hazard labels by W. H. Brady Series 96157 or equivalent.

2.05 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the *ENGINEER*.
- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. General:
 - 1. Degrease and clean surfaces to receive nameplates and tape labels.
 - 2. Install nameplates and tape labels parallel to equipment lines.
 - 3. Secure nameplates to equipment fronts using aluminum, rivets. Secure nameplate to inside face of recessed panelboard doors in finished locations. Use of screws or adhesive is unacceptable.
 - 4. Embossed tape will not be permitted for identification of electrical equipment other than individual wall switches, receptacles, control device stations and instruments.

5. All tags and/or nameplates shall be located in a position to be readable after completion of the installation of the equipment. Final nameplate wording will be as approved by the *ENGINEER*.
6. Provide and install nameplates for all equipment installed, and all equipment circuits modified. If a source is changed for any electrical equipment, nameplates and wire markers shall be modified for every circuit, equipment, receptacle, or device affected.

B. Wire identification:

1. All power, control, and instrumentation wire and cable installed shall be clearly and permanently labeled within six (6") inches of all electrical terminations, splices, and connections using pre-printed alpha-numeric vinyl cloth marking tags. All labeling shall conform to the alpha-numeric system approved by the Engineer during construction. Labeling shall indicate the field identification number of all wire and cable and the phase of all power connectors.
2. Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits, and with control wire number as indicated on schematic and interconnection diagrams for control wiring.
3. All wire and cable furnished, installed and/or terminated under this Contract shall be externally color-coded and at all termination points, contain an alpha-numeric coding for each phase, neutral, and/or grounding conductor installed. This coding shall be used consistently throughout the power distribution system installed under this Contract.
4. All 480V power wiring phases shall be color-coded brown, orange, yellow (A, B, C) along their entire length not concealed in the conduit system.
5. All 240/120V power wires shall be color-coded black, red, white (A, B, N) along their entire length not concealed in the conduit system.
6. Terminal strips shall be clearly and permanently marked with waterproof ink or indelible pencil. Each wire shall be marked consistently throughout the entire system, using wherever possible the notation of the wires given on the manufacturer's wiring diagrams, Contractor's working drawings, as shown on the Contract Drawings and as approved by the Engineer. Each wire shall be labeled at both termination points. All wire numbers shall appear on as-built drawings before these drawings will be accepted.

7. The entire length of exposed ground conductors and the entire exposed portion in junction boxes, FD boxes, and other enclosures (not concealed by the conduit system) shall be marked with green tape along the entire length.
8. All ground wires shall be color-coded green.

C. Conduit Identification:

1. Under this Contract, the Contractor shall clearly and permanently label as specified in this Section all electrical raceways installed under *Section 25 05 33, Raceway and Boxes for Electrical Systems*, and shown on the Contract Drawings. Labels shall be installed at all raceway termination points.

D. Nameplate engraving schedule:

1. Provide nameplates to identify all electrical distribution and control equipment, and loads served. Letter height: 1/8-inch for individual switches and loads served, 1/4-inch for distribution and control equipment identification.
2. The Contractor shall furnish and install nameplates on all junction boxes, motor starters, ventilation equipment, unit heaters, control panels, transformers, panelboards, pushbuttons, indicating lights, disconnect switches, circuit breakers and any other electrical equipment installed and/or connected to under this Contract as specified herein.
3. All junction and pull boxes shall have the words "JUNCTION BOX" or "PULL BOX" on the nameplate with the individual box number listed below these words, e.g., (JBX-1) and shall be two (2") inches high by four (4") inches wide.
4. All variable frequency drives, motor starters, circuit breakers, panelboards, transformers, capacitors, disconnects, control panel and control station/pilot devices shall have the individual name as listed on the Contract Drawings and shall be one (1") inch high by three (3") inches wide.
5. All other miscellaneous equipment and motors shall have the individual name listed (as directed by the Engineer) on a one (1") inch high by two (2") inch wide nameplate.
6. Identify all panels, load centers, disconnect switches, motor starters and motor control centers with voltage rating using Brady labels.

3.03 CLEANING

- A. Comply with requirements of *Section 01 74 00, Cleaning and Restorations*.
- B. Remove and dispose of all debris.

PART 4 - PAYMENT

4.01 ELECTRICAL IDENTIFICATION

- A. Quantity and Payment: No separate payment shall be made for this item. Include all costs for *ELECTRICAL IDENTIFICATION* in the prices bid for the various related items of work as designated in the Proposal.

****END OF SECTION****

SECTION 26 32 15
(16623)
PACKAGED DIESEL ENGINE GENERATOR SYSTEMS
(200 KW AND LARGER)

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included:

1. Packaged engine generator system.
2. Exhaust silencer and fittings.
3. Fuel fittings and subbase fuel tank.
4. Battery and charger.
5. Automatic transfer switch (ATS).
6. Sound-attenuated weatherproof enclosure.
7. Fuel to fill fuel tank.

B. Related work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 03 30 00: Concrete*
3. *Section 01 78 23: Operating and Maintenance Data*
4. *Section 01 78 36: Guarantees*
5. *Section 26 05 00: Basic Electrical Requirements*
6. *Section 26 05 19: Wire and Cable*
7. *Section 26 05 26: Grounding and Bonding for Electrical Systems*

8. *Section 26 05 33: Raceway and Boxes for Electrical Systems*

C. Payment:

1. Unless otherwise noted in the Proposal Section, no separate payment shall be made for this item.
2. Include all costs for *PACKAGED DIESEL ENGINE GENERATOR SYSTEMS* in the prices bid for the various related items of work as designated in the Proposal.

1.02 SYSTEM DESCRIPTION

- A. The system shall consist of a standby generator rated 130 kW with a diesel powered internal combustion engine, with all associated hardware required to make a workable and functioning power supply.
- B. The engine shall be fueled by No. 2 Fuel Oil stored in a 350-gallon skid tank. The exhaust system shall use a critical-type muffler for use in a residential neighborhood.
- C. The generator shall be capable of powering the specified loads continuously. The generator shall be capable of sequentially starting all connected equipment, and lighting required for normal operations.
- D. The generator will be connected to the facility critical loads via an ATS and shall be capable of maintaining 80% of rated voltage while starting the loads in a predetermined sequence or simultaneously.
- E. On loss of electric utility supplied power, the generator shall start automatically and after it reaches full voltage, operate the automatic transfer switch (ATS) to connect the facility-load to the generator. After utility power is restored, the facility shall be transferred back to the utility service and the emergency generator shall automatically shut down.
- F. The generator set shall start and accept load within 10 seconds of a power failure and shall have a 15-minute delay before retransfer to the normal source in accordance with Article 700-12 of the National Electrical Code.
- G. The generator shall be rated 130 kW, 163 kVA at 0.80 power factor, 208/120 volts, 3 phase, 60 Hertz, 1800 RPM. The generator shall be installed outdoors. The generator set shall be equipped with a sound-attenuated weatherproof enclosure.

- H. The Contractor is responsible to furnish and install the first full tank of fuel once delivered to site. The Contractor is responsible for all fuel required for testing purposes. At completion of project Contractor is responsible for all fuel required to refill tank.

1.03 SUBMITTALS

- A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. Manufacturer's product data:
 - 1. Complete list of all materials proposed to be furnished and installed under this section.
 - 2. Specifications and other data required to demonstrate compliance with the specified requirements.
 - 3. Submit product data showing dimensions, weights, ratings, interconnection points, and internal wiring diagrams for engine, generator, control panel, battery, battery rack, battery charger, exhaust silencer, vibration isolators, fuel tank, radiator, and remote annunciator.
 - 4. Furnish complete system schematic and wiring diagrams consisting of the engine-generator set and transfer switch as defined in this Specification.
- C. Submit shop drawings showing plan and elevation views with overall and interconnection point dimensions, fuel consumption rate curves at various loads, ventilation and combustion air requirements, and electrical diagrams including schematic and interconnection diagrams.
- D. Submit generator sizing calculations confirming that the proposed standby generator meets the specified performance requirements. Calculations shall show load stop, load applied voltage dip and surge kW, kVA at each step. Load steps are included in Paragraph 1.02 above.
- E. Submit manufacturer's installation instructions.

1.04 QUALITY ASSURANCE

- A. Qualifications of manufacturer:

1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the method and materials to be used.
 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.
- C. Basis of acceptance:
1. The manufacturer's installation instructions will provide the basis for acceptance or rejection of the work performed under this section.
- D. Supplier: Authorized distributor of engine generator manufacturer with service facilities within 50 miles of project site.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of *Section 01 66 00, Storage and Protection*.
- B. Protection:
1. Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
- D. Delivery and storage:
1. Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use.

2. Store in strict accordance with the manufacturer's recommendations as approved by the *ENGINEER*.
3. Protect equipment from dirt and moisture.

1.06 WARRANTY AND WARRANTY REPAIRS

- A. Warranties: A two year warranty shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B. The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the warranty period.

1.07 OPERATION AND MAINTENANCE MANUALS

- A. Operation and maintenance manuals shall be provided in accordance with *Section 01 78 23, Operation and Maintenance Data*.
- B. Manuals in final form shall be available a minimum of five (5) working days prior to the instruction of the *OWNER'S* personnel.
- C. Include instructions for normal operation, routine maintenance requirements, service manuals for engine and fuel tank, oil sampling and analysis for engine wear, and emergency maintenance procedures.
- D. Accurately record location of engine generator and mechanical and electrical connections.

1.08 MAINTENANCE

- A. Extra materials:
 1. Provide two additional sets of each fuel, oil, and air filter element required for the engine generator system.
- B. Maintenance service:
 1. Furnish service and maintenance of packaged engine generator system for one year from Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Products: References to specified proprietary products are used to establish minimum standards of utility and quality. Unless otherwise approved by the *ENGINEER*, provide only the specific products. Design is based on the materials specified.
- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.
- C. Single manufacturer: This equipment shall be manufactured by a single source manufacturer who has been regularly engaged in the production of engine-generator sets for a minimum of ten years. The emergency electric generating system described herein, including these components shall be factory built, factory tested, and shipped by this single source manufacturer, so there is one source of supply and responsibility for warranty, parts, and service. This manufacturer shall have a local representative who can provide factory-trained servicemen, required stock of replacement parts, and technical assistance.
- D. Acceptable manufacturers:
 - 1. Generac Model SD130 or equivalent.
- E. Safety standard: The electric generating system must meet all requirements of the current edition of NFPA 110 including design specifications, prototype tests, one-step full-load pick-up, and installation acceptance.
- F. The responsibility for performance to this Specification includes the entire system and cannot be split up among individual suppliers of components comprising the system, but must be assumed solely by the supplier of the system. The manufacturer shall furnish complete system schematic and wiring diagrams consisting of the engine-generator set and transfer switch as defined in this Specification.
- G. All controls shall be the standard of the manufacturer, who is engaged in the manufacture of engine-generator sets, transfer switches, and accessories and has them available for sale on the open market. Control parts shall be identified by part numbers of this manufacturer and shall have second source listing where applicable. Control systems that are supplied by a sub-vendor or subcontractor of the vendor and not incorporated within the documentation drawings of the engine-generator manufacturer are not acceptable.

2.02 ENGINE-GENERATOR SET

- A. General: This system shall include one Generac Model SD130 engine-generator set or equivalent, and as represented in the published specifications for that model. Each set shall be rated for 130 kW, 163 kVA, at 0.8 PF, 60 Hz, 3 phase, 4 wire, 208/120 volts on a continuous standby basis. Each engine-generator set shall be mounted on a heavy-duty steel base to maintain proper alignment between components, and each set shall incorporate vibration isolators of the type and quantity as specified by the set manufacturer, whether mounted internally or externally to the set.
- B. Engine: Engine shall be stationary, liquid-cooled, diesel for use with number 2 diesel fuel. Design shall be 4 cycle, 6 cylinders, minimum displacement of 504 cubic inches, turbocharged and aftercooled where required by engine manufacturer. Engine shall be certified by the engine manufacturer as capable of driving a generator producing a kW rating as specified herein. Engine shall be capable of driving the generator of the specified rating on a continuous standby basis for the duration of normal utility source interruptions per SAE J1349 conditions. Fuel injectors and valves shall not require adjustment while in service.
- C. Engine equipment shall include the following:
1. An electric starter as required by the manufacturer.
 2. Positive displacement, mechanical full pressure lubrication oil pump, full flow lubrication oil filters with replaceable elements and dipstick oil level indicator.
 3. Replaceable dry element air cleaner.
 4. Engine speed electronic governing system to automatically control generator frequency to $\pm 0.25\%$ of rated frequency from no-load to full-load rated output.
 5. Engine starter battery charging alternator, with solid-state voltage regulator.
 6. Engine mounted thermostatically controlled water jacket heater for each engine to aid in quick starting. Heater shall be rated 1500 watts, 120 volts, single phase, 60 Hertz.

D. Engine cooling system:

1. Engine shall be radiator cooled by engine mounted radiator system including belt-driven pusher fan, coolant pump, and thermostat temperature control. Performance of components shall be as required by set manufacturer.
2. The manufacturer shall provide 50% ethylene glycol antifreeze solution to fill engine cooling system.

E. Engine exhaust system:

1. Exhaust muffler shall be provided for each engine of size as recommended by the set manufacturer. The muffler shall be of the critical type. The muffler shall be mounted on the enclosure.
2. Provide an exhaust condensation trap with manual drain valve to trap and drain off exhaust condensation and to prevent condensation from entering the engine.
3. Provide a suitable rain cap at the stack outlet. Provide all necessary flanges and special fittings for proper installation.
4. The manufacturer shall mount and install all exhaust components as required to comply with applicable codes and regulations. All components shall be properly sized to assure proper operation without excessive back pressure when installed as shown on Drawings. Make provisions as required for pipe expansion and contraction.

F. Engine fuel system:

1. Provide fuel filter with replaceable element.
2. Provide engine driven mechanical positive displacement fuel pump.

G. Generator:

1. Generator shall be single-bearing, self-aligning, four-pole, synchronous type, revolving field, with amortisseur windings, with direct drive centrifugal blower for proper cooling and minimum noise, with temperature compensated solid-state voltage regulator, with brushless rotating rectifier exciter system. No brushes will be allowed. Generator shall be directly connected to engine flywheel housing and driven through a flexible coupling to insure permanent alignment; gear driven generators

are not acceptable under this specification. Insulation shall meet NEMA standard for Class H. The maximum temperature rise shall not exceed 130°C above a 40°C ambient. Generator design shall prevent potentially damaging shaft currents.

2. The three-phase, broad range, reconnectible generator shall have 12 leads brought out to allow connection by user to obtain any of the available voltages for the unit.
3. Voltage regulator shall be solid-state design and shall function by controlling the exciter magnetic field between stator and rotor to provide no load to full load regulation of rated voltage within $\pm 0.5\%$ during steady-state conditions. The engine-generator set and regulator must sustain at least 90% of no load voltage for ten seconds with 250% of rated load at near zero power factor connected to its terminals.
 - a. The voltage regulator shall be insensitive to severe load induced waveshape distortion from SCR or thyristor circuits such as those used in battery charging (UPS) and motor speed control equipment.
 - b. The control panel shall provide a minimum of $\pm 5\%$ voltage adjustment from rated value.
4. The generator, exciter, and voltage regulator shall be designed and manufactured by the engine-generator set manufacturer so that the characteristics shall be matched to the torque curve of the prime mover. This design allows the prime mover to use its fullest power producing capacity (without exceeding it or over compensating) at speeds lower than rated, to provide the fastest possible system recovery from transient speed dips. A system that routinely selects a linear-type (straight line) constant volts/hertz characteristics, without regard for the engine power and torque characteristics, will not meet this specification. These characteristics shall be demonstrable as follows:
 - a. With engine-generator set operating at rated speed, voltage and load, reduce engine speed to half rated by manually overriding the engine speed governor control. Engine-generator set must recover to full speed with the rated load connected when the engine speed governor control is returned to its normal mode.
 - b. Calculations must demonstrate that the exciter and voltage regulator will permit utilization of at least 80% of maximum available prime mover torque at all engine speeds between 50%

and rated speed, and with rated unity power factor load connected to its terminals.

5. Exciter shall be three-phase, full-wave, rectified with heavy-duty silicon diodes mounted on the common rotor shaft and sized for maximum motor starting loads. Systems using three-wire solid-state control element (such as transistors or SCR's) rotating on the rotor shall not be acceptable. Exciter shall be PMG type.
6. Generator design shall be of the self-protecting type, as demonstrated by the prototype short-circuit test as described under "Testing" herein. All other generator performance criteria shall be equivalent to that of the specified equipment.

H. Control panels and controls:

Provide a H-100 controller or equivalent microprocessor based control and monitoring system that supervises all performance parameters of the engine and alternator. The panel face shall be weather protected and suitable for outdoor use. The panel shall include the following controls and features.

1. Analog meters - 2.5", 90° scale. One each for display of kilowatts, frequency, voltage and amperage.
2. Digital display panel:
 - a. Menu driven display panel with two line, 16 characters per line, LED alphanumeric display to indicate engine data, alternator data and provide means to make adjustments.
 - b. The engine data to be displayed shall include oil pressure, oil temperature, water temperature, battery voltage, engine speed, running time (hours), governor duty and number of starts.
 - c. The alternator data to be displayed shall include AC voltage (line and phase), current (3 phases), kilowatts, kilowatt-hours and exciter duty.
 - d. The adjustment menu shall enable adjustment of the voltage ($\pm 5\%$), time delay start, time delay stop and frequency.
 - e. The menu switches shall be "tactile feel" for positive indication that switch has operated.

3. A three position RUN-OFF-AUTO switch with a flashing red indication when the switch is in the off position.
4. A two position mushroom head emergency stop switch.
5. Automatic voltage regulation and engine speed governing system.
 - a. The voltage regulation performance shall be less than .5% from no load to full load, the drift shall be less than $\pm.5\%$ for a 60°F in ambient temperature change and the random voltage variation shall be less than $\pm.5\%$.
 - b. The governor performance shall be isochronous from no load to full load, the frequency drift shall be less than $\pm.5\%$ and the random frequency variation shall be less than $\pm.25\%$ from no load to full load.
6. The panel shall alarm when any of the following conditions occur. The amber warning light shall be lit and a digital message shall appear.
 - a. Battery condition monitoring:
 - (1) Low DC Voltage: activates when battery drops below 25 VDC. (except during engine starting).
 - (2) High DC Voltage: activates when battery voltage exceeds 32 VDC.
 - (3) Weak Battery: activates when battery voltage drops below 60 percent of nominal voltage for more than 2 seconds during engine cranking.
 - b. Engine sender monitoring:
 - (1) Oil pressure sender.
 - (2) Engine temperature sender.
 - c. Generator set parameter monitoring:
 - (1) Low oil pressure warning pre-alarm.
 - (2) High coolant temperature pre-alarm.

