PROJECT SPECIFICATIONS

WATER PLANT FILTER IMPROVEMENTS

Sea Girt Water Department
Borough of Sea Girt
Monmouth County, New Jersey

H2M Project No.
SGRT2050

JANUARY 2021
ADDENDUM No. 2 FEBRUARY 2021

Prepared for:

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TABLE OF CONTENTS

BOROUGH OF SEA GIRT
MONMOUTH COUNTY, NEW JERSEY

WATER PLANT MISCELLANEOUS IMPROVEMENTS
SEA GIRT WATER TREATMENT PLANT

AGREEMENT

CLOSE-OUT DOCUMENTS

GENERAL CONDITIONS

SPECIAL CONDITIONS

ATTACHMENTS

TABLE OF CONTENTS

BOROUGH OF SEA GIRT

Instructions to Bidders and Statutory Requirements

NOTICE TO BIDDERS

NOTICE IS HEREBY GIVEN that sealed bids will be received by the *Clerk,* for the *Sea Girt Borough Water and Sewer Department,* County of *Monmouth,* State of New Jersey on ***Thursday, March 4, 2021 at 10:00 a.m.*** prevailing time at *Sea Girt Borough Hall, 321 Baltimore Boulevard, Sea Girt NJ 08750* at which time and place bids will be opened and read in public for:

Sea Girt Water Plant Miscellaneous Improvements

Complete digital sets of Bid Documents including the Contract Documents [Construction Drawings, Project Manual with Specifications, Agreement between Owner and Contractor, and the Conditions of the Contract (General, Supplementary and other Conditions)] may be obtained online as a download for Forty-Nine Dollars ($49.00) at the following website: www.H2Mprojects.com under 'Public Projects' beginning January 20, 2021. Complete hard copy sets of the Bid Documents may be obtained from REV, 330 Route 17A, Suite #2, Goshen, New York 10924 (tel: 1-877-272-0216), upon posting the sum of Seventy-Five Dollars ($75.00) per set to offset the cost of reproduction from the same website. Checks or money orders shall be made payable to REV. Packaging and shipping costs are additional and shall be borne by the Bidder, upon payment as indicated in the Advertisement for Bids.

Bidders are required to comply with the requirements of N.J.S.A. 10:5-31 et seq. and N.J.A.C. 17:27-1 et seq.

_____

Dawn Harriman, Borough Clerk

Publication date: Wednesday, January 20, 2021

Instructions To Bidders And Statutory Requirements

I. CONTRACT DOCUMENTS

Complete digital sets of Bid Documents including the Contract Documents [Construction Drawings, Project Manual with Specifications, Agreement between Owner and Contractor, and the Conditions of the Contract (General, Supplementary and other Conditions)] may be obtained online as a download for Forty-Nine Dollars ($49.00) at the following website: www.H2Mprojects.com under 'Public Projects' beginning January 20, 2021. Complete hard copy sets of the Bid Documents may be obtained from REV, 330 Route 17A, Suite #2, Goshen, New York 10924 (tel: 1-877-272-0216), upon posting the sum of Seventy-Five Dollars ($75.00) per set to offset the cost of reproduction from the same website. Checks or money orders shall be made payable to REV. Packaging and shipping costs are additional and shall be borne by the Bidder, upon payment as indicated in the Advertisement for Bids.

Payment will not be refunded and the Contract Documents need not be returned.

It is the obligation of the Bidder to make any investigations (including but not limited to the investigation of subsurface conditions) that he may deem necessary to achieve a complete bid, prior to submitting a proposal. Borings, test excavations and other subsurface investigations, if any, made prior to the construction of the project, the records of which are available to Bidders, are intended solely for use as a guide for design. The Contractor agrees that (s)he will make no claims against the Owner if, in carrying out the project, (s)he finds that the actual conditions encountered do not conform to those indicated by said borings, test excavations and other subsurface investigations.

Any estimates of quantity shown on the plans or in the formal proposal based on said borings, test excavations and other subsurface investigations are in no way warranted to indicate the true quantities. The Contractor agrees (s)he will make no claims against the Owner if the actual quantity or quantities do not conform to the estimated quantity or quantities.

II. SUBMISSION OF BIDS

A. Sealed bids shall be received by the contracting unit, hereinafter referred to as "owner," in accordance with public advertisement as required by law, with a copy of said notice being attached hereto and made a part of these specifications.

B. Sealed bids will be received by the designated representative at the time and location of bid opening as stated in the Notice to Bidders, and at such time and place will be publicly opened and read aloud.

C. The bid shall be submitted in a sealed envelope: (1) addressed to the owner, (2) bearing the name and address of the bidder written on the face of the envelope, and (3) clearly marked "BID" with the contract title and/or bid # of the contract being bid.

D. It is the bidder's responsibility that bids are presented to the owner at the time and at the place designated. Bids may be hand delivered or mailed; however, the owner disclaims any responsibility for bids forwarded by regular or overnight mail. If the bid is sent by express mail service, the designation in sub-section C, above, must also appear on the outside of the express mail envelope. Bids received after the designated time and date will be returned unopened.

E. Sealed bids forwarded to the owner before the time of opening of bids may be withdrawn upon written application of the bidder who shall be required to produce evidence showing that the individual is or represents the principal or principals involved in the bid. Once bids have been opened, they shall remain firm for a period of sixty (60) calendar days.

F. All prices and amounts must be written in ink or preferably machine-printed. Bids containing any conditions, omissions, unexplained erasures or alterations, items not called for in the bid proposal form, attachment of additive information not required by the specifications, or irregularities of any kind, may be rejected by the owner. Any changes, whiteouts, strikeouts, etc. in the bid must be initialed in ink by the person signing the bid.

G. Each bid proposal form must give the full business address**,** business phone, fax, e-mail if available, the contact person of the bidder, and be signed by an authorized representative as follows:

- Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by one of the members of the partnership or by an authorized representative, followed by the signature and designation of the person signing.
- Bids by corporations must be signed in the legal name of the corporation, followed by the name of the State in which incorporated and must contain the signature and designation of the president, secretary or other person authorized to bind the corporation in the matter.
- Bids by sole-proprietorship shall be signed by the proprietor.
- When requested, satisfactory evidence of the authority of the officer signing shall be furnished.

H. Bidder should be aware of the following statutes that represent "Truth in Contracting" laws:

- N.J.S.A. 2C:21-34, et seq. governs false claims and representations by bidders. It is a serious crime for the bidder to knowingly submit a false claim and/or knowingly make material misrepresentation.
- N.J.S.A. 2C:27-10 provides that a person commits a crime if said person offers a benefit to a public servant for an official act performed or to be performed by a public servant, which is a violation of official duty.
- N.J.S.A. 2C:27-11 provides that a bidder commits a crime if said person, directly or indirectly, confers or agrees to confer any benefit not allowed by law to a public servant.
- Bidder should consult the statutes or legal counsel for further information.

III. BID SECURITY AND BONDING REQUIREMENTS

The following provisions if indicated by an (X), shall be applicable to this bid and be made a part of the bid documents:

[X] A. BID GUARANTEE

Bidder shall submit with the bid a certified check, cashier's check or bid bond in the amount of ten percent (10%) of the total price bid, but not in excess of $20,000, payable unconditionally to the owner. When submitting a Bid Bond, it shall contain Power of Attorney for full amount of Bid Bond from a surety company authorized to do business in the State of New Jersey and acceptable to the owner. The check or bond of the unsuccessful bidder(s) shall be returned pursuant to N.J.S.A. 40A:11-24a. The check or bond of the bidder to whom the contract is awarded shall be retained until a contract is executed and the required performance bond or other security is submitted. The check or bond of the successful bidder shall be forfeited if the bidder fails to enter into a contract pursuant to N.J.S.A. 40A:11-21.

Failure to submit a bid guarantee shall result in rejection of the bid.

[X] B. CONSENT OF SURETY

Bidder shall submit with the bid a Certificate (Consent of Surety) with Power of Attorney for full amount of bid price from a Surety Company authorized to do business in the State of New Jersey and acceptable to the owner stating that it will provide said bidder with a Performance Bond in the full amount of the bid. This certificate shall be obtained in order to confirm that the bidder to whom the contract is awarded will furnish Performance and Payment Bonds from an acceptable surety company on behalf of said bidder, any or all subcontractors or by each respective subcontractor or by any combination thereof which results in performance security equal to the total amount of the contract, pursuant to N.J.S.A. 40A:11-22.

Failure to submit a consent of surety form shall result in rejection of the bid.

[X] C. PERFORMANCE BOND

Bidder shall simultaneously with the delivery of the executed contract, submit an executed bond in the amount of one hundred percent (100%) of the acceptable bid as security for the faithful performance of this contract.

The performance bond provided shall not be released until final acceptance of the whole work and then only if any liens or claims have been satisfied. The surety on such bond or bonds shall be a duly authorized surety company authorized to do business in the State of New Jersey pursuant to N.J.S.A. 17:31-5.

Failure to submit this with the executed contract shall be cause for declaring the contract null and void pursuant to N.J.S.A. 40A:11-22.

[X] D. LABOR AND MATERIAL (PAYMENT) BOND

Bidder shall with the delivery of the performance bond submit an executed payment bond to guarantee payment to laborers and suppliers for the labor and material used in the work performed under the contract.

Failure to submit a labor and material bond with the performance bond shall be cause for declaring the contract null and void.

[X] E. MAINTENANCE BOND

Upon acceptance of the work by the owner, the contractor shall submit a maintenance bond (N.J.S.A. 40A:11-16.3) in an amount not to exceed 25% of the project costs guaranteeing against defective quality of work or materials for the period of two (2) years.

IV. INTERPRETATION AND ADDENDA

A. The bidder understands and agrees that its bid is submitted on the basis of the specifications prepared by the owner. The bidder accepts the obligation to become familiar with these specifications.

B. Bidders are expected to examine the specifications and related bid documents with care and observe all their requirements. Ambiguities, errors or omissions noted by bidders should be promptly reported in writing to the appropriate official. Any prospective bidder who wishes to challenge a bid specification shall file such challenges in writing with the contracting agent no less than three business days prior to the opening of the bids. Challenges filed after that time shall be considered void and having no impact on the contracting unit or the award of a contract pursuant to N.J.S.A. 40A:11-13. In the event the bidder fails to notify the owner of such ambiguities, errors or omissions, the bidder shall be bound by the requirements of the specifications and the bidder's submitted bid.

C. No oral interpretation and or clarification of the meaning of the specifications for any goods and services will be made to any bidder. Such request shall be in writing, addressed to the owner's representative stipulated in the specification. In order to be given consideration, a written request must be received at least seven (7) business days prior to the date fixed for the opening of the bid for goods and services.

All interpretations, clarifications and any supplemental instructions will be in the form of written addenda to the specifications, and will be distributed to all prospective bidders. All addenda so issued shall become part of the specification and bid documents, and shall be acknowledged by the bidder in the bid. The owner's interpretations or corrections thereof shall be final.

When issuing addenda, the owner shall provide required notice prior to the official receipt of bids to any person who has submitted a bid or who has received a bid package pursuant to N.J.S.A. 40A:11-23c.1.

D. Discrepancies in Bids

1. If the amount shown in words and its equivalent in figures do not agree, the written words shall be binding. Ditto marks are not considered writing or printing and shall not be used.

2. In the event that there is a discrepancy between the unit prices and the extended totals, the unit prices shall prevail. In the event there is an error of the summation of the extended totals, the computation by the owner of the extended totals shall govern.

E. Pre-Bid Conference

If stated in the Notice to Bidders:

- X A Pre-Bid Conference is not required for this bid.

- A pre-bid conference for this proposal will be held on _____.
  Attendance is not mandatory, but is strongly recommended. Failure to attend does not relieve the bidder of any obligations or requirements.

V. BRAND NAMES, STANDARDS OF QUALITY AND PERFORMANCE

A. Brand names and/or descriptions used in these specifications are to acquaint bidders with the types of goods and services desired and will be used as a standard by which goods and services offered as equivalent will be evaluated.

B. Variations between the goods and services described and the goods and services offered are to be fully identified and described by the bidder on a separate sheet and submitted with the bid proposal form. Vendor literature WILL NOT suffice in explaining exceptions to these specifications. In the absence of any exceptions by the bidder, it will be presumed and required that the goods and services as described in the bid specification be provided or performed.

C. It is the responsibility of the bidder to document and/or demonstrate the equivalency of the goods and services offered. The owner reserves the right to evaluate the equivalency of the goods and services.

D. In submitting its bid, the bidder certifies that the goods and services to be furnished will not infringe upon any valid patent or trademark and that the successful bidder shall, at its own expense, defend any and all actions or suits charging such infringement, and will save the owner harmless from any damages resulting from such infringement.

E. Only manufactured and farm products of the United States, wherever available, shall be used pursuant to N.J.S.A. 40A:11-18.

F. The contractor shall guarantee any or all goods and services supplied under these specifications. Defective or inferior goods shall be replaced at the expense of the contractor. The contractor will be responsible for return freight or restocking charges.

VI. INSURANCE AND INDEMNIFICATION

The insurance documents indicated by an (X) shall include but are not limited to the following coverage's.

A. INSURANCE REQUIREMENTS

[X] 1. Worker's Compensation Insurance

Workers Compensation insurance shall be maintained in full force during the life of the contract, covering all employees engaged in performance of the contract pursuant to N.J.S.A. 34:15-12(a) and N.J.A.C. 12:235-1.6.

[X] 2. General Liability Insurance

General liability insurance shall be provided with limits of not less than $1,000,000 any one person and $1,000,000 any one accident for bodily injury and $3,000,000 aggregate for property damage, and shall be maintained in full force during the life of the contract.

[X] 3. Automotive Liability Insurance

Automotive liability insurance covering contractor for claims arising from owned, hired and non-owned vehicles with limits of not less than $1,000,000 any one person and $1,000,000 any one accident for bodily injury and $1,000,000 each accident for property damage, shall be maintained in full force during the life of the contract.

☐ 4. Other Forms Of Insurance Required

_____

_____

B. CERTIFICATES OF THE REQUIRED INSURANCE

Certificates of Insurance for those policies required above shall be submitted with the contract. Such coverage shall be with an insurance company authorized to do business in the State of New Jersey and shall name the owner as an additional insured.

Self-insured contractors shall submit an affidavit attesting to their self-insured coverage and shall name the owner as an additional insured.

[X] C. INDEMNIFICATION

Bidder shall indemnify and hold harmless the owner from all claims, suits or actions, and damages or costs of every name and description to which the owner may be subjected or put by reason of injury to the person or property of another, or the property of the owner, resulting from negligent acts or omissions on the part of the contractor, the contractor's agents, servants or subcontractors in the delivery of goods and services, or in the performance of the work under the contract.

VII. PRICING INFORMATION FOR PREPARATION OF BIDS

A. The owner is exempt from any local, state or federal sales, use or excise tax.

B. Estimated Quantities (Open-End Contracts): The owner has attempted to identify the item(s) and the estimated amounts of each item bid to cover its requirements; however, past experience shows that the amount ordered may be different than that submitted for bidding. The right is reserved to decrease or increase the quantities specified in the specifications pursuant to N.J.A.C. 5:30-11.2 and 11.10. NO MINIMUM PURCHASE IS IMPLIED OR GUARANTEED.

C. Contractor shall be responsible for obtaining any applicable permits or licenses from any government entity that has jurisdiction to require the same. All bids submitted shall have included this cost.

D. Bidders shall insert prices for furnishing goods and services required by these specifications. Prices shall be net, including any charges for packing, crating, containers, etc. All transportation charges shall be fully prepaid by the contractor, F.O.B. destination and placement at locations specified by the owner. As specified, placement may require inside deliveries. No additional charges will be allowed for any transportation costs resulting from partial shipments made for the contractor's convenience.

VIII. STATUTORY AND OTHER REQUIREMENTS

The following are mandatory requirements of this bid and contract.

A. MANDATORY AFFIRMATIVE ACTION CERTIFICATION

No firm may be issued a contract unless it complies with the affirmative action provisions of N.J.S.A. 10:5-31 et seq. and N.J.A.C. 17:27-1 et seq. The following information summarizes the full, required regulatory text, which is included as Exhibit A of this bid specification.

1. Goods and Services (including professional services) Contracts

Each contractor shall submit to the public agency, after notification of award but prior to execution of a goods and services contract, one of the following three documents:

i. A photocopy of a valid letter that the contractor is operating under an existing Federally approved or sanctioned affirmative action program (good for one year from the date of the letter); or

ii. A photocopy of a Certificate of Employee Information Report approval, issued in accordance with N.J.A.C. 17:27-4; or

iii. A photocopy of an Employee Information Report (Form AA 302) provided by the Division and distributed to the public agency to be completed by the contractor in accordance with N.J.A.C. 17:27-4.

2. Maintenance/Construction Contracts

After notification of award, but prior to signing the contract, the contractor shall submit to the public agency compliance officer and the Division of Contract Compliance and Equal Employment Opportunity in Public Contracts (Division) an initial project workforce report (Form AA201) provided to the public agency by the Division for distribution to and completion by the contractor, in accordance with N.J.A.C. 17:27-7.

The contractor shall also submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of the contract to the Division and to the public agency compliance officer. The contractor shall also 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.

B. AMERICANS WITH DISABILITIES ACT OF 1990

Discrimination on the basis of disability in contracting for the purchase of goods and services is prohibited. Bidders are required to read Americans With Disabilities language that is included as Appendix A of this specification and agree that the provisions of Title II of the Act are made a part of the contract. The contractor is obligated to comply with the Act and to hold the owner harmless.

C. STOCKHOLDER DISCLOSURE

N.J.S.A. 52:25-24.2 provides that no corporation or partnership shall be awarded any contract for the performance of any work or the furnishing of any goods and services, unless, prior to the receipt of the bid or accompanying the bid of said corporation or partnership, bidders shall submit a statement setting forth the names and addresses of all stockholders in the corporation or partnership who own ten percent or more of its stock of any class, or of all individual partners in the partnership who own a ten percent or greater interest therein. The included Statement of Ownership shall be completed and attached to the bid proposal. This requirement applies to all forms of corporations and partnerships, including, but not limited to, limited partnerships, limited liability corporations, limited liability partnerships and Subchapter S corporations. Failure to submit a stockholder disclosure document shall result in rejection of the bid.

D. PROOF OF BUSINESS REGISTRATION

N.J.S.A. 52:32-44 requires that each bidder (contractor) submit proof of business registration with the bid proposal. Proof of registration shall be a copy of the bidder's Business Registration Certificate (BRC). A BRC is obtained from the New Jersey Division of Revenue. Information on obtaining a BRC is available on the internet at www.nj.gov/njbgs or by phone at (609) 292-1730. 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) Prior to receipt of final payment from a contracting agency, a contractor must submit to the contacting agency an accurate list of all subcontractors or attest that none was used;

3) 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 not properly provided or maintained under a contract with a contracting agency. Information on the law and its requirements is available by calling (609) 292-1730.

If boxes of the following items are checked, they are mandatory requirements of the bid proposal and contract.

[X] E. NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW ACT

The manufacturer or supplier of chemical substances or mixtures shall label them in accordance with the N.J. Worker and Community Right to Know Law (N.J.S.A. 34:5A-1 et seq., and N.J.A.C 8:59-2 et seq.,). Containers that the law and rules require to be labeled shall show the Chemical Abstracts Service number of all the components and the chemical name. Further, all applicable Safety Data Sheets (SDS) - hazardous substance fact sheet - must be furnished.

[X] F. PREVAILING WAGE ACT

Pursuant to N.J.S.A. 34:11-56.25 et seq., contractors on projects for public work shall adhere to all requirements of the New Jersey Prevailing Wage Act. The contractor shall be required to submit a certified payroll record to the owner within ten (10) days of the payment of the wages. The contractor is also responsible for obtaining and submitting all subcontractors' certified payroll records within the aforementioned time period. The contractor shall submit said certified payrolls in the form set forth in N.J.A.C. 12:60-6.1(c). It is the contractor's responsibility to obtain any additional copies of the certified payroll form to be submitted by contacting the New Jersey Department of Labor and Workforce Development, Division of Workplace Standards. Additional information is available at www.state.nj.us/labor/lsse/lspubcon.html.

[X] G. THE PUBLIC WORKS CONTRACTOR REGISTRATION ACT

N.J.S.A. 34:11-56.48 et seq. requires that a general or prime contractor and any listed subcontractors named in the contractor's bid proposal shall possess a certificate *at the time the bid proposal is submitted*. After bid proposals are received and prior to award of contract, the successful contractor shall submit a copy of the contractor's certification along with those of all listed subcontractors. All non-listed subcontractors and lower tier sub-subcontractors shall be registered prior to starting work on the project. It is the general contractor's responsibility that all non-listed sub-contractors at any tier have their certificate prior to starting work on the job.

Under the law a "contractor" is "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 provisions of the New Jersey Prevailing Wage Act [N.J.S.A. 34:11-56.25, et seq.] It applies to contractors based in New Jersey or in another state.

The law defines "public works projects" as contracts for "public work" as defined in the Prevailing Wage statute [N.J.S.A. 34:11-56.26(5)]. The term means:

- "Construction, reconstruction, demolition, alteration, or repair work, or maintenance work, including painting and decorating, done under contract and paid for in whole or in part out of the funds of a public body, except work performed under a rehabilitation program.
- "Public work" shall also mean construction, reconstruction, demolition, alteration, or repair work, done on any property or premises, whether or not the work is paid for from public funds…"
- "Maintenance work" means the repair of existing facilities when the size, type or extent of such facilities is not thereby changed or increased. While "maintenance" includes painting and decorating and is covered under the law, it does not include work such as routine landscape maintenance or janitorial services.

To register, a contractor must provide the State Department of Labor with a full and accurately completed application form. The form is available online at www.state.nj.us/labor/lsse/lspubcon.html.

N.J.S.A. 34:11-56.55 specifically prohibits accepting applications for registration as a substitute for a certificate of registration.

☒ H. NON-COLLUSION AFFIDAVIT

The Affidavit shall be properly executed and submitted with the bid proposal.

☒ I. PAY TO PLAY

Starting in January, 2007, business entities are advised of their responsibility to file an annual disclosure statement of political contributions with the New Jersey Election Law Enforcement Commission (ELEC) pursuant to N.J.S.A. 19:44A-20.27 if they receive contracts in excess of $50,000 from public entities in a calendar year.

Business entities are responsible for determining if filing is necessary. Additional information on this requirement is available from ELEC at 888-313-3532 or at www.elec.state.nj.us.

IX. METHOD OF CONTRACT AWARD

A. The length of the contract shall be stated in the technical specifications. Pursuant to requirements of N.J.A.C. 5:30-5.1 et seq., any contract resulting from this bid shall be subject to the availability and appropriation of sufficient funds annually. Please see Section X, Termination of Contract, Sub-section E, for additional information.

B. If the award is to be made on the basis of a base bid only, it shall be made to that responsible bidder submitting the lowest base bid.

C. If the award is to be made on the basis of a combination of a base bid with selected options, it shall be made to that responsible bidder submitting the lowest net bid.

D. The owner may also elect to award the contract on the basis of unit prices.

E. The form of contract shall be submitted by the owner to the successful bidder. Terms of the specifications/bid package prevail. Bidder exceptions must be formally accepted by the owner.

F. In the event that there is a discrepancy between prices written in words and written in figures, prices written in words shall govern. No bid will be accepted which does not contain a price for each and every item on the bid form.

F. The Owner will make an award of the Contract(s) under and pursuant to N.J.S.A. 40A: 11-1 et seq., (New Jersey Public Contracts Law), within sixty (60) days from the date of the receipt of bids.

X. CAUSES FOR REJECTING BIDS

Bids may be rejected for any of the following reasons:

A. All bids pursuant to N.J.S.A. 40A:11-13.2;

B. If more than one bid is received from an individual, firm or partnership, corporation or association under the same name;

C. Multiple bids from an agent representing competing bidders;

D. The bid is inappropriately unbalanced;

E. The bidder is determined to possess, pursuant to N.J.S.A. 40A:11-4b, Prior Negative Experience; or,

F. If the successful bidder fails to enter into a contract within 21 days, Sundays and holidays excepted, or as otherwise agreed upon by the parties to the contract. In this case at its option, the owner may accept the bid of the next lowest responsible bidder. (N.J.S.A. 40A:11-24b)

XI. TERMINATION OF CONTRACT

A. If, through any cause, the contractor shall fail to fulfill in a timely and proper manner obligations under the contract or if the contractor shall violate any of the requirements of the contract, the owner shall there upon have the right to terminate the contract by giving written notice to the contractor of such termination and specifying the effective date of termination. Such termination shall relieve the owner of any obligation for balances to the contractor of any sum or sums set forth in the contract. Owner will pay only for goods and services accepted prior to termination.

B. Notwithstanding the above, the contractor shall not be relieved of liability to the owner for damages sustained by the owner by virtue of any breach of the contract by the contractor and the owner may withhold any payments to the contractor for the purpose of compensation until such time as the exact amount of the damage due the owner from the contractor is determined.

C. The contractor agrees to indemnify and hold the owner harmless from any liability to subcontractors/suppliers concerning payment for work performed or goods supplied arising out of the lawful termination of the contract by the owner under this provision.

D. In case of default by the contractor, the owner may procure the goods or services from other sources and hold the contractor responsible for any excess cost.

E. Continuation of the terms of the contract beyond the fiscal year is contingent on availability of funds in the following year's budget. In the event of unavailability of such funds, the owner reserves the right to cancel the contract.

F. ACQUISITION, MERGER, SALE AND/OR TRANSFER OF BUSINESS, ETC.

It is understood by all parties that if, during the life of the contract, the contractor disposes of his/her business concern by acquisition, merger, sale and or/transfer or by any means convey his/her interest(s) to another party, all obligations are transferred to that new party. In this event, the new owner(s) will be required to submit all documentation/legal instruments that were required in the original bid/contract. Any change shall be approved by the Owner.

G. The contractor will not assign any interest in the contract and shall not transfer any interest in the same without the prior written consent of the owner.

H. The owner may terminate the contract for convenience by providing 60 calendar days advanced notice to the contractor.

I. A successful Bidder, upon failure or refusal to execute and deliver the Contract Agreement and the required bonds and insurance certificates within the time specified in the bid, shall be liable to the Owner for damages suffered. Said damages shall be defined as the difference between the amount specified in the successful bid and the amount for which the Owner may contract with another party to perform the work covered by said bid, if the latter amount is in excess of the former, together with any additional expenses incurred by the Owner as a result of such Bidder's failure to enter into the contract, including, but not limited to, the expense for re-advertisement for bids and the processing of such bids.

XII. PAYMENT

A. No payment will be made unless duly authorized by the Owner’s authorized representative and accompanied by proper documentation.

B. Payment will be made in accordance with the Owner’s policy and procedures.

EXHIBIT A
AMERICANS WITH DISABILITIES ACT OF 1990
Equal Opportunity for Individuals with Disability

The contractor and the Borough of Sea Girt, (hereafter "owner") do hereby agree that the provisions of Title 11 of the Americans With Disabilities Act of 1990 (the "Act") *(42 U.S.C. S121 01* 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 there unto, 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 that 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 other 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 the Agreement or otherwise at law.

EXHIBIT B

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 take affirmative action to ensure that such applicants are recruited and employed, 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 action 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, where applicable, will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, 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 applicable employment goal prescribed by N.J.A.C. l7:27-7.3; 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 applicable employment goal established in accordance with N.J.A.C. l7:27-7.3. 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 attempt to hire or schedule minority and

women workers directly, consistent with the applicable employment goal. 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 the applicable employment goal, the contractor or subcontractor agrees to be prepared to hire or schedule minority and women workers directly, consistent with the applicable employment goal, 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 or is so notified by the Division that the union is not referring minority and women workers consistent with the applicable employment goal.

(B) If the hiring or scheduling of a workforce consistent with the employment goal has not or cannot be achieved 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 consistent with the applicable county employment goals:

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

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

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

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

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, to assure, consistent with the applicable State and Federal statutes and court decisions, that sufficient minority and women employees remain on the site consistent with the employment goal; and to employ any minority and women workers laid off by the contractor on any other construction site on which its workforce composition is not consistent with an employment goal established pursuant to rules implementing N.J.S.A. 10:5-31 et. seq.;

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

(i) 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 determine the qualifications of such individuals and if the contractor's or subcontractor's workforce in each construction trade is not consistent with the applicable employment goal, it shall hire or schedule those individuals who satisfy appropriate qualification standards. 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.

(ii) If the contractor's or subcontractor's workforce is consistent with the applicable employment goal, the name of any interested women or minority individual shall be maintained on a waiting list for the first consideration, in the event the contractor's or subcontractor's workforce is no longer consistent with the applicable employment goal.

(iii) 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 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) provided to the public agency by the Division 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 Contract Compliance & EEO 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 Contract Compliance & EEO for conducting a compliance investigation pursuant to **Subchapter l0 of the Administrative Code (NJAC 17:27).**

BOROUGH OF SEA GIRT

BID DOCUMENT CHECKLIST*

Required by owner	Submission Requirement	Initial each required entry and if required submit the item
☒	Bid Proposal Form	
☒	Consent of Surety (with Power of Attorney for full amount of Bid Price)	
☒	Acknowledgement of Receipt of Addenda	
☒	Mandatory Affirmative Action Language	
☒	Stockholder Disclosure Certification	
☒	Non-Collusion Affidavit	
☒	Equipment Certification	
☒	Contractor's Experience Statement	
☒	List of Subcontractors	
☒	State Treasurer's List of Debarred, Suspended, and Disqualified Bidders	
☒	Prompt Payment Certification	
☒	Proof of Business Registration	
☒	Bid Guarantee (with Power of Attorney for full amount of *Bid* Bond)	
☒	Disclosure of Investments in Iran Certification	
☒	Public Works Contractor Certificate	

*This form must be submitted. It is provided for bidder's use in assuring compliance with all required documentation.

BID PROPOSAL FORM

SGRT2050 Sea Girt Water Treatment Plant Miscellaneous Improvements

Filter media replacement, flow meters, new sample bench, HVAC improvements

The undersigned proposes to furnish and delivery the below goods/services pursuant to the bid specification and made part hereof. If this bid shall be accepted by the Owner, the undersigned agrees to complete the entire work proposed under this contract within 120 consecutive calendar days and achieve the Substantial Completion status within 90 consecutive calendar days from the date specified in the "Notice to Proceed" and as indicated in the Special Conditions.

Item No.	Quantity	Item Description	Units	Unit Price	Subtotal
1	1	Mobilization and Demobilization	Lump Sum	$	$
2	1	Removal and Disposal of Existing Media	Lump Sum	$	$
3	1	Pressure Wash Filters	Lump Sum	$	$
4	15	Sand Valve Replacements (Contingency)	Each	$	$
5	1	New Filter Media	Lump Sum	$	$
6		Flow Meters			
6a	1	Refurbish Existing	Lump Sum	$	$
6b	1	Provide & Install New	Lump Sum	$	$
7	1	Disinfection and Water Quality Sampling	Lump Sum	$	$
8	1	Vessel Start-up	Lump Sum	$	$
9	1	Cash Allowance	Lump Sum	$ 10,000	$ 10,000
10	1	Replace Sampling Bench	Lump Sum	$	$
11	1	Record Documents and O&M Manuals	Lump Sum	$	$
12	1	Air Vacuum Valves	Lump Sum	$	$
13	1	Make-up Air Unit & Appurtenances	Lump Sum	$	$
14	1	Exhaust Fans & Appurtenances (qty. 3)	Lump Sum	$	$
15	1	HVAC Testing and Balancing	Lump Sum	$	$
16	1	Railing on Roof	Lump Sum	$	$
		TOTAL			**$**

_____
Total Amount in words

$_____
Total Amount in numbers

_____ _____
Company Name Federal I.D. # or Social Security #

_____
Address

_____ _____
Signature of Authorized Agent Type or Print Name

Title:_____

_____ _____
Telephone Number Date

_____ _____
Fax Number E-mail address

CONSENT OF SURETY

A performance bond will be required from the successful contractor on this project, and consequently, all bidders shall submit, with their bid, a consent of surety in substantially the following form:

To:_____
(Owner)

Re: _____
(Contractor)

_____SGRT2050 Filter Room Improvements_____
(Project Description)

This is to certify that the
_____
(Surety Company)

will provide to _____ a performance bond in
(Owner)
the full amount of awarded contract in the event that said contractor is awarded a contract for the above project.

_____
(CONTRACTOR)

_____
(Authorized Agent of Surety Company)

Date:_____

CONSENT OF SURETY MUST BE SIGNED BY AN AUTHORIZED AGENT OR REPRESENTATIVE OF A SURETY COMPANY AND NOT BY THE INDIVIDUAL OR COMPANY REPRESENTATIVE SUBMITTING THE BID.

BOROUGH OF SEA GIRT

ACKNOWLEDGMENT OF RECEIPT OF ADDENDA

The undersigned Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Dated	Acknowledge Receipt (initial)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

☐ **No addenda were received**:

Acknowledged for: _____
(Name of Bidder)

By: _____
(Signature of Authorized Representative)

Name: _____
(Print or Type)

Title: _____

Date: _____

AFFIRMATIVE ACTION COMPLIANCE NOTICE
N.J.S.A. 10:5-31 and N.J.A.C. 17:27

GOODS AND SERVICES CONTRACTS
(INCLUDING PROFESSIONAL SERVICES)

This form is a summary of the successful bidder's requirement to comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17:27-1 et seq.

The successful bidder shall submit to the public agency, after notification of award but prior to execution of this contract, one of the following three documents as forms of evidence:

(a) A photocopy of a valid letter that the contractor is operating under an existing Federally approved or sanctioned affirmative action program (good for one year from the date of the letter);

OR

(b) A photocopy of a Certificate of Employee Information Report approval, issued in accordance with N.J.A.C. 17:27-4;

OR

(c) A photocopy of an Employee Information Report (Form AA302) provided by the Division and distributed to the public agency to be completed by the contractor in accordance with N.J.A.C. 17:27-4.

The successful vendor may obtain the Affirmative Action Employee Information Report (AA302) from the contracting unit during normal business hours.

The successful vendor(s) must submit the copies of the AA302 Report to the Division of Contract Compliance and Equal Employment Opportunity in Public Contracts (Division). The Public Agency copy is submitted to the public agency, and the vendor copy is retained by the vendor.

The undersigned vendor certifies that he/she is aware of the commitment to comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17:27.1 et seq. and agrees to furnish the required forms of evidence.

The undersigned vendor further understands that his/her bid shall be rejected as non-responsive if said contractor fails to comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17:27-1 et seq.

COMPANY: _____ SIGNATURE: _____

PRINT NAME:_____ TITLE: _____

DATE: _____

STOCKHOLDER DISCLOSURE CERTIFICATION
This Statement Shall Be Included with Bid Submission

Name of Business_____

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

OR

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

Check the box that represents the type of business organization:

☐ Partnership ☐ Corporation ☐ Sole Proprietorship

☐ Limited Partnership ☐ Limited Liability Corporation ☐ Limited Liability Partnership

☐ Subchapter S Corporation

Sign and notarize the form below, and, if necessary, complete the stockholder list below.

Stockholders:

Name: _____ Name: _____

Home Address: _____ Home Address: _____

_____ _____

Name: _____ Name: _____

Home Address: _____ Home Address: _____

_____ _____

Name: _____ Name: _____

Home Address: _____ Home Address: _____

_____ _____

Subscribed and sworn before me this ___ day of
_____ , 2 __.

(Notary Public)

My Commission expires:

_____
(Affiant)

_____
(Print name & title of affiant)

(Corporate Seal)

NON-COLLUSION AFFIDAVIT

State of New Jersey
County of _____ ss:

I, _____ residing in _____
(name of affiant) (name of municipality)
in the County of _____ and State of
_____of full age, being duly sworn according to law on my oath depose and say that:

I am _____ of the firm of _____
(title or position) (name of firm)

_____ the bidder making this Proposal for the bid

entitled _____, and that I executed the said proposal with
(title of bid proposal)
full authority to do so that said bidder has not, directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the above named project; and that all statements contained in said proposal and in this affidavit are true and correct, and made with full knowledge that the _____ _____relies upon the truth of the statements contained in said Proposal
(name of contracting unit)
and in the statements contained in this affidavit in awarding the contract for the said project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, except bona fide employees or bona fide established commercial or selling agencies maintained by
_____.

Subscribed and sworn to

before me this day _____
Signature

_____, 2____

_____
(Type or print name of affiant under signature)

_____
Notary public of

My Commission expires _____

(Seal)

EQUIPMENT CERTIFICATION

The undersigned Bidder hereby certifies as follows:

The bidder owns or controls all the necessary equipment required to accomplish the work described in the specifications. List equipment below (add additional sheet if necessary):

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Name of Bidder: _____

By: _____
(Signature)

Name of above: _____
(Print)

Title: _____

Date:_____

CONTRACTOR'S EXPERIENCE STATEMENT

The bidder is requested to state below what work of a similar character to that included in the proposed contract (s)he has done, and give references that will enable the Owner to judge his/her experience, skill and business standing.

Bidders and proposed subcontractors may be required to submit additional information regarding their respective financial condition prior to the award of the contract.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Add supplementary page(s) if necessary.

LIST OF SUBCONTRACTORS

As per the requirements of N.J.S.A. 40A:11-16, the following subcontractors must be listed if applicable. Additionally, all subcontractors shall be qualified in accordance with P.L. 1971, c. 198 (C40A:11-1 et seq.).

_____ **Initial Here If None**

Type of Work	Name and Address
Plumbing Work	_____
	_____
	_____
Electrical	_____
	_____
	_____
Structural Steel & Ornamental Work	_____
	_____
	_____
HVAC Work	
	_____
	_____
	_____
Other	_____
	_____
	_____

Add supplementary page if necessary.

STATE TREASURER'S LIST OF DEBARRED, SUSPENDED AND DISQUALIFIED BIDDERS

The Contractor shall submit with his /her bid a sworn statement, as set forth herein signed by an officer or partner of the Contractor, indicating whether or not the Contractor is at the time of the bid, included on the State Treasurer's List of Debarred, Suspended, or Disqualified Bidders. The Contractor will immediately notify the Owner whenever it appears that a Contractor is on the State Treasurer's List. The Contractor may be debarred, suspended or disqualified from contracting with the State of New Jersey and NJDEP if the Contractor commits any of the acts listed in N.J.A.C. 7:1D-2.2.

STATE OF NEW JERSEY _____

§:

COUNTY OF _____

I, _____ of the City of _____ in the

County of _____ and the State of _____ of full age, being duly

sworn according to law on my oath depose and say that:

I am _____, an officer of the firm of

_____ the bidder making the Proposal for the above named work, and that I executed the said Proposal with full authority to do so that said bidder at the time of making of this bid, is not included on the State of New Jersey, State Treasurer's List of Debarred, Suspended and Disqualified Bidder; and that all statements contained in said Proposal and in this affidavit are true and correct, and made with the full knowledge that the Owner as Local Unit relies upon the truth of the statements contained in said Proposal and in the statements contained in this affidavit in awarding the contract for said work.

The undersigned further warrants that should the name of the firm making this bid appear on the State Treasurer's List of Debarred, Suspended and Disqualified Bidders at anytime prior to, and during the life of this Contract, including the Guarantee Period, that the Borough of Sea Girt shall be immediately notified by the signatory of this Eligibility Affidavit.

The undersigned understands that the firm making the bid as a Contractor is subject to debarment, suspension and/or disqualification in contracting with the State of New Jersey and the Department of Environmental Protection if the Contractor, pursuant to N.J.A.C. 7:1D-2.2 commits any of the acts listed therein, and as determined according to applicable law and regulation.

_____

(Insert Name and Address of Contractor)

_____

(Insert Name and Title of Affiant)

Subscribed and sworn
before me this _____ day
of _____ 20___

_____

Notary Public of _____
My commission expires _____, 20___

PROMPT PAYMENT CERTIFICATION

I make this certification on behalf of myself as a representative of the contractor named below ("Contractor") and on behalf of the Contractor. I certify that for each application for payment submitted in connection with this project: (1) the work covered by that application for payment has been completed in accordance with the contract documents; (2) the payment requested is due; and (3) all amounts have been paid by the Contractor for work for which previous payments were issued. No application for payment will be submitted without Contractor having paid all subcontractors and suppliers their share of any funds received by Contractor pursuant to any previous application(s) for payment. I understand and acknowledge that this entire certification will be considered incorporated into every request for payment. I understand and acknowledge that if Contractor submits an application for payment without (1) having completed work in accordance with the contract documents, (2) payment requested being due, and/or (3) having paid all subcontractors and suppliers their share of any funds received by Contractor pursuant to any previous application(s) for payment, then Contractor has submitted a false claim and false certification, subjecting Contractor to liability, damages and penalties under the New Jersey False Claims Act, N.J.S.A. 2A:32C-1 et seq.

If there is some legitimate reason Contractor cannot timely pay a subcontractor or supplier, then Contractor must submit a signed certification or affidavit to the owner/government entity fully explaining the situation, when the situation arose, and when it will be resolved. A failure to submit such an explanatory certification waives any defenses Contractor may later seek to assert in connection with liability under the New Jersey False Claims Act, N.J.S.A. 2A:32C-1 et seq. or any other law, including N.J.A.C. 7:1D et seq.

I further understand and acknowledge that a false certification, whether express or implied, that (1) the work covered by an application for payment has been completed in accordance with the contract documents, (2) the payment requested is due, and/or (3) all amounts have been paid by the Contractor to subcontractors or suppliers for work for which previous payments were issued, is misleading with respect to the goods and services Contractor is providing.

I also understand and acknowledge that the requirements that (1) work has been completed in accordance with the contract documents, (2) the payment requested is due, and (3) all amounts have been paid by the Contractor for work for which previous payments were issued, are material to the State's decision to allocate State funding dollars for this contract, and also material to any local government entity's decision to retain and make payment to the contractor. I understand and acknowledge that if owner/government entity makes payment knowing of such violations, that does not demonstrate that the requirements are not material, and does not constitute a waiver of liability under the New Jersey False Claims Act, N.J.S.A. 2A:32C-1 et seq. To the contrary, Contractor recognizes that owner/government entity may decide to continue to pay Contractor due to contractual and/or logistical requirements or considerations.

Additionally, I understand and acknowledge that a false certification, whether express or implied, that (1) the work covered by an application for payment has been completed in accordance with the contract documents, (2) the payment requested is due, and/or (3) all amounts have been paid

by the Contractor for work for which previous payments were issued, constitutes legitimate grounds for debarment pursuant to N.J.A.C. 7:1D et seq.

_____ _____
(Signature) (Date)

_____
(Name and Title of Signer – Please Type)

BUSINESS REGISTRATION CERTIFICATE

A Business Registration Certificate serves two purposes:

- **For public contracting, as proof of valid business registration with the New Jersey Division of Revenue.** All contractors and subcontractors must provide this documentation when seeking to do business with the State of New Jersey, and other public agencies in this state.
- **To comply with Chapter 85, P.L. 2006, defined under N.J.S.A. 54A:7-1.2.** You must use the Business Registration Certificate if you are an unincorporated construction contractor performing work in New Jersey of you are a registered unincorporated contractor requesting proof of certification.

If you are a registered vendor but have not received the Business Registration Certificate in the mail, you may obtain a certificate online. Please note that this certificate is not required by all businesses in New Jersey, but only those doing business with the public sector.

You may check the online registration inquiry to determine if the business is already registered. If you have not registered but are required to have this certificate, you will need to complete Form NJ-REG. Representatives of the Division's Client Registration activity are available to assist in the registration process. **609-292-9292.**

****The links for the Business Registration Certificate and the NJ-REG will be listed at the end of this document.****

Form NJ-REG:

In most cases, you may submit Form NJ-REG online. Exceptions and additional requirements include:

- Any business including an out-of-state business with a presence or nexus in New Jersey, operating as a **corporation, limited partnership, limited liability company or limited liability partnership** must first obtain legal authority to operate in the state prior to submitting Form NJ-REG. Generally, this is accomplished by filing a Certificate of Incorporation or Formation with the Division.
- **Out-of-state businesses** that believe they do not have state tax nexus will file a paper form NJ-REG in order to obtain a Business Registration Certificate. Business entities that file form NJ-REG only will be subject to a nexus review, initiated and conducted by the Division of Taxation.
- **Individuals or Unincorporated Construction Contractors** with no business tax of employer obligations may register using Form NJ-REG-A instead of Form NJ-REG in order to obtain the Business Registration Certificate. Individuals who have created and are operating as a business entity (e.g. LLC) may not use Form REG-A.
- **Non-profit organizations** although required to register for tax purposes are not subject to the proof registration requirement when contracting with public agencies in this state.

Instructions on obtaining required forms:

To obtain a **Business Registration Certificate**: www.state.nj.us/treasury/revenue

1. Click on “I WANT TO” --- Obtain a Business Registration Certificate
2. Click on “Obtain a Certificate Online” (blue print)
3. Fill out name and Tax Payer ID **or** Business Entity ID
4. Click “submit” and follow direction.

To register for **Form NJ-REG** online as well as **NJ-REG paper forms & directions** and **NJ-REG-A**: www.nj.gov/treasury/revenue

1. (Left side) Click on “Form & Register a New Business”
2. Follow directions.

BID GUARANTEE

KNOW ALL MEN BY THESE PRESENTS, that we _____

_____, Hereinafter called the Principal, as Principal, and the _____, of _____ a corporation duly organized under the laws of the State of _____, hereinafter called the Surety, as Surety, are held and firmly bound unto _____

_____

hereinafter called the Obligee, in the sum of _____

_____ Dollars

($_____), for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, The Principal has submitted a bid for _____

_____

_____

_____

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such contract, for the prompt payment of labor and material furnished in the prosecution thereof and in the Maintenance thereof, or in the event of the failure of the Principal to enter such contract and give such bond or bonds, if the Principal shall pay to the obligee the difference, not to exceed the penalty hereof, between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.
SIGNED AND SEALED this _____ day of _____ A.D. 20____

In the presence of:

_____(Seal)

PRINCIPAL

_____	_____
WITNESS	TITLE
	_____(Seal)
	SURETY
_____	_____(Seal)
WITNESS	TITLE

THIS AGREEMENT, entered into this ___ day of _____, 202_

BETWEEN

BOROUGH OF SEA GIRT
a municipal corporation of the State of New Jersey
having its principal office at
321 Baltimore Blvd., Sea Girt, NJ 08750

herein called “Borough”,

AND

Name
Address
City, State, Zip

herein called “Contractor”

WHEREAS, by virtue of authority under the laws of the State of New Jersey vested in the Borough, request for proposals were solicited and were received for the Project known as _____ in the Borough of Sea Girt (the “project”) were received on or before _____, 202_, and

WHEREAS, the contract was thereafter awarded to the Contractor hereinbefore named by the Mayor and Council of the Borough of Sea Girt on the ____ day of _____, 202_, and the Local Public Contracts Law requires that a formal contract should be executed by and between the Borough and the Contractor;

WITNESSETH, therefore, that the parties hereto, in consideration of the mutual agreements herein contained, mutually undertake, promise and agree for themselves, their respective successors and assigns as follows:

1. The Contractor shall perform the Project known as _____in the Borough of Sea Girt provided for in the awarded bid, and shall perform all services and supply documents described in the bid specifications for this project, in strict accordance with this Contract and Local Public Contract Law, and the terms and conditions of the successful bid for a total consideration of $_____ .

2. This contract shall consist of the following:

A. Bid Specifications (or Request for Proposal) and plans prepared by the Borough, together with any addenda relating thereto.

B. The Proposal and Bid submitted by the Contractor, including all documents, submissions and representations contained therein.

C. The Resolution of award made by the Mayor and Council of the Borough.

D. All the terms of the within agreement and all provisions required by law to be inserted in this Contract, whether actually inserted or not.

3. All provisions, representations and attachments which make up Contractor's successful bid package are represented to be true and accurate, and Contractor agrees and represents that it, its owners, agents, employees and representatives reaffirm same and shall be bound by same. All provisions of the contract relating to the time of performance and completion of the project are of the essence of this contract. Work shall within ten (10) days of the date of award and work shall be completed no later than _____ (__) days after commencement of work..

4. The Contractor must comply with all local, state and federal laws, rules and regulations applicable to this contract.

5. No extension of time for completion of contract work shall be granted by anyone, except the Mayor and Council of the Borough, by resolution, upon written application therefore by the Contractor. The Mayor and Council shall have sole discretion to grant any

extension upon such terms as it deems proper and may require Contractor to submit written reasons for any delay. The within paragraph shall not affect any liquidated damage provision which may be contained within this Contract.

6. The Contractor represents that if there is a subcontractor associated with its performance of this Contract, that it shall hold the Borough harmless and indemnify it, including damages, attorney's fees and costs, against any claims by said subcontractor(s). The above not withstanding, if Contractor is aware, or becomes aware, of the one or any other subcontractor making a claim related to the subject matter of this Contract, the Contractor shall provide to the Borough Clerk a statement from each and every subcontractor that the subcontractor is subordinate and subject to the within Contract and that there is no obligation on the part of the Borough to pay to, or to see to the payment of any sums to any subcontractor.

7. Performance and Payment Bond, Maintenance Bond and Protective Policy and Certificates of Insurance covering worker's compensation and occupational diseases, public liability and property damage, fire and all risk insurance, as may be required, shall be filed with the Municipal Clerk and shall be subject to approval of the Mayor and Council of the Borough or their designee for adequacy of protection.

8. The Contractor shall not assign, transfer, convey or otherwise dispose of this Contract, or his right, title or interest in or to it, or any part thereof, or assign, by power of attorney or otherwise, any of the moneys due or to become due under this Contract, without the previous written consent of the Mayor and Council of the Borough, as evidenced by a duly passed Resolution of said Mayor and Council.

9. The Performance and Payment Bond, Maintenance Bond and Protective Policy and Certificates as required under the Bid Specifications (or Request for Proposal) and

paragraph _____ herein above shall be filed with the Borough Clerk within the time periods set forth in the Request for Proposal.

10. Payments shall be made to the Contractor within thirty days of the submission of a voucher, unless other payment arrangements are prescribed by an applicable plan or specifications, or unless Council or CFO approval cannot be obtained within that time period, in which case payment shall be made as soon thereafter as possible. No payment shall constitute a waiver and/or an accord and satisfaction of any claims by the Borough for penalty, liquidated damage or otherwise which may be provided for in this contract in connection with the project. Application for any payment or payments shall be on an approved voucher form of the Borough, which form may be secured from the Borough Clerk.

11. The Contractor represents and warrants that:

A. It is financially solvent and sufficiently experienced and competent to comply with the bid specifications and perform the work without claims from third parties.

B. The facts stated in its bid and the information given by it pursuant to the form of proposal are true and correct in all respects, both at the time given and through and at least until all conditions and terms of this contract and the law are fulfilled and met.

C. It has read and complied with all the requirements set forth in the contract documents specified in detail in this contract.

D. Applicable State Law. Contractor hereby reaffirms, and agrees to comply with, the mandatory Equal Employment Opportunity language and provisions as required by N.J.S.A. 10:5-31 et. seq. (P.L. 1975, C. 127), N.J.A.C. 17:27, as well as all business registration requirements under the law.

12. During the performance of this contract, the Contractor further agrees as follows:

A. To comply with N.J.A.C. 17:27-3.1 et. seq. promulgated by the Treasurer pursuant to P.L. 1975, c. 127, as amended and supplemented from time to time.

B. The parties to this contract agree to incorporate into this contract the mandatory language of N.J.A.C. 17:27-3.5(a) promulgated by the Treasurer pursuant to P.L. 1975, c. 127, as amended and supplemented from time to time, and vendor shall fully comply with same.

C. The parties to this contract agree to incorporate into this contract the mandatory language of N.J.A.C. 4.1 et. seq. and N.J.A.C. 17:27.5.1 et. seq. promulgated by the Treasurer pursuant to P.L. 1975, c. 127, as amended and supplemented from time to time and the Vendor agrees to comply fully with same.

D. Pursuant to N.J.A.C. 17:27-3.7(a), the Contractor agrees to make good faith efforts to meet targeted county employment goals established in accordance with N.J.A.C. 27-5.2, to the extent applicable.

E. In the event the inclusion of any of the above provisions is inconsistent with Title 17 of the New Jersey Administrative Code, the parties to this contract agree such provision(s) or part(s) thereof is hereby deleted.

F. The Contractor is responsible for assuring the quality and technical accuracy of all documents and representations contained in its accepted bid. In the event that the Contractor fails to perform the work agreed to in compliance with this Contract, State and local law, the bid specifications and its bid and representations, the Borough may terminate the Contract in accordance with State Statutes and Administrative Code, and the Borough may recover any and all costs and fees as provided by Statute or Regulation.

G. Each Contractor shall submit to the public agency, after notification of award but prior to execution of a goods and services contract, one of the following three documents:

   i. Appropriate evidence that the Contractor is operating under an existing Federally approved or sanctioned affirmative action program;

   ii. A certificate of employee information report approval, issued in accordance with N.J.A.C. 17:27-4; or

   iii. An employee information report (Form AA302) electronically provided by the Division and distributed to the public agency, through the Division's website, to be completed by the Contractor, in accordance with N.J.A.C. 17:27-4.

H. Contractor shall assure that its subcontractors comply with the registration and certification requirements set forth herein.

And it is further understood and agreed that the covenants, conditions and agreements herein contained are binding on the parties hereto, their successors, assigns and legal representatives.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be signed by their respective authorized officers and the proper corporate and/or municipal seals affixed hereto, the date and year first above written.

ATTEST: BOROUGH OF SEA GIRT

_____ BY: _____

LORRAINE P. CARAFA, RMC
Municipal Clerk

KEN FARRELL
Mayor

Contractor

ATTEST: _____

BY: _____

_____ _____

GENERAL CONDITIONS

1.0 GENERAL

The general conditions of the contract outline certain general responsibilities of the Owner and the Contractor (who are the parties to the contract).

2.0 DEFINITIONS

Whenever the words defined in this section or pronouns used in their stead occur in the contract documents, they shall have the meanings given herein.

ADDENDA - Written or graphic instruments issued prior to the execution of the agreement which modify or interpret the contract documents by additions, deletions, clarifications or corrections.

AGREEMENT - The written agreement between the Owner and the Contractor covering the work to be performed; other contract documents are attached to the Agreement and made a part thereof as provided herein.

BID - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the work to be performed.

BIDDER - Any person, firm or corporation submitting a bid for the work.

BONDS - Bid, performance, payment bonds, maintenance bonds and other instruments of security, furnished by the Contractor and his surety in accordance with the contract documents.

BOROUGH – Borough of Sea Girt

CHANGE ORDER - A written order to the Contractor authorizing an addition, deletion or revision in the work within the general scope of the contract documents, or authorizing an adjustment in the contract price or contract time.

CONTRACT DOCUMENTS - The contract, including advertisement for bids, instructions to bidders, bid, bid bond, agreement, labor and material payment bond, performance bond, notice of award, notice to proceed, change order, drawings, specifications and addenda.

CONTRACT PRICE - The total monies payable to the Contractor under the terms and conditions of the contract documents.

CONTRACT TIME - The number of calendar days stated in the contract documents for the completion of the work.

CONTRACTOR - The person, firm or corporation with whom the Owner has executed the agreement.

DRAWINGS - The part of the contract documents which show the characteristics and scope of the work to be performed and which have been prepared or approved by the Engineer.

ENGINEER - The Engineer for the Borough of Sea Girt.

FIELD ORDER - A written order effecting a change in the work not involving an adjustment in the contract price or an extension of the contract time issued by the Resident Engineer to the Contractor during construction.

FINAL CONTRACT ACCEPTANCE - Acceptance of the work after a final inspection has been made and work accepted by the Owner.

NOTICE OF AWARD - The written notice of the acceptance of the bid from the Owner to the successful bidder stating that upon compliance by the successful bidder with the conditions precedent enumerated therein within the time specified, Owner will sign and deliver the Agreement.

NOTICE TO PROCEED - Written communication issued by the Owner to the Contractor authorizing him to proceed with the work and establishing the date of commencement of the work.

OWNER - The Owner is the Borough of Sea Girt.

PROJECT - The undertaking to be performed as provided in the contract documents.

RESIDENT ENGINEER - The authorized representative of the Owner who is assigned to the project site or any part thereof.

SHOP DRAWINGS - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the work shall be fabricated or installed.

SPECIFICATIONS - A part of the contract documents consisting of written descriptions of a technical nature of materials, equipment, construction systems, standard and workmanship.

SUBCONTRACTOR - An individual, firm or corporation having a direct contract with the Contractor or with any other subcontractor for the performance of a part of the work at the site.

SUBSTANTIAL COMPLETION - That date as certified by the Engineer when the construction of the project or a specified part thereof is sufficiently completed, in accordance with the contract documents, so that the project or specified part can be utilized for the purposes for which it is intended.

SUPPLIER - Any person or organization who supplies materials or equipment for the work, including that fabricated to a special design.

WORK - All labor necessary to produce the construction required by the contract documents and all materials and equipment incorporated or to be incorporated in the project.

WRITTEN NOTICE - Any notice to any party of the agreement relative to any part of the agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or their authorized representative at the work site.

3.0 CORRELATION AND INTENT OF CONTRACT DOCUMENTS

3.1 INTENT

It is the intent of the specifications and plans to describe a complete project to be constructed in accordance with the contract documents. Any work that may reasonably be inferred from the specifications or plans as being required to produce the intended result shall be supplied whether or not it is specifically called for. An omission from one drawing, if shown elsewhere on the contract drawings, is considered to be part of the contract work. The contract documents comprise the entire agreement between the Owner and the Contractor.

3.2 CORRELATION OF DOCUMENTS

The contract documents are complementary; that is, what is called for by one is as binding as if called for by all. If the Contractor finds a conflict, error or discrepancy in the contract documents, they will call it to the attention of the Engineer in writing before proceeding with the work affected thereby.

If a conflict is found on the drawings, figure dimensions shall govern over scale dimensions.

3.3 APPLICATION OF SPECIAL REQUIREMENTS

Each Contractor and Subcontractor shall be responsible for making himself aware of and shall specifically comply with all special requirements of the contract documents.

It shall be the responsibility of each Contractor and Subcontractor to be aware of, and comply with such other conditions included in the contract documents as may be applicable to the contract. It is not intended that all requirements with regard to the conduct of the work be included in any one section of the contract documents.

3.4 DISCREPANCIES, ERRORS AND OMISSIONS

The plans and specifications are intended to be explanatory of each other, but should any discrepancy or any misunderstanding arise as to the import of anything contained therein, the interpretation and decision of the Engineer shall be final and binding.

Any correction of errors or omissions in plans and specifications may be made by the Engineer when such correction is necessary for the proper fulfillment of the intention as construed by them. Where

correction of errors or omissions, except as provided in the following two paragraphs, adds to the amount of work to be done by the Contractor, compensation for said additional work shall be made under the item for extra work, except where the additional work may be classed under some item of work for which a unit price is included in the bid.

Any work performed after the discovery of an error or omission in the plans or specifications, without the written approval of the Resident Engineer shall be at the risk and expense of the Contractor.

All work, materials and equipment indicated on the plans and not mentioned in the specifications, or vice versa, and all work and materials usual and necessary to make the work complete in all its parts, whether or not they are mentioned in the specifications, shall be furnished and executed the same as if they were called for on both the plans and specifications, but will not entitle the Contractor to consideration of any claim for extra compensation.

On all work of a remodeling nature or installation to an existing structure the actual situation of the site controls any information given which may affect the quantity, size and quality of materials required for a satisfactorily completed contract, whether or not such information is indicated on the plans or within the specifications.

3.5 ADDITIONAL INSTRUCTIONS AND DETAILED DRAWINGS

The Contractor may be furnished supplementary working drawings as necessary to carry out the work included in the contract. Supplementary working drawings will be issued when necessary to show changes or define the work in more detail and they shall also be considered as contract plans.

3.6. COMPLIANCE WITH LAWS

The Contractor shall keep fully informed of all existing and future state and national laws and municipal ordinances and regulations in any manner affecting those engaged or employed in the work, the materials and equipment used in the work, or the conduct of the work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. If any discrepancy or inconsistency is discovered in the specifications or other documents for the work in relation to any such law, ordinance, regulation, order or decree, the Contractor shall forthwith report the same to the Resident Engineer in writing. The Contractor shall at all times observe and comply with, and cause all their agents and employees to observe and comply with all such existing and future laws, ordinances, regulations, orders and decrees, and he shall protect and indemnify the Owner, its officers, and agents against any claim or liability arising from or based upon violation of any such law, ordinance, regulation, order or decree, whether by themselves or their employees. Unless legal construction of the contract states to the contrary elsewhere in the contract documents, the law of the place or building shall govern the construction of this contract.

The Contractor shall comply with the Department of Labor, Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standard Act (PL 91-54).

The Contractor's attention is directed to the provisions of Section 4 (b) (4) of The Occupational Safety and Health Act of 1970 as follows:

"Nothing in this act shall be construed to supersede or in any manner affect any workman's compensation law or to enlarge or diminish or affect in any manner the common law or statutory rights, duties, or liabilities of employers and employees arising out of, or in the course of, employment."

3.7 PROVISIONS REQUIRED BY LAW DEEMED INSERTED

Each and every provision of law or clause required by law to be inserted in this contract shall be deemed to be inserted herein, and the contract shall be read and enforced as though they were included herein. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the contract shall forthwith be physically amended to make such insertion.

4.0 RESPONSIBILITIES AND OBLIGATIONS OF CONTRACTOR

4.1 GENERAL

The Contractor shall and will, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this contract, within the time herein specified, in accordance with the provisions of this contract and said specifications, in accordance with the drawings covered by this contract any and all supplemental plans and drawings, and in accordance with the directions of the Resident Engineer as given from time to time during the progress of the work. He shall furnish, erect, maintain, and remove such construction plant and such temporary works as may be required.

All work shall be done under the direct supervision of the Contractor. The Contractor shall provide a safe place for the performance of the work by the contractors, suppliers, and their employees, and for access, use, work, or occupancy by all authorized persons.

The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements, and limitations of the contract documents, and shall do, carry on, and complete the entire work to the satisfaction of the Owner and Engineer.

The Contractor shall in no way be relieved of their responsibility under this contract by any right of the Resident Engineer to give permission or issue orders relating to any part of the work, by any such permission given or orders issued, or by failure of the Resident Engineer to give such permission or issue such orders.

4.2 SEPARATE CONTRACTS

The Contractor shall coordinate their 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 Contractor and the subcontractors shall keep informed of the progress and the work details of other contractors and shall notify the Resident Engineer immediately of lack of progress or defective workmanship on the part of other contractors. 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 of others shall be construed as acceptance by them of the status of the work as being satisfactory for proper coordination with their own work.

4.3 MUTUAL RESPONSIBILITY OF CONTRACTORS

If, through acts of neglect on the part of the Contractor, any other Contractor or subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other Contractor or subcontractor by agreement if such other Contractor or subcontractor will also settle. If such other Contractor shall assert any claim against the Owner on account of any damage alleged to have been sustained the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any such claims.

4.4 SUBCONTRACTING

(A) The Contractor may utilize the services of specialty subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty subcontractors.

(B) The Contractor shall not assign or sublet any part of the work without prior written acceptance by the Owner. Acceptance by the Owner will be based on written statements from the Contractor containing such information on the requested assignment as the Owner may require. Acceptance of subcontractors by the Owner will not be made until after award of the contract of the Contractor.

(C) The Contractor shall be as fully responsible to the Owner for the acts and omissions of their subcontractors, and of persons either directly or indirectly employed by them, as they are for the acts and omissions of persons directly employed by them.

(D) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the general conditions and other terms of the contract documents insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract as the Owner may exercise over the Contractor under any provisions of the contract documents.

(E) Nothing contained in this contract shall create any contractual relation between any subcontractor and the Owner.

4.5 PROTECTION OF WORK AND PROPERTY

The Contractor shall continuously maintain adequate protection of all their work and materials from damage or theft and shall protect the Owner's property and all adjacent property from injury or loss arising in connection with activities under this contract. The Contractor shall make good any such

damage, injury, or loss, except such as may be directly due to errors in the contract documents or such as may be caused by agents or employees of the Owner.

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. They shall take all necessary precautions for the safety of and will provide the necessary protection to prevent damage, injury or loss to all employees on the work and other persons who may be affected thereby, all the work and all materials or equipment to be incorporated therein, whether in storage on or off the site and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavement, roadway, structures and utilities not designated for removal, relocation or replacement in the course of construction. They shall designate a responsible member of their organization on the work, whose duty shall be the prevention of accidents, and the name of the person so designated shall be reported to the Owner in writing. In an emergency affecting the safety of life, or of the work or adjoining property, the Contractor, without special instruction or authorization from the Resident Engineer is hereby permitted to act at their discretion to prevent such threatened loss or injury, and they must take such action as instructed or authorized by the Resident Engineer.

Nothing in this contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached to the work or the soil, but all such materials shall, upon being so attached or affixed, become the property of the Owner.

4.6 INDEMNITY

The Contractor shall indemnify and save harmless the Owner and the Owner's agents, and employees, from and against all losses and claims, demands, payments, suits, actions, recoveries, and judgments of every nature and description brought or recovered against them by reason of any act or omission of the said Contractor, their subcontractors, their agents, or employees, in the execution of the work or in guarding same.

4.7 NON-INTERFERENCE WITH AND PROTECTION OF PUBLIC

The Contractor shall conduct their work so as to interfere as little as possible with private business and public travel. Wherever necessary or required, and at their own expense, they shall maintain fences, furnish watchmen, maintain lights and take such precautions as may be necessary to protect life and property.

4.8 SUPERVISION OF WORK

The Contractor shall give the work the constant attention necessary to facilitate the progress thereof and shall cooperate with the Resident Engineer in every possible way.

At all times, the Contractor shall have as their agent on the work a competent superintendent, who is acceptable to the Owner and capable of reading and thoroughly understanding the plans and specifications. The superintendent on the work shall have full authority to act for the Contractor and to execute the orders or the directions of the Resident Engineer without delay and supply promptly

such materials, equipment, tools, labor and incidentals as may be required. It shall be the responsibility of the superintendent to coordinate the work of all subcontractors.

The Contractor shall not sell and shall neither permit nor suffer the introduction or use of intoxicating liquors upon or about the work embraced in this contract.

4.9 ASSIGNMENT

The Contractor shall constantly give their personal attention to the faithful prosecution of the work, shall keep the same under their personal control, shall not assign, by power of attorney or otherwise, or sublet the work as a whole or substantial part of whole, without the previous written consent of the Owner and shall not either legally or equitably assign any of the monies payable under this agreement, or their claim thereto, unless by and with the like consent of the Owner and the surety on the Bonds.

4.10 LABOR PROVISIONS

The Contractor shall employ only competent persons to perform the work, and shall discharge, whenever ordered to do so by the Owner any employee who is disorderly or whose conduct in the opinion of the Owner is detrimental to the prosecution of the work.

No person whose age or physical condition is such as to make their employment dangerous to their health and safety or to the health and safety of others shall be employed on the work.

4.11 NIGHT AND SUNDAY WORK

No work shall be done at night or on Sunday except (1) usual protective work, such as pumping and the tending of lights, fires and heating apparatus, (2) work done in case of emergency threatening injury to persons or property, or (3) if all the conditions set forth in the next paragraph below are met.

No work other than included in (1) and (2) above shall be done at night except when (A) in the opinion of the Resident Engineer the work will be of advantage to the Owner and can be performed satisfactorily at night and in accordance with Borough Ordinances, (B) the work will be done by a group organized for regular and continuous night work, and (C) the Resident Engineer has given written permission for such night work. Work hours are from 8:00 a.m. to 5:00 p.m. unless indicated otherwise in Special Conditions Section. The contractor's work schedule shall conform to the Borough of Sea Girt Utilities Holiday schedule, no work can be performed on holidays unless approved 10 days in advance.

4.12 BOROUGH OF SEA GIRT HOLIDAY SCHEDULE

The following are the holidays recognized by the Borough of Sea Girt:

New Year's Day, Martin Luther King Day, Lincoln's Birthday, President's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, Thanksgiving, Day after Thanksgiving, and Christmas Day.

4.13 WAGE RATES

All laborers, workers and mechanics shall be paid the prevailing rate of wage for the type of work to be done in the territory in which it is to be performed. The violation of the foregoing provision shall constitute a breach of the contract, and the foregoing provisions shall be considered to be a contract for the benefit of the workers, laborers and mechanics upon which such laborers, workers, and mechanics shall have the right to maintain action for the difference between the prevailing rate of wage and the rate of wage actually received by them. In case any dispute arises as to the amount of the prevailing rate of wage, such dispute shall be referred to the Commissioner of Labor of the State of New Jersey, or to such other person as will be designated by the Commissioner of Labor as an arbitrator to settle such dispute, and the parties shall be bound by the decision of such arbitrator.

The Contractor shall note that the "Prevailing Wage Rate Determination" pursuant to Chapter 150 of the New Jersey Laws of 1963, New Jersey Department of Labor and Industry, of current date and applicable to the location of the work, is made a part of this contract. Prevailing wage rates are included at the end of this Section.

Contractors and subcontractors performing the described work shall post the prevailing wage rates for each craft and classification involved as herein determined in prominent and easily accessible places at the site of the work or at such place or places as are used to pay workmen their wages.

Contractor shall pay the greater of either the State or Federal Prevailing Wage Rate.

The payroll of each Contractor and each subcontractor must be certified as follows:

> "I certify that the payroll is correct and complete, that the wage rates contained therein are not less than the applicable rates contained in the wage decision of the New Jersey Department of Labor and that the classification set forth for each laborer or mechanic conforms with the work he performs."

_____
SIGNATURE

_____
Typed Name and Title

4.14 EMPLOY SUFFICIENT LABOR AND EQUIPMENT

If in the opinion of the Resident Engineer the Contractor is not employing sufficient labor and equipment to complete this contract within the time specified, the Resident Engineer may, after giving written notice, require the Contractor to employ such additional labor and equipment as may be necessary to enable the work to progress properly. If the Contractor continues after receiving such notice to prosecute the work in an insufficient manner, the Owner may terminate the contract or

take over part of the work as specified in Article 5.2 of the General Conditions entitled "OWNER'S RIGHT TO TAKE OVER THE WORK."

4.15 ACCESS TO WORK

For purposes already specified and for any other purpose, the Owner, the Engineer and their agents and employees may enter upon the work and the premises used by the Contractor and the Contractor shall provide safe and proper facilities therefore.

Representatives of Federal, State, County and Local Government Departments may enter the work site for the purpose of inspection and verifying that their requirements are being fulfilled. The Contractor shall provide them the same facilities as they would the Owner.

4.16 EXAMINATION OF THE WORK

The Owner, the Engineer, and their representatives, at all times, shall be furnished with every reasonable facility for ascertaining that the equipment and materials used and employed and the workmanship are in accordance with the requirements and intentions of the contract documents. All work done and all materials furnished shall be subject to their inspection and acceptance. If any work should be covered up without acceptance or consent of the Resident Engineer, it must be uncovered for examination at the Contractor's expense, if required by the Resident Engineer.

Re-examination of questioned work may be ordered by the Resident Engineer and if so ordered, the work must be uncovered by the Contractor. If such work is found in accordance with the contract documents, the Owner shall pay the cost of re-examination as extra work, but if such work is found not in conformance with the contract documents the cost of re-examination and replacement shall be at the Contractor's expense.

The inspection of the work shall not relieve the Contractor of any of their obligations to fulfill their contract as prescribed and unacceptable work shall be made good and unsuitable materials shall be rejected notwithstanding that such unacceptable work and materials have been previously overlooked and accepted on estimates for payment. All work shall be tested to the satisfaction of the Owner and the Resident Engineer before acceptance.

4.17 UNACCEPTABLE WORK

The Contractor shall promptly remove from the premises all work and materials rejected by the Resident Engineer as failing to conform to the contract documents, whether incorporated or not, and the Contractor shall promptly replace and re-execute their own work in accordance with the contract.

If the Contractor does not correct such defective work or remove and replace such rejected work within a reasonable time, all as specified in a written notice, the Owner may have the deficiency corrected or the rejected work removed and replaced. All direct or indirect costs of such correction or removal and replacement, including compensation for additional professional services, shall be paid by the Contractor, and an appropriate deductive change order shall be issued. The Contractor

will also bear the expenses of making good all work of others destroyed or damaged by correction, removal or replacement of their defective work.

4.18 MISTAKES OF CONTRACTOR

The Contractor shall make good any defect, omission, or mistake for which they or their employees are responsible, or they shall pay to the Owner all expenses, losses, and damages incurred there from as determined by the Resident Engineer.

4.19 FACILITIES AND UTILITIES

The Contractor shall be deemed to have examined the site and to have secured full knowledge of all conditions under which the work is to be executed and completed, including the available roadway, rail and other approaches to the site and the space available for work areas, storage and for temporary offices and sheds.

The site and approach facilities are to be used with due regard for the Owner's requirements and the requirements of others who may have been engaged by the Owner. If it should become necessary to move the materials or facilities of the Contractor, they shall do so upon request of the Owner, and any expense so incurred shall be borne by the Contractor unless the request involves a movement from a previously approved working or storage area.

4.20 PRICES FOR WORK

The Owner shall pay, and the Contractor shall receive, the prices stipulated in the Bid Form as full compensation for everything furnished and done by the Contractor under this contract, including all work required but not specifically mentioned, and also for all loss or damage arising out of the nature of the work aforesaid, from the action of the elements, or from any unforeseen obstruction or difficulty encountered in the prosecution of the work, for all expense incurred by or in consequence of the suspension or discontinuance of the work as herein specified, and for well and faithfully completing the work and the whole thereof, as herein provided.

4.21 SUSPENSION OF WORK

Should the Owner be prevented or enjoined from proceeding with the work either before or after the start of construction by reason of any litigation or other reason beyond the control of the Owner, the Contractor shall not be entitled to make or assert claim for damage by reason of said delay, but time for completion of the work will be extended to such reasonable time as the Owner may determine will compensate for time lost by such delay with such determination to be set forth in writing.

4.22 DELAYS AND EXTENSION OF TIME

If the Contractor is delayed at any time in the progress of the work by any act or neglect of the Owner or of any employee or by changes ordered in the work, or by lockouts, fire, unavoidable casualties, or by delay authorized by the Resident Engineer or by any cause which the Resident

Engineer shall decide to justify the delay, then the time of completion may be extended for such reasonable time as the Owner may decide.

No such extension shall be made for a delay occurring more than ten (10) days before a claim therefore is made in writing to the Resident Engineer. In the case of a continued cause of delay, only one claim is necessary.

4.23 EMERGENCY SERVICES TO CORRECT HAZARDOUS CONDITIONS

The Contractor shall maintain a telephone number at all times after regular working hours, including weekend and holidays, where they or their representative shall be prepared to act to correct conditions on the site deemed to constitute an emergency by either the Owner, their designated agent, the Resident Engineer, or local authorities but shall not wait for instructions before proceeding to properly protect both life and property. If a condition on the site requires attention after working hours, either the OWNER, their designated agent, Resident Engineer, or local authority shall call the Contractor or their representative at the emergency telephone number, identify themselves and describe the emergency condition. The Contractor is expected to dispatch personnel and equipment to adequately institute corrective measures within two (2) hours. If for some reason the Contractor or their representative cannot be reached at the emergency number after a reasonable time (1/2 hour), the Owner shall have the right to initiate corrective measures immediately.

In the event that the Contractor fails to maintain safe job conditions and traffic conditions, including, but not limited to, trench settlement and hazardous piling or storage of backfill or construction materials, after failure of the Contractor to commence substantial steps at the job site to rectify the situation within two (2) hours of the time the Contractor has been notified of the unsafe condition, the Owner may hire guards, take such precautions, make such repairs and take any other steps which the Owner or the Owner's agent in its discretion, considers necessary to protect the property, persons, or the Owner. The cost of any of these precautions, guards, or steps shall be deducted from the payments due the Contractor, and the Contractor will be billed for these services, work and material at prevailing rates.

4.24 PRIVATE AND PUBLIC PROPERTY

The Owner will acquire all property including rights-of-way and easements necessary for construction. Any land and access thereto not specifically shown to be furnished by the Owner that may be required for temporary construction facilities or for storage of materials shall be provided by the Contractor with no liability to the Owner. The Contractor shall confine their apparatus and storage to such additional areas as they may provide at their expense.

The Contractor shall not enter upon private property for any purpose without obtaining permission of the property owner and shall be responsible for the preservation of all public property, trees, monuments, structures and improvements, along and adjacent to the street or right-of-way, and shall use every precaution necessary to prevent damage or injury thereto. The Contractor shall use suitable precautions to prevent damage to pipes, conduits, and other underground structures, and shall protect carefully all monuments and property marks from disturbance or damage until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until directed.

4.25 TIME FOR COMPLETION AND LIQUIDATED DAMAGES

The contract documents are intended to be between the Contractor and the Owner. The date of beginning and the time for completion as specified in the agreement of the work to be done hereunder are essential conditions of this contract, and it is mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the "Notice to Proceed".

The Contractor agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed by and between the Contractor and the Owner that the time for the completion of the work described herein is a reasonable time for completion, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

The Contractor and the Owner recognize that delay in completion of the project will result in damage to the Owner in terms of the effect of the delay in the use of the project, and will also result in additional cost to the Owner for engineering, inspection and administration of the contract. Because some of this damage is difficult or impossible to estimate, the parties agree that if the Contractor fails to complete the project and each and every part and appurtenance thereof fully, entirely and in conformity with the provisions of the contract within the time stated in the contract, the Contractor shall pay the Owner liquidated damages, in accordance with the following schedule, in lieu of the above stated actual damage. Such liquidated damages shall be paid for each and every calendar day, as hereinafter defined, that the Contractor is in default on time to complete the work.

SCHEDULE OF LIQUIDATED DAMAGES FOR EACH CONSECUTIVE CALENDAR DAY OF OVERRUN IN CONTRACT TIME

ORIGINAL CONTRACT AMOUNT		LIQUIDATED DAMAGES
From More Than	To and Including	Per Calendar Day
$ -0-	$ 10,000	$ 100
10,000	25,000	150
25,000	50,000	250
50,000	100,000	375
100,000	500,000	500
500,000	1,000,000	750
1,000,000	2,000,000	1,000
2,000,000	5,000,000	2,000
5,000,000	10,000,000	5,000
10,000,000	20,000,000	4,000
20,000,000	---	5,000

If the completion date or revised completion date of the contract is such that final landscaping cannot be performed due to seasonal restrictions, an extension of time to begin at the startup of the next planting and seeding season will be allowed to complete that portion of the contract. If the Contractor extends the final landscaping beyond this additional planting season, liquidated damages will be charged for the planting work.

It is further agreed that time is of the essence of each and every portion of this contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever, and where under the contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this contract, provided that the Contractor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor is without fault and the Contractor's reasons for the time extension are acceptable to the Owner, provided further, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to:

(A) Any preference, priority or allocation order duly issued by the United States Government,

(B) Unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, strikes, fires, floods, epidemics, quarantine restrictions, freight embargoes, and severe weather, and

(C) Any delays of subcontractors or suppliers occasioned by any of the causes specified in sub-sections (A) and (B) above.

Provided, further, that the Contractor, within ten (10) days from the beginning of such occurrence unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, shall notify the Owner, in writing, of the causes of the delay. The Owner shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.

If the Contractor does not finish their work within the time for completion specified, the Owner shall have full authority to and may deduct and retain from the final estimate an amount to cover the actual cost of inspection services paid by the Owner from the time of completion specified and the date the Contractor fully completes the contract.

Extensions of time may be granted by the Owner by reason of unusual difficulty or for other causes deemed by the Owner to be good and sufficient, and the Owner will waive the inspection costs aforesaid for the time of such extensions provided, however, that the Contractor shall pay any other cost or damage attendant upon or resulting from any and all such extensions, and provided further that requests for extensions shall be accompanied by an approval, in writing, by the surety company appearing as such on the bonds furnished by the Contractor in accordance with this contract.

4.26 ACCESS TO RECORDS

The Contractor shall maintain books, records, documents, drawings, field records and other evidence directly pertinent to performance of work under this agreement in accordance with accepted professional practice, appropriate accounting procedures and practices. Borough of Sea Girt, the State of New Jersey Department of Labor and Industry, the State of New Jersey Department of Environmental Protection or any of their duly authorized representatives shall have access to such books, records, documents, drawings, field records and other evidence for the purpose of inspection, audit and copying. The Contractor will provide proper facilities for such access and inspection.

5.0 RESPONSIBILITIES AND OBLIGATIONS OF THE OWNER

5.1 GENERAL

NOT USED

5.2 LAND OF OWNER, USE OF, BY CONTRACTOR

The Owner shall provide the necessary land and easements upon which the work under this contract is to be done, and will, so far as is necessary, permit the Contractor to use as much of the land and easements as is required for the erection of temporary construction facilities and storage of materials, together with the right of access to same, but beyond this, the Contractor shall provide, at their cost and expense, any additional land required.

5.3 OWNER'S RIGHT TO TAKE OVER THE WORK

If the Contractor should be adjudged bankrupt, or if they should make a general assignment for the benefit of their creditors, or if a receiver should be appointed to take over their affairs, or if they should fail to prosecute their work with due diligence and carry the work forward in accordance with their work schedule and the time limits set forth in the contract documents, or if they should fail to substantially perform one or more of the provisions of the contract documents to be performed by them, the Owner may serve written notice on the Contractor, stating its intention to exercise one of the remedies hereinafter set forth and the grounds upon which the Owner bases its right to exercise such remedy.

In any event, unless the matter complained of is satisfactorily cleared within ten (10) days after service of such notice, the Owner, without prejudice to any other right or remedy, may exercise one of such remedies at once.

(A) The Owner may terminate the services of the Contractor, which termination shall take effect immediately upon notice thereof on the Contractor and their surety, where upon the surety shall have the right to take over and perform the contract. If the surety does not commence performance of the contract within ten (10) days after service of the notice of termination, the Owner may take over the work, take possession of and use all materials that have been delivered to the site and paid for, and prosecute the work to completion by such means as it shall deem best. In the event of such termination of their service, the Contractor shall not be

entitled to any further payment under the contract until the work is completed and accepted. If the Owner takes over the work and if the unpaid balance of the contract price when the Owner takes over the work exceeds the cost of completing the work, including compensation for any damages or expenses incurred by the Owner through the default of the Contractor, such excess shall be paid to the Contractor. In such event, if such cost, expenses, and damages shall exceed such unpaid balance of the contract price, the Contractor and their surety shall pay the difference to the Owner. Such costs, expenses and damages shall be certified by the Engineer.

(B) The Owner may take control of the work and either make good the deficiencies of the Contractor itself or direct the activities of the Contractor in doing so, employing such additional help as the Owner deems advisable. In such event the Owner shall be entitled to collect from the Contractor and their surety, or to deduct from any payment then or thereafter due the Contractor, the costs incurred by it through the default of the Contractor, provided the Owner approves the amount thus charged to the Contractor.

(C) The Owner may require the surety on the Contractor's bond to take control of the work at once and see to it that all the deficiencies of the Contractor are made good with due diligence. As between the Owner and the surety, the cost of making good such deficiencies shall all be borne by the surety. If the surety takes over the work, either upon termination of the services of the Contractor or upon instructions from the Owner to do so, the provisions of the contract documents shall govern in respect to the work done by the surety, the surety being substituted for the Contractor as to such provisions including provisions as to payment for the work and provisions of this section as to the right of the Owner to do the work itself or to take control of the work.

5.4 RIGHT OF OCCUPANCY

The Owner shall have the right if necessary, to take possession of and to use any completed or partially completed portions of the work, even if the time for completing the entire work or such portions of the work has not expired and even if the work has not been finally accepted. Such possession and use shall not constitute final contract acceptance of such portions of the work. The Owner shall also have the right to enter the premises for the purpose of doing work not covered by its contract with the Contractor.

5.5 PERMITS

The Owner, at their own expense, will obtain certain permits from the Federal Government, State, County and other agencies as required for the project. The permits are listed in the "Special Conditions." The Contractor, at their own expense, shall obtain permits to use explosives for rock excavation and such other permits as are required by law to be obtained by the Contractor. When necessary or appropriate, the Contractor shall assist the Owner in the acquisition of permits.

5.6 TERMINATION OF CONTRACT FOR CONVENIENCE OF OWNER

The Owner in its sole and absolute discretion, may, for its convenience, terminate the Contract without prior notice. Upon that event the Contractor shall:

A. Promptly demobilize and remove all equipment and materials from the project; and

B. Shall be entitled to compensations limited to:

1. Payment for work performed at the contract price contained in the schedule of values;
2. The actual cost of work not the subject of a contract price in the schedule of values;
3. The actual cost of demobilization;
4. Equipment/goods cancellation and restocking charges; and
5. Overhead at 10% and Profit at 10% on items payable above under paragraphs 2, 3 and 4.

6.0 AUTHORITY OF THE ENGINEER

6.1 ENGINEER'S STATUS DURING CONSTRUCTION

The Engineer shall act as the Owner's consultant in support of and through the Resident Engineer. The duties and responsibilities and the limitations of authority of the Engineer during construction are set forth in these general conditions and shall not be extended without written consent of the Owner and the Engineer.

Neither the Engineer nor the Resident Engineer is responsible for the Contractor's means, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and will not be responsible for Contractor's failure to perform the work in accordance with the contract documents.

The Engineer will have the authority to disapprove or reject work which is defective, and will also have authority to require special inspection or testing of the work whether or not the work is fabricated, installed or completed.

Neither the Engineer's authority to act under this Article nor any decision made by them in good faith either to exercise or not to exercise such authority shall give rise to any duty or responsibility of the Engineer to the Contractor, any subcontractor, any of their agents or employees or any other person performing any of the work.

The Engineer will issue a final Certification for Payment based on the recommendations of the Resident Engineer indicating the work has been completed in accordance with the Contract Documents, with exceptions noted thereon.

The Engineer will witness the start up and testing of the equipment and will approve the work for final acceptance.

All work called for under this contract shall be done and performed to the satisfaction of the Engineer. The Engineer shall in all cases decide the quantity, quality, acceptability and fitness of the several kinds of work to be performed and materials to be furnished under this contract. The Engineer shall decide all questions which may arise as to the interpretation of any part of the Contract Documents, including without limitation the plans and specifications, as to the fulfillment of this contract on the part of the Contractor. The decision and determination, should any question arise, shall be a condition precedent to the right of the Contractor to receive payment.

6.2 ENGINEER'S INTERPRETATIONS AND DECISIONS

The Engineer, through the Resident Engineer, will issue with reasonable promptness such written clarifications or interpretations (in the form of drawings or otherwise) as he may determine necessary for the proper execution of the work, such clarifications and interpretations to be consistent with or reasonably inferable from the overall intent of the Contract Documents. If the Contractor believes that a written clarification and interpretation entitles him to an increase in the contract price or contract time, they may make a claim therefore as provided in Article 7.

The Engineer will be the initial interpreter of the terms and conditions of the contract documents and the judge of the performance there under. In their capacity as interpreter and judge, they will exercise their best efforts to insure faithful performance by both the Owner and the Contractor. They will not show partiality to either and shall not be liable for the results of any interpretation or decision rendered in good faith. Claims, disputes and other matters relating to the execution and progress of the work or the interpretation of or performance under the contract documents shall be referred initially to the Resident Engineer who will refer it to the Engineer for decision, which they shall render in writing within a reasonable time.

7.0 CONDUCT OF THE WORK

7.1 QUANTITIES OF ESTIMATE

Wherever the estimated quantities of work to be done and materials to be furnished under this contract are shown in any of the documents, including the bid, they are given for use in comparing bids and the right is specially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the OWNER to complete the work contemplated by this contract, and such increase or decrease shall not give cause for claims or liability for damages. A variation in actual quantities from bid quantities that exceeds fifteen percent (15%) will require an evaluation as to whether or not renegotiation is necessary.

7.2 NEGOTIATIONS OF CONTRACT AMENDMENTS, CHANGE ORDERS AND EXTRA WORK.

This section covers changes in contract scope or contract time. Changes in contract scope shall be work which was not included in the scope of the work at the time of forming the contract, and will

not be construed to mean work for which unit bids were received but the actual quantities differ from the bid quantities as a result of field measurement or field survey. Changes in the unit prices of cut categories will not be renegotiated if actual quantities deviate from bid quantities.

The Resident Engineer, without invalidating the contract, may order extra work or make changes in the work, adjusting the contract amount or contract time by a written change order. All such work shall be executed under the conditions of the original contract. The Owner or their representative shall have the authority to make minor changes in the work not involving extra cost and not inconsistent with the scope of the work. On changes involving extra work or changes in contract time, the Resident Engineer will direct the Contractor in writing to proceed with the designated changes. The Contractor shall commence work upon receipt of the written order. Until the value of the change order has been agreed upon by the Resident Engineer and Contractor using Methods A, B or C described hereafter, time and material records will be kept as described in Method C.

Except in an emergency endangering life or property, no extra work or change shall be made unless ordered in writing by the Resident Engineer and no claim for an addition to the contract amount shall be valid unless so covered.

The value of such extra work or change shall be determined by one or more of the following:

METHOD A Unit prices or combinations of unit prices which formed the basis of the original contract or included in previous change orders and which shall be considered to include all Contractor's overheads and profit. The Resident Engineer, at their sole discretion, may use prices for items of similar work contained in a Contractor's bid item breakdown for lump sum contracts. These items shall be considered to include allowances for overhead and profit.

METHOD B A lump sum based on the Contractor's estimate and accepted by the Resident Engineer which shall include overhead and profit in accordance with the allowances given in Method C below.

METHOD C Actual Costs, Plus Overhead and Profit

Actual Costs are defined as follows:

(A) Hourly actual wage rate for all workers directly assigned to the specific operation including the foreman, but excluding wages and salaries paid to other administrative or supervisory personnel.

(B) Fringe benefits including, but not limited to, health and welfare, pension and vacation funds.

(C) Actual cost of all material used and incorporated into the permanent construction, including freight and delivery charges as shown on original receipted bills. For all materials not incorporated into permanent construction, but necessarily involved in the performance of the work, the Contractor shall receive an amount equal to the

actual cost of such materials when they are no longer required for the performance of the work.

(D) Actual additional cost of Contractor's general, public liability and property damage insurance, workman's compensation insurance, social security tax, state unemployment compensation contributions and state temporary disability benefits, and other types of insurance which may be required for the performance of the increased work.

(E) Actual Contractor's equipment cost, including fuels and lubricants. If not in conformance with the associated equipment distributor's standard rental rates or the rental rate blue book rates the Contractor must submit documentation for the rate. Equipment and tools having a value of less than $50 are considered to be part of overhead as defined below. Fuels and lubricants consumed by equipment shall be included in their rental costs.

(F) Costs for the preparation of shop drawings or cost estimates which cost shall be indicated separately in the change order. On change orders initiated by the Contractor, the cost of shop drawings or cost estimates will not be allowable.

(G) Actual cost of subcontracted work.

Allowable Percentages for Overhead and Profit shall be as follows:

(A) For extra work not in excess of $10,000., the Contractor may add 10% to cover job site and home office overheads and 10% profit (excluding subcontracted work).

(B) For subcontracted work not in excess of $10,000., a total markup of 10% is allowed to cover the contractor's overheads and profit.

(C) For extra work in the range of $10,000 to $100,000., the overheads and profit will be negotiated between the Contractor and the Resident Engineer.

(D) Change Order work shall commence promptly upon receipt of a fully executed change order or upon written directive by the Resident Engineer to proceed with the work. Any delays in starting or expeditiously pursuing the work will be charged against the contractor.

In signing a Change Order, the Contractor signifies that their markups per overhead and profit include job site and home office overhead.

The Resident Engineer shall select a combination of any or all of the above methods for determining the charge for contract amendments, change orders or extra work.

If the Resident Engineer selects Method A, "Unit Prices," or Method B, "Lump Sum," the Contractor must furnish sufficient documentation to allow the Resident Engineer to determine the reasonableness of the unit price or lump sum proposed. This documentation may include, but is not limited to, such items as purchase orders or invoices for equipment or material which is to be incorporated into the work, detailed quantities of material to be used, detailed estimates of labor and equipment, and any other such items which may be required. Documentation for the unit price and lump sum charges must be submitted in the same format required for the submission of costs under Method C.

If the Resident Engineer selects Method C, the Contractor shall keep daily records of such extra work and shall notify the Resident Engineer 24 hours before commencement of work. The daily records shall include the names of men employed and hours worked, materials and equipment incorporated, and machinery used, if any, in the prosecution of such extra work. This daily record shall be signed by the Contractor's authorized representative and (if accepted) by the Resident Engineer verifying the work accomplished and the materials and labor expended. Separate daily records shall be submitted for each contract change order. Payment for extra work shall be made in accordance with the Resident Engineer's accepted records of time, rentals and materials used. Rental of equipment shall be charged against the extra or changed work only for the actual time the equipment is used specifically therefore.

If said work requires the use of machinery not on the job, the cost of transportation of such machinery to and from the work, not exceeding a distance of 100 miles, shall be added to the rental.

Changed work shall be adjusted, with separate consideration for the work added and the parts omitted. Amount of adjustment for parts omitted shall be estimated at the time omission of work is authorized and the agreed adjustments will be deducted from or added to the subsequent monthly estimates.

The Contractor's attention is especially called to the fact that they shall be entitled to no claim for damages from anticipated profits on any portion of work that may be omitted.

7.3 EXTENSION OF TIME

When the contract is amended or extra work is ordered near the completion of the contract or when changes are ordered at any time during the progress of the work, which requires an unavoidable increase of time for the completion of the contract, in the opinion of the Resident Engineer, a suitable extension of the time for completion shall be granted as a part of the Change Order for the extra work.

7.4 CHANGES NOT TO AFFECT BONDS

It is distinctly agreed and understood that any changes made in plans and specifications for this work or otherwise in the scope of work to be performed by the Contractor, whether such changes increase or decrease the amount thereof, or any change in the manner or time of payments made by the Owner to the Contractor shall in no way annul, release or affect the liability and surety on the bonds given by the Contractor.

7.5 CLAIMS FOR EXTRA COST

If the Contractor claims that any changes in the work or any clarification or interpretations by means of drawings or otherwise involve extra cost, they shall give the Resident Engineer written notice thereof within twenty (20) calendar days after receipt of such instructions or of notice of such changes and, in any event, before proceeding to carry out such instructions to put such changes into effect, except in case of an emergency endangering life or property. In all such cases the Contractor shall keep a correct account of the extra cost in such form as the Resident Engineer may direct and shall present such account supported by receipts to the Resident Engineer who shall pass upon the claim. The Owner shall be entitled to reject any claim for extra cost in which the foregoing procedure is not followed.

7.6 ALTERNATE DISPUTE RESOLUTION

Pursuant to P.L. 1997, c. 371 (40A: 11-50) all construction contract documents shall provide that disputes arising under the contract shall be submitted to a process of resolution pursuant to alternative dispute resolution practices prior to being submitted to a court for adjudication. Accordingly, any dispute arising under the contract which cannot be resolved between the Borough and the Contractor, shall be submitted to mediation, binding arbitration or non-binding arbitration pursuant to industry standards, prior to being submitted to a court for adjudication. Binding arbitration shall not be invoked except upon the written consent of the Owner and the Contractor.

In case of a dispute the Borough or the Contractor may make a demand for mediation by filing such demand in writing with the other party. The demand shall be made within sixty (60) days after the dispute first arises or it is deemed waived. If the Borough and the Contractor agree on a single individual selection there shall be one mediator. If no agreement is reached within thirty (30) days after demand for mediation, there shall be three (3) mediators, one named in writing by the Borough and the second by the Contractor within fifteen (15) days after demand for mediation, and a third chosen by the two who are appointed. The single mediator's decision shall be binding or if there are three (3) mediators, the decision of any two of them shall be binding.

Should either the Borough or the Contractor refuse or neglect to appoint a mediator or to furnish the mediator with any necessary papers or information, they are empowered by both parties to proceed ex parte. The decision of the mediator shall be a condition precedent to any right of legal action that either party may have against the other.

The mediators, if they so deem, are authorized to award to the party whose contention is upheld such sums as they deem proper for the time, expense, and trouble incident to the appeal, and, if the appeal was taken without reasonable cause, damages for delay. The compensation for the mediators shall be agreed upon in advance by the parties, and the mediator shall assess the costs and charges of the mediation on either or both parties.

The work shall not be interrupted or delayed during any mediation proceeding except on written agreement by both parties.

7.7 ADDITIONAL OR SUBSTITUTE BOND

If at any time, for justifiable cause, the Owner shall be or become dissatisfied with any surety or sureties indicated on the performance or labor and material bonds, the Contractor, within five (5) days after notice from the Owner to do so, shall substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished such an acceptable bond to the Owner.

7.8 WORK TO CONFORM

All work shall conform, during progress and on completion, and remain truly to the line, levels and grades indicated on the plans or given in writing by the Resident Engineer and shall be built in a thoroughly substantial and workmanlike manner, in accordance with the plans and specifications and directions given from time to time by the Resident Engineer. In no case shall any work in excess of the plan requirements and specifications be paid for unless ordered in writing by the Resident Engineer.

All work done without instructions having been given by the Resident Engineer or done without proper lines or levels, or done during the absence of the Resident Engineer or their agent, will not be estimated or paid for except when such work is authorized by the Owner in writing. Work so done may be ordered uncovered or taken down, removed and replaced at the Contractor's sole cost and expense.

7.9 RECORD DRAWINGS

The Owner shall be responsible for the preparation of all final record drawings. The Contractor shall assist the Owner by providing field record information as the work progresses. This information shall be in the form of blue line prints, with changes marked in red.

8.0 FINAL COMPLETION AND PAYMENTS

8.1 PROGRESS SCHEDULE

No later than thirty (30) days after award of the contract, the Contractor shall submit to the Resident Engineer a schedule showing in detail the planned progress of the work. The schedule shall show start and finish dates for each important portion of the work, including all necessary testing. No contractor request for progress payments will be processed until an acceptable schedule has been reviewed and accepted by the Resident Engineer. Progress schedules must be kept up to date on a weekly basis. Unacceptable schedules will be returned to the Contractor.

8.2 PROGRESS ESTIMATES AND PAYMENTS

Final progress payment applications are due by the first of each month. At least 5 days before each monthly progress payment falls due for approval (but not more often than once per month), the

Contractor will submit to the Resident Engineer a partial payment estimate filled out and signed by the Contractor, covering the work performed during the period covered by the partial payment estimate and supported by such data as the Resident Engineer may reasonably require. Where any specific item(s) in the partial payment estimate is in dispute, the Resident Engineer may delete those costs from the estimate and approve the acceptable portion of the payment request. Payment requested for stored materials and/or equipment shall be subject to the following conditions being met or satisfied:

A. The materials and/or equipment shall be received in a condition satisfactory for incorporation in the work.

B. The materials and/or equipment shall be stored in such manner that they will not be damaged due to weather, construction operations or any other cause.

C. An invoice from the supplier shall be furnished for each item on which payment is requested.

D. The Contractor shall furnish written proof from the supplier of 90 percent payment for the materials and/or equipment no later than 30 days after receipt of payment for same from the Owner. The Owner shall have the right to deduct from the next payment estimate an amount equal to the payment for said material and/or equipment if reasonable and adequate proof is not submitted.

The Contractor warrants and guarantees that title to all work materials and equipment covered by an Application for Payment whether incorporated in the project or not, will pass to the Owner upon the receipt of such payment by the Contractor free and clear of all lien, claims, security interests or encumbrances (except 10 percent retention which may be withheld from suppliers and subcontractors to guarantee completion and performance). The owner will withhold 10 % for retainage of materials payments. The Resident Engineer, after receipt of each partial payment estimate, will indicate in writing either their approval of payment and present the partial payment estimate to the Owner, or return the partial payment estimate to the Contractor indicating in writing their reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate. The Owner shall review the partial payment estimate at its next regularly scheduled meeting and if approved payment shall be made available to the Contractor within five days. The Owner shall retain not more than two percent of the amount of each payment claimed.

When the work is substantially complete (Operational or Beneficial Occupancy), the withheld amount shall be further reduced below two percent but not less than twice the current market value of the work yet to be completed. On completion and acceptance of a part of the work on which the price is stated separately in the Contract Documents, payment shall be made in full, including retained percentages, less authorized deductions.

8.3 PROGRESS PAYMENTS

Partial payments to the Contractor will be made by the Owner on the fourth Friday of each calendar month, or as soon thereafter as practicable, on the basis of a duly certified and approved estimate

made by the Resident Engineer of the work performed during the preceding calendar month under this contract. Such partial payments will be made, provided that the Contractor is performing the overall job in a diligent manner. In making partial payments, two percent on the amount of each estimate will be retained until final completion and final contract acceptance of all work covered by the contract.

The Owner will retain two percent (2%) of the payments claimed, provided the Contractor's progress and performance are judged satisfactory by the Resident Engineer.

It is agreed that this is an entire contract for one whole and complete work and that no partial payments on account by the Owner nor the use of parts of the proposed equipment shall constitute an acceptance of any part of the work before its entire completion and final contract acceptance.

8.4 PAYMENTS WITHHELD

The Owner may withhold or nullify the whole or part of an estimate on account of subsequently discovered evidence to such extent as may be necessary to protect the Owner from loss on account of:

(A) Unacceptable work not remedied or work only partially completed.

(B) Claims filed or reasonable evidence indicating probable filing of claims.

(C) Failure of the Contractor to make payments properly to subcontractor or for material or labor.

(D) A reasonable doubt that the contract can be completed for the balance then unpaid.

(E) Failure of the Contractor to keep their work progressing in accordance with their progress schedule.

(F) Failure to submit certified payrolls (including subcontractors) corresponding to the time period covered by the payment request.

(G) Failure to submit work schedules as required.

When the above grounds are removed, payment shall be made for amounts withheld because of them.

8.5 MEASUREMENT OF QUANTITIES

Scheduled items of work completed under this contract will be measured for payment by the Resident Engineer as provided in the specifications and according to United States standard measures. The Resident Engineer will make all necessary measurements for certification of quantities for payment.

8.6 SUBSTANTIAL COMPLETION

When the Contractor considers that the work, or a designated portion thereof which is acceptable to the Owner, is substantially complete as defined in Section 2 of the General Conditions, the Contractor shall prepare a list of items to be completed or corrected for submission to the Resident Engineer. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents. When the Resident Engineer, on the basis of an inspection, determines that the work or designated portion thereof is substantially complete, the Engineer shall prepare a Certificate of Substantial Completion which shall, (1) establish the date of substantial completion, (2) state the responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the work and insurance and, (3) fix the time within which the Contractor shall complete the items listed therein.

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 Owner and the Contractor for the written acceptance of the responsibilities assigned to them in such Certificate.

On substantial completion of the work or designated portion thereof and upon application by the Contractor and certification by the Engineer, the Owner shall make payment, reflecting adjustment and retainage, if any, for such work or portion thereof, as provided in the Contract Documents.

8.7 FINAL COMPLETION AND FINAL PAYMENT

Upon receipt of written notice that the work is ready for final inspection and acceptance by the Owner and upon receipt of final application for payment, the Engineer and Resident Engineer will promptly make such inspection. When the Engineer finds the work acceptable under the Contract Documents, the Engineer will promptly issue a final certification for payment, stating to the best of their knowledge, information and belief, and, on the best basis of their observation and inspections, that the work has been completed in accordance with the terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor is due and payable.

Neither the final payment nor the remaining retained percentage shall become due until the Contractor submits to the Owner (1) an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work for which the Owner might, in any way, be responsible, have been paid or otherwise satisfied, (2) Contractor's Release, (3) Consent of Surety to Final Payment, (4) Certification of Prevailing Rate of Wage on Public Contracts, (5) Maintenance Bonds and (6) 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. (7) such other data required by the Owner establishing payment or satisfaction of all such obligations.

If, after substantial completion of the work, final completion thereof is materially delayed through no fault of the Contractor, or by the issuance of change orders affecting final completion, and the Resident Engineer so confirms, the Owner shall, upon application by the Contractor and certification by the Engineer, and without terminating the Contract, make payment of the balance due for that

portion of the work fully completed and accepted. If the remaining balance of the work not fully completed or corrected is less than the retainage stipulated in the Contract Documents, the written consent of the Surety to the payment of the balance due of that portion of the work fully completed and accepted shall be submitted by the Contractor to the Owner prior to the certification of such payment. Such payments shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims by either party against the other.

8.8 LIENS

If at any time before the expiration of the period within which claims must be entered under the Municipal Mechanics Lien Law N.J.S.A. 2A:44-125, or if not otherwise specified by law, within thirty (30) days after the whole work herein agreed to be performed and all the labor and materials herein agreed to be delivered have been performed, delivered, or completed and accepted by the OWNER, any person or persons claiming to have performed any labor or furnished any materials and equipment toward the performance or completion of this contract shall file suitable notice with the Owner. The Owner may retain, until the discharge thereof, from the monies under its control all or so much of such money as shall be sufficient to satisfy and discharge the amount claimed to be due in such notice, together with the cost of any action or actions brought to enforce such lien created by the filing of such notice.

Monthly progress and final payment waivers for Contractors Affidavit of Release of Liens are required for all sub-contractors, suppliers and vendors on a form acceptable to the Owner.

8.9 ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE

The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of this work. With acceptance of final payment, the Contractor shall sign a Contractor's Release relieving the Owner of all further claims arising from the contract. No payment, final or otherwise, shall operate to release the Contractor or their sureties from any obligations under this contract or the performance and labor and material bond.

9.0 MISCELLANEOUS

9.1 NOTICE AND SERVICE THEREOF

Any notice to any Contractor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted by certified or registered mail to the said Contractor at their last given address, or delivered in person to the said Contractor or their authorized representative on the work.

9.2 TAXES

The Contractor shall study all tax laws for the jurisdiction in which the work is being done, particularly so-called sales and use taxes for which they may be liable as a consumer or user of

goods. The Owner is a tax-exempt organization and such taxes shall not be included in the bid amounts.

9.3 GUARANTEE

The Contractor guarantees that the work to be done under this contract and the workmanship performed and the materials and equipment used in the construction of the same, shall be free from defect or flaws, that each item or equipment shall be in accordance with the specifications, that the strength of all parts of all manufactured equipment shall be adequate and that the performance test requirements of the specifications shall be fulfilled. The guarantee period shall be for two years after the date of final acceptance of the work by the Owner as stated on the certificate of final completion or as required by the detailed specifications, and the Contractor shall repair or replace, promptly and without charge, all work, equipment, and material or parts thereof, as required, which fail to meet the above guarantee during the periods herein quoted.

The guarantee period shall be applicable only as against the bond and shall in no way affect the Owner's right of recovery for breach of any express or implied warranties as such shall be governed by N.J.S.A. 12A-2-1 et seq. and any other applicable remedies.

9.4 WAIVERS

Neither inspection by the Resident Engineer, nor any order, measurement, or certificate, nor any payment for or acceptance of the whole or any part of the work by the Owner nor any extension of time, nor any possession taken by the Owner or its employees shall operate as a waiver of any provision of this contract, or any power herein reserved to the Owner, of any right of the Owner for breach of any implied or expressed warranties of this contract as such will be governed by N.J.S.A. 12A-2-1 et seq. and any other applicable remedies, or any right to damages herein provided, nor shall the waiver of any breach of this contract be held to be a waiver of any subsequent breach. Any remedy provided in this contract shall be taken and construed as cumulative, that is, in addition to each and every other remedy herein provided and in addition to other suits, actions, or legal proceedings, the Owner shall also be entitled as of right to a writ of injunction against any breach of any of the provisions of this contract.

9.5 PATENTS

The Contractor shall hold and save harmless the Engineer and the Owner, its officers, agents, servants, and employees from liability of any nature or kind, including cost and expenses for or on account of any patented or un-patented invention, process, article, or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents.

License or royalty fees for the use of a process which is authorized by the Owner of the project must be reasonable, and paid to the holder of the patent, or their authorized licensee, direct by the Owner and not by or through the Contractor.

If the Contractor used any design, device, or material covered by letters patent or copyright, they shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood that, without exception, the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor or their sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract, and shall indemnify the Owner for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

9.6 CONTRACT DOCUMENTS

The successful bidder will be furnished a maximum of five (5) additional copies of the Contract Documents without charge after award of the contract.

9.7 CONTRACTOR'S WARRANTY OF TITLE

The Contractor warrants and guarantees that title to all work, materials and equipment covered by an application for payment, whether incorporated in the project or not, will have passed to the Owner prior to the making of the application for payment, free and clear of all liens, claims, security interests in encumbrances, and that no work, materials or equipment covered by an application for payment will have been acquired by the Contractor or by any other person performing the work at the site or furnishing materials and equipment for the project to an agreement under which an interest therein or encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

SPECIAL CONDITIONS

1.0 NORMAL WORKING HOURS

Construction operations and activities shall be limited to daylight hours Monday through Friday between the hours of 7:00 A.M. and 5:00 P.M. unless variances to these times are granted in times of emergency.

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. The number of machines in operation at a given time shall be limited to the minimum practicable. All engine generators or pumps shall have mufflers and be enclosed within a temporary structure.

No work shall be done at night, or on Saturdays, or on Sundays, or Holidays in accordance with the General Conditions, Section 4.11 with the exception of what is specifically indicated herein. Holiday schedule shall conform to the holiday schedule established by the Borough of Sea Girt. The Contractor shall conform to this schedule when establishing their work schedule. The holidays are as follows:

1. New Years Day;
2. Lincoln's Birthday;
3. President's Day;
4. Good Friday;
5. Memorial Day;
6. Independence Day;
7. Labor Day;
8. Columbus Day;
9. Election Day;
10. Veteran's Day;
11. Thanksgiving Day;
12. Day after Thanksgiving Day;
13. Christmas Day

2.0 PERMITS

The Contractor shall be required to obtain all the necessary building, construction, electrical and HVAC permits other than those specifically listed herein as being obtained by the Owner.

The Owner will reimburse the Contractor for only the fees associated with the aforementioned permits. Any other costs, including but not limited to labor, bonding, and overhead must be include in the bid price by the Contractor.

The Contractor will be required to obtain permits from the New Jersey Department of Environmental Protection's Division of Water Resources, Bureau of Solid Waste Management and/or the New Jersey Public Utilities Commission for each truck that will be hauling any debris from the construction site depending on the requirements of each Agency.

The Contractor must obtain a Solid Waste Disposal Permit from the New Jersey Department of Environmental Protection's Division of Water Resources; Bureau of Solid Waste Management when other than a publicly licensed dumping site is used for the disposal of construction debris. The Solid Waste Administration has recently advised that broken paving, blacktop, trees, marsh mat, etc. are considered solid waste and must be dumped only in an approved licensed fill site. The cost of permits and any necessary fees in connection with disposing of construction debris and unsuitable material at the landfill site shall be borne by the Contractor.

A copy of all permits obtained by the Owner and the Contractor must be maintained at the jobsite. Any additional permits required as the result of construction techniques employed by the Contractor such as, but not limited to, temporary access roads, additional easements through wetlands, etc., must be obtained by the Contractor. If any variances have been requested by the Contractor for which the Owner has obtained the permit, the Contractor must submit the necessary documentation for the Owner for subsequent submission by the Owner to the appropriate regulatory agency for obtaining these variances. These permits and permit variances must also receive the concurrence of the Engineer. The Owner will not be responsible for the approval or denial of any permit or permit variances as he is solely acting as the coordinating agent with the regulatory agencies, nor any time delays resulting from the processing of any requested permits or permit variances.

The Contractor will be responsible for any changes or amendments considered by him and for all delays and costs caused by his amendments. The Contractor shall be responsible for all costs of the Owner and Engineer required to acquire his requested amendments.

No work will be permitted in the area covered by the permit until the requested permits or permit variances have been approved by the appropriate regulatory agency and either the Owner has received this approval in writing or the Contractor, if he is the party obtaining the permit, has presented a copy of the written approval received to the Owner.

No work may be performed in permit areas without review of the proposed work procedure by the Engineer and a copy of the permit variance must be available for inspection at the site. If a permit condition is violated, the deficient action will be stopped with no recourse to the Owner for extra work or time delay. The permitting agency will be notified and will be informed of the corrective actions taken to remedy the deficient action.

The result of permit violations may be revocation of permit, in which case the Contractor may be held liable for any costs of delays incurred by the Owner. The Contractor will be informed of the violation and will be requested to submit, to the resident inspection staff, his plans to rectify the violations.

3.0 CONSTRUCTION LIMITS

The Contractor is advised that he shall be restricted to the maximum clearing and working width in easements and rights-of-way.

4.0 CONSTRUCTION EASEMENTS

The Owner shall obtain construction easements that are required for the completion of the Water/Sewer installation work. The Contractor shall obtain other easements for any other work site within the project area where he deems such acquisition is necessary to the adequate, safe and timely completion of the work. The Owner will purchase no easements other than those shown on the contract plans. No direct payment will be made to the Contractor for any expenses related to temporary easement acquisition or restoration thereof. The Contractor shall indemnify and save name and description and from all damages and injuries resulting from any excavation or disturbances of such easements as the Contractor may require.

5.0 RESPONSIBILITY TO PROTECT PRIVATE PROPERTY

The Contractor shall not enter upon private property for any purpose without obtaining permission from the owner of said private property. He shall be responsible for the preservation of all public and private property along and adjacent to the work area and shall use every precaution to prevent damage or injury thereto. Large trees within the work area that can be avoided should be protected to their driplines. When or where any direct or indirect damage or injury is done to public or private property by or on account of any act of omission, neglect or misconduct in the execution of the work or in consequence of non-execution on the part of the Contractor, he shall restore, at his own expense, such property to a condition similar or equal to that existing before such damage was done, or he shall make good such damage or injury. The Engineer may upon 48 hours of notice, take the necessary measure to restore or make good such damage and the cost thereof will be deducted from any monies due or which may become due the Contractor under the Contract.

The Contractor shall maintain access to all driveways and properties for public use where work is being performed. Any grass area disturbed by the contractor shall be restored with sod. The Contractor shall include in his cost work for the removal, storing, reinstalling and/or restoration required, such as the removal of jungle gyms, fencing, ground cover, stone yard, edging, underground sprinkler systems, etc.

6.0 STORAGE, HANDLING AND DELIVERY

The Contractor is to provide all required storage for machinery, equipment, supplies, material, etc. The storage area is to be coordinated with the Owner. In addition, the Contractor shall not utilize private property for storage or delivery unless the Contractor has received approval from the Owner prior to the start of construction. The cost of all storage, handling and delivery shall be borne by the Contractor.

7.0 CONSTRUCTION SCHEDULE

The Contractor shall submit his construction schedule for all work to the Owner and Engineer for approval prior to the start of said work. The schedule shall also be accompanied by the sequence of work. For any nighttime work required, the schedule shall include dates, start and stop times.

8.0 PIPE CONSTRUCTION

All DIP and valves being installed are required to be polyethylene encased, the encasement shall be installed in accordance with ANSI/AWWA C105/A21.5. All pipe connections shall be restraint joints as per the contract documents. The pipe connections shall be Field Lok gaskets, where Field Lok gaskets cannot be used then mechanical joints with megalug restraint system shall.

9.0 CONTRACT TIME SCHEDULE

Following the Notice to Proceed (NTP), the Contractor shall have ninety (90) days to substantial completion, and one hundred twenty (120) calendar days to achieve final project completion.

10.0 LUMP SUM PRICE BREAKDOWN

The Contractor may be required to provide breakdown prices for specific items included in the lump sum price if so requested on the Contract Bid Forms. The Owner may require this work be deleted from the Contract and thus the breakdown price will be used for the adjustment of the Contract lump sum price. This requirement would be in addition to the Lump Sum Price Breakdown required in the Contract Conditions, Section 1.04.07 Itemized Cost Breakdown for Lump Sum Bids.

11.0 BIDDER QUALIFICATION

In order to substantiate the ability of Bidder, they shall complete as part of the requirements of these specifications, the Contractor's Experience Statement page whereby they list location, owner and date of prior project's which they have completed similar to this project.

Only those bids will be considered by the Owner which are submitted by bidders who have been continuously engaged in this type of work.

No bids will be considered from any bidder who has not performed this type of work and who cannot substantiate the same on the form provided in the bid documents.

12.0 SUBSURFACE CONDITIONS

All information given on the drawings or in the contract documents relating to subsurface conditions, existing pipes, test pits and other structure is from the best sources available to the Specifications, Instruction to Bidders, Item 31.0 Bid Item Breakdown and the Supplementary owner. All such information and the drawings of existing conditions are furnished only for the information and convenience of bidders.

It is agreed and understood that the Owner does not warrant or guarantee that the accuracy of the materials, pipes, or other structures encountered during construction will be the same as those indicated by the log of test pits, test borings, or by the information given on the contract drawings or in the Contract Documents.

The bidder is responsible for ascertaining the character, quantities, and conditions of the various materials and the work to be done. It shall be the responsibility of the Contractor to perform test pits at each of the proposed interconnections prior to start of construction in order to ascertain the specific location, elevations, material and fittings that are existing. No separate payment will be made for these tests pits; they shall be included in the lump sum bid price.

It is further agreed and understood that the bidder or the Contractor will not use any of the information made available to him or obtained in any examination made by him in any manner as a basis or ground of claim or demand of any nature, against the owner or the engineer, arising from or by reason of any variance which may exist between the information offered and the actual material or structures encountered during the construction work, except as may otherwise to be provided for in the Contract Documents.

13.0 PAVEMENT MAINTENANCE

It is the obligation of the Contractor to maintain all pavement surfaces in a smooth and rideable condition at all times. The Contractor shall at his own expense, immediately correct all deficiencies in the roadway surface when noted by himself, or when directed by the owner or Borough. If deficiencies are not corrected within seven (7) calendar days of notification, the owner will proceed with the necessary repairs and deduct the costs thereof from any monies due the contractor.

14.0 LOCAL ROAD OPENINGS

The Contractor must comply with the "Rules and Regulations for Road Openings of the State of New Jersey Department of Transportation".

All local roadway trench openings shall be done in conformance with the above stated requirements.

All construction signing shall be consistent with the manual on Uniform Traffic Control Devices and meet the specific requirements of the County Engineering Department.

Before the owner issues a certificate of final acceptance for the work, the restoration of local roadways and/or vegetation must be satisfactory to the Owner.

15.0 ACCEPTANCE OF RESTORATION

The Contractor is advised that no final payment, release of retainage and/or in place bonds will occur until final acceptance letters associated with right-of-way restoration have been received from the Owner.

16.0 SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

In order to protect the lives and health of the general public and the Contractor's employees under this Contract, the Contractor shall comply with all pertinent provisions of the Contract Work Hours and Safety Standards Act, as amended, commonly known as the Construction Safety Act as it pertains to health and safety standards; and shall maintain an accurate record of all causes of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under Contract.

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. All employees working on the project and other persons and/or organizations who may be affected thereby;
2. All the work, materials and equipment to be incorporated therein, whether in storage on or off the site; and;
3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and underground facilities not designated for removal, relocation or replacement in the course of construction.

The Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss, and shall erect and maintain all necessary safeguards for such safety and protection. The Contractor shall notify owners of adjacent property and of underground facilities and utility owners when prosecution of the work may affect them, and shall cooperate with them; in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property referred to in paragraph B or C caused directly, or indirectly, in whole or in part, by Contractor, any subcontractor, supplier or any other persons or organization directly or indirectly employed by any of them to perform or furnish any of the work or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of drawings or specifications or to the acts or omissions of Owner or Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor).

Contractor's duties and responsibilities for the safety and protection of the work shall continue until such time as all the work is completed and Engineer has issued a notice to Owner and Contractor that the work is acceptable (except as otherwise expressly provided in connection with substantial completion).

The Contractor shall designate a responsible representative at the site whose duty shall be the prevention of accidents. This person shall be Contractor's superintendent, unless otherwise designated in writing by Contractor or Owner.

The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his machinery, equipment and methods, and for any damage which may result from their failure or their proper construction, maintenance, or operation.

The Contractor shall submit a detailed safety program at the preconstruction conference referenced in Division 1 Section 1.03.01.

17.0 CURBING, CONCRETE, PAVEMENT AND LANDSCAPE AREAS

The Contractor shall note existing concrete curbing, sidewalk, pavement and fencing within the project limits. The Contractor shall be responsible to maintain these items in their original condition. Should they be damaged during construction, the Contractor shall be required to repair and/or replace all damaged areas.

The cost thereof shall be borne by the Contractor and no additional payment shall be made for repair or replacement.

18.0 TRAFFIC MAINTENANCE

The Contractor's attention is directed to Division 1, Section 1.06.02 in the Supplementary Conditions. If the Contractor closes any roadways, he must provide a detour traffic plan in accordance with all applicable local regulations.

The Contractor may detour traffic around isolated and immediate work areas by utilizing flagmen or uniformed traffic directory are provided and if permission is granted by the local governing bodies. Barricades shall be used on each end of the area of construction where traffic is to be maintained. Complete barricades extending the full width of the road (if necessary) shall be used on each end of the sections or road closed to traffic and shall be approved by State, County and local governing bodies prior to closing of road. Adequate provisions must be maintained at all times to permit the passage of emergency vehicles, local residents and to permit access to places of business.

Should the Contractor desire to close a portion of any parking area or street or wishes to deviate, alter or add to the approved detour plan, he shall submit a detailed detour plan to the Engineer and the MUA in advance of the anticipated closing to allow adequate time for review and approval of plans. No deviations shall be permitted without prior approval from all governing bodies having jurisdiction over that road.

Any restriction or diversion of traffic at any time shall be subject to the review of the Engineer. Review by the Engineer of the Contractor's traffic control system shall in no way relieve the Contractor from his full responsibility for the maintenance and protection of onsite traffic.

No separate payment will be made for detour plans, traffic maintenance and traffic control devices, etc., but all related costs shall be included in the lump sum bid.

19.0 SAW CUTTING

The Contractor shall be required to saw cut at the locations as indicated on the contract drawings or as directed by the Engineer. The cuts shall be to a minimum depth so the existing asphalt material has been fully cut. Cutting shall be performed using a water cooled power saw mounted on wheels. All saw cutting equipment shall conform to applicable N.J.D.O.T. standards. The existing concrete and pavement shall be removed and properly disposed of by the Contractor.

No separate payment shall be made for saw cutting, but the cost thereof, shall be included in the lump sum price bid for the various items in the Bid Schedule.

20.0 DOWNTIME

The Contractor shall not charge for down time due to conflicts with existing utilities encountered during construction. The Contractor is required to perform test pits as necessary prior to beginning all work and is responsible to locate all existing utilities.

21.0 DEWATERING

The Contractor shall provide all dewatering as required to perform the required work. All dewatering shall be in accordance with N.J.D.E.P. requirements. No separate payment shall be made for dewatering, but the cost thereof shall be included in the lump sum bid.

22.0 MAINTAINING WATER SERVICE

The Contractor shall maintain potable water service to the existing water customers with minimal amount of downtime of water service to the existing water customers.

Prior to the Contractor initiating a dry tie in connection to the existing water main, the Contractor shall coordinate and review with the Owner the isolation gate valves that the Owner needs to close. The Contractor shall provide the Owner with an estimate of the amount of time required to complete the physical connection and to place the water system back in service. The Contractor shall not start a tie in unless all of the required materials, equipment and personnel are on-site. The maximum downtime of water service to the existing water customers shall be limited to four (4) hours.

The Contractor shall submit to the Owner and the Engineer a work plan for review and approval showing a sequence of construction where by the completion the tie-ins to the existing water mains and the cutting and capping of the existing water mains are done in such a sequence as to minimize the amount of time that the water service to the existing water customers is disrupted.

Where on the construction drawing the Contractor is directed to provide temporary water service to the existing water customers, the Contractor shall submit to the Owner and Engineer for review and approval a plan that shows the means and methods that the Contractor intends to implement to accomplish the temporary water service.

-- END OF SPECIAL CONDITIONS --

MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, the undersigned _____
(name or legal title and address of Contractor)

as PRINCIPAL, and _____
(legal title of surety)

a corporation organized and existing under the laws of the State of _____, as SURETY, are held and firmly bound unto the Borough of Sea Girt, as OBLIGEE, in the full and just several sums of _____ ($_____) lawful money of the United States of America for maintenance to be paid to the said OBLIGEE or its attorney, successors, or assigns, to the payment of which sums well and truly to be made, the said PRINCIPAL and SURETY bind themselves, their heirs, administrators, executors, successors and assigns, jointly and severally firmly by these presents;

WHEREAS, said PRINCIPAL has entered into a certain contract with same OBLIGEE dated _____, (hereinafter called the contract), for_____

_____,

which contract and the contract documents for said work shall be deemed a part hereof as fully as if set forth herein.

NOW, THEREFORE, the joint and several conditions of this Bond are such:

That if the bounden PRINCIPAL shall remedy without cost to the said OBLIGEE any defects which may develop during a period of **two (2) years** from the date of completion and acceptance of the work performed under said contract, provided such defects, in the judgment of the OBLIGEE, are caused by defective or inferior materials or workmanship, then this part of this obligation shall be void; otherwise, it shall be and remain in full force and effect.

The PRINCIPAL and the SURETY agree that any alterations, changes or additions to the contract documents, and/or any alterations, changes or additions to the work to be performed under the contract in accordance with the contract documents, and/or any alterations, changes or additions to the contract, and/or any giving by the OBLIGEE of any extensions of time for the performance of the contract in accordance with the contract documents, and/or any act of forbearance of either the PRINCIPAL or the OBLIGEE toward the other with respect to the contract documents and the contract and/or the reduction of any percentage to be retained by the OBLIGEE as permitted by the contract documents and by the contract, shall not release the PRINCIPAL, and the SURETY, or either of them, or their heirs, executors, administrators, successors and assigns, in any manner whatsoever, from liability under this bond, and the SURETY, for value received, does waive notice of any such alterations, changes, additions, extensions of time, acts of forbearance and/or reduction of retained percentage.

IN WITNESS WHEREOF, the PRINCIPAL and SURETY have executed this instrument under their several seals this _____ day of _____20_____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its proper officers, pursuant to authority of its governing body.

IN PRESENCE OF:

(IF CORPORATION)

Attest:

_____ By_____
(Corporate Principal)

_____
(Name and Title)

(Seal)

_____
(Business Address)

(IF INDIVIDUAL OR PARTNERSHIP)

Witness:

_____ By: _____

_____
(Name and Title)

_____ By: _____

_____
(Name and Title)

_____
(Business Address)

(SURETY)

Attest:

_____ By: _____
(Corporate Surety)

(Seal) _____
(Business Address)

CONTRACTOR'S RELEASE

KNOW ALL MEN BY THESE PRESENTS THAT _____
(Contractor)
of _____ County and State of _____does hereby

acknowledge that he has received this _____ day of _____, 20____, from

The Borough of Sea Girt the sum of One Dollar ($1.00) and other valuable consideration in full satisfaction and payment of all sums of money owing payable and belonging to the Contractor by any means whatsoever, for and on account of a certain agreement hereinafter called the Contract, between the said Contractor and the Borough of Sea Girt dated _____.