- (3) Low fuel
 - (4) Overload alarm: when total kW load exceeds 100% of standby rating (110% of prime power rating) for 5 seconds, a load shed signal is issued and a warning alarm is activated.
 - (5) Overcurrent: when the current on any phase exceeds 110% of the generator set rated current for more than 10 seconds.
 - (6) Under frequency: when frequency drops to less than 59 Hz for more than 5 seconds.
7. The genset shall shut down when any of the conditions occur. The red warning light shall be lit and a digital message shall appear.
- a. Low oil pressure.
 - b. High coolant temperature.
 - c. Low coolant level.
 - d. Magnetic pickup failure: indicates that the engine cannot be safely governed.
 - e. Fail to crank: indicates potential fault with magnetic pickup or engine starting system.
 - f. Overcrank: Cranking time exceeds 75 seconds continuous or limit of cycle cranking attempts.
 - g. Overspeed: engine speed exceeds 115% of nominal.
 - h. EEPROM Error: a memory error which prevents safe control operation.
 - i. High AC Voltage: AC voltage exceeds 110% for 10 seconds, or exceeds 130% of rated.
 - j. Low AC Voltage: AC voltage falls below 85% of rated for more than 10 seconds.
 - k. Underfrequency: AC frequency falls below 90% of rated for more than 20 seconds.

- l. Overcurrent: AC current on any phase exceeds rated generator set current by 110% to 175%, and the AC time/current integral exceeds alternator thermal limits.
 - m. Short circuit: AC current exceeds 175% of rated, and the AC time/current integral exceeds the alternator thermal limits.
 - n. Customer selected faults up to 4).
8. The following output contacts shall be provided.
- a. Common Alarm Relay: One form “C” contact set, rated 2 amps at 30 VDC. Operates on all warning and shutdown conditions.
 - b. Load Shed Relay: One Form “A” contact set, rated 2 amps at 30 VDC.
 - c. Ready to Load Relay: One Form “A” contact set, rated 2 amps at 30 VDC. Operates when generator set reaches 90% of rated voltage and frequency.
 - d. NFPA 110 Alarm Relays: One Form “A” contact set, rated 2A at 30 VDC. Operates on NFPA 110 required warning conditions.
 - e. Auxiliary Run Relay: Each relay provides 3 Form “C” contacts rated 10A at 240 VAC.

I. Auxiliary equipment:

- 1. Starting battery: Battery shall be supplied for each engine and shall be mounted in a battery rack within the engine-generator set skidbase.
- 2. Battery charger(s): A voltage regulated battery charger shall be provided for each engine-generator set. Chargers shall be equipped with float, taper, and equalize charge settings. The charger power shall be supplied from the normal source.
- 3. Vibration isolators: Each engine-generator set shall be mounted on vibration isolators either internal or external to the set skidbase.
- 4. Generator circuit breaker with 400 amp trip rating.

- J. Generator set protective housing:
1. Engine generator set shall be factory enclosed in a heavy gauge galvanized steel enclosure constructed with corner posts and finished with baked enamel paint. Enclosure to have large easily opened hinged doors to allow access to the engine, alternator and control panel. Each door to be fitted with rust proof hardware and lockable with identical keys. Provide a factory mounted rust resistant critical type muffler along with stainless steel flex tube, a sealed collar surrounding the roof exhaust opening and an exhaust pipe rain cap. Rubber vibration dampeners to help reduce exterior noise levels shall be incorporated.
 2. The enclosure shall be sound attenuating and the design must be such that sound levels are less than 71 dbA at 23 feet when the unit is operated at full load under normal ambient conditions.
- K. Provide a 350- gallon double wall generator subbase fuel tank. Tank shall have a closed top hydroshield to prevent entry of rainwater. The tank side and channels shall be 7 gauge steel and the tank top, bottom and ends shall be 10 gauge steel. Tank shall have floor supports, and tie rod stiffeners as required for the operating conditions. The tank exterior shall have a prime coat and a finish coat of enamel. The tank interior shall have a rust preventive coating and shall not be galvanized. The tank shall have fittings for NFPA 30 emergency vent, fill line, level gauges, normal vent, fuel supply, fuel return, low level switch and leak detector switch. Provide low level and leak detection switches. The low level switch shall be set to detect when a 3 hour fuel supply remains in the tank. The actual level shall be determined by the generator set manufacturer.

2.03 MANUFACTURERS - AUTOMATIC TRANSFER SWITCHES

- A. Generac Power Series with ATC-300 + Controller or equivalent.
- B. The transfer switch manufacturer must be the manufacturer selected to provide the emergency generator.

2.04 AUTOMATIC TRANSFER SWITCH

- A. General: The transfer switches shall be designed, built, tested, furnished and warranted by the manufacturer of the standby power generating equipment to ensure one source of responsibility and equipment compatibility. The manufacturer shall provide factory trained parts and service support through a

factory authorized distributor that is regularly doing business in the area of the installation.

B. Transfer switch:

1. The automatic transfer switch shall be rated 400 amps 3-pole, 208/120 volts and 60 Hz., Generac Power Series with ATC-300+ or equivalent in a NEMA 1 enclosure. Transfer switches that must be derated when installed in an enclosure (due to integral overcurrent devices or any other reasons) do not meet this specification. Transfer switch shall be rated for continuous operation in ambient temperatures of -40°C (-40°F) to 67°C (150°F). The transfer switch shall be braced for 65K amps symmetrical short circuit current.
2. Construction:
 - a. Automatic transfer switch shall be over center operation, double-throw construction, positively electrically and mechanically interlocked by a simple mechanical beam to prevent simultaneous closing (for break before make operation), and mechanically held in both normal and emergency positions.
 - b. Automatic transfer switch shall be quick-break, quick-make operation so that the speed of opening and closing is not controlled by an operator during manual operation. Automatic transfer switch shall provide a center "Programmed Transition" position for manual switching. Automatic transfer switches shall be approved for manual operation under full load by integral mounted, permanently-attached, high-dielectric, manual operating handle. Manual operating handles, which are normally stored and must be installed for manual operation, do not meet this specification.
 - c. The electrical operating means shall be a direct-acting, constant force in both directions. Bi-directional linear induction motor to provide minimum friction, straight-line switch action. Motor shall be attached directly to the switching mechanism without the use of gears, cams, or other complex mechanical linkage methods. Transfer switches using solenoid operators and relying upon gravity, weights, or momentum for closing in either position do not meet this Specification. Automatic transfer switches shall not contain any integral overcurrent devices in the main power circuit, including molded case circuit breakers or fuses. The automatic transfer switch electrical actuator shall have an independent

disconnect means to disable the electrical operation during manual switching.

- d. Manual operating handle and controls (other than key-operated switches) shall be accessible to authorized personnel only by opening the key-locking cabinet door. Automatic transfer switches with manual operating handles and non-key-operated control switches located on the outside of the cabinet do not meet this Specification.
 - e. Maximum transfer time in either direction shall be controlled by the "Programmed Transition" feature which is incorporated to allow motors time to coast to rest.
 - f. All automatic transfer switches shall have transparent protective covers to protect operating personnel during manual operation, and to allow an operator to visually determine that the main contacts are "Open" or "Closed".
 - g. The main switch contacts shall be of the no-maintenance type and high-pressure silver-cadmium oxide to resist burning and pitting for long-life operation. All switches shall have arc chutes and heat absorbing material and metal leaves for positive extinguishing of arcs quickly and effectively; arc chutes shall have insulating covers to prevent interphase flashover.
 - h. Automatic transfer switches shall have one (1) S.P.D.T. (Single Pole Double Throw), 240-volt auxiliary switch on both the normal and emergency sides, operated by the transfer switch. These auxiliary switches shall be factory wired to an easy access terminal block and may be used to monitor transfer switch position for controlling indicator lamps or other peripheral equipment.
3. Terminals: Complete AL-CU (Aluminum-Copper) lugs, U.L. Listed and CSA Certified shall be provided for both normal and emergency load positions. Top feed for load connections shall be provided. Load connections shall be field changeable either from top-to-bottom or bottom-to-top. Wiring space at normal, emergency, and load lugs inside the transfer switch cabinet shall comply with 1999 NEC Table 373-6(b). Full rated neutral bar with lugs for normal, emergency, and load neutral conductors shall be provided inside the cabinet.

4. Controls:
- a. Control accessories shall be mounted on the inside of the main cabinet door. This is to allow for ease of service when the main cabinet lockable door is open, but to prevent access by unauthorized personnel.
 - b. Control circuit disconnect plugs shall be provided to de-energize control circuits to avoid the hazards of electrical shock to personnel while making adjustments.
 - c. The ATC-300+ electronic control, undervoltage and time delay modules, shall be a printed circuit board for ease of service. The solid-state undervoltage sensors shall simultaneously monitor all phases of the normal and emergency power sources to provide field adjustable range sensors for specified applications. Voltage pickup settings shall be adjustable from a minimum of 85% to a maximum of 100% of nominal voltage. Voltage dropout settings shall be adjustable from a minimum of 74% to a maximum of 98% of the pickup setting with a fixed dropout time delay of 0.5 second. Voltage sensors shall be of the temperature compensated type, for maximum deviation over the temperature range of -32°C (-25°F) to 79°C (175°F). Voltage sensors shall allow for adjustment to sense partial loss of voltage on any phase of the normal or emergency power source, even where motor feedback voltages exist.
 - d. Controls shall signal the emergency power system to start upon signal from normal source voltage sensors. Solid-state time delay start shall avoid nuisance engine-generator set start-ups on momentary voltage dips or interruptions.
 - e. The transfer switch shall transfer the load to the emergency power system after the engine-generator set reaches proper voltage and frequency and has stabilized.
 - f. The transfer switch shall control the engine-generator set to allow the set to start and transfer the load within 10 seconds after a normal source power failure. It shall be the responsibility of the transfer switch supplier to meet this requirement.
 - g. The transfer switch shall retransfer the load to the normal source after normal source power is restored, allowing normal source to stabilize before retransfer.

- h. The controls shall signal the engine-generator set to stop after load retransfer to the normal source, but shall maintain the availability of the emergency source in the event that the normal source fails shortly after retransfer. The controls shall allow the engine-generator set to run unloaded for a cooldown period prior to shutdown.
- i. The controls shall provide an automatic retransfer of the load from the emergency source to the normal source if the emergency source fails when the normal source is available.
- j. The transfer switch operating power for transfer and retransfer shall be obtained from the source to which the load is being transferred.
- k. Main cabinet front door mounted controls and indicator lamps shall consist of oil-tight, neon position indicator lamps (NORMAL - White and EMERGENCY - Amber) and key-operated Test and Selector switches to provide the following functions:
 - (1) TEST - Simulated normal source power loss to control unit for testing engine-generator set capability. Control system shall provide for system test without load transfer.
 - (2) NORMAL - Normal operating position and also restored the system to standby operation.
 - (3) RETRANSFER - Spring-loaded momentary position of switch, that overrides retransfer time delay to cause the immediate return of the normal source after a test or actual power outage.
- l. The controls shall include an exerciser to automatically exercise the generator under station load for 30 minutes every week. The time of day, day of week and exercise duration shall be adjustable. The exerciser shall be connected to load side of transfer switch. Provide a switch to disable the “exercise under load” feature.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work and field dimensions are as shown on Drawings.

- B. Verify that required utilities are available in proper location and ready for use.
- C. Beginning of installation means installer accepts existing conditions.
- D. Verify phase sequence of existing electric service and match generator phase sequence to utility phase sequence.

3.02 INSTALLATION

- A. Install unit complete and make operational.
- B. Install muffler horizontally on spring type compensating hangers as close to unit as practical.
- C. Provide 1/2 inch (12 mm) copper drain with draincock from bottom of muffler to nearest floor drain for periodic draining of muffler.
- D. Install engine at sufficient height above base to permit dropping oil pan without removing unit.
- E. Provide vibration isolation of exhaust equipment to prevent transfer of vibration into building components enclosing the standby power system.
- F. External conduit and wiring and transfer switch will be furnished and installed under applicable electrical sections, but all conduit, wiring and connections between the engine and its control panel and generator and its control panel, is included herein.
- G. Mount engine-generator set on a structural steel frame or skid. Provide vibration isolators suitable to prevent transmission of vibration to building structure between set and frame, and securely anchored to the concrete foundation. Obtain from supplier of engine-generator set a drawing giving location and size of foundation bolts for unit proposed, in sufficient time to be available when needed to place foundation. Galvanized anchor bolts shall be furnished by engine-generator set manufacturer.
- H. Sheet metalwork and ventilating controls in connection with engine cooling are specified under Heating and Ventilating. External piping connections to engine shall be made with flexible armored hose furnished with engine.
- I. Electrical equipment and materials shall be listed by UL wherever standards have been established by that agency.

3.03 WIRING AND CONNECTIONS:

- A. Provide conduit, wiring, and connections required and recommended by unit supplier.
- B. Install all control and alarm wiring in rigid steel conduit.
- C. Connect neutral point of generator and generator frame to ground by green insulated copper conductor of adequate size.
- D. Connect motorized dampers in cooling and exhaust equipment to auxiliary contact on transfer switch to open dampers when unit is energized.

3.04 EQUIPMENT START-UP:

- A. Operate the unit to demonstrate ability to operate continuously without vibration, jamming, leaking or overheating and to perform specified functions, after installation and after manufacturer's representative check of installed equipment.
- B. Comply with manufacturer's operating and maintenance instructions during start-up and operation.
- C. Make all final adjustments necessary to place the equipment in working order. Prior to any testing or operation of the units, the manufacturer's service representative shall inspect the installation, and shall certify, in writing, that the assemblies are, in all ways, ready for operation. Start-up shall not commence without the presence of the manufacturer's representative.

3.05 FIELD QUALITY CONTROL:

- A. Upon completion of the installation and as soon as conditions permit, the diesel engine driven generator, including the engine, generator, electrical circuit controls, transfer controls other devices shall be tested in the presence of the *OWNER* by the service representative for the manufacturer of the engine driven generator unit to verify that the system functions as specified.
- B. Perform load test with 0.8 power factor reactive load bank connected to the generator for a full load nameplate test. Run the test for a duration of four hours. Take system data readings each 30 minutes.
- C. The manufacturers' representatives shall make such changes in wiring or connections and such adjustments, repairs or replacements to make the circuit,

device or control system function as specified and comply with the Contract Documents.

- D. Acceptance of test will be verified when the unit operates without alarm or abnormal conditions for the duration of the entire test. Retest if this requirement is not met until acceptance criteria has been verified.
- E. Record in 20 minute intervals during four hour test:
 - 1. Kilowatts
 - 2. Amps
 - 3. Voltage
 - 4. Coolant temperature
 - 5. Air temperature
 - 6. Frequency
 - 7. Oil pressure
- F. As part of the field test, each of the automatic shutdown devices shall be tested and the respective values recorded at which the devices will stop engine. Any adjustments required shall be made in the devices to make the operating values correspond to those recommended by the engine manufacturer and as recorded during the stop test.
- G. Take and record octave band sound pressure level readings while the engine driven generator is operating using the station load. These readings shall be within the limits identified in the engine generator data submittals for acceptable sound level.
- H. After completion of testing, provide additional fuel, as required, to fill the fuel system tank.

3.06 MANUFACTURER'S FIELD SERVICES

- A. All systems and equipment furnished under this Contract shall be tested for proper operation. Refer to applicable Sections of Specifications.
- B. All corrections, adjustments, repairs shall be made by technically qualified personnel using parts furnished by the original equipment manufacturer.
- C. Upon completion of the work, all component parts, individually, and as a whole shall be adjusted and left in satisfactory operating condition.
- D. All systems and equipment shall be adjusted/repared by qualified personnel.

3.07 ADJUSTING

- A. Adjust work.
- B. Adjust generator output voltage and engine speed.

3.08 CLEANING

- A. Clean work.
- B. Clean engine and generator surfaces. Replace oil and fuel filters.

3.09 DEMONSTRATION

- A. Provide systems demonstration.
- B. Described loads connected to standby system and restrictions for future load additions.
- C. Simulate power outage by interrupting normal source, and demonstrate that system operates to provide standby power.

****END OF SECTION****

SECTION 31 23 00
(02220)
EXCAVATING, FILLING AND GRADING

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:

1. Stripping, storage and redistribution of topsoil.
2. Excavating for footings and foundations.
3. Filling and backfilling to attain indicated grades.
4. Trenching and trench backfilling.
5. Rough and finish grading of the site.
6. Furnishing and installing broken stone subbase material for slabs, foundations and structures.
7. Furnishing and installing quarry blend stone subbase material for pavements and other structures.
8. Orange delineation geotextile
9. Providing borrow material.
10. Rip Rap for outlet protection.
11. Disposal of excess material.
12. Testing Services.
13. Any additional work as may be specified in the Statement of Work.

B. Related Work:

1. Other sections of the *Specifications*, not referenced below, shall also apply to the extent required for proper performance of this work.

2. *Section 01 35 43: Environmental Protection Procedures*
3. *Section 01 57 13: Temporary Soil Erosion and Sediment Control Measures*
4. *Section 31 10 00: Clearing Site*

C. References:

1. New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction, 2007, and all amendments thereto (Standard Specifications):
 - a. Section 204: Borrow Excavation
 - b. Sections 301: Subbase
 - c. Subsection 301.05: Compaction
 - d. Subsection 901.03: Aggregate, Coarse
 - e. Subsection 901.03.01: Broken Stone
 - f. Subsection 901.03.02: Washed Gravel
 - g. Subsection 901.08: Riprap Stones
 - h. Subsection 901.10: Dense Graded Aggregate
 - i. Subsection 901.11: Soil Aggregates
 - j. Subsection 903.09: Controlled Low Strength Material (CLSM)
2. American Concrete Institute:
 - A. ACI-229R; Controlled Low Strength Material.
3. American Society for Testing and Materials (ASTM):
 - a. D-698: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
 - b. D-1556: Density and Unit Weight of Soil in Place by the Sand-Cone Method.