NOW, THEREFORE, the said _____
(Contractor)

(for myself, my heirs, executors and administrators) (for itself, its successors and assigns) do by these presents remise, release, quit-claim and forever discharge the said Borough of Sea Girt, its successors and assigns, of and from all claims and demands arising from or in connection with the said contract dated _____ and of and from all manner of action and actions, cause and causes of action and actions, suits, debts, dues, duties, sum and sums of money, accounts, reckonings, bonds, bills, specialties, covenants, contracts, agreements, promises, variances, damages, judgments, extends, execution, claim and demand, whatsoever in law or equity, or otherwise which against the said Borough of Sea Girt, its successors or assigns ever had, now have, or which (I, my heirs, executors, or administrators)(it, its successors and assigns) hereinafter can, shall or may have, for, upon or by reason of any matter, cause or thing whatsoever, from the beginning of the world to the date of these presents.

IN WITNESS WHEREOF, _____ has caused these
(Contractor)

presents to be duly executed the _____ day of _____ 20_____.

Signed, sealed and delivered
in the presence of:

_____ _____
Witness Individual Contractor

(Seal)

_____ _____
Witness Partnership Contractor

By: _____
(Partner)

(Seal)

Attest:

_____ _____
Secretary Corporate Contractor

By: _____
President or Vice President

(Seal)

STATEMENT OF SURETY COMPANY

In accordance with the provisions of the Agreement dated _____

between The Borough of Sea Girt (Owner) and _____

_____ (Contractor), the _____

_____(Surety) Surety on the Material and Labor Payment Bond of

_____ after a careful examination
(Contractor)

of the books and records of said Contractor or after receipt of an affidavit from the Contractor, which examination of affidavit satisfies Surety that all claims for labor and materials have been satisfactorily settled, hereby approved of the final payment under the Contract Agreement, and by these presents witnesseth that payment to the Contractor of the final estimates shall not relieve Surety of any of its obligations to the Borough of Sea Girt as set forth in the said Surety Company Bond.

IN WITNESS WHEREOF, said Surety has hereunto set its hand and seal this _____ day of

_____ 20___.

Attest:

_____ By: _____

_____
(Name and Title)

(Seal)

NOTE: This statement, if executed by any person other than the President or Vice President of the Company, must be accompanied by a certificate issued on the same day showing authority conferred upon the person so signing to execute such instruments on behalf of the Company represented.

STATE OF NEW JERSEY – DIVISION OF PURCHASE AND PROPERTY
DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN

Quote Number: _____ **Bidder/Offeror:** _____

PART 1: CERTIFICATION

BIDDERS MUST COMPLETE PART 1 BY CHECKING EITHER BOX.

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 or entity, nor any of its parents, subsidiaries, or affiliates, is identified on the Department of Treasury's Chapter 25 list as a person or entity engaging in investment activities in Iran. The Chapter 25 list is found on the Division's website at . Bidders **must** review this list prior to completing the below certification. **Failure to complete the certification will render a bidder's proposal non-responsive.** If the Director finds a person or entity to be in violation of 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

PLEASE CHECK THE APPROPRIATE BOX:

○ **I certify, pursuant to Public Law 2012, c. 25, that neither the bidder listed above nor any of the bidder's parents, subsidiaries, or affiliates is listed** on the N.J. Department of the Treasury''s list of entities determined to be engaged in prohibited activities in Iran pursuant to P.L. 2012, c. 25 ("Chapter 25 List"). I further certify that I am the person listed above, or I am an officer or representative of the entity listed above and am authorized to make this certification on its behalf. **I will skip Part 2 and sign and complete the Certification below.**

OR

○ **I am unable to certify as above because the 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 will result in the proposal being rendered as non-responsive and appropriate penalties, fines and/or sanctions will be assessed as provided by law.

PART 2: PLEASE PROVIDE FURTHER INFORMATION RELATED TO INVESTMENT ACTIVITIES IN IRAN

You must provide a detailed, accurate and precise description of the activities of the bidding person/entity, or one of its parents, subsidiaries or affiliates, engaging in the investment activities in Iran outlined above by completing the boxes below.

EACH BOX WILL PROMPT YOU TO PROVIDE INFORMATION RELATIVE TO THE ABOVE QUESTIONS. PLEASE PROVIDE THOROUGH ANSWERS TO EACH QUESTION. IF YOU NEED TO MAKE ADDITIONAL ENTRIES, CLICK THE "ADD AN ADDITIONAL ACTIVITIES ENTRY" BUTTON.

Name _____ Relationship to Bidder/Offeror _____

Description of Activities _____

_____

Duration of Engagement _____ Anticipated Cessation Date _____

Bidder/Offeror Contact Name _____ Contact Phone Number _____

ADD AN ADDITIONAL ACTIVITIES ENTRY

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; that the State of New Jersey 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 the State to notify the State 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 State, permitting the State to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print): _____ Signature: _____

Do Not Enter PIN as a Signature

Title: _____ Date: _____

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

PREVAILING WAGE RATE DETERMINATION

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

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

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

Prevailing Wage Rate

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

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

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

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

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

Apprentice Rate Schedule

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

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

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

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

Comments/Notes

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

Public Works Contractor Registration

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

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

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

Snow Plowing

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

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

	03/01/18
Journeyman (Mechanic)	W37.98 B23.93 T61.91

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

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

Ratio of Apprentices to Journeymen - 1:4

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

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

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 - MONMOUTH

Craft: Boilermaker **PREVAILING WAGE RATE**

	01/01/19
Foreman	W49.72 B44.34 T94.06
General Foreman	W51.72 B45.34 T97.06
Journeyman	W44.72 B42.70 T87.42

Craft: Boilermaker **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 Hours	65%	70%	75%	80%	85%	90%	95%			
Benefit =	36.36	37.26	38.18	39.07	39.39	40.89	41.79			

Ratio of Apprentices to Journeymen - *

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

Craft: Boilermaker **COMMENTS/NOTES**

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

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

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

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays (except Labor Day) shall be paid at double the hourly rate. All hours on Labor Day shall be paid at four times the hourly rate.
- If any other craft employed by the same contractor, or a subcontractor thereof, receives double time in lieu of time and one-half, then the Boilermaker shall receive double time in lieu of time and one-half.
- For "Municipal Water Works" projects only, the following shall apply: Four 10 hour days may be worked Monday through Thursday at straight time. Friday may be used as a make-up day for a day lost to inclement weather, holiday or other conditions beyond the control of the employer. Overtime shall be paid for any hours that exceed 10 hours per day or 40 hours per week.

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

County - MONMOUTH

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

	01/01/19
Foreman	W32.80 B16.37 T49.17
General Foreman	W33.30 B16.37 T49.67
Mechanic	W31.30 B16.37 T47.67

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 - MONMOUTH

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

	05/01/18
Deputy Foreman	W45.20 B33.03 T78.23
Foreman	W48.20 B33.03 T81.23
Journeyman	W42.20 B33.03 T75.23

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

INTERVAL	PERIOD AND RATES									
6 Months	40%	50%	55%	60%	65%	70%	75%	80%		
Benefits	3.86	4.83	5.31	5.80	21.83	23.27	24.72	26.15		

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.

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 - MONMOUTH

Craft: Carpenter **PREVAILING WAGE RATE**

	11/01/18
Foreman	W56.94 B32.45 T89.39
Journeyman	W49.51 B28.22 T77.73

Craft: Carpenter **APPRENTICE RATE SCHEDULE**

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

Ratio of Apprentices to Journeymen - 1:3

Craft: Carpenter **COMMENTS/NOTES**

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

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

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

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

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

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

	11/01/18
Foreman	W56.94 B32.45 T89.39
Journeyman	W49.51 B28.22 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 Rate	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.

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.

County - MONMOUTH

Craft: Cement Mason **PREVAILING WAGE RATE**

See "Bricklayer, Stone Mason" Rates

Craft: Cement Mason **COMMENTS/NOTES**

See " Bricklayer, Stone Mason" Rates

County - MONMOUTH

Craft: Diver **PREVAILING WAGE RATE**

	11/02/18
Diver	W58.74 B46.87 T105.61
Tender	W47.00 B46.87 T93.87

Craft: Diver **COMMENTS/NOTES**

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

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

AIR DIVES:
0-59 feet: No additional wage
60-74 feet: + $0.25 per foot
75-125 feet: + $0.78 per foot

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

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

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

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

Craft: Dockbuilder **PREVAILING WAGE RATE**

	11/02/18
Foreman	W54.05 B46.87 T100.92
Foreman (Concrete Form Work)	W53.25 B33.76 T87.01
Journeyman	W47.00 B46.87 T93.87
Journeyman (Concrete Form Work)	W46.30 B33.76 T80.06

Craft: Dockbuilder **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	18.80	23.50	30.55	37.60						
Benefit	31.25	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**

APPRENTICE RATE SCHEDULE FOR CONCRETE FORM WORK ONLY:

INTERVAL PERIOD AND RATES
Yearly 18.52 23.15 30.10 37.04
Benefits 23.24 for all intervals

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

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

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

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

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

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

Craft: Drywall Finisher **PREVAILING WAGE RATE**

	11/01/18
Foreman	W43.95 B24.40 T68.35
General Foreman	W45.94 B24.40 T70.34
Journeyman	W39.95 B24.40 T64.35

Craft: Drywall Finisher **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	40%	50%		60%	70%		80%	90%		
Benefits	Intervals	1 to 2 =	10.65	Intervals	3 to 4 =	13.17	Intervals	5 to 6 =	16.25	

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 - MONMOUTH

Craft: Electrician **PREVAILING WAGE RATE**

	06/04/18
* Foreman (1 to 11 Journeymen)	W54.56 B40.36 T94.92
* Lead Foreman (11 + Journeymen)	W56.51 B41.80 T98.31
* Racking (Solar) Ground Handler	W38.97 B28.83 T67.80
Assistant General Foreman	W57.49 B42.52 T100.01
General Foreman (2 or more Foreman)	W60.90 B45.04 T105.94
Journeyman, Cable Splicer	W48.72 B36.03 T84.75
Plan Reader	W52.13 B38.55 T90.68

Craft: Electrician **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 months	25%	30%		Yearly	40%	50%	60%	80%		
Benefit =	9.01	10.82			14.42	18.02	21.62	28.84		

Ratio of Apprentices to Journeymen - 2:3

Craft: Electrician **COMMENTS/NOTES**

* Please note that the Racking (Solar) Ground Handler work classification can only be used for the installation of the solar support system (the racking system) and shall not include any other aspect of the solar system installation, such as the panels, wiring, conduit, etc. In addition, with respect to all other aspects of a SOLAR project, those classifications listed above may be used, with the exception of the Plan Reader (does not apply to solar projects). However, the Foreman and Lead Foreman rates shall be paid accordingly: Foreman (16 + Journeymen)- Wage $56.02 Benefits $41.44, Total $97.46, Lead Foreman- Wage $56.51, Benefits $41.80, Total $98.31.

THESE RATES ALSO APPLY TO THE FOLLOWING:
- All burglar and fire alarm work.

- All fiber optic work.
- Teledata work in new construction (including additions).
- Teledata work involving 16 instruments or more.

FOREMAN REQUIREMENTS:
- 1 to 11 workers- 1 must be a Foreman
- 12 to 22 workers- 1 must be a Lead Foreman and 1 must be a Foreman
- 23 workers- 1 must be a Lead Foremen and 2 must be a Foreman
- 24 to 34 workers- 1 must be a General Foreman and 3 must be a Foreman
- 35 to 36 workers- 1 must be a General Foreman and 4 must be a Foreman
- 37 to 46 workers- 1 must be a General Foreman, 1 must be an Assistant General Foreman and 4 must be a Foreman
- For each additional 40 workers- 1 additional Assistant General Foreman shall be added

HEIGHT WORK:
- Work performed 50 feet above ground or floor - additional $2.00 per hour.
- Work on radio and transmission towers, and smoke stacks: +25% of the Total Rate.

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, per hour, 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 of benefits.

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.

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 - MONMOUTH

Craft: Electrician - Teledata (15 Instruments and Less) **PREVAILING WAGE RATE**

	10/29/18	10/28/19	11/02/20
Master Tech./Gen. Foreman (31+ workers on job)	W59.46 B25.57 T85.03	W60.88 B26.18 T87.06	W62.23 B26.76 T88.99
Senior Tech./Asst. Gen. Foreman (21-30 workers on job)	W57.18 B24.59 T81.77	W58.54 B25.17 T83.71	W59.84 B25.73 T85.57
Technician A/Foreman (11-20 workers on job)	W52.60 B22.62 T75.22	W53.85 B23.16 T77.01	W55.06 B23.68 T78.74
Technician B/Working Foreman (4-10 workers on job)	W50.32 B21.67 T71.99	W51.51 B22.15 T73.66	W52.66 B22.64 T75.30
Technician C/Journeyman (1-3 workers on job)	W45.74 B19.67 T65.41	W46.83 B20.13 T66.96	W47.87 B20.59 T68.46

Craft: Electrician - Teledata (15 Instruments and Less) **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
* 6 Months	35%	35%	40%	43%	48%	54%	61%	67%	74%	81%
Benefit	6.72	6.72	7.67	8.26	9.21	10.36	11.70	12.86	14.19	15.54

Ratio of Apprentices to Journeymen - 2:3

Craft: Electrician - Teledata (15 Instruments and Less) **COMMENTS/NOTES**

* The apprentice wage rate is paid at the percentage of the Technician C/Journeyman wage rate.

NOTES:
1) These rates are for service, maintenance, moves and/or changes affecting 15 instruments or less. These rates may NOT be used for any new construction or any fiber optic work.
2) The number of workers on the jobsite is the determining factor for which Foreman category applies.

HEIGHT WORK (work performed 50 feet above ground/floor): +$2.00 per hr.

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

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

benefits

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, 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. Sunday holidays will be observed the following Monday.

County - MONMOUTH

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 - MONMOUTH

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

	06/04/18
Assistant General Foreman	W57.90 B42.11 T100.01
Cable Splicer	W49.08 B35.68 T84.76
Equipment Operator	W49.08 B35.68 T84.76
Foreman- (5-10 Journeyman workers on job)	W54.96 B39.96 T94.92
General Foreman	W61.34 B44.61 T105.95
Groundman	W34.35 B24.98 T59.33
Journeyman Lineman	W49.08 B35.68 T84.76
Lead Foreman	W56.93 B41.39 T98.32
Plan Reader	W52.51 B38.18 T90.69

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

INTERVAL	**PERIOD AND RATES**									
1000 Hours	60%	65%	70%	75%	80%	85%	90%			
Benefits	21.42	23.20	24.98	26.77	28.55	30.34	32.11			

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

* FOR UTILITY WORK PLEASE SEE STATEWIDE RATES

HEIGHT WORK:
Work performed 50 feet above ground or floor- additional $2.00 per hour.
Work on radio and transmission towers, and smoke stacks: +25% of the Total Rate.

SHIFT DIFFERENTIALS:
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, 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. Sunday holidays will be observed the following Monday.

County - MONMOUTH

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	67% 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.

* The apprentice wage rate is paid at the percentage of the Journeyman Lineman wage rate located in the "Statewide" rate package.

County - MONMOUTH

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	28.53	30.91	33.29	35.66	38.04	40.42	42.80			
Benefits	25.01	26.41	27.83	29.24	30.65	32.05	33.47			

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

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

County - MONMOUTH

Craft: Elevator Constructor **PREVAILING WAGE RATE**

	01/01/19
Helper-Over 5 Years	W40.28 B37.34 T77.62
Helper-Under 5 Years	W40.28 B36.53 T76.81
Mechanic (Journeyman) over 5 years	W57.55 B38.72 T96.27
Mechanic (Journeyman) under 5 years	W57.55 B37.57 T95.12
Mechanic in Charge (Foreman) over 5 years	W64.74 B39.29 T104.03
Mechanic in Charge (Foreman) under 5 years	W64.74 B38.00 T102.74
Probationary Helper (1st 6 months)	W28.78 B35.84 T64.62

Craft: Elevator Constructor **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	55%	65%	70%	80%						
Benefits	full	journeyman	benefit	rate for	all	intervals				

Ratio of Apprentices to Journeymen - *

* Total number of helpers and apprentices shall not exceed the number of mechanics on the job except where 2 teams are working, 1 additional helper or apprentice may be employed for first 2 teams and an extra helper or apprentice for each additional 3 teams. Further, the employer may use as many helpers or apprentices as needed under the direction of a mechanic in wrecking old plants, handling and hoisting material, and on foundation work. When replacing cables on exisiting elevators, employer may use 2 helpers or apprentices to 1 mechanic.

Craft: Elevator Constructor **COMMENTS/NOTES**

SHIFT DIFFERENTIALS:
- 2nd Shift (4:30 PM to 12:30 AM) shall be established on the basis of 7.5 hours of work for 8 hours of pay, plus an additional 10% per hour.
- 3rd Shift (12:30 AM to 8:00 AM) shall be established on the basis of 7 hours of work for 8 hours of pay, plus an additional 15% per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays, Sundays, and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday to Thursday or Tuesday to Friday, at straight time. When working a 4-10 hour day schedule, all hours worked on a day other than the days established for the 4-10 hour schedule shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and 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 - MONMOUTH

Craft: Glazier **PREVAILING WAGE RATE**

	05/15/18	05/01/19
* Leadman	W47.11 B25.06 T72.17	W49.11 B25.06 T74.17
Foreman	W48.94 B25.23 T74.17	W52.81 B23.62 T76.43
General Foreman	W50.77 B25.40 T76.17	W54.81 B23.75 T78.56
Journeyman	W45.28 B24.89 T70.17	W48.81 B23.36 T72.17

Craft: Glazier **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	50%	55%		60%	65%		70%	75%		
Benefits	Intervals	1 to 2 =	9.11	Intervals	3 to 4 =	11.71	Intervals	5 to 6 =	13.20	

Ratio of Apprentices to Journeymen - 1:4

Craft: Glazier **COMMENTS/NOTES**

Hazard/Height Pay: +$1.00 per hour

* When there are three (3) men working on a jobsite for three (3) days or longer, 1 Journeyman may be designated as a Leadman for the duration of the job, provided he has his OSHA certification.

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

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

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

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

rate.

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

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

	09/19/18
Foreman	W55.77 B31.92 T87.69
General Foreman	W58.11 B33.03 T91.14
Journeyman	W53.99 B31.36 T85.35

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

INTERVAL	PERIOD AND RATES									
Yearly	25.15	29.84	36.00	42.16						
Benefits	18.71	22.13	24.41	26.56						

Ratio of Apprentices to Journeymen - 1:3

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

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

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

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

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

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

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

	09/19/18
Asbestos Helper Abatement	W36.00 B24.41 T60.41
Firestop/Hazmat	W25.68 B9.25 T34.93

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

INTERVAL	PERIOD AND RATES									
	SEE	HEAT &	FROST	INSULATOR						

Ratio of Apprentices to Journeymen - 1:3

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

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

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

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

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

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

Craft: Ironworker **PREVAILING WAGE RATE**

	07/10/18	07/01/19	07/01/20
Rod /Fence Foreman	W44.39 B46.12 T90.51	W0.00 B0.00 T92.51	W0.00 B0.00 T94.26
Rod/Fence Journeyman	W41.39 B46.12 T87.51	W0.00 B0.00 T89.51	W0.00 B0.00 T91.26
Structural Foreman	W46.44 B46.12 T92.56	W0.00 B0.00 T94.56	W0.00 B0.00 T96.56
Structural Journeyman	W43.44 B46.12 T89.56	W0.00 B0.00 T91.56	W0.00 B0.00 T93.56

Craft: Ironworker **APPRENTICE RATE SCHEDULE**

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

Ratio of Apprentices to Journeymen - 1:4

Craft: Ironworker **COMMENTS/NOTES**

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

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

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

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

OVERTIME:

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

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

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

	08/01/18
Journeyman (Handler)	W31.48 B22.31 T53.79

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

INTERVAL	PERIOD AND RATES									
Yearly	18.89	22.04	25.18	28.33						
Benefit	20.66	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 additonal 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.

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.
- 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. (Holidays start at 12:00 am).

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

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

	05/15/18
Class A Journeyman	W33.45 B29.12 T62.57
Class B Journeyman	W32.95 B29.12 T62.07
Class C Journeyman	W28.01 B29.12 T57.13
Foreman	W37.63 B29.12 T66.75
General Foreman	W41.81 B29.12 T70.93

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

INTERVAL	PERIOD AND RATES									
6 Months	60%	70%	80%	90%						
Benefit	25.87	25.87	25.87	25.87						

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 - Building **COMMENTS/NOTES**

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

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

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- When a 2-shift schedule is worked, including a day shift, both shifts shall be established on the basis of 8 hours pay for 8 hours worked. The second shift shall receive the regular rate plus an additional 10%.
- When a 3-shift schedule is worked, the day shift shall be established on the basis of 8 hours pay for 8 hours worked, the second shift shall be established on the basis of 8 hours pay for 7.5 hours worked, and the third shift shall be established

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

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

RECOGNIZED HOLIDAYS: New Year's Day, 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 - MONMOUTH

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	20.28	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**

As of 3-1-19, benefits shall be $21.03.
As of 3-1-20, benefits shall be $21.78.

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

Craft: Laborer-Residential and Modular Construction **PREVAILING WAGE RATE**

	04/26/18
* Skilled Tradesman (only applies to Modular Construction)	W25.85 B5.45 T31.30
Foreman (person directing crew, regardless of his skill classification)	W29.85 B5.45 T35.30
Laborer	W21.85 B5.45 T27.30
Laborer (for single family and stand-alone duplex owned by single owner)	W16.35 B2.95 T19.30

Craft: Laborer-Residential and Modular Construction **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
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. Each housing unit must be fully and independently functional; each housing unit must have its own kitchen and bathroom. The definition includes all incidental items such as site work, parking areas, utilities, streets and sidewalks. Please note the construction must be Residential in nature. A First Floor at or below grade may contain commercial space not to exceed 50% square footage of the floor; at least 50% of the First Floor must contain living accommodations or related nonresidential uses (e.g. laundry space, recreation/hobby rooms, and/or corridor space). Basement stories below grade used for storage, parking, mechanical systems/equipment, etc., are considered basement stories which are not used in determining the building's height. An attic is an unfinished space located immediately below the roof. Such space is not used in determining a building's height even if used for storage purposes. 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 as defined above. 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, 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 - MONMOUTH

Craft: Millwright **PREVAILING WAGE RATE**

	11/01/18
Foreman	W57.03 B33.67 T90.70
Journeyman	W49.59 B29.36 T78.95

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 - MONMOUTH

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 - MONMOUTH

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 - MONMOUTH

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

	05/04/17
Foreman	W59.13 B27.67 T86.80
General Foreman	W61.13 B27.67 T88.80
Journeyman	W54.13 B27.67 T81.80

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

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

Ratio of Apprentices to Journeymen - 1:4

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

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

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

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

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

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

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

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

	12/01/17
Apprentice (1st year)	W25.45 B11.00 T36.45
Apprentice (2nd year)	W29.45 B18.00 T47.45
Foreman (Charge Person)	W37.60 B18.17 T55.77
Journeyman 1 (at least 1 year of working exp. as a journeyman)	W33.33 B18.17 T51.50
Journeyman 2 (at least 2 years of working exp. as a journeyman)	W37.10 B18.17 T55.27

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 - MONMOUTH

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

	05/17/18	05/01/19	05/01/20
Foreman	W43.80 B24.35 T68.15	W45.45 B24.35 T69.80	W47.45 B24.35 T71.80
General Foreman	W47.78 B24.67 T72.45	W49.43 B24.67 T74.10	W51.43 B24.67 T76.10
Journeyman	W39.82 B24.04 T63.86	W41.47 B24.04 T65.51	W43.47 B24.04 T67.51

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

INTERVAL	PERIOD AND RATES									
6 Months	40%	45%	55%	65%	70%	75%	80%	80%		
Benefits	8.05	8.05	10.05	10.05	11.05	11.05	14.05	14.05		

Ratio of Apprentices to Journeymen - 1:4

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

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

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

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

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

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

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

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

	05/17/18	05/01/19	05/01/20
Foreman	W32.27 B19.91 T52.18	W33.07 B19.95 T53.02	W33.92 B19.95 T53.87
General Foreman	W35.20 B20.06 T55.26	W36.00 B20.10 T56.10	W36.85 B20.10 T56.95
Journeyman	W29.34 B19.77 T49.11	W30.14 B19.77 T49.91	W30.99 B19.77 T50.76

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

INTERVAL	PERIOD AND RATES									
	SEE	PAINTER	NEW	CONSTR UC	TION					

Ratio of Apprentices to Journeymen - 1:4

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

NOTE: These rates may only be used on jobs where no major alterations (only doing painting and carpeting with nothing else being changed in the office or on the project) occur, and where not more than 3 other trades are present on the job, but may NOT, under any circumstances, be used for work on bridges, stacks, elevated tank, or generating stations.

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

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

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

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

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

	05/04/17
Journeyman	W35.18 B24.75 T59.93

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 - MONMOUTH

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

	05/04/17
Foreman	W48.92 B24.92 T73.84
General Foreman	W50.92 B24.92 T75.84
Journeyman	W43.92 B24.92 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 - MONMOUTH

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

	05/04/17
Foreman	W47.87 B25.27 T73.14
General Foreman	W49.87 B25.27 T75.14
Journeyman	W42.87 B25.27 T68.14

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 - MONMOUTH

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

	05/17/18	05/01/19	05/01/20
Foreman	W45.82 B24.11 T69.93	W46.75 B24.11 T70.86	W47.68 B24.11 T71.79
Journeyman	W40.75 B24.11 T64.86	W41.68 B24.11 T65.79	W42.61 B24.11 T66.72

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

INTERVAL	PERIOD AND RATES									
	SEE	PAINTER	NEW	CONSTR UC	TION					

Ratio of Apprentices to Journeymen - 1:4

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

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 - MONMOUTH

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

	05/17/18	05/01/19	05/01/20
Foreman	W33.11 B19.81 T52.92	W34.13 B19.81 T53.94	W35.15 B19.81 T54.96
Journeyman	W30.10 B19.81 T49.91	W31.03 B19.81 T50.84	W31.96 B19.81 T51.77

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

INTERVAL	PERIOD AND RATES									
		SEE	PAINTER	NEW	CONSTR UC	TION				

Ratio of Apprentices to Journeymen - 1:4

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

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

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

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

County - MONMOUTH

Craft: Pipefitter **PREVAILING WAGE RATE**

.

Craft: Pipefitter **COMMENTS/NOTES**

See PLUMBERS Rates

County - MONMOUTH

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 - MONMOUTH

Craft: Plumber **PREVAILING WAGE RATE**

	07/01/18	07/01/19
Assistant General Foreman	W53.13 B38.88 T92.01	W0.00 B0.00 T94.13
Foreman	W52.64 B38.88 T91.52	W0.00 B0.00 T93.65
General Foreman	W55.56 B38.88 T94.44	W0.00 B0.00 T96.53
Journeyman	W48.74 B38.88 T87.62	W0.00 B0.00 T89.82

Craft: Plumber **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	35%	45%	55%	65%	75%					
Benefits	23.76	25.87	27.98	30.09	32.20					

Ratio of Apprentices to Journeymen - 1:4

Craft: Plumber **COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE AS OF 7-1-18:

INTERVAL	PERIOD AND RATES				
Yearly	35%	45%	55%	65%	75%
Benefits	24.25	26.49	28.76	31.00	33.26

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

FOREMAN REQUIREMENTS (number of Plumbers on site):
- (1to 8)- 1 Foreman
- (9 to 16)- 1 Foreman and 1 Assistant General Foreman
- (17 to 40)- 1 Foreman for every (1 to 8 Plumbers) and 1 Assistant General Foreman every (1 to 5 gangs). One note, a "gang" is a group of 8 men.
- (41 and more)- 1 Foreman for every (1 to 8 Plumbers), 1 Assistant General Foreman every (1 to 5 gangs) and 1 General Foreman. One note, for every additional Assistant General Foreman over five designated, the General Foreman shall receive an additional 10 cents per hour.

SHIFT DIFFERENTIALS:
-The second shift shall work 7.5 hours and receive 8 hours pay, at a rate equal to the hourly rate plus 25%, inclusive of benefits.
- When a third shift is worked, the third shift shall work 7.5 hours and receive 8 hours pay, at a rate equal to the hourly rate

plus 30%, inclusive of benefits.
- A second shift may be established without a first shift, provided the second shift starts at 1:00 PM or later.

OVERTIME:
- Hours in excess of 8 per day, or before of after the regular workday, Monday through Friday, that are not shift work, and the first 10 hours on Saturdays, shall be paid at time and one-half, inclusive of benefits. Hours in excess of 10 on Saturdays, and all hours on Sundays and holidays, shall be paid at double time, inclusive of benefits.
- Four 10-hour days may be worked, Mon to Thurs, at straight time, with Friday used as a make-up day for a day lost due to inclement weather. If Fri. is not a make-up day, the first 10 hours shall be paid at time and one-half, and hours in excess of 10 at double time, 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 - MONMOUTH

Craft: Roofer **PREVAILING WAGE RATE**

	06/07/18
Foreman	W39.52 B26.28 T65.80
Journeyman	W37.52 B26.28 T63.80

Craft: Roofer **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	15.00	18.76	22.51	26.26	30.01	33.77				
Benefits	0.00	0.00	21.40	21.40	21.40	21.40				

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 requring complete removal of existing systems, installation done over existing roof): 1:3 or fraction thereof.

Craft: Roofer **COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES ENTERING PROGRAM AFTER 4-1-17:

INTERVAL	PERIOD AND RATES							
6 Months	15.00	18.76	22.51	24.38	26.26	28.14	30.01	33.77
Benefits	0.00	0.00	21.40	21.40	21.40	21.40	21.40	21.40

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 - MONMOUTH

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

	04/03/19
Foreman	W36.79 B34.37 T71.16
Journeyman	W35.54 B34.37 T69.91

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	11.63	13.26	14.88	16.52	18.57	20.23	21.90	23.56	25.23	26.90

Ratio of Apprentices to Journeymen - 1:3

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

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

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

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

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

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

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

	06/29/18	06/01/19	06/01/20
Foreman	W51.11 B40.19 T91.30	W0.00 B0.00 T94.05	W0.00 B0.00 T97.55
Journeyman	W48.11 B40.19 T88.30	W0.00 B0.00 T91.05	W0.00 B0.00 T94.55

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

INTERVAL	PERIOD AND RATES									
6 months	40%	45%	50%	55%	60%	65%	70%	75%		
Benefits	13.65	15.19	16.75	18.29	19.83	27.01	29.00	30.97		

Ratio of Apprentices to Journeymen- 1:3, except for the following types of work where the ratio shall be 1:1 (architectural metal work, testing and balancing, lockers, shelving and toilet partitions).*
* For work performed in a fabrication shop, the ratio will be applied on a "company-wide" basis (i.e. the total number of apprentices and journeymen employed by the company).

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

JOB SITE FOREMAN REQUIREMENTS:
- When there are 2 to 9 Sheet Metal Workers on a jobsite, 1 must be designated a Foreman.
- When there are 10 to 16 Sheet Metal Workers on a job site, 2 must be designated Foremen.
- When there are 17 to 23 Sheet Metal Workers on a job site, 3 must be designated Foremen.
- For every 7 addtional Sheet Metal Workers on a job site, there shall be 1 additional Foreman.

SHOP FOREMAN REQUIREMNTS (For custom fabrication):
- When there are 1 to 10 Sheet Metal Workers in the shop, 1 must be designated a Foreman.
- For every 10 additional Sheet Metal Workers in the shop, 1 must be designated a Foreman.

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

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- There must be a day shift worked in order to have a 2nd and/or 3rd Shift.
- Shop work does not satisfy shift requirements.
- 2nd Shift (4:30 PM-12:30 AM) shall be paid an additional 15% of the regular rate per hour inclusive of benefits, and receive 8 hours pay for 7.5 hours of work.
- 3rd Shift (12:30 AM-8:00 AM) shall be paid an additional 25% of the regular rate per hour inclusive of benefits, and 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, that are 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 at double the regular rate.

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. Saturday holidays will be observed the preceding Friday, Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

Craft: Sprinkler Fitter **PREVAILING WAGE RATE**

	01/01/19
Foreman	W64.33 B28.97 T93.30
General Foreman	W67.45 B28.97 T96.42
Journeyman	W60.23 B28.97 T89.20

Craft: Sprinkler Fitter **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
1000 hours	10.50	12.25	50%	55%	60%	65%	70%	75%	80%	85%
Benefits	11.87	11.87	23.72	23.72	23.72	23.72	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	11.87	11.87	23.72	23.72	23.72	23.72	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 Friday, 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 - MONMOUTH

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

	01/01/19
Finisher	W47.07 B34.58 T81.65

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

INTERVAL	PERIOD AND RATES									
750 Hours	40%	45%	50%	55%	60%	65%	70%	75%	85%	95%

Ratio of Apprentices to Journeymen - 1:4

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

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

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

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

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

	12/03/18
Finisher	W45.08 B30.27 T75.35
Setter	W58.37 B33.69 T92.06

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

INTERVAL	PERIOD AND RATES									
750 Hours	35%	40%	50%	55%	60%	65%	70%	75%	80%	90%

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 - MONMOUTH

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

	01/01/19
Tile Setter	W59.03 B36.82 T95.85

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

INTERVAL	PERIOD AND RATES									
750 Hours	40%	45%	50%	55%	60%	65%	70%	75%	85%	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 - MONMOUTH

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

	01/01/19
Grinder or Assistant	W54.24 B36.03 T90.27
Mechanic	W55.84 B36.05 T91.89
Terrazzo Resinous Worker	W46.57 B29.20 T75.77

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

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

Ratio of Apprentices to Journeymen - 1:5

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

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES ENTERING PROGRAM AFTER 7-1-17:

INTERVAL PERIOD AND RATES
1500 Hours 35% 45% 60% 70% 80% 90% 100%

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.

County - MONMOUTH

Craft: Truck Driver **PREVAILING WAGE RATE**

	11/01/18
Bucket, Utility, Pick-up, Fuel Delivery trucks	W40.95 B32.38 T73.33
Dump truck (single axle), Asphalt Distributor, Tack Spreader	W40.95 B32.38 T73.33
Euclid-type vehicles (large off-road equipment)	W41.10 B32.38 T73.48
Helper on Asphalt Distributor truck	W40.95 B32.38 T73.33
Slurry Seal, Seeding/Fertilizing/Mulching truck	W40.95 B32.38 T73.33
Straight 3-axle trucks, Dump Truck (3-axle), Dump Truck (tandem)	W41.00 B32.38 T73.38
Tractor-Trailer truck (all types)	W41.10 B32.38 T73.48
Vacuum or Vac-All truck (entire unit)	W40.95 B32.38 T73.33
Winch Trailer Driver	W41.20 B32.38 T73.58

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 between 6:00 AM and 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

"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 $37.33. As of 11-1-18, benefits on overtime shall be $37.93.
- 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, Veteran's Day, Thanksgiving Day, Christmas Day. Veteran's Day may be substituted for the day after Thanksgiving. Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - MONMOUTH

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

	11/01/18
Driver	W33.01 B32.38 T65.39
New Hires: 1st Year	W33.01 B32.38 T65.39

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 $37.33, As of 11-1-18, benefits on overtime shall be $37.93.

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

County - MONMOUTH

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

TERRITORY

ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

OPERATING ENGINEERS **Rates Expiration Date :**

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

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

SHIFT DIFFERENTIALS:
- Shift work must run for 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive an additional 10% of the regular rate inclusive of benefits, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, plus an additional 10% of the regular rate inclusive of benefits, per hour. The third shift shall receive 8 hours pay for 7 hours of work, plus an additional 15% of the regular rate inclusive of benefits, per hour.
- When such hours are mandated by the project owner, a shift that starts between 8:00 PM and midnight and ends by 6:00 AM Saturday, or that starts after 8:00 PM on Sunday, provided there are consecutive hours of work within the shift, shall receive an additional 15% of the regular rate, inclusive of benefits.
- On Highway, Road, Street, and Sewer projects irregular shifts starting between 5:00 PM and 12:00 AM may be worked Monday through Friday, and shall receive an additional 15% of the regular rate, inclusive of benefits. When working with other trades that receive a higher irregular shift rate, the Operating Engineer shall also receive the higher irregular shift rate.

OVERTIME:
- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veteran's Day.

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

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
50.18	32.85	83.03	85.38

CLASSIFICATIONS:

A-Frame

Backhoe (combination)

Boom Attachment on loaders (Except pipehook)

Boring & Drilling Machine

Brush Chopper, Brush Shredder, Tree Shredder, Tree Shearer

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: Outside Material Tower 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) * receives an addtional $1.00 per hour on 100 ft. up to 199 ft. total height, and an additional $2.00 per hour on 200 ft. and over total height.

Hydraulic Crane (10 tons & under)

Hydraulic Dredge

Hydro-Axe

Hydro-Blaster

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

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
50.18	32.85	83.03	85.38

CLASSIFICATIONS:

Jack (screw, air hydraulic, power-operated unit, or console type, Except hand jack or pile load test type)

Log Skidder

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)

Whiphammer

Winch Truck (hoisting)

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
48.27	32.85	81.12	83.47

CLASSIFICATIONS:

Asphalt Curbing Machine

Asphalt Plant Engineer

Asphalt Spreader

Autograde Curb Trimmer & Sidewalk Shoulder Slipform (CMI & similar types)

Autograde Curecrete Machine (CMI & similar types)

Autograde Tube Finisher & Texturing Machine (CMI & similar types)

Bar Bending Machines (Power)

Batcher, Batching Plant, & Crusher [On Site]

Belt Conveyor System

Boom-Type Skimmer Machine

Bridge Deck Finisher

Bulldozer (all sizes)

Captain (Power Boats)

Car Dumper (railroad)

Compressor & Blower unit for loading/unloading of concrete, cement, fly ash, or similar type materials (used independently or truck-mounted)

Compressor (2 or 3 battery)

Concrete Breaking Machine

Concrete Cleaning/Decontamination Machine

Concrete Finishing Machine

Concrete Saw or Cutter (ride-on type)

Concrete Spreader (Hetzel, Rexomatic & similar types)

Concrete Vibrator

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
48.27	32.85	81.12	83.47

CLASSIFICATIONS:

Conveyors - under 125 feet

Crane Signalman

Crushing Machine

Directional Boring Machine

Ditching Machine - Small (Ditchwitch, Vermeer or similar types)

Dope Pot - Mechanical (with or without pump)

Dumpster

Elevator

Fireman

Fork Lift (Economobile, Lull & similar types)

Front End Loader (1 cu. yd. and over but less than 2 cu. yds.)

Generator (2 or 3 battery)

Giraffe Grinder

Goldhofer/Hydraulic Jacking Trailer

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)

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

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
48.27	32.85	81.12	83.47

CLASSIFICATIONS:

Laddervator

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)

Rod Bending Machines

Roller (black top)

Scale (power)

Seamen Pulverizing Mixer

Shoulder Widener

Silo

Skimmmer Machine (boom type)

Steel Cutting Machine (service & maintenance)

Tamrock Drill

Tractor

Transfer Machines

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
48.27	32.85	81.12	83.47

CLASSIFICATIONS:

Tug Captains

Tug Master (Power Boats)

Ultra High Pressure Waterjet Cutting Tool System - Operator/Maintenance Technician

Vacuum Blasting Machine - Operator/Maintenance Technician

Vibrating Plant (used with unloading)

Welder & Repair Mechanic

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
44.93	32.85	77.78	80.13

CLASSIFICATIONS:

Assistant Engineer/Oiler

Driller's Helper

Field Engineer - Transit man or Instrument man

Maintenance Apprentice (Deckhand)

Maintenance Apprentice (Oiler)

Mechanic's Helper

Off Road Back Dump

Tire Repair & Maintenance

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
42.35	32.85	75.20	77.55

CLASSIFICATIONS:

Field Engineer - Rodman or Chainman

TERRITORY

ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	01/01/2019		**07/01/2019**
Rate	Fringe	Total	Total
52.51	32.85	85.36	87.71

CLASSIFICATIONS:

Lead Engineer, Foreman Engineer, Safety Engineer (minimum)

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
51.77	32.85	84.62	86.97

CLASSIFICATIONS:

Autograde Pavement Profiler (CMI & similar types)

Autograde Pavement Profiler - Recycle Type (CMI & similar types)

Autograde Placer/Trimmer/Spreader Combination (CMI & similar types)

Autograde Slipform Paver (CMI & similar types)

Backhoe (Excavator)

Central Power Plant

Concrete Paving Machine

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

Draglines

Drill, Bauer, AMI and similar types

Drillmaster, Quarrymaster

Drillmaster/Quarrymaster (down-the-hole drill), rotary drill, self-propelled hydraulic drill, self-powered drill

Elevator Grader

Field Engineer-Chief of Party

Front End Loader (5 cu. yards or larger)

Gradall

Grader, Rago

Helicoptor Co-Pilot

Helicoptor Communications Engineer

Juntann Pile Driver

Locomotive (large)

Mucking Machine

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

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
51.77	32.85	84.62	86.97

CLASSIFICATIONS:

Pavement & Concrete Breaker (Superhammer & Hoe Ram)

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

Vacuum Truck

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
46.64	32.85	79.49	81.84

CLASSIFICATIONS:

Chipper

Compressor (single)

Concrete Spreader (small type)

Conveyor Loader (Except elevator graders)

Engines, Large Diesel (1620 HP) & Staging Pump

Farm Tractor

Fertilizing Equipment (operation & maintenance)

Fine Grade Machine (small type)

Form Line Grader (small type)

Front End Loader (under 1 cubic yard)

Generator (single)

Grease, Gas, Fuel, & Oil Supply Trucks

Heaters (Nelson or other type)

Lights - portable generating light plant

Mixer, Concrete (small)

Mulching Equipment (operation & maintenance)

Power Broom or Sweeper

Pump (diesel engine & hydraulic - regardless of power)

Pump (larger than 2 inch suction, including submersible pumps)

Road Finishing Machine (small type)

Roller - grade, fill, or stone base

Seeding Equipment (operation & maintenance)

Sprinkler & Water Pump Trucks

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
46.64	32.85	79.49	81.84

CLASSIFICATIONS:

Steam Generator or Boiler

Stone Spreader

Tamping Machine (vibrating ride-on type)

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

Water or Sprinkler Truck

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

Welding System - Multiple (rectifier transformer type)

Wellpoint Systems (including installation by bull gang and maintenance)

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
53.59	32.85	86.44	88.79

CLASSIFICATIONS:

Helicoptor Pilot/Engineer

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
58.27	32.85	91.12	93.47

CLASSIFICATIONS:

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

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
57.27	32.85	90.12	92.47

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), 100 tons and over and TOWER CRANE with boom (including jib and/or leads) from 100 ft. to 139 ft.

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
53.77	32.85	86.62	88.97

CLASSIFICATIONS:

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

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
56.27	32.85	89.12	91.47

CLASSIFICATIONS:

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

Effective Dates:

	01/01/2019		07/01/2019
Rate	Fringe	Total	Total
52.77	32.85	85.62	87.97

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), under 100 tons with a boom (including jib and/or leads) from 100 ft. to 139 ft.

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

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

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

SHIFT DIFFERENTIALS:
- Shift work must run for 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive an additional 10% of the regular rate inclusive of benefits, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, plus an additional 10% of the regular rate inclusive of benefits, per hour. The third shift shall receive 8 hours pay for 7 hours of work, plus an additional 15% of the regular rate inclusive of benefits, per hour.
- When such hours are mandated by the project owner, a shift that starts between 8:00 PM and midnight and ends by 6:00 AM Saturday, or that starts after 8:00 PM on Sunday, provided there are consecutive hours of work within the shift, shall receive an additional 15% of the regular rate, inclusive of benefits.
- On Highway, Road, Street, and Sewer projects irregular shifts starting between 5:00 PM and 12:00 AM may be worked Monday through Friday, and shall receive an additional 15% of the regular rate, inclusive of benefits. When working with other trades that receive a higher irregular shift rate, the Operating Engineer shall also receive the higher irregular shift rate.

OVERTIME:
- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veteran's Day.

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

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
55.40	32.85	88.25	90.60

CLASSIFICATIONS:

Helicopter Co-Pilot & Communications Engineer

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

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
51.34	32.85	84.19	86.54

CLASSIFICATIONS:

A-Frame

Cherry Picker -10 tons or less (Over 10 tons use crane rate)

Hoist (all types Except Chicago-boom)

Jack (screw, air hydraulic, power-operated unit or console type, Except hand jack or pile load test type)

Side Boom

Straddle Carrier

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

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
48.68	32.85	81.53	83.88

CLASSIFICATIONS:

Aerial Platform Used On Hoists

Apprentice Engineer/Oiler with Compressor or Welding Machine

Captain (Power Boats)

Compressor (2 or 3 in battery)

Concrete Cleaning/Decontamination Machine Operator

Conveyor or Tugger Hoist

Directional Boring Machine

Elevator or House Car

Fireman

Forklift

Generator (2 or 3)

Heavy Equipment Robotics, Operator/Technician

Maintenance Utility Man

Master Environmental Maintenance Technician

Tug Master (Power Boats)

Ultra High Pressure Waterjet Cutting Tool System Operator/Maintenance Technician

Vacuum Blasting Machine Operator/Maintenance Technician

Welding Machines, Gas or Electric Converters on any type-2 or 3 in battery including diesels

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
47.15	32.85	80.00	82.35

CLASSIFICATIONS:

Compressor (Single)

Generators

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

Welding System, Multiple (Rectifier Transformer Type)

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
45.39	32.85	78.24	80.59

CLASSIFICATIONS:

Assistant Engineer/Oiler

Drillers Helper

Field Engineer - Transit/Instrument Man

Maintenance Apprentice (Deckhand)

Maintenance Apprentice (Oiler)

Off Road Back Dump

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
52.96	32.85	85.81	88.16

CLASSIFICATIONS:

Lead Engineer, Foreman Engineer, Safety Engineer (Minimum)

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
42.35	32.85	75.20	77.55

CLASSIFICATIONS:

Field Engineer - Rodman or Chainman

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
52.10	32.85	84.95	87.30

CLASSIFICATIONS:

Field Engineer-Chief of Party

Vacuum Truck

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
60.29	32.85	93.14	95.49

CLASSIFICATIONS:

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

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
58.63	32.85	91.48	93.83

CLASSIFICATIONS:

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

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
55.79	32.85	88.64	90.99

CLASSIFICATIONS:

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

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
54.13	32.85	86.98	89.33

CLASSIFICATIONS:

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

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

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
55.79	32.85	88.64	90.99

CLASSIFICATIONS:

Helicopter Pilot & Engineer

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

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

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

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

SHIFT DIFFERENTIALS:
- Shift work must run for 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive an additional 10% of the regular rate inclusive of benefits, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, plus an additional 10% of the regular rate inclusive of benefits, per hour. The third shift shall receive 8 hours pay for 7 hours of work, plus an additional 15% of the regular rate inclusive of benefits, per hour.
- When such hours are mandated by the project owner, a shift that starts between 8:00 PM and midnight and ends by 6:00 AM Saturday, or that starts after 8:00 PM on Sunday, provided there are consecutive hours of work within the shift, shall receive an additional 15% of the regular rate, inclusive of benefits.
- On Highway, Road, Street, and Sewer projects irregular shifts starting between 5:00 PM and 12:00 AM may be worked Monday through Friday, and shall receive an additional 15% of the regular rate, inclusive of benefits. When working with other trades that receive a higher irregular shift rate, the Operating Engineer shall also receive the higher irregular shift rate.

OVERTIME:
- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veteran's Day.

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

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
51.77	32.85	84.62	86.97

CLASSIFICATIONS:

Driller

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
44.93	32.85	77.78	80.13

CLASSIFICATIONS:

Driller's Helper

FREE AIR TUNNEL JOBS **Rates Expiration Date :**

{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 $3.00 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

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Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
44.25	31.53	75.78	78.28

CLASSIFICATIONS:

Walking Boss & Superintendent

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
43.95	31.53	75.48	77.98

CLASSIFICATIONS:

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

FREE AIR TUNNEL JOBS **Rates Expiration Date :**

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
43.45	31.53	74.98	77.48

CLASSIFICATIONS:

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

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
45.95	31.53	77.48	79.98

CLASSIFICATIONS:

Blaster

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.90	31.53	74.43	76.93

CLASSIFICATIONS:

Top Labor Foreman

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.55	31.53	74.08	76.58

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:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.40	31.53	73.93	76.43

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)

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

FREE AIR TUNNEL JOBS **Rates Expiration Date :**

Effective Dates:

	03/01/2019		03/01/2020
Rate	Fringe	Total	Total
42.00	31.53	73.53	76.03

CLASSIFICATIONS:

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

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

The well driller and/or helper may perform all work relative to the construction, finishing, and servicing of wells, pumps and borings for ground water supply. The present methods of well drilling entailing as they do, many diverse job operations calling for drilling, pump discharge, piping, and the operation of various types of related power equipment, shall all be within the job duties and functions of the well driller and/or helper. In the event that an extension of work should occur beyond water well drilling functions, into the field of general construction work, such extension of work would come under the appropriate rates listed elsewhere in this wage determination.

- For Work Hours, Shift Differentials, Overtime Rates, and Recognized Holidays see the "Operating Engineers" section of this wage determination.

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
50.52	32.85	83.37	85.72

CLASSIFICATIONS:

Driller

Effective Dates:

01/01/2019			07/01/2019
Rate	Fringe	Total	Total
43.68	32.85	76.53	78.88

CLASSIFICATIONS:

Driller's Helper

OPERATING ENGINEERS MARINE-DREDGING **Rates Expiration Date :**

NOTE: These wage rates only apply to dredging and other marine construction activities occurring in navigable waters and their tributaries.
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:

10/01/2017

Rate	Fringe	Total
38.18	14.33	52.51

CLASSIFICATIONS:

Lead Dredgerman, Operator, Leverman

Licensed Tug Operator (over 1000 HP)

Effective Dates:

10/01/2017

Rate	Fringe	Total
33.03	13.92	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:

10/01/2017

Rate	Fringe	Total
31.09	13.77	44.86

CLASSIFICATIONS:

Certified Welder

OPERATING ENGINEERS MARINE-DREDGING **Rates Expiration Date :**

Effective Dates:

10/01/2017

Rate	Fringe	Total
30.24	13.40	43.64

CLASSIFICATIONS:

Mate, Drag Barge Operator, Steward, Assistant Fill Placer

Welder

Effective Dates:

10/01/2017

Rate	Fringe	Total
29.26	13.32	42.58

CLASSIFICATIONS:

Boat Operator

Effective Dates:

10/01/2017

Rate	Fringe	Total
24.30	12.62	36.92

CLASSIFICATIONS:

Shoreman, Deckhand, Rodman, Scowman

MICROSURFACING/SLURRY SEAL **Rates Expiration Date :**

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

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

MICROSURFACING/SLURRY SEAL **Rates Expiration Date :**

Effective Dates:

03/01/2017

Rate	Fringe	Total
30.30	21.27	51.57

CLASSIFICATIONS:

Cleaner, Taper

ASPHALT LABORERS - SOUTH **Rates Expiration Date :**

"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 $3.00 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:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
43.75	31.53	75.28	77.78

CLASSIFICATIONS:

Paving Foreman

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.30	31.53	73.83	76.33

CLASSIFICATIONS:

Head Raker

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.15	31.53	73.68	76.18

CLASSIFICATIONS:

Raker, Screedman, Luteman

ASPHALT LABORERS - SOUTH **Rates Expiration Date :**

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
41.90	31.53	73.43	75.93

CLASSIFICATIONS:

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

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.00	31.53	73.53	76.03

CLASSIFICATIONS:

Milling Controller

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.20	31.53	73.73	76.23

CLASSIFICATIONS:

Traffic Control Coordinator

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

TEST BORING PRELIMINARY TO CONSTRUCTION-NORTH **Rates Expiration Date :**

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:

10/17/2017

Rate	Fringe	Total
31.62	25.55	57.17

CLASSIFICATIONS:

Helper (4th year helper)

Effective Dates:

10/17/2017

Rate	Fringe	Total
39.69	25.55	65.24

CLASSIFICATIONS:

Driller

Effective Dates:

10/17/2017

Rate	Fringe	Total
45.73	25.55	71.28

CLASSIFICATIONS:

Foreman

HEAVY & GENERAL LABORERS - NORTH **Rates Expiration Date :**

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 $3.00 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:

	03/01/2019		03/01/2020
Rate	Fringe	Total	Total
41.50	31.53	73.03	75.53

CLASSIFICATIONS:

"D" Rate:
basic, landscape, asphalt, slurry seal, or railroad track laborer; utility meter installer; 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:

	03/01/2019		03/01/2020
Rate	Fringe	Total	Total
42.20	31.53	73.73	76.23

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 :**

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.45	31.53	73.98	76.48

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:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
46.00	31.53	77.53	80.03

CLASSIFICATIONS:

"A" Rate:
blaster

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
43.75	31.53	75.28	77.78

CLASSIFICATIONS:

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

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
44.75	31.53	76.28	78.78

CLASSIFICATIONS:

"GENERAL FOREMAN" Rate

HEAVY & GENERAL LABORERS - SOUTH **Rates Expiration Date :**

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 $3.00 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:

	03/01/2019		03/01/2020
Rate	Fringe	Total	Total
41.50	31.53	73.03	75.53

CLASSIFICATIONS:

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

Effective Dates:

	03/01/2019		03/01/2020
Rate	Fringe	Total	Total
41.50	31.53	73.03	75.53

CLASSIFICATIONS:

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

HEAVY & GENERAL LABORERS - SOUTH **Rates Expiration Date :**

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.20	31.53	73.73	76.23

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:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.20	31.53	73.73	76.23

CLASSIFICATIONS:

wagon or directional drill operator; drill master

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
46.00	31.53	77.53	80.03

CLASSIFICATIONS:

blaster

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
43.75	31.53	75.28	77.78

CLASSIFICATIONS:

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

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
44.75	31.53	76.28	78.78

CLASSIFICATIONS:

general foreman

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

HEAVY & GENERAL LABORERS - SOUTH **Rates Expiration Date :**

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.45	31.53	73.98	76.48

CLASSIFICATIONS:

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

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

PIPELINE - MAINLINE TRANSMISSION **Rates Expiration Date :**

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:

	06/08/2018	
Rate	Fringe	Total
54.61	29.59	84.20

CLASSIFICATIONS:

Pipeline Journeyman Welder

PIPELINE - MAINLINE TRANSMISSION **Rates Expiration Date :**

Effective Dates:

06/08/2018

Rate	Fringe	Total
54.61	29.59	84.20

CLASSIFICATIONS:

Pipeline Journeyman

Effective Dates:

06/08/2018

Rate	Fringe	Total
33.55	20.42	53.97

CLASSIFICATIONS:

Pipeline Helper

PIPELINE - GAS DISTRIBUTION **Rates Expiration Date :**

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:

	11/01/2018		**11/01/2019**
Rate	Fringe	Total	Total
60.00	23.73	83.73	86.23

CLASSIFICATIONS:

Pipeline Journeyman Welder

Effective Dates:

	11/01/2018		**11/01/2019**
Rate	Fringe	Total	Total
60.00	23.73	83.73	86.23

CLASSIFICATIONS:

Pipeline Journeyman

Effective Dates:

	11/01/2018		**11/01/2019**
Rate	Fringe	Total	Total
38.46	17.54	56.00	57.67

CLASSIFICATIONS:

Pipeline Helper

ASPHALT LABORERS- NORTH **Rates Expiration Date :**

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 $3.00 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:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
43.75	31.53	75.28	77.78

CLASSIFICATIONS:

Asphalt Foreman

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.45	31.53	73.98	76.48

CLASSIFICATIONS:

Asphalt Screedman

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
42.20	31.53	73.73	76.23

CLASSIFICATIONS:

Asphalt Raker or Lute Man

TERRITORY

ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

ASPHALT LABORERS- NORTH **Rates Expiration Date :**

Effective Dates:

	03/01/2019		**03/01/2020**
Rate	Fringe	Total	Total
41.50	31.53	73.03	75.53

CLASSIFICATIONS:

Asphalt Laborer

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date :**

Electrician-Utility Work (North)
(For apprentice rates refer to Electrician-Utility Work (North) in any county rate package).
These rates apply to work contracted for by the following utility companies:
Public Service Electric & Gas Co. of NJ, GPU Energy, Borough of Madison Electric Department, Sussex Rural Electric Cooperative, Rockland Utilities, and Butler Municipal Electric Co.
These rates do not apply to work on substations or switching stations.
For Utility work contracted for by a utility company other than those listed above or those listed under "Electrician-Utility Work (South), see the "Outside Commercial Rates" for the county in which the jobsite is located.

* FOR OUTSIDE COMMERCIAL RATES PLEASE SEE COUNTY RATES

The regular workday is 8 hours, between 6:00 AM and 6:00 PM.
FOR EMERGENCY WORK ONLY: (emergency work is defined as work caused by storm, catastrophe, act of god, and circumstances beyond the control of the employer)-all hours of work shall be paid at double the hourly rate.
SHIFT DIFFERENTIALS:
Shift work must run for a minimum of 5 consecutive workdays.
2nd shift (between the hours of 4:30 PM and 1:00 AM): 8 hours of work + 17.3% of the regular rate, inclusive of benefits.
3rd shift (between the hours of 12:30 AM and 9:00 AM): 8 hours of work + 31.4% of the regular rate per hour, inclusive of benefits.

OVERTIME:
Hours in excess of 8 per day, or before or after the regular wokday Monday through Friday, that is not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.
Four 10-hour days may worked, at straight time, between 7:00 AM and 6:30 PM, Monday through Thursday.

RECOGNIZED HOLIDAYS:
New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day and Christmas Day, or day on which they are legally observed.

Effective Dates:

	12/02/2018		**12/01/2019**	**11/29/2020**
Rate	Fringe	Total	Total	Total
55.13	36.93	92.06	94.45	96.84

CLASSIFICATIONS:

Chief Lineman

Effective Dates:

	12/02/2018		**12/01/2019**	**11/29/2020**
Rate	Fringe	Total	Total	Total
52.01	34.84	86.85	89.11	91.36

CLASSIFICATIONS:

Journeyman Lineman

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date :**

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
52.01	34.84	86.85	89.11	91.36

CLASSIFICATIONS:

Special License Operator

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
51.49	34.49	85.98	88.22	90.44

CLASSIFICATIONS:

Transit Man

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
49.93	33.45	83.38	85.53	87.70

CLASSIFICATIONS:

Line Equipment Operator

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
43.69	29.27	72.96	74.84	76.73

CLASSIFICATIONS:

Dynamite Man

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
65.01	43.55	108.56	111.38	114.19

CLASSIFICATIONS:

General Foreman

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
59.81	40.07	99.88	102.47	105.05

CLASSIFICATIONS:

Assistant General Foreman

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date :**

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
58.25	39.02	97.27	99.79	102.32

CLASSIFICATIONS:

Line Foreman

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
42.13	28.22	70.35	72.17	73.99

CLASSIFICATIONS:

Street Light Mechanical Leader

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
40.05	26.83	66.88	68.62	70.34

CLASSIFICATIONS:

Groundman Winch Operator

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
40.05	26.83	66.88	68.62	70.34

CLASSIFICATIONS:

Groundman Truck Operator

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
39.53	26.48	66.01	67.71	69.43

CLASSIFICATIONS:

Street Light Mechanic

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
39.53	26.48	66.01	67.71	69.43

CLASSIFICATIONS:

Line Equipment Mechanic

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

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date :**

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
33.81	22.65	56.46	57.91	59.38

CLASSIFICATIONS:

Groundman 2nd Year

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
31.21	20.91	52.12	53.47	54.80

CLASSIFICATIONS:

Groundman 1st Year

Effective Dates:

12/02/2018			12/01/2019	11/29/2020
Rate	Fringe	Total	Total	Total
51.49	34.49	85.98	88.22	90.44

CLASSIFICATIONS:

Line Equipment Foreman

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date :**

Electrician-Utility Work (South)
(For apprentice rates refer to Electrician-Utility Work (South) in any county rate package).
These rates apply to work contracted for by the following utility company:
Atlantic City Electric.
These rates do not apply to work on substations or switching stations.
For utility work contracted for by a utility company other than the one listed above or those listed under "Electrician-Utility Work (North), see the "Outside Commercial Rates" for the county in which the jobsite is located.

* FOR OUTSIDE COMMERCIAL RATES PLEASE SEE COUNTY RATES

The regular workday is 8 hours, between 7:00 AM and 4:30 PM.
FOR EMERGENCY WORK ONLY: (emergency work is defined as work caused by storm, catastrophe, act of god, and circumstances beyond the control of the employer)- all hours of work shall be paid at double the hourly rate.
SHIFT DIFFERENTIALS:
Shift work must run for a minimum of 5 consecutive workdays.
When two (2) or three (3) shifts are worked the following shall apply:
1st shift (between the hours of 8:00 AM and 4:30 PM)
2nd shift (between the hours of 4:30 PM and 12:30 AM): 8 hours of work + 10% of the regular rate of pay for 7.5 hours worked.

3rd shift (between the hours of 12:30 AM and 8:00 AM): 8 hours of work + 15% of the regular rate of pay for 7 hours worked.

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

Four 10-hour days may be worked, at straight time, between 6:00 AM and 6:00 PM, Monday through Thursday with Friday used as a make-up day.

RECOGNIZED HOLIDAYS:
New Year's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day or on days celebrated.

WORKING RULES:
There shall be a Foreman in charge of each work crew. No crews are to exceed twelve (12) men, including Foremen.

There shall be a General Foreman designated for transmission work when three (3) or more crews are on the same job and for distribution work where there are are more than twenty (20) employees on site.
A small job crew shall consist of five (5) or less employees, one (1) of the Journeyman Linemen in the crew shall be designated as a Small Job Foreman.
Work performed from ladders and/or mechanical lift equipment shall be the work of Linemen and/or Apprentices.
On new construction, fitting and framing poles, towers or structures may be done by Journeymen and/ or Apprentices. Groundmen may assist, but may not perform any work which would be performed by Linemen if assembled in the air.
There shall be a Journeyman Lineman in each pole setting, erection, grounding, wire and cable-pulling crew of more than three (3) men.

Effective Dates:

12/02/2018

Rate	Fringe	Total
60.86	48.05	108.91

CLASSIFICATIONS:

General Foreman

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date :**

Effective Dates:

12/02/2018

Rate	Fringe	Total
54.21	44.12	98.33

CLASSIFICATIONS:

Foreman

Effective Dates:

12/02/2018

Rate	Fringe	Total
51.35	42.44	93.79

CLASSIFICATIONS:

Small Job Foreman

Effective Dates:

12/02/2018

Rate	Fringe	Total
47.55	40.18	87.73

CLASSIFICATIONS:

Heavy Equipment Operator

Effective Dates:

12/02/2018

Rate	Fringe	Total
47.55	40.18	87.73

CLASSIFICATIONS:

Cable Splicer

Effective Dates:

12/02/2018

Rate	Fringe	Total
47.55	40.18	87.73

CLASSIFICATIONS:

Journeyman Lineman

Effective Dates:

12/02/2018

Rate	Fringe	Total
47.55	40.18	87.73

CLASSIFICATIONS:

Journeyman Welder

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date :**

Effective Dates:

12/02/2018

Rate	Fringe	Total
47.55	40.18	87.73

CLASSIFICATIONS:

Journeyman Painter

Effective Dates:

12/02/2018

Rate	Fringe	Total
38.04	34.55	72.59

CLASSIFICATIONS:

Light Equipment Operator

Effective Dates:

12/02/2018

Rate	Fringe	Total
33.29	31.73	65.02

CLASSIFICATIONS:

Groundman Truck Driver

Effective Dates:

12/02/2018

Rate	Fringe	Total
30.91	30.31	61.22

CLASSIFICATIONS:

Groundman 3rd Year

Effective Dates:

12/02/2018

Rate	Fringe	Total
28.53	28.91	57.44

CLASSIFICATIONS:

Groundman 2nd Year

Effective Dates:

12/02/2018

Rate	Fringe	Total
26.15	27.51	53.66

CLASSIFICATIONS:

Groundman 1st Year

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

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date :**

Effective Dates:

12/02/2018

Rate	Fringe	Total
20.92	24.41	45.33

CLASSIFICATIONS:

Flagman

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

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS **Rates Expiration Date :**

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 $3.00 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:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
66.38	31.53	97.91	101.16

CLASSIFICATIONS:

Walking Boss & Superintendent

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
65.93	31.53	97.46	100.71

CLASSIFICATIONS:

Heading Foreman, Shaft Foreman, Rod Foreman, Electrical Foreman, Rigging Foreman

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS **Rates Expiration Date :**

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
65.18	31.53	96.71	99.96

CLASSIFICATIONS:

Iron Foreman, Caulking Foreman, Form Foreman, Cement Finishing Foreman, Concrete Foreman, Track Foreman, Clean-up Foreman, Grout Foreman

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
68.93	31.53	100.46	103.71

CLASSIFICATIONS:

Blaster

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
64.35	31.53	95.88	99.13

CLASSIFICATIONS:

Top Labor Foreman

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
63.83	31.53	95.36	98.61

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:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
63.60	31.53	95.13	98.38

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)

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

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS **Rates Expiration Date :**

Effective Dates:

03/01/2019			03/01/2020
Rate	Fringe	Total	Total
63.00	31.53	94.53	97.78

CLASSIFICATIONS:

All others (including Powder Watchman, Change House Attendant, Top Laborer, Job Steward)

MEDIA AND GRAVEL SPECIFICATIONS					
Layer	Depth	Approximate Bags per Filter	Size	Description	Uniformity Coefficient
Top	*18"	253	0.60 - 0.80 mm	Anthracite	Less than 1.6
5th	*18"	510	0.30 - 0.35 mm	Greensand Plus™	Less than 1.6
4th	3"	40	0.8 - 1.2 mm	Torpedo Sand	Less than 1.65
3rd	3"	38	1/4" x 1/8"	Graded Gravel	---
2nd	3"	37	1/2" x 1/4"	Graded Gravel	---
Bottom	3"	35	3/4" x 1/2"	Graded Gravel	---
Subfill	---	142 CF	---	Concrete	---

* Depth after skimming (1" extra is included for skimming).

FILTER SPECIFICATIONS:

NUMBER OF FILTER UNITS:
TWO (2)

NUMBER OF FILTER CELLS:
TWO (2)

FILTER AREA:
157.5 SQ. FT./FILTER (78.8 SQ. FT./CELL)

FILTRATION RATE:
1000 GPM (500 GPM/FILTER, 3.1 GPM/SQ. FT.)

BACKWASH RATE:
630-788 GPM/CELL (8-10 GPM/SQ. FT./CELL)
ACTUAL GPM TO BE DETERMINED IN FIELD AT START-UP

AIR PRESSURIZATION RATE:
AIR: 120 CFM/CELL @ 12 PSI (1.5 CFM/SQ. FT./CELL)

AIRWASH RATE:
AIR: 288 CFM/CELL @ 5 PSI (3.65 CFM/SQ. FT./CELL)

ESTIMATED SHIPPING WEIGHT (TANK ONLY):
20,000 LBS.

PRESSURE VESSEL REQUIREMENTS

CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT EDITION OF THE ASME CODE SECTION VIII, DIV 1 FOR NON-FIRED PRESSURE VESSELS DESIGN

VESSEL(S) SHALL BEAR ASME STAMP

PRESSURE REQUIREMENTS

WORKING PRESSURE: 150 PSIG
HYDROSTATIC TEST PRESSURE: 195 PSIG

DESIGN SAFETY FACTOR SHALL BE 3.5

MATERIALS OF CONSTRUCTION

NUMBER OF VESSELS: 2

TANK DIAMETER TO BE 8'-0"

HEADS: 5/8" SA-516 GR. 70 STEEL
SHELL: 1/2" SA-516 GR. 70 STEEL
INTERNALS: ASTM A 36 STEEL OR EQUIV.

CONSTRUCTION SPECIFICATIONS:

UNDERDRAIN:
TONKA STANDARD HEADER/LATERAL SCH. 80 PVC UNDERDRAIN WITH TONKA UNDERDRAIN NOZZLES ON 12" CENTERS FOR CONCRETE ENCASEMENT INSIDE THE FILTER VESSEL. NOTE: CONCRETE TO BE FURNISHED BY INSTALLING CONTRACTOR - NOT INCLUDED BY TONKA.

AIRWASH:
HEADER/LATERAL AIRWASH DISTRIBUTOR, SCH. 40 304 SS WITH ORIFICES ON 6" CENTERS, STRUCTURALLY SUPPORTED FROM SIDEWALL OF FILTER

DISTRIBUTION:
HEADER/LATERAL INLET DISTRIBUTOR, SCH. 40 STEEL STRUCTURALLY SUPPORTED FROM SIDEWALL OF FILTER

PIPING:
EXTERIOR FACE PIPING: CLASS 53 DUCTILE IRON, CEMENT LINED AND PRIME PAINTED. PROVIDED WITH GRADE 5 ZINC PLATED FASTENERS

AIRWASH PIPING: CLASS 53 DUCTILE IRON, UNLINED AND PRIME PAINTED. PROVIDED WITH GRADE 5 ZINC PLATED FASTENERS

TANK FLANGES:
150 LB. FLAT FACE SLIP ON WELD FLANGES FACTORY WELDED ON SPLIT CENTERS

COUPLINGS:
3000 LB. NPT, STEEL

INTERNAL FASTENERS:
STAINLESS STEEL

NOTES:

1) ALL DIMENSIONS ARE SUBJECT TO NORMAL CONSTRUCTION TOLERANCES.

2) PIPING MUST BE PROVIDED WITH ADEQUATE SUPPORTS TO PREVENT UNDUE STRESSES AND DAMAGE TO VESSEL. PIPE SUPPORTS BY OTHERS.

3) TONKA EQUIPMENT COMPANY IS PROVIDING THE HEREIN DESCRIBED EQUIPMENT WITH SOME SURFACES RECEIVING SURFACE PREPARATION AND PRIME PAINT COAT ONLY.

   BEFORE APPLICATION OF THE FINISH COAT, THE PRIMED SURFACE MUST BE PROPERLY CLEANED AND PREPARED. THE FINISH COAT MUST BE APPLIED WITHIN SIXTY (60) DAYS OF APPLICATION OF THE PRIMER COAT OR SPECIAL SURFACE PREPARATION PROCEDURES MUST BE FOLLOWED.

   TONKA EQUIPMENT COMPANY WILL NOT WARRANT THE SURFACE PREPARATION OR THE PRIME COAT IF PRODUCTS OF ANY MANUFACTURER OTHER THAN THAT OF THE PRIME COAT ARE USED OR IF THE ABOVE NAMED PAINT MANUFACTURER'S RECOMMENDATIONS ARE NOT FOLLOWED DURING THE APPLICATION OF THE FINISH COATS.

4) SUITABLE LIFTING LUGS WILL BE SUPPLIED.

5) INSTALLATION AND GROUT ARE BY OTHERS.

6) SEE PIPING ARRANGEMENT DRAWING FOR LIMITS OF TONKA SUPPLIED PIPING. DASHED FACEPIPING NOT BY TONKA.

7) INSTALLATION AND FIT-UP OF ALL FACEPIPING NOT BY TONKA.

8) VESSELS TO BE FIELD LEVELED AND PLUMBED WITHIN 1/8"

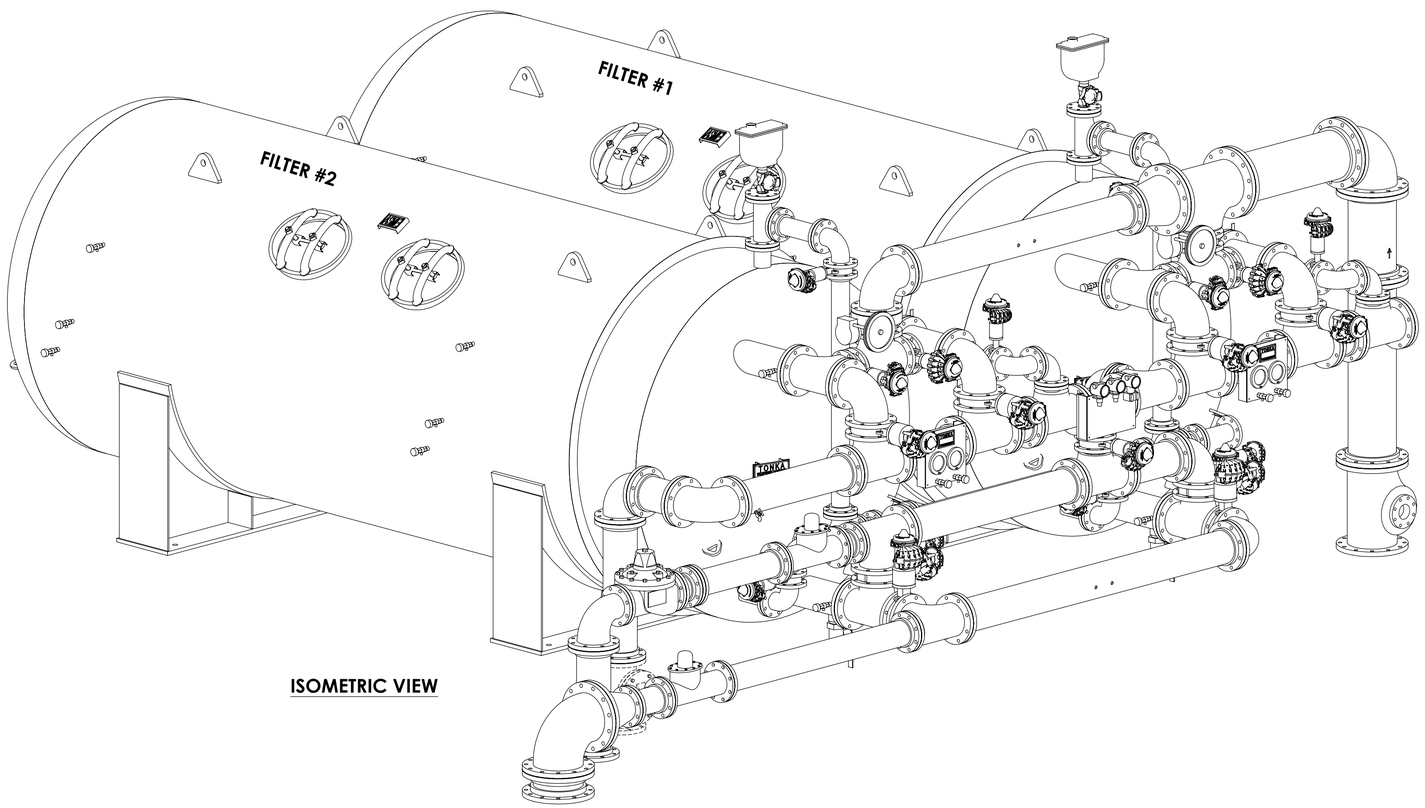
9) MEDIA AND AIRWASH GRID INSTALLATION BY OTHERS. INSTALLATION INSTRUCTIONS TO BE PROVIDED.

10) DO NOT PURCHASE OR INSTALL CONNECTING PIPING UNTIL TONKA'S EQUIPMENT HAS BEEN INSTALLED. TONKA IS NOT RESPONSIBLE FOR PIPING PURCHASED OR INSTALLED BEFORE ACTUAL FIELD DIMENSIONS ARE VERIFIED BY CONTRACTOR TO PROVIDE FLEXIBILITY OF PIPING FIT-UP, IF REQUIRED.

11) ANCHOR BOLTS BY OTHERS, IF REQUIRED.

12) PROPER EARTH GROUND BY OTHERS.

13) SOME VALVES SHOWN ARE BY OTHERS. REFER TO TONKA LETTER OF QUOTATION FOR ITEMS IN TONKA SCOPE OF SUPPLY.



ISOMETRIC VIEW

Paint Specifications

INTERIOR PAINT SPECIFICATIONS					
Paint Manufacturer	Series	Color	Coat	Blast profile	Dry Film Thickness
Tnemec	N140-15BL	Tank White	Stripe	SSPC-SP10	3-5 Mils
Tnemec	N140-15BL	Tank White	Prime		3-5 Mils
Tnemec	N140-1255	Beige	Finish		4-6 Mils
Tnemec	N140-15BL	Tank White	Finish		4-6 Mils
Total Prime and Finish DFT					11-17 Mils

EXTERIOR PAINT SPECIFICATIONS					
Paint Manufacturer	Series	Color	Coat	Blast profile	Dry Film Thickness
Tnemec	N140-15BL	Tank White	Stripe	SSPC-SP6	3-5 Mils
Tnemec	N140-1255	Beige	Prime		3-5 Mils
Tnemec	*	*	Finish *		*
Total Prime DFT					3-5 Mils

* Finish coat to be applied by others.

REV.	DESCRIPTION	REV. BY	APPR. BY	APPR. DATE
B	CHANGE TO STAINLESS STEEL AIRWASH	DDI	EJW	03/09/2011
A	ADD TRANSMITTER PANEL, UPDATE MEDIA & PAINT SPECS, ADD DIMENSIONS AND NOTE TO PAGE 2, 3 & 4, ADDED PAGE 6 FOR SECTION VIEWS, ADDED COUPLINGS TO INLET TEES	DDI	EJW	02/18/2011
0				

DO NOT SCALE DRAWING

DRAWING SIZE: D
DRAWN BY: DDI
START DATE: 11/15/2010
PROJECT MGR: EJW
DWG. SCALE: 1:20
APPR. BY: EJW
APPR. DATE: 12/09/2010

TONKA WATER TREATMENT SYSTEMS

TONKA EQUIPMENT COMPANY

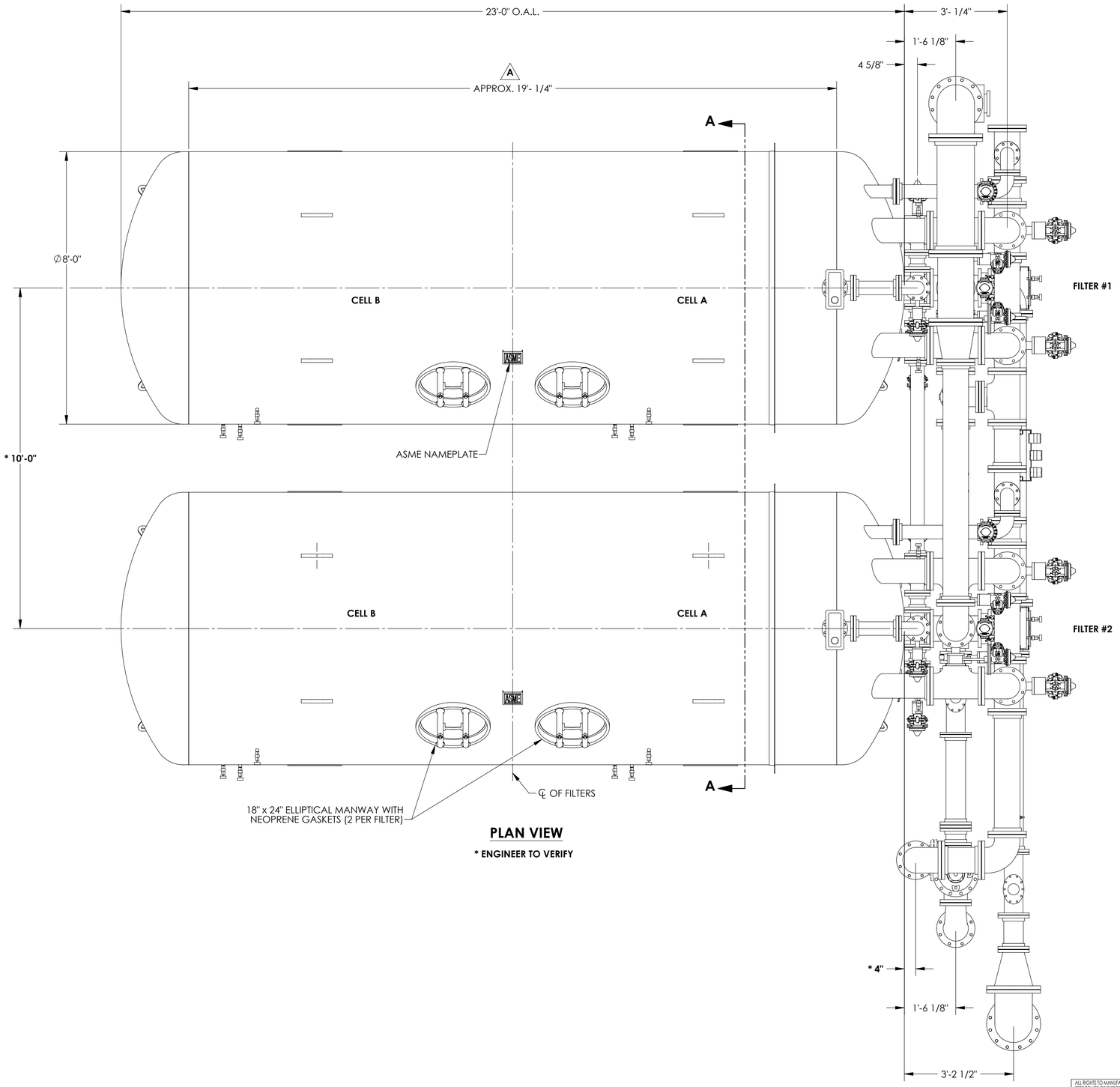
SERVING PEOPLE SINCE 1956 THROUGH THE DESIGN AND MANUFACTURE OF MUNICIPAL AND INDUSTRIAL WATER TREATMENT SYSTEMS.
13305 WATERTOWER CIRCLE
PLYMOUTH, MN 55441
OFFICE: (763) 559-2837
FAX: (763) 559-1979
http://www.tonkawater.com

HPF
ISO VIEW & SPECIFICATIONS
SUBMITTAL DRAWING
SEA GIRT, NJ

SHEET NUMBER: 1 OF 6
REV: B
DRAWING NUMBER: 00043709

PROJECT NUMBER: 10155

Last Saved: Friday, June 22, 2012 5:40:43 PM



PLAN VIEW

*** ENGINEER TO VERIFY**

DRAWING SIZE: D	TONKA WATER TREATMENT SYSTEMS	**TONKA EQUIPMENT COMPANY**	
		SERVING PEOPLE SINCE 1956 THROUGH THE DESIGN AND MANUFACTURE OF MUNICIPAL AND INDUSTRIAL WATER TREATMENT SYSTEMS. 13305 WATERTOWER CIRCLE PLYMOUTH, MN 55441 OFFICE: (763) 559-2837 FAX: (763) 559-1979 http://www.tonkawater.com	
DRAWN BY: DDI	START DATE: 11/15/2010	**HPF PLAN VIEW SUBMITTAL DRAWING** SEA GIRT, NJ	SHEET NUMBER: 2 OF 6
PROJECT MGR: EJW	DWG. SCALE: 1:20		REV: B
APPR. BY: EJW	APPR. DATE: 12/09/2010		DRAWING NUMBER: 00043709

DO NOT SCALE DRAWING

Project Number: 10155

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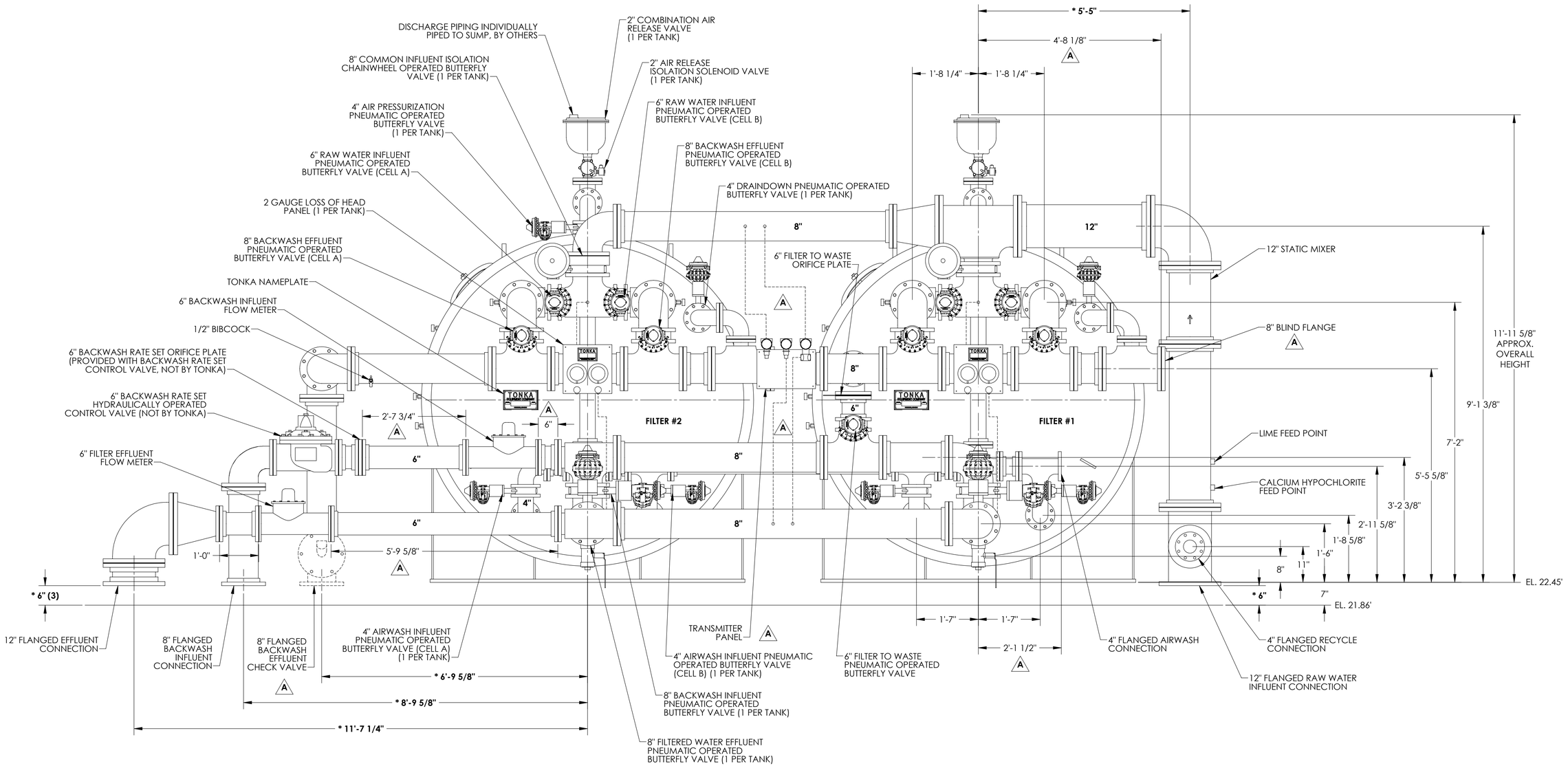

FRONT ELEVATION

*** ENGINEER TO VERIFY**

DRAWING SIZE:	DRAWN BY:	START DATE:	PROJECT MGR:	DWG. SCALE:	APPR. BY:	APPR. DATE:
D	DDI	11/15/2010	EJW	1:16	EJW	12/09/2010

TONKA WATER TREATMENT SYSTEMS
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HPF
PIPING ARRAINGEMENT
SUBMITTAL DRAWING
SEA GIRT, NJ

SHEET NUMBER: 3 OF 6
REV: B
DRAWING NUMBER: 00043709
PROJECT NUMBER: 10155

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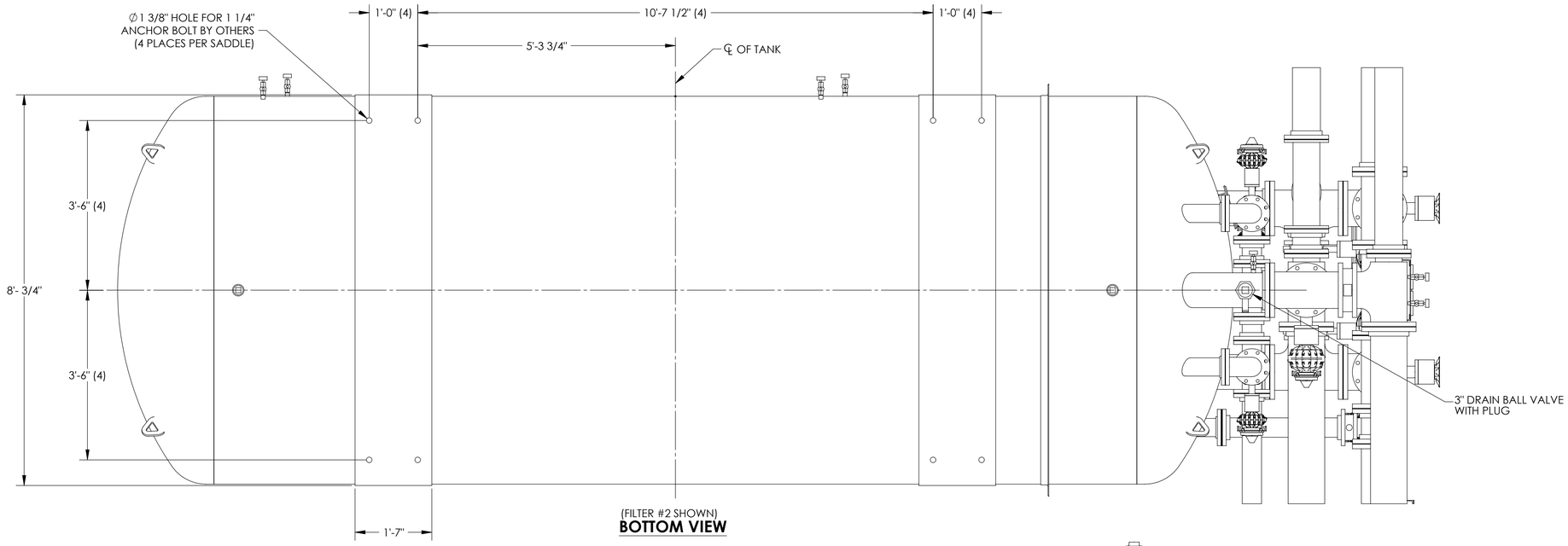
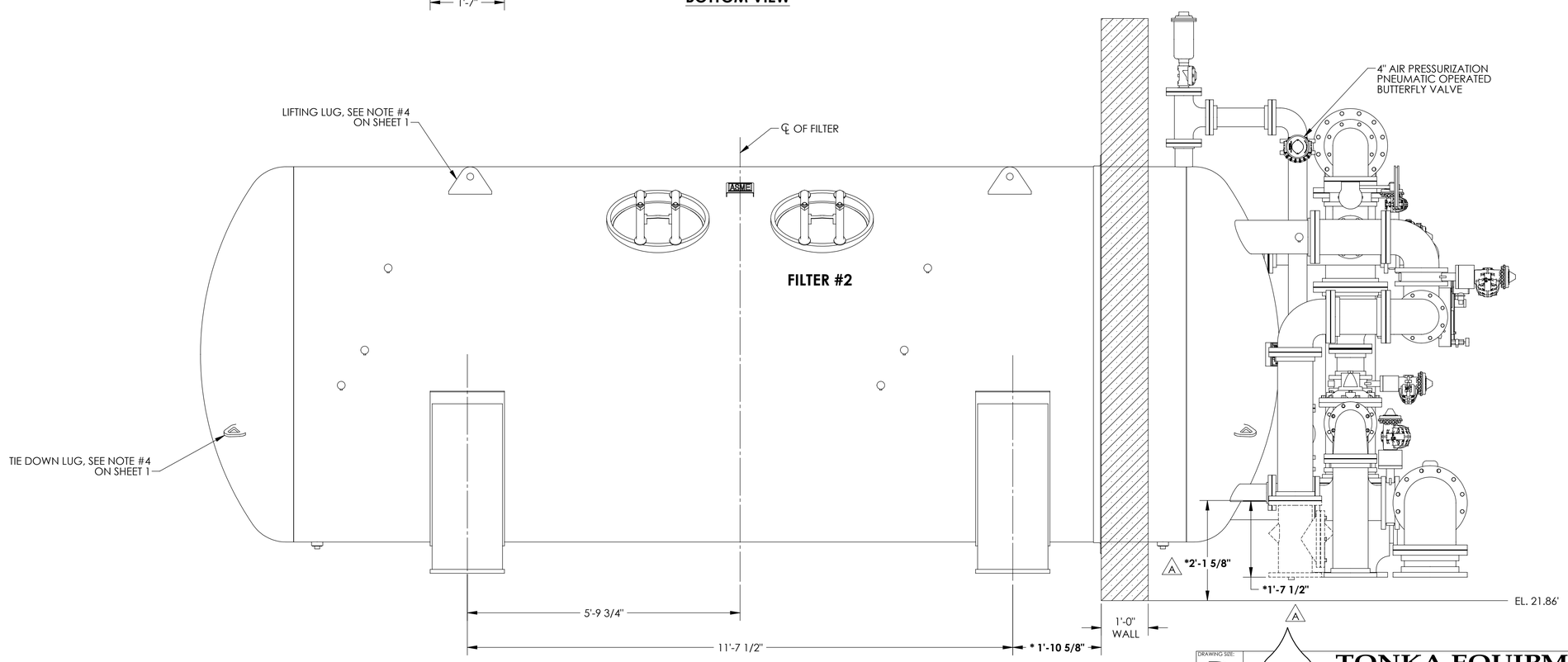


(FILTER #2 SHOWN)

BOTTOM VIEW



SIDE ELEVATION

*** ENGINEER TO VERIFY**

DO NOT SCALE DRAWING

DRAWING SIZE: D	TONKA WATER TREATMENT SYSTEMS		
DRAWN BY: DDI	START DATE: 11/15/2010		
PROJECT MGR: EJW	DWG. SCALE: 1:16		
APPR. BY: EJW	APPR. DATE: 12/09/2010		

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HPF
SIDE AND BOTTOM VIEWS
SUBMITTAL DRAWING

SEA GIRT, NJ

SHEET NUMBER: 4 OF 6

REV: **B**

DRAWING NUMBER: **00043709**

PROJECT NUMBER: **10155**

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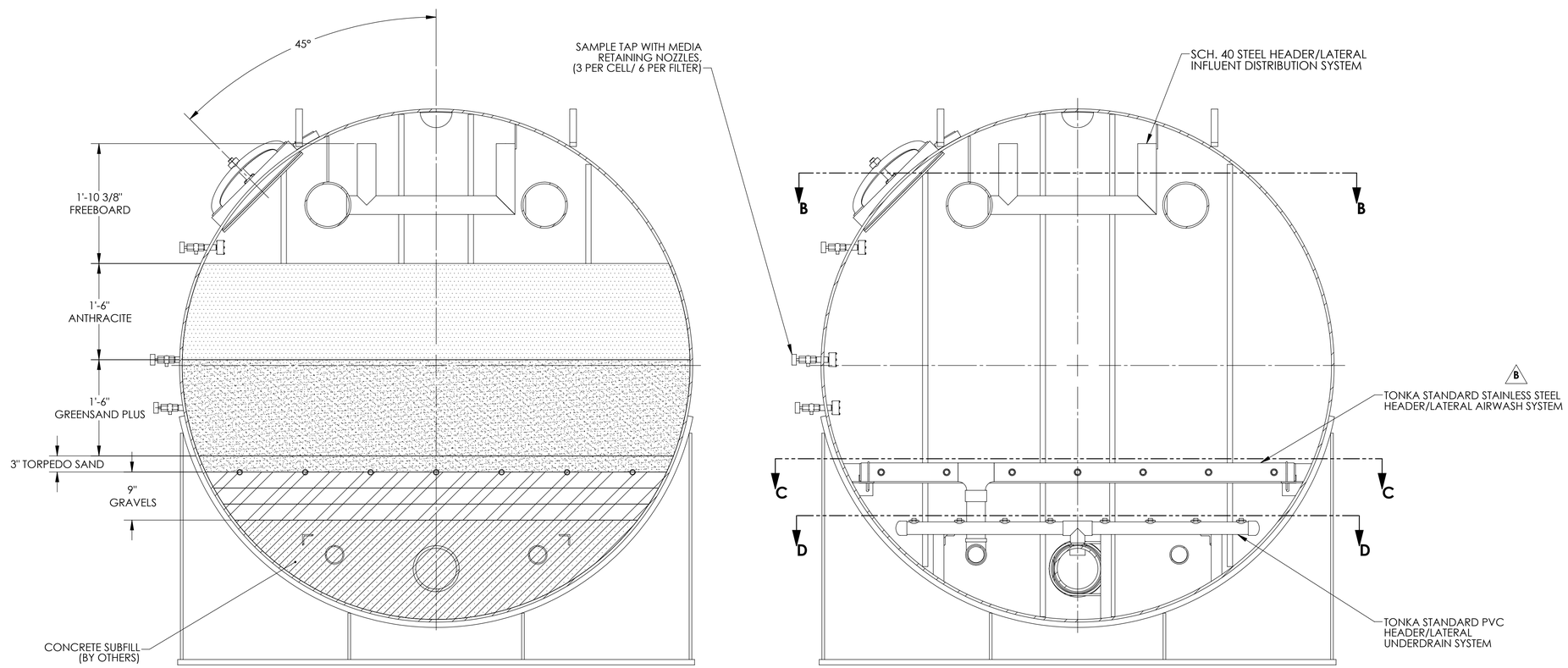

SECTION A-A

DO NOT SCALE DRAWING

DRAWING SIZE:		
D		
DRAWN BY: DDI	START DATE: 11/15/2010	
PROJECT MGR: EJW	DWG. SCALE: 1:12	
APPR. BY: EJW	APPR. DATE: 12/09/2010	

TONKA WATER TREATMENT SYSTEMS

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HPF
SECTION A-A
SUBMITTAL DRAWING
SEA GIRT, NJ

SHEET NUMBER:	REV:
5 OF 6	B
DRAWING NUMBER: 00043709	

PROJECT NUMBER: 10155

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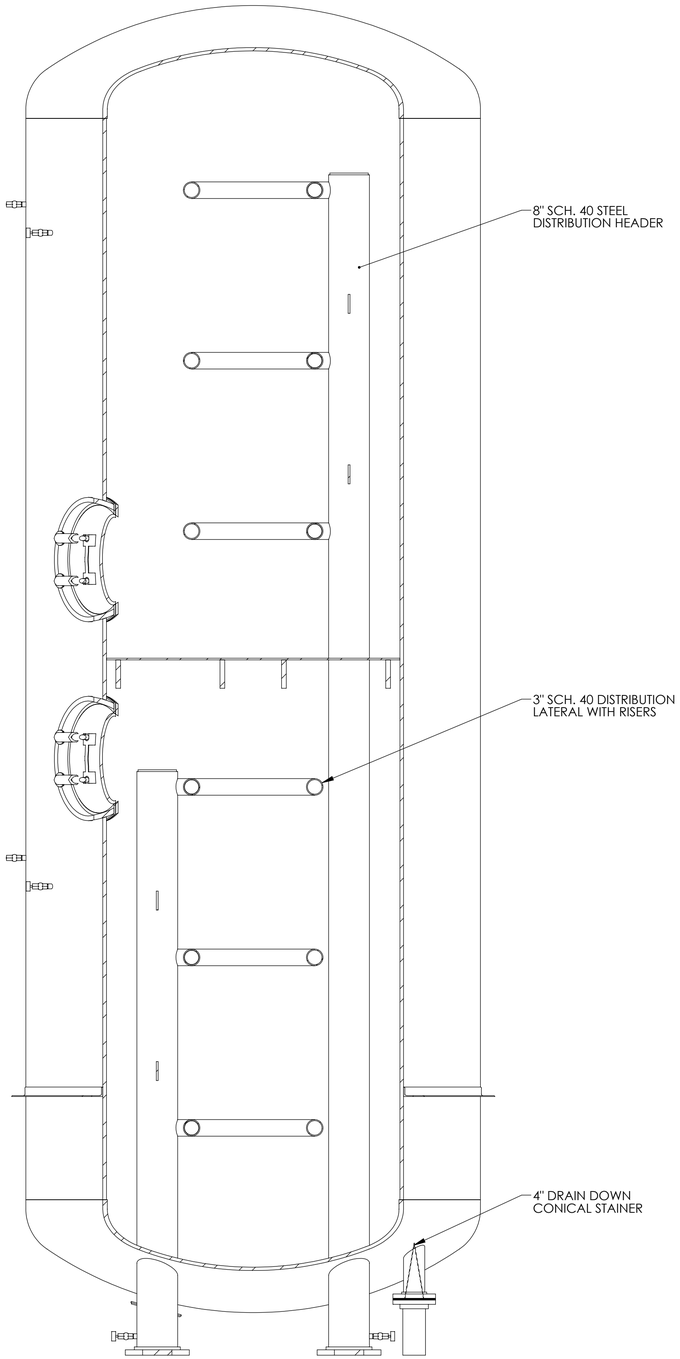
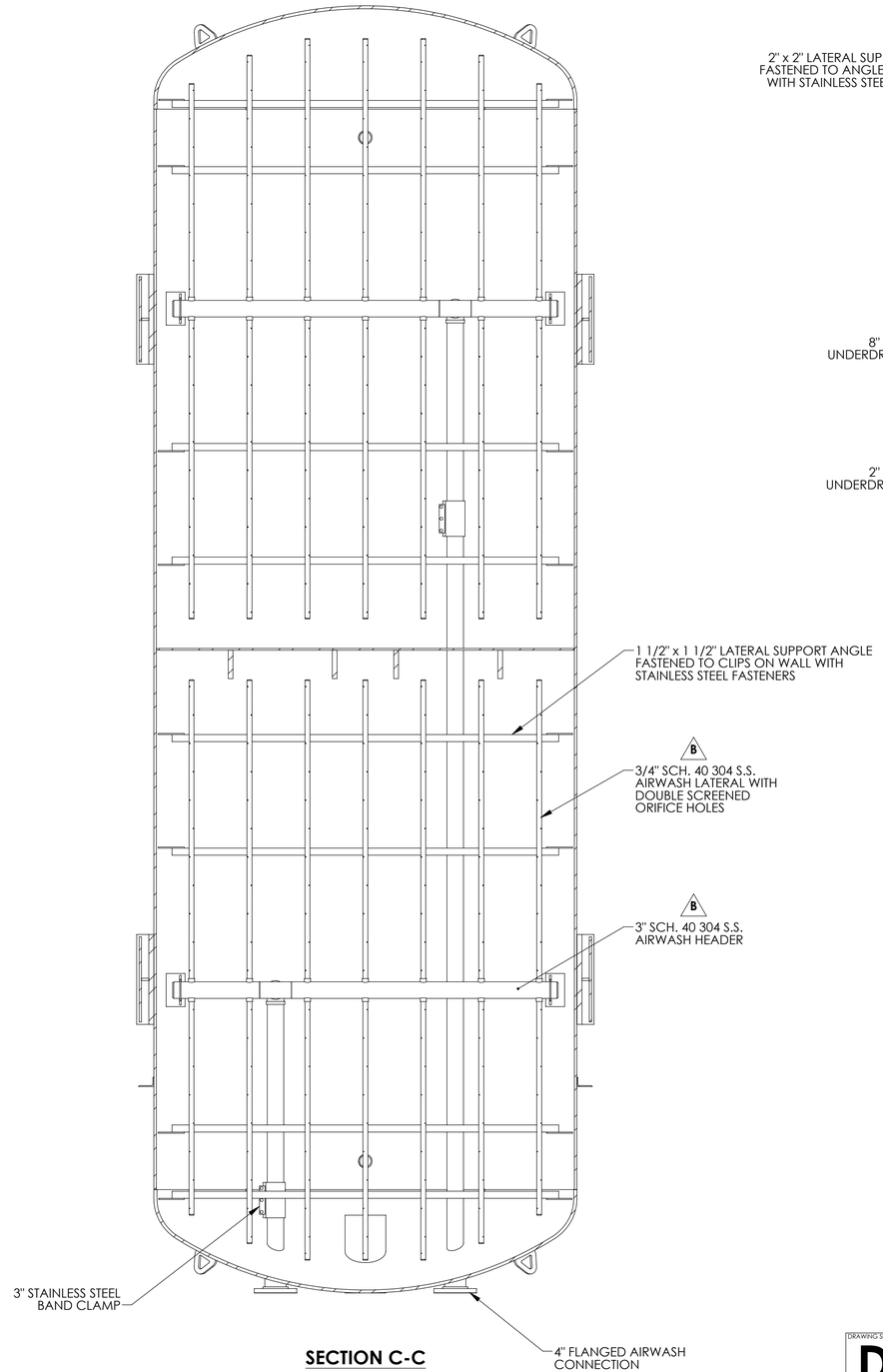


SECTION B-B

DISTRIBUTION LAYOUT

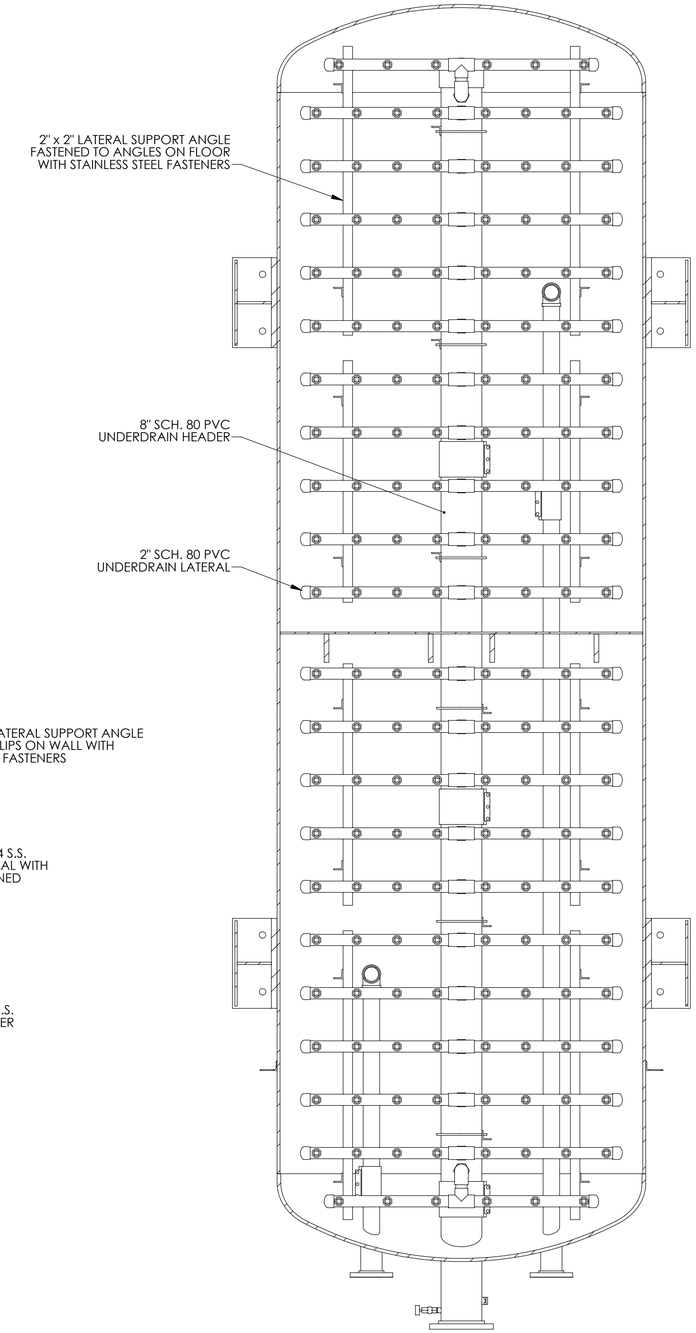
(AIRWASH AND UNDERDRAIN
COMPONENTS NOT SHOWN)



SECTION C-C

AIRWASH LAYOUT

(UNDERDRAIN COMPONENTS NOT SHOWN)



SECTION D-D

UNDERDRAIN LAYOUT

DO NOT SCALE DRAWING

DRAWING SIZE: D			
DRAWN BY: DDI	START DATE: 11/15/2010		
PROJECT MGR: EJW	DWG. SCALE: 1:16		
APPR. BY: EJW	APPR. DATE: 12/09/2010		

TONKA WATER TREATMENT SYSTEMS

TONKA EQUIPMENT COMPANY

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HPF
SECTION VIEWS B-B, C-C & D-D
SUBMITTAL DRAWING
SEA GIRT, NJ

SHEET NUMBER: 6 OF 6	REV: B
DRAWING NUMBER: 00043709	

PROJECT NUMBER: 10155

Last Saved: Friday, June 22, 2012 5:40:43 PM

PART 1 - GENERAL

1.01 BRIEF PURPOSE OF PROJECT / GENERAL

A. The purpose of the project is to replace the filter media in two (2) iron filtration pressure vessels, with interior / exterior pressure wash of surfaces. Additionally, the existing flow meters will be removed and refurbished, and stored by the Owner for later use. New flow meters identical to existing will be installed. The two (2) existing air vacuum relief valves shall be removed and replaced. Finally, the sample test bench countertop, sink, and cabinetry shall be replaced.

B. In addition to the work described above the project scope shall also include upgrades to facility's existing HVAC systems. These upgrades shall include the replacement of two (2) existing exhaust fans, the installation of one (1) new exhaust fan, and the installation of one (1) new gas-fired make-up air unit. New structural supports for the gas-fire make-up air unit shall also be provided along with new rooftop fall protection. New ductwork, piping, wiring, controls, and other components shall be furnished and installed in accordance with the bid documents.

C. All work shown and specified in the Contract Documents shall be the work of this Construction Contract. The Owner does not anticipate awarding other prime contracts for the project as shown.

D. This Section provides an abbreviated summary of the work for the Construction Contract associated with the Owner's program to construct the project.

1.02 NOMENCLATURE

A. Where the terms "Engineer/Architect", "Architect/Engineer", "Engineer", or "Architect" are used throughout these Contract Documents, they shall mean the firm of H2M architects + engineers as may be abbreviated by H2M or H2M Group.

B. The terms "Contractor" and/or "Prime Contractor" where used shall refer to the individual or company who has entered into an agreement with the Owner to perform the work contained within these Contract Documents. The lack of word capitalization shall be incidental.

1.03 ABBREVIATED SUMMARY OF WORK

A. Furnish all labor, equipment, materials, tools, means, methods, and incidentals necessary to complete the Work as required by the Contract Documents for this Construction Contract. The contractor shall coordinate, through the Owner/Engineer, the work of their contract with any work by others.

B. This following abbreviated summary is provided in order to briefly describe the work covered by the Contract Documents for this Construction Contract. It is not all inclusive of the work under the Contract.

C. The work includes, but is not limited to, the following:
   1. Replacement of filter media for (2) iron removal pressure vessels.
   2. Replace (3) flow meters in kind, refurbish and return existing meters.
   3. Replace sample test bench countertop and cabinetry.
   4. Install rooftop make-up air unit and associated piping, ductwork, structural, and architectural work.
   5. Replace (2) exhaust fans, install (1) new exhaust fan.

D. All other work shown and specified in the Contract Documents.

1.04 PARTIAL LISTING OF SPECIFIC CONTRACT REQUIREMENTS

A. The Contract Documents detail the work included in the Contract. Related requirements and conditions covered by the Contract Documents include, but are not limited to, the following:
   1. Adherence to work restrictions as specified in Section 012100. Such restrictions include, but are not limited to:
      a. Guidelines and requirements of the "Owner".
   2. Guidelines and requirements of the New Jersey Department of Environmental Protection.
   3. Guidelines and requirements of the local Health Department.
   4. Guidelines and requirements of the American Water Works Association (AWWA).

1.05 PARTIAL LISTING OF OVERALL CONTRACT REQUIREMENTS

A. The Contract Documents detail the work included in the Contract. Related requirements and conditions covered by the Contract Documents include, but is not limited to, the following:
   1. Debris removal and daily and final cleaning up.
   2. Site utilization and management so as not to disrupt the Owner’s ability to operate the existing facilities in a safe and efficient manner.
   3. Maintain the Owner’s ability to operate the facility at all times during the construction period.
   4. Facilities to be used during the contract period that are to be used by the Owner or his representatives and others involved with constructing the project.
   5. Product and equipment storage and handling requirements.
   6. Starting and adjusting of the equipment and systems required under the project.
   7. Site safety in accordance with all applicable federal, state, and local regulations.
   8. Project submittals, meetings, testing services, schedules, shop drawings, closeout procedures and documents, manuals, as-built drawings, and final commissioning of the work shall be provided as required by the Contract.
   9. To not hinder the Owner’s ability to deliver a safe and potable water supply.

1.06 OWNER SUPPLIED PRODUCTS AND UTILITIES

A. The Owner will not be supplying equipment, labor, or tools for the project.

B. The Owner will be supplying products or materials for the project as follows:
   1. Products shown on the Drawings or specified elsewhere.

C. The Owner will pay for electricity usage.
   1. Power tool usage during specified working hours will only be permitted.

D. The Owner reserves the right to stop paying for electrical usage at any time if, in the opinion of the Owner/Engineer, the Contractor causes excessive electrical charges or does not conserve electricity to the maximum extent possible in the opinion of the Engineer. All Contractors shall conserve electricity during the course of construction.

1.07 EXISTING CONDITIONS

A. The Drawings show certain information that has been obtained by the Owner regarding various pipelines, structures, and utilities that exist at the location of the project both below and at grade.

B. The Owner and the Engineer expressly disclaims all responsibility for the accuracy or completeness of the information given on the Drawings with regard to existing facilities.

C. In the case where the Contractor discovers an obstruction not indicated on the Drawings or not described via specification reference, then the Contractor shall immediately notify the Engineer of the obstructions' existence.

D. The Engineer will determine if the obstruction is to be relocated or removed.

E. Compensation for this extra work will be paid for in accordance with the provisions in the Contract for "Extra Work".

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 011100

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Site access and control of areas outside of site.

B. Contractor use of the premises.

C. Contractor storage, parking and deliveries.

D. Work hours, employee conduct and miscellaneous employee requirements.

E. Contract requirements related to maintaining Owner's current operations and excess inspection required.

F. Suggested construction sequence.

1.02 SITE ACCESS AND CONTROL

A. The Contractor shall use the designated entrance to the site as shown on the drawings. If no site entrance is designated, the Contractor shall use an entrance designated by the Owner's Construction Representative.
   1. The Owner may permit, solely at the Owner's discretion, the temporary use of another entrance for site access.
   2. The Owner will only review requests made by the Contractor for an exception to the designated site entrance if made in writing at least 72 hours in advance of each of the times desired for use.

B. The Contractor is to maintain the entrance area clear of materials, vehicles and any other obstacle or debris. Failure to do so will result in a minimum back charge of $750 per occurrence.

C. The area around the site is a residential neighborhood. The Owner intends to be a good neighbor. The Contractor shall not close any road for any period in time. The Contractor shall take whatever measures are necessary to not cause any inconvenience to the area's residents.

D. The Contractor is responsible to employ methods to prevent construction materials and/or debris from leaving the site. The Contractor is responsible to routinely monitor the areas surrounding the site during the day as well as at the end of the work-day and to immediately clean up any area to its previous condition.

E. The Contractor shall employ methods to prevent the transmission of dirt from vehicles driving on exposed areas of the site from reaching the surrounding roadways. The Contractor will be responsible to immediately clean the roadway, should the measures being taken by the Contractor not satisfactorily control the transmission of any dirt to the roadway.

F. Any damages to areas outside the site, spills of soil, liquid, or any other material shall immediately be repaired, cleaned and restored to its previous condition.

G. The Contractor shall comply with all state and local requirements for allowable weight limits of vehicleson all roads.

H. The Owner reserves the right to back charge the Contractor for all costs associated with maintaining the grounds as well as maintaining areas outside the site, which may be disturbed by the Contractor should the Contractor fail to maintain or repair the aforementioned in a condition acceptable to the Owner.

I. Do not discard or dispose of any waste on-site.

J. The Contractor shall be responsible for managing dust.

1.03 CONTRACTOR USE OF THE PREMISES

A. Premises, for the purpose of this Contract, shall mean the site, buildings and other structures located within the property line or in any temporary or permanent construction easements identified on the plans.

B. The Contractor shall use and manage the premises and the associated construction activities as follows:
   1. To not hinder the Owner's ability to operate their facilities.
   2. To allow for stockpiling of construction material and debris without any significant hardship, as defined by the Owner's Construction Representative, on the Owner or other contractors.
   3. To allow for the delivery of equipment and materials by independent trucking companies by leaving enough space for backing in and out of areas.
   4. To allow for the safe, unimpeded travel way of the Owners vehicles, Owner's Construction Representative's vehicles, Engineer's vehicles, construction vehicles and heavy construction equipment about the entire site.

C. Contractor shall maintain the premises in a safe condition throughout the construction period. Compliance with OSHA regulations and site safety shall be the responsibility of the Contractor as it relates to work of the Contract. The posting of all applicable OSHA safety signs shall be the responsibility of the Contractor.

D. The Contractor shall provide temporary handrails, as required, for their work or for work put in place by their Contract that will require temporary handrails. Construction of temporary handrails shall be as specified in Section 015000.

E. The Contractor shall be responsible for protecting Owner's property. All existing buildings, structures, shrubs, trees, lawn fixtures, sculptures and misc. equipment shall be protected at all times. Any removals or relocation of said objects, if allowed shall be as directed by Owner's Construction Representative.

F. The Contractor shall protect all of the physical structures, property and improvements upon the site from damage by their Work and shall immediately repair or replace damage caused by construction operations, employees or equipment employed by the Contractor. All labor, materials and equipment and outside contractors that are employed by the Owner to repair damage caused by the Contractor shall be billed to the Contractor directly or withheld from money due the Contractor for work already completed.

G. Limit use of the site to the areas shown on the Contract Drawings and the adopted Site Utilization Plan. Confine operations to permit others working on the site easy access to all areas of Work.

H. Keep all existing operations areas, driveways, roads, and parking areas free and clear of materials and equipment. Do not unreasonably encumber the site with materials and equipment. Confine stockpiling of excess excavated material, materials and equipment to areas selected under the Site Utilization Plan or as designated by the Owner's construction representative. Locate storage sheds and trailers to areas designated in the plan or by the Owner's Construction Representative.

I. Immediately remove excess excavated material or relocate to areas on the site requiring placement of fill. Do not stockpile excess material on the site.

J. The construction site space is limited and it shall be the Contractor's responsibility to manage the site during the entire construction period with input from all concerned parties as to meeting their needs. Equal consideration of the needs of others with that of the Contractor's shall be provided as judged by the Owner.

K. The Contractor is responsible for cleaning up their own materials and debris. Failure to maintain a clean work site daily, will result in other performing the work and The Contractor being back charged for the cleaning cost plus construction administration fees.

L. Use of the existing building facilities during construction is prohibited including but not limited to: toilet rooms, telephone and water fountains. The Contractor shall be fined **($250)** per occurrence if their employee (or subcontractor's employee) is observed disregarding these rules.

M. Refer to Section 015000 - Temporary Facilities and Controls for minimum rubbish removal requirements.

N. Do not discard or dispose of any waste on-site.

1.04 CONTRACTOR STORAGE, PARKING AND DELIVERIES

A. Do not unreasonably encumber the premises with materials and equipment. Do not store material in existing buildings. Store all equipment and materials to allow the Owner's employees to operate and conduct their business safely.

B. Confine premise storage areas to locations designated by the Owner. Immediately repair or replace damaged facilities to the satisfaction of the Owner and to a condition that existed before the damage occurred as determined by preconstruction photographs, or if photographs are unavailable, to that deemed by the Owner.

C. No storage materials will be permitted within the buildings at any time during construction.

D. Storage of chemicals and painting shall be outside the existing or new structures and shall follow manufacturer's guidelines.

E. Compressed gas containers shall be properly stored and secured per OSHA, to the satisfaction of the Owner. Failure to do so will result in a **[$250]** back charge, per occurrence.

F. Contractor shall provide minimum of 48 hours advance written notice to the Owner's Construction Representative for deliveries of materials, site visits by inspectors, manufacturer's representatives or any other occasion that impacts the use of the site. Contractor shall be responsible for any costs that are incurred by the owner, for failure to meet previously agreed upon appointments or work schedules.

G. Deliveries sent to the Owner will not be signed for or unloaded by the Owner. They will be directed to the construction site and if no employee is on site, the delivery will be rejected, at the contractor's expense.

H. Night deliveries of equipment (past the designated quitting time) will not be permitted. Do not schedule trucking companies to deliver equipment or wait for the job site to open. Delivery trucks shall not obstruct the site entrance, shall not sit within the neighborhood causing an obstruction or perceived nuisance, nor be left idling on or off the site for any period of time.

I. Parking shall be in the designated areas of the site only. All automotive type vehicles are to be locked when parked or unattended to prevent unauthorized use. Do not leave vehicles or equipment unattended with the motor running or the ignition key in place. Any vehicles or trucks in non-designated areas may be towed at contractor's expense.

1.05 WORK HOURS, EMPLOYEE CONDUCT AND MISCELLANEOUS EMPLOYEE REQUIREMENTS

A. The Contractor will be permitted to schedule working days and hours as specified in the General Terms and Conditions, if no times are specified therein then the work hours shall be Monday - Friday 7:00 am - 5:00 pm.

B. Employees are to act in a professional manner. Any employee using inappropriate language or who is disruptive to the work environment will be banned from the site.

C. Proper work attire is required. Shirts are to be worn at all times and no short pants are permitted.

D. Employees shall not converse with local residents.

E. Any employee found under the influence of any drug or alcohol will be banned from the site.

1.06 CONTRACT REQUIREMENTS RELATED TO MAINTAINING OWNER'S CURRENT OPERATIONS AND EXCESS INSPECTION REQUIRED

A. The Contractor shall schedule working days and hours as specified. The Contractor shall pay all excess costs for inspection services provided by the Owner/Engineer for working beyond the times specified.

B. The hourly rate paid for inspection services beyond normal working hours shall be at a maximum billing rate of **[$180]** per hour, which shall be used to compute the overtime hourly charge.

1.07 SUGGESTED CONSTRUCTION SEQUENCE

A. The following is one suggested general, not all-inclusive, sequence of construction that may be used to complete all the work under the Contract within the time specified.

B. Since permit levels of treatment must be maintained during construction, then certain existing process equipment and units cannot be taken offline until new facilities are placed into permanent, fault free operation.

C. Work restrictions may be noted throughout the suggested sequence provided below. The Contractor shall comply with all noted work restrictions that appear.

D. The following suggested sequence is provided for information only, and shall not be interpreted as specification of the Contractors means and methods of construction, which are to be solely a matter of his determination:
   1. Mobilize to the project location
   2. Isolate and drain Vessel #1
   3. Dispose of existing filter media in accordance with all local, state, and federal regulations
   4. Pressure wash interior and exterior of Vessel #1
   5. After repairing any sand valves as required or directed, install new filter media in Vessel #1
   6. Replace air vacuum valve for Vessel #1
   7. Disinfect, sample, and start up Vessel #1
   8. Repeat steps 2 through 7 for Vessel #2

9. Coordinate shutdown of plant with Owner in order to replace the flow meters
10. Remove existing sample bench: cabinets, sink, and countertop
11. Install new sample bench
12. Factory refurbish existing flow meters and return to Owner for storage
13. Clean up and demobilize from project location

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 011400

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Allowance pricing for the following items:
   1. Contingency Account.

B. This Section covers the requirements for use of the cash allowances listed above contained in the proposal (Bid Forms, Price Schedule) and included in the Contract Price bid by the Contractor and defines and stipulates the charges that will be paid for out of the stipulated allowances.

C. The Contractor shall include the cash allowances stipulated in this Section in the amount bid.

D. Eligible costs described in this Section, and Sections referenced herein, will be the only costs paid for out of the stipulated allowances.

E. All other costs associated with the project as specified and/or shown, including but not limited to the delivery, installation and all Contractor overhead and/or collateral expenses are to be distributed among the other portions of the work and shall be included in other bid items.

1.02 SUBMITTALS

A. Make all submissions under the provisions of Section 013300.

B. For each type of product/material specified to be furnished under allowance pricing provide documentation of the unit pricing on manufacturer's letterhead certifying pricing of the product/material.

C. Submit additional backup information to substantiate the invoiced amount(s) as the Engineer may require for review and approval, prior to order or payment of item.

D. Provide written breakdowns for extra work as the Owner may require.

1.03 PAYMENTS TO BE MADE OUT OF CONTINGENCY ACCOUNT

A. Include the cash allowance of $[10,000] (Ten Thousand Dollars and Zero Cents) in the amount bid for use upon the Owner's instructions.

B. Include the cash allowance amount indicated in the proposal for use upon the Owner's instructions for additional improvements beyond those identified in the contract documents and for unforeseen conditions.

C. The Owner will draw funds from the contingency account only upon prior approval by the Owner's Construction Field Representative and Engineer.

D. Funds remaining at project closeout shall be credited to the Owner.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 012100

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section specifies the requirements for measurements and records made for payment purposes and describes the item(s) under which payment(s) will be made for the Work performed under this Contract.

B. All work shown or specified in the Contract Documents shall be performed.

C. Items not specified to be measured or paid for, but which are part of the work required to deliver the project to substantial completion (for which no specific pay item exists in the Price Schedule) shall be included in an appropriate unit price item or in a lump-sum item.

D. Comply with the requirements pertaining to the restoration of all surfaces, which shall be restored to a condition equal to or better than that existed prior to work starting under this contract.

1.02 MEASUREMENT REQUIREMENTS

A. All required measurements shall be made by the Contractor with the Engineer.

B. Any measurements not witnessed by Engineer and which cannot be verified or substantiated by Engineer will not be approved and payment under the item(s) requiring such measurements will not be made.

C. Coordinate measurements monthly, for the preparation of periodic pay estimates.

D. Where payments will be made for removing existing materials, whether part of the plant process or naturally occuring, notify Engineer so that he may witness the measurements.
   1. All materials removed without conforming to the above procedures, which Engineer cannot verify or substantiate, will not be paid for.
   2. Maintain complete, neat, clean, and legible field notes for all measured items.
   3. Notes shall contain spaces for Contractor’s and Engineer’s signatures plus additional space for comments.
   4. An original and a carbon copy shall be made for all notes and one copy shall be turned over to Engineer daily.
   5. The Engineer’s signature shall not be constituted as an acceptance of the work, or the measurements made, but shall mean that he was present when the measurements were made.

1.03 SUBMITTALS

A. See Section 013300.

B. Field notes of all measurements for payment purposes delivered to Engineer daily.

C. Copies of all invoices required for payments out of cash allowance(s).

D. Monthly Applications for Payment.

E. Record Drawings showing the locations and quantities of all items measured for payment purposes.

1.04 SCHEDULING

A. Notify Engineer, as far in advance as possible, of the recording of measurements so that Engineer may observe existing conditions, work being performed, and measurements being made.

B. Allow for and afford Engineer ample time, space, and equipment to observe measurements and to verify measurements and elevations.

PART 2 - PRODUCTS

2.01 GENERAL

A. Provide all labor, materials, facilities, levels, measuring devices and all other equipment and items necessary to properly and accurately perform all measurements for payment purposes.

B. Payment for certain items not specifically listed in the bid forms but otherwise required by the technical specifications shall be deemed included as part of the General Conditions and the individual unit price and lump sum bid items provided for in the proposal.