- c. D-1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- d. D-4254: Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
- e. D-2166: Unconfined Compressive Strength of Cohesive Soil.
- f. D-2922: Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).

1.02 DEFINITIONS

- A. Excavation: Removal and disposal of all material encountered when establishing required grade elevations, including pavements and other obstructions visible on the ground surface, and underground structures and utilities indicated to be demolished and removed.
- B. Unauthorized excavation: Removal of materials beyond specified subgrade elevations without approval of *ENGINEER*.

1.03 SUBMITTALS

- A. Comply with the provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.
- B. All materials shall be accompanied by a delivery ticket indicating the name and address of the supplier and the origin of the material.
- C. All materials shall be free of contaminants or hazardous materials and substances that may be harmful to human, animal, plant or aquatic life and meets any applicable NJDEP regulations regarding the material composition. Recycled materials shall be accompanied by a certification from the supplier that the material meets the above requirements.
- E. Test reports:
 - 1. One optimum moisture, maximum density curve for each type of soil encountered, including a complete test report as specified in ASTM D-1557.
 - 2. Field Density test reports.

3. Report of actual Unconfined Compressive Strength and/or results of bearing tests for each stratum encountered at footing subgrades. The report shall be prepared in accordance with ASTM D-2166.
 4. Test reports on all borrow material and select backfill material in accordance with the following standards:
 - a. Particle Size Analysis of Soils: ASTM D-422.
 - b. Liquid Limit, Plastic Limit and Plasticity Index of Soils: ASTM D-4318.
 5. Submit test reports as specified in the Specification Section entitled, "Testing Laboratory Services".
- E. Submit mix designs for Controlled Low Strength Material. Each mix design shall be submitted on portland cement concrete mix design forms utilized by the NJDOT giving the source of materials and test data.

1.04 QUALITY ASSURANCE

- A. Requirements of regulatory agencies:
1. All excavations shall be in compliance with Federal Occupational Safety and Health Act and rules and regulations of State of New Jersey Department of Labor and Workforce Development, "Construction Safety Act," N.J.S.A. 34:5-166, et seq.
 2. Comply with the requirements of the High Voltage Proximity Act; N.J.S.A. 34:6-47.1.
 3. Excavation work shall be in compliance with applicable requirements of other governing authorities having jurisdiction.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Transport materials from outside project limits in accordance with General Conditions, paragraph entitled, "Operations and Storage Areas."

1.06 PROJECT CONDITIONS

- A. Site information: Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that *OWNER* will not be responsible for interpretations or conclusions drawn there from by *CONTRACTOR*. Data are made available for the convenience of *CONTRACTOR*.
- B. Prior to performing any excavation work, contact New Jersey One Call at 1-800-272-1000 for a utility mark-out.
- C. Existing utilities:
 - 1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the Utility Owner immediately for directions. Cooperate with *OWNER* and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of Utility Owner.
 - 2. Do not interrupt existing utilities serving facilities occupied and used by *OWNER* or others, except when permitted in writing by *ENGINEER* and then only after acceptable temporary utility services have been provided.
- C. Weather conditions: Do not place, spread, roll or fill material during freezing, raining, or otherwise unfavorable weather conditions. Do not resume work until conditions are favorable as determined by the *ENGINEER*.

PART 2 - PRODUCTS

2.01 GENERAL

- A. General: All fill and backfill materials shall be subject to the approval of the *ENGINEER*.
- B. Notifications:
 - 1. For approval of borrow materials, notify the *ENGINEER* at least five (5) working days in advance of intention to import material, designate the proposed borrow area, and perform sampling and testing at *CONTRACTOR'S* expense, if directed by the *ENGINEER*, to prove the quality and suitability of the material.

2. For approval of on-site materials, notify the *ENGINEER* at least five (5) working days in advance of placing material and perform sampling and testing at the Contractor's expense to prove the quality and suitability of the material.
- C. All materials provided shall be free of contaminants or hazardous materials and substances that may be harmful to human, animal, plant or aquatic life and shall meet any applicable NJDEP regulations regarding the material composition.

2.02 MATERIALS

A. On-Site Fill and Backfill:

1. On-site material may be used for fill and backfill subject to the approval of the *ENGINEER*, and only in accordance with the following:
 - a. Topsoil: Topsoil excavated from on-site may be used to conduct topsoil construction providing that the excavated topsoil complies with the requirements described in *Section 32 92 19, Seeding*. The *OWNER* makes no representation that the topsoil on-site is suitable for reuse. The Contractor shall remove excess excavated topsoil from the site unless otherwise shown on the drawings.
 - b. On-site materials used for structural filling and backfilling shall be free from deleterious substances, stumps, brush, weeds, roots, sod, rubbish, garbage and matter that may decay, and shall conform to the requirements for Soil Aggregate I-13 of Subsection 901.11 of the Standard Specifications.
 - c. Other material excavated from the site may be used for general filling and backfilling that is not beneath or within ten feet (10') horizontally of any tank, structure, footing or foundation, under paved areas, behind retaining walls or in trenches, subject to the approval of the *ENGINEER*, and to the following requirements:
 - (1) Free from deleterious substances, stumps, brush, weeds, roots, sod, rubbish, garbage and matter that may decay.
 - (2) Free of large rocks or lumps that, in the opinion of the *ENGINEER*, may create voids or prevent proper compaction.

B. Borrow material:

1. General fill and Backfill (Non-Structural):

a. Free from deleterious substances, stumps, brush, weeds, roots, sod, rubbish, garbage and matter that may decay, and conforming to the requirements for Soil Aggregate I-13, of Subsection 901.11 of the Standard Specifications, except as modified by the supplemental requirements below:

(1) Containing no rocks or lumps over four inches in greatest dimension.

(2) Composed of soil aggregate, or soil aggregate and rock. The portion passing the four-inch sieve shall contain not more than twelve percent (12%) by weight of material passing the number 200 sieve. When composed of soil aggregate and rock, the proportion of soil aggregate shall not be less than that required to fill all the rock voids.

b. General fill material may be used for:

(1) Backfill of demolition work that is not beneath or within ten feet (10') horizontally of any tank, structure, footing or foundation or behind retaining walls.

(2) General filling and backfilling that is not beneath or within ten feet (10') horizontally of any tank, structure, footing or foundation or behind retaining walls. General fill may be used under exterior paved areas and in trenches, however, that are not within ten feet (10') horizontally of foundations.

2. Trench Backfill, Structural Fill and Backfill Material:

a. Shall conform to the requirements specified for on-site fill material except as modified by the supplemental requirements below:

b. Backfill material shall be Soil Aggregate designation I-13 unless otherwise designated on the Plans. Soil Aggregate backfill materials, when designated, shall conform to Subsection 901.11 of the Standard Specifications.

c. Backfill material shall be 15:1 or 20:1 sand/cement dry mix when designated on the Plans.

3. Controlled Low Strength Material (CLSM) (Flowable Fill):
 - a. CLSM material shall conform to Subsection 903.09 of the Standard Specifications as amended herein.
 - b. Use CLSM that consists of a mixture of cement, water, fine aggregate, and admixtures. Proportion the CLSM mixture to provide a backfill material that is self-compacting and capable of being excavated with hand tools at a later date.
 - c. Proportion the CLSM to produce a 28-day compressive strength of 50 to 150 pounds per square inch.
 - d. When rapid setting CLSM is required, use an accelerating admixture to produce a fast setting flowable mixture.
 - e. Ensure that the CLSM for backfilling of conduit and piping has a permeability of $1.7 \times 10^{-3} \pm 0.2 \times 10^{-3}$ centimeters per second when tested according to ASTM D 5084.
 - f. At least 45 days before the start of any CLSM placement, prepare trial batches of CLSM of the same materials and proportions proposed for use in the Contract. Submit each mix design on NJDOT approved concrete mix design forms, naming the sources of materials and test data.
 - g. The *ENGINEER* or his representative may be present at the time of verification batching to confirm that the proportions and materials batched conform to the proposed mix designs. Prepare at least six 6 x 12-inch compression test cylinders for each batch to be tested according to ASTM D 5971 for 28-day strengths except for fast setting mixes. Test fast-setting CLSM at the specified cure time. If fly ash is used in the CLSM, the *ENGINEER* will require an additional set of cylinders to ensure that the strength of the CLSM does not exceed 150 pounds per square inch in 90 days.
 - h. For acceptance testing, the *CONTRACTOR* shall take one (1) sample per day unless testing is waived when less than 20 cubic yards is placed in a day. If strength does not comply, the *ENGINEER* may require a new mix design for the CSLM.
4. Broken stone material:
 - a. Broken stone subbase material under slabs, foundations and structures shall conform to Subsection 901.03.01 of the Standard

Specifications and meeting the gradations specified in Table 901.03-1. Size shall be #57 unless otherwise shown on the Plans.

- b. Trench stabilization material for bedding shall conform to the above requirements. Size shall be #57 unless otherwise shown on the Plans.

5. Quarry Blend (Quarry Processed) (QP) stone Material:

- a. Quarry Blend stone subbase for bituminous and concrete pavements and other structures shall be Type I-5 conforming to the requirements for Soil Aggregate in Subsection 901.11 of the Standard Specifications.
- b. Quarry Blend stone for Stone Paving shall conform to the above requirements except that recycled concrete aggregate, blast furnace slag or Recycled Asphalt (RAP) shall not be used.
- c. Quarry Blend stone for in-kind restoration of stone driveways shall match existing in gradation and color.

6. Dense Graded Aggregate:

- a. Dense Graded Aggregate for bituminous and concrete pavements and other structures shall conform to the requirements in Subsection 901.10 of the Standard Specifications. "Recycled concrete aggregate, blast furnace slag or Reclaimed Asphalt Pavement (RAP) shall not be used".
- b. Dense Graded Aggregate for Stone Paving shall conform to the above requirements except that recycled concrete aggregate, blast furnace slag or Recycled Asphalt (RAP) shall not be used.
- c. Dense Graded Aggregate may also be produced by mixing reclaimed asphalt pavement (RAP) with approved virgin aggregate in accordance with Subsection 901.10.03 of the NJDOT Standard Specifications as amended and specified herein at the Contractor's option.
 - (1) Sampling and testing to verify compliance with the requirements of Subsection 901.10.03 shall be performed at the rate of five (5) samples per each days production.

- (2) Virgin Dense Graded Aggregate from an approved source shall be added when necessary to achieve gradation requirements.
- (3) Density control shall conform to Section 302 of the Standard Specifications.
- (4) Moisture density relationship (proctor) shall be determined for each new mix prior to conducting in-place density testing.
- (5) Dense Graded Aggregate produced from Reclaimed Asphalt Pavement (RAP) shall be constructed to twice the depth shown on the Drawings when Dense Graded Aggregate is shown at no additional cost to the OWNER.

7. Rip-Rap:

- a. Rip-rap stones shall consist of rock conforming to the requirements for ledge rock of Subsection 901.08 of the Standard Specifications.
- b. Rip-rap shall be composed of a well-graded mixture such that 50% of the mixture by weight shall be larger than the median size (d_{50}) shown on the Plans.
- c. The riprap shall be composed of a well-graded mixture such that 50% of the mixture by weight shall be larger than the d_{50} size as determined from the design procedure. A well-graded mixture as used herein is defined as a mixture composed primarily of the larger stone sizes, but with a sufficient mixture of other sizes to fill the progressively smaller voids between the stones. The diameter of the largest stone size in such a mixture shall be 1.5 times the d_{50} size. The d_{75} should be 1.25 times the d_{50} and the d_{15} should be 0.5 times the d_{50} size.

8. K5 Sand:

- a. K5 Sand: K5 sand shall be a well graded sand with less than 15% fines and a permeability greater than 20" per hour as determined in accordance with NJAC 7:9A-6.2. Certified test results showing gradation and permeability shall be submitted with a two (2) pound sample of the material proposed for use.

9. Geotextiles:
- a. Provide geotextile rolls with protective wrapping and, before placement, store rolls in a manner that protects against moisture and minimizes exposure to ultraviolet radiation. For applications that are above ground or exposed to ultraviolet radiation, provide geotextiles that are inert to commonly encountered chemicals and are stabilized against ultraviolet light degradation. Label each roll to provide product identification.
 - b. Use geotextiles conforming to the requirements in Table 919.01-1 for the intended use.

Table 919.01-1 Requirements for Geotextiles		
Category	Test Method	Class
Subsurface Drainage Geotextile	AASHTO M 288	Class 2
Stabilization Geotextile	AASHTO M 288	Class 1
Temporary Silt Fence ⁽¹⁾	AASHTO M 288	-
Erosion Control Geotextile ^{(2) (3)}	AASHTO M 288	Class 1 or 2 ⁽²⁾
Paving Fabric	AASHTO M 288	-

(1) Use the same geotextile requirements for both silt fence and heavy-duty silt fence. Reinforce heavy-duty silt fence with wire mesh as shown on the Plans.

(2) For inlet filter, use Class 2 for woven filament geotextiles or Class 1 for all other types of geotextiles.

(3) For inlet filter, Type 2, in addition to the AASHTO M 288 requirements, ensure that the geotextile's burst strength is at least 650 pounds per square inch when tested according to ASTM D3786.

- c. For geotextiles that are being permanently incorporated into the Contract, submit a certification of compliance.
- d. Orange Delineation Geotextile shall conform to AASHTO M288, Class 2 and be Mirafi Orange Delineation Nonwoven Geotextile, 160N/O, or equivalent.

2.03 OTHER MATERIALS

- A. All other materials, not specifically described for a complete and proper installation, shall be as selected by the *CONTRACTOR* and approved by the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which excavating, filling and grading are to be performed and notify the *ENGINEER*, in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in an acceptable manner.

3.02 PREPARATION

- A. Prior to commencement of work, establish location and extent of all utilities in the work areas. Maintain, protect as required existing utilities that pass through the work area.
- B. Prior to excavation in pavement areas, cut existing pavement vertically with sharp tool on a straight line to the limits of excavation shown on Plans or as directed by the *ENGINEER*. Maintain cut straight and neat, or recut and dress as directed by the *ENGINEER*.
- C. Protection of persons and property:
 - 1. Barricade open excavations occurring as part of this work and post with warning lights as required to protect persons on the site. Operate warning lights as recommended by authorities having jurisdiction.
 - 2. Protect trees, shrubs, lawns and other features remaining as part of final landscaping.
 - 3. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
 - 4. Refer to paragraphs of General Conditions regarding protection of vegetation and structures.
 - 5. In the event of damage, immediately make all repairs and replacements to the approval of the *ENGINEER* at no cost to the *OWNER*.

3.03 CONSTRUCTION

- A. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.

- B. Use of explosives: The use of explosives is not permitted unless approved by the *ENGINEER*.
- C. Dust control:
1. Use all means necessary to control dust on and near the work if such dust is caused by the *CONTRACTOR'S* operations during performance of the work or if resulting from the conditions in which the *CONTRACTOR* leaves the site.
 2. Thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors and concurrent performance of other work on the site.
- D. Excavation:
1. Unauthorized excavation: Unauthorized excavation, including remedial work directed by the *ENGINEER*, shall be at the *CONTRACTOR'S* expense. Under footings, foundation bases, retaining walls, and other structures, fill unauthorized excavation by removing all loosened material and extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering the required top elevation. Lean concrete fill may be used to bring subgrade elevations to proper positions when acceptable to the *ENGINEER*. Under pipes, fill unauthorized excavation by removing all loosened material and providing broken stone material as required to attain a firm and unyielding subgrade and/or foundation and to attain required grade elevations to the approval of the *ENGINEER*.
 2. Additional excavation:
 - a. When excavation has reached required subgrade elevations, notify the *ENGINEER* who will make an inspection of conditions.
 - b. If unsuitable bearing materials are encountered at the required subgrade elevations, carry excavations deeper and replace the excavated material as directed by the *ENGINEER*.
 - c. Removal of unsuitable material and its replacement as directed will be paid on the basis of contract conditions relative to changes in work if payment has not been provided for in the *PROPOSAL*.

3. Stability of excavations:
 - a. Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space.
 - b. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

4. Shoring and bracing:
 - a. Provide materials for shoring and bracing, such as sheet piling, uprights, stringers and cross-braces, in good serviceable condition.
 - b. Establish requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction.
 - c. Maintain shoring and bracing in excavations regardless of time period excavations will be open.
 - d. Brace, sheet, and support trench walls in such a manner that they will be safe and that the ground alongside the excavation will not slide or settle, and that all existing improvements of every kind, whether on public or private property, will be fully protected from damage.
 - e. In the event of damage to such improvements, immediately make all repairs and replacements necessary to the approval of the *ENGINEER* and at no additional cost to the *OWNER*.
 - f. Arrange bracing, sheeting and shoring so as to not place stress on any portion of the completed work until the general construction thereof has proceeded far enough to provide sufficient strength.
 - g. Exercise care in the drawing and removal of sheeting, shoring, bracing and timbering to prevent collapse and caving of the excavation faces being supported.

5. Dewatering:
 - a. Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area.

- b. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
 - c. Convey water removed from excavations and rainwater to collecting or run-off areas. Establish and maintain temporary drainage ditches and other diversions outside excavation limits for each structure. Do not use trench excavations as temporary drainage ditches.
6. Material storage:
- a. Stockpile satisfactory excavated materials where directed until required for use as backfill or fill. Place, grade and shape stockpiles for proper drainage.
 - b. Only environmentally suitable stockpile sites may be used for the purposes of staging or storing materials, equipment and suitable trench backfill material. Environmentally suitable sites must be level, and devoid of mature stands of natural vegetation. Drainage facilities and features, wetlands, vernal habitats and stream corridors are not environmentally suitable sites. [NJAC 7:22-10.11(1)1]
 - c. The boundary of the stockpile area shall be clearly marked by hay bales, silt fencing or another appropriate method. Where fill is to be stored in excess of 10 days, a suitable means of protecting excavated material from wind and water erosion shall be employed. Erosion control methods may include one or more of the following: mulching, sprinkling, silt fencing, hay baling and stone covering. [NJAC 7:22-10.11(1)2]
 - d. Locate and retain soil materials away from edge of excavations.
 - e. Dispose of excess soil material and waste materials as herein specified. Excavated material unsuitable for backfilling shall be kept separate from other materials excavated, and disposed of. Materials suitable for backfilling shall not be disposed of until completion of filling or backfilling operations.

7. Excavation for structures:
 - a. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 feet, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction and for inspection.
 - b. In excavating for footings and foundations, take care not to disturb bottom excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive concrete.
8. Excavation for pavements: Cut surface under pavements to comply with cross-sections, elevations and grades as shown.
9. Excavation for trenches:
 - a. Dig trenches to the uniform width required for the particular item to be installed, sufficiently wide to provide ample working room.
 - (1) Maximum trench width to a point one foot (1') above the outside top of pipe shall be the pipe inner diameter plus eighteen inches (18") for pipe less than or equal to eighteen inches (18") in inner diameter. For pipe greater than eighteen inches (18") in inner diameter, the maximum initial trench width shall be two (2) times the pipe inner diameter.
 - (2) Maximum trench width at ground surface where limited, shall be as shown on Plans.
 - b. Excavate trenches to the depth indicated or required. Carry the depth of trenches for piping to establish the indicated flow lines and invert elevations. Beyond the building perimeter, keep bottoms of trenches for which elevations are not given sufficiently below finish grade to avoid freeze-ups.
 - c. Trenches for pipes shall not be opened more than the number of linear feet of pipe that can be placed and backfilled in one (1) day.
 - d. Grub roots and stumps within six inches (6") of outside surface of pipe bottom and sides to minimum depth of six inches (6") below grade. Backfill trenches with concrete where trench excavations pass within eighteen inches (18") of column or wall footings and

which are carried below the bottom of such footings, or which pass under wall footings. Place concrete to the level of the bottom of adjacent footing.

e. Pipe bedding shall be as shown on Plans.

10. Excavation for detention/retention basins:

a. Excavate basin using a backhoe operating from existing grade. No rubber-tired equipment shall be allowed in the basin. Only low ground pressure tracked vehicles shall be allowed in the basin.

b. All necessary precautions shall be taken to prevent densification of the subgrade material.

11. Cold weather protection: Protect excavation bottoms against freezing when atmospheric temperature is less than thirty-five degrees (35°).

E. Backfill, fill and compaction:

1. General:

a. Place acceptable material in layers to required subgrade elevations.

b. Fills: Use material obtained from on-site excavation, except use borrow material when specified and/or shown on the Plans or as directed by the *ENGINEER*.

c. Backfilling: Use material obtained from on-site excavation, except use select backfill when specified and/or shown where indicated on Plans or as directed by the *ENGINEER*. Backfill above top of pipe, with material free from stones, rock fragments, dirt clogs or frozen material greater than two inches (2") in largest dimension.

d. Do not provide borrow material until all acceptable excavated materials on the site have been utilized in the work.

e. Place the various types of materials in the areas as designated on the Plans, or as directed by the *ENGINEER*.

2. Backfill excavation as promptly as work permits, but not until completion of the following:

- a. Acceptance by *ENGINEER* of construction below finish grade including, where applicable, damp proofing, waterproofing and perimeter insulation.
 - b. Inspection, testing, approval and recording locations of underground utilities.
 - c. Removal of concrete formwork.
 - d. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
 - e. Removal of trash and debris.
 - f. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
3. Backfilling prior to approvals:
- a. Should any of the work be so enclosed or covered up before it has been approved, uncover all such work at no additional cost to the *OWNER*.
 - b. After the work has been completely tested, inspected and approved, make all repairs and replacements necessary to restore the work to the condition in which it was found at the time of uncovering, all at no additional cost to the *OWNER*.
4. Ground surface preparation prior to filling:
- a. Remove vegetation, debris, unsatisfactory soil materials, obstructions and deleterious materials from existing ground surface to a depth of not less than four inches (4") and not more than six inches (6") prior to placement of fills. Plow, strip or break-up sloped surfaces steeper than one (1) vertical to four (4) horizontal to a depth of not less than six inches (6") so that fill material will bond with existing surface.
 - b. When existing ground surface has a density less than that specified under "Compaction," for the particular area classification, break up the ground surface, pulverize, moisture-condition to the optimum moisture content, and compact to required depth and percentage of maximum density.

5. Placement and compaction:
- a. Place backfill materials in layers not more than six inches (6") in loose depth.
 - b. Control soil compaction during construction providing minimum percentage of density specified for each area classification listed below.
 - c. Building and pavement areas are defined, for the purpose of this Paragraph, as extending a minimum of five feet (5') beyond the building and/or pavement.
 - d. Compact soil to not less than the following percentages of maximum dry density for soils which exhibit a well-defined moisture density relationship determined in accordance with ASTM D-1557; and not less than the following percentages of relative density determined in accordance with ASTM D-4254, for soils which will not exhibit a well-defined moisture-density relationship.
 - (1) Structures: Compact top twelve inches (12") of subgrade and each layer of backfill or fill material at 95 percent (95%) maximum dry density or 90 percent (90%) relative dry density.
 - (2) Building Areas: Compact top twelve inches (12") of subgrade and each layer of backfill or fill material at 95 percent (95%) maximum dry density or 90 percent (90%) relative dry density.
 - (3) Lawn or Unpaved Areas: Compact top six inches (6") of subgrade and each layer of backfill or fill material at 90 percent (90%) maximum dry density.
 - (4) Walkways: Compact top six inches (6") of subgrade and each layer of backfill or fill material at 95 percent (95%) maximum dry density or 90 percent (90%) relative dry density.
 - (5) Pavement Areas: Compact top twelve inches (12") of subgrade and each layer of backfill or fill material at 95 percent (95%) maximum dry density or 90 percent (90%) relative dry density.
 - (6) Subbase Materials: Compact each layer of subbase material to 95 percent (95%) of maximum dry density.
 - (7) Trench Stabilization Materials: Compact each layer of material to 95 percent (95%) of maximum dry density.

- e. Moisture control:
 - (1) Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.
 - (2) Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
 - (3) Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by disking, harrowing or pulverizing until moisture content is reduced to a satisfactory value.
- f. Puddling or jetting will not be permitted.
- g. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice, or other unsuitable materials.
- h. Place backfill and fill materials evenly adjacent to structures, to required elevations. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around structure to approximately same elevation in each lift.
- i. Compact backfill to height of two feet (2') above top of pipe using approved flat-faced mechanical tampers. Compact backfill more than two feet (2') above top of pipe using approved vibratory mechanical tampers.

F. Grading:

- 1. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

2. Grading outside building lines:

Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes, and as follows:

- a. Lawn or unpaved areas: Finish area to receive topsoil to within not more than 0.10 feet above or below the required subgrade elevations.
 - b. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10 feet above or below the required subgrade elevation.
 - c. Pavement: Shape surface of areas under pavement line, grade and cross-section, with finish surface not more than ½ inch above or below the required subgrade elevation.
3. Grading surface of materials under building slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of ½ inch when tested with a ten-foot (10') straightedge.
 4. Compaction: After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.
 5. Treatment after grading:
 - a. After grading is completed and the *ENGINEER* has finished his inspection, permit no further excavating, filling or grading except with the approval of and inspection of the *ENGINEER*.
 - b. Use all means necessary to prevent erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.
 6. Subgrade preparation: All subgrade preparation shall be performed in accordance with the applicable Sections of the Standard Specifications except as may be modified by this Specification Section.
- G. Controlled Low Strength Material:
1. Combining other backfill materials in the same trench as CLSM shall not be permitted.
 2. Mixing and placement of CLSM shall begin only when the ambient temperature is at least 30°F. During placement, the CLSM mixture shall have a temperature of at least 41°F and shall not be placed on frozen ground.

3. The CLSM mixture shall be discharged directly from the truck into the trench to be filled with care taken to prevent the pipe from becoming displaced.
4. Place CLSM according to the limitations specified in *Section 03 30 00, Concrete*. Place CLSM across the area to minimize rehandling. Protect CLSM as specified in *Section 03 30 00, Concrete*.
5. CLSM shall not be used to replace pavement, base courses or drainage layers that form the structure of the roadway.

H. Quarry blend stone subbase course:

1. General:
 - a. Subbase Course consists of placing quarry blend stone subbase material in layers of specified thickness over subgrade surface to support pavements and structures, as shown on Plans.
 - b. Provide subbase course in accordance with Section 301 of the Standard Specifications, except as otherwise modified by this Specification Section.
2. Grade control: During construction, maintain lines and grades including crown and cross-slope of subbase course.
3. Placing:
 - a. Prior to placing subbase course under bituminous concrete or other non-portland cement concrete surfaces, apply an herbicide to the subgrade material. The type of herbicide and the method of application shall be approved by the *ENGINEER* prior to beginning this work.
 - b. Place subbase course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase material during placement operations.
 - c. When a compacted subbase course is shown to be eight inches (8") or less, place material in a single layer. When shown to be more than eight inches (8") thick, place material in equal layers, except no single layer shall be more than eight inches (8") in thickness when compacted.

- d. Spread, shape and compact all subbase course material deposited on the subgrade during the same day.
- I. Broken (crushed) stone subbase course:
1. General: Broken Stone Subbase Course consists of placing material in layers of specified thickness, over subgrade surface to support structures as shown on the Plans.
 2. Placing: Place Broken Stone Subbase Course as specified for Quarry Blend Stone Subbase Course.
- J. Rip-Rap:
1. Excavate, shape and compact the underlying material to produce a firm, even surface.
 2. Place geotextile over the entire area where riprap is to be placed and extend it at least 12 inches on each side. Bury the geotextile that is extended outside of the riprap area a minimum of 6 inches into the soil. When joining sections of geotextile, overlap the geotextile by a minimum of 18 inches in the direction of flow.
 3. Place a 6-inch layer of coarse aggregate without damaging or dislodging the geotextile. Firmly bed the riprap stones into the coarse aggregate without damaging or displacing the geotextile.
 4. Use larger riprap stones in the lower courses. Fill spaces between the riprap stones with smaller stones of the same type and quality. Firmly ram the smaller stones into place.
 5. Provide an even, finished surface for the slope or channel protection.

3.04 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Remove waste materials, including excess excavated material, trash and debris, and dispose of it off the Owner's property.
- B. Excavated material unsuitable for backfill as set forth in N.J.A.C. 7:14-2.13, considered to be solid waste pursuant to N.J.A.C. 7:26-1.6 and meeting the requirements for I.D.27 shall be removed from the construction site and disposed of at a sanitary landfill approved and licensed by NJDEP. [NJAC 7:22-10.11(e)1]

3.05 FIELD QUALITY CONTROL

- A. Quality control testing during construction: Allow testing service to inspect and approve subgrades and fill layers before further construction work is performed.
1. Perform field density tests in accordance with ASTM D-1556 (Sand Cone Method), or ASTM D-2922 (Nuclear Method).
 2. Footing subgrades: For each strata of soil on which footings will be placed, conduct at least one (1) test to verify required design bearing capacities. Test shall be performed by a qualified soils Engineer licensed in the State of New Jersey. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to *ENGINEER*.
 3. Number of field density tests shall be provided in accordance with the following minimum test schedule:
 - a. Minimum Compaction Testing Frequency

Location	Frequency
Buildings and structures	1 test group ^a for every 5,000 square feet
Road	1 test group ^a for every 300 linear feet of road
Parking Lots	1 test group ^a for every 10,000 square feet
Unpaved areas	1 test group ^a for every 20,000 square feet
Pipe Trench	1 test group for every 300 linear feet

^a one test group consists of compaction tests on each layer of fill and backfill material.
 - b. One test whenever there is a definite suspicion of a change in the quality of moisture control or effectiveness of compaction.
 4. Take all tests at locations as directed by the *ENGINEER*.
- B. If in the opinion of *ENGINEER* based on testing service reports, subgrade or fills that have been placed are below specified density, provide additional compaction and testing as directed by the *ENGINEER* at no expense to the *OWNER*. This shall include compaction and testing at areas initially tested and at other locations as directed.
- C. Additional requirements for testing are described in the Specification Section entitled, "Testing Laboratory Services."

3.06 PROTECTION

- A. Protection of graded areas:
 - 1. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
 - 2. Repair and re-establish grades in settled, eroded and rutted areas to specified tolerances.
- B. Reconditioning compacted areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape and compact to required density prior to further construction.

PART 4 - PAYMENT

4.01 EXCAVATION, FILLING AND GRADING

- A. No separate measurement or payment shall be made for this item. All work including earthwork for piping and structures shall be paid for under the prices submitted for the various related items of work listed in the *PROPOSAL*. The costs for the work of this section shall include line-cutting existing pavements whenever encountered; stripping and storage of topsoil; excavation of all materials encountered of whatever nature; dewatering; shoring and bracing; stripping of surfaces; placing and compacting excess materials in fill areas; disposal of unsuitable or surplus materials; trench excavation; backfilling; site grading including shaping and dressing of slopes and other surfaces; compaction; subgrade and subbase preparation; testing; and all other incidental or necessary work.

4.02 BORROW FILL MATERIAL

- A. Measurement: The quantity for which payment will be made will be for the volume of material provided, measured in place, as specified and shown on the Plans, or as directed by the *ENGINEER*.
- B. Payment: Will be made on a cubic yard basis under the item *BORROW FILL MATERIAL* in the *PROPOSAL*, which price shall include cost of excavating and hauling; placing and compacting the material and forming and shaping the fill areas and slopes; and all other incidental or necessary work.

4.03 QUARRY BLEND STONE SUBBASE MATERIAL FOR PAVEMENTS AND OTHER STRUCTURES

- A. Measurement: The quantity for which payment will be made will be for the area of material provided, measured in place, as specified and shown on the Plans, or as directed by the *ENGINEER*.
- B. Payment: Will be made for the quantity as above determined, measured in square yards, at the unit price bid for the item *QUARRY PROCESSED STONE SUBBASE MATERIAL, TYPE I-5*, in the *PROPOSAL*, which price shall include subgrade preparation, grading, compacting and all other incidental or necessary work.

4.04 DENSE GRADED AGGREGATE BASE COURSE

- A. Measurement: The quantity for which payment will be made will be for the area of material provided, measured in place, as specified and shown on the Plans, or as directed by the *ENGINEER*.
- B. Payment: Will be made for the quantity as above determined, measured in square yards, at the unit price bid for the item *DENSE GRADED AGGREGATE BASE COURSE, ____" THK*, in the *PROPOSAL*, which price shall include subgrade preparation, grading, compacting and all other incidental or necessary work.

4.05 BROKEN STONE TRENCH STABILIZATION and SELECT BACKFILL

- A. Measurement: The quantity for which payment will be made will be for the volume of material actually provided, measured in place, as specified and shown on the Plans, or as directed by the *ENGINEER*.
- B. Payment: Will be made for the quantity as above determined, measured in cubic yards, at the price per cubic yard bid for each of the various items of *TRENCH STABILIZATION and SELECT BACKFILL* in the *PROPOSAL*, which prices shall include excavation and disposal of unsuitable or excess material, subgrade preparation, providing materials, grading, compacting and all other incidental or necessary work.

4.06 GEOTEXTILES

- A. Measurement: The quantity for which payment will be made will be for the area of material provided, measured in place, as specified and shown on the Plans, or as directed by the *ENGINEER*.

- B. Payment: Will be made for the quantity as above determined, measured in square yards, at the unit price bid for the various item *GEOTEXTILES*, in the *PROPOSAL*, which price shall include subgrade preparation, geotextile, placement and all other incidental or necessary work.

4.07 ORANGE DELINEATION GEOTEXTILES

- A. Measurement: The quantity for which payment will be made will be for the area of material provided, measured in place, as specified and shown on the Plans, or as directed by the *ENGINEER*.
- B. Payment: Will be made for the quantity as above determined, measured in square yards, at the unit price bid for the various item *ORANGE DELINEATION GEOTEXTILE*, in the *PROPOSAL*, which price shall include subgrade preparation, geotextile, placement and all other incidental or necessary work.

4.08 SUBBASE REPAIR

- A. Measurement: The quantity for which payment will be made will be for the area of subbase actually repaired, measured in place, as specified and shown on the Plans, if and when directed by the *ENGINEER*.
- B. Payment: Will be made for the quantity as above determined, measured in square yards, at the unit price bid for the various items of *SUBBASE REPAIR*, in the *PROPOSAL*, which price shall include excavation and disposal of unsuitable material, subgrade preparation, backfill material as shown, grading, compacting and all other incidental or necessary work.

4.09 CONTROLLED LOW STRENGTH MATERIAL

- A. Measurement: The quantity for which payment will be made will be for the volume of material provided, measured in place, within the limits shown on the Plans.
- B. Payment: Will be made for the quantity as above determined, measured in cubic yards, at the price per cubic yard bid for each of the various items of *CONTROLLED LOW STRENGTH MATERIAL*, in the *PROPOSAL*, which price shall include providing and placing material; stockpiling excavated material; disposal of excavated material when no longer needed, subgrade preparation, grading, and all other incidental or necessary work.

4.10 DRIVEWAY RESTORATION IN KIND

- A. Measurement: The quantity for which payment will be made will be for the area of driveway actually restored, measured in place, as specified and shown on the Plans, or as directed by the *ENGINEER*.
- B. Payment: Will be made for the quantity as above determined, measured in square yards, at the unit price bid for the item *DRIVEWAY RESTORATION IN KIND*, in the *PROPOSAL*, which price shall include subgrade preparation, grading, providing stone to match existing, compacting and all other incidental or necessary work

4.11 RIP-RAP STONE SLOPE PROTECTION

- A. Quantity: The quantity for which payment will be made will be for the area of Rip-Rap installed as specified and shown on the Plans, or as directed by the *ENGINEER*.
- B. Payment: Payment will be made for the quantity as above determined, measured in square yards, at the unit price bid in the *PROPOSAL* for the item *RIP-RAP STONE SLOPE PROTECTION*, _____" *thk*, $D_{50} = \underline{\hspace{1cm}}$ which price shall include excavation and disposal of excavated materials; grading and preparation of the subgrade; geotextile stabilization fabric; coarse aggregate, Rip-Rap stone; grading; and all else necessary or required, complete as specified and shown on the Plans.