PART 3 - EXECUTION

3.01 GENERAL

A. Perform all measuring required under this Section.

B. Record all measurements and calculated quantities on the Record Drawings.

C. No measurement shall be made for work performed within the limits of Lump Sum Items.

D. Item descriptions and measurements are as follows:
   1. Mobilization: measurement and payment shall be made as a Lump Sum. The amount payable for mobilization will be paid when 10% (ten percent) of the contract work has been completed.
   2. Removal and Disposal of Existing Media: existing filter media located within the filter vessels shall be removed.The amount will be calculated as a Lump Sum.
   3. Pressure Washing: pressure washing shall be completed for both the interior and exterior of the filter vessels. The amount shall be included as a Lump Sum.
   4. Sand Valves: sand valves shall be procured and installed on each of the existing filters, for potential in-kind replacement, as directed by the Engineer, and as may be justified via interim inspection of the interior mechanical conditions of each filter vessel during delivery of construction. The measurement and paymenyt of this bid item will be calculated on a lump sum per unit basis, including the delivery of all materials, labor, accessories, and coordination necessary to replace any deficient sand valves in-kind with existing.
   5. New Filter Media: the new media shall be made up of anthracite, gravel, and Greensand Plus. This media shall be placed within both filter vessels. The amount will be calculated as a Lump Sum.
   6. Flow Meters: flow meters varying in size from four inches (4") in diameter to twelve inches (12") in diameter.
      a. Factory refurbish and return existing flow meters to Owner. This amount will be calculated as a Lump Sum.
      b. Provide and install new flow meters. This amount will be calculated as a Lump Sum.
   7. Disinfection and Water Quality Sampling: after the new filter media is placed within the filter vessels, the equipment shall be disinfected. After disinfection, testing shall be

conducted in order to determine whether all of the materials were properly disinfected. The amount will be calculated as a Lump Sum.

8. Vessel Start-Up: start-up shall commence after successfully disinfecting the equipment. The amount will be calculated as a Lump Sum.
9. Cash Allowance: a cash allowance of $10,000 (ten thousand dollars) to be included in the amount bid for additional improvement beyond those identified in the plans and specifications. This amount will be included as a Lump Sum.
10. Test Bench: the test bench located in the filter room shall be replaced entirely. Testing equipment shall be protected during construction and remounted once new cabinetry is installed. The amount will be included as a Lump Sum.
11. Air Vacuum Valves: remove existing air vacuum valves from vessels, install new in-kind valves. This amount will be calculated as a Lump Sum.
12. Record Documents and O&M Manuals: the Contractor shall provide Record Documents showing how the new equipment was installed, as well as furnish and provide operation and maintenance manuals for the new equipment. The amount will be included as a Lump Sum.
13. Make-Up Air Unit and Appurtenances: The Contractors shall provide and install one (1) rood-mounted make-up air unit, as shown in the Conctract Drawings. Appurtenances and appurtenant work included under this item shall refer to the work and equipment required to provide a complete and functional installation, including but not limited to ductwork, fittings, installation of new gas piping and gas fittings, waterproofing around the unit and all penetrations, and required structural modifications to support the unit as shown in the Contract Drawings. The amount shall be included as a Lump Sum.
14. Exhaust Fans and Appurtenances: the Contractor shall provide three (3) exhaust fans as shown on the Contract Drawings. Included in this item are all appurtenant equipment and products required for a complete and functional installation of each exhaust fan, including but not limited to ductwork, fittings, and wiring. The amount shall be included as a Lump Sum.
15. HVAC Testing and Balancing: the Contractor shall complete HVAC testing and balacing after the installation of all HVAC equipment. The Contractor shall test and adjust the HVAC equipment as necessary to achieve proper balancing. The amount shall be included as a Lump Sum.
16. Roof Railing: Contractor shall furnish and install fall protection railing on the roof as shown in the Contract Drawings. Basis of design is a non-bolted, portable railing system. The amount shall be included as a Lump Sum.

3.02 PART 4 - PAYMENTS

3.03 GENERAL REQUIREMENTS AND STIPULATIONS

A. No separate payments will be made for the Work under this Contract except for the pay items stipulated in this Part 4.

B. All costs in connection with the Work shall be included in one or more of the pay items, as appropriate.

C. Each pay item shall be full compensation for all costs in connection with the item including, but not limited to:
   1. the furnishing of all materials, labor, equipment, tools, and all incidentals,
   2. the installation of all materials, equipment, facilities, accessories and appurtenant items,
   3. proper share of overhead and profit,
   4. mobilization/demobilization,
   5. submittals,
   6. General and Supplemental Conditions,
   7. all temporary facilities and controls

8. all related and incidental work and items necessary or required to complete the Work and to provide completely connected, operational and approved systems capable of performing as required.

D. In addition to those items described above, Paragraph 4.02 lists specific items of work under each pay item to assist Contractor in appropriating the costs to the proper pay item.

3.04 PAY ITEMS

A. The name of the following pay item is the abbreviated form of the Bid Item as contained on the Price Schedule in the Bid Forms. The name, as shown below or on the Bid Form, shall not be construed to represent a complete description of all or the Work included under such time as is provided only as a means of identification and for ease of conversation.

END OF SECTION 012200

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section includes the requirements for substitution of specified products during construction.

B. *The* Engineer *will consider requests for substitutions only within* ***thirty (30)*** *days from the date of the Notice to Proceed.*

C. Only products not specifically named in the bid are eligible for substitution in accordance with the requirements contained herein these specifications.

D. Products named by the Bidder, at the time of bid, shall be furnished and installed and substitutions will not be considered by the Owner/Engineer for those products named in the bid.

1.02 CONTRACTOR'S OPTIONS

A. For products specified only by reference standard, select any product meeting that standard.

B. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named which complies with the Specifications.

C. Where products are not named, then submit products that meet the specifications.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS

A. Name - The Drawings and Specifications list acceptable manufacturers, commercial names, trademarks, brands and other product, material and equipment designations. Such names are provided to establish the required type, quality and other salient requirements of procurement.

B. Equals - An item equal to that named or described on the Drawings or in the Specifications may be provided by Contractor if accepted by the Engineer.

C. A request for product substitution constitutes a representation that the Contractor:
   1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
   2. Shall provide the same warranty for the Substitution as for the specified Product.
   3. Shall coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner, including extra charges by material suppliers and vendors.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
   5. Shall reimburse the Owner and the Engineer for review or redesign services associated with re-approval by authorities.
   6. Shall reimburse the Owner for all additional engineering services claimed by the Engineer for extra services associated with the review of the Contractor’s substituted item since it could not have been originally included in the Engineer’s professional engineering services agreement. Reimbursement shall be based on the man-hours expended, at current billing rates.

D. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

E. Substitution Submittal Procedure:
   1. The Contractor shall submit the REQUEST FOR SUBSTITUTION FORM for consideration including all required information.
   2. The Contractor shall use the form included within this Section.
   3. All forms shall be type written.
   4. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence.

F. The burden to prove product equivalence rests on the Contractor.

G. The Engineer will notify Contractor in writing of decision to accept or reject request and at that time the Contractor can make a formal submittal in accordance with the requirements contained in Section 013300.

H. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

PART 3 - EXECUTION

NOT USED

This space left intentionally blank.

REQUEST FOR SUBSTITUTION FORM

Project: SGRT2050 Filter Room Rehab Substitution Request Number:_____

Contractor:_____

Address:_____

To:_____ Date:_____

H2M Project Number: SGRT2050 Owner: Sea Girt Borough

Contract Name:_____ Contract No.:_____

Specification Title:_____

Section:_____ Page:_____ Article/Paragraph:_____

Drawing No(s).:_____

Proposed Substitution:_____

Manufacturer:_____ Address:_____

Trade Name:_____ Phone #: (____)_____

Installer:_____ Address:_____

Phone #: (____)_____

History: ___New product ___2-5 years old ___5-10 years old ___More than 10 years old

Differences between proposed substitution and specified product:

___Point-by-point comparative data attached

Reason for not providing specified item (Attach separate sheet if necessary):

Typical Similar Installation:

Project:_____

Engineer / Architect:_____

Address:_____

Owner:_____

Date Installed:_____

Submit complete installation list on separate sheets.

Proposed substitution affects other parts of Work: ___No ___Yes

Explain:_____

Gross Savings to Owner for accepting substitution: $_____

Proposed substitution changes Contract Time: ___No ___Yes

Add / deduct (circle):_____ days

Supporting data attached for evaluation of the proposed substitution:

___Product Data ___Photos ___Drawings ___Tests ___Reports ___Samples

___Other (explain):_____

Attached data includes description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified.

Attached data also includes a description of changes to Contract Documents that proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. Proposed Substitution has been fully checked and coordinated with Contract Documents.
2. Proposed Substitution does not affect dimensions shown on Drawings.
3. Proposed Substitution does not require revisions to any other Prime Contractor's work.
4. The undersigned will pay for changes to building design, including Architectural and Engineering design, detailing, and construction costs caused by requested Substitution.
5. Proposed Substitution will have no adverse affect on other trades, construction schedule, or specified warranty requirements.
6. Maintenance and service parts will be locally available for proposed substitution.
7. The undersigned further states that the function, appearance, and quality of proposed Substitution are equivalent or superior to specified item.

This request for product substitution also constitutes a representation that I, as the Contractor:

1. Has investigated proposed Product and determined that it meets or exceeds the quality of the specified Product.
2. Shall provide the same warranty for the Substitution as for the specified Product.
3. Shall coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner, including extra charges by other Prime Contractors, material suppliers, and vendors.

4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Shall reimburse the Owner and the Engineer for review or redesign services associated with re-approval by authorities.
6. Shall reimburse the Owner for all additional engineering services claimed by the Engineer for extra services associated with the review of the Contractor's substituted item since it could not have been originally included in the Engineer's professional engineering services agreement. Reimbursement shall be based on the man-hours expended, at current billing rates.

Contractor's Authorized Representative (Typewritten):_____

Authorized Signature:_____

Date:_____

END OF SECTION 012500

PART 1- GENERAL

1.01 SUMMARY

A. The work under this Section of the Specification shall consist of the establishment of the Contractor's general plant, including shops, storage area, equipment, office and such sanitary and other facilities as are required by local or state law and all other work performed or costs incurred before beginning Work.

1.02 MATERIALS AND INSTALLATION

A. Such materials as are required for mobilization and that are not to be a part of the complete Contract shall be as determined by the Contractor, except that they shall conform to any pertinent local or state law, regulation or code.

B. The work required to provide the above facilities and services for mobilization shall be done in a safe and workmanlike manner and shall conform with any pertinent local or state law, regulation or code. Good housekeeping consistent with safety shall be maintained.

1.03 MEASUREMENT AND PAYMENT

A. The amount to be paid for mobilization in the monthly pay estimate is limited to the following maximum amounts:
   1. Original Contract Amount (Including Mobilization)

FROM MORE THAN ($)	**UP TO AND INCLUDING** ($)	**MAXIMUM AMOUNT FOR 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

B. The amount for mobilization shall be payable to the Contractor whenever (s)he completes ten (10%) percent of the work of the Contract. For the purposes of this Item, 10% of the work shall be considered completed when the total of payments earned and paid, as reflected by estimates of work done, not including the amount bid for this Item or for materials and equipment suitably stored, shall exceed 10% of the total amount bid for this Contract.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 012700

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work under this Section specifies the procedures used to process partial payments and the Final Payment Request.

1.02 TIME FOR COMPLETION

A. Inasmuch as the provisions of the Contract relating to the time for performance and completion of the Work are for the purposes of enabling the Owner to proceed with the construction of a public improvement in accordance with a predetermined program, and inasmuch as failure to complete the Work within the period herein specified may result in damage or loss to the Owner, time is of the essence of the Contract.

B. Time for completion of the Work shall be in accordance with that stipulated in the Contract Documents.

C. The date for completion will be calculated from the date shown on the Notice to Proceed. The Contractor shall execute the Work with diligence from day to day, and complete it within the time fixed.

D. For the purpose of defining the date of substantial completion, the Project will be considered complete when all Work covered by the Contract has been performed and all installations and equipment have been tested and are ready for permanent use. Removal of the Contractor's equipment and other minor adjustments which do not prevent use of the Project will not be a factor in establishing the date of substantial completion.

E. Notwithstanding the foregoing, the Engineer will establish the date of substantial completion when the project is accepted and ready for operation, and no large or major items of work are as yet outstanding. At such time, the Engineer will issue a punch list, itemizing the items of work remaining. The punch list will include "minor" items only, as defined solely by the Engineer. Any prior punch lists, which include "major" or significant items, as defined by the Engineer, shall not be a criterion in establishing the date of substantial completion.

1.03 PARTIAL COMPENSATION

A. At the Owner's discretion, the Contractor may receive compensation for materials and products delivered to the site yet not installed providing:
   1. A canceled check or paid bill from the supplier is submitted to the Engineer indicating that the Contractor has paid the supplier for the material or equipment.
   2. The material or piece of equipment is properly stored and protected from the elements and/or vandalism in accordance with the manufacturer's written requirements for long term storage.
   3. A certificate of insurance is provided for the material or piece of equipment in the event of a fire, vandalism, theft, etc.
   4. A bill of material is delivered to the Engineer at the time of delivery itemizing the subject material or equipment. Payment will be made for on-site material and/or equipment in the amount of 80% of the gross amount of the paid invoice. This payment will be subject to the normal retainage of the partial estimate.
   5. The Engineer has agreed to the pre-purchasing of the materials.

B. The Contractor may not receive compensation for materials and products stored in the Contractor's yard or shop unless permitted by the Owner.

1.04 APPLICATIONS FOR PAYMENT

A. The Contractor shall review the percentage of work completed during the payment period with the Engineer, based on the bid items in the proposal. The Engineer shall make the final decision on the percentage of work completed.

B. The form of application for payment shall be AIA Document G702, application and certificate for payment supported by AIA Document G703, Continuation Sheet.

C. Submit one (1) copy of each payment application, completed, signed and notarized.

D. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

E. The payment application shall include a Contractor Invoice and an Owner Claim Voucher.

F. Provide completed Labor Affidavit Form for each pay period included in the certified payroll reports for each payment application for both the contractor and any subcontractor(s).

G. Submit payment application to Engineer no later than the first day of each month. Payments received after the first day of each month shall be reviewed and processed after the first day of the following month. Only one application for payment will be reviewed and processed each month.

H. Submit certified payroll receipts for all workers and subcontractors. Payroll receipts shall be submitted with every application for payment. All payroll receipts shall be certified correct and notarized by a Notary in the State of New Jersey. Application for Payment will not be processed unless all payroll receipts are received.

I. Contractor shall pay all workers and have all subcontractors pay all workers the prevailing New York State Wage Rates.

J. Owner may conduct on-site interviews with all workers to verify payments of prevailing wage rates are enforced.

K. The Engineer shall submit the documentation along with an Engineer's Payment Report to the Owner for payment.

L. Retainage in the amount of 5% will be held from each partial payment. Retainage will only be released upon full completion of the project and will be included in the final payment.

1.05 ACCEPTANCE OF FINAL PAYMENT REQUEST

A. The Contractor shall be conclusively deemed to have accepted the Final Payment Request as a correct statement of the total liability of the Owner and of the compensation paid and to be paid to the Contractor by the Owner unless within seven (7) days after delivery of his copy of the Final Payment Request to him, the Contractor shall return such copy to the Owner together with a statement of his objections to such request and of any claim for damages or compensation in excess of the amounts shown on the Request. The acceptance by the Contractor of the Final Payment Request approved by the Owner shall constitute a release and shall discharge the Owner from all further claims by the Contractor arising out of or relating to the Contract, including but not limited to, a release from all impact costs.

1.06 SCOPE OF PAYMENTS

A. The Contractor shall receive and accept the compensation as herein provided, in full payment for furnishing all materials, labor, tools, and equipment and for performing all work contemplated

and embraced under the Contract, also for all loss or damage arising out of the nature of the Work or from the action of the elements, or from any unforeseen difficulties or obstructions which may arise or be encountered during the prosecution of the Work, and for all risks of every description connected with the prosecution of the Work, until its final acceptance by the Owner, also for all expenses incurred by, or in consequence of, the suspension or discontinuance of the said prosecution of the Work as herein specified, and for all actual or alleged infringements of patent, trademark, or copyright, and for completing the Work and the whole hereof, in an acceptable manner, according to the Plans, Specifications, and other Contract Documents. The payment of any partial or final estimate shall in no way or in no degree prejudice or affect the obligation of the Contractor, at his own cost and expense, to renew or replace all defects and imperfections, or damages. The Engineer shall be the judge, and the said Contractor shall be liable to the Owner for failure so to do.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED.

END OF SECTION 012900

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Schedule of Values

1.02 SCHEDULE OF VALUES

A. Submit for approval prior to the start of the work a Schedule of Values that indicates a breakdown of the labor, materials and equipment and other costs used in the preparation of the bid. This schedule shall be in sufficient detail to indicate separate figures for such items as excavation, concrete, equipment and all other items making up the lump sum price. The cost breakdown shall be separately itemized for each lump sum bid item in the project.

B. Where the cost breakdown includes items for bond payment, insurance payment, job set-up, or job mobilization, these items will be paid based on paid invoices and copies of cancelled checks.

C. Submit a Schedule of Values to the Engineer for review and approval within fifteen (15) calendar days from the date shown on the Notice to Proceed.

1.03 FORM OF SUBMITTAL

A. Submit typewritten Contract Cost Breakdown on AIA Form G703 - Application and Certificate for Payment Continuation Sheet or EJCDC 1910-8-E. The Engineer reserves the right to revise the form or provide a form prepared by the Engineer.

B. Use the Table of Contents of the Contract Specifications as a basis for format for listing costs of work for Sections under Divisions 1-48 as sections apply to work. Not all Sections need be assigned a breakout price as determined by the Engineer.

C. Identify each line item with number and title as listed in Table of Contents.

D. Provide dollar values for each line item for labor, overhead, profit, material, and equipment components for each category of work if requested by the Engineer.

E. List quantities of materials specified under unit price allowances.

F. The Schedule of Values, after approval by the Engineer, shall be the basis for the Contractor's Application for Payment.

G. The first Application for Payment will not be reviewed prior to an approved breakdown.

1.04 PREPARATION OF SCHEDULE OF VALUES

A. Breakdown schedule of values based on bid items in proposals with further breakdown below each item. In addition to the above, provide a separate line item cost below each bid item, as applicable, for each of the following items which shall be supported by proof where requested by Engineer:
   1. Performance and payment bonds.
   2. Insurance.
   3. Mobilization and Demobilization (Amounts shall be equal in value).
   4. Temporary facilities and measures as specified in Section 015000.
   5. Project Coordination Meetings as specified in Section 013100.
   6. Preparation of the Project Construction Schedule, and updates, as specified in Section 013300.

7. Preparation of Weekly Schedules as specified in Section 013100
8. Rubbish removal and daily cleaning up. (Provide a total dollar amount and a daily rate for each calendar day during the contract period.)
9. Construction photographs as specified in Section 013233.
10. Surveyor used for layout.
11. A total dollar amount for furnishing all the Operations and Maintenance Manuals specified throughout the specifications.
12. Final cleaning.

B. Show total costs including overhead and profit.

C. Provide additional details and data to substantiate the cost breakdown as requested by the Engineer.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 012973

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work of this Section includes:
   1. Requests for Interpretation or for information
   2. Coordination between contractors, if applicable
   3. Administration of subcontracts
   4. Communication and coordination requirements
   5. Qualifications of Contractor's job site superintendent

B. Site staffing requirements for the Contractor's superintendent are also specified herein, the costs for which shall be included in the Contract price.

1.02 REQUEST FOR INTERPRETATION OR INFORMATION

A. The Contractor shall use the Request for Interpretation/Information Form included within this Section when the Contractor feels that additional information is needed to perform the work of the Contract.

B. The Engineer may not respond to any requests unless the form is used.

C. The Engineer's verbal response(s) to the Contractor's formal requests, if provided, shall not constitute an official response and if acted upon by the Contractor are done so at the Contractor's own risk and liability and shall not be subject to claims for additional compensation.

D. A signed facsimile or emailed image of the form will be accepted.

E. The Engineer will respond in writing to the request as soon as possible.

1.03 SUBCONTRACTOR ADMINISTRATION AND COORDINATION

A. Terms and conditions of the Contract shall be binding upon each subcontractor.

B. Furnish each subcontractor and major equipment vendor at least one (1) copy of the Plans and Technical Specifications.

C. Provide at least one (1) copy of each approved shop drawing to each subcontractor whose work may depend upon the contents of the shop drawing submittal. The Owner reserves the right to stop all work, without claims for delay, until such time as appropriate subcontractors are furnished with appropriate shop drawings.

D. The Contractor shall sequence and schedule the work of subcontractors. Coordinate construction and administration activities of subcontractors. The Engineer and Owner will not accept telephone calls, facsimiles or office visits from any subcontractors on the project. Subcontractor and vendor questions and clarifications shall be directed to the Engineer by the Contractor.

E. The Contractor's on-site project superintendent shall inspect all the work of all of his/her subcontractors, as it is being constructed. The Contractor's subcontractor shall not be permitted to do any work on the site without the Contractor's job site superintendent also being there to inspect the work as it is being performed.

1.04 UTILITY COORDINATION

A. Comply with the requirements of the N.J.A.C. Title 14 Chapter 2 - Underground Facilities: One-Call Damage Prevention. Submit a letter stating the case number.

B. Comply with the utility coordination requirements contained in the General Conditions.

1.05 PUBLIC/PRIVATE UTILITIES

A. Notify all public and private utilities in accordance with N.J.A.C. 14:2-3.1(b) and all other local and state laws for location and markout of existing utilities in the vicinity of the work.

B. Repair all utilities damaged during the Work to the standards and approval of the respective utility at no cost to the Owner.

1.06 SPECIFIC COORDINATION REQUIREMENTS

A. Sequence and schedule work so as not to interfere with the work by others. Coordinate the work of this Contract with the work by others. In case of conflicts due to improper coordination by the Contractor, the Owner/Engineer's resolution will be final. No compensation will be awarded for extra work required to resolve conflicts.

B. Coordinate space requirements, supports, and installation of mechanical, electrical and plumbing work which may be indicated diagrammatically on the Drawings. Follow routing shown for pipes, ducts, and conduit as closely as practicable. Place runs parallel with building lines. Utilize spaces efficiently to maximize accessibility for other installations, maintenance, and to facilitate repairs.

C. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of all fixtures and outlets with finish elements and work by all other trades.

D. Coordinate the work by complying with the following:
   1. Email Account: Each Contractor shall maintain an email account that shall be used to improve communication. An email shall not constitute a formal advisement regarding the terms and conditions of the contract. Email shall only be considered an informal way of notifying relevant parties of project related activities.

E. Project Coordination Meetings: Participate in and attend the Project Coordination Meetings as specified below:
   1. A minimum of two (2) project coordination meetings will be held at the Owner’s office or project site.
   2. The meetings will be held when so called for by the Engineer.

F. The Contractor shall sequence and schedule work so as not to interfere with the work by others and to afford each Contractor the time to complete their contractual obligations with the Owner. Coordinate the work of this Contract with the work by others. Coordination includes, but is not limited to, the following:
   1. The Contractor shall annotate on each of his own shop drawings and submittals, information that is relevant to the work of others or where potential conflicts in the installed work may occur. The Contractor shall “bubble” in green ink the area of potential conflict so as to alert the reviewer.
   2. In case of conflicts due to improper coordination by any Contractor, the Owner/Engineer’s resolution will be final. No compensation will be awarded for extra work required to resolve conflicts or to coordinate the work of all contracts.

3. Coordinate space requirements, supports, and installation of mechanical, electrical and plumbing work which may be indicated diagrammatically on the Drawings. Follow routing shown for pipes, ducts, and conduit as closely as practicable. Place runs parallel with building lines. Utilize spaces efficiently to maximize accessibility for other installations, maintenance, and to facilitate repairs.

G. Shop Drawings and Submittals Coordination Procedure:

H. The Contractor shall also coordinate the work by complying with the following:
   1. Construction Schedule: The Contractor shall provide a construction schedule as specified in Section 013216 - Construction Schedules.
   2. Weekly Schedule: By 3:00 PM of each Friday during the construction period, the Contractor shall fax or email a typed memo addressed to the Engineer/Owner's resident field engineer/inspector and designated office project manager summarizing the work for the following week. The memo shall also be faxed or emailed to the Owner. The memo shall briefly itemize the planned activities for the coming week. The memo shall also include a summary of expected material/equipment deliveries, concrete pours, utility tie-ins, excavated material removals and other heavy construction traffic that may impact the work activities for the coming week.
   3. Email Account: The Contractor shall maintain an email account that shall be used to improve communication. An email shall not constitute a formal advisement regarding the terms and conditions of the contract. Email shall only be considered an informal way of notifying relevant parties of project related activities.
   4. Email List: The Contractor, within five (5) calendar days from the Notice To Proceed, shall provide a list of email addresses for each major equipment supplier and local representative, if such exists. A contact person shall be provided for each email address.

1.07 CONTRACTOR'S JOB SITE SUPERINTENDENT

A. The Contractor shall employ an on-site superintendent as specified herein below. He/She shall be a full-time employee of the Contractor.

B. The Contractor shall name the job site superintendent within five (5) days of the Notice To Proceed. A letter to the Engineer shall be provided.

C. He/She shall have the authority to sequence and schedule the work, and to staff the project, so as not to interfere with the work by others and to complete the work daily within the time so required.

D. The Superintendent shall have a minimum of five (5) years of experience as a job site superintendent for projects of equal size and complexity.

E. The superintendent shall not be a foreman or crew supervisor.

F. The superintendent shall be qualified to perform the duties so required to successfully complete the work in accordance with the Contract Documents.

G. The superintendent shall speak English. If required by the Engineer, provide a resume for the proposed superintendent that shall be typed and shall list the qualifications of the superintendent. Prior to the Contractor assigning a superintendent to the project, he may wish to arrange an interview with the Engineer to determine the proposed superintendent's ability to properly coordinate the work through the Owner/Engineer. The Contractor shall employ a superintendent acceptable to the Owner.

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REQUEST FOR INTERPRETATION/INFORMATION (RFI)

OWNER'S NAME: Sea Girt Borough

PROJECT NAME & CONTRACT DESIGNATION: SGRT2050 Filter Room Rehab

CONSTRUCTION CONTRACT NO.: SGRT2050

Product, Item, or System:	
Request Date:	RFI No.:
Specification Section:	Paragraph Ref:
Contract Drawing Reference(s):	
Describe Request:	
Signed:	See Contractor's Attachments for Additional Description for Information
Owner/Engineer Response:	
Engineer (Printed):	See Engineer's Attachments for Additional Information
Engineer's Signature & Date	*Response Accepted By Contractor* *Contractor's Signature & Date*

The Work shall be carried out in accordance with these supplemental instructions without change in Contract amount or Contract time for completion. Prior to proceeding with these instructions, indicate your acceptance of these instructions by signing where indicated and returning this form to the Engineer.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 013100

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work of this Section includes the requirements for progress meetings.

1.02 PRE-CONSTRUCTION CONFERENCE

A. The Contractor is required to attend the pre-construction conference at a location, date, and time selected by the Owner.

B. The owner, a partner, or a corporate officer representing the Contractor shall attend the conference. The job site superintendent and office project manager for the Contractor shall also attend.

C. The Engineer will prepare an agenda for the conference.

1.03 PROGRESS MEETINGS

A. Progress meetings will be held approximately once every two (2) weeks during the project. The Owner may elect to hold meetings more or less frequently.

B. At least seven (7) calendar days advance notice will be given by the Engineer or the date for the upcoming meeting will be set during the progress meeting.

C. Attendance at progress meetings shall be mandatory. An amount of $1,000 shall be deducted from the Contract Amount for each announced meeting not attended by the Contractor.

D. The owner, a partner, or a corporate officer representing the Contractor shall attend each announced progress meeting. The job site superintendent and office project manager for each Contractor shall also attend.

E. Subcontractors shall attend when requested by the Owner or Engineer at no cost to the Owner.

F. Meetings will be conducted by Engineer at a location selected by the Owner, normally at or adjacent to the project site.

G. The minimum agenda will cover:
   1. Review minutes of previous meetings.
   2. Identify present problems and resolve them.
   3. Plan work progress during next work period.
   4. Review the status of off-site fabrication and delivery schedule.
   5. Review shop drawings and submittal schedules.
   6. Review change order status.
   7. Review status of construction progress schedule.
   8. Coordinate access requirements.
   9. Other business related to the work.

1.04 OTHER MEETINGS

A. Attend special meetings which may be required or called for by Federal, State or Local authorities, utility companies, Owner, Engineer or any other firm, person or organization related to the project.

1.05 CONDUCTING MEETINGS

A. General - This paragraph covers Owner and/or Engineer meetings with Contractor and/or his subcontractors. Neither Owner nor Engineer wishes to meet solely with a subcontractor and requests for such meetings will be discouraged. If a meeting is deemed necessary, every effort will be made to have Contractor attend. If, for some reason, circumstances do not allow such, the meeting may be held, minutes of the meeting will be sent to contractor and decisions on any major questions will be reserved until contractor has been consulted. Subcontractors may accompany contractor to meetings provided contractor notifies Engineer in advance.

B. Chairman - When Engineer/Owner attend meetings, Engineer, or his duly authorized representative, will act as chairman. Should Owner-Contractor meetings be necessary, Owner will chair such meetings.

C. Notices - Engineer or Owner will issue notices of meetings to all parties concerned and will note, thereof, who must attend and who may attend if they so desire. When a Contractor desires a formal meeting, make a request through Engineer. Except when Engineer determines that a prompt meeting is essential, all notices will be issued at least one week in advance of the meeting date.

D. Agenda - All parties shall inform Engineer of items desired to be discussed and Engineer will notify all parties of all items to be considered. This is to allow each party to fully prepare for the meeting. This shall not be construed to mean that other items cannot be brought up at the meetings.

E. Time Limits - It is the intent to hold productive and efficient meetings and to keep them as short as is reasonably possible. The Chairman will be the sole judge as to whether or not further discussion on any matter is warranted and all discussions shall cease when he so orders.

F. Minutes - Minutes of meetings will be kept, written and distributed by the Chairman or his duly authorized representative. Minutes of all meetings will be available upon request to the Chairman.

G. Conduct - It is the intent to conduct all meetings in an orderly manner, to reasonably discuss all items and to hear and observe the rights and opinions of all parties. The Chairman will allow each party to speak, however, he reserves the right to order any individual to leave the meeting at any time for any reason.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 013119

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section specifies the requirements for preparing construction schedules and for keeping them up to date.

B. All schedules shall be submitted in accordance with the requirements contained herein in Section 013300.

1.02 CONSTRUCTION SCHEDULE - GENERAL

A. Coordinate the work and maintain the construction schedule. In the event actual progress begins to lag the schedule, promptly employ additional means and methods of construction to make up the lost time.

B. Keep the construction schedule current and revise and resubmit as often as necessary to accurately reflect the conditions of the work, past progress and anticipated future progress.

C. The construction schedule shall be completed, submitted, and deemed received by the Engineer prior to the first payment application.

D. The schedule, when approved by the Engineer and the Owner, shall establish the dates for starting and completing work for the various portions of the Contract. It shall be the duty of the Contractor to conform to his/her own schedule and to perform the work within the time limits indicated. Failure to adhere to the approved schedule shall expose the Contractor to disputes, claims and additional costs incurred by others.

E. Coordinate letting of subcontracts, material purchases, shop drawing submissions, delivery of materials, and sequence of operations, to conform to the schedule.

1.03 CONSTRUCTION SCHEDULE - GANTT CHART TYPE

A. The schedule shall show, in detail, the proposed sequence of the work and the estimated date of starting and completing each stage of the work in order to complete the project within the contract time.

B. Prepare the schedule in a manner so that the actual progress of the work can be recorded and compared with the expected progress.

C. Coordinate the construction schedule with the proposed schedules of the equipment suppliers and subcontractors.

D. The schedule shall be plotted out in color and shall be 36-inch by 40-inch. It shall contain as many sheets as are necessary to show all rolled down tasks. Partially printed schedules will not be accepted. The Contractor shall arrange to have it plotted on a color plotter suitable for the intended application.

E. The schedule shall show the following:
   1. Task links/task dependency in blue ink.
   2. Work under the Contract in green ink.
   3. Work by others in blue ink.
   4. Milestone dates (zero duration) by a red diamond.
   5. The end date for each task and subtask at the end of a bar.
   6. The description of all major tasks within the bar. The bar shall be red.
   7. Critical path.

1.04 REVISION OF PROJECT PROGRESS SCHEDULE

A. The Contractor shall evaluate and provide updated construction schedules monthly in accordance with job requirements. Each update shall be submitted to the Engineer for information purposes and be provided by the last Friday of every month

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 013216

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section specifies the requirements for making submissions for the project. Electronic submissions will be required unless expressly noted otherwise.

B. Refer to Section 013216 - Construction Schedule for the requirements concerning the submission of construction schedules and for making updates thereto.

1.02 IDENTIFICATION OF SUBMITTALS

A. Each and every submission shall be provided by the Contractor and shall be accompanied by a SUBMISSION TRANSMITTAL FORM. The Contractor shall use the specimen form made a part of this Section. *Submittals not containing the form will be returned to the Contractor un-reviewed.* The Engineer will not review project submissions until such time as the form is competed in its entirety. Identify each submittal and resubmittal using the form.

B. Each individual submittal shall be identified with a ‘submission log number’ as specified here in this example: 033000.01-1
   1. The Section number for which the submittal applies, followed by a period, shall be indicated, "033000.".
   2. The submittal within the Section shall be indicated by the next grouping "01". For instance and in this example, the concrete design mix may be submission "01", the waterstop catalog cut may be "02", and so on. Submittals shall be sequentially numbered within the Specification Section, i.e. 01, 02, etc.
   3. The number of times the submission was made shall be preceded by a dash and a numerical suffix as follows: "-1". In this example, the concrete design mix is being submitted for the first time. Use the number "1" for the first time it is being submitted.
   4. Subsequent submissions of the concrete design mix shall utilize the original number and a sequential numeric suffix, i.e. "2" for a resubmission, "3" for the second resubmission, and so on. Substitute the new number for the original "1".

C. Where a layout drawing, containing different elements of the project, is being submitted and there is a question as to what the log number might be, then the Contractor shall contact the Engineer so that an agreed upon log number can be assigned.

D. It is incumbent on the Contractor to initially assign the submission log number designation to each submission. Submissions not containing a log number, as specified above, will be returned to the Contractor un-reviewed by the Engineer.

E. Every submittal shall also be accompanied by a Transmittal Letter (or "Speed Form") addressed to the Engineer’s Project Manager as hereinafter defined.

1.03 COORDINATION OF SUBMITTALS

A. Prior to submitting to the Engineer, fully coordinate all interrelated work. As a minimum, do the following:
   1. Determine and verify all field dimensions and conditions by field measuring existing conditions and the installed work of this Contract and work by others.
   2. Coordinate with all trades, subcontractors, vendors, system and equipment suppliers and manufacturers, public agencies, and utility companies and secure all necessary approvals, in writing.

B. Make submittals in groups containing all associated items that in some way depend upon each other.

1. This also applies to color charts, as one color may not be able to be selected without the selection of other colors so as to form a color-coordinated group.
2. The Engineer may elect not to review partial or incomplete submissions, whereupon he will notify the Contractor of the additional submissions that are required before a review can be made.

1.04 TIMING OF SUBMITTALS

A. Make submittals far enough in advance of scheduled dates of installation to provide time for reviews, for securing necessary approvals, for possible revisions and re-submittals, and for placing orders and securing delivery. The Engineer will review submittals in a manner as expedient as possible, and will generally send a written response to the Contractor within seven (7) calendar days of receipt of submittals.

B. Submissions may be returned reviewed, unreviewed, rejected, returned conditioned upon submission of related items, or for other reasons set forth in the Contract Documents.

C. Make submissions well in advance as the returning, rejecting or disapproval of submissions or other similar circumstances are possible and are deemed "avoidable delays". Costs for these delays or those attributed to Contractor's tardiness in making submittals shall be borne by the Contractor.

D. ***All*** submittals requiring Engineer's review (except operations manuals) as required under the technical specifications of these documents shall be submitted within **FORTY FIVE (45)** consecutive calendar days after the date of the Notice to Proceed. An amount of **$250** per calendar day shall be deducted from payment due the Contractor for ***each*** day that an outstanding submittal exists, said amount being the cost associated with the Engineer's review.

E. Operation and maintenance manuals shall be submitted at least **FORTY FIVE (45)** consecutive calendar days prior to scheduled startup of the unit or system.

F. If material or equipment is installed before it has been deemed to be in general compliance with the Contract Documents, as determined by the Engineer, the Contractor shall be liable for its removal and replacement at no extra charge and without an increase in contract time.

1.05 DESTINATION OF SUBMITTALS

A. Each submission of documents shall be accompanied by a transmittal form containing the name of the project, the contract name, the Engineer's project manager, a submittal ID number, and a description of content for the submitted items.

B. A copy of the TRANSMITTAL FORM shall also be provided to the Engineer's inspector at the job site.

C. Electronic submittals shall be transmitted through the Newforma® Project Center website or by email, pending instruction by the Engineer. H2M architects + engineers is using a project information application called Newforma® Project Center. One of its components is Newforma Info Exchange, a web application that facilitates sending and sharing transmittals, and file sharing.

D. As an external team member on this project the Contractor will be required to access the H2M architects + engineers/Newforma Info Exchange website for information related to the project, including file transfers, RFI, Submittals, Action Items, and project Calendar information. The Contractor will have access to this website using any internet-capable computer running Internet Explorer or Firefox. All data transmitted through the H2M architects + engineers/Newforma Info

Exchange website is encrypted and logged. Further instructions will be provided to the Contractor after the contract is awarded.

E. Other submissions, such as material samples or other items as instructed by the Engineer, shall be sent to the Engineer's office as follows:
H2M Associates, Inc.
4810 Belmar Boulevard, Suite 201
Wall Township, NJ 07753
Attention: David Sheldon, P.E.

1.06 CLARITY OF SUBMITTALS

A. All printed materials shall be neat, clean, professionally drafted by hand or by computer, clear, legible, and of such quality that they can be easily reproduced by normal photocopying.

B. All electronic submittals shall be produced with a minimum resolution of 300 dpi.

C. Binders of information shall be separated into groups, subsystems, or similar equipment/function. Copies not conforming to this paragraph will be returned to the Contractor without the Engineer's review.

1.07 CONTRACTOR'S REPRESENTATION

A. By making a submission, the Contractor represents that he has determined and verified all field measurements and dimensions, field construction criteria, site and building constraints in terms of limitations in moving equipment into an enclosed space, materials, catalog and model numbers and similar data and that he has checked and coordinated each submission with other work at or adjacent to the project site in accordance with the requirements contained in Section 013100 - Project Management and Coordination and the Contract Documents.

B. Every SUBMISSION TRANSMITTAL FORM shall contain the Contractor's approval stamp and date showing that the submittal has been approved by the Contractor. The Engineer will not review submittals that have not yet been reviewed and approved by the Contractor.

1.08 ENGINEER/ARCHITECT'S REVIEW

A. Engineer will review and comment on each submission conforming to the requirements of this Section.
1. Engineer's review will be for conformance with the design concept of the project and will be confined to general arrangement and compliance with the Contract Documents only, and will not be for the purpose of checking dimensions, weights, clearances, fittings, laying lengths, tolerances, interference's, for coordinating the work by others or subcontractors.
2. The Engineer's review of a separate item, or portion of a system, does not represent a review of an assembly or system in which the item functions.

B. The Engineer will mark submittals as follows:
1. NO EXCEPTION TAKEN (**A**) - No corrections, no marks. The content of this submittal has been reviewed by the Engineer and been found to be in general compliance with the Contract Documents. No further submission of this submittal is required and the information contained in the submittal may be built into the work in accordance with the Contract Documents.
2. MAKE CORRECTIONS NOTED (**B**) - Minor amount of corrections. The content of this submittal has been reviewed by the Engineer and has been found in general to be in compliance with the Contract Documents. The notations made on the submittal by the Engineer shall be incorporated into the work in accordance with the terms and conditions of the Contract Documents. No further submission of this submittal is required.

3. AMEND AND RESUBMIT (**C**) - The content of this submittal has been reviewed by the Engineer and this review has determined that additional data and/or modification to the submitted data or other changes are required to bring the work represented in this submittal into compliance with the Contract Documents. This submittal shall be reviewed and revised in accordance with the Engineer's comments and resubmitted to the Engineer for review. The information contained on the resubmittal shall not be incorporated into the work until the submittal is returned to the Contractor marked "NO EXCEPTION TAKEN" or "MAKE CORRECTIONS NOTED".
4. REJECTED (**D**) - The content of this submittal has been reviewed by the Engineer and has been determined not to be in accordance with the requirements contained in the Contract Document and requires too many corrections or other justifiable reason. The submittal shall be corrected and resubmitted or a submittal of an alternate shall be provided. No items are to be fabricated under this mark.
5. SUBMIT SPECIFIED ITEM (**E**) - The content of this submittal has been reviewed by the Engineer and this review has indicated that the work displayed in the submittal is not in compliance with the Contract Documents. The Contractor shall submit another submittal for this portion of the work, which complies with the Contract Documents.
6. RECEIVED (**R**) - This submittal is accepted on the project and filed for record purposes only, in accordance with the terms and conditions of the Contract Documents. Documents marked "RECEIVED" will not be returned.

C. No payment will be made on any item for which a submission is required if such submission:
   1. has not been made,
   2. has been made but was not stamped "No Exceptions Taken" by Engineer,
   3. has been made and stamped "Make Corrections Noted", but contractor has not complied with Engineer's notes marked on the submittal,
   4. has been made and stamped "No Exceptions Taken", but item provided does not conform to the shop drawing nor to the Contract Documents.

D. Submittals not required by these specifications will not be recognized or processed.

E. Provide an 8-inch by 10-inch space for the Engineer's review stamp.

1.09 RESUBMISSIONS

A. Prepare new and additional submissions, make required corrections, and resubmit corrected copies until found in compliance with the Contract Documents.

B. On, or with, re-submittals, clearly describe revisions and changes made, other than the corrections requested by Engineer, which did not appear on the previous submissions.

1.10 CONTRACTOR'S RESPONSIBILITIES

A. Engineer's review of submittals shall not relieve the Contractor of his/her responsibility for any deviation from the requirements of the Contract Documents nor relieve the Contractor from responsibility for errors or omissions in the submittals.

B. No portion of the work requiring a submission shall be commenced until the Engineer has found the submission in general compliance with the Contract Documents.

C. The Contractor shall provide written notification of any specification or drawing deviation.

1.11 EXCESS COSTS FOR ENGINEERING/ARCHITECTURAL SERVICES

A. The Owner will charge to the Contractor, and will deduct from the partial and final payments due the Contractor, all excess engineering and architectural expenses incurred by the Owner for extra services (work) conducted or undertaken by the Engineer as stipulated below:
   1. Services and other similar charges because of the Contractor's errors, omissions, or failures to conform to the requirements of the Contract Documents as related to administrative charges associated with non-compliance with the requirements for making project submissions.
   2. Services and other similar charges required to examine and evaluate any changes or alternates proposed by the Contractor and which may vary from the Contract Documents.
   3. Services and other similar charges as a result of the Contractor's proposed substitution of materials, equipment or products which require a redesign of any portion of the project, as contained in the Contract Documents at the time of bid.
   4. Services and other similar charges as a result of the Contractor's proposed substitution of products which require an engineering and/or architectural evaluation, beyond the time stipulated in Section 012500, to determine if the substituted product is equal to that specified.
   5. Services and other similar charges as a result of changes by the Contractor to dimensions, weights, sizes, voltages, phase, horsepower, materials of construction, and similar physical or operating characteristics of the product furnished which require redesign of the project in any way.
   6. Services and other similar charges for the review of resubmissions of shop drawings that have been marked as "No Exceptions Taken" or "Make Corrections Noted".
   7. Services and other similar charges for the review of shop drawings submitted more than two (2) times for the same product or portion of the work.

1.12 MISCELLANEOUS SUBMITTALS

A. Provide a Submittal Schedule within seven (7) calendar days from the date of the Notice to Proceed. The Submittal Schedule shall list all submittals for the project referenced by draft log number. Provide the estimated date that the submittal will be transmitted to the Engineer for review.

B. Within seven (7) calendar days from the date of the Pre-Construction Meeting, submit a Proposed Products List. This list shall be a complete listing of all products proposed for use, with name of manufacturer, service headquarters, trade name and model number of each product. Partial listings will not be accepted.

C. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.13 SUBCONTRACTOR LIST

A. The Contractor shall submit, on AIA Form G705, within THIRTY (30) calendar days after the date of the Notice to Proceed, a list of all subcontractors, including the names of the major subcontractors that were submitted at the time of the bid.

1.14 MATERIAL SAFETY DATA SHEETS (MSDS)

A. Comply with "Right to Know" requirements of N.J.S.A. 34:5A-1, concerning notification of the use of toxic substances.

B. Any product or substance used by the Contractor or its subcontractors which is listed in Subpart Z of OSHA Part 1910 Title 29 of the Code of Federal Regulations entitled "Toxic and Hazardous

Substances" shall be identified to the Owner/Engineer by the Contractor's submission of a standard Material Safety Data Sheet (MSDS) in accordance with "Right To Know" requirements.

C. Products will not be permitted to be kept on site without a MSDS.

1.15 SHOP DRAWINGS

A. Submit shop drawings for all fabricated work, for all manufactured items and for items specifically required by the specifications.

B. Submit each shop and layout drawing to Engineer in the form of one (1) quality reproducible transparency and two (2) prints.
   1. After the submittal has been reviewed by the Engineer, the transparency will be annotated, prints will be made for Engineer's and Owner's use, records, and distribution.
   2. Engineer will return the transparency to the Contractor.
   3. Send one print to the Owner as specified above.

C. Submit one (1) electronic copy of each standard drawing, catalog cut, or other material. All shop drawings or submittals that are not in the standard 8-1/2" x 11" format shall be submitted both electronically and in paper. Samples shall be delivered directly to the office of the Engineer. The Engineer will return an electronic copy of each submittal once reviewed.

D. Subcontractors shall submit shop drawings directly to the Contractor for checking. Thoroughly check subcontractors' shop drawings for measurements, sizes of members, details, materials, and conformance with the Contract Documents.
   1. Return submittals which are found to be inaccurate or in error.
   2. Do not submit to the Engineer until all corrections have been made.

E. Clearly show the relationship of the various parts of the project and where the information provided on the submission depends upon field measurements and existing conditions.

F. The Contractor shall make all measurements, confirm existing conditions, and include them on the shop drawings before making a submission to the Engineer.

G. Submissions for a single item, or group of related items shall be complete.

H. When submitting manufacturers' catalogs, pamphlets or other data sheets, in lieu of prepared shop drawings, clearly mark the items being submitted for review.

I. If the shop drawings contain any departures from the contract requirements, specifically describe them in the letter of transmittal.
   1. Where such departures require revisions to layouts, structural, architectural, electrical, HVAC or any other changes to the work as shown, Contractor shall, at his own expense, prepare and submit revised drawings accordingly.
   2. Make drawings the same size as the Contract Drawings and to the same scale.

1.16 SAMPLES

A. Where required, or where requested by the Engineer, submit sample or test specimens of materials to be used or offered for use.
   1. Samples shall be representative, in all respects, of the material offered or intended, shall be supplied in such quantities and sizes as may be required for proper examination and tests, and shall be delivered to Engineer, prepaid, along with identification as to their sources and types of grades.
   2. Submit samples well in advance of anticipated use to permit the making of tests or examinations.

B. Samples will be checked for conformance with the design and for compliance with the Contract Documents.

C. Work shall be in accordance with the approved sample. The use of materials or equipment for which samples are requested or required to be submitted is not permitted until such time that the Engineer has completed his review.

1.17 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Engineer.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation. Provide manufacturer's instructions with shop drawings.

1.18 CERTIFICATIONS

A. Submit certifications of compliance indicated in the Contract Documents.

B. Certifications shall be complete and exact, they shall be properly authenticated by the written signature, in ink, of an owner, officer or duly authorized representative of the person, firm or organization issuing such certification and they shall guarantee that the materials or equipment are in complete conformance with the requirements of these specifications.

1.19 COLORS AND PATTERNS

A. Unless the precise color and pattern are specified, whenever a choice of color or pattern is available in a specified product, submit accurate color and pattern charts for Engineer's and Owner's review and selection.

1.20 MANUFACTURER'S SERVICE CENTER

A. The product of a manufacturer who does not maintain an adequate nearby service center and a sufficient stock of spare parts are subject to rejection by Engineer solely on that basis.

B. With each submission, submit information on manufacturer's facilities and give complete details of his service policies and capabilities, and a general idea of the stock of spare parts available. Submit this information in the form of a certification. Also include names, addresses and telephone numbers of at least three of the service center's present customers who are in the area of the project.

1.21 TEST RESULTS AND INSTALLATION

A. Whenever field startup services are specified, the Contractor shall obtain from the manufacturer and submit to the Engineer Manufacturer Startup Reports (MSR's). The report shall detail the results of the field visit and all special conditions resulting from the startup.

B. Whenever field or factory tests are required on materials, equipment and systems, such tests shall be performed and the test results submitted to Engineer in the form of a MSR.

C. Do not deliver to the project or incorporate into the work any materials or equipment for which Engineer has not completed his review and found same to be in general conformance with the Contract Documents.

D. Submit MSR's within thirty (30) calendar days after the date of the startup or factory test.

1.22 SPARE PARTS LIST

A. Prepare a list of all spare parts specified to be provided in other Sections. Compile the total list for the purposes of reviewing actual spare parts delivered versus spare parts specified to be provided. The list shall reference the Section, model number, and quantity to be provided.

1.23 WAIVER OF CERTAIN SUBMITTAL REQUIREMENTS

A. Unless otherwise specified, the requirement to submit data and samples for products specified for approval will be waived for products specified by brand name if the specifically named products are furnished for the work. In such cases, the Contractor shall submit two (2) copies of required Product Data directly to the Engineer's field representative for information and verification during its incorporation into the work. The SUBMISSION TRANSMITTAL FORM shall always be used.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

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CONTRACTOR'S COMPANY NAME
ADDRESS

SUBMISSION TRANSMITTAL FORM
CLIENT NAME: Sea Girt Borough
PROJECT TITLE: SGRT2050 Filter Room Rehab

H2M PROJECT NO.: SGRT2050

Product, Item, or System Submitted:			
Submission Date:		Submission Log No.:	
Specification Section:		Paragraph Reference:	
Contract Drawing Reference(s):			
Manufacturer's Name:			
Manufacturer's Mailing Address:			
Manufacturer's Contact Information:	*Name*	( ) *Tel. no.*	*Email*
Supplier's Name:			
Supplier's Mailing Address:			
Supplier's Contact Information:	*Name*	( ) *Tel. no.*	*Email*
This item is a substitution for the specified item:		____ No	____ Yes
Contrator's Approval Stamp with Signature & Date		Contractor's Brief Comments or Remarks (attach separate letter as needed): By making this submission, we represent that we have determined and verified all field measurements and dimensions, field construction criteria, site and building constraints in terms of limitations in moving the item into the enclosed space, materials, catalog and model numbers and similar data and that we have checked and coordinated this submission with other work at or adjacent to the installed location in accordance with the requirements contained in the Contract Documents.	

END OF SECTION 013300

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Codes

B. Governing agencies

C. Permits

1.02 CODES

A. Comply with the requirements of the various codes referred to in these Specifications. Such codes shall be the date of the latest revision in effect at the time of receiving bids.

B. If there is a conflict between local, state, and/or Federal regulatory requirements, seek a consultation with the State Department of Labor. Resolve conflicts to the satisfaction of the State Department of Labor prior to commencing work.

C. Electrical Work: Conform to the requirements of the National Electrical Code (NEC) unless otherwise shown or specified. The Owner will be the sole judge of the interpretation of these rules and requirements.

1.03 GOVERNING AGENCIES

A. All work shall conform to and be performed in strict accordance with all governing agencies such as, but not limited to:
   1. Occupational Safety and Health Act - OSHA
   2. State Department of Environmental Conservation
   3. State Building Code
   4. State Fire Code
   5. National Fire Protection Association - NFPA
   6. National Electrical Code
   7. State Plumbing Code
   8. County Department of Health
   9. Town Codes, Rules, Laws and Ordinances
   10. Sewer District Sewer Use Code
   11. Local Water Department
   12. Electric Utility
   13. Gas Utility

1.04 PERMITS AND INSPECTIONS

A. Representatives of the Owner shall have access to the work for inspection purposes. The Contractor shall provide facilities suitable to the Owner to facilitate inspections of the installed work.

B. Obtain and pay for all permits, fees, licenses, certificates, inspections and other use charges required in connection with the work.

C. Such permits include, but are not limited to:
   1. Building permits that are required by the municipality where the work is located. Arrange for inspections of the work by the municipal building department before closing in the installed work, if so required. Work will not be accepted for payment until such inspections are performed and accepted by the building department.

1.05 LISTINGS

A. Equipment and materials for which Underwriters' Laboratories, Inc. (UL) provides product listing service, shall be listed and bear the listing mark. Alternately, ETL Testing Laboratories, Inc. Product Safety Testing Listing is acceptable if the listed product has been tested to the applicable UL Standard.

1.06 FIRE RESISTANT CONSTRUCTION MATERIALS AND ASSEMBLIES

A. Conform to the fire rating classifications based upon the test methods and acceptance criteria in the Standard, Fire Tests of Building Construction and Materials for which Underwriters' Laboratories, Inc. (UL) provides listings.

B. Materials and assemblies shall comply with the acceptance criteria, detailed description of the assembly, its performance in the fire test and other pertinent details such as specification of materials, Classification coverage, and alternate assembly details.

C. Alternatively, fire resistance rating classifications by other issuing organizations listed in the Fire and Building Codes are acceptable.

1.07 COORDINATION WITH ELECTRIC UTILITY COMPANY

A. Comply with the utility company requirements for the incoming electric service.
   1. Pay the utility company's charges in connection with the installation of the incoming service.

1.08 COORDINATION WITH GAS UTILITY COMPANY

A. Comply with the gas utility company requirements including inspection for the incoming gas service.
   1. Pay the utility company's charges in connection with the installation and inspection of the incoming service.

1.09 COORDINATION WITH WATER UTILITY

A. Comply with the water utility requirements for water and fire service connections. Obtain and pay for all necessary permits from the water utility. Obtain authority to connect to the existing water mains.
   1. Make necessary connections to existing public water mains under supervision of the water utility representative.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 014100

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements for monitoring the quality of the constructed project.

B. Work of this Section also includes services of an independent testing laboratory for quality assurance testing.

C. The services of the testing laboratory will be paid for out of the cash allowance included by the Contractor in the price as bid in accordance with the requirements contained herein and in Section 012100 - Allowances.

1.02 REFERENCES

A. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

B. ASTM E699 - Practice for Criteria for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating Building Components in Accordance with Test Methods Promulgated by ASTM Committee E6.

1.03 QUALITY ASSURANCE - CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or workmanship that is more precise.

C. Perform work by persons qualified to produce workmanship of specified quality.

D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

E. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

1.04 QUALITY ASSURANCE - TESTING LABORATORY

A. In order to establish compliance with the Contract Documents, materials shall be tested, examined and evaluated before they are incorporated into the work. During and after installations, additional tests, examinations, and evaluations shall be made to determine continued compliance throughout the course of the work.

B. Testing laboratory shall be a reputable, experienced firm that is capable of performing all of the required testing and authorized to operate in the state in which the project is located.

C. Perform all sampling and testing in accordance with specified procedures and use the materials, instruments, apparatus, and equipment required by the codes, regulations and standards. Where specific testing requirements or procedures are not described, perform the testing in accordance with all pertinent codes and regulations and with recognized standards for testing.

D. In the event that samples and test specimens are not properly taken, handled, stored or delivered or if other requirements of this Section are not complied with, Engineer reserves the

right to delegate any or all of this work to others, or to take whatever action deemed necessary to ensure that sampling and testing are properly accomplished, for which all costs shall be borne by Contractor.

E. Engineer reserves the right to disapprove the use of a specific testing laboratory, even after prior approval, if the laboratory fails to meet or comply with the requirements of this Section. If this should occur, immediately discharge the testing laboratory and retain the services of a different laboratory acceptable to Engineer.

F. The testing laboratory shall meet the following criteria:
   1. Be capable of performing all of the required tests.
   2. Be regularly engaged in performing the types of services required.
   3. Have adequate facilities, materials, equipment, and personnel to perform the services.
   4. Have an adequately trained, experienced and qualified staff.
   5. Have at least one registered professional engineer licensed in the state in which the project is located who shall be capable of performing field tests, supervising laboratory testing and interpreting test results. The professional engineer shall be thoroughly knowledgeable in materials, soils, asphalt paving and concrete.
   6. Shall be able to be on the Project site within two hours after being notified.
   7. Comply with the requirements of ASTM C1077, ASTM D3740, ASTM D4561, ASTM E548 and ASTM E699.
   8. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

1.05 REFERENCE STANDARDS

A. Conform to reference standards by date that the project was last bid.

B. Obtain copies of standards when required by Contract Documents.

C. Should specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.06 SUBMITTALS

A. Within fifteen (15) calendar days from the date of the Notice to Proceed, submit documentation from three (3) testing laboratories that clearly indicates experience, location, qualifications of staff, and descriptions of any limitations or restrictions of the firm.
   1. Include a price schedule for standard tests and a billing rate schedule for technician classifications.
   2. Based upon this information, the Engineer will select one firm to be the primary testing laboratory and one firm to act as a standby.

B. Certified copies of each test report shall be mailed directly to the Engineer. The Contractor shall arrange with the laboratory to secure copies.

C. Each report shall be in writing and shall include the testing method used, the test results, the specified results, the exact location of where the test specimens were taken, the date taken, Project identification, Contractor's name and other pertinent information required for a complete and meaningful test report.

D. Each report shall be signed and certified by a responsible officer of the testing laboratory.

E. E-mail reports directly to Engineer within 24 hours after the sample is taken, except in those instances when tests cannot be immediately performed because of required curing, incubation periods, or lengthy testing procedures.

F. The laboratory shall verbally communicate test results when requested by the Engineer. This does not eliminate nor replace the requirements for a written report.

1.07 SCHEDULING - LABORATORY SERVICES

A. Except where otherwise specified, the Engineer will determine the number of samples to be taken, the date and time samples will be taken and tests made, the number and type of tests to be performed, who will collect the samples, how they will be handled and stored and when laboratory personnel are required on site.

B. Engineer will notify Contractor of his decision to take samples and/or have tests made and provide him with the pertinent information. Contractor is responsible for notifying the testing laboratory and for having the testing performed, on schedule.

C. In addition to the above, Contractor shall make his own arrangements for the sampling and testing of materials he proposes to incorporate into the work. This shall not be paid for out of the cash allowance.

D. Notify Engineer at least 72 hours in advance of the times at which scheduled samples or tests will be conducted.

E. If samples and/or tests cannot be taken or performed when required, delay the work until such time that they can be accomplished. Where possible, any work that has been installed but has not been sampled or tested as required, shall be tested by other means. Upon Engineer's request, uncover any work, which has been buried or covered, and perform special tests designated by Engineer. If the work cannot be tested by other means, Engineer may declare the work unacceptable. All costs associated with noncompliance and for special testing shall be borne by the Contractor and not be paid for out of the cash allowance.

F. Should the testing laboratory be scheduled to take or collect samples or to perform tests, and finds that it is unable to do so as a result of delays in construction, inclement weather, or any other reason, reschedule the tasks for a date acceptable to Engineer. Costs associated with times testing laboratory is unable to perform scheduled services shall be borne by the Contractor and will not be paid for under the allowance.

G. Plan all work and operations to allow for the taking and collection of samples and allow adequate time for the performance of tests. Delay the progress of questionable work until the receipt of the certified test reports.

1.08 FIELD OBSERVATION OF CONTRACTOR'S WORK

A. The Engineer will provide periodic observation of the Contractor's work.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions. Verify that the existing substrate is capable of structural support or attachment of new Work being applied or attached. Examine and verify specific conditions described in individual specification sections. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance. Seal cracks or openings of substrate prior to applying next material or substance.

B. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 FIELD QUALITY CONTROL

A. Allow representatives of the testing laboratory access to the work at all time. Provide all equipment, labor, materials, and facilities required by the laboratory to properly perform its functions. Cooperate with and assist laboratory personnel during the performance of their work.

B. Test specimens and samples shall be taken by the person(s) designated in other Sections, or as directed by Engineer. Conduct field sampling and testing in the presence of Engineer. Provide all materials, equipment, facilities and labor for securing samples and test specimens and for performing all field-testing.

END OF SECTION 014500

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section supplements the General Conditions.

B. The Work of this Section includes temporary facilities, utilities, and controls to be furnished by the Contractor for this project as it is specified herein.

1.02 CARE AND PLACEMENT

A. All temporary and permanent facilities and controls and all other elements on the project site shall meet all standards of the Occupational Safety and Health Act of 1970 and subsequent revisions. The Contractor shall comply with all requirements of the Act.

B. The Contractor shall take every precaution and shall provide such equipment and facilities as are necessary or required for the safety of its employees and persons at the site.

C. In the event of damage to existing and/or temporary facilities then immediately make all repairs and replacements to an equal condition prior to the event.

1.03 QUALITY PERFORMANCE

A. Comply with and perform all work in accordance with the requirements of local authorities and utility companies having jurisdiction, and all applicable codes, regulations and ordinances.

B. Secure approvals from the appropriate jurisdictions and utility companies on all repairs, relocations, connections, disconnections and the Work.

C. All barricades, warning signs, lights, temporary signals and other protective devices shall conform with "Manual on Uniform Traffic Control Devices for Streets and Highways", US Government Printing Office.

1.04 SUBMITTALS

A. The Contractor shall provide a list of contact numbers as follows:
   1. Contractor's superintendent and office project manager (home, cellular, office, fax, trailer, and email address).
   2. All subcontractors.
   3. All utility companies.
   4. Emergency services such as fire department, police, and ambulance.
   5. Contractor shall also submit the following:
      a. Name and qualifications of person or persons who shall be available to render first aid.
      b. Names, addresses and telephone numbers of personnel who can be telephoned and act on behalf of Contractor in the event of emergencies or other problems requiring prompt attention during winter shutdown, holidays, nights and other periods when the Contractor's superintendent may be absent from the project site.

B. The Contractor shall provide a sketch showing routing of temporary water service for construction purposes and for exfiltration tank testing. Provide cuts and plumber's certification for backflow device(s).

1.05 CONTRACTOR'S RESPONSIBILITY

A. The Contractor shall be responsible for the installation, performance, maintenance, and repair of all temporary facilities and controls specified herein this Section as originally provided.

B. The Owner reserves the right to immediately correct a Contractor caused action, if in the opinion of the Owner, the situation may result in the immediate loss of life, property, and degradation of the environment. The costs for actions taken by the Owner shall be deducted from money due or to become due the Contractor. Amounts in excess shall be paid by the Contractor.

C. If the Contractor caused situation is not deemed immediate, then the Contractor shall, within 24 hours of receipt of written and/or verbal notice, correct the defect or unsatisfactory condition.

D. The Owner may repair, correct, replace, or install temporary facilities to correct the situation if the Contractor fails to perform within the allowed time. The costs to make the corrections shall be deducted from money due or to become due the Contractor. Amounts in excess shall be paid by the Contractor.

PART 2 - PRODUCTS

2.01 GENERAL

A. The Owner may use temporary power lines, pipes, roadways or other facilities that the Contractor furnishes, installs, and maintains (then removes at the completion of the work), during the period of construction.

B. The location of all temporary power lines, roadways, and other necessary temporary facilities shall be subject to the approval of the Engineer, and these shall be located and operated so as not to interfere with the operation of the facilities.

2.02 WATER FOR CONSTRUCTION PURPOSES

A. The Contractor shall obtain water from the nearest potable water source as designated by the Owner.

B. The Owner will pay for water usage for general construction activities such as dust control and for sanitary purposes, like hand washing.

C. Potable water, used for pipe exfiltration testing, process tank testing, storage tank testing, or elevated water storage tank testing, will not be paid for by the Owner. The Contractor shall include the costs for water for this purpose in the price as-bid.

D. The Contractor shall install his or her own backflow prevention device at the supply point where it is connected to the Owner's system.
   1. The water purveyor shall approve the device.
   2. The device shall be tested and certified as functioning properly.
   3. Post the certification in a location acceptable to the water purveyor.

E. A water meter shall also be installed on any water service lines used to supply water for exfiltration testing.

F. The Contractor shall exercise measures to conserve water.

G. Provide insulation and heat tracing to prevent freezing of temporary piping. Drain hoses at the end of each use.

H. All Contractors, subcontractors, and personnel involved in the project shall be permitted to use water for construction purposes as provided under this paragraph.

2.03 SANITARY FACILITIES

A. The Contractor shall provide and maintain his or her own temporary toilet facilities and enclosures.

B. These facilities shall be maintained in a strictly sanitary manner and be screened from the general public.

C. All facilities shall be in accordance with the Occupational Safety and Health Act (OSHA) standards and all other applicable local codes.

D. The locations of such facilities shall be determined by the Engineer or the Owner .

E. All applicable codes and regulations regarding the maintenance and method of waste disposal for these facilities will be strictly enforced. These facilities shall be of the portable type.

F. The Owners sanitary facility will not be available for use by the contractor.

G. Comply with the requirements also contained in Section 015719 - Environmental Protection.

2.04 HEAT

A. The Contractor shall provide and pay for heating devices and fuel as required to maintain adequate heat for specific construction operations; i.e. painting, application of coatings, etc. where so specified elsewhere in these specifications.

B. The Contractor shall heat buildings to properly apply paint in accordance with Section 099100 requirements.

C. Maintain minimum ambient temperature of 40 degrees F in areas where construction is in progress, unless otherwise indicated in specifications or as required by proposed working conditions and manufacturer's installation/application instructions.

2.05 VENTILATION

A. The Contractor shall ventilate enclosed areas to assist in the curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors or gases.

B. The Contractor shall ventilate buildings to safely apply paint in accordance with Section 099100 requirements.

2.06 BARRIERS AND PROTECTION

A. The Contractor shall provide railings, barricades, signs, fences and other protective devices to prevent unauthorized entry to construction areas, to allow for the Owner's safe use of the site and to protect existing facilities and adjacent structures from damage from the work.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing buildings.

C. Provide protection for plant life designated to remain.

D. Protect vehicular traffic, stored materials, public utilities, site and structures from damage.

E. Provide warning signs, detour signs and other traffic control devices to insure the safety of plant operators and to adequately direct traffic around the work. Illuminate barricades, obstructions, and warning signs from sunset to sunrise.

2.07 TEMPORARY FENCING

A. The Contractor is responsible for performance compliance with OSHA standards.

B. The Contractor shall provide temporary safety fence around all open excavations or other dangerous conditions on the construction site.
   1. All temporary safety fencing shall be designed and erected in compliance with OSHA standards, but in no case less stringent than these specifications for fencing.
   2. Fence is to be bright orange in color, a minimum of 4 feet high, and properly secured using 1" diameter steel pipe at 4'-0" on-center as support posts.
   3. Stake each support post to a depth of 18" and tamp securely into place.
   4. Each post shall be plumb.
   5. Secure fencing to posts using heavy-duty 12" long cable ties or tie wire.
   6. The fence and supports shall remain the property of the Contractor and be promptly removed at the appropriate time.
   7. Post the following sign every 100-ft. along the perimeter of the fence: "RESTRICTED AREA KEEP OUT".
      a. Each sign shall be commercially printed and be 18" x 36".
      b. It shall be secured to the fence with heavy-duty tie wraps.

C. The General Contractor shall install temporary safety fencing around the outside perimeter of each open tank that requires excavation and which is to be constructed under Contract G.
   1. Fencing shall be securely installed and maintained in accordance with OSHA regulations until the railing and grating has been installed.
   2. Fencing shall be installed on exterior tank walls where excavation is required.

2.08 TEMPORARY HANDRAILS AND SCAFFOLDS

A. All temporary handrailing and scaffolds shall be designed and erected in compliance with OSHA standards. The Contractor is responsible for performance compliance with OSHA standards.

B. Handrails shall be securely installed and maintained in accordance with OSHA regulations until the permanent railing or grating has been permanently installed and approved by the Engineer.

C. All scaffolding and platforms shall be erected in a safe and substantial manner complying with OSHA requirements.

D. All temporary handrails and scaffolds shall be designed by a professional engineer licensed in the state where the project is being constructed.
   1. The design drawings and details shall be stamped by the licensed engineer and submitted for record purposes.
   2. The Contractor's design engineer shall visit the site to certify that the handrailing and/or scaffolds have been erected pursuant to the stamped design.

E. The General Contractor shall install temporary handrails around the inside perimeter of each open tank that is to be constructed under Contract G.

F. The General Contractor shall protect all openings in building/structures of any type such as shafts, deck openings, and other building related chases.

G. The General Contractor shall also install two (2) separate temporary handrailing installations at two (2) separate stages of the construction for all structures where OSHA requires handrailing is to be provided.
   1. OSHA approved wooden railing shall be installed at the point where the deck platform formwork is proceeding and before reinforcement steel is placed.
      a. Railing shall be installed using the bridge brackets used to construct the cantilevered platforms or other method as selected by the Contractor in compliance with OSHA.
      b. Coordinate and advise the Prime Electrical Contractor of the date when the handrailing will be in place so that embedded conduit can be installed.
   2. The second installation of railing shall be fabricated of steel structural members with aircraft cable and turnbuckles installed immediately after the deck platform is constructed and the formwork is removed.

2.09 EROSION CONTROL

A. The Contractor shall provide measures to keep the ground surface well drained, but avoid erosion of embankments, excavations, the project site, and adjacent areas.

B. The Contractor shall comply with all local codes, rules, and regulations concerning soil erosion.
   1. Use hay bales or silt fences to control erosion to the satisfaction of the Engineer and regulatory agencies. Use hay bales or silt fences to stop silt and sediment from reaching surface waters, parking lots and roads.
   2. Leave erosion control methods in place until ground cover is established or until date of substantial completion.

C. The Contractor shall install erosion control measures as shown on the Drawings.

D. Comply with the requirements also contained in Section 015719 - Environmental Protection.

2.10 DUST CONTROL

A. The Contractor shall provide measures to control dust resulting from the work.

B. Control dust at locations and in such quantities and frequencies as required to prevent dust from becoming a nuisance to the surrounding area.

C. In the event the Contractor does not adequately provide for dust control, or should insufficient quantities of dust control agents be placed and Contractor fails to place additional quantities within 4 hours after Engineer's direction, Owner will perform the required work by whatever means deemed expedient and all expenses incurred by Owner will be charged to and paid by Contractor.

D. Take care in selecting and applying dust control agents so as not to make roadways or walkways slippery, muddy or hazardous. Dust control agents shall be acceptable to the Engineer.

E. The Contractor shall provide all roadways with dust control.

2.11 RUBBISH REMOVAL

A. The Contractor shall be responsible for overall rubbish removal.

B. Burning of rubbish and trash will not be permitted.

C. The Contractor shall clean up trash as specified in Section 011400 - Work Restrictions or more often if the trash interferes with the work of others, presents a hazard or if directed by the Engineer.

D. Dispose of rubbish and waste materials in accordance with state regulations and local ordinances.

E. The Contractor shall also place rubbish containers at locations selected by the Engineer.
   1. Furnish adequately sized rubbish containers from the date of initial mobilization to the date of final payment.
   2. As a minimum, the Contractor shall furnish two (2) 55-gallon general trash containers. Secure the top of each container to the container.
   3. Secure the container itself so that it does not get blown about the site.

F. The Contractor shall be responsible for maintaining the site free of trash.

G. Each Contractor shall assist the General Contractor in maintaining the site free of trash and debris.
   1. It shall be the sole responsibility of the General Contractor to prevent trash from being blown about the site.
   2. Provide a worker to police the site at least for 1 hour at the end of each day that work is being undertaken by the General Contractor.

2.12 SECURITY

A. The Contractor shall provide security and facilities to protect work from unauthorized entry, vandalism and theft.

B. Coordinate with Owner's security program, if applicable.

C. The Contractor has full responsibility for the working area until final acceptance and payment.

D. The Contractor shall maintain the perimeter fence that pre-existed prior to the start of construction. A temporary perimeter fence shall be required at all times during the construction and until the new perimeter fence is installed, or until the project is accepted by the Owner.

E. It shall be the Contractor's responsibility to lock all gates to the site, and on the access road, at the end of each work day.

F. All on-site employees shall bear, at all times, an identification badge, conspicuously worn, which shall include, at a minimum, a passport or similar size photograph, the name of the employee and the name of the company.

G. Any employee working on site without a photo identification badge will be instructed to leave the site.

H. All company vehicles shall be conspicuously identified, through sufficiently sized lettering on both the passenger and driver sides, with the company name, address and telephone number.
   1. All employee owned vehicles shall have an 8-1/2 inch by 11 inch sign with the company name, address and telephone number placed on the dashboard on the driver side.
   2. Vehicles may be subject to search by the Owner or owner's representatives.
   3. Any vehicle that does not have the company name, address and telephone number will not be permitted on the Owners' property.

I. Submit to the Owner a complete listing of all employees that will or might be performing work at the project site.
   1. Furthermore, provide sufficient information as may be required for the Owner to conduct background checks, in accordance with the Fair Credit Reporting Act.
   2. Background checks may be performed at the discretion of the Owner due to the sensitive nature of the work and the extensive, and sometimes unsupervised, access to Owner property and buildings.
   3. The Contractor shall be required, on request from the Owner, at any time prior to or during the work, to provide releases from its employees and officers to the Owner, H2M, and a background search firm, hired by either the Owner or H2M, to conduct background checks in accordance with the Fair Credit Reporting Act and applicable state law.

2.13 PARKING

A. Provide and maintain access to fire hydrants, building entrances, process tanks, doors and the work in general.

B. The Contractor shall have his or her employees and subcontractors park in areas designated by the Owner/Engineer.

C. If designated on the Contract Drawings, then only use those areas for parking.

2.14 DAMAGES

A. The Contractor, with the prior approval of the Owner/Engineer, shall promptly repair any damage, directly or indirectly caused by the Contractor's operations.

B. All repairs shall be to the complete satisfaction of the Owner and equal in quality to that which pre-existed.

2.15 FIRST AID FACILITIES & EMERGENCY TELEPHONE NUMBERS

A. The Contractor shall provide and maintain adequately equipped first aid facilities in a location or at locations that are readily accessible to workmen, Engineer and visitors to the site.

B. Provide at least one on-site employee who is properly trained in first aid and who shall be available to render first aid whenever construction is in progress.

C. Provide a list of emergency telephone numbers as specified above.

D. Post the list of emergency telephone numbers as directed by the Engineer.

2.16 POLLUTION CONTROL

A. Do not permit pollutants, such as chemicals, fuels, lubricants, calcium chloride, sewage, water containing sediments and other deleterious, poisonous, toxic or oxygen demanding substances to enter or leach into streams, lakes, wetlands, other surface waters, into groundwater, or into the air.

B. In waters used for public water supply or used for trout, salmon or other game or forage fish spawning or nursery, control measures must be adequate to assure that turbidity in the receiving water will be increased not more than 10 standard turbidity units (s.t.u.) in the absence of other more restrictive locally established limitations, unless otherwise permitted by the State.

C. In no case shall the classification for the surface water be violated, unless otherwise permitted by the State.

D. In water used for other purposes, the turbidity shall not exceed State limits.

2.17 REMOVALS

A. Remove all items provided under this Section except as otherwise specified.

PART 3 - EXECUTION

3.01 PROTECTION OF EXISTING UTILITIES AND PUBLIC WORKS

A. Maintain and protect existing utilities and public works including, but not limited to, conduits, sewers, water mains, electric and telephone conductors or conduits, and gas mains encountered during the construction.

B. In the event that it is not possible to cross over, under, around or otherwise avoid the existing utility, the owner of the utility shall be notified that the utility must be altered or moved.

C. In the event that damage shall result to any service pipe for water or gas, or any private or public sewer or conduit, the Contractor shall immediately, and at its own expense, repair same to the satisfaction of the Engineer.

D. Any contents from the pipes, sewers or conduits shall be immediately removed and disposed in accordance with applicable laws.

3.02 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS

A. Remove temporary above grade or buried utilities, equipment, facilities and materials, immediately following substantial completion and prior to release of retainage.

B. Remove underground installations to a minimum depth of 2 feet.

C. Regrade site to restore to existing slope and elevation, and restore the surface.

D. Clean and repair damage caused by installation or use of temporary work.

E. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

F. Remove temporary parking and access roads.

G. Regrade area to existing slope and elevation and restore the surface to its existing condition.

H. Final payment will not be processed until all removals have been completed to the satisfaction of the Owner/Engineer.

3.03 PROTECTION OF EXISTING PROPERTY

A. Protect existing structures and finishes during performance of the work.

B. Protect existing trees and plants during performance of the work.

C. Do not deposit excavated materials or store materials around trees or plants or attach guy wires to trees.

END OF SECTION 015000

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section includes the general requirements for products that are to be furnished, installed, or otherwise incorporated into the project.

1.02 QUALITY ASSURANCE APPLIES TO ALL PRODUCTS

A. In addition to the Contractor's warrantees and guarantees on materials and equipment required under the General Conditions of the Contract and the Technical Specifications contained hereinafter, the Contractor shall also be responsible for all materials, equipment, and products that have or is planned to be incorporated into the work.
   1. The Contractor shall be responsible for the finished work and that it accurately and completely complies with these Contract Documents.
   2. The Contractor shall be responsible for work performed by subcontractors, equipment suppliers, and material vendors.
   3. The Contractor shall be satisfied as to the product's performance before it is ordered for installation. At the Contractor's option, he/she shall have tested each product to determine compliance with these specifications.

B. The Engineer may check all or any portion of the work and the Contractor shall afford all necessary assistance to the Engineer in carrying out such checks.
   1. Such checking by the Engineer shall not relieve the Contractor of any responsibilities for the accuracy or completeness of the work.
   2. Such checking is a courtesy service being provided by the Owner and does not relieve the Contractor of his/her responsibilities under this Construction Contract.

C. If witnessed shop tests or inspections are required at the point of manufacture, the Contractor shall keep the Engineer advised as to the progress of the work to allow inspection at the proper time and place. Provide at least two (2) weeks advance notice before scheduled shop tests.

D. Should a dispute arise as to the quality of workmanship, equipment or material performance, then the final decision regarding acceptability with these Contract Documents shall be that of the Owner.

E. At the request of the Engineer, the Contractor shall promptly provide the services of a competent representative of the manufacturer at the project site, fully equipped and prepared to answer questions, perform tests, make adjustments and to prove compliance with the Contract Documents free of all additional charges. Proof of compliance shall be the responsibility of the Contractor, and such special visits to the project site by the manufacturer shall not be eligible under any cash allowances or stipulated man-hours necessary to startup the system and/or train the Owner as may be specified in the Technical Specifications.

1.03 QUALITY ASSURANCE - EQUIPMENT

A. Erect and install products under the supervision of a competent and experienced superintendent. The method of installation, including anchorage, clearances, and tolerances for rotating assemblies, methods of support for equipment and adjacent piping, shall be as recommended by the equipment manufacturer unless detailed on the Drawings or specified.

B. All material furnished shall be new, and guaranteed free from defects in workmanship, installation, and design.

C. Design and fabricate equipment in conformance with ANSI, ASTM, ASME, ASHRAE, IEEE, NEC and NEMA Standards.

1. Equipment shall withstand the stresses that may occur during fabrication, testing, transportation, installation and conditions of operation.
2. Pumps shall conform to the requirements of the Hydraulic Institute.
3. Equipment shall comply with the latest OSHA regulations and the ANSI Safety Standards.

D. Equipment shall be products of manufacturers who produce evidence of their ability to promptly furnish any and all interchangeable replacement parts as may be needed at any time within the expected life of the equipment.

E. Manufacturers shall also have readily available access to suitable and accurate testing facilities for performing the required shop tests.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Equipment shall have been in successful regular operation under comparable conditions for a period of at least five (5) years.
   1. This time requirement does not apply when the manufacturer posts an Owner/Engineer acceptable Performance Bond or Letter of Credit for the duration of the time period that will guarantee replacement of the equipment in the event of failure.
   2. The bond shall be in a form that is acceptable to the Owner's legal council.

B. The Owner reserves the right to reject any material or equipment manufacturer who, although he appears to be qualified and meets the technical requirements, does not provide satisfactory evidence indicating adequate and prompt post-installation repair and maintenance service, as required to suit the operational requirements of the Owner.

C. Whenever it is required that the Contractor furnish materials or manufactured articles or shall do work for which no detailed specifications are set forth, the materials or manufactured articles shall be of the best grade in quality and workmanship obtainable on the market from firms of established good reputation, or, if not ordinarily carried in stock, shall conform to the usual standards for first-class materials or articles of the kind required.

D. Perform work in full conformity and harmony with the intent to secure the best standard of construction and equipment of the work as a whole or in part.

E. Items of any one type of material or equipment shall be the product of a single manufacturer.
   1. For ease of the Owner in maintaining and obtaining service for equipment and for obtaining spare parts from as few places as possible, to the maximum extent possible, use equipment of a single manufacturer.
   2. The Engineer reserves the right to reject any equipment from various manufacturers if suitable equipment can be secured from fewer manufacturers and to require that source of materials be unified to the maximum extent possible.

F. Substitute equipment shall not be fabricated nor installed until after written decision to accept request is received from the Engineer.

2.02 NAMEPLATES

A. Each unit of equipment shall have the manufacturer's name or trademark on a stainless steel nameplate securely affixed in a conspicuous place.

B. The manufacturer's name or trademark may be cast integrally with stamp, or otherwise permanently marked upon the item of equipment.

C. Such other information as the manufacturer may consider necessary for complete identification shall be shown on the nameplate.

2.03 FABRICATIONS

A. Insofar as possible, shop prefabricate all items complete and ready for installation.

B. Accurately fabricate all items to the details shown on the Drawings and on the shop drawings found in compliance with the Contract Documents.

PART 3 - EXECUTION

3.01 PREPARATION

A. Prior to work under any Section, carefully inspect the existing work and verify that it is complete to the point where the work under that Section may properly commence.

B. Avoid the need to remove and replace work and to avoid unnecessary cutting and patching.

C. Inspect all surfaces to be sure that they have been properly prepared before applying new work to such surfaces.

D. Verify that all work can be installed in strict accordance with the drawings and the approved shop drawings. Immediately report discrepancies to Engineer.

E. Do not proceed with the work under any Section until these conditions are obtained.

3.02 INSTALLATION

A. Furnish and install materials and equipment in accordance with the instructions of the applicable manufacturer, fabricator or processors, except as otherwise provided in the Contract Documents.

B. All work shall be done in a workmanlike manner and set to proper lines and grades. The work shall be square, plumb and/or level as the case may be.

C. Where performance criteria are specified, do all work necessary to attain the required end results.

3.03 FIELD QUALITY CONTROL

A. Neither observations by Engineer nor inspections, tests or approvals by other persons shall relieve the Contractor from his obligations to perform the work in accordance with the requirements of the Contract Documents.

B. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any work to specifically be inspected, tested or approved by some public body, the Contractor shall assume full responsibility therefore, pay all costs in connection therewith, and furnish the Engineer with the required certificates of inspection, testing or approval.

C. The Owner reserves the right to independently perform laboratory tests on random samples of material or performance tests on equipment delivered to the site.
   1. These tests, if made, will be conducted in accordance with the appropriate referenced standards or specification requirements.

2. The entire shipment represented by a given sample, samples or piece of equipment may be rejected on the basis of the failure of samples or pieces of equipment to meet specified test requirements.
3. All rejected materials or equipment shall be removed from the site, whether stored or installed in the work, and the required replacements shall be made, all at no additional cost to Owner.

3.04 ADJUST AND CLEAN

A. Upon the completion of installations, and as a condition of its acceptance, visually inspect all work, adjust all components for proper alignment and touch-up abrasions and scratches to make them completely invisible.

B. Thoroughly examine all materials and equipment with protective or decorative finishes for defects and damage prior to being covered.
   1. In the case of buried items of work, restore protective surface covers so as to conform to the Contract Documents prior to being backfilled, buried or embedded, as the case may be.
   2. In the case of exposed items of work, for which a decorative finish is required, all scratches, discoloration's, unmatched colors, disfigurations and damages shall be repaired and touched-up so as to provide a neat, clean finish, and be uniform in color.

3.05 UNCOVERING WORK

A. Unless otherwise specified or directed by Engineer, no work shall be covered until it has been observed, tested, photographed, measured, and authorized to be covered by Engineer.

B. Tie distances to above ground physical structures as reference points to all underground utilities, conduits, pits, manholes, valves, and pipelines shall be obtained by the Contractor prior to covering the work. Immediately comply with the Engineer's direction to uncover the work if tie distances were not obtained.

C. If any work has been covered with Engineer's consent and Engineer considers it necessary or advisable that covered work be observed or tested, the Contractor, at Engineer's request, shall uncover, expose or otherwise make available for observation, or testing as Engineer may require, that portion of the work in question, furnishing all necessary labor, material and equipment.
   1. If it is found that such work is defective, the Contractor shall bear all the expenses of such uncovering, exposure, observation, and testing of satisfactory reconstruction, including compensation for additional engineering services and an appropriate deductive change order shall be issued.
   2. If, however, such work is not found to be defective, the Contractor shall be allowed an increase in the contract price or an extension of the contract time, or both, directly attributable to such uncovering, exposure, observation, testing and reconstruction if he makes a claim therefore as provided in the General Conditions.

3.06 DEFECTIVE WORK

A. The repair, removal, replacement and correction of defective work is a part of this Contract and shall be promptly performed in accordance with the requirements set forth in the General Conditions or other portions of the Contract Documents. All costs in connection with the correction of defective work shall be borne by the Contractor.

B. Products that fail to maintain the performance or other salient requirements of the Contract Documents, shows undue wear, or other deleterious effects during the maintenance period, shall be considered defective.

END OF SECTION 016100

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Section includes the transportation, handling, storage and protection of products that are to be incorporated into the work.

B. The procedures for turning equipment over to the Owner for installation by others is also included herein.

1.02 GENERAL

A. Items shall be delivered as complete assemblies direct from the manufacturer with all internal wiring, piping, valving, and control devices intact except where partial disassembly is required by transportation regulations, protection of components, or where physical constraints may exist or be created for the setting of the item.

B. Coordinate the disassembly and reassembly requirements with the manufacturer. Determine the need and extent of reassembly prior to bid.
   1. All labor, material and equipment costs associated with the disassembly and reassembly of the product shall be included in the Contract Price.
   2. Where reassembly of equipment is necessary, then the manufacturer shall provide reassembly instruction at the project site.
   3. A technician shall be present during the entire reassembly procedure and the manufacturer shall certify, in writing, that the unit was reassembled properly in accordance with instructions provided by the manufacturer and that all as-specified warranties remain in effect.
   4. The manufacturer's reassembly inspection time shall be in addition to the field service time specified and shall be included in the Contract Price. This time shall not be eligible for payment under any cash allowance item.

C. In the case where equipment is to be installed by others, then the supplying contractor shall be responsible for its reassembly. If reassembly is necessary and the unit(s) are to be set inside an enclosure or building, reassemble the equipment inside said enclosure. The equipment once reassembled shall be turned over to the installing contractor as specified below.

1.03 PACKING

A. Transport products in containers, crates, boxes or similar means such that the products are protected against damage that may occur during transportation.

B. All parts shall be packaged separately or in container where parts of similar systems are grouped.

C. Part numbers shall be indicated on the individual part. Use indelible ink to mark part numbers.

D. All equipment shipments shall be included with a parts list showing a description (name) of the part and the manufacturer's part number.
   1. The parts list shall be shipped in a plastic zippered envelope with the words "Parts List" lettered on it in indelible ink.
   2. The parts list shall be placed inside the shipping container so that it is on the top of the contents.

E. Equipment shall be shipped with storage, handling and installation instructions.

1. The Engineer reserves the right to withhold payment for equipment delivered to the site until such time as the storage, handling and installation instructions are supplied by the manufacturer.
2. In the case where operation and maintenance manuals have been provided by the manufacturer, which includes the installation instructions, then the installation instructions shall also be included with the equipment shipment.

F. Delicate instruments and devices, reagents, chemicals, and glassware shall be shipped in packaging normally provided by the manufacturer.

G. The Contractor shall require the manufacturer to be responsible for the proper packing of all products.

1.04 SHIPPING AND DELIVERY

A. Product deliveries shall be accompanied with a bill of lading indicating the place of origination and the Contractor's purchase order number.

B. Inspect shipments immediately upon delivery, to assure compliance with requirements of the Contract Documents and those products are undamaged.

C. Promptly remove damaged material and unsuitable items from the job site.

D. Provide equipment and personnel to handle products by methods to prevent soiling; disfigurement or damage.

1.05 STORAGE

A. Store sensitive products and all spare parts in weather tight, climate controlled enclosures in an environment favorable to product.

B. Store and protect products in accordance with the manufacturer's instructions.

C. All other products that are to be installed underground or products such as pipe, valves, and fittings shall be stored outdoors but shall be blocked off the ground and covered with impervious sheet coverings.

D. Store fabricated products above the ground on blocking or skids.

E. Store loose granular materials in well-drained areas on solid surfaces to prevent mixing with foreign matter.

F. Provide adequate ventilation to avoid condensation.

G. In accordance with manufacturer's instructions protect bearings, couplings, shafts, rotating components, and assemblies. Protection of said equipment shall be continuous until the time the equipment is placed into permanent service.

H. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.

I. Do not store volatile liquids in any building on site.

J. Storage of products shall be the responsibility of the supplying contractor. The installing contractor shall take all necessary precautions to protect the equipment being furnished by others.

K. Store with seals and labels intact and legible.

1.06 EQUIPMENT INSTALLED BY OTHERS

A. All products, except products noted on the Drawings or specified, shall be furnished and installed under this Contract.
   1. Only noted or specified products shall be furnished under this Contract for installation by others.
   2. If it is not noted on the Drawings or specified, then the product shall be furnished and installed under the Contract.

B. The Contractor shall furnish these products to the Owner. These products shall be stored as specified above.

C. The Owner will then advise the installing contractor that the product(s) are ready for installation.
   1. In the case where the product is stored in a proper enclosure, but not stored inside the building to be constructed under this project, then the installing contractor shall move the product into the building to a location adjacent to the final location shown on the Drawings.
   2. In all cases, the installing contractor shall be responsible for moving from storage, uncrating, anchoring, mounting and installing the product as required by the Contract Documents.

D. The Contractor and installing contractor(s) shall be present at the time the equipment is turned over to the Owner. Immediately thereafter, the Owner will turn the product over to the installing contractor for installation.

E. The Owner, Contractor, Engineer and the installing contractor shall inspect the condition of the product at this time.
   1. Any defects in the product will be noted and the Contractor will be advised to make all repairs immediately.
   2. The installing contractor shall still be required to install the product if the damage is deemed cosmetic by the Engineer.
   3. The manufacturer's installation instructions or wiring diagram shall be turned over to the installing contractor at this time by the Contractor.
   4. Any damage occurring to the product during moving, setting and mounting the unit(s) shall be the responsibility of the installing contractor.
   5. The Contractor is advised to take photographs to document the condition prior to it being turned over to the installing contractor.
   6. The installing contractor is advised to take photographs to document the condition prior to its acceptance.

F. The supplied unit(s) remain the property of the Contractor until final acceptance of the work.

G. Any damage caused to the unit(s) due to improper installation, workmanship, and non-compliance with the manufacturer's written installation instructions shall be the responsibility of the contractor who caused said damage. The burden of proof shall rest with the supplying Contractor.

H. In the event the Contractor discovers misuse, abuse or improper installation of the unit(s) by the installing contractor, then he shall immediately notify the Engineer in writing. The Engineer will investigate the accusations and make a determination. The Engineer's determination shall be binding and agreed to by both parties.

I. If the Engineer's determination substantiates the accusations of the Contractor, then the Contractor shall install the unit(s), the costs for which will be paid for as extra work. All costs

associated with the extra work change order, including engineering and attorney fees of the Owner and Contractor will be deducted from money due the installing contractor.

1.07 PROTECTION OF WORK

A. The Contractor shall protect the installed work. All costs for protection shall be borne by the Contractor. Provide coverings as necessary to protect installed products from damage, from traffic and subsequent construction operations. Remove when no longer needed.

B. Cover and protect equipment from dust, moisture or physical damage. Protect finished floor surfaces prior to allowing equipment or materials to be moved over such surfaces. Maintain finished surfaces clean, unmarred and suitably protected until accepted by the Owner.

C. Additional time required to secure replacements and to make repairs will not be considered by the Engineer to justify any extension in the Contract Time of Completion. In the event of the damage, promptly make replacement and repairs to the approval of the Engineer at no additional costs.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 016500

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Cleaning during the progress of the work

B. Cleaning prior to final payment

1.02 SCHEDULING

A. Sequence, schedule, and coordinate final cleaning work with the final cleaning work to be performed by other prime contractors.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cleaning materials shall be appropriate to the surface and materials being cleaned.

B. Provide pads to protect finished surfaces from cleaning materials.

PART 3 - EXECUTION

3.01 PREPARATION

A. Post signs to advise building occupants if wet and/or slippery floor conditions exist during cleaning operations.

3.02 PROGRESS CLEANING

A. Keep all buildings, enclosures, and confined areas where work is being performed under the Contract free from unattended combustible materials.

B. Remove rust spots as they develop.

3.03 FINAL CLEANING

A. Remove dust, dirt, grease, stains, paint drips and runs, plastic, labels, tape, glue, rope, and other foreign materials from visible interior and exterior surfaces.

B. Do not move dust from spot to spot. Remove directly from the surface on which it lies by the most effective mean such as appropriately treated dusting cloths or vacuum tools. When doing high cleaning, do not allow dust to fall from high areas onto furniture and equipment below.

C. Dismantle and remove all temporary structures, scaffolding, fencing, and equipment. Remove waste materials, rubbish, lumber, block, tools, machinery, and surplus materials.

D. Perform the following prior to final payment:
   1. Broom clean all exterior concrete surfaces and vacuum clean all interior concrete surfaces.
   2. Dust and spot clean painted and vinyl covered walls.
   3. Clean and polish all unpainted metal on doors such as trim, hardware, kickplates and doorknobs.
   4. Vacuum clean carpets and mats.
   5. Repair, patch, and touch-up marred surfaces to specified finish and to match adjacent surfaces.

6. Replace all broken and scratched glass and mirrors.
7. Wash and clean interior and exterior window surfaces. All glass shall be clean and free of dirt, grime, streaks and excessive moisture. Wipe drippings and other marks from windowsills, sashes and woodwork. Do not use windowsills in lieu of ladders.
8. Polish bright metal by damp wiping and drying with a suitable cloth. If a polished appearance is not thereby produced, apply appropriate metal polish.
9. Clean and polish all stainless steel surfaces, including control panels supplied under this Contract.
10. Clean furniture and equipment in accordance with manufacturers instructions.
11. Clean all paved roads, lots and drives which were paved as work under this Contract and all existing paved surfaces using a mechanical street cleaner.
12. Repair or repaint damaged pavement markings.
13. Vacuum and clean with a damp cloth light fixtures, including glass and plastic lenses, ceiling and wall mounted lights, cover panels, side panels, louvers, fixture frames and lamps.
14. Remove all rust spots and stains from new and pre-existing concrete, painted surfaces, and all other surfaces.
15. Clean and disinfect all pre-existing toilet facilities that were entered upon and used by the Contractor during the project.
16. Replace damaged existing toilet fixtures, such as sinks, toilet bowls, urinals, and mirrors, with in-kind units if so directed by the Engineer.
17. Wash all existing floors that were in any way impacted by the construction operations.
18. Inspect interior and exterior surfaces, and all work areas, to verify that the entire work is clean and ready for use by the Owner. The project will not be considered substantially complete until all final cleaning has been performed.
19. Clean dirt that has accumulated between grating and grating angles/supports.
20. Thoroughly clean all pits, galleries, manholes, pipes, channels, tanks, wells and all structures entered upon.

END OF SECTION 017423

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work of this Section includes the following:
   1. Starting systems
   2. Testing, adjusting, and balancing
   3. Updating of manufacturer's operations and maintenance manuals and wiring diagrams

1.02 STARTING SYSTEMS

A. The Contractor shall coordinate, schedule, and sequence the start-up of various equipment and systems.

B. Where the start-up of a system or piece of equipment is dependent upon the start-up of other system(s) or equipment, then the Contractor shall schedule and sequence the start-ups to coincide.

C. Notify the Engineer at least 14 calendar days prior to the start-up of each item or system so that (s)he can schedule the startup with the Owner and utilities.

D. Where applicable, verify that each piece of equipment or system has been checked for proper:
   1. lubrication,
   2. water pressures,
   3. terminal connections,
   4. control sequence,
   5. for conditions which may cause damage or delay the start-up procedure.

E. Verify that the equipment has been installed in accordance with the manufacturer's requirements.

F. Complete all pre-startup checklists that may be required by the system vendor.
   1. In the event that start-up activities are delayed as a result of the Contractor's failure to properly check the completed installation and a manufacturer's representative is on the job site waiting for corrections to be made, then the Engineer may, at his/her sole discretion, postpone start-up until such time as the corrections have been made without any extra costs.
   2. The Owner may deduct from money due the Contractor the excess cost of engineering associated with having the Engineer present during the start-up.
   3. The deduction shall be equal to the Engineer's effective billing rate times the total number of hours delayed during the start-up activities.

G. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

H. Verify that wiring and support components for equipment are complete and tested.

I. Execute start-up under supervision of applicable Contractor's personnel in accordance with manufacturer's instructions.

J. The Contractor shall have the job site superintendent present during all start-up activities.

K. Provide manufacturer's authorized technician at the site when specified and in accordance with the requirements contained in Section 014500 - Quality Control.

L. Submit manufacturer's start-up reports (MSR's) in accordance with Section 013300.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 017500

PART 1 - GENERAL

1.01 SUBMITTALS

A. Submit the following documents to the Engineer before Substantial Completion:
   1. Project Record Documents as specified in Section 017839.
   2. Operations and Maintenance Manuals prepared in accordance with Section 017823 and be updated as a result of start-up activities.
   3. Manufacturer's Start-up Reports (MSR's) for all equipment and systems where manufacturer field time is specified.
      a. Each MSR shall be signed by the field technician(s) who attended the start-up.
      b. If the manufacturer is taking exception to the installation or if the warranty is voided, he shall provide a statement to that effect and provide reasons and justification to explain the company's position.
   4. One binder containing original counterparts of all warranties, guarantees, bonds, or affidavits as specified in the Technical Specification Sections. These documents shall contain the original signatures and be placed in a plastic sheet protector, one document per protector.
   5. Spare parts checklist itemizing all spare parts furnished under the Contract summarized by Section.
   6. Electrical Underwriter's Certificate where the prime construction contract includes electrical construction or where this Contract is for a Prime Electrical Construction Contract.

B. Submit the following items to the Engineer with the final application for payment:
   1. Final Application for Payment prepared by the Engineer for Contractor's execution showing final amount of Contract including change orders.
   2. Maintenance Bond prepared in accordance with the Contract or General Conditions.
   3. Utility company signoffs and inspection approvals, if applicable.
   4. Federal, state, county, town and local signoffs and inspection approvals, where applicable.

C. All documents shall be complete, signed, dated, and notarized (where applicable) and be subject to the Engineer's acknowledgment of receipt or approval.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 017800

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section specifies the requirements for Operations and Maintenance Manuals required to be prepared by system suppliers and equipment manufacturers.

B. The Contractor shall submit Operations and Maintenance Manuals for all equipment.

C. Where the technical specifications call for the submission of manuals, said manuals shall be prepared in accordance with the requirements contained herein. It being understood that manuals shall be submitted for all equipment even if it is not specifically called out in the specifications.

1.02 MANUAL CONTENTS AND FORMAT

A. All paper Operations and Maintenance Manuals shall be as specified hereinafter.

B. The binder shall be 8 1/2" x 11", metal hinge, vinyl, large capacity by National or Equal. It shall show the name of the manufacturer or supplier and project name on the spine of the binder.

C. A cover shall be provided showing the names of the Owner, Engineer, Contractor, and Manufacturer.
   1. It shall show the Contractor's order number and manufacturer's project number.
   2. The address of the manufacturer, service station telephone number, project title, contract number, and year shall also be shown.

D. Provide tabbed color dividers for each separate product and system.
   1. The name of the product shall be typed on the tab.
   2. A separate tab shall also be provided for information such as troubleshooting instructions, spare parts list, etc.

E. An index shall be provided in the back of the binder, with a separate tab, providing a quick way for the operator to find key and important topics contained in the manual.

F. A separate listing for all charts, graphs, tables, figures and shop drawings shall be provided directly following the table of contents.

G. Each manual shall contain one (1) copy of all shop drawings deemed in compliance with the Contract Documents by the Engineer submitted for the equipment or system for which the manual is prepared.
   1. Only these shop drawings shall be included in the manual.
   2. All shop drawings larger than 8 1/2" x 11" shall be folded and placed in a heavy duty, top loading plastic sheet protector with the title of the drawing showing; one (1) drawing per protector page.

H. Where emergency generator(s) are included as work of this Contract, the manufacturer's standard manual will be allowed if the manual clearly shows the instructions for the particular model of generator. Cross out chapters and paragraphs that do not apply to the Owner's generator.

I. Where manuals are prepared for treatment systems for water, a process chapter, written in plain language for the operators, shall be prepared by the manufacturer providing the following:
   1. A general discussion regarding the theory of the process.

2. A specific discussion relating the theory to the project as designed and constructed. Provide capacities, sizes, loading rates, application criteria, design values, and design assumptions.
3. Provide model numbers for equipment comprising the system.
4. Provide figures, tables, and graphs to assist the operator in understanding the operation of the treatment system.
5. Where operator interfaces are provided, provide step-by-step instructions for changing a process control variable such as set points.
    a. The instructions shall be numbered and written such as "press", "hold" "scroll", etc.
    b. Each operator interface instruction sheet shall be laminated and placed in the binder.
    c. Another laminated sheet shall be provided and placed inside the control panel.

J. Each manual shall contain the following as a minimum:
1. Table of contents
2. Final version of the warranty statement approved by the Engineer
3. Nameplate data of each component, year of installation, contract number and specification number
4. Name, address and telephone number of the manufacturer and the manufacturer's local representative(s)
5. Installation instructions
6. Operation instructions including adjustments, the interrelation of components and the control sequence describing break-in, start-up, operation and shutdown
7. Emergency operating instructions and capabilities
8. Maintenance requirements include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair and reassembly instructions; and alignment, adjusting, balancing, and checking instructions
9. Troubleshooting guide and corrective maintenance (repair) procedures for all electrical and mechanical equipment. These guides shall list the most frequent and common problems, together with the symptoms, possible causes of the trouble, and remedies
10. Drawings (pictures or exploded views) which clearly depict and identify each part, suitable for assembly and disassembly of entire system and each component
11. Wiring and control diagrams, if applicable
12. Panelboard circuit directories including electrical service characteristics, if applicable
13. Part list with current prices; ordering information; and recommended quantities of spare parts to be maintained in storage
14. Charts of valve tag numbers, with location and function of each valve, keyed to the process and instrumentation diagram prepared as part of the Contract Documents
15. Name, address, and telephone number of nearest parts supply house and nearest authorized repair service center.
16. List of recommended spare parts and the recommended number of each per unit and per group of units.

K. All electronic Operations and Maintenance Manuals shall be as specified hereinafter.
1. All files shall be in Adobe PDF format and submitted on compact discs.
2. Files shall be organized by specification section and then by product.
3. An electronic index and list of all charts, graphs, tables, figures, and shop drawings shall be included.
4. All information provided in the paper Operations and Maintenance Manual shall be included in the electronic version.

L. Submit one (1) copy of a preliminary draft manual at least fourteen (14) calendar days prior to the date set for start-up.
1. The Engineer will review the manual for content and compliance with these specifications.
2. Written comments will be provided, but the manual will not be returned.

3. The manual will be used at start-up, to record changes that should be made to the final manual.
4. The manual will be retained on the site until such time as the final, updated manual is provided.

M. Two (2) weeks after the date the unit was placed into service and the Owner has gained beneficial use, submit five (5) paper copies and two (2) electronic copies of the final updated Operations and Maintenance Manual. Refer to Section 017500 - Starting and Adjusting for requirements related to updating the manual(s).

N. Where installation instructions are not included with the manual, they shall be shipped at least ten (10) days prior to the date the equipment is scheduled for installation.

1.03 RETAINAGE

A. The Engineer will retain from payment due the Contractor, for failure to submit manuals as specified, an amount equal to 2% of the scheduled value for the equipment or system for which the manual applies. This Contract requirement only applies when a manual is specified to be provided in the Technical Specifications for a particular system or piece of equipment.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 017823

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section includes:
   1. Maintenance of documents
   2. Recording of record information
   3. Submission of record documents

B. Work of this section also includes the furnishing of underground pipeline documentation.

1.02 PLANS AND SPECIFICATIONS FURNISHED TO THE CONTRACTOR

A. One (1) complete set of Contract Documents (plans, specifications and addenda) will be furnished to the Contractor in electronic portable document format (PDF).

B. Additional sets will be furnished to the Contractor at $250 per set.

1.03 MAINTENANCE OF DOCUMENTS

A. The Contractor shall maintain at the site one (1) set of the following: drawings, specifications, addenda, change orders, approved shop drawings, test reports, operations and maintenance manuals, and shop drawing log.

B. The Contractor shall make these documents available for use by the Owner, Engineer, regulatory agencies and other parties designated by the Owner.

C. Provide a drawing rack for storage of plans.

D. Maintain these documents in a clean, dry, legible condition throughout the entire contract period.

1.04 RECORDING OF RECORD INFORMATION

A. Affix a stamp to each Contract Drawing and Shop Drawing reading as follows: "RECORD DOCUMENT" - "NAME OF PROJECT" - "CONTRACTOR NAME" in 2-inch high printed letters. The stamp shall be specifically prepared for this project.

B. Keep the record documents current as the work progresses. Record information concurrent with construction progress.

C. Do not permanently conceal any work until required information has been recorded.

D. Legibly mark the Contract Plans to record actual construction, including, but not limited to the following:
   1. All as-built work.
   2. All approved field changes and conditions.

E. <u>Shop Drawings</u>: Maintain as record documents. Legibly mark-up to show changes made due to field conditions encountered during construction.

1.05 PROJECT RECORD DOCUMENTS

A. Maintain a complete and accurate log of control and survey work as it progresses.

B. The Contractor shall on completion of major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction, site work and underground facilities installed.

C. If applicable, the primary electric service, gas service, and communication lines installed by the respective utility shall also be located on the record drawings prepared by the Contractor's surveyor.

1.06 SUBMITTAL OF RECORD DOCUMENTS

A. The Contractor shall deliver to the Engineer three (3) full-size sets of drawings and one (1) PDF electronic copy detailing as-built chemical treatment installations, one (1) month prior to the date of startup of the plant site as outlined in the construction schedule. These shall be submitted to the Department of Environmental Protection, Bureau of Water Systems Engineering (BWSE) by the Engineer for certification of installation and inspection. Drawings shall be submitted by the Contractor to the Engineer in accordance with the requirements of this Section.

B. At Substantial Completion, the Contractor shall deliver one (1) preliminary record set of as-built documents to the Engineer with all changes conspicuously ballooned or otherwise emphasized.

C. The work will not be considered substantially complete until such time as the preliminary record documents are delivered and acceptable to the Engineer. Mark this set "Preliminary Record Drawings".

D. Prior to Final Completion, the Contractor shall conform the preliminary record drawings to the comments made by the Engineer. The Contractor shall provide one (1) set of full-scale paper as-built drawings and one (1) electronic copy in portable document format (PDF).

E. As-built drawings shall be the same size as the Contract Drawings, with 1/2-inch margins space on three sides and a 2-inch margin on the left side for binding.

F. Each drawing shall bear in the title box the words "FINAL RECORD DRAWINGS" and the name of the Contractor in heavy black lettering 1/2 inch high and be certified as complete and accurate.

G. As a convenience, Engineer will make available to the Contractor electronic media of the Contract Drawings for the sole purpose of the Contractor preparing as-built drawings.

H. Electronic media made available is without guarantee of compatibility with the Contractor's software or hardware.
   1. If the Contractor wishes to take advantage of this offer, the Contractor will be required to execute an indemnification and hold harmless agreement with the Engineer.
   2. Electronic media will be provided free of charge on disc in a zipped format.
   3. Electronic media shall be returned to the Engineer upon acceptance of the as-built drawings by the Owner.

1.07 RELATED DOCUMENTS

A. Provide certificate of release of liens if requested by the Engineer.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 017839

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work of this Section includes the requirements for demonstrating and training of installed systems, equipment, and products.

B. Manufacturer field services and the credit for unused service time is also included herein.

1.02 MANUFACTURER'S FIELD SERVICES

A. When specified in individual specification sections require field services to be provided, said services shall be provided by qualified, authorized and factory trained representative(s) of the manufacturer (supplier).

B. Field services shall generally consist of:
   1. installation supervision,
   2. verify terms of the manufacturer's warranty,
   3. equipment and system calibration,
   4. startup supervision,
   5. and operation and maintenance instructions to the Owner's employees.

C. Such services do not include service time to correct a factory fault, correct problems resulting from a factory wiring or control logic error, or errors caused by poor or improper installation by the Contractor.

D. Sale representatives are not acceptable.

E. The times specified to be provided by the manufacturer does not relieve the manufacturer from providing sufficient service time to place the equipment or systems into satisfactory operation and to obtain the specified performance. The manufacturer shall provide, as a minimum, the times specified in the Specification Sections.

F. Where manufacturer services are specified for control panel or control center startup, the representative shall be experienced and trained to work on and field rewire such devices.
   1. Field representatives for control panel startup shall understand the control sequence specified and, in the case of programmable logic controllers, are able to make revisions to the factory program using handheld programming devices or laptop computers.
   2. The time spent by the representative to correct a PLC program shall not be included in the time specified for startup.
   3. The Owner will not pay for time spent in the field to correct a PLC programming problem.

G. Submit manufacturers' startup reports (MSR's) in accordance with the requirements contained in Section 013300 - Submittals.

1.03 SUBMITTALS

A. Manufacturer's Startup Reports

1.04 QUALITY CONTROL

A. The Contractor shall adhere to all instructions provided by the manufacturer's authorized representative.

B. All verbal instructions necessary to satisfy performance of the equipment or the system shall be immediately provided by the Contractor. The manufacturer shall document all verbal orders in writing at a time suitable to the Contractor.

C. All written instructions provided in operation, maintenance, and installation guides and manuals, provided by the manufacturer of such equipment and or system, shall be complied with by the Contractor.

D. The Contractor shall comply with all manufacturer requirements such that written or implied warranties remain in full force during the time period so specified elsewhere in the technical specifications.

E. Should manufacturer's instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

F. Actions and/or non performance by the Contractor that may void manufacturer warranties shall not constitute a release of the specified warranty, and all warranty claims made by the Owner shall be paid for by the Contractor as if the manufacturer's warranty was still in effect.

1.05 SCHEDULING - FIELD SERVICES

A. The Contractor shall arrange field service on dates acceptable to the Owner and Engineer.

B. The service visits shall be scheduled at least 2 weeks in advance so that the Owner and Engineer can adequately staff the date.

C. Operator training will not be allowed until such time as the Manufacturer's Operation and Maintenance Manuals have been supplied and approved by the Engineer.
   1. The field service technician shall review the contents of the manual with designated employees of the Owner.
   2. Field services will not be deemed provided until the MSR is provided.

1.06 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to Owner's personnel prior to date of Substantial Completion.

B. Utilize manufacturer's and vendor's Operation and Maintenance Manuals as basis for instruction. Review contents of the manual with the Owner's personnel in detail to explain all aspects of operation and maintenance.

C. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of the equipment or of the system.

D. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

E. The Contractor shall arrange to have the manufacturer's Operation and Maintenance Manuals updated with information that has been added during start-up activities.

F. The final manual shall contain the most recent information and reflect all operational and maintenance aspects of the final installed and functioning system or equipment component of the system.

G. Any changes to control panel wiring diagrams or interconnection wiring schematics shall be made and new prints provided as an update to previously approved manuals.

H. Manufacturer field time shall be as specified in individual Sections of the Technical Specifications.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 017900

PART 1 GENERAL

1.01 RELATED SECTIONS

A. Drawings and general provisions of the Agreement, including General and Supplementary Conditions, and Division 01 of the Project Manual, apply to Work of this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Disconnecting, capping or sealing, and abandoning in-place or removing site utilities.
   2. Salvaging items for reuse.

B. Furnish labor and materials necessary to install a complete system.

C. Identification of utilities.

1.03 DEFINITIONS

A. Demolish: Completely remove and legally dispose of off-site.

B. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

C. LEAD-SAFE working practices - an EPA term defining Contractor required procedures for containing work areas, minimizing dust and cleaning up when working with possible lead paint during construction projects.

D. Recycle: Recovery of demolition waste for subsequent processing in preparation for reuse.

E. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

F. Remove and Reinstall: Detach items from existing construction, store, prepare them for reuse, and reinstall them where indicated.

G. Remove and Salvage: Detach items for existing construction and store for Owner.

H. Salvage: Carefully detach from existing construction, in a manner to prevent damage, and store for Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.

1.04 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of the General Construction Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
   1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.05 SUBMITTALS

A. Pursuant to Section 013300 - Submittal Procedures.

B. Submit to the Engineer proposed abandonment and removal schedule and procedures.

1.06 QUALITY ASSURANCE

A. Conduct demolition operations in a manner that will minimize interference with structure to remain and with public or private property in the vicinity of said operations.

B. Pre-demolition Conference: Conduct conference at Project site with Architect. Review methods and procedures related to building demolition including, but not limited to, the following:
   1. Inspect and discuss condition of construction to be demolished.
   2. Review structural load limitations of existing structures.
   3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review and finalize protection requirements.
   5. Review procedures for protection of structure to remain, existing utilities, and existing exposed surfaces to remain.

C. Review items to be salvaged and returned to Owner and/or reused in the construction process.

1.07 REGULATORY REQUIREMENTS

A. Conform to applicable state and local codes for demolition of structures, safety of adjacent structures, dust control, runoff control, disposal and utility removal and cap offs.

B. Obtain required permits from Regulatory and Governing Authorities.

C. Notify affected utility companies before starting Work and comply with their requirements.

D. Do not close or obstruct roadways, sidewalks or adjacent utilities without approval by authorities having jurisdiction and Architect.

E. Conform to applicable regulatory procedures when discovering hazardous or contaminated materials. Hazardous and/or contaminated material removal are not the responsibility of this Contractor except where noted. Removal of all refrigerant from air conditioning and other cooling equipment is part of this contract for such equipment scheduled to be removed.

1.08 PROJECT CONDITIONS

A. Owner assumes no responsibility for buildings and structures to be demolished.
   1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

B. Except where indicated to be salvaged as part of this Contract, on-site storage of removed items or materials is not permitted.

C. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

PART 2 PRODUCTS

2.01 NOT APPLICABLE

PART 3 EXECUTION

3.01 EXAMINATION

A. Provide, erect, and maintain temporary barriers and security devices as required.

B. Protect existing materials, structure, driveways and walls which are not to be demolished.

C. Prevent movement or settlement of remaining structure. Provide bracing and shoring, as required.

D. Mark location of utilities.

E. Verify that utilities have been disconnected and capped before starting demolition.

F. Review Project Record Documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

G. Survey existing conditions and correlate with requirements indicated to determine extent of selective and complete demolition required. Record existing conditions by use of pre-construction photographs.

H. Inventory and record the conditions of items to be removed and reinstalled and items to be removed and salvaged.

3.02 PREPARATION

A. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings and structures to be demolished.
   1. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.
   2. Arrange to shut off indicated utilities with the applicable local utility provider.
   3. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
   4. Cut off pipe or conduit a minimum of 24 inches below grade and well outside areas to be excavated. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction. Record location of any stubs still connected to active systems.

B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
   1. Strengthen or add new supports when required during progress of demolition.
   2. Brace and stabilize any structure removed and stored for reinstallation to preserve stability and alignment of structure during it removal from its existing location, during transport of the structure from its existing location, and to and from all storage locations, both during storage and during transport to the structure's final location on the Work site.
   3. Engineer, design and install bracing, shoring and stabilization to comply with the following:
      a. Loads imposed by movement.
      b. Additional load and environmental effects of vibration.
      c. All other loads identified by an independent engineer.

3.03 DEMOLITION REQUIREMENTS

A. Conduct demolition to minimize interference with structure to remain.

B. Provide temporary enclosures and protection to maintain a weathertight building at all times.

C. Cease operations immediately if adjacent structure appears to be in danger. Notify authority having jurisdiction and Architect immediately. Do not resume operations until directed.

3.04 PROTECTION

A. Existing Facilities: Protect adjacent walkways, roofs, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

B. Existing Utilities: Maintain utility services to remain and protect from damage during demolition operations.
   1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
   2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
      a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

C. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction, and as indicated. Comply with requirements in Section 015000 - "Temporary Facilities and Controls".
   1. Protect adjacent buildings and facilities from damage due to demolition activities.
   2. Protect existing site improvements, appurtenances, and landscaping to remain.
   3. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   4. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
   5. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.

D. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.05 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
   2. Provide 72 hours' notice of any operations likely to mar, stain, discolor, singe, or otherwise disturb adjoining exposed surfaces. Consult with Owner and Architect for best method of preservation of existing building surface to remain.
   3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
   5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   6. Dispose of demolished items off-site at an approved facility.

3.06 DEMOLITION, GENERAL

A. General: Demolish indicated existing buildings and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Demolition under this Project does not include any removal or relocation of asbestos containing materials or removal of any buried tanks. Identification and demolition of such materials/items will be completed prior to commencement of work under this Project.
      a. Hazardous Materials: If materials suspected of containing hazardous materials other than those identified to be removed are encountered, do not disturb; immediately notify Owner.
   2. Disconnect, remove, and/or end cap and identify designated utilities within demolition areas as indicated on the drawings.
   3. Remove materials to be re-installed or retained in manner to prevent damage. Store and protect in accordance with requirements of this Section.
   4. Remove demolished materials from site and dispose of legally.
   5. Do not burn or bury materials on site. Remove demolished materials as Work progresses. Leave building and site in clean condition.
   6. Demolish in an orderly and careful manner. Protect existing supporting structural members.
   7. At or adjacent to existing construction to remain, neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small poser tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
   8. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   9. Maintain fire watch during and for at least 48 hours after flame cutting operations as required by applicable local and state regulations.
   10. Maintain adequate ventilation when using cutting torches.
   11. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   12. Remove air-conditioning equipment without releasing refrigerants. Dispose of any refrigerant materials in accordance with authorities having jurisdiction. Refrigerant materials to be handled by a qualified and trained refrigerant technician.
      a. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations and other authorities having jurisdiction regulations. Include name and address of technician and date(s) refrigerant was recovered.
   13. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
   2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

3.07 DEMOLITION BY MECHANICAL MEANS

A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete demolition operations above each floor or tier before disturbing supporting members on the next lower level.

B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled decent.
   1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.
   2. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

C. Below-Grade Construction: Demolish foundation walls and other below-grade construction where such construction is two or more feet below finished grade.
   1. Demolish all such below-grade construction that lies within the footprint indicated for new construction or that extends up to 5 feet outside the footprint indicated for new construction.
   2. Abandon all such below-grade construction lying over 5 feet outside the footprint indicated for new construction.
   3. Remove below-grade construction, including basements, foundation walls, and footings, to depths indicated.
   4. Septic and/or holding tanks shall be pumped out by a licensed professional septic system contractor. Metal tanks shall be removed and disposed of in accordance with aiuthorities having jurisdiction. Backfill tank excavations with select granular fill. Concrete tanks, distribution boxes and drywells if outside the new structure footprint and pavement areas may be crushed (after pumping) and compacted in place or filled with lean concrete unless prohibited by local codes. Concrete septic tanks, drywells and distribution boxes within the new structure footprint and/or pavement areas shall be removed, backfilled in lifts and compacted with select granular fill.

3.08 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before demolition operations began.

B. Promptly repair damage to adjacent structure caused by demolition operations.

END OF SECTION 024119

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Preparation for pressure washing of iron vessels.

B. Pressure washing requirements.

1.02 REFERENCES

A. Section 011400 – Work Restrictions

PART 2 – PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify site conditions and vessel details.

3.02 PREPARATION

A. Provide rigging/access to allow working of all areas of the vessels.

B. All vessel openings shall be adequately protected during pressure washing to prevent any spray, dirt, or debris from entering vessel openings or piping.

C. All debris generated during pressure washing activities shall be collected and retained on site. All debris shall be disposed of in accordance with all state, federal, and local laws.

3.03 APPLICATION

A. All exterior surfaces of the vessel are to be pressure washed following completion of the work.

B. Water pressure shall be a minimum of 2,500 psi. Contractor shall use the means necessary to accomplish the level of cleanliness less than 70µ/S or as directed by engineer.

C. Water shall be of a minimum temperature of 120-150°F and shall be capable of removing accumulated anthracite, ferrosand, dirt, mildew, and algae. Water temperature shall be maintained with hot water or steam generator.

D. Stubborn staining shall be removed by soft bristle scrub brush. Stain scrubbing may be facilitated with a mild chlorine solution if approved by engineer.

E. Work shall progress such that completed sections are not soiled by subsequent activities.

F. Any damage to the site due to cleaning activities shall be restored by the contractor at his own expense.

3.04 TOLERANCES

A. A. Minimum water temperature: 120°F.

3.05 FIELD QUALITY CONTROL

A. Do not perform pressure washing when temperatures may create ice formation or when wind conditions will create a nuisance to adjacent properties and buildings.

END OF SECTION 025129.13

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Shop and field fabricated ferrous metal items.

B. Structural steel members.

C. Weld repairs to steel lap seams.

1.02 RELATED SECTIONS

1.03 REFERENCES

A. AISC - Code of Standard Practice - Manual of Steel Construction - Allowable Stress Design (ASD).

B. ASTM A36/A36M - Structural Steel.

C. ASTM A53/A53M - Hot-Dipped, Zinc-coated Welded, and Seamless Steel Pipe.

D. ASTM A108 - Steel Bars, Carbon, Cold-Finished, Standard Quality.

E. ASTM A123/A123M - Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products.

F. ASTM A153/A153M - Zinc Coating (Hot Dip) on Iron and Steel Hardware.

G. ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners.

H. ASTM A563 - Carbon and Alloy Steel Nuts.

I. ASTM A568/A568M - General Requirements for Steel, Carbon and High-Strength Low-Alloy Hot-Rolled Sheet and Cold-Rolled Sheet.

J. AWS A2.4 - Symbols for Welding, Brazing, and Nondestructive Examination.

K. AWS D1.1/D1.1M - Structural Welding Code.

L. SSPC (Steel Structures Painting Council) - Painting Manual.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Shop Drawings:
   1. Indicate profiles, sizes, connections, reinforcing, anchorage, size and type of fasteners, and accessories.
   2. Include erection drawings, elevations, and details where applicable.

C. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

D. Welders' Certificates: Certify welders employed on the Work have met AWS qualification within the previous twelve (12) months.

E. Manufacturer's Mill Certificate: Certify that Products meet or exceed specified requirements.

1.05 QUALIFICATIONS

A. Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the project is located. Shop drawings must be signed and sealed by a Professional Structural Engineer.

B. Fabricate structural steel members in accordance with AISC Code of Standard Practice.

1.06 FIELD MEASUREMENTS

A. Verify field measurements.

B. Replacement fabrications shall be of same dimensions, strength, and gage as original members, unless noted differently on drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Steel Sections: ASTM A36; sizes to match existing where not indicated on drawings.

B. Plates: ASTM A283; gage to match existing where not indicated on drawings.

C. Pipe: ASTM A53, Grade B; schedule to match existing where not indicated on drawing.

D. Bolts, Nuts, and Washers ASTM A325 and Teflon coated: ASTM A325

E. Welding Materials: AWS D1.1; type required for materials being welded.

2.02 FABRICATION

A. Fit and shop assemble in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline.

E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise. Components shall be comparable in size and capacity to existing components in similar anchorage situations.

F. Fabricate support framing for openings and edges where existing supports are inadequate.

2.03 FINISHES

A. Prepare surfaces to be primed. Refer to Section 099870 - Steel Tank Coating System.

B. Do not prime surfaces in direct contact with concrete or where field welding is required.

C. Shop prime structural steel members.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work, including the removal of existing metal fabrications that require replacement.

B. Beginning of installation means erector accepts existing conditions.

C. Verify that opening sizes and dimensional tolerances are acceptable.

D. Verify that supports are correctly positioned.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components indicated on shop drawings.

D. Connections shall be capable of transferring loads identical to capacity of existing connections.

E. Perform field welding in accordance with AWS D1.1. Provide a fire watch during all hot work operations.

F. Secure to prevent movement and anchor by welding.

G. Obtain Engineer approval prior to site cutting or making adjustments not scheduled.

END OF SECTION 055000

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated cabinet units.

B. Countertops.

C. Cabinet hardware.

D. Factory finishing.

E. Preparation for installing utilities.

1.02 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2018).

B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2017, with Errata (2019).

C. BHMA A156.9 - American National Standard for Cabinet Hardware; 2015.

D. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2016.

E. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

F. UL (DIR) - Online Certifications Directory; Current Edition.

G. WI (CSIP) - Certified Seismic Installation Program (CSIP); Current Edition.

H. WI (MCP) - Monitored Compliance Program (MCP); Current Edition.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.04 SUBMITTALS

A. See Section 013300 - SUBMITTALS, for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Scale of Drawings: 1-1/2 inch to 1 foot (125 mm to 1 m), minimum.
   2. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
   3. Include certification program label.

C. Product Data: Provide data for hardware accessories.

D. Samples: Submit actual samples of architectural cabinet construction, minimum 8 inches (200 mm) square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.

E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of _____ experience.
   1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
   2. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

B. Quality Certification: Comply with WI (CSIP) woodwork association quality certification service/program in accordance with requirements for work specified in this section.
   1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   2. Provide designated labels on shop drawings as required by certification program.
   3. Provide designated labels on installed products as required by certification program.
   4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
   5. Replace, repair, or rework all work for which certification is refused.

1.06 MOCK-UP

A. Provide mock-up of typical base cabinet, wall cabinet, and countertop, including hardware, finishes, and plumbing accessories.

B. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

1.08 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 CABINETS

A. Quality Standard: Economy Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Wood Veneer Faced Cabinet:
   1. Exposed Surfaces: HPVA HP-1 Grade B, Ash, plain sliced, random-matched or as selected by the Owner.
   2. Semi-Exposed Surfaces: HPVA HP-1 Grade B, Ash, plain sliced, random-matched.
   3. Concealed Surfaces: HPVA HP-1 Grade C, Ash, plain sliced, random-matched.

C. Cabinets:
   1. Finish - Exposed Exterior Surfaces: Wood.
   2. Door and Drawer Front Retention Profiles: Fixed panel.
   3. Casework Construction Type: Type B - Face-frame.
   4. Interface Style for Cabinet and Door: Style 2 - Finish Inset; reveal overlay.
   5. Cabinet Design Series: As indicated on drawings.