4.12 RECONSTRUCT STONE SWALE

- A. Quantity: The quantity for which payment will be made will be for area of swale actually constructed, measured in the field, in locations shown or as directed by *ENGINEER*.
- B. Payment: Will be for the quantity as above determined, measured in square yards, at unit price per square yard bid in Proposal for the item *RECONSTRUCT STONE SWALE*, _____' *WIDE*, which price shall include cost of excavation, grading and filling; subgrade preparation; geotextile fabric; stone swale construction; restorations and all else necessary or required, complete as specified and shown on the Plans.

*****END OF SECTION*****

SECTION 32 31 50
(02849)
BOLLARDS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work Included:

1. Concrete filled pipe bollards.

B. Related work:

1. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this work.
2. *Section 03 30 00: Concrete*

1.02 REFERENCES

A. New Jersey State Department of Transportation Standard Specifications for Road and Bridge Construction (1989):

1. Reflectors: Subsection 916.14

B. New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction, 2007, and all amendments thereto (Standard Specifications):

1. Subsection 903.03: Concrete.

1.03 SUBMITTALS

A. Comply with provisions of *Section 01 33 23, Shop Drawings, Product Data and Samples*.

B. Manufacturer's product data:

1. Complete materials list of all materials proposed to be furnished and installed under this section.

2. *Specifications* and other data required that demonstrate compliance with the specified requirements.
- C. Manufacturer's recommended installation procedures.

1.04 QUALITY ASSURANCE

- A. Qualifications of manufacturer:
1. Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the *ENGINEER*.
- B. Qualifications of workmen:
1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.
 2. Provide adequate numbers of workmen skilled in the necessary crafts and properly informed of the methods and materials to be used.
 3. In acceptance or rejection of the work of this section, the *ENGINEER* will make no allowance for lack of skill on the part of workmen.

1.05 WARRANTY AND WARRANTY REPAIRS

- A. Warranties shall be provided as specified in *Section 01 78 36, Guarantees*. A copy of the manufacturer's warranty shall accompany the shop drawing submittal.
- B. The *CONTRACTOR* and/or equipment manufacturer shall be responsible for all costs of warranty repair work including removal, shipping, reinstallation and re-start-up during the maintenance period.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products: Whenever materials or equipment are described using a certain brand, make, supplier, manufacturer or by specification, such naming shall be regarded

as a standard and be intended to convey function, design features, general style, type, materials of construction, character and quality of material or equipment, serviceability and other described essential characteristics.

- B. Other materials may be considered by the *ENGINEER* in accordance with the provisions of *Section 01 25 13, Substitutions*.

2.02 MATERIALS

- A. Concrete filled pipe bollards:

1. Pipe shall be 6" O.D. schedule 40, galvanized steel pipe.
2. Concrete shall be minimum 3000 psi at 28 days and completely fill pipe.

- B. Reflectors: Reflector units shall be Type A or B, prismatic center mount conforming to subsection 916.16 of the NJDOT Standard Specifications.

- C. Coatings:

1. Concrete filled pipe bollards:

- a. Surface preparation: SSPC-SP2, Hand-tool.
- b. Sherwin-Williams:
1 coat "Kem Bond HS Universal Primer" (2-5 mils DFT)
2 coats "ProMar 200 Exterior Latex Semi-Gloss Enamel" (1.5-1.8 mils DFT/ coat)
- c. M.A.B.:
1 coat "Rust O-Lastic Anti-Corrosive Primer" (1.8-2.2 mils DFT)
2 coats "Rich Lux Semi-Gloss Latex Enamel" (1.2-1.6 mils DFT/coat)
- d. Carboline
1 coat "Carbocrylic 3358" (2-3 mils DFT)
1 coat "Carbocrylic 3359" (2-3 mils DFT)
- e. Or equivalent.

2.03 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and as selected by the *CONTRACTOR* subject to the approval of the *ENGINEER*.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that work may be completed in strict accordance with the design.
- C. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION - PIPE BOLLARDS

- A. Pipe bollards shall be cut so that the depth-of-bury equals the height above ground.
- B. Pipe bollards shall be installed as shown on the Plans.
- C. Pipe bollards to receive sleeves shall be prime painted before installation. Pipe bollards not receiving sleeves shall be given a prime coat and two (2) finish coats of paint as specified herein; color as selected by the *ENGINEER*.

3.03 CLEANING

- A. Clean exposed surface of all grease, dirt and other foreign materials.
- B. Touch up all marred or abraded surfaces in accordance with manufacturer's directions.

PART 4 – PAYMENT

4.01 BOLLARDS

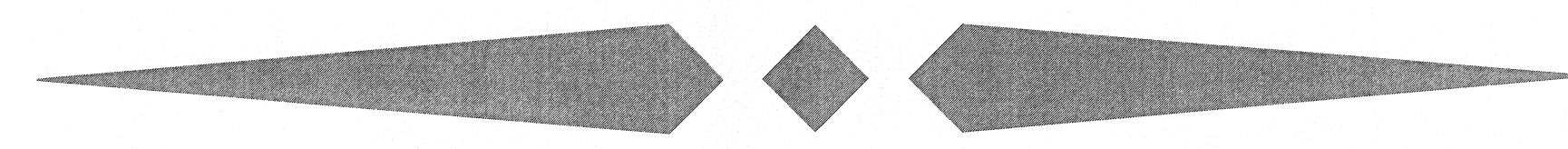
- A. No separate payment shall be made for this item. Include all costs for *BOLLARDS AND REFLECTOR UNITS* in the prices bid for the various related items of work as designated in the Proposal.

4.02 CONCRETE FILLED PIPE BOLLARDS

- A. Quantity: The quantity for which payment will be made will be for the number of bollards actually constructed, measured in the field, in locations as shown or as directed by the *ENGINEER*.
- B. Payment: Payment will be made for the quantity as above determined, measured in units, at the unit price bid in the *PROPOSAL* for the various items of *CONCRETE FILLED PIPE BOLLARDS*, which price shall include cost of saw cutting existing pavement; excavation and grading; providing bollard; reflectors; concrete backfill; painting; restorations; and all else necessary or required, complete as specified and shown on the Plans.

****END OF SECTION****

DPW BUILDING EMERGENCY GENERATOR REPLACEMENT



UNION COUNTY SCOTCH PLAINS, UNION COUNTY, NEW JERSEY

UNION COUNTY ENGINEERING PROJECT 2013-028

CONTRACT NO. BA# 20-2018

MARCH 2018

**UNION COUNTY OFFICIALS
BOARD OF CHOSEN FREEHOLDERS**

SERGIO GRANADOS
BETTE JANE KOWALSKI
BRUCE BERGEN
LINDA CARTER
ANGEL G. ESTRADA
ANGELA R. GARRETSON
CHRISTOPHER HUDAK
MOHAMED S. JALLOH
ALEXANDER MIRABELLA

CHAIRMAN
VICE CHAIRMAN
FREEHOLDER
FREEHOLDER
FREEHOLDER
FREEHOLDER
FREEHOLDER
FREEHOLDER

CLERK OF THE BOARD

JAMES E. PELLETIERE, RMC

COUNTY MANAGER

EDWARD T. OATMAN

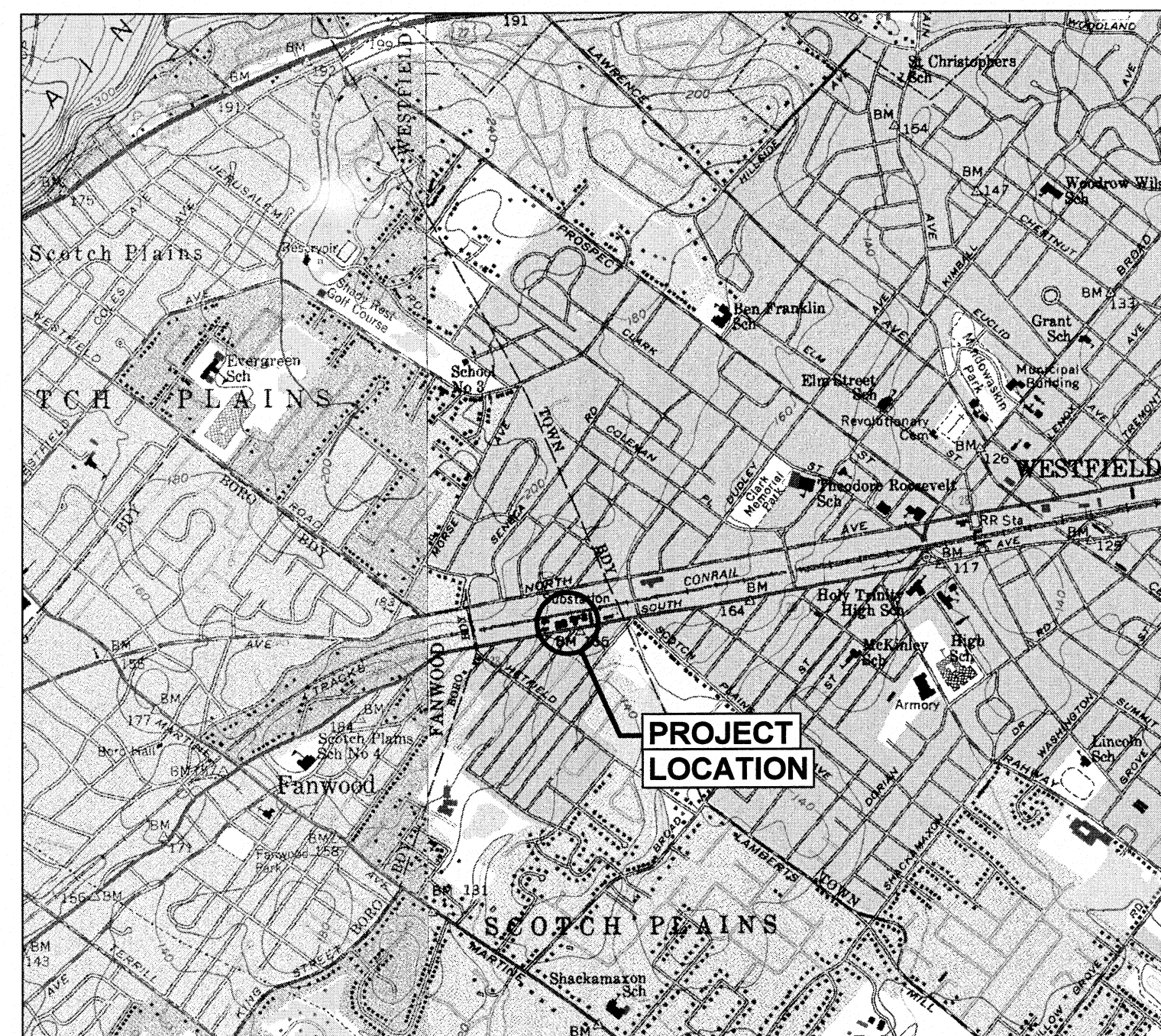
**DEPARTMENT OF ENGINEERING, PUBLIC WORKS AND
FACILITIES MANAGEMENT**

JOSEPH A. GRAZIANO, SR.

CPWM DIRECTOR

**COUNTY ENGINEER
DIVISION OF ENGINEERING**

THOMAS O. MINEO, P.E.

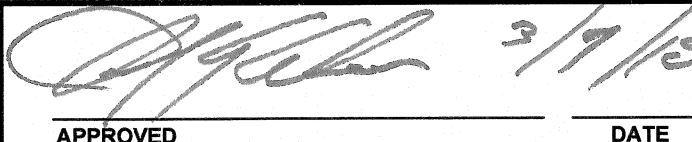
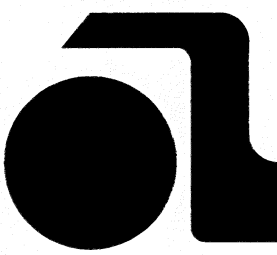


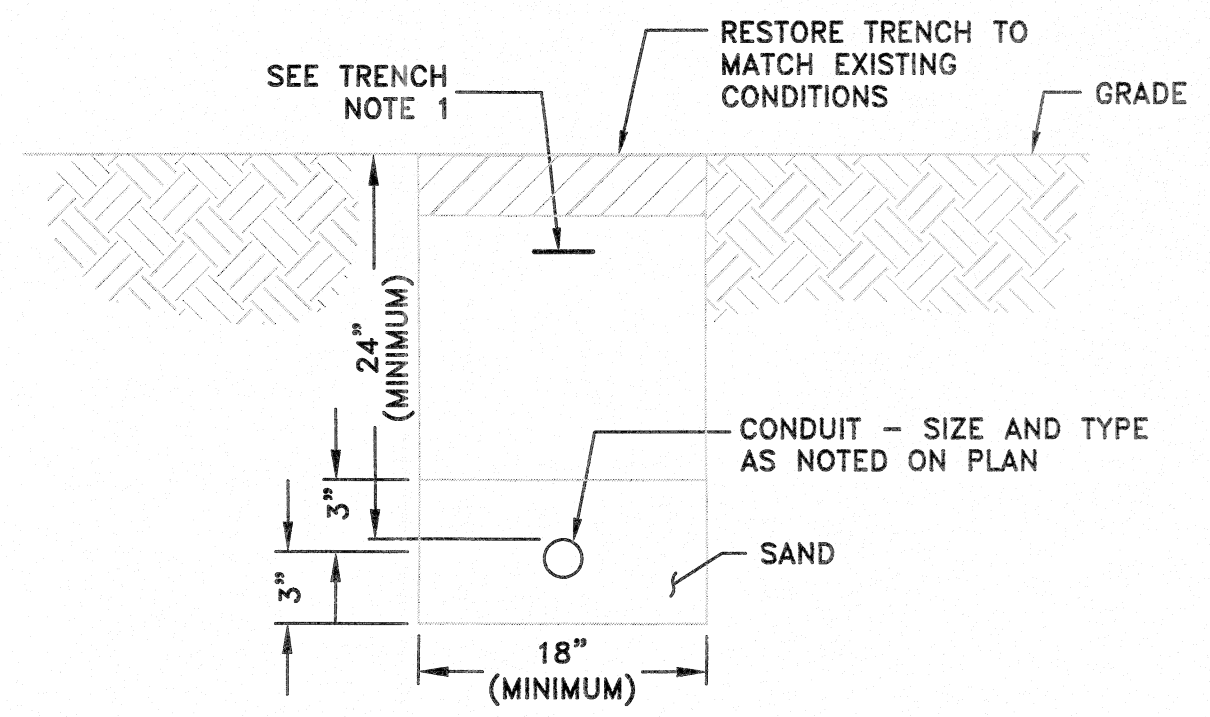
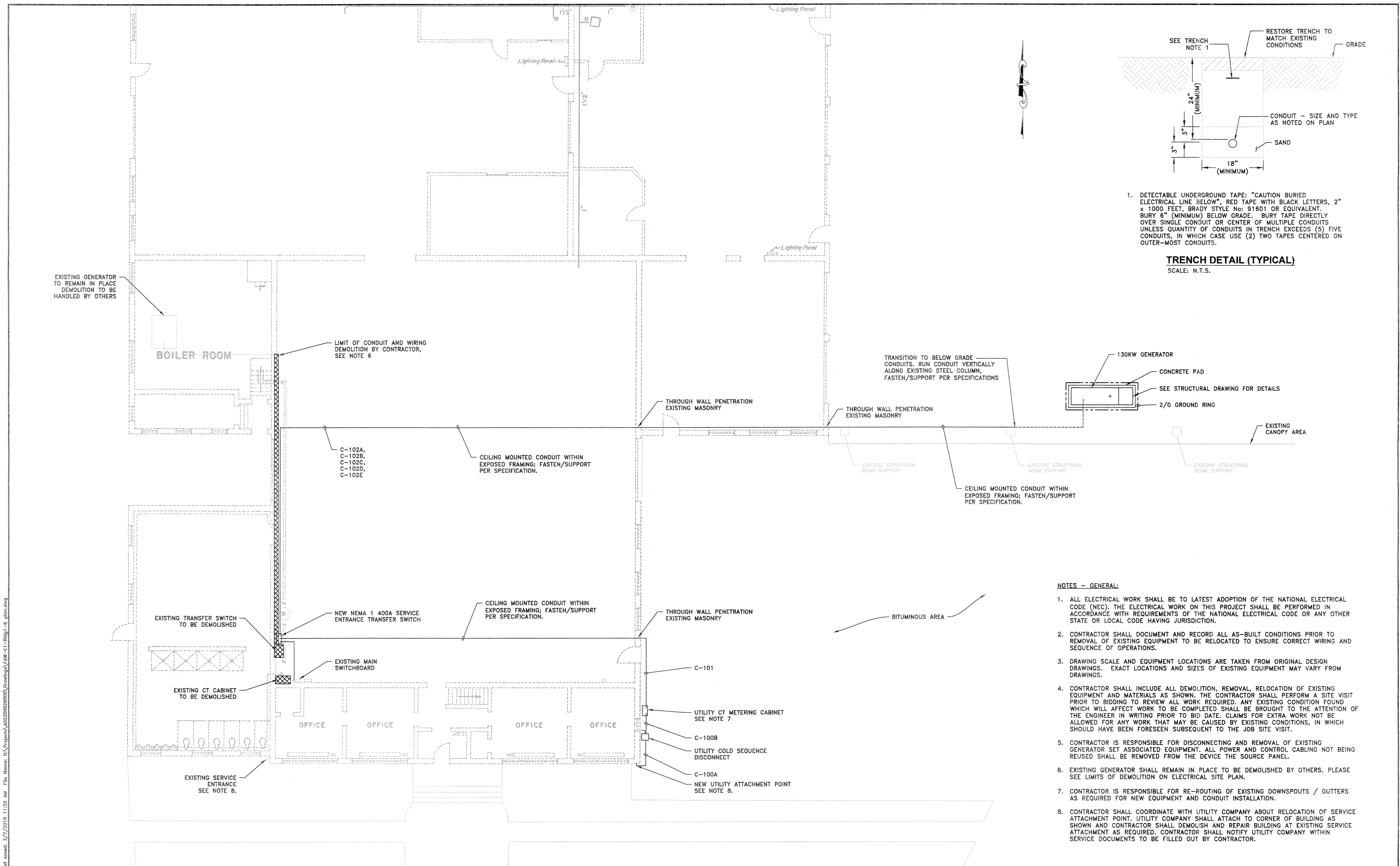
LOCATION MAP
SCALE: 1" = 2000'

INDEX OF DRAWINGS

- G1 TITLE SHEET
- E1 ELECTRICAL SITE PLAN
- E2 BLOCK DIAGRAMS AND SCHEDULES
- S1 STRUCTURAL DETAILS

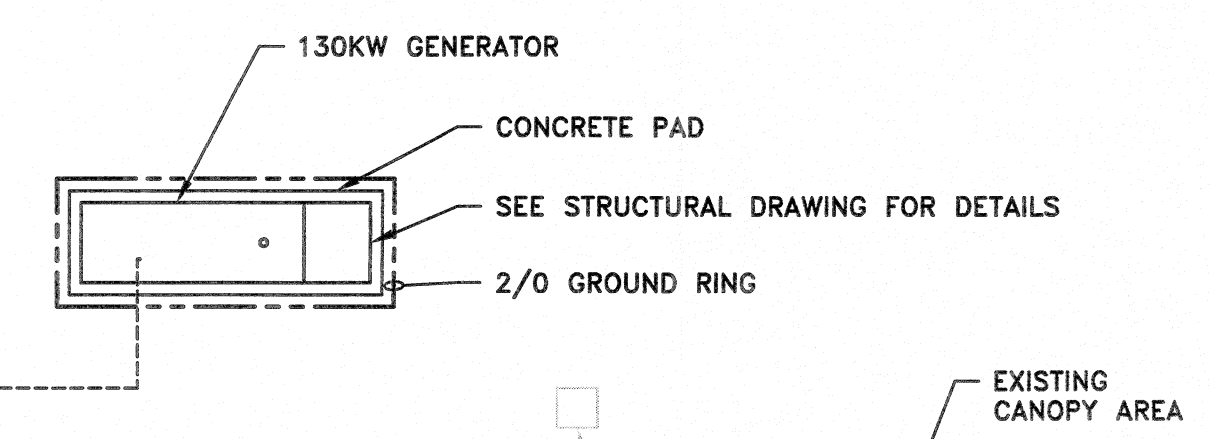
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 APPROVED DATE	REVISIONS	DATE	BY	 ALAIMO GROUP Consulting Engineers NJDCA 25GA27988400 200 HIGH STREET MOUNT HOLLY, N.J. 2 MARKET STREET PATERSON, N.J.	PROJECT NO.: A-0530-0026-000	SHEET G1
	Richard A. Alaimo PROFESSIONAL ENGINEER NEW JERSEY LICENSE NO. 13195					FILE NO.:



1. DETECTABLE UNDERGROUND TAPE: "CAUTION BURIED ELECTRICAL LINE BELOW", RED TAPE WITH BLACK LETTERS, 2" x 1000 FEET, BRADY STYLE No: 91601 OR EQUIVALENT. BURY 6" (MINIMUM) BELOW GRADE. BURY TAPE DIRECTLY OVER SINGLE CONDUIT OR CENTER OF MULTIPLE CONDUITS UNLESS QUANTITY OF CONDUITS IN TRENCH EXCEEDS (5) FIVE CONDUITS, IN WHICH CASE USE (2) TWO TAPES CENTERED ON OUTER-MOST CONDUITS.

TRENCH DETAIL (TYPICAL)
SCALE: N.T.S.



- NOTES - GENERAL:**
- ALL ELECTRICAL WORK SHALL BE TO LATEST ADOPTION OF THE NATIONAL ELECTRICAL CODE (NEC). THE ELECTRICAL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE OR ANY OTHER STATE OR LOCAL CODE HAVING JURISDICTION.
 - CONTRACTOR SHALL DOCUMENT AND RECORD ALL AS-BUILT CONDITIONS PRIOR TO REMOVAL OF EXISTING EQUIPMENT TO BE RELOCATED TO ENSURE CORRECT WIRING AND SEQUENCE OF OPERATIONS.
 - DRAWING SCALE AND EQUIPMENT LOCATIONS ARE TAKEN FROM ORIGINAL DESIGN DRAWINGS. EXACT LOCATIONS AND SIZES OF EXISTING EQUIPMENT MAY VARY FROM DRAWINGS.
 - CONTRACTOR SHALL INCLUDE ALL DEMOLITION, REMOVAL, RELOCATION OF EXISTING EQUIPMENT AND MATERIALS AS SHOWN. THE CONTRACTOR SHALL PERFORM A SITE VISIT PRIOR TO BIDDING TO REVIEW ALL WORK REQUIRED. ANY EXISTING CONDITION FOUND WHICH WILL AFFECT WORK TO BE COMPLETED SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING PRIOR TO BID DATE. CLAIMS FOR EXTRA WORK NOT BE ALLOWED FOR ANY WORK THAT MAY BE CAUSED BY EXISTING CONDITIONS, IN WHICH SHOULD HAVE BEEN FORESEEN SUBSEQUENT TO THE JOB SITE VISIT.
 - CONTRACTOR IS RESPONSIBLE FOR DISCONNECTING AND REMOVAL OF EXISTING GENERATOR SET ASSOCIATED EQUIPMENT. ALL POWER AND CONTROL CABLING NOT BEING REUSED SHALL BE REMOVED FROM THE DEVICE THE SOURCE PANEL.
 - EXISTING GENERATOR SHALL REMAIN IN PLACE TO BE DEMOLISHED BY OTHERS. PLEASE SEE LIMITS OF DEMOLITION ON ELECTRICAL SITE PLAN.
 - CONTRACTOR IS RESPONSIBLE FOR RE-ROUTING OF EXISTING DOWNSPOUTS / GUTTERS AS REQUIRED FOR NEW EQUIPMENT AND CONDUIT INSTALLATION.
 - CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY ABOUT RELOCATION OF SERVICE ATTACHMENT POINT. UTILITY COMPANY SHALL ATTACH TO CORNER OF BUILDING AS SHOWN AND CONTRACTOR SHALL DEMOLISH AND REPAIR BUILDING AT EXISTING SERVICE ATTACHMENT AS REQUIRED. CONTRACTOR SHALL NOTIFY UTILITY COMPANY WITHIN SERVICE DOCUMENTS TO BE FILLED OUT BY CONTRACTOR.

- REFERENCE NOTE:**
- BACKGROUND REFERENCE DRAWINGS FROM "COUNTY OF UNION DIVISION OF ENGINEERING" HEATING SYSTEMS, PUBLIC WORKS COMPLEX, LDS UC 13525 SHEET 2 OF 5.
 - BACKGROUND REFERENCE DRAWINGS FROM "COUNTY OF UNION DIVISION OF ENGINEERING" SOUTH AVENUE PUBLIC WORKS COMPLEX, LDS UC 20003278.

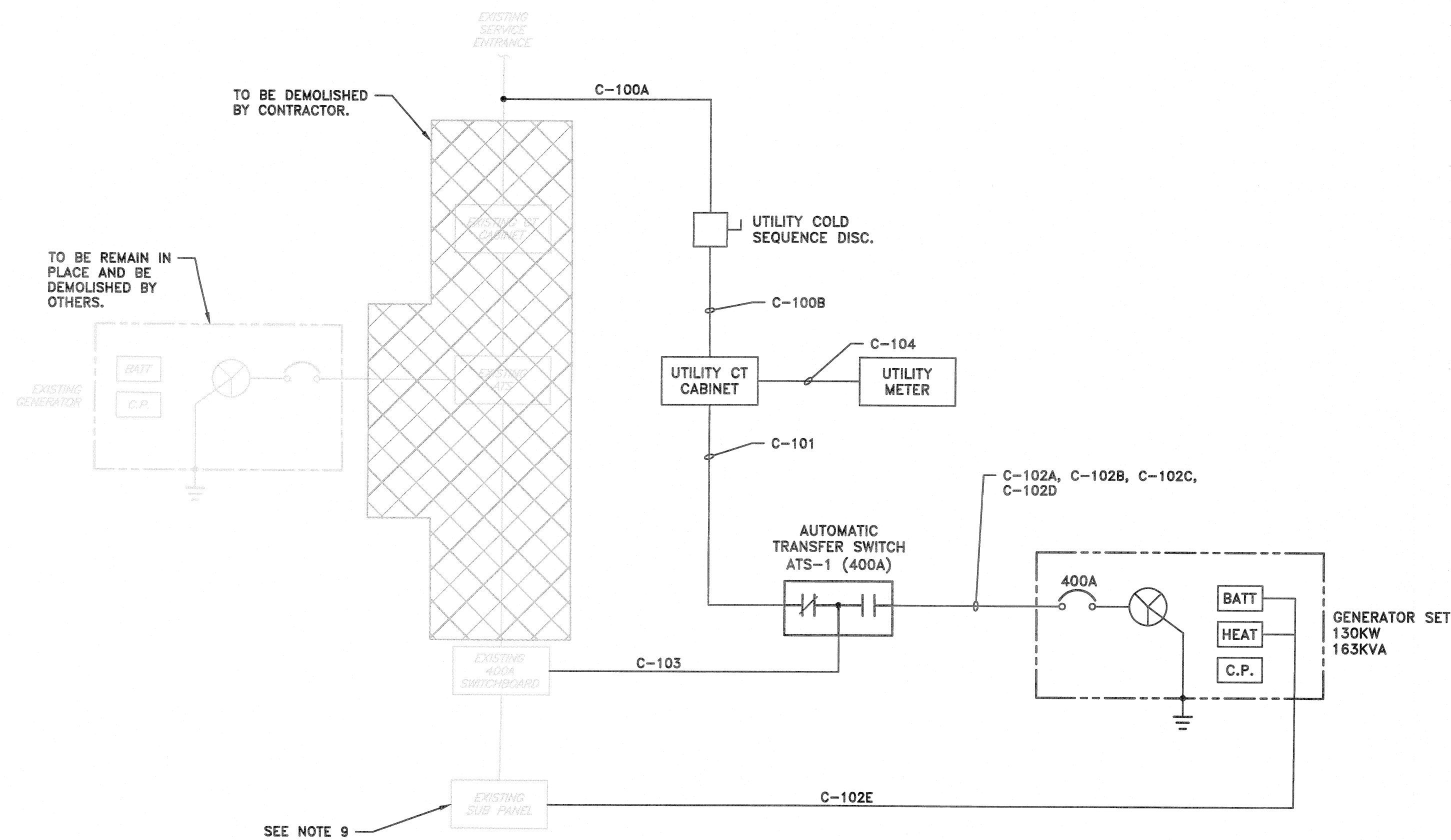
APPROVED: Richard A. Alaimo PROFESSIONAL ENGINEER NEW JERSEY LICENSE NO. 13195	REVISIONS DATE BY	 ALAIMO GROUP Consulting Engineers NJDCA 25GA27988400 200 HIGH STREET MOUNT HOLLY, N.J. 2 MARKET STREET PATERSON, N.J.	DPW BUILDING EMERGENCY GENERATOR REPLACEMENT	CLIENT: UNION COUNTY	DATE: MAR. 2018	SHEET E1
	CONTRACT NO.: BA# 20-2018		PROJECT LOCATION: SCOTCH PLAINS UNION COUNTY NEW JERSEY	PROJECT NO.: A-0530-0026-000	DRAWN BY: JRN	CHECKED BY: DMM

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

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NOTES - GENERAL:

- ALL ELECTRICAL WORK SHALL BE TO LATEST ADOPTION OF THE NATIONAL ELECTRICAL CODE (NEC). THE ELECTRICAL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE OR ANY OTHER STATE OR LOCAL CODE HAVING JURISDICTION.
- ALL ELECTRICAL GROUNDING SHALL BE IN ACCORDANCE WITH THE NEC ARTICLE 250 AND MANUFACTURERS RECOMMENDATIONS. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A COMPLETE GROUNDING SYSTEM IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. ELECTRICAL WIRE RACEWAYS, APPARATUS AND PANEL ENCLOSURES AND OTHER NON-CURRENT CARRYING METAL PARTS SHALL BE MECHANICALLY JOINED TO FORM A CONTINUOUS CONDUCTING METALLIC PATH AND ASSURE ELECTRICAL CONTINUITY OF THE GROUNDING CIRCUITS. THE STRANDED COPPER BONDING JUMPER CABLES AND/OR GROUND WIRES SHALL BE INSTALLED WHERE REQUIRED. THE SURFACE WHERE GROUNDING CONNECTIONS ARE TO BE MADE SHALL BE CLEAN AND DRY. STEEL SURFACES SHALL BE GROUND OR FILED TO REMOVE ALL SCALE, RUST, GREASE AND DIRT. COPPER AND GALVANIZED STEEL SHALL BE CLEANED WITH EMERY CLOTH TO REMOVE OXIDE BEFORE MAKING CONNECTIONS.
- CONTRACTOR SHALL DOCUMENT AND RECORD ALL AS-BUILT CONDITIONS PRIOR TO REMOVAL OF EXISTING EQUIPMENT TO BE RELOCATED TO ENSURE CORRECT WIRING AND SEQUENCE OF OPERATIONS.
- DRAWING SCALE AND EQUIPMENT LOCATIONS ARE TAKEN FROM ORIGINAL DESIGN DRAWINGS. EXACT LOCATIONS AND SIZES OF EXISTING EQUIPMENT MAY VARY FROM DRAWINGS.
- CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUITS AND CABLES AS SHOWN ON THE CONTRACT DRAWINGS.
- CONTRACTOR SHALL PROVIDE ALL NECESSARY CUTTING, PATCHING, EXCAVATION, BACKFILL, AND SEAL ALL THROUGH WALL PENETRATIONS AS NEEDED FOR EXTERIOR CONDUITS.
- CONTRACTOR SHALL INCLUDE ALL DEMOLITION, REMOVAL, RELOCATION OF EXISTING EQUIPMENT AND MATERIALS AS SHOWN. THE CONTRACTOR SHALL PERFORM A SITE VISIT PRIOR TO BIDDING TO REVIEW ALL WORK REQUIRED. ANY EXISTING CONDITION FOUND WHICH WILL AFFECT WORK TO BE COMPLETED SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING PRIOR TO BID DATE. CLAIMS FOR EXTRA WORK NOT BE ALLOWED FOR ANY WORK THAT MAY BE CAUSED BY EXISTING CONDITIONS, IN WHICH SHOULD HAVE BEEN FORESEEN SUBSEQUENT TO THE JOB SITE VISIT.
- CONTRACTOR SHALL FURNISH AND INSTALL GENERATOR SET IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS AND MANUFACTURER RECOMMENDATIONS. CONTRACTOR SHALL COORDINATE CONDUIT ENTRY AND PLACEMENT WITH MANUFACTURER SHOP DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL EXISTING UTILITIES PRIOR TO ANY EXCAVATION.
- CONTRACTOR IS RESPONSIBLE FOR DISCONNECTING AND REMOVAL OF EXISTING GENERATOR SET ASSOCIATED EQUIPMENT. ALL POWER AND CONTROL CABLING NOT BEING REUSED SHALL BE REMOVED FROM THE DEVICE THE SOURCE PANEL. THE EXISTING GENERATOR SHALL REMAIN IN PLACE TO BE REMOVED BY OTHERS.
- CONTRACTOR SHALL VERIFY ALL VOLTAGE, CURRENT AND FIELD ROTATION PRIOR TO DISCONNECTING ANY EXISTING EQUIPMENT. CONTRACTOR WILL ENSURE CORRECT RATINGS AND ROTATION AFTER PROPOSED NEW EQUIPMENT HAS BEEN INSTALLED AND ENERGIZED.
- ALL CONDUIT RUNS ARE DIAGRAMMATICALLY SHOWN ON THE DRAWINGS. THE FINAL ROUTING OF CONDUITS SHALL BE DETERMINED BY THE ELECTRICAL CONTRACTOR AND APPROVED BY THE ENGINEER. CONDUIT SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. EXPOSED CONDUITS SHALL BE INSTALLED PARALLEL TO BEAMS AND WALLS. CONDUIT SHALL BE TERMINATED SO AS TO PERMIT NEAT CONNECTIONS TO EQUIPMENT.
- ALL DEVICE BOXES, COVER PLATES AND JUNCTION BOXES SHALL BE RATED NEMA 4X OR 12.
- ALL FIELD WIRING TERMINATIONS SHALL BE MADE AT TERMINALS LOCATED IN THE INDIVIDUAL COMPARTMENTS OR ENCLOSURES. USE OF WIRE NUTS OR DIRECT WIRING WILL NOT BE ACCEPTED. ALL TERMINATION POINTS MUST BE IDENTIFIED IN THE SHOP DRAWINGS AND PERMANENTLY / CLEARLY MARKED IN ACCORDANCE WITH THE SPECIFICATION REQUIREMENTS. TERMINATOR / TERMINAL BLOCK MATERIALS SHALL BE SIZED FOR THE INSTALLED CONDUCTORS.
- ALL WIRES SHALL BE NEATLY BUNDLED AND TAGGED TO INDICATE THE CONNECTED DEVICE. EACH WIRE SHALL BE COLOR CODED AND TAGGED WITH A PLASTIC SLEEVE TYPE WIRING TAG. WIRING SHALL BE TAGGED AT EACH POINT OF TERMINATION.
- CONDUIT INSTALLATION INTO EQUIPMENT WITH EXPOSED LIVE COMPONENTS SHALL BE ROUTED FOR BOTTOM ENTRY WHERE POSSIBLE OR SEALED IN A WATERTIGHT MANNER ACCEPTABLE TO THE ENGINEER.
- ALL DEVICES AND APPARATUS FURNISHED SHALL BE NEW AND SHALL BE UL LISTED.
- THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUIT REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS ACCEPTABLE TO THE ENGINEER MAY BE MADE BY THE CONTRACTOR TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATION.
- EXISTING UNDERGROUND PIPE, CONDUIT AND APPURTENANCES ARE NOT SHOWN. CONTRACTOR SHALL LOCATE ALL EXISTING SUBSURFACE EQUIPMENT WHICH MAY CONFLICT WITH NEW CONSTRUCTION SO AS TO AVOID CONFLICTS OR DAMAGE.
- CONTRACTOR SHALL COORDINATE AND SCHEDULE SHUTDOWNS AT SUITABLE TIMES TO THE OWNER. OWNER AND CONTRACTOR SHALL JOINTLY LOCK OUT AND TAG OUT BREAKERS AND SWITCHES DURING SHUTDOWN PERIODS.
- CONTRACTORS SHALL COORDINATE WITH UTILITY COMPANY FOR ALL SERVICE INSTALLATIONS, REQUIREMENTS AND SERVICE APPLICATIONS.