6. Adjustable Shelf Loading: 50 lbs. per sq. ft.
   a. Deflection: L/144.
7. Cabinet Style: Reveal overlay on face frame or as selected by the Owner.
8. Cabinet Doors and Drawer Fronts: Stile and rail, raised panel style or as selected by the Owner.
9. Drawer Side Construction: Manufacturer's option.
10. Drawer Construction Technique: As recommended by fabricator.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

B. Hardwood Edgebanding: Use solid hardwood edgebanding matching species, color, grain, and grade for exposed portions of cabinetry.

2.03 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.
   1. Manufacturers:
      a. Franklin International, Inc; Titebond Original Wood Glue: www.titebond.com/sle.

B. Fasteners: Size and type to suit application.

C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.

D. Concealed Joint Fasteners: Threaded steel.

E. Grommets: Standard plastic grommets for cut-outs, in color to match adjacent surface.

2.04 HARDWARE

A. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch (25 mm) spacing adjustments.

B. Drawer and Door Pulls: "U" shaped wire pull, steel with chrome finish, 4 inch centers ("U" shaped wire pull, steel with chrome finish, 100 mm centers).

C. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish.

D. Catches: Touch type.

E. Drawer Slides:
   1. Type: Full extension with overtravel.
   2. Static Load Capacity: Commercial grade.
   3. Mounting: Side mounted.
   4. Stops: Integral type.
   5. Features: Provide self closing/stay closed type.
   6. Manufacturers:
      a. Accuride International, Inc: www.accuride.com.
      b. Grass America Inc: www.grassusa.com.
      c. Knape & Vogt Manufacturing Company: www.knapeandvogt.com.
      d. Substitutions: See Section 016000 - Product Requirements.

F. Hinges: European style concealed self-closing type, steel with polished finish.
   1. Manufacturers:
      a. Grass America Inc: www.grassusa.com.
      b. Substitutions: See Section 016000 - Product Requirements.

G. Sliding Door Track Assemblies: Upper and lower track of satin anodized aluminum, with matching shoe equipped with nylon rollers.

2.05 SHOP TREATMENT OF WOOD MATERIALS

A. Provide UL (DIR) listed and approved identification on fire retardant treated material.

B. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

2.06 SITE FINISHING MATERIALS

A. Stain, Shellac, Varnish, and Finishing Materials: In compliance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2.07 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

2.08 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.

C. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.

D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. System - 11, Polyurethane, Catalyzed.
      b. Stain: As selected by Engineer.
      c. Sheen: Satin.
      d. Products:
         1) Sherwin-Williams Sayerlack® Premium Polyurethane Clear Topcoat, TZL71 Series, AWI Finishing System 11.
         2) Substitutions: Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

C. Use fixture attachments in concealed locations for wall mounted components.

D. Use concealed joint fasteners to align and secure adjoining cabinet units.

E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim for this purpose.

F. Secure cabinets to floor using appropriate angles and anchorages.

G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING

A. Adjust installed work.

B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION 064100

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops for manufactured casework.

B. Sinks molded into countertops.

C. Epoxy resin sinks.

1.02 PRICE AND PAYMENT PROCEDURES

A. See Section 012100 - Allowances, for cash allowances affecting this section.

1.03 REFERENCE STANDARDS

A. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.

B. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2018.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2019b.

D. AWI (QCP) - Quality Certification Program; Current Edition.

E. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2018).

F. AWMAC (GIS) - Guarantee and Inspection Services Program; Current Edition.

G. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2017, with Errata (2019).

H. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

I. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.

J. SEFA 2 - Installations; 2010.

K. SEFA 3 - Laboratory Work Surfaces; 2010.

L. WI (CCP) - Certified Compliance Program (CCP); Current Edition.

M. WI (CSIP) - Certified Seismic Installation Program (CSIP); Current Edition.

N. WI (MCP) - Monitored Compliance Program (MCP); Current Edition.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.

D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

F. Sustainable Design Submittal: Documentation for sustainably harvested wood-based components.

G. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

H. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

I. Installation Instructions: Manufacturer's installation instructions and recommendations.

J. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

B. Quality Certification:
   1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   2. Provide designated labels on shop drawings as required by certification program.
   3. Provide designated labels on installed products as required by certification program.
   4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 COUNTERTOPS

A. Quality Standard: See Section 123100.

B. Quality Standard: SEFA 3 for laboratory worksurfaces.

C. Epoxy Resin Countertops: Filled epoxy resin molded into homogenous, non-porous sheets; no surface coating and color and pattern consistent throughout thickness; with integral or adhesively seamed components.
   1. Flat Surface Thickness: 1 inch (25 mm), nominal.
   2. Flammability: Self-extinguishing, when tested in accordance with ASTM D635.
   3. Surface Finish: Smooth, non-glare.
   4. Color: Black.
   5. Back and End Splashes: Same material, same thickness; separate for field attachment.

2.02 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
   1. Join lengths of tops using best method recommended by manufacturer.
   2. Fabricate to overhang fronts and ends of cabinets 1 inch (25 mm) except where top butts against cabinet or wall.
   3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   2. Height: 4 inches (102 mm), unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Engineer of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install laboratory worksurface countertops in compliance with requirements of SEFA 2.

B. Install vanities in accordance with manufacturer92s instructions and approved shop drawings

C. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

D. Attach epoxy resin countertops using compatible adhesive.

E. Seal joint between back/end splashes and vertical surfaces.

3.04 CLEANING

A. Clean countertops surfaces thoroughly.

3.05 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 123600

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Pipe, pipe fittings, valves, and connections for piping systems.
   1. Domestic water.

1.02 REFERENCES

A. Section 014500 - Quality Control: Requirements for references and standards.

B. ANSI/UL 263 - Standard for Safety for Fire Tests of Building Construction and Materials

C. ASME B16.3 - Malleable Iron Threaded Fittings.

D. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.

E. ASME B16.22 - Wrought Copper and Bronze Solder Joint Pressure Fittings.

F. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV.

G. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV.

H. ASME B16.51 - Pipe Flanges and Flanged Fittings: NPS ½ through NPS 24

I. ASME B31.9 - Building Service Piping.

J. ASME SEC IX - Welding and Brazing Qualifications.

K. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.

L. ASTM A234/A234M - Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.

M. ASTM B32 - Solder Metal.

N. ASTM B42 - Seamless Copper Pipe.

O. ASTM B88 - Seamless Copper Water Tube.

P. ASTM B306 - Copper Drainage Tube (DWV).

Q. ASTM D1784 - Rigid Vinyl Compounds.

R. ASTM D1785 - PVC Plastic Pipe, Schedule 40

S. ASTM D2466 - PVC Plastic Fittings, Schedule 40

T. ASTM D2665 - PVC Drain, Waste, and Vent Pipe and Fittings

U. ASTM D2564 - Solvent Cements for PVC Pipe and Fittings

V. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials

W. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials

X. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops

Y. ASTM F1866 - Fabricated PVC DWV Fittings

Z. AWWA C651 - Disinfecting Water Mains.

AA. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves.

AB. NSF/ANSI Standard 14 - Plastic Piping Components and Related Materials.

AC. NSF/ANSI Standard 61 - Drinking Water System Components - Health Effects.

AD. PPI Technical Report TR-4/06

AE. Plumbing Code of New Jersey

1.03 SUBMITTALS FOR REVIEW

A. Section 013300 - Submittals: Procedures for submittals.

B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

C. Shop Drawings: Provide installation drawings indicating pipe/tubing layout and location of plumbing fixtures.

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with State of New Jersey and local code.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

C. Welding Materials and Procedures: Conform to ASME SEC IX and applicable state labor regulations.

D. Welders Certification: In accordance with ASME SEC IX.

E. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

1.05 REGULATORY REQUIREMENTS

A. Perform Work in accordance with the State of New Jersey and local code.

B. Conform to applicable code for installation of backflow prevention devices.

C. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Accept press-connect fittings bagged. Inspect to ensure EPDM seal is present.

C. Provide temporary protective coating on steel valves.

D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 - PRODUCTS

2.01 DOMESTIC WATER PIPING, ABOVE GRADE

A. Copper Tubing: ASTM B88, Type L, hard drawn.
   1. Fittings:
      a. ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
      b. VIEGA or approved equal, ProPress Fittings: Bronze, or copper conforming to ASME B16.51, ICC LC 1002, IAPMO PS 117, NSF 61, and NSF 61-G or NSF 372. ProPress fittings shall have an EPDM sealing element and Smart Connect (SC) feature.
         2-1/2-inch thru 4-inch shall have a 420 stainless steel grip ring, PBT separator ring, EPDM sealing element and Smart Connect (SC) feature.
   2. Joints: ASTM B32, solder, Grade 95TA.

2.02 FLANGES, UNIONS, AND COUPLINGS

A. Pipe Size 3 inches and Under:
   1. Ferrous pipe: Class 150 malleable iron threaded unions.
   2. Copper tube and pipe: Class 150 bronze unions with soldered joints.

B. Pipe Size Over 1 inch:
   1. Ferrous pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
   2. Copper tube and pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.

C. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.03 GATE VALVES

A. Up To and Including 3 inches:
   1. Manufacturers:
      a. Stockham.
      b. Watts.
      c. Nibco
   2. MSS SP-80, Class 125, bronze body, bronze trim, rising stem, handwheel, inside screw, solid wedge disc, solder or threaded ends.

2.04 BALL VALVES

A. Manufacturer: Apollo Model 70-200 Series.

B. Construction, 4 inches and Smaller: MSS SP-110, Class 150, 600 psi CWP, bronze, two piece body, chrome plated brass ball, regular port, TFE seats and stuffing box ring, blow-out proof stem, lever handle, solder ends.

2.05 STRAINERS

A. Size 2 inch and Under:
   1. Manufacturers:
      a. Watts

2. Threaded brass body for 175 psi CWP Y pattern with 1/32 inch stainless steel perforated screen.

2.06 ESCUTCHEONS

A. Chrome slip-on type, one piece.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Section 013100 - Project Management and Coordination: Verification of existing conditions before starting work.

3.02 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.03 INSTALLATION (GENERAL)

A. Install in accordance with manufacturer's instructions.

B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls. Effect changes in size with reducing fittings.

D. Install piping to maintain headroom, conserve space, and not interfere with use of space.

E. Group piping whenever practical at common elevations.

F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Provide loops, pipe offsets or expansion loops.

G. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

H. Install bell and spigot pipe with bell end upstream.

I. Install valves with stems upright or horizontal, not inverted.

J. Install water piping to ASME B31.9.

K. Sleeve pipes passing through partitions, walls and floors.

L. PVC pipe and fittings shall be manufactured as a system and be the product of one manufacturer.

M. PVC pipe systems are not permitted for use in applications with operating temperatures exceeding 140°F.

N. PVC pipe systems shall be protected from chemical agents, fire stopping materials, thread sealant, plasticized vinyl products, or other aggressive chemical agents not compatible with PVC compounds.

O. Install buried PVC sanitary sewer and storm piping in accordance with the requirements of ASTM D 2321 and ASTM F 1668.

3.04 APPLICATION

A. Install unions downstream of valves and at equipment or apparatus connections.

B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

C. Install gate or ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

D. Install ball or gate valves for throttling, bypass, or manual flow control services.

3.05 ERECTION TOLERANCES

A. Section 014500 - Quality Control: Tolerances.

B. Establish invert elevations, slopes for drainage to ¼ inch per foot minimum. Maintain gradients.

C. Slope water piping minimum 0.25 percent and arrange to drain at low points.

3.06 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Prior to starting work, verify system is complete, flushed and clean.

B. Ensure pH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).

C. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L chlorine residual.

D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.

E. Maintain disinfectant in system for 24 hours.

F. If final disinfectant residual tests less than 25 mg/L, repeat treatment.

G. Flush disinfectant from system until chlorine residual equal to that of incoming water or 1.0 mg/L. Dechlorinate water flushed from system to a chlorine residual of less than 1.0 mg/l.

H. Take samples no sooner than 24 hours after flushing, from 5 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.07 SERVICE CONNECTIONS

A. Provide approved backflow preventer and strainer on water service under provisions of Section 331213.

3.08 FIELD QUALITY CONTROL

A. Pressure test piping with air upon completion of rough-in. Check all joints for leakage by swabbing with a soap and water solution while under test pressure. Repair leaks and retest until acceptable results are obtained. Pressure during test shall be at least 50% greater than normal water supply pressure and held for a period of one hour. After test, purge entire system of test gas.

B. PVC pipe or fittings shall not be tested with compressed air or gas.

END OF SECTION 221000

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Laboratory sink.

1.02 RELATED SECTIONS

A. Section 221000 - Plumbing Piping.

1.03 REFERENCES

A. ASME A112.18.1 - Finished and Rough Brass Plumbing Fixture Fittings.

B. ASME A112.19.2 - Vitreous China Plumbing Fixtures.

C. NFPA 70 - National Electrical Code.

1.04 SUBMITTALS FOR REVIEW

A. Section 013300 - Submittals: Procedures for submittals.

B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.

1.05 SUBMITTALS FOR INFORMATION

A. Section 013300 - Submittals: Procedures for submittals.

B. Manufacturer's Instructions: Indicate installation methods and procedures.

1.06 SUBMITTALS AT PROJECT CLOSEOUT

A. Section 017800 - Closeout Submittals: Procedures for submittals.

B. Maintenance Data: Include fixture trim exploded view and replacement parts lists.

C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.07 REGULATORY REQUIREMENTS

A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

B. Plumbing fixtures shall be labeled with the US EPA WaterSense label.

1.08 DELIVERY, STORAGE, AND PROTECTION

A. Accept fixtures on site in factory packaging. Inspect for damage.

B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.09 WARRANTY

A. Section 017800 - Closeout Submittals: Warranties.

1.10 EXTRA MATERIALS

A. Section 017800 - Closeout Submittals.

PART 2 - PRODUCTS

2.01 LABORATORY SINKS

A. Bowl:
   1. Manufacturer: Fisherbrand, Model: Drop In Epoxy Resin Sink.
   2. 11.8 inch x 11.8 inch x 28 inch heavy gauge epoxy resin bowl and anti- splash edge.

B. Trim:
   1. Manufacturer: Fisherbrand.
   2. Other acceptable manufacturers offering equivalent products.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

B. Confirm that millwork is constructed with adequate provision for the installation of counter top sinks.

3.02 PREPARATION

A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.03 INSTALLATION

A. Install each fixture with trap, easily removable for servicing and cleaning.

B. Provide chrome plated rigid or flexible supplies to fixtures with screwdriver stops, reducers, and escutcheons.

C. Install components level and plumb.

D. Install and secure fixtures in place with wall support and bolts.

E. Seal fixtures to wall and floor surfaces with sealant, color to match fixture.

3.04 INTERFACE WITH OTHER PRODUCTS

A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.05 ADJUSTING

A. Section 017500 - Starting and Adjusting: Adjusting installed work.

B. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.06 CLEANING

A. Section 017800 - Closeout Submittals: Cleaning installed work.

B. Clean plumbing fixtures and equipment.

3.07 PROTECTION OF FINISHED WORK

A. Section 017800 - Closeout Submittals: Protecting installed work.

B. Do not permit use of fixtures.

END OF SECTION 224000

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. This section describes the general requirements for all mechanical items and systems required by the Contract Documents.

B. Comply with all Contract Requirements, General Conditions, Supplementary Conditions and Division 1 Sections applying to or affecting the Work of Division 23.

C. Unless specifically dimensioned, the Work shown on the Drawings is in diagrammatic form only to show general arrangement.

D. Include, in the Work, all accessories and appurtenances, necessary and integral, for the intended operation of any system, component or device, as such systems, components and devices are specified.

E. Do not install pipe or conduit through ductwork.

F. If the pipe or duct size shown on the Drawings does not match the connection size of the equipment that it is connected to, provide the necessary transition pieces at the piece of equipment.

G. Do not use or allow to be used asbestos or asbestos-containing materials on this project. Be rigorous in assuring that all materials, equipment, systems and components thereof do not contain asbestos. Any deviations from this requirement shall be remedied at the Contractor's expense without regard to prior submittal approvals.

1.02 RELATED DOCUMENTS

A. The General Conditions and General Requirements Division 1 apply to the Work of this Section.

1.03 REFERENCE STANDARDS

A. Compliance with the following codes and standards shall be required:

1.	Codes, Rules and Regulations of the State of New Jersey	
2.	USAS	USA Standards Institute (Formerly ASA)
3.	AMCA	Air Moving and Conditioning Association
4.	ADC	Air Diffusion Council
5.	NEMA	National Electrical Manufacturers Association
6.	FM	Factory Mutual
7.	NFPA	National Fire Protection Association
8.	ASTM	American Society for Testing Materials
9.	UL	Underwriters Laboratories, Inc.
10.	NEC	National Electrical Code
11.	ASME	American Society of Mechanical Engineers
12.	ANSI	American National Standards Institute
13.	OSHA	Occupational Safety and Health Act
14.	BSA	Board of Standards and Appeals
15.	MEA	Materials and Equipment Acceptance
16.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers.
17.	AWWA	American Water Works Association
18.	MSS	Manufacturer's Standardization Society of the Valve and Fitting Industry
19.	ARI	American Refrigeration Institute

20. SMACNA Sheet Metal and Air Conditioning Contractor's Nation-al Association
21. TEMA Tubular Exchanger Manufacturers Association
22. F.S. or FED Spec. Federal Specification
23. ASA Acoustical Society of America
24. NACE National Association or Corrosion Engineers
25. ASSE American Society of Sanitary Engineers
26. International Building Code
27. International Fire Code
28. International Existing Building Code
29. International Fuel Gas Code
30. International Plumbing Code
31. International Energy Conservation Code
32. International Mechanical Code
33. IRI Industrial Risk Insurers
34. AGA American Gas Association
35. AABC American Air Balance Council
36. NEBB National Environmental Balancing Bureau
37. AWS American Welding Society

1.04 DEFINITIONS

A. "Provide" means furnish and install, complete the specified material, equipment or other items and perform all required labor to make a finished installation.

B. "Furnish and install" has the same meaning as given above for "Provide."

C. Refer to General Conditions for other definitions.

1.05 ABBREVIATIONS

A. Reference by abbreviation may be made in the Specifications and the Drawings in accordance with the following list:
1. HVAC Heating, Ventilating and Air Conditioning
2. CM Construction Manager
3. AC Air Conditioning
4. H & V Heating and Ventilating
5. AWG American Wire Gauge
6. BWG Birmingham Wire Gauge
7. USS United States Standard
8. B & S Brown & Sharpe
9. OS & Y Outside Screw and Yoke
10. IBBM Iron Body Brass Mounted
11. WSP Working Steam Pressure
12. PSIG Pounds per Square Inch Gauge
13. PRV Pressure Reducing Valve
14. GPM Gallons per Minute
15. MBH Thousand BTU per hour
16. BTU British Thermal Units
17. WG Water Gage
18. LB Pound (Also shown as: #)
19. ASME American Society of Mechanical Engineers
20. ASTM American Society for Testing Materials
21. ABMA American Boiler Manufacturers Association
22. ASA American Standards Associates
23. MER Mechanical Equipment Room

See Drawings for additional abbreviations

1.06 REVIEW OF CONTRACT DOCUMENTS AND SITE

A. Give written notice with the submission of bid to the Engineer of any materials or apparatus believed inadequate or unsuitable, in violation of laws, ordinances, rules or regulations of Authorities having jurisdiction, and any necessary items of work omitted. In the absence of such written notice it is mutually agreed that the Contractor has included the cost of all required items in his proposal for a complete project.

B. Contractors shall acknowledge that they have examined the Plans, Specifications and Site, and that from his own investigations he has satisfied himself as to the nature and location of the Work; the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials; availability of labor, utilities, roads and uncertainties of weather; the composition and condition of the ground; the characters quality and quantity of subsurface materials to be encountered; the character of equipment and facilities needed preliminary to and during the execution of the Work; all federal, state, county, township and municipal laws, ordinances and regulations particularly those relating to employment of labor, rates of wages, and construction methods; and all other matters which can in any way affect the Work or the cost thereof under this Contract. Any failure by the Contractor to acquaint himself with the available information concerning these conditions will not relieve him from the responsibility for successfully performing the Work.

C. Owner assumes no responsibility for any understanding or representation made during or prior to the negotiation and execution of this Contract unless such understanding or representations are expressly stated in the Contract and the Contract expressly provides that the responsibility, therefore, is assumed by the Owner.

1.07 MEASUREMENTS

A. Base all measurements, both horizontal and vertical from established bench marks. Make all Work agree with these established lines and levels. Verify all measurements at site; and check the correctness of same as related to the Work.

1.08 LABOR AND MATERIALS

A. Provide all materials and apparatus required for the Work of new and first-class quality. Furnish, deliver, arrange, erect, connect and finish all materials and equipment in every detail, so selected and arranged as to fit properly into the building spaces.

B. Remove all materials delivered, or work erected, which does not comply with Drawings or Specifications, and replace with proper materials, or correct such work as directed, at no additional cost to the Owner.

1.09 COVERING OF WORK

A. Do not cover up or hide from view any duct, piping, fitting, or other work of any kind before it has been examined or approved by the Engineer and/or other authority having jurisdiction over the same. Remove and correct immediately any unacceptable or imperfect work or unauthorized or disapproved materials discovered immediately after being disapproved.

1.10 PROTECTION

A. Protect the Work and material of all trades from damage and replace all damaged material with new.

B. Protect work and equipment until the Work is finally inspected, tested, and accepted; protect the Work against theft, injury or damage; and carefully store material and equipment received on site which is not immediately installed; close open ends of work with temporary covers or plugs during construction to prevent entry of foreign material.

C. Preserve all public and private property, along and adjacent to the Work, and use every precaution necessary to prevent damage or injury thereto. Use suitable precautions to prevent damage to pipes, conduits and other underground structures or utilities, and carefully protect from disturbance or damage all property marks until an authorized agent has witnessed or otherwise referenced their location, and do not remove them until directed.

1.11 CUTTING AND PATCHING

A. Provide all cutting and rough patching required for the Work. Perform all finish patching.

B. Furnish and locate all sleeves and inserts required before the floors and walls are built, pay the cost of cutting and patching required for pipes where sleeves and inserts were not installed in time, or where incorrectly located. Provide all drilling required for the installation of hangers.

C. Punch or drill all holes cut through concrete slabs or arches from the underside. Do not cut structural members without the approval of the Engineer. Perform all cutting in a manner directed by the Engineer.

D. Do not do any cutting that may impair strength of building construction. Do no drill any holes, except for small screws, in beams or other structural members without obtaining prior approval. All Work shall be done in a neat manner by mechanics skilled in their trades and as approved.

1.12 SUBMITTALS

A. Submit for review, shop drawings for all materials and equipment furnished and installed under this Contract. Submissions shall include but not be limited to:
   1. Ductwork layout drawings, air devices and accessories
   2. Piping and equipment layout drawings.
   3. Piping materials, valves, hangers, supports and accessories
   4. Automatic temperature control equipment, diagrams and control sequences
   5. Equipment, fixtures, and appurtenances
   6. Insulation
   7. Rigging Plan - Include the name of the rigging company; a layout drawing that details the crane with its outriggers extended outward. Provide dimensions showing how rigging operations will affect the road and parking lines being used, the type of crane and its specification including crane arm height, lift capacity, crane reach.

B. Reports
   1. Compliance with listings and approvals for equipment and for fire ratings.
   2. Acceptance certificates from inspecting agencies.
   3. Complete printed and illustrated operating instructions in report format.
   4. Manufacturer's performance tests of equipment.
   5. Field pipe and duct testing reports.
   6. Field operating test results for equipment.
   7. Performance report on the balancing of air systems.
   8. Performance reports for vibration isolation equipment.
   9. Manufacturer's reports on motorized equipment alignment and installation.

C. Specific references to any article, device, product or material, fixture or item of equipment by name, make or catalog number shall be interpreted as establishing a basis of cost and a

standard of quality. All devices shall be of the make and type listed by Special Agencies, such as the Underwriters' Laboratories, and where required, approved by the Fire Department.

1.13 SPACE ALLOTMENTS AND SUBSTITUTIONS

A. The space allotments and equipment layouts on the Drawings are based on the manufacturer's model indicated or scheduled as the "Basis of Design". Ensure that any equipment that is submitted other than the "Basis of Design" will fit in the space allotment and will provide the necessary maintenance clearances as recommended by the manufacturer. If maintenance clearances are not met, pay for any changes such that maintenance clearances will be met.

B. Bear all costs associated with re-layout of the equipment, changes to piping/ductwork, and other changes as required if approved equipment other than the "Basis of Design" equipment is purchased. This shall also include any structural steel modifications and structural steel design changes. Submit, at no cost to the Owner, a steel design stamped by a structural engineer licensed in the state in which the Work is to be performed for structural modifications that must be made resulting from the use of equipment other than the "Basis of Design" or not specified.

1.14 PAINTING

A. Prime paint all bare supplemental steel, supports and hangers required for the installation of Division 23 Work in accordance with "Painting" Specification Section. Touch up welds of galvanized surfaces with galvanizing primer.

1.15 MATERIAL SAFETY DATA SHEETS

A. Submit material safety data sheets (MSDS) for all chemicals, hydraulic fluids, seal oils, lubricating oils, glycols and any other hazardous materials used in the performance of the Work, in accordance with the US Department of Labor, Occupational Safety and Health Administration (OSHA) hazard communication and right-to-know requirements stipulated in 29 CFR 1910.1200 (g).

1.16 MOTORS AND STARTERS

A. Provide new NEMA Standard electric motors, sized and designed to operate at full load and full speed continuously without causing noise, vibration, and temperature rise in excess of their rating. Provide motors with a service factor of at least 1.15.

B. Equip motors for belt driven equipment with rails with adjusting screws for belt tension adjustment. Weather protect motors exposed to the weather.

C. Install high efficiency electric motors for air handling units, relief fans, and exhaust fans.

D. Provide all motors for use with Variable Frequency Drives with "high efficiency inverter duty" insulation class "F" with class "B" temperature rise and that conform to or exceed the International Energy Conservation Code or the Federal EP Act of 1992 requirements for efficiency.

E. Provide stainless steel nameplates, permanently attached to the motor, and having the following information as a minimum:
   1. Manufacturer
   2. Type
   3. Model
   4. Horsepower
   5. Service Factor
   6. RPM

7. Voltage/Phase/Frequency
8. Enclosure Type
9. Frame Size
10. Full-Load Current
11. UL Label (where applicable)
12. Lead Connection Diagram
13. Bearing Data
14. Efficiency at Full Load.

F. Provide motors whose sound power levels do not exceed that recommended in NEMA MG 1-12.49.

G. Provide motors with drive shafts long enough to extend completely through belt sheaves when sheaves are properly aligned and balanced.

H. Protect motor starters on equipment located outdoors in weatherproof NEMA 4X enclosures.

I. Provide weatherproof NEMA 4X disconnect switches when located outdoors.

J. Motor Characteristics:
   1. 120V/1/60 Hz, 208V/1/60 Hz or 240V/1/60 Hz: Capacitor start, open drip-proof type, ball bearing, rated 40 C. continuous rise.
   2. 208V/3/60 Hz, 240V/3/60 Hz or 460/3/60 Hz: NEMA B, normal starting torque, single speed, squirrel-cage type, open drip-proof, rated 40 C continuous rise, with ball bearings rated for B-10 life of 100,000 hours and fitted with grease fittings and relief ports. Provide motors with aluminum end brackets with steel inserts in bearing cavities.

1.17 ACOUSTICAL PERFORMANCE OF EQUIPMENT AND SYSTEMS

A. Install the Work in such a manner that noise levels from operation of motor driven equipment, whether airborne or structure-borne, and noise levels created by or within air handling equipment and air distribution and control media, do not to exceed sound pressure levels determined by the noise criteria curves published in the ASHRAE guide.

B. Acoustical Tests
   1. Owner may direct the Contractor to conduct sound tests for those areas that are deemed too noisy.
   2. If NC level exceeds the requirements of the Contract Documents due to improper installation or operation of mechanical systems, make changes or repairs to bring noise levels to within required levels.
   3. Retest until specified criteria have been met.

1.18 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Instructions and Demonstration for Owner's Personnel
   1. Provide operating and maintenance instruction to the Owner when project is completed and all HVAC equipment serving the building is ready to be turned over to the Owner.
   2. Turn over the HVAC equipment to the Owner only after the final testing and proper balancing of HVAC systems.
   3. Instruct the Owner's personnel in the use, operation and maintenance of all equipment of each system.
   4. The above instruction requirements are in addition to that specified for specific equipment or systems. Conform to specified requirements if more stringent or longer instruction is specified for specific equipment or systems.

1.19 CODES, RULES, PERMITS & FEES

A. Give all necessary notices, obtain all permits and pay all government sales taxes, fees, and other costs, in connection with the Work. Unless indicated otherwise, fees for all utility connections, extensions, and tap fees for water, storm, sewer, gas, telephone, and electricity will be paid directly to utility companies and/or agencies by the Owner. File all necessary plans, prepare all documents and obtain all necessary approvals of all governmental departments having jurisdiction; obtain all required certificates of inspection for the Work and deliver same to the Owner's Representative before request for acceptance and final payment for the Work.

B. Conform to the requirements of the NFPA, NEC, FM, UL and any other local or State codes which may govern.

1.20 RECORD DRAWINGS

A. During the progress of the Work, make a record set of drawings of all changes by which the actual installation differs from the Drawings.

B. Create all record drawings in AutoCAD version 2002 or later in .dwg format. Upon completion of the Work, submit to the Engineer for approval three complete sets of hard copies of the record drawings, of the same size as the Drawings for approval. Upon approval by the Engineer furnish the Owner a CD copy of the record drawings along with one hard copy for their records.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 CLEANING AND ADJUSTING

A. Cleaning
   1. Blow out, clean and flush each system of piping and equipment, to thoroughly clean the systems.
   2. Clean all materials and equipment; leave in condition ready to operate and ready to receive final finishes where required.
   3. Clean the operating equipment and systems to be dust free inside and out.
   4. Clean concealed and unoccupied areas such as plenums, pipe and duct spaces and equipment rooms to be free of rubbish and dust.

B. Adjusting
   1. Adjust and align equipment interconnected with couplings or belts.
   2. Adjust valves of all types and operating equipment of all types to provide proper operation.

C. Lubrication
   1. Lubricate equipment as recommended by the manufacturer, during temporary construction use.
   2. Provide complete lubrication just prior to acceptance.

D. Permanent Equipment Operating During Construction
   1. Use only in same service as the permanent applications.
   2. Use disposable filters during temporary operation.
   3. Replace expendable media, including belts used for temporary operation and similar materials just prior to acceptance of the Work.

4. Repack packing in equipment operated during construction just prior to system acceptance, using materials and methods specified by the equipment manufacturer.

E. Retouch or repaint equipment furnished with factory finish as required to provide same appearance as new.

F. Tools
1. Provide one set of specialized or non-standard maintenance tools and devices required for servicing the installed equipment.

3.02 EQUIPMENT BASES, PLATFORMS AND SUPPORTS

A. Provide supporting platforms, steel supports, anchor bolts, inserts, etc., for all equipment and apparatus provided.

B. Obtain prior approval for installation method of structural steel required to frame into building structural members for the proper support of equipment, conduit, etc. Welding will be permitted only when approved by the Engineer.

C. Submit shop drawings of supports to the Engineer for approval before fabricating or constructing.

D. Provide leveling channels, anchor bolts, complete with nuts and washers, for all apparatus and equipment secured to concrete pads and further supply exact information and dimensions for the location of these leveling channels, anchor bolts, inserts, concrete bases and pads.

E. Where supports are on concrete construction, take care not to weaken concrete or penetrate waterproofing.

3.03 ACCESSIBILITY

A. Install valves, dampers and other items requiring access conveniently and accessibly located with reference to the finished building.

3.04 USE OF EQUIPMENT

A. The use of any equipment, or any part thereof, even with the Owner's consent, is not an indication of acceptance of the Work on the part of the Owner, nor shall it be construed to obligate the Owner in any way to accept improper work or defective materials.

3.05 MODIFICATIONS OF EXISTING WORK

A. Coordinate the Work with all other contractors and provide necessary dimensions for all openings. Provide all cuts and openings which are necessary for the Work for passage of piping and ductwork

B. Upon completion, remove all temporary piping and equipment, shoring, scaffolds, etc., and leave all areas clean and free from material and debris resulting from the Work performed under this Section. Provide rough patching in areas required.

3.06 EQUIPMENT INSTALLATION

A. Locate and set equipment anchor bolts, dowels and aligning devices for equipment requiring them.

B. Level and shim the equipment; coordinate and oversee the grouting work.

C. Perform field assembly, installation and alignment of equipment under direct supervision provided by the manufacturer or with inspections, adjustments and approval by the manufacturer.

D. Alignment and Lubrication Certification for Motor Driven Apparatus
   1. After permanent installation has been made and connections have been completed, but before the equipment is continuously operated, have a qualified representative of the equipment manufacturer inspect the installation and report in writing on the manufacturer's letterhead on the following:
      a. Whether shaft, bearing, seal, coupling, and belt drive alignment and doweling is within the manufacturer’s required tolerances so that the equipment will remain aligned in the normal service intended by the Contract Documents and that no strain or distortion will occur in normal service.
      b. That all parts of the apparatus are properly lubricated for operation.
      c. That the installation is in accordance with manufacturer's instructions.
      d. That suitable maintenance and operating instructions have been provided for the Owner's use.
      e. Make any corrections to items that are required or recommended based on the manufacturer’s inspection and have the equipment re-inspected.

E. Belt Drives
   1. V-belt drives - a driving and driven sheave grooved for belts of trapezoidal cross-section. Construct belts of fabric and rubber so designed so as not to touch the bottom of the grooves, the power being transmitted by the contact between the belts and V-shaped groove sides. Design drives for a minimum of 150 percent of motor horsepower. Provide companion type driven sheaves.
   2. Select drives to provide for 12-1/2 percent variation in speed, plus or minus, from specified speed. Provide all motors with adjustable sheaves except where indicated otherwise in the Specifications or on the Drawings.
   3. Install all fans with adjustable pitch sheaves on their drive motors. Select sheaves to provide air quantities under specified conditions. Put air systems into operation, and determine as a result of the completed air balance the actual size of sheaves required to produce specified air quantities on installed systems. The adjustable pitch sheaves shall then be replaced with the proper size fixed sheaves. Remove adjustable pitch sheaves from premises. Provide fixed motor sheaves manufactured by Wood's.
   4. Where indicated on the Drawings or specified, provide spare motor, bearings, and belts.

F. Machinery Guards
   1. Protect motor drives by guards furnished by the equipment manufacturer or in accordance with the Sheet Metal and Air Conditioning Contractors National Association's Low Pressure Duct Manual. Provide guards of all types approved as acceptable under OSHA Standards.

G. Equipment Start-up
   1. Require each equipment manufacturer to provide qualified personnel to inspect and approve equipment and installation and to supervise the start-up of the equipment and to supervise the operating tests of the equipment.
   2. If a minimum number of hours for start-up and instruction are not stated with the equipment specifications, these shall be 2 full 8-hour working days as a minimum.
   3. Advise Owner of start-up at least 72 hours in advance.

3.07 CLOSEOUT PROCEDURES

A. General Operating and Maintenance Instructions: Arrange for each installer of operating equipment and other work that requires regular or continuing maintenance, to meet at the site with the Owner's personnel to provide necessary basic instructions in the proper operation and

maintenance of the entire Work. Where installers are not expert in the required procedures, include instruction by the manufacturer's representatives.

B. Where applicable, provide instruction and training, including application of special coatings systems, at manufacturer's recommendation.

C. Provide a detailed review of the following items:
   1. Maintenance manuals
   2. Record documents and catalog cuts for each piece of equipment.
   3. Spare parts and materials
   4. Tools
   5. Lubricants
   6. Fuels
   7. Identification systems
   8. Control sequences
   9. Hazards
   10. Cleaning

D. Warranties, bonds, maintenance agreements, and similar continuing commitments.

E. Demonstrate the following procedures:
   1. Start-up
   2. Shut-down
   3. Emergency operations
   4. Noise and vibration adjustments
   5. Safety procedures
   6. Economy and efficiency adjustments
   7. Effective energy utilization.

F. Prepare instruction periods to consist of approximately 50% classroom instruction and 50% "hands-on" instruction. Provide minimum instruction periods as follows:

Systems or Equipment	Training Time (Hours)
Make-up Air Units	8 hrs.
Exhaust Fans	4 hrs.
DDC Control System	8 hrs.
All other equipment	4 hrs. (each)

Note: Consult individual equipment specification sections for additional training requirements.

G. Prepare a written agenda for each session and submit for review and approval. Include date, location, purpose, specific scope, proposed attendance and session duration.

H. Record training sessions in digital format, format as selected by the Owner. Turn over digital files to the Owner after training has been completed.

END OF SECTION 230010

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. This Section describes the draining, disconnecting, dismantling, demolition, removal, relocation, rerouting and reconnection of existing mechanical facilities, in a neat and workmanlike manner, of mechanical systems, materials and accessories as required, as shown on the Drawings and specified herein, to accomplish alteration, restoration and to accommodate the Work.

1.02 RELATED WORK

A. General Mechanical Requirements - Section 230010

1.03 REFERENCES

A. BOCA Building Code

B. NFPA Fire Code

C. ANSI A10.6 - Safety Requirements for Demolition

D. National Association of Demolition Contractors (NADC) - Demolition Safety Manual

E. NFPA 51B - Cutting and Welding Processes

F. NFPA 70 - National Electrical Code

G. NFPA 241 - Safeguarding Building Construction and Demolition Operations

H. OSHA 29 CRF 1910 - Occupational Safety and Health Standards

I. US EPA - Clean Air Act Amendment of 1990.

1.04 SUBMITTALS

A. Demolition Schedule

B. Fire Watch Procedures

C. Welding/Burning Permit - Obtain a welding/burning permit from the local Fire Official prior to the start of any welding or burning in accordance with the local Fire Code or as required by the Owner.

1.05 QUALITY ASSURANCE

A. Only employ workers skilled in the specific trades involved for cutting, patching and removal.

B. Job Conditions: Prior to start of the Work, make an inspection accompanied by the Engineer to determine physical condition of adjacent construction that is to remain.

1.06 SPECIAL PRECAUTIONS

A. Do not torch cut ductwork.

B. Torch cutting of other mechanical equipment will be permitted only with the specific written approval of the Engineer.

C. Include “Fire Watch” procedures as required by the Fire Code and/or Owner’s Fire Insurance Carrier for any cutting work that may produce sparks. Submit fire watch procedures for approval.

D. Perform draining operations so that damage to existing building components does not occur.

PART 2 - PRODUCTS

2.01 GENERAL

A. Adequately sized rubbish containers for the proper and safe disposal of all debris.

PART 3 - EXECUTION

3.01 PREPARATION

A. Construct temporary partitions enclosing respective work prior to any demolition work. Erect temporary fencing and signage around demolished materials.

B. Protect existing materials and equipment which are not to be demolished.

C. Prevent movement of structure; provide required bracing and shoring.

D. Do not begin the work until the time schedules and manner of operations have been approved by the Engineer and Owner. Include all interruptions of existing services in schedules submitted for approval by the Engineer and Owner.

3.02 GENERAL

A. Provide alteration and demolition of mechanical facilities as required by the Drawings and Specifications. The Drawings are diagrammatic and do not show the exact location of all existing mechanical work. Where existing equipment is to remain in service during construction, provide rerouting and reconnection of mechanical services as required to maintain continuous service.

B. Review all equipment with the Engineer and Owner prior to disposal. Completely remove existing ductwork, piping, conduit and similar items to be abandoned that are not embedded in walls or floor slabs unless otherwise shown on the Drawings. Cap open ends at all walls and floors.

C. Remove, store and protect all equipment or materials designated to be turned over to the Owner. Coordinate exact location of storage with the Owner.

D. Temporarily cap ends of ductwork, piping and sanitary vent piping to avoid entry of dirt, debris, or discharge of foul odors and gases.

E. Where existing louvers or ductwork penetrations are to remain, blank-off the opening on the inside with galvanized sheet metal on both sides of 2-inch thick, 6 pcf density rigid fiberglass board insulation. Paint side attached to the opening with weather resistant flat black paint.

F. Do not close or obstruct egress width to exits.

G. Do not disable or disrupt building fire or life safety systems without five (5) days prior written notice to the Engineer and Owner.

H. Conform to procedures applicable when discovering hazardous or contaminated materials.

I. Conduct demolition to minimize interference with adjacent building structures or Owner's operations.

J. Cease operations immediately if structure appears to be in danger or hazardous materials are encountered. Notify Engineer. Do not resume operations until directed.

K. Demolish in an orderly and careful manner. Do not cut or remove more than is necessary to accommodate the new construction or alteration.

L. Remove demolished materials from site daily. Do not burn or bury materials on site. Dispose of all material at an approved disposal facility.

M. Protect finished surfaces at all times and repair or replace, if damaged, to match existing construction to the satisfaction of the Engineer.

3.03 PROTECTION FROM FREEZING

A. It is intended that the building remain protected from damage due to freezing temperatures. To that end, keep in place and in operation existing equipment and systems used for heating until scheduling permits shutdown.

B. Where the removal of equipment, etc. will leave an area unprotected from freezing, notify the Owner and Engineer at least 72 hours in advance prior to removal so appropriate steps can be taken by the Owner to protect the area. Provide temporary heating equipment sufficient to prevent freezing.

3.04 DISCONNECTION AND INTERRUPTION OF MECHANICAL SERVICES

A. When portions of an existing piping system or ductwork system are removed, and this removal causes loss of operation to another piece of equipment due to open or disconnected piping or ductwork, cap piping or ductwork or provide temporary piping or ductwork system to retain operation of the system.

3.05 MECHANICAL EQUIPMENT REMOVAL

A. Remove all mechanical equipment as shown on the Drawings. Remove all electrical work, including wiring between equipment, and wiring to power source or point of origin.

B. Where equipment is supported by steel and/or structural supports, remove these supports.

3.06 DUCTWORK REMOVAL

A. Disconnect all ductwork which must be removed, at the closest joint and support the remaining ductwork.

B. Prepare all remaining ductwork joints at the point of disconnection to receive new ducts or blank-off panels.

C. Remove all ductwork supports and miscellaneous steel with ductwork to be demolished.

3.07 INSULATION REMOVAL

A. Remove insulation, together with all piping, fittings, valves and equipment designated for demolition.

3.08 CONTROL WIRING REMOVAL

A. Disconnect and remove all control wiring and tubing, including conduit, for the Automatic Temperature Control (ATC) System associated with equipment and systems to be removed.

END OF SECTION 230015

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The Work covered under this Section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the pipe hanger and supports as described in this Specification. Size hangers and supports to fit the outside diameter of the

1.02 REFERENCES

A. ASTM B633 - Specification for Electrodeposited Coatings of Zinc on Iron and Steel

B. ASTM A123 - Specification for Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip

C. ASTM A653 - Specification for Steel Sheet, Zinc-Coated by the Hot-Dip Process

D. ASTM A1011 - Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability (Formerly ASTM A570)

E. MSS SP58 - Manufacturers Standardization Society: Pipe Hangers and Supports- Materials, Design, and Manufacture

F. MSS SP69 - Manufacturers Standardization Society: Pipe Hangers and Supports- Selection and Application

G. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices

1.03 QUALITY ASSURANCE

A. Provide hangers and supports used in fire protection piping systems listed and labeled by Underwriters Laboratories.

B. Steel pipe hangers and supports shall have the manufacturer’s name, part number, and applicable size stamped in the part itself for identification.

C. Design and manufacture hangers and supports in conformance with MSS SP 58.

1.04 SUBMITTALS

A. Submit product data on all hanger and support devices, including shields and attachment methods. Include as a minimum as part of product data materials, finishes, approvals, load ratings, and dimensional information.

B. Submit Pipe Hanger and Support Application Schedule.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Manufacturer: Subject to compliance with these specifications, provide pipe hanger and support systems manufactured by:
   1. Cooper B-Line, Inc.
   2. Carpenter and Patterson

3. Grinnell

2.02 PIPE HANGERS AND SUPPORTS

A. Hangers
   1. Uninsulated pipes 2 inch and smaller:
      a. Adjustable steel swivel ring (band type) hanger, B-Line B3170.
      b. Adjustable steel swivel J-hanger, B-Line B3690.
      c. Malleable iron ring hanger, B-Line B3198R or hinged ring hanger, B3198H.
      d. Malleable iron split-ring hanger with eye socket, B-Line B3173 with B3222.
      e. Adjustable steel clevis hanger, B-Line B3104 or B3100.
   2. Uninsulated pipes 2-1/2 inch and larger:
      a. Adjustable steel clevis hanger, B-Line B3100.
      b. Pipe roll with sockets, B-Line B3114.
      c. Adjustable steel yoke pipe roll, B-Line B3110.
   3. Insulated pipe- Hot or steam piping:
      a. 2 inch and smaller pipes: use adjustable steel clevis with galvanized sheet metal shield. B-Line B3100 with B3151 series.
      b. 2-1/2 inch and larger pipes
         1) Adjustable steel yoke pipe roll with pipe covering protection saddle. B-Line B3110 with B3160-B3165 series.
         2) Pipe roll with sockets with pipe covering protection saddle, B-Line B3114 with B3160-B3165 series.
   4. Insulated pipe- Cold or chilled water piping:
      a. 5 inch and smaller pipes: use adjustable steel clevis with galvanized sheet metal shield. B-Line B3100 with B3151 series.
      b. 6 inch and larger pipes:
         1) Pipe roll with sockets with pipe covering protection saddle, B-Line B3114 with B3160-B3165 series.
         2) Adjustable steel yoke pipe roll with pipe covering protection saddle. B-Line B3110 with B3160-B3165 series.

B. Pipe Clamps
   1. When flexibility in the hanger assembly is required due to horizontal movement, use pipe clamps with weldless eye nuts, B-Line B3140 or B3142 with B3200. For insulated lines use double bolted pipe clamps, B-Line B3144 or B3146 with B3200.

C. Multiple or Trapeze Hanger
   1. Construct trapeze hangers from 12 gauge roll formed ASTM A1011 SS Grade 33 structural steel channel, 1-5/8 inch by 1-5/8 inch minimum, B-Line B22 strut or stronger as required.
   2. Mount pipes to trapeze with 2 piece pipe straps sized for outside diameter of pipe, B-Line B2000 Series.
   3. For pipes subjected to axial movement:
      a. Strut mounted roller support, B-Line B3126. Use pipe protection shield or saddles on insulated lines.
      b. Strut mounted pipe guide, B-Line B2417.

D. Wall Supports
   1. Pipes 4 inch and smaller:
      a. Carbon steel hook, B-Line B3191.
      b. Carbon steel J-hanger, B-Line B3690.
   2. Pipes larger than 4 inch:
      a. Welded strut bracket and pipe straps, B-Line B3064 and B2000 series.

b. Welded steel brackets, B-Line B3066 or B3067, with roller chair or adjustable steel yoke pipe roll. B-Line B3120 or B3110. Use pipe protection shield or saddles on insulated lines.

E. Floor Supports
1. Hot piping under 6 inch and all cold piping:
a. Carbon steel adjustable pipe saddle and nipple attached to steel base stand sized for pipe elevation. B-Line B3093 and B3088T or B3090 and B3088. Screw or weld pipe saddle to appropriate base stand.
2. Hot piping 6 inch and larger:
a. Adjustable Roller stand with base plate, B-Line B3117SL
b. Adjustable roller support and steel support sized for elevation, B-Line B3124

F. Vertical Supports
1. Steel riser clamp sized to fit outside diameter of pipe, B-Line B3373.
2. Copper Tubing Supports
a. Size hangers to fit copper tubing outside diameters.
1) Adjustable steel swivel ring (band type) hanger, B-Line B3170CT.
2) Malleable iron ring hanger, B-Line B3198RCT or hinged ring hanger B3198HCT.
3) Malleable iron split-ring hanger with eye socket, B-Line B3173CT with B3222.
4) Adjustable steel clevis hanger, B-Line B3104CT.
b. For supporting vertical runs use epoxy painted or plastic coated riser clamps, B-Line B3373CT or B3373CTC.
c. For supporting copper tube to strut use epoxy painted pipe straps sized for copper tubing, B-Line B2000 series, or plastic inserted vibration isolation clamps, B-Line BVT series.

G. Plastic Pipe Supports
1. V-Bottom clevis hanger with galvanized 18-gauge continuous support channel, B-Line B3106 and B3106V, to form a continuous support system for plastic pipe or flexible tubing.
2. Supplementary Structural Supports
a. Design and fabricate supports using structural quality steel bolted framing materials as manufactured by Cooper B-Line. Provide roll formed channels, 12 gauge ASTM A1011 SS Grade 33 steel, 1-5/8 inch by 1-5/8 inch or greater as required by loading conditions. Submit designs for pipe tunnels, pipe galleries, etc., to Engineer for approval. Use clamps and fittings designed for use with the strut system.

H. Pipe Supports Between Anchors and Pipe Expansion Loops
1. Provide supports between pipe anchors designed to cause minimal resistance to piping movement. Provide roller hanger supports or slide plates between anchors.
2. Provide supports near the L bends of pipe thermal expansion loops. No more than 12 inches from either side of the horizontal elbow.

2.03 SPRING HANGERS

A. For critical high temperature piping, at hanger locations where the vertical movement of the piping is ¾ inch or more, or where it is necessary to avoid the transfer of load to adjacent hangers or connected equipment, provide approved constant support hangers. However, where the piping movement occurs at a hanger supporting a portion of piping riser on which a rigid support is also located, variable spring hangers may be used for any amount of expansion up to the full recommended working range of the spring, provided the change in supporting effect of the variable spring is added to the design load of the rigid support.

B. Where transfer of load to adjacent hangers or equipment is not critical, and where the vertical movement of the piping is less than ¾ inch, variable spring hangers may be used, provided the

variation in supporting effect does not exceed 25 percent of the calculated piping load through its total vertical travel.

C. The total travel for constant support hangers shall be equal to actual travel plus 20 percent. In no case shall the difference between actual and total travel be less than one inch.

D. Furnish constant support hangers with travel stops, which shall prevent upward and downward movement of the hanger. The travel stops shall be factory installed so that the hanger level is at the “cold” position. Design the travel stops to permit future reengagement, even in the event the lever is at a position other than “cold”, without having to make hanger adjustments.

E. For low temperature systems where vertical movements are anticipated, use approved precompressed variable spring hangers.

2.04 UPPER ATTACHMENTS

A. Beam Clamps
   1. Use beam clamps where piping is to be suspended from building steel. Select clamp type on the basis of load to be supported, and load configuration.
   2. Use center loaded beam clamps where specified. For steel clamps provide B-Line B3050, or B3055. For malleable iron or forged steel beam clamps with cross bolt provide B-Line B3054 or B3291-B3297 Series as required to fit beams.

B. Concrete Inserts
   1. Use cast in place spot concrete inserts where applicable; either steel or malleable iron body, B-Line B2500 or B3014. Select spot inserts to allow for lateral adjustment and to have means for attachment to forms. Select inserts to suit threaded hanger rod sizes, B-Line N2500 or B3014N series.
   2. Use continuous concrete inserts where applicable. Provide 12 gauge channels, ASTM A1011 SS Grade 33 structural quality carbon steel, complete with Styrofoam inserts and end caps with nail holes for attachment to forms. Provide continuous concrete inserts with a load rating of 2,000 lbs/ft. in concrete, B-Line B22I, 32I, or 52I. Select channel nuts suitable for strut and rod sizes.
   3. Provide Drop-In, shell type anchors with an internally threaded, all-steel shell with expansion cone insert and flush embedment lip. Manufacture anchors from plated carbon steel, 18-8 stainless steel and 316 stainless steel. Install anchors with carbide tipped hammer drill bits made in accordance to ANSI B212.15-1994 specifications. Test anchors to ASTM E488 criteria and listed by ICC (formerly ICBO) and SBCCI. Provide anchors listed by the following agencies as required by the local building code: UL, FM. Select inserts to suit threaded hanger rod sizes, Redhead Multi-Set.

2.05 ACCESSORIES

A. Hanger Rods shall be threaded both ends or continuous threaded rods of circular cross section. Use adjusting locknuts at upper attachments and hangers. No wire, chain, or perforated straps are allowed.

B. Provide shields that are 180 degree galvanized sheet metal, 12 inch minimum length, 18 gauge minimum thickness, designed to match outside diameter of the insulated pipe, B-Line B3151.

C. Pipe protection saddles shall be formed from carbon steel, 1/8 inch minimum thickness, sized for insulation thickness. Saddles for pipe sizes greater than 12 inch shall have a center support rib.

2.06 FINISHES

A. Indoor Finishes
   1. Coat hangers and clamps for support of bare copper piping with copper colored epoxy paint, B-Line Dura-Copper®. Use additional PVC coating of the epoxy painted hanger where necessary.
   2. Zinc plate hangers for other than bare copper pipe in accordance with ASTM B633 OR provide an electro-deposited green epoxy finish, B-Line Dura-Green®.
   3. Provide pre-galvanized strut channels in accordance with ASTM A653 SS Grade 33 G90 or provide an electro-deposited green epoxy finish, B-Line Dura-Green®.

B. Outdoor and Corrosive Area Finishes
   1. Hot dip galvanize hangers and struts located outdoors after fabrication in accordance with ASTM A123. Provide all hanger hardware as hot dip galvanized or stainless steel. Zinc plated hardware is not acceptable for outdoor or corrosive use.
   2. Provide hangers and strut manufactured of type 304 stainless steel with stainless steel hardware where located in corrosive areas.

PART 3 - EXECUTION

3.01 PIPE HANGERS AND SUPPORTS

A. Adequately support pipe by pipe hanger and supports specified in PART 2 PRODUCTS. Allow for forces imposed by expansion joints, satisfy structural requirements and maintain proper clearances with respect to adjacent piping, equipment and structures. Size hangers for insulated pipes sized to accommodate insulation thickness.

B. Keep the different types of hangers to a minimum and provide hangers that are neat, without complicated bolting and with the number of parts of each hanger and its anchor kept to a minimum.

C. Make accurate weight balance calculations to determine the required supporting forces at each hanger or support location and the pipe weight load at each equipment connection.

D. Provide pipe hangers capable of supporting the pipe in all conditions of operation selected to allow free expansion and contraction of the piping, and prevent excessive stress resulting from transferred weight being induced into the pipe or connected equipment.

E. Painted or shop prime all hangers and supports that are not galvanized.

F. Support horizontal steel piping in accordance with MSS SP-69 Tables 3 and 4, excerpts of which follow below:

NOMINAL PIPE SIZE (INCHES)	ROD DIAMETER (INCHES)	MAXIMUM SPACING (FEET)
1/2 to 1-1/4	3/8	6
1-1/2	3/8	9
2	3/8	10
2-1/2	1/2	11
3	1/2	12
3-1/2	1/2	13
4	5/8	14
5	5/8	16
6	3/4	17

8	3/4	19
10	7/8	22
12	7/8	23
14	1	25
16	1	27

G. Support horizontal copper tubing in accordance with MSS SP-69 Tables 3 and 4, excerpts of which follow below:

NOMINAL PIPE SIZE (INCHES)	ROD DIAMETER (INCHES)	MAXIMUM SPACING (FEET)
1/2 to 3/4	3/8	5
1	3/8	6
1-1/4	3/8	6
1-1/2	3/8	8
2	3/8	8
2-1/2	1/2	9
3	1/2	10
3-1/2	1/2	11
4	1/2	12
5	1/2	13
6	5/8	14
8	3/4	16

H. For grooved end steel pipe:

NOMINAL PIPE SIZE (INCHES)	MAXIMUM SPACING (FEET)
1-1/2 and under	7
2 through 4	10
5 and over	12

Do not leave any pipe length unsupported between any two coupling joints.

I. Provide means of preventing dissimilar metal contact such as plastic coated hangers, copper colored epoxy paint, or non adhesive isolation tape- B-Line Iso-pipe. Galvanized felt isolators sized for copper tubing may also be used, B-Line B3195CT.

J. Install hangers to provide a minimum of 1/2 inch space between finished covering and adjacent work.

K. Place a hanger within 12 inches of each horizontal elbow.

L. Support vertical piping independently of connected horizontal piping. Support vertical pipes at every floor. Wherever possible, locate riser clamps directly below pipe couplings or shear lugs.

M. Where several pipes can be installed in parallel and at the same elevation, provide trapeze hangers as specified in section 2.02 C. Space trapeze hangers according to the smallest pipe size, or install intermediate supports according to schedules in this Section.

N. Do not support piping from other pipes, ductwork or other equipment that is not building structure.

O. Where horizontal piping movements are greater than ½ inch, or where the hanger rod angularity from the vertical is greater than four degrees from the cold to hot position of the pipe, offset the hanger pipe and structural attachments in such a manner that the rod is vertical in the hot position.

P. In any part of the building which is steel-framed, attach hangers to the building structural steel beams. Where hangers do not correspond with the building structural steel beams, provide supplemental steel members continuously welded or bolted to the building structural steel beams. Provide two (2) coats of primer on the supplemental steel. In any parts of the building which is a concrete structure, attach hangers to the concrete structure by installing anchors into the concrete.

3.02 CONCRETE INSERTS

A. Secure pipe hangers attached to concrete structure and slabs with embedded inserts, anchor bolts or concrete fasteners. Use a safety factor of 5 in selection of all inserts and expansion bolts unless there are seismic requirements (See “Seismic Restraint” specification if applicable). In which case, the larger of the two loadings shall govern the design.

B. Provide inserts for placement in formwork before concrete is poured.

C. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

D. Where concrete slabs form finished ceilings, provide inserts to be flush with slab surface.

E. E. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inch.

END OF SECTION 230529

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vibration isolation requirements.

B. Vibration-isolated equipment support bases.

C. Vibration isolators.

D. Vibration-isolated and/or seismically engineered roof curbs.

1.02 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

B. ASHRAE (HVACA) - ASHRAE Handbook - HVAC Applications; Most Recent Edition Cited by Referring Code or Reference Standard.

C. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. MFMA-4 - Metal Framing Standards Publication; 2004.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate selection and arrangement of vibration isolation control components with the actual equipment to be installed.
   2. Coordinate the work with other trades to provide additional framing and materials required for installation.
   3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
   4. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.04 SUBMITTALS

A. Design Documents: Prepare and submit all information required for plan review and permitting by authorities having jurisdiction, including but not limited to floor plans, details, and calculations.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for products, including materials, fabrication details, dimensions, and finishes.
   1. Vibration Isolators: Include rated load capacities and deflections; include information on color coding or other identification methods for spring element load capacities.

C. Shop Drawings - Vibration Isolation Systems:
   1. Include dimensioned plan views and sections indicating proposed arrangement of vibration isolators; indicate equipment weights and static deflections.
   2. Vibration-Isolated Equipment Support Bases: Include base weights, including concrete fill where applicable; indicate equipment mounting provisions.

D. Evaluation Reports: For products specified as requiring evaluation and recognition by a qualified evaluation service, provide current evaluation reports.

E. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

F. Evidence of qualifications for manufacturer.

G. Manufacturer92s detailed field testing and inspection procedures.

H. Field quality control test reports.

1.05 QUALITY ASSURANCE

A. Comply with applicable building code.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 VIBRATION ISOLATION REQUIREMENTS

A. Provide vibration isolation systems to reduce vibration transmission to supporting structure from vibration-producing HVAC equipment and/or HVAC connections to vibration-isolated equipment.

B. Comply with applicable general recommendations of ASHRAE (HVACA), where not in conflict with other specified requirements:

C. General Requirements:
   1. Select vibration isolators to provide required static deflection.
   2. Select vibration isolators for uniform deflection based on distributed operating weight of actual installed equipment.

D. Equipment Isolation: As indicated on drawings.

2.02 VIBRATION-ISOLATED EQUIPMENT SUPPORT BASES

A. Manufacturers:
   1. Vibration-Isolated Equipment Support Bases:
   2. Source Limitations: Furnish vibration-isolated equipment support bases and associated components and accessories produced by a single manufacturer and obtained from a single supplier.

2.03 VIBRATION ISOLATORS

A. Manufacturers:
   1. Vibration Isolators:
   2. Source Limitations: Furnish vibration-isolators and associated accessories produced by a single manufacturer and obtained from a single supplier.

B. General Requirements:
   1. Resilient Materials for Vibration Isolators: Oil, ozone, and oxidant resistant.
   2. Spring Elements for Spring Isolators:
      a. Color code or otherwise identify springs to indicate load capacity.
      b. Lateral Stability: Minimum lateral stiffness to vertical stiffness ratio of 0.8.
      c. Designed to operate in the linear portion of their load versus deflection curve over deflection range of not less than 50 percent above specified deflection.
      d. Designed to provide additional travel to solid of not less than 50 percent of rated deflection at rated load.
      e. Selected to provide designed deflection of not less than 75 percent of specified deflection.
      f. Selected to function without undue stress or overloading.

2.04 VIBRATION-ISOLATED AND/OR SEISMICALLY ENGINEERED ROOF CURBS

A. Manufacturers:
   1. Vibration-Isolated and/or Seismically Engineered Roof Curbs:
   2. Source Limitations: Furnish vibration-isolated roof curbs and associated accessories produced by a single manufacturer and obtained from a single supplier.

B. Vibration Isolation Curbs:
   1. Nonseismic Curb:
      a. Location: Between structure and rooftop equipment.
      b. Construction: Aluminum.
      c. Integral vibration isolation to comply with requirements of this section.
      d. Weather exposed components consist of corrosion resistant materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as shown on the drawings.

B. Verify that mounting surfaces are ready to receive vibration isolation and/or seismic control components and associated attachments.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.

C. Secure fasteners according to manufacturer's recommended torque settings.

D. Install flexible piping connections to provide sufficient slack for vibration isolation and/or seismic relative displacements as indicated or as required.

E. Vibration Isolation Systems:
   1. Vibration-Isolated Equipment Support Bases:
      a. Provide specified minimum clearance beneath base.
   2. Spring Isolators:
      a. Position equipment at operating height; provide temporary blocking as required.

b. Lift equipment free of isolators prior to lateral repositioning to avoid damage to isolators.
c. Level equipment by adjusting isolators gradually in sequence to raise equipment uniformly such that excessive weight or stress is not placed on any single isolator.

3. Clean debris from beneath vibration-isolated equipment that could cause short-circuiting of isolation.
4. Use elastomeric grommets for attachments where required to prevent short-circuiting of isolation.
5. Adjust isolators to be free of isolation short circuits during normal operation.
6. Do not overtighten fasteners such that resilient material isolator pads are compressed beyond manufacturer's maximum recommended deflection.

3.03 FIELD QUALITY CONTROL

A. Inspect vibration isolation components for damage and defects.

B. Vibration Isolation Systems:
1. Verify isolator static deflections.
2. Verify required clearance beneath vibration-isolated equipment support bases.
3. Verify vibration isolation performance during normal operation; investigate sources of isolation short circuits.

C. Correct deficiencies and replace damaged or defective vibration isolation and/or seismic control components.

D. Submit detailed reports indicating inspection and testing results and corrective actions taken.

END OF SECTION 230548

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. This Section describes the marking and identification materials for identifying mechanical equipment, ductwork and piping systems.

B. Mark and identify all mechanical equipment, ductwork and piping systems described herein, and as shown and specified in the Contract Documents.

1.02 REFERENCES

A. ANSI A13.1 - Scheme for the Identification of Piping Systems.

B. Z53.1 - Safety Color Code for Marking Physical Hazards.

C. OSHA 29 CFR 1910 - Subpart J, General Environmental Controls

1.03 SUBMITTALS

A. Identification Scheme - Submit scheme of identification codes.

B. Samples - Submit samples of tags, attachments, labeled and identified.

C. Equipment Schedules - Submit mechanical equipment schedules, listing proposed equipment numbers, and their location and function.

D. Product Data: Provide manufacturers catalog literature for each product required.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

A. Seton

B. Bunting

C. W.H. Brady Company

2.02 MECHANICAL EQUIPMENT MARKERS

A. Identify all mechanical equipment, bare or insulated, installed in the rooms or on the roof, by means of lettered and numbered nameplate (not stenciled) identifying the equipment and service. Refer to the Drawings for equipment identifications. Nameplates shall be aluminum with permanent 1 ½ inch high white letters on a black background, mechanically affixed and installed in a readily visible location on the equipment. Coordinate the final equipment designation with the Owner.

B. In addition to markers, all mechanical equipment shall be furnished with the manufacturer's identification plate showing the name of equipment, manufacturer's name and address, date of purchase, model number and performance data.

2.03 DUCT WORK IDENTIFICATION

A. Provide full air distribution system identification at each side of a wall penetration, in a mechanical room, at all changes in direction and at no more than 50 foot intervals. Provide arrows identifying direction of flow.

B. Fire damper or Smoke damper access points shall be permanently identified on the exterior by a label having letters not less than 0.5 inch in height reading: SMOKE DAMPER or FIRE DAMPER.

C. Identification shall be preprinted labels.

D. Letter Size: 1-1/2 inches in height.

PART 3 - EXECUTION

3.01 LAY IN CEILING TILES AND ACCESS DOORS

A. Provide a lettered and numbered nameplate for each access door indicating the mechanical equipment that the door provides access too.

B. Where VAV boxes, hot water reheat coils, or other mechanical devices are installed above a lay-in ceiling tile system, provide and install color coded thumb tabs to mark the location of the equipment above the ceiling.

END OF SECTION 230555

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. This section specifies requirements for testing, adjusting, and balancing of all air distribution systems, including the equipment and devices associated with each system.

B. The work includes setting speed and flow, adjusting equipment and devices installed for systems, recording data, conducting tests, preparing and submitting reports, and recommending modifications to the mechanical installations specified in other Sections of the Specifications.

1.02 RELATED WORK

A. Drawings and general provisions of the Contract, including General Conditions, any Supplemental Conditions and Division 1 Specification Sections, govern the work of this section.

1.03 SUBMITTALS

A. Submit proof that the testing, adjusting and balancing agency meets the requirements of Section 1.04 “Quality Assurance”, and all other specified requirements.

B. Prior to performing the work, submit sample blank forms of the test reports that will be submitted by the entity performing work of this Section, indicating all data and parameters included.

C. Submit certified test reports, signed by the authorized representative of the testing and balancing agency. Certify the reports to be proof that the systems have been tested, adjusted and balanced in accordance with the selected reference standards (NEBB or AABC); are an accurate representation of how the systems have been installed; are a true representation of how the systems are operating at completion of the testing, adjusting and balancing procedures; and are an accurate record of all final quantities measured, to establish normal operating values of the systems. Submittal of test report shall be in the following format:
   1. Draft Report: Upon completion of testing, adjusting and balancing procedures, prepare draft reports on the approved forms. Draft report may be handwritten, but must be complete, factual, accurate and legible. Organize and format draft reports in the same manner specified herein for the final reports. Submit two complete sets of draft reports. Only one complete set of draft reports will be returned.
   2. Final Report: Upon verification and approval of draft reports, prepare final reports, type written and organized and formatted as described herein. Submit two complete sets of final reports.
      a. Report Format: Submit reports using the standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted and balanced. Include schematic systems diagrams. Enclose the report contents in a 3-ring binder. Divide the contents into the below listed divisions, separating them by divider tabs with titles descriptive of the contents:
         1) General Information and Summary.
         2) Air Systems.
      b. Report Contents: Provide the following minimum information, forms and data:
         1) General Information and Summary: Identify the testing, adjusting and balancing Agency, Contractor, Owner, Architect/Engineer, and Project on the inside cover sheet. Include addresses, and contact names and telephone numbers. Include a certification sheet containing the seal and name, address, telephone number and signature of the Agency’s responsible certified Test and Balance Engineer. Include in this division a listing of the instrumentation used for the procedures, along with the proof of calibrations.

2) Include in the remainder of the reports the appropriate forms containing, as a minimum, the information indicated on the standard report forms prepared by AABC or NEBB, for each item of equipment and system. Prepare a schematic diagram for each item of equipment and system, to accompany each respective report form.

c. Calibration Reports: Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards within a period not exceeding six months prior to conducting the test procedures.

d. Existing Systems: Where existing systems are to be added to or modified include in the report results of operational tests taken prior to modifications including but not limited to existing fan curves, pressure readings and flow measurements. Include in the report copies of the equipment and motor nameplate data along with equipment performance curves indicating operating points prior to any modifications and, where existing equipment is retained, operating points after system balance. Where terminals are adjusted or modified include terminal performance curves/data and final readings.

1.04 QUALITY ASSURANCE

A. Test, adjust and balance systems and equipment by using competent mechanics regularly employed by a testing, adjusting and balancing Subcontractor whose primary business is the testing, adjusting and balancing of building mechanical systems. The testing, adjusting and balancing Subcontractor shall be a business established for a minimum of 10 years.

B. The testing, adjusting, and balancing Subcontractor shall be certified by the Associated Air Balance Council (AABC) or the National Environmental Balancing Bureau (NEBB).

C. Instrumentation type, quantity, and accuracy shall be as described in AABC's "National Standards for Field Measurement and Instrumentation, or Total System Balance, or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems."

D. All instrumentation shall be calibrated at least every 6 months or more frequently if required by the instrument manufacturer.

1.05 PERFORMANCE REQUIREMENTS

A. Comply with all applicable Federal, State and Local laws, ordinances, regulations and codes, and the latest industry standards including, but not limited to the entities listed below for procedures, measurements, instruments and test reports for testing, adjusting and balancing work:
   1. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
   2. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
   3. National Environmental Balancing Bureau (NEBB)
   4. Associated Air Balance Council (AABC)

B. Set the air delivery or intake of each diffuser, grille and register to be as designed or within five percent of the air flow rates shown on the Drawings.

C. Set the fan air flow rate and static pressure rise across the fan to be within 10 percent above the design value at design speed.

1.06 JOB CONDITIONS

A. Require the testing and balancing specialist to review his work with the respective manufacturers of the equipment and devices involved, and coordinate and schedule all work.

B. Furnish and install balancing dampers, pressure taps, gauges, and other components as required for a properly balanced system, whether or not specified herein or shown on the Drawings, all at no additional cost to the Owner. Make all adjustment or replacement parts recommended by the testing and balancing specialist in strict accordance with the respective equipment manufacturer's recommendations.

C. Coordinate with the control manufacturer's representative to set the adjustment of the automatically operated dampers to operate as required.

1.07 GENERAL

A. The Owner will occupy the building during the entire testing, adjusting, and balancing period. Cooperate with the Owner during testing, adjusting, and balancing operations to minimize conflicts with the Owner's operations.

B. Complete all tests specified herein to the satisfaction of the Engineer before final acceptance.

C. The Engineer, or his representative, is the sole judge of the acceptability of the tests. The Engineer may direct the performance of any such additional tests, as he deems necessary in order to determine the acceptability of the systems, equipment, material and workmanship. No additional payment will be made for any test required by the Engineer.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 EXAMINATION

A. Obtain design drawings and specifications and become thoroughly acquainted with the design intent.

B. Obtain copies of approved shop drawings of all air handling equipment, air outlets (supply, return and exhaust), and the temperature control diagrams, including intended sequence of operations.

C. Existing Systems: Where existing systems are to be added to or modified perform operational tests prior to modifications including but not limited to existing fan curves, pressure readings and flow measurements.
   1. Obtain copies of the equipment and motor nameplate data along with equipment performance curves indicating operating points prior to any modifications. Where terminal units are to be adjusted or modified obtain performance data for these units.

D. Examine installed work and conditions under which testing is to be done to ensure that work has been completed, cleaned, and is operable. Do not proceed with testing, adjusting and balancing until unsatisfactory conditions have been corrected in a manner approved by the testing and balancing specialist.

E. Examine the air systems to see that they are free from obstructions. Determine that all dampers and registers are open, moving equipment is lubricated, clean filters are installed, and automatic controls are functioning; and perform other inspections and maintenance activities necessary for proper operation of the systems.

F. Where existing systems are to be modified or added to ensure that all filters are clean and any operational problems that will prevent system balance have been brought to the attention of the Owner and repaired.

3.02 TESTING, ADJUSTING AND BALANCING

A. Notify the Owner 48 hours in advance of starting any tests. Do not perform any tests until acknowledgment of notification and approval has been received from the Owner.

B. Provide all necessary instruments and personnel for the tests. If, in the opinion of the Engineer, the results of such tests show that the Work has not complied with the requirements of the Contract Documents, make all additions or changes necessary to put the system in proper working condition and pay all expenses for all subsequent tests which are necessary to determine whether the Work is satisfactory. Any additional work or subsequent tests shall be carried out at the convenience of the Engineer.

C. Test all packaged equipment in strict accordance with the equipment manufacturer's requirements.

D. Perform any and all other tests that may be required by the local municipality or other governing body, board or agency having jurisdiction.

E. Perform testing, adjusting, and balancing after leakage and pressure tests on air distribution systems have been satisfactorily completed.

F. Actuate all safety devices in a manner that clearly demonstrates their workability and operation.

G. Cut insulation and ductwork for installation of test probes to the minimum extent necessary to allow adequate performance of test procedure.

H. Perform tests and compile test data for all air systems.

I. Include a schematic diagram locating the air inlets, outlets, fans, equipment, dampers and regulating devices for air systems.

J. All instruments used shall be provided by the entity performing the Work of this Section, and shall be accurately calibrated and maintained in good working order.

K. Air Systems

L. Perform the testing, adjusting and balancing of air systems in accordance with the detailed procedures outlined in the referenced standards; including but not be limited to the following:
   1. Test, record and adjust fan rpm to design requirements.
   2. Test and record motor full load amperes.
   3. Make a pitot tube traverse of main supply ducts and obtain design flow rate at fans.
   4. Test and record system static pressure, velocity pressure and total pressure.
   5. Test and adjust system for design supply, transfer and return air flow rate.
   6. Test and adjust system for minimum and maximum design flow rates of outside air.
   7. Test and record return air temperatures.
   8. Test and record coil and fan leaving air temperatures.
   9. Adjust all main supply, return, relief, and exhaust air ducts to proper design flow rate.
   10. Adjust all zones to proper design flow rate for supply, return, transfer, relief and exhaust air.
   11. Test and adjust each diffuser, grille and register.
   12. Identify each grille, diffuser and register as to location and area on the schematic diagram.

13. Identify and list in the final report size, type and manufacturer of diffusers, grilles and registers and all tested equipment. Use manufacturer's data on all equipment to make required calculations for testing, adjusting and balancing. Include design required velocity and test resultant velocity, required flow rate and test resultant flow rate after adjustment as part of readings and tests of diffusers, grilles and registers.
14. Adjust all diffusers, grilles and registers to minimize drafts in all areas.
15. Permanently mark all dampers after air balance is complete so that they can be restored to their correct position, if disturbed later.
16. Seal openings in ductwork for pitot tube insertion with snap-in plugs after air balance is complete.

END OF SECTION 230594.12

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. This section describes the insulation, jackets and insulating accessories for sheet metal ductwork as scheduled in Part 3 of this Section and as shown on the Drawings.

1.02 REFERENCES

A. National Fire Protection Association (NFPA):
   1. NFPA 255 - Surface Burning Characteristics of Building Materials.

B. Greenguard

C. 2018 International Energy Conservation Code

D. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):

E. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.

F. Underwriters Laboratories, Inc. (UL):
   1. UL 723 - Surface Burning Characteristics of Building Materials.

G. American Society for Testing and Materials (ASTM):
   1. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
   2. ASTM C177 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
   3. ASTM C518 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
   4. ASTM C553 - Mineral Fiber Blanket and Felt Insulation.
   5. ASTM C612 - Specification for Mineral Fiber Block and Board Thermal Insulation.
   6. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel
   7. ASTM C921 - Properties of Jacketing Materials for Thermal Insulation.
   8. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation
   9. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
   10. ASTM E84 - Surface Burning Characteristics of Building Materials.
   11. ASTM E96 - Water Vapor Transmission of Materials.

1.03 DEFINITIONS

A. Greenguard: Greenguard Environmental Institute

B. IAQ: Indoor Air Quality

C. EPA: Environmental Protection Agency

D. WHO: World Health Organization

E. ASJ: All Service Jacket

F. SSL: Self-Sealing Lap

G. FSK: Foil-Scrim-Kraft; jacketing

H. PSK: Poly-Scrim-Kraft; jacketing

I. PVC: Polyvinyl Chloride

J. FRP: Fiberglass Reinforced Plastic

K. Cold Piping/Ductwork/Surfaces: Pipes or surfaces where the normal operating temperature is 60 degrees F or lower.

1.04 SUBMITTALS

A. Product data: To include product description, manufacturer's installation instructions, types and recommended thicknesses for each application, and location of materials.

B. Provide samples and mock-ups of systems as required.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient conditions required by manufacturers of tapes, adhesives, mastics, cements, and insulation materials.

B. Follow manufacturer’s recommended handling practices.

C. Supply fiberglass products that assure excellent IAQ (Indoor Air Quality) performance through Greenguard Certification.

D. Mold: Carefully inspect any insulation that has been exposed to water. If it shows any sign of mold growth remove it from the Site. If the material is wet but shows no sign of mold, dry rapidly and thoroughly. If it shows signs of facing degradation from wetting remove it from the Site. Discard air handling insulation used in the air stream if exposed to water.

1.06 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer: Company specializing in manufacturing Products specified with minimum 3 years documented experience.
   2. Installer: Company specializing in performing the Work of this Section with minimum 3 years documented experience.

B. Materials:
   1. Flame spread/smoke developed rating of 25/50 or less in accordance with ASTM E84, NFPA 255 and UL 723.
   2. Certify insulation for duct, pipe and equipment for above grade exposed to weather outside building as being self-extinguishing for 1" thickness in less than 53 seconds when tested in accordance with ASTM D1692.

PART 2 - PRODUCTS

2.01 FIBERGLASS DUCT WRAP

A. Flexible Fiber Glass Blanket meeting ASTM C 553 Types I, II and III, and ASTM C 1290; Greenguard compliant.

B. Factory Applied Vapor Retarder Jacket: FSK or PSK conforming to ASTM C 1136 Type II.

C. Maximum service temperature of 250º F (Faced) or 350° F (Unfaced).

D. Density:
   1. Concealed areas: Minimum 0.75 PCF.
   2. Exposed areas: Minimum 1.0 PCF.

E. Approved Products:
   1. Friendly Feel Duct Wrap by Knauf

2.02 FIBERGLASS RIGID BOARD

A. Rigid Fiber Glass Board insulation meeting ASTM C 612 Type IA and IB.

B. Mean temperature by ASTM C 177 and a maximum service temperature of 450º F.

C. Factory Applied Vapor Retarder Jacket: ASJ conforming to ASTM C 1136 Type I, or FSK or PSK conforming to ASTM C 1136 Type II.

D. Density:
   1. Concealed areas: Minimum 3 PCF
   2. Exposed areas: Minimum 6 PCF

E. Approved Products:
   1. Insulation Board by Knauf

2.03 INTERNAL DUCT LINING

A. Conforming to ASTM C 1071 Type 1 and NFPA 90A & 90B.

B. Noise Reduction Coefficient (NRC): ASTM C 423 Type A Mounting, 0.40 or higher for ½" product, 0.60 or higher for 1" product.

C. Rated for a maximum air velocity of 6000 Feet per minute.

D. Approved Products:
   1. Textile Duct Liner with HydroshieldÔ Technology by Knauf.

2.04 FIBERGLASS INSULATION ACCESSORIES

A. Aluminum Jacket - 0.016-inch (0.406 mm) thick in smooth, corrugated, or embossed finish with factory applied moisture barrier. Overlap 2-inch (50 mm) minimum.

B. Laminated Self-Adhesive Water and Weather Seals - apply per manufacturers' recommendations.

C. Tapes - Vapor barrier type, self-sealing, non-corrosive, fire-retardant. Approved Manufacturer: Compac Corporation

D. Adhesives - Approved Manufacturer: Foster

E. Mastic - Approved Manufacturer: Foster

F. Vapor Barrier Coating - Approved Manufacturer: Foster

2.05 SHEET WATERPROOFING MEMBRANE

A. Prefabricated, self-adhering, sheet-type waterproofing membrane shall be FlexClad-400 by MFM Building Products Corp. or approved equal.

B. Description:
   1. Top Layer: Stucco-embossed, UV-resistant aluminum weathering surface.
   2. Middle Layer: Multiple layers of high-density cross-linked polymer film.
   3. Bottom Layer: Uniform layer of rubberized asphalt adhesive, protected by disposable silicone release paper.

C. Color: As selected by Architect/Engineer.

D. Material Thickness: ASTM D 1970, 40 Mils Nominal

E. Flexibility: ASTM D 1970, Pass.

F. Vapor Permeance: ASTM E 96, 0 perms.

G. Nail Sealability: ASTM D 1970, Pass.

H. Heat Aging: ASTM D 794, Pass.

I. Tear Resistance: ASTM D 1424, Average: 660 grams.

J. Ultimate Elongation MD: ASTM D 412, 434 percent.

K. Ultimate Elongation CMD: ASTM D 412, 246 percent.

L. Low Temperature Flexibility: 1,000,000 Cycles at -10 Degrees F, 1,200 Cycles at -20 Degrees F, No cracking.

M. Flame Spread Index: ASTM E 84, 0.

N. Smoke Density Index: ASTM E 84, 5.

O. Wind-Driven Rain: SFBC TAS-110-95, 100 mph, No leakage or failure.

P. UV Stability: Excellent.

Q. Accessories: MFM Spray Adhesive

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that all ductwork is tested and approved prior to insulation installation.

B. Verify that all surfaces are clean, dry and without foreign material before applying insulation materials.

3.02 DUCTWORK REQUIRING INSULATION

A. Insulate Ductwork as specified in the DUCTWORK INSULATION SCHEDULE.
   1. Insulate any additional ductwork or plenums indicated to be insulated on the Drawings.

3.03 INSTALLATION (GENERAL)

A. Install all materials using skilled labor regularly engaged in this type of work. Install all materials in strict accordance with manufacturer's recommendations, building codes, and industry standards.

B. Locate insulation and cover seams in the least visible location. Extend all surface finishes in such a manner as to protect all raw edges, ends and surfaces of insulation.

C. On cold surfaces where a vapor retarder must be maintained, apply insulation with a continuous, unbroken moisture and vapor seal. Insulate and vapor seal all hangers, supports, anchors, or other projections secured to cold surfaces to prevent condensation.

D. Install insulation neatly, accurately and without voids, in accordance with manufacturer's instructions and NIAC National Commercial and Industrial Insulation Standards.

E. Install ductwork hanger supports on the outside of the insulation. Where vertical ducts are supported to the building structure, insulate the ductwork supports to prevent condensation.

F. Insulate ductwork using insulation of the type and thickness scheduled at the end of this Section.

G. If specified insulation board thickness does not cover ductwork standing seams and reinforcing angles, insulate them by adhering a grooved strip of fiberglass board with a thickness at least 1 ½ inches greater than the height of the seam or angle covered over the standing seam or angle.

3.04 FIBERGLASS INTERNAL DUCT LINING

A. Apply Duct Lining in strict accordance with the latest edition of SMACNA's "HVAC Duct Construction Standard Metal & Flexible" and NAIMA's "Fibrous Glass Duct Liner Standard".

B. Select length of mechanical fasteners in accordance with the manufacturer's recommendation as listed on each product. Install mechanical fasteners perpendicular to the duct surface, and such that the pin does not compress the liner more than ?" relative to the nominal thickness of the insulation.

C. Adhesive shall conform to ASTM C 916. Apply adhesive to the sheet metal with a 90% minimum coverage. Coat all exposed edges of the duct liner with the same adhesive. Repair all rips and tears using an adhesive that conforms to ASTM C 916.

D. Cover all internal duct areas with duct liner. Firmly butt transverse joints with no gaps and coat with adhesive. Overlap and compress longitudinal corner joints.

E. When air velocities are 4000 to 6000 FPM, apply metal nosing to all upstream transverse edges to additionally secure the insulation.

3.05 FIBERGLASS WRAP INSULATION

A. Apply external duct wrap per insulation schedule even where internally lined.

B. Install Duct Wrap to obtain specified R-value using a maximum compression of 25%.

C. Firmly butt all joints.

D. Overlap the longitudinal seam of the vapor retarder a minimum of 2 inches.

E. Where vapor retarder performance is required, repair all penetrations and damage to the facing using pressure-sensitive foil tape or mastic prior to system startup.

F. Use pressure-sensitive foil tapes a minimum 3 inches wide and apply by moving pressure using a squeegee or other appropriate sealing tool.

G. Additionally secure Duct Wrap to the bottom of rectangular ductwork over 24 inches wide using mechanical fasteners on 18-inch centers. Do not over-compress insulation during installation.

H. Overlap unfaced Duct Wrap a minimum of 2 inches and fasten using 4-inch to 6-inch nails or skewers spaced 4 inches apart, or secured with a wire/banding system. Do not damage the Duct Wrap.

3.06 FIBERGLASS BOARD INSULATION

A. Fit insulation by scoring, cutting and mitering to fit the contour of the ductwork.

B. Attach insulation to ductwork in thickness scheduled by brushing adhesive uniformly on all sides of ductwork covering 100 percent of ductwork surface. Press insulation into place, making complete contact with adhesive. Butt edges of insulation board tightly together without gaps.

C. Additionally, hold insulation in place by impaling on pins welded to all four sides of the ductwork. Locate and weld pins a minimum 12 inch on center with a minimum of 2 rows per side of duct and no less than 3 inches from the edges of the ductwork. Secure insulation to pins with 1 inch diameter hold-down washers. As an alternate to welded pins, provide “Gripnail” mechanical surface fasteners by Gripnail Corporation using pneumatic hammer designed for this work.

D. Seal all joints, seams, breaks, and punctures in facing with adhesive and cover with 3 inch wide sealing tape. Flash supports with vapor barrier coating.

E. For rectangular ducts and plenums exposed to weather, pitch ductwork or insulation board minimum ¼ inch per foot to prevent rainwater from accumulating on top of duct or plenum. Cover insulation board with Sheet Waterproofing Membrane.

3.07 SHEET WATERPROOFING MEMBRANE

A. Surface Preparation:
   1. Prepare surfaces in accordance with manufacturer’s instructions.
   2. Ensure tops of ducts have sufficient slope to eliminate ponding water.
   3. Ensure bottoms of ducts have foil-faced rigid insulation boards installed.
   4. Ensure surfaces are clean and dry.
   5. Remove dirt, dust, oil, grease, hand oils, processing lubricants, moisture, frost, and other contaminants that could adversely affect adhesion of waterproofing membrane.
   6. Prime metal, concrete, and masonry surfaces with primers approved by waterproofing membrane manufacturer.

B. Application:
   1. Apply waterproofing membrane in accordance with manufacturer’s instructions on all exterior insulated ductwork and at locations indicated on the Drawings.
   2. Apply membrane to clean, dry, primed metal ductwork and foil-faced rigid insulation boards. Do not apply over wet or non-rigid insulation.
   3. Apply membrane in accordance with manufacturer’s air, material, and surface temperature requirements.
   4. Apply firm, uniform pressure with hand roller to entire membrane to ensure proper adhesion. Concentrate pressure at seams and on underside of ductwork.

5. Apply membrane to ducts in accordance with manufacturer's instructions.
6. Apply membrane shingle fashion to shed water over, not against laps.
7. Do not terminate membrane on bottom of duct.
8. Apply minimum 3-inch laps and minimum 6-inch end laps for ductwork applications.
9. Embed membrane to bottom of ducts over 24 inches wide in light continuous layer of adhesive applied to insulation face.
10. Apply membrane to bottom of insulated ducts over 36 inches wide using mechanical attachment, in addition to adhesive, in accordance with manufacturer's instructions. Install pints on 12-inch centers with rows staggered.
11. Apply adhesive to areas where special adhesion requirements exist, including duct bottoms, flashings, transitions, joints, elbows, valves, tees, and other fittings.

C. Protection:
1. Protect applied waterproofing membrane and fabric flexible duct connections from damage during construction.

3.08 DUCTWORK INSULATION SCHEDULE

A. Fiber Glass Insulation Schedule:

Ductwork System	Type	Minimum R-Value
Supply Ducts and Plenums, Concealed	Fiberglass Duct Wrap	6
Return Ducts and Plenums, Concealed	Fiberglass Duct Wrap	6
Supply and Return Ducts and Plenums, Exposed in the Space Served	Uninsulated	NA
Supply and Return Ducts and Plenums, Exposed Other Than in the Space Served	Fiberglass Rigid Board	6
Outdoor Air Intake Ducts, Indoors	Fiberglass Rigid Board	6
Ducts Located Outdoors	Fiberglass Rigid Board	8
Unused Portions of Louvers	Louver Blank Off Panels	As Specified
Ductwork 20 Feet Upstream and Downstream of Air Handling Units and Supply and Return Fans, Located Indoors	Fiberglass Internal Duct Lining	Note 1
Ductwork 20 Feet Upstream and Downstream of Air Handling Units and Supply and Return Fans, Located Outdoors	Fiberglass Internal Duct Lining	Note 1
General Exhaust Ducts Except as Noted	Uninsulated	NA

NOTE 1 - Ductowork to be provided with 1-inch internal lining in addition to externally applied insulation in accordance with the table above.

END OF SECTION 230719

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The work specified as part of this Section consists of the integration of equipment controls supplied as part of manufactured items, materials and equipment required by the Drawings and under Divisions 23 and 26 to achieve operational and coordinated Sequences of Operation as Specified. Work shall include management of the system start up and operational check out, coordination of functions of controllers supplied as part of equipment packages, sizing of control valves and damper operators for dampers, interconnection of systems, provision and installation of all accessory devices required for complete system operation including dampers, control valves and actuators not provided as part of equipment, coordination of start up and testing and demonstration of the operation of Sequences of Operation to the Owner and his representatives.

1.02 RELATED SECTIONS

A. The General Conditions of the Contract, Supplementary Conditions, and General Requirements are a part of these Specifications and shall be used in conjunction with this Section as a part of the Contract Documents. Consult them for further instructions pertaining to this work. The Contractor is bound by the provisions of Division 00 and Division 01.

B. The following Sections constitute related work:
   1. Section 230010 - General Mechanical Requirements
   2. Equipment and Systems specified under Division 23
   3. Division 26

1.03 QUALITY ASSURANCE

A. System Installer Qualifications
   1. The Integrator shall have a minimum of five years experience in the integration of systems of a similar nature to those of this Project.
   2. The Integrator shall have an office within 50 miles of the project site and provide 24-hour response in the event of a customer call.

B. Codes and Standards: Meet requirements of all applicable standards and codes, except when more detailed or stringent requirements are indicated by the Contract Documents, including requirements of this Section.
   1. Underwriters Laboratories: Products shall be UL-916-PAZX listed.
   2. National Electrical Code - NFPA 70.

C. All products used in this installation shall be new, currently under manufacture, and shall have been applied in similar installations for a minimum of 2 years. This installation shall not be used as a test site for any new products unless explicitly approved by the Owner's representative in writing prior to bid date. Spare parts shall be available for at least 5 years after completion of this Contract.

1.04 SUBMITTALS

A. Submit at the time of bid the name and qualifications of the firm that will be responsible for the Integration function along with the qualifications of the specific personnel proposed. The Owner and Architect/Engineer may choose to interview the personnel proposed for the project.

B. Contractor shall provide shop drawings and manufacturer’s standard specification data sheets on all materials and hardware to be provided. No work may begin on any segment of this project until the Architect/Engineer and Owner have reviewed submittals for conformity with the

Drawings and Specifications. All shop drawings shall be provided to the Owner electronically as .dwg or .dxf file formats.

C. Submit a written sequence of operation for each system indicating which functions are to be controlled by controls provided as part of manufactured equipment and which functions will be under control of devices provided as part of this Section.

D. Submit interconnecting wiring diagrams for all systems. These diagrams may rely on diagrams for controls of manufactured equipment provided that the interface points are clearly identified and copies of the manufactured item's control diagrams are submitted for information as part of the submittal package.

E. Submit any additional information or data which is deemed necessary to determine compliance with these specifications or which is deemed valuable in documenting the system to be installed.

F. Submit the following within 30 days of contract award:
   1. A work plan and schedule for the start up and check out of all systems including time requirements and resources required from all Sub-Contractors involved.
   2. A complete list of equipment to be used indicating quantity, manufacturer and model number.
   3. A schedule of all control valves including the valve size, model number (including pattern and connections), flow, CV, pressure rating, and location.
   4. A schedule of all control dampers. This shall include the damper size, pressure drop, manufacturer and model number.
   5. Provide manufacturers cut sheets for major system components. When manufacturer's cut sheets apply to a product series rather than a specific product, the data specifically applicable to the project shall be highlighted or clearly indicated by other means. Each submitted piece of literature and drawings shall clearly reference the specification and/or drawing that the submittal is being submitted to cover.
   6. The submittals required under this Section shall be considered as For Information Only. Review by the Architect/Engineer shall not relieve the Contractor from the responsibility of providing fully operational systems.

1.05 WARRANTY

A. Warrant all work as follows:
   1. Labor & materials for control system specified shall be warranted free from defects for a period of twelve (12) months after final completion acceptance by the Owner. Control System failures during the warranty period shall be adjusted, repaired, or replaced at no charge or reduction in service to the Owner. The Contractor shall respond to the Owner's request for warranty service within 24 hours during customary business hours.
   2. At the end of the final start-up/testing, if equipment and systems are operating in a manner satisfactory to the Owner and Architect/Engineer, the Owner shall sign certificates certifying that the control system's operation has been tested and accepted in accordance with the terms of this Specification. The date of Owner's acceptance shall be the start of warranty.

PART 2 - PRODUCTS

2.01 STANDARD OF QUALITY AND PERFORMANCE

A. Products specified are not intended to form a complete scope of supply. They are intended to set a level of quality for items that the Contractor may need to supply to implement a complete Sequence of Operation. Products of a comparable quality and performance may be submitted for approval by the Architect/Engineer.

2.02 MOTORIZED DAMPERS

A. Dampers shall be modulating double-acting opposed blade or parallel blade dampers as required, designed and tested in accordance with AMCA 500. Obtain and verify the location, size and pressure rating of each damper prior to fabrication and delivery. Verify the layout of equipment and ductwork before dampers are fabricated. Pressure drop shall not exceed 0.03 inches water gauge static pressure at 1000 fpm in the fully-open position, and shall be rated for at least 2000 fpm average velocity. Damper shut-off pressure rating shall exceed the fan maximum total head-pressure.

B. Dampers shall be constructed of extruded aluminum or at least No. 16 gauge galvanized steel, with each blade being not more than 8 inches; wide damper frame channel shall be at least 5 inches deep. Each blade end shall have a 3/8 inch stainless steel or plated steel shaft rotating in self-lubricating bearings mounted in a damper channel frame. Blades mounted vertically shall be supported by thrust bearings. Control shaft shall be at least ½ inch diameter.

C. Flat-steel damper blades shall be made rigid by folding the edges. Blades shall have interlocking edges and shall be provided with EPDM or neoprene compressible seals at point of contact. Foam seals are not acceptable. Provide compression-type stainless steel jamb seals continuously along blade edges.

D. Each damper shall be assembled in the manufacturer's shop as a complete unit. Dampers, when closed, shall be guaranteed by the manufacturer not to leak in excess of 20 cfm per square foot at 4 inches w.g. static pressure. Provide dampers with operators having sufficient power to limit leakage to the rate specified.

E. Damper seals shall be suitable for an operating range of minus 20 degrees F (or 20 degrees F below the heating outside design temperature, whichever is lower) at the lower end to 200 degrees F at the upper end.

F. A complete damper assembly shall have blades no longer than 48 inches and no higher than 48 inches. Where greater length or height is required, the assembly shall be made of a combination of sections. Dampers shall be sized for the required air velocity and pressure classification.

G. Approved Manufacturers Arrow Damper & Louver or approved equal.

2.03 TEMPERATURE SENSORS

A. Temperature sensors shall be Resistance Temperature Device (RTD) or Thermistor.

B. Duct sensors shall be rigid or averaging as required. Averaging sensors shall be a minimum of 5 feet in length.

C. Immersion sensors shall be provided with a separable stainless steel well. Pressure rating of well is to be consistent with the system pressure in which it is to be installed.

D. Space sensors shall be equipped with set-point adjustment, override switch, display, and communication port.

E. Provide matched temperature sensors for differential temperature measurement. Differential accuracy shall be within 0.2 degrees F.

F. The space temperature, setpoint, and override confirmation shall be annunciated by a digital display for each zone sensor. The setpoint shall be selectable utilizing buttons.

2.04 RELAYS

A. Control relays shall be UL listed plug-in type with dust cover. Contact rating, configuration, and coil voltage suitable for application.

B. Time delay relays shall be UL listed solid-state plug-in type with adjustable time delay. Delay shall be adjustable plus or minus 200% (minimum) from set-point shown on plans. Contact rating, configuration, and coil voltage suitable for application. Provide NEMA 1 Type enclosure when not installed in local control panel.

2.05 TRANSFORMERS AND POWER SUPPLIES

A. Control transformers shall be UL listed, Class 2 current-limiting type, or shall be furnished with over-current protection in both primary and secondary circuits for Class 2 service.

B. Unit output shall match the required output current and voltage requirements. Current output shall allow for a 50% safety factor. Output ripple shall be 3.0 mV maximum Peak-to-Peak. Regulation shall be 0.10% line and load combined, with 50 microsecond response time for 50% load changes. Unit shall have built-in over-voltage protection.

C. Unit shall operate between 0 degrees C and 50 degrees C.

D. Unit shall be UL recognized.

2.06 CURRENT SWITCHES

A. Current-operated switches shall be self-powered, solid state with adjustable trip current. The switches shall be selected to match the current of the application and output requirements of the control system.

2.07 LOCAL CONTROL PANELS

A. All indoor control cabinets shall be fully enclosed NEMA 1 or NEMA 4 rating as required. Provide cabinet with hinged door, key-lock latch, and removable sub-panels. A single key shall be common to all field panels and sub-panels.

B. Interconnections between internal and face-mounted devices pre-wired with color-coded stranded conductors neatly installed in plastic troughs and/or tie-wrapped. Terminals for field connections shall be UL listed for 600-volt service, individually identified per control/interlock drawings, with adequate clearance for field wiring. Control terminations for field connection shall be individually identified per control drawings.

C. Provide on/off power switch with over-current protection and main air gauge for control power sources to each local panel.

PART 3 - EXECUTION

3.01 GENERAL WORKMANSHIP

A. Install equipment, piping, wiring/conduit parallel to building lines (i.e. horizontal, vertical, and parallel to walls) wherever possible.

B. Provide sufficient slack and flexible connections to allow for vibration of piping and equipment.

C. Install all equipment in readily accessible location as defined by Chapter 1 Article 100 part A of the NEC. Control panels shall be attached to structural walls unless mounted in equipment

enclosure specifically designed for that purpose. Panels shall be mounted to allow for unobstructed access for service.

D. Verify integrity of all wiring to ensure continuity and freedom from shorts and grounds.

E. All equipment, installation, and wiring shall comply with acceptable industry specifications and standards for performance, reliability, and compatibility and be executed in strict adherence to local codes and standard practices.

3.02 WIRING

A. All control and interlock wiring shall comply with the national and local electrical codes and Division 26 of these Specifications. Where the requirements of this Section differ with those in Division 26, the requirements of this Section shall take precedence.

B. Do not install Class 2 wiring in conduit containing Class 1 wiring. Do not use boxes and panels containing high voltage for low voltage wiring except for the purpose of interfacing the two (e.g. relays and transformers).

C. Control wiring located in a plenum space that is not installed in a conduit shall be plenum rated.

D. All wire-to-device connections shall be made at a terminal block or terminal strip. All wire-to wire connections shall be at a terminal blocks, or with a crimped connector. All wiring within enclosures shall be neatly bundled and anchored to permit access and prevent restriction to devices and terminals.

E. Maximum allowable voltage for control wiring shall be 120V. Provide and install step down transformers.

F. All wiring shall be installed as continuous lengths, where possible. Any required splices shall be made only within an approved junction box or other approved protective device.

G. Maintain fire rating at all penetrations in accordance with other Sections of this Specification and local codes.

H. Size of conduit and size and type of wire shall be the design responsibility of the Contractor, in keeping with the manufacturer's recommendations and the NEC.

I. Locate control and status relays in designated enclosures only. These relays may also be located within packaged equipment control panel enclosures. These relays shall not be located within Class 1 starter enclosures.

J. Follow manufacturer's installation recommendations for all communication and network cabling. Network or communication cabling shall be run separately from other wiring.

K. Adhere to Division 26 requirements for installation of raceway.

L. Maintain an updated (as-built) wiring diagram with terminations identified at the job site.

M. Flexible metal conduits and liquid-tight, flexible metal conduits shall not exceed 3feet in length and shall be supported at each end. Flexible metal conduit less than 1/2" electrical trade size shall not be used. In areas exposed to moisture liquid tight, flexible metal conduits shall be used.

3.03 INSTALLATION OF SENSORS

A. Install sensors in accordance with the manufacturer's recommendations.

B. Mount sensors rigidly and adequate for the environment within which the sensor operates.

C. Room temperature sensors shall be installed on concealed junction boxes properly supported by the wall framing.

D. All wires attached to sensors shall be air sealed in their conduits or in the wall to stop air transmitted from other areas affecting sensor readings.

E. Install duct static pressure tap with tube end facing directly down-stream of air flow.

F. Sensors used in mixing plenums, and hot and cold decks shall be of the averaging type. Averaging sensors shall be installed in a serpentine manner horizontally across duct. Each bend shall be supported with a capillary clip.

G. All pipe mounted temperature sensors shall be installed in wells. Install all liquid temperature sensors with heat conducting fluid in thermal wells.

H. Wiring for space sensors shall be concealed in building walls. EMT conduit is acceptable within mechanical and service rooms.

I. Install outdoor air temperature sensors on north wall complete with sun shield at designated location.

3.04 FLOW SWITCH INSTALLATION

A. Install using a thread-o-let in steel pipe. In copper pipe use C x C x F Tee, no pipe extensions or substitutions allowed.

B. Mount a minimum of 5 pipe diameters upstream and 5 pipe diameters downstream or 2 feet which ever is greater, from fittings and other obstructions.

C. Install in accordance with manufacturers' instructions.

D. Assure correct flow direction and alignment.

E. Mount in horizontal piping - flow switch on top of the pipe.

3.05 ACTUATOR INSTALLATION

A. Mount and link control damper actuators per manufacturer's instructions.

B. To compress seals when spring return actuators are used on normally closed dampers, power actuator to approximately 5 degrees open position, manually close the damper, and then tighten the linkage.

C. Check operation of damper/actuator combination to confirm that actuator modulates damper smoothly throughout stroke to both open and closed positions.

D. Valves - Actuators shall be mounted on valves with adapters approved by the actuator manufacturer. Actuators and adapters shall be mounted following manufacturer's recommendations.

3.06 WARNING LABELS

A. Affix plastic labels on each starter and equipment automatically controlled. Label shall indicate the following:

C A U T I O N

This equipment is operating under automatic control and may start at any time without warning.

3.07 IDENTIFICATION OF HARDWARE AND WIRING

A. All wiring and cabling, including that within factory-fabricated panels, shall be labeled at each end within 2 inches of termination with a cable identifier and other descriptive information.

B. Permanently label or code each point of field terminal strips to show the instrument or item served.

C. Identify control panels with minimum 1-cm letters on laminated plastic nameplates.

D. Identify all other control components with permanent labels. Identifiers shall match record documents. All plug-in components shall be labeled such that removal of the component does not remove the label.

3.08 CLEANING

A. The Contractor shall clean up all debris resulting from his or her activities daily. The contractor shall remove all cartons, containers, crates, etc. under his control as soon as their contents have been removed. Waste shall be collected and placed in a location designated by the Construction Manager or General Contractor.

B. At the completion of work in any area, the Contractor shall clean all of his/her work, equipment, etc., making it free from dust, dirt and debris, etc.

C. At the completion of work, all equipment furnished under this Section shall be checked for paint damage, and any factory finished paint that has been damaged shall be repaired to match the adjacent areas. Any metal cabinet or enclosure that has been deformed shall be replaced with new material and repainted to match the adjacent areas.

3.09 PROTECTION

A. The Contractor shall protect all work and material from damage by his/her work or workers, and shall be liable for all damage thus caused.

B. The Contractor shall be responsible for his/her work and equipment until finally inspected, tested, and accepted. The Contractor shall protect his/her work against theft or damage, and shall carefully store material and equipment received on site that is not immediately installed. The Contractor shall close all open ends of work with temporary covers or plugs during storage and construction to prevent entry of foreign objects.

3.10 FIELD QUALITY CONTROL

A. All work, materials and equipment shall comply with the rules and regulations of applicable local, state, and federal codes and ordinances as identified in Part 1 of this Section.

B. Contractor shall continually monitor the field installation for code compliance and quality of workmanship. All visible piping and or wiring runs shall be installed parallel to building lines and properly supported.

C. Contractor shall arrange for field inspections by local and/or state authorities having jurisdiction over the work.

3.11 ACCEPTANCE

A. The control systems will not be accepted as meeting the requirements of completion until all tests described in this Specification have been performed to the satisfaction of both the Engineer and Owner.

B. The full range of operation for all Sequences of Operation shall be demonstrated. Where sequences are dependent on season or outside conditions these conditions may be simulated for the purpose of demonstration if approved by both the Architect/Engineer and the Owner. If simulations cannot be acceptably created the Contractor shall perform the demonstration during the proper period.

C. Any tests that cannot be performed due to circumstances beyond the control of the Contractor may be exempt from the Completion requirements if stated as such in writing by the Owner's representative. Such tests shall then be performed as part of the warranty.

END OF SECTION 230991

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The Work specified as part of this Section consists of the work required to achieve operational and coordinated Sequences of Operation as described. Work includes coordination of functions of controllers supplied as part of equipment packages, sizing of control valves, interconnection of systems, provision and installation of all accessory devices required for complete system operation including devices not provided as part of equipment, coordination of start up and testing and demonstration of the operation of Sequences of Operation to the Owner and his representatives.

B. The control system operation of all equipment shall be subject to the operational modes, conditions and logic described in this Section and the controlled equipment manufacturer's recommendations.

C. Training of the Owner's personnel in the operation, trouble shooting, adjustment and repair of all system controls.

1.02 RELATED SECTIONS AND WORK

A. Division 26

B. Owner's Fire Alarm System (FAS)

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

3.01 GENERAL

A. General
   1. Conform to the requirements of the Owner's standards for all electrical work and devices.
   2. All systems shall be capable of operating independently based on set points and limits either input manually.
   3. All space sensors and thermostats shall have an lcd display indicating their set point, the condition sensed and the mode of operation they are responding to.
   4. All equipment to be integrated with new or existing facility controls and devices including interlocks.

3.02 SEQUENCE OF OPERATION - EXHAUST FANS

A. General:
   1. The exhaust fan shall run continuously 24 hours a day, 7 days a week.

3.03 SEQUENCE OF OPERATION - MAKE-UP AIR UNIT

A. General:
   1. The make-up air unit shall be provided with packaged controls. Provide all required additional controllers, devices, sensors, etc. to achieve all required control sequences.

B. Run Conditions - Scheduled:
   1. The make-up air unit shall run continuously 24 hours a day, 7 days a week.

C. Outside Air Damper:
   1. The outside air damper shall open anytime the unit runs and shall close anytime the unit stops. The supply fan shall start only after the damper status has proven the damper is open.
   2. The outside air damper shall close 4sec (adj.) after the supply fan stops.
   3. Alarms shall be provided as follows:
      a. Outside Air Damper Failure: Commanded open, but the status is closed.
      b. Outside Air Damper in Hand: Commanded closed, but the status is open.

D. Supply Fan:
   1. The supply fan shall run anytime the unit is commanded to run. To prevent short cycling, the supply fan shall have a user definable (adj.) minimum runtime, unless shutdown on safeties.
   2. Alarms shall be provided as follows:
      a. Supply Fan Failure: Commanded on, but the status is off.

E. Zone Temperature Control:
   1. The controller shall monitor the supply air temperature and shall maintain a supply air temperature set point of 70 degress F (adj.) based on zone heating requirements:
      a. The unit will have one (1) zone sensor.

F. Modulating Gas Heat:
   1. The controller shall measure the supply air temperature and stage the heating to maintain its heating set point. To prevent short cycling, there shall be a user definable (adj.) minimum runtime.
   2. The heating shall be enabled whenever:
      a. Outside air temperature is less than 65degreeF (adj.).
      b. AND the supply air temperature is below heating set point.
      c. AND the fan status is on.

G. Prefilter Status:
   1. The controller shall monitor the prefilter status.
   2. Alarms shall be provided as follows:
      a. Prefilter Change Required: Prefilter differential pressure exceeds a user definable limit (adj.).

H. Supply Air Temperature:
   1. The controller shall monitor the supply air temperature.
   2. Alarms shall be provided as follows:
      a. High Supply Air Temp: If the supply air temperature is greater than 120 degree F (adj.).
      b. Low Supply Air Temp: If the supply air temperature is less than 45 degree F (adj.).

END OF SECTION 230993

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. This Section describes the pipe, valves, fittings, and joining materials for use with the piping systems described in this Section and as shown on the Drawings.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Section 230555 - Mechanical System Identification

C. Section 232007 - Piping Specialties

1.03 ABBREVIATIONS

A. The following are standard abbreviations:
   1. CWP: Cold working pressure.
   2. EPDM: Ethylene-propylene-diene-terpolymer rubber.
   3. NRS: Nonrising stem.
   4. OS&Y: Outside screw and yoke.
   5. PTFE: Polytetrafluoroethylene plastic.
   6. SWP: Steam working pressure.
   7. TFE: Tetrafluoroethylene plastic.
   8. NPS: Nominal Pipe Size

1.04 SUBMITTALS

A. Product Data: For each type of valve indicated: Include body, seating, and trim materials; valve design; pressure and temperature classifications; end connections; arrangement; dimensions; and required clearances. Include list indicating valve and its application. Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.

B. Product data on pipe, fittings, gaskets, and bolts. Include dimensions, specifications, and manufacturer. Provide pipe and valve application schedule.

C. Provide product data, including but not be limited to dimensions, specifications, manufacturer, installation and operation instructions, temperature and pressure ratings, end connections, and required clearances on piping specialties included in this Specification.

D. Welder Certifications - Furnish the names of pipe welders and welding operators employed by the Contractor to perform the Work who have been qualified to use the welding procedures which have been qualified in accordance with the specified pressure piping codes or AWS or NFPA standards.

E. Shop Drawings
   1. Where deviations from the Drawings and Specifications are proposed for any reason, submit shop drawings identifying proposed deviations showing layout of all piping, fittings, materials, dimensions, and fabrication and installation details. Submit a comparison table of the specified features and ratings of the specified item and those of the proposed deviation to allow a direct comparison.
   2. The review of deviations will be for pressure drop only. The review will not address clearances or accessibility. No dimensional or coordination check will be made.

3. The Contractor has the sole responsibility to review the Drawings, coordinate piping fabrication, and provide clearances and access for installation, maintenance and balancing of this Work, and Work of other trades. Unless specifically dimensioned, Drawings indicate approximate locations only. The Contractor has the sole responsibility to locate and route the piping.
4. Submit all layout shop drawings on not less than ¼ inch equals 1 foot scale drawings.

1.05 REFERENCES

A. Division 1 - Quality Control: Requirements for references and standards.

B. AGA Z21.22 - Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems.

C. ANSI C111 - Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings

D. ASME B16.3 - Malleable Iron Threaded Fittings.

E. ASME B16.5 - Steel Pipe Flanges and Flanged Fittings

F. ASME B16.9 - Factory-Made Wrought Steel Buttwelding Fittings

G. ASME B16.15 - Cast Bronze Threaded Fittings

H. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.

I. ASME B16.22 - Wrought Copper and Bronze Solder Joint Pressure Fittings.

J. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV.

K. ASME B16.24 - Cast Copper Alloy Pipe Flanges and Flanged Fittings.

L. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV.

M. ASME B16.39 - Pipe Unions, Malleable Iron Threaded

N. ASME-B31.1 - Power Piping.

O. ASME B31.2 - Fuel Gas Piping.

P. ASME B31.5 - Refrigeration Piping.

Q. ASME B31.9 - Building Service Piping.

R. ASME B36.10M - Welded and Seamless Wrought Steel Pipe

S. ASME SEC IV - Construction of Heating Boilers.

T. ASME SEC IX - Welding and Brazing Qualifications.

U. ASTM A47 - Ferritic Malleable Iron Castings

V. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.

W. ASTM A74 - Cast Iron Soil Pipe and Fittings.

X. ASTM A105 - Forgings, Carbon Steel, for piping components.

Y. ASTM A126 - Gray Iron Castings for Valves, Flanges, and Pipe Fittings

Z. ASTM A181 - Forgings, Carbon Steel, for General Purpose Piping

AA. ASTM A197 -Cupola Malleable Iron

AB. ASTM A234/A234M - Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.

AC. ASTM A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile

AD. ASTM B32 - Solder Metal.

AE. ASTM B42 - Seamless Copper Pipe.

AF. ASTM B62 - Composition Bronze or Ounce Metal Castings

AG. ASTM B75 - Seamless Copper Tube

AH. ASTM B88 - Seamless Copper Water Tube.

AI. ASTM B306 - Copper Drainage Tube (DWV).

AJ. ASTM B584 - Copper Alloy Sand Castings for General Applications

AK. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.

AL. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings.

AM. AWS A5.8 - Specification for Brazing Filler Material

AN. AWWA C651 - Disinfecting Water Mains.

AO. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves.

AP. NFPA 30 - Flammable and Combustible Liquids Code

AQ. NFPA 54 - National Fuel Gas Code.

AR. NSF 61 - Domestic Water Pipe, Valves, and Fittings.

AS. Mechanical Code of New Jersey State-Latest Edition

AT. Plumbing Code of New Jersey State-Latest Edition

AU. Fuel Gas Code of New Jersey State-Latest Edition

AV. FM - Factory Mutual Compliance

AW. UL - Underwriter’s Laboratory Compliance

1.06 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:
   1. Protect internal parts against rust and corrosion.

2. Protect threads, flange faces, grooves, and weld ends.
3. Set angle, gate, and globe valves closed to prevent rattling.
4. Set ball and plug valves open to minimize exposure of functional surfaces.
5. Set butterfly valves closed or slightly open.
6. Block check valves in either closed or open position.

B. Use the following precautions during storage:
1. Maintain valve end protection.
2. Store valves indoors and maintain at higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use hand wheels or stems as lifting or rigging points.

D. Protect all flange faces with wood, plastic or soft metal to prevent damage to parts.

E. Protect all pipe threads from damage with plastic plugs or caps.

F. Mark and identify all piping materials in accordance with the Reference Standards specified herein.

PART 2 - PRODUCTS

2.01 GENERAL

A. When two or more valves of the same type are used in the same service, furnish all valves of this type from the same manufacturer.

B. Specific manufacturer's model numbers are cited in the following Piping Material Schedules to establish the desired quality and performance for each type valve or material. Equivalent products by other approved manufacturers are also acceptable. Approval shall be subject to review by the Engineer.

2.02 NATURAL GAS PIPING (ABOVE GROUND)

Item	Pipe Size	Description	Manufacturer/ Model No.
Pipe	All sizes	Schedule 40 seamless, ASTM A 53 Grade B	Wheatland
Joints	3 ½ inches & smaller at pressure 14 inches w.c. & less	Threaded connections	
	4 inches & larger at pressures 14 inches w.c. & less; or all pipe sizes at pressure greater than 14 inches w.c.	Welded connections	

Item	Pipe Size	Description	Manufacturer/ Model No.
Fittings	3 ½ inches & smaller at pressure 14 inches w.c. & less	Threaded Joints - 150#, malleable iron, ASTM B16.3	Anvil
	4 inches & larger at pressures 14 inches w.c. & less; or all pipe sites at pressure greater than 14 inches w.c.	Welded Joints - Standard weight, seamless steel, butt weld, ASTM A234	Weldbend
Valves	All sizes	Class 150, bronze body, full port, bronze plug, non-lubricated, PTFE Fluorocarbon sleeve, threaded, steel wrench	Mueller Steam Specialty Non Lubricated Plug Valves

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Unless otherwise shown, route piping in the most direct manner parallel to building lines in accordance with the Drawings. Group piping whenever practical at common elevations.

B. Accurately align, support and connect piping without forcing.

C. Locate piping so that access to and clearance around equipment, and minimum piping headroom of 7 feet is maintained, except where otherwise shown.

D. Space piping so that insulation and flanges, if any, have at least 1 inch clearance after maximum movement.

E. Where pipe elevations are not shown, pitch supply and return lines to positive drain points and/or coils.

F. Provide accessible flanges or union connections on the supply and return connections of terminal equipment and other items which must be disconnected for maintenance. Where unions are furnished as an integral part of the equipment, additional unions are not required unless required for access to or removal of components. Arrange equipment piping connections so that maintenance can be made without removing large sections of pipe or relocating the equipment.

G. Connect branch lines in steam service and compressed air to the top or upper half of the line, preferably the top.

H. Use fittings for all changes of direction. Bending of steel pipe is not permissible.

I. Clean all piping materials before installation to remove grease, loose dirt, mill scale and other foreign matter.

J. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Provide loops, pipe offsets and anchors.

K. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

L. Install gate or ball valves for shut-off and to isolate equipment, parts of systems, or vertical risers.

M. Sleeve pipes passing through partitions, walls and floors.

N. Identify piping under provisions of “Mechanical System Identification” Specification.

O. Provide escutcheons at all locations where piping installed exposed to view penetrates wall, partitions, floors and ceilings.

P. Conceal all pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade or floors, unless indicated to be exposed to view.

Q. Install flexible connectors at inlet and discharge connections of pumps and other vibration producing equipment.

R. Install strainers on the supply side of each control valve, pressure regulating valve, solenoid valve, trap, and elsewhere as indicated.

S. For all nipples up to and including six inches in length provide extra-heavy shoulder type. For all nipples over six inches in length provide corresponding material, quality and thickness as the pipe on which they are used. Do not use close nipples. Provide nipples with designation mark of the manufacturer conforming to the ASTM pipe specifications for system served.

T. For pressures over 15 psig, use nipples and caps instead of plugs for permanent closures. Plugs in equipment provided by equipment manufacturers are acceptable.

U. Do not install piping above electrical panels. Route piping around panels.

3.02 NATURAL GAS PIPING SYSTEMS

A. Provide capped dirt legs, full size of piping, for gas piping as close to the inlet of equipment as practical.

B. Provide vent to outside at pressure regulators sized for pressure regulator failure.

C. Above grade outdoor threaded piping and fittings shall be galvanized.

D. Above grade outdoor welded piping and fittings shall be painted or provided with a coating and taping system in accordance with utility company requirements.

3.03 THREADED CONNECTIONS

A. Ream pipe ends to remove burrs.

B. Use only standard ANSI taper threads. Threads shall be full, sharp, clean, and free of fins and burrs.

C. Apply joint sealing tape or paste to male threads only. Do not use paste on compressed air lines. When sealing fuel oil piping, use a thread-sealing compound suitable for oil when making up joints. When sealing natural gas piping, use a thread-sealing compound suitable for natural gas when making up joints.

D. Do not use close or short nipples of a size where the length of unthreaded pipe is less than the width of a pipe wrench.

E. Thredolets or similar code-approved fittings may be used for branch connections.

F. Provide unions at all threaded valve locations to facilitate the removal of the valve.

G. Joint Sealing Compound; Hercules, RectorSeal or approved equal.

3.04 WELDED CARBON STEEL CONNECTIONS

A. Perform welding using qualified welders and procedures following specified reference standards.

B. Do not use mitered welds for elbows.

C. Welded branch connections may be used in place of welding tees provided that requirements of the applicable ASME Code for pressure piping, B31.1 and/or B31.9 are met.

D. Weldolets or similar code-approved fittings may be used for branch connections.

E. Qualifications of welders, welding procedures, performance of welders and welding operators are required complying with the requirements of ASME B31.9 and ASME Boiler and Pressure Vessel Code, Section IX. Keep records and certifications required by code on file and available for inspection.

F. Whenever welding is done close to walls, floors or building structure, thoroughly clean the surfaces of weld splatter. Remove weld splatter from the surface of all welds, pipe and pipe supports.

G. Provide long radius pattern for welding elbows unless otherwise shown on the Drawings.

H. Examine and inspect welded pipe joints as follows:
   1. Visually examine all welded pipe joints for imperfections using qualified representatives. Submit qualifications to the Engineer.
   2. Make available to the Engineer records of visual examinations upon request.
   3. Remove weld defects by grinding or chipping and repair or replace joints in accordance with approved procedures.
   4. Make shop and field welded joints available to the Owner for nondestructive inspection and examination upon request.

3.05 CONNECTIONS OF DISSIMILAR METALLIC MATERIALS

A. Isolate connections between dissimilar metallic materials using dielectric connections. Use dielectric unions or flanges that provide a complete isolation of the two ends, including bolts for flanges, using materials suitable for the design pressure, temperature and fluid contained.

3.06 VALVES

A. Provide valves of the same size as the pipe in which they are installed, unless shown otherwise on the Drawings. At pumps, match valve size to pipe size and not pump connection size.

B. Install valves with the stem on or above the horizontal. Install valves with the stem horizontal if requirements of headroom, access or chain operation must be met.

C. Pack valves and adjust glands before final acceptance.

D. Install valve extension stems or chain operators where the center of valve hand wheels is more than 6 feet-6 inches above the floor and valve is 2 ½" and larger. Prove chain hooks where required to prevent fouling of chains on equipment and to clear walkways. Terminate chains approximately 3 feet-6 inches above the floor. Provide worm gear operators or impact hand wheels for all valves 6 inches and larger.

E. Extended Stems: Where insulation is indicated or specified, provide extended stems arranged to receive insulation and a protective sleeve that allows operation of the valve without breaking the vapor seal or disturbing the insulation.

F. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

G. Locate valves for easy access and provide separate support where necessary.

H. Install check valves for proper direction of flow and as follows:
   1. Swing Check Valves: In horizontal position with hinge pin level.
   2. Lift Check Valves: With stem upright and plumb

I. Install butterfly valves with stems horizontal to allow support for the disc and the cleaning action of the disc.

J. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

K. Install balancing valves with lengths of straight pipe upstream and downstream of valve as per manufacturer's instructions such that calibrated accuracy is maintained As a minimum provide straight lengths as per the following table;

REQUIRED STRAIGHT LENGTHS

Valve Size	**Upstream (In Pipe Diameters)**	**Downstream (In Pipe Diameters)**
½"-3"	3	1
4"-12"	5	2

L. Chain wheel Actuators- Valve actuation assembly with sprocket rim, brackets, and chain.
   1. Sprocket rim with Chain guides: Ductile Iron (Aluminum for applications exposed to weather), of type and size required for valve.
   2. Brackets: Type, number, size, and fasteners required to securely mount actuator on valve.
   3. Chain: Stainless steel, of size required to fit sprocket rim.
   4. Manufacturers:
      a. Babbitt Steam Specialty Co.
      b. Roto Hammer Industries

3.07 PRESSURE TESTING, FLUSHING AND CLEANING

A. Pressure test piping systems in accordance with applicable codes and as described herein.

B. Pressure testing - Schedule pressure testing so that it may be witnessed by the Engineer, Owner, or their representative. Perform tests in accordance with the following procedures:
   1. Before testing, complete the installation of each pipe line, including final supports, hangers and anchors. Perform testing before insulation or paint is applied for examination during

the test. Clean piping and equipment of metal cuttings and foreign matter as they are installed.

2. Codes - Pressure test piping to assure integrity of material and workmanship in accordance with the applicable ASME Code for pressure piping (B31) and New Jersey State Code.
3. Protection of Equipment - Protect equipment, instruments and piping specialties which are not included in the test by either disconnecting from the piping and blanking off the end of the pipe with a blind flange, plug or cap, or isolating by insertion of a line blind or spool piece as required. Disconnect pneumatic control lines and close all openings.
4. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
5. Piping may be tested in sections or circuits as required for the progress of the work.
6. Provide all systems to be pressurized with the appropriate gauges, certified calibrated by the manufacturer, and pressure-relieving devices.
7. Install relief valve set at a pressure no more than 1/3 higher than the test pressure, to protect against damage by expansion of liquid or other source of overpressure during the test. Do not allow test pressure to exceed maximum pressure for any vessel, pump, valve, or other component in system under test.
8. Records - Provide records of all tests showing line designation, test pressure, ambient temperature, date of test, retests and signature of witness.

C. Pneumatic Test Procedures - Perform pneumatic testing in accordance with ASME B31.9
1. Prior to application of full pneumatic test pressure, perform a preliminary test at 10 psig for a minimum of ten (10) minutes to reveal any major leaks.
2. After the preliminary test, apply pressure gradually in stages until test pressure is reached.
3. Test durations:
   a. For all systems the minimum test duration is that required to thoroughly examine the system for leaks.
   b. Natural gas piping; Maintain test pressure for a minimum of one hour but not less than ½ hour for each 500 cubic feet of pipe volume. After test, purge the entire system of test gas.
   c. For all other systems maintain test pressure for a minimum of ten (10) minutes without fluctuation.
4. Check all joints, valves, etc. for leaks with a thick soap-water solution.
5. Repair leaks as specified under “Repair of Line Leaks”.
6. Repeat pneumatic test until there are no leaks.
7. Ensure that adequate protection is provided to prevent injury to persons or property during leak testing.
8. Test systems to the pressure indicated under “Pressure Testing Schedule”

D. Service Testing - Perform service testing in accordance with ASME B31.9.
1. For gases and steam and condensate service not over 15 psig, and for nontoxic, noncombustible, nonflammable liquids at pressures not over 100 psig and temperatures not over 200 degrees F a system test with the service fluid is acceptable. This exemption does not apply to natural gas piping.
2. Bring the piping system up to operating pressure gradually with visual examination at a pressure between one-half and two-thirds of design pressure. Make a final examination at operating pressure.
3. Repair leaks as specified under “Repair of Line Leaks”
4. Repeat service test until there are no leaks.

E. Repair of Line Leaks - Comply with the following procedures for repair of leaks. In each case retest after repairs are made.
1. Soldered/Brazed Joints - Remove solder/brazing alloy and reapply with proper flux.

2. Flanged Joints - Check to determine flange end alignment and that all bolts are uniformly tightened with the required torque. If leak persists, depressurize the line, remove gasket, examine flange end face, and insert new gasket.
3. Threaded Joints - Tighten joint to a required torque. If leak does not stop, replace pipe and/or fittings. Do not use pipe dope, cement or seal weld to stop pipe leaks.
4. Gasketed Joints - Remove existing gasket and insert new gasket.
5. Welded Steel Joints - Repair pipe in accordance with applicable ASME B31 code.
6. Leaks in Material - Leaks located in pipe or fitting material require the replacement of that section of pipe or fitting and a repeat of the entire system using the complete procedure required for that system. Caulking, welding or epoxy is not permitted. Repair all damage caused by leaks.

F. Pressure Testing Schedule:

Service	Test Type	Design Operating Pressure (psig)	Test Pressure (psig)
Fuel Oil Piping	Pneumatic		1.25 times maximum working pressure
Steam Piping	Hydrostatic		1.5 times maximum working pressure, but not less than 100 psi
Condensate Piping	Hydrostatic		1.5 times maximum working pressure, but not less than 100 psi
Natural Gas Piping	Pneumatic		1.5 times maximum