**ELECTRICAL
BLOCK DIAGRAM**

				CONDUIT		CABLE	
NUMBER	SIZE	TYPE	NEW/EXIST	FROM	TO	PHASE CONDUCTOR QUANTITY/SIZE	GROUND CONDUCTOR QUANTITY/SIZE
C-100A	4	GRS	NEW	UTILITY SERVICE ENTRANCE	COLD SEQUENCE DISCONNECT	(4) 500 KCMIL/CU/XHHW	---
C-100B	4	GRS	NEW	COLD SEQUENCE DISCONNECT	UTILITY CT CABINET	(4) 500 KCMIL/CU/XHHW	(1) #4/0 AWG/CU/XHHW
C-101	4	EMT/PVC	NEW	UTILITY CT CABINET	AUTOMATIC TRANSFER SWITCH ATS-1	(4) 500 KCMIL/CU/XHHW	(1) #4/0 AWG/CU/XHHW
C-102A	4	EMT/PVC	NEW	AUTOMATIC TRANSFER SWITCH ATS-1	GENERATOR SET	(4) 500 KCMIL/CU/XHHW	(1) #4/0 AWG/CU/XHHW
C-102B	4	EMT/PVC	NEW	AUTOMATIC TRANSFER SWITCH ATS-1	GENERATOR SET	1/4" PULL ROPE	---
C-102C	1	EMT/PVC	NEW	AUTOMATIC TRANSFER SWITCH ATS-1	GENERATOR SET	(12) #14 AWG/CU/XHHW	(1) #14 AWG/CU/XHHW
C-102D	1	EMT/PVC	NEW	AUTOMATIC TRANSFER SWITCH ATS-1	GENERATOR SET	1/4" PULL ROPE	---
C-102E	1	EMT/PVC	NEW	EXISTING SUB-PANEL	GENERATOR SET	(6) #10 AWG/CU/XHHW	(3) #10 AWG/CU/XHHW
C-103	4	EMT	NEW	AUTOMATIC TRANSFER SWITCH ATS-1	EXISTING SWITCHBOARD	(4) 500 KCMIL/CU/XHHW	(1) #4/0 AWG/CU/XHHW
C-104	1 1/2	GRS	NEW	UTILITY CT CABINET	UTILITY METER	UTILITY METERING WIRING	---

APPROVED: *[Signature]*
Richard A. Alaimo
 PROFESSIONAL ENGINEER
 NEW JERSEY LICENSE NO. 13195

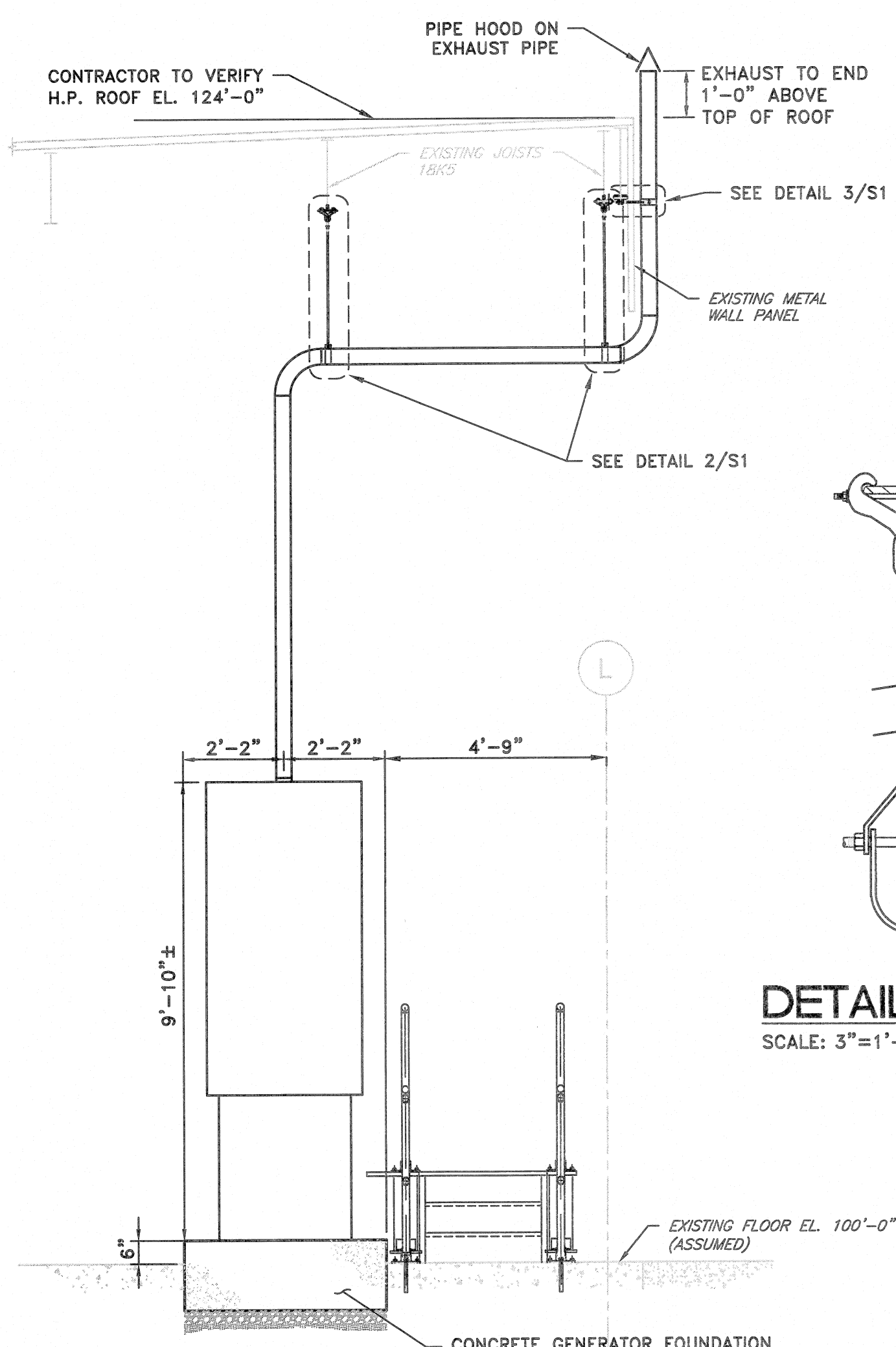
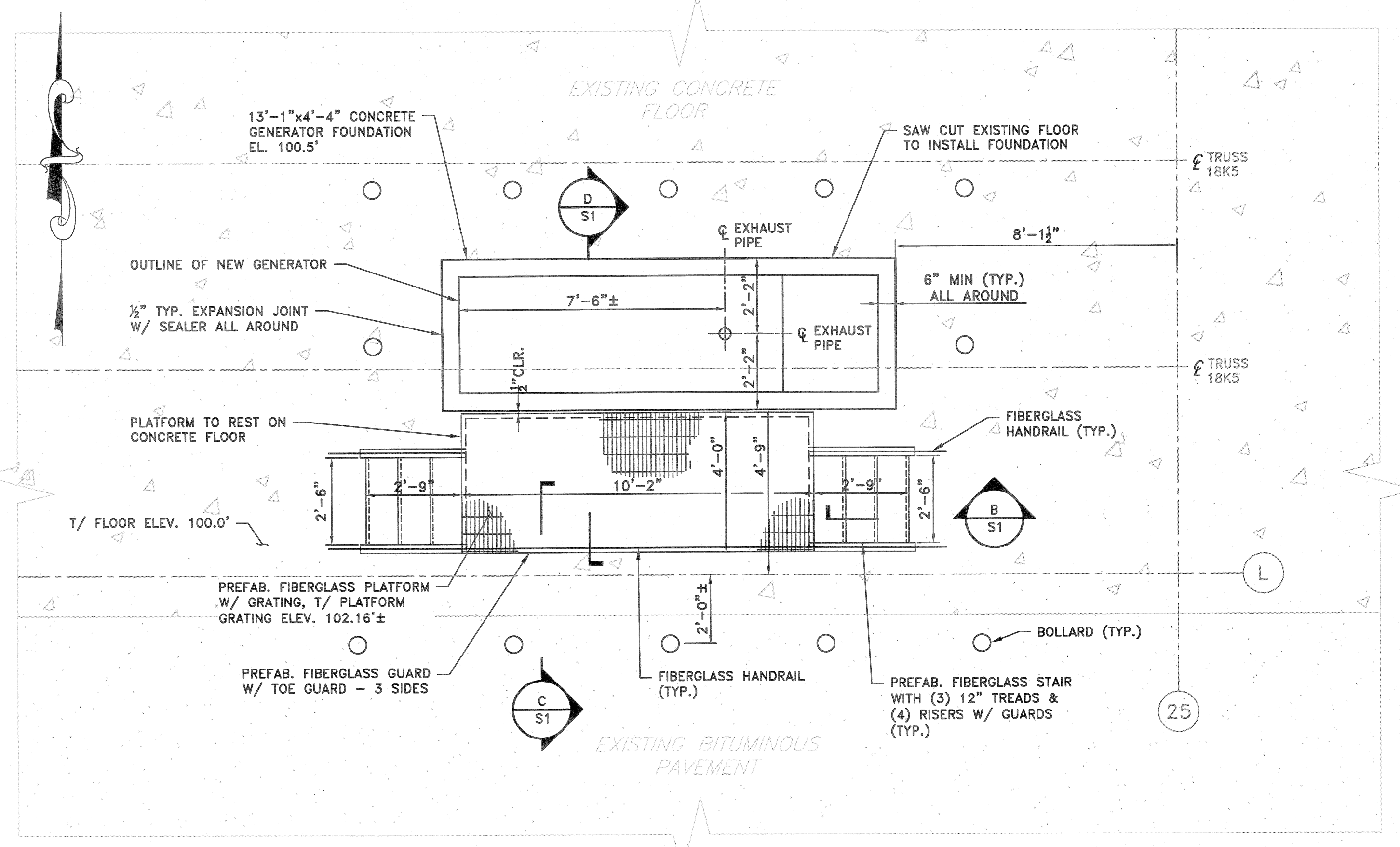
REVISIONS	DATE	BY

ALAIMO GROUP
 Consulting Engineers
 NJDCA 25GA27988400
 200 HIGH STREET MOUNT HOLLY, N.J.
 2 MARKET STREET PATERSON, N.J.

DPW BUILDING
 EMERGENCY GENERATOR REPLACEMENT
 BLOCK DIAGRAM AND
 SCHEDULES
 SCALE: NONE

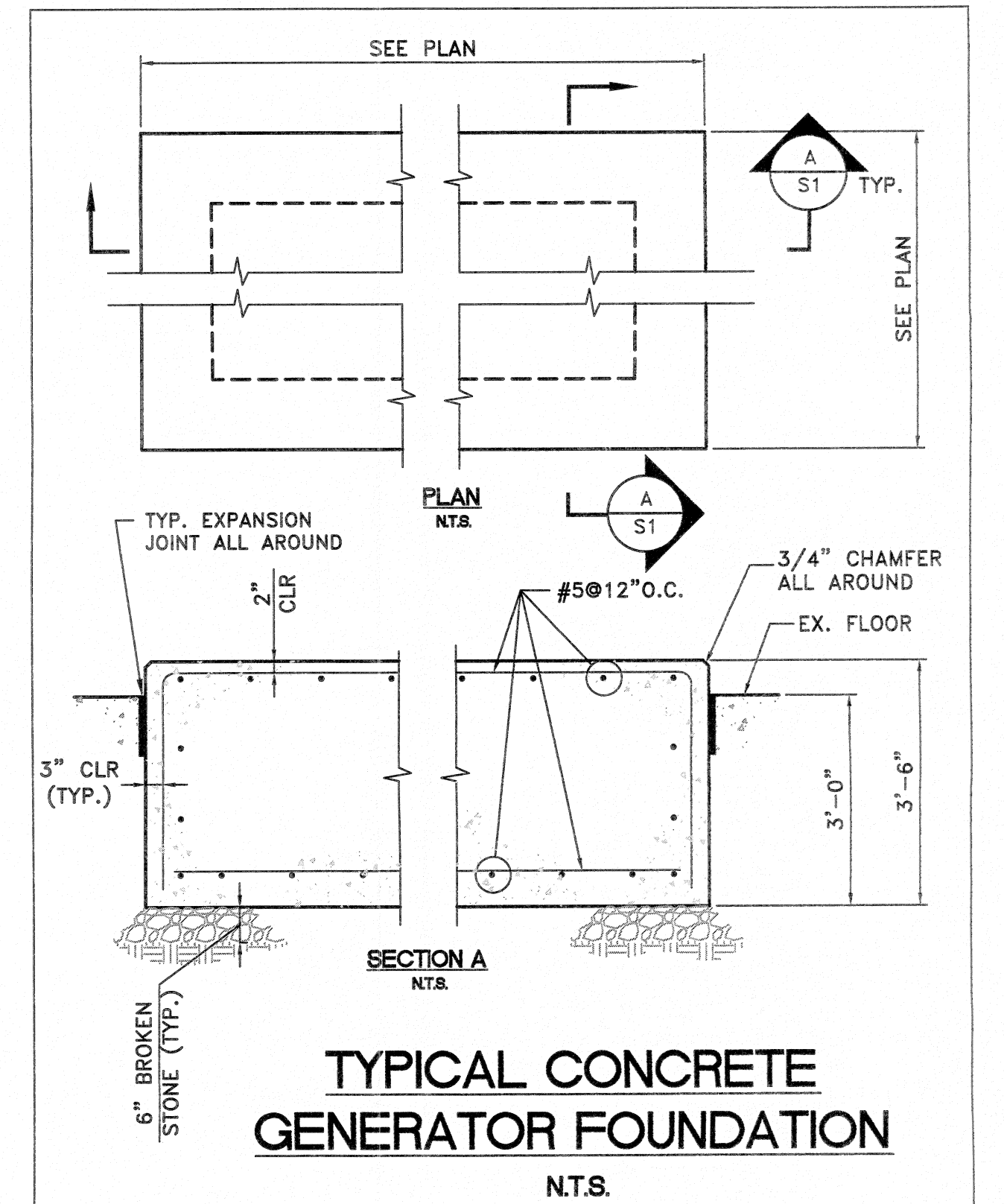
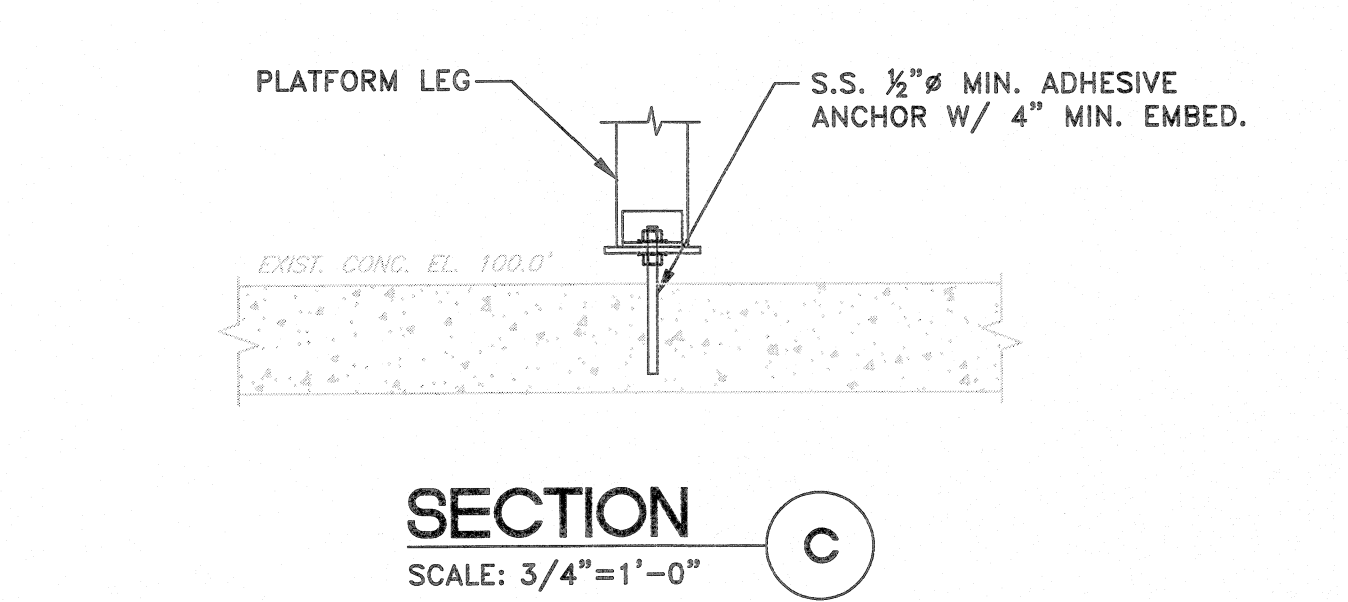
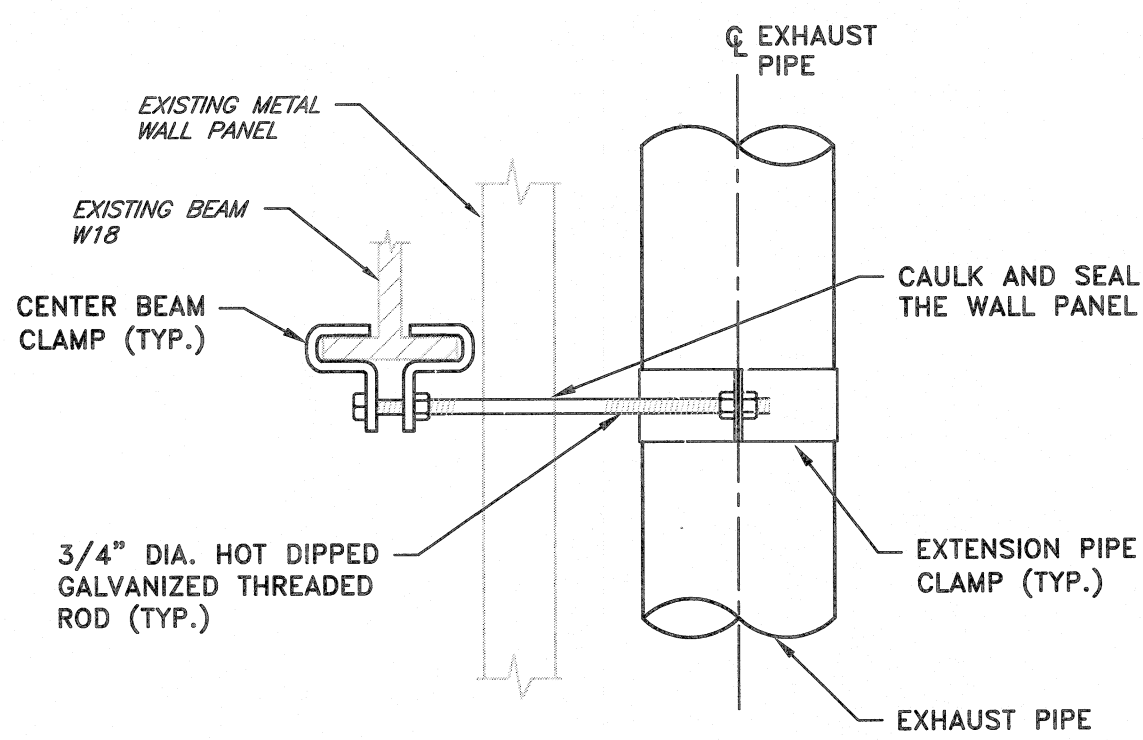
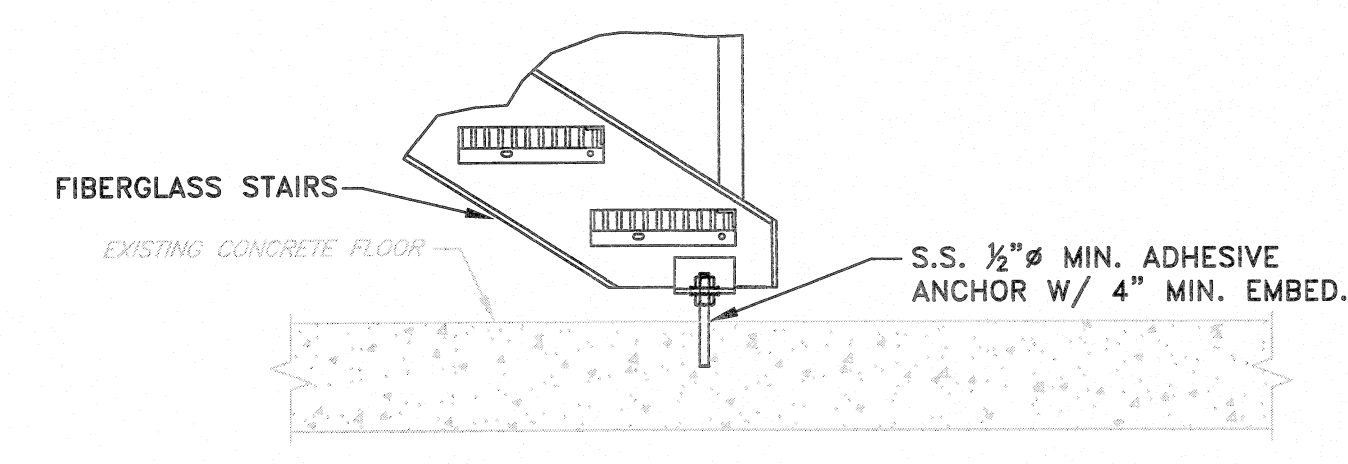
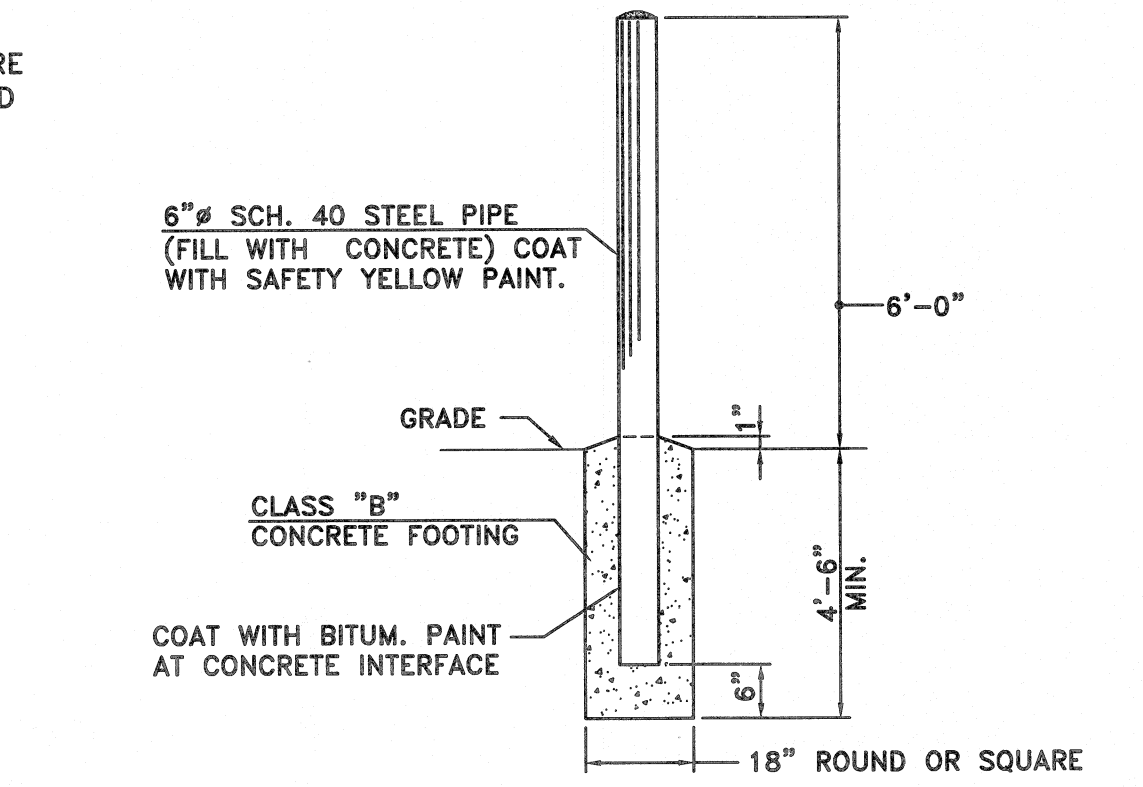
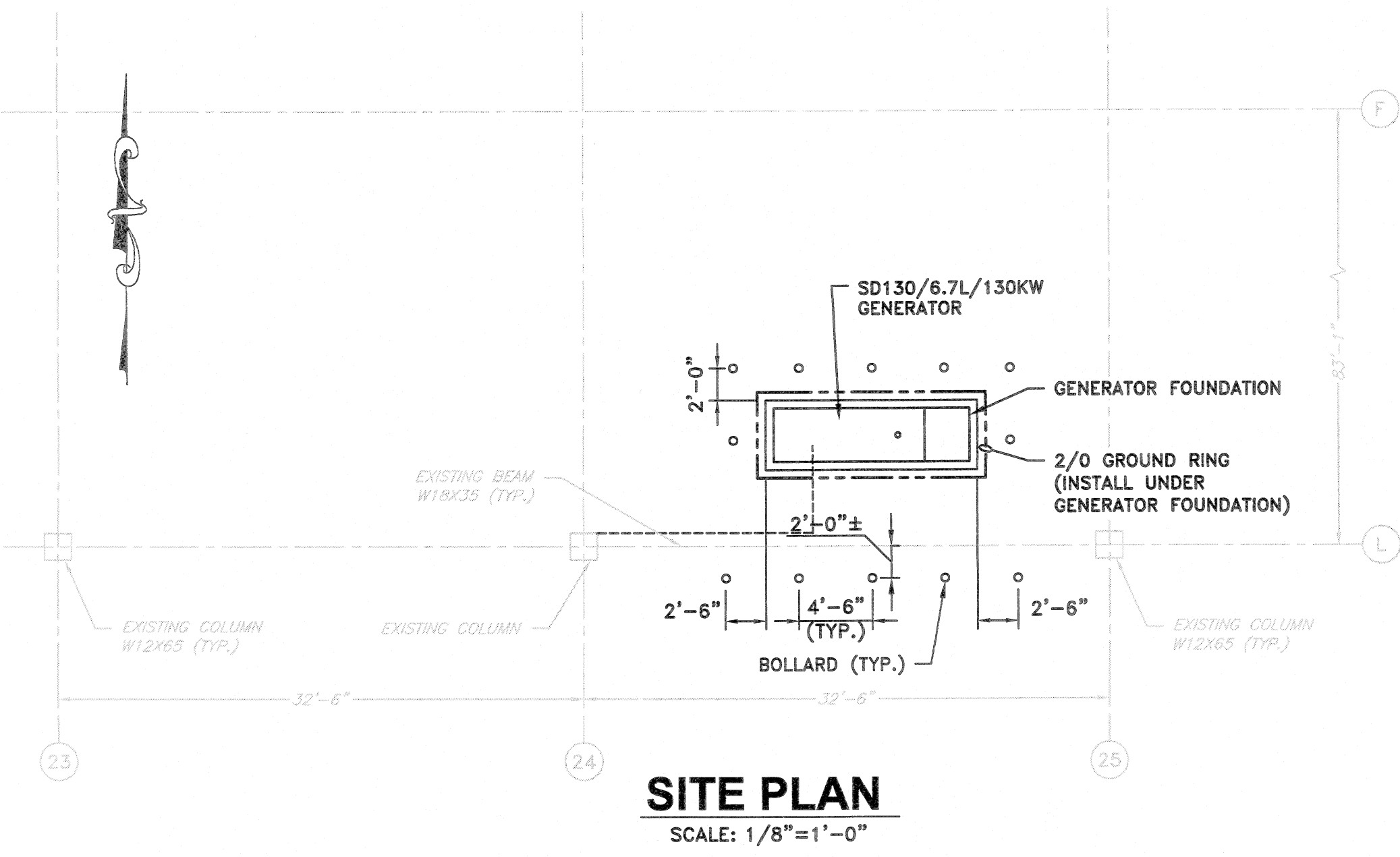
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 PROJECT LOCATION: SCOTCH PLAINS UNION COUNTY NEW JERSEY
 PROJECT NO.: A-0530-0026-000
 CONTRACT NO.: BA# 20-2018
 DATE: MAR. 2018
 DESIGNED BY: JRN
 DRAWN BY: DMM
 CHECKED BY: [Signature]
 DEPT. HEAD: [Signature]
 SHEET: E2
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- PLATFORM/STAIR NOTES:**
- CONTRACTOR SHALL INSTALL CUSTOM DESIGNED PLATFORMS AND STAIRS BY FIBERGLASS COMPOSITE STRUCTURES OR EQUAL. THE PLATFORM SHALL BE DESIGNED FOR A MIN. LIVE LOAD OF 100 PSF OR 1000 LB CONCENTRATED LOAD WHICHEVER IS GREATER. HANDRAILS AND GUARDS SYSTEMS SHALL MEET THE DESIGN REQUIREMENTS OF ASCE 7-10 (I.E. 200 LB CONCENTRATED LOAD OR 50 LBS/FT WHICHEVER IS GREATER).
 - DRAWINGS SHALL BE SIGNED AND SEALED BY A NEW JERSEY LICENSED PROFESSIONAL ENGINEER AND BE SUBMITTED TO THE ENGINEER FOR REVIEW.
 - SEE SPECIFICATION FOR ADDITIONAL REQUIREMENTS.

- CONCRETE CONSTRUCTION GENERAL NOTES:**
- ALL CONCRETE WITH 1.5 LBS/C.Y. OF FIBERMESH 150 OR EQUAL SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI IN 28 DAYS.
 - REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 80. REINFORCING STEEL SHALL BE DETAILED AND FABRICATED IN ACCORDANCE WITH ACI 315, LATEST EDITION. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185; LAP A MINIMUM OF 2 INCHES AT SIDES AND ENDS. REINFORCING CONTRACTOR SHALL FURNISH ALL NECESSARY ACCESSORIES. REINFORCING CONTRACTOR SHALL SUBMIT SHOP DETAIL DRAWINGS OF ALL REINFORCING FOR APPROVAL PRIOR TO FABRICATION IN ACCORDANCE WITH THE SPECIFICATIONS.
 - ALL CONCRETE CONSTRUCTION SHALL CONFORM TO ACI 318, ACI 301, AND IBC (CURRENT NEW JERSEY ADOPTED EDITIONS). CONCRETE SHALL BE CURED FOR A MINIMUM OF 7 DAYS.
 - ALL FOOTINGS AND FOUNDATIONS SHALL BEAR ON COMPACTED SUBGRADE AND COMPACTED STONE.
 - ALL FILLS AND BACKFILL SHALL BE PLACED IN LAYERS NOT TO EXCEED 6 INCHES (6") IN THICKNESS. THE BACKFILL SHALL BE THOROUGHLY COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS. CONTRACTOR SHALL PLACE AND COMPACT LAYERS ON ALTERNATING SIDES OF WALL TO MINIMIZE LATERAL PRESSURE ON WALL.
 - SEE SPECIFICATIONS FOR FILL AND BACKFILL MATERIAL.
 - FOR LOCATIONS, ARRANGEMENT, SIZE, DETAILS OF UTILITIES AND PIPING WITHIN AND PENETRATING CONCRETE STRUCTURES REFER TO THE APPROPRIATE DISCIPLINE'S DRAWINGS. NO PIPING OR CONDUIT MAY PENETRATE FOOTINGS UNLESS SPECIFICALLY DETAILED ON THE CONCRETE DRAWINGS. CONTRACTOR TO NOTIFY THE ENGINEER OF ANY POTENTIAL CONFLICTS WITH THE FOOTING ELEVATIONS AND PIPING OR CONDUIT PRIOR TO POURING THE FOUNDATIONS.
 - ANY ALUMINUM IN CONTACT WITH DISSIMILAR MATERIALS (CONCRETE, STEEL OR MASONRY) SHALL HAVE THE CONTACT SURFACE COATED WITH A BITUMINOUS PAINT.
 - DRILLED IN ADHESIVE ANCHORS SHALL BE HILTI STAINLESS STEEL HAS THREADED RODS WITH NUT AND WASHER INSTALLED WITH HILTI HIT HY-200 ADHESIVE ANCHORING SYSTEM OR EQUIVALENT, MINIMUM EMBEDMENT AS SHOWN ON DRAWINGS.
 - WHENEVER AN ELECTRICAL GROUNDING SYSTEM IS REQUIRED AND FOOTINGS CONTAIN REINFORCING BARS #4 OR LARGER, AND THE TOTAL PERIMETER OF THE FOOTING IS MORE THAN 20 FEET, THEN THE REINFORCING SHALL BE BONDED TOGETHER TO FORM PART OF THE ELECTRICAL GROUNDING SYSTEM IN ACCORDANCE WITH SECTION 250-50 OF THE NATIONAL ELECTRICAL CODE, CURRENT EDITION.
 - COLD WEATHER CONCRETING (AVERAGE DAILY TEMPERATURE BELOW 40 DEGREES FOR MORE THAN THREE CONSECUTIVE DAYS AND THE AIR TEMPERATURE IS NOT GREATER THAN 50 DEGREES FOR MORE THAN HALF OF ANY 24 HOUR PERIOD) SHALL BE DONE IN STRICT ACCORDANCE WITH ACI 306R-16 "COLD WEATHER CONCRETING".
 - HOT WEATHER CONCRETING SHALL BE DONE IN STRICT ACCORDANCE WITH ACI 305R-10 "HOT WEATHER CONCRETING".
 - UNFORMED CONCRETE SURFACES SCHEDULED TO RECEIVE A SECOND LIFT OF CONCRETE SHALL BE GIVEN A RAKE OR SCRATCHED FINISH.
 - SAW CUT EXISTING CONCRETE FLOOR TO INSTALL THE GENERATOR FOUNDATION.
 - CAULK AND SEAL WALL PANEL AFTER INSTALLATION OF PIPE CLAMP.



- GENERAL NOTES:**
- EXISTING CONDITIONS SHOWN ARE BASED ON PLANS PROVIDED BY THE OWNER. PRESENTATION OF EXISTING INFORMATION ON THESE DRAWINGS IN NO WAY IMPLIES ITS COMPLETENESS OR ACCURACY. THE CONTRACTOR IS RESPONSIBLE FOR FIELD MEASURING ALL EXISTING CONDITIONS AND PROPOSED WORK TO ENSURE PROPER FIT.
 - FOR DETAILED DESIGN AREAS, SEE ENLARGED DETAILS ON REFERRING DRAWINGS.
 - SEE THIS DRAWING FOR GENERAL CONCRETE NOTES & DETAILS.
 - SEE E-SERIES DRAWINGS FOR ELECTRICAL EQUIPMENT.

APPROVED: Richard A. Alaimo PROFESSIONAL ENGINEER NEW JERSEY LICENSE NO. 13195	REVISIONS DATE BY	 ALAIMO GROUP Consulting Engineers NJDCA 25GA27988400 200 HIGH STREET MOUNT HOLLY, N.J. 2 MARKET STREET PATERSON, N.J.	DPW BUILDING EMERGENCY GENERATOR REPLACEMENT	CLIENT: UNION COUNTY	DATE: MAR. 2018	SHEET S1
	STRUCTURAL SITE PLAN AND DETAILS		PROJECT LOCATION: SCOTCH PLAINS UNION COUNTY NEW JERSEY	PROJECT NO.: A-0530-0026-000	DESIGNED BY: NC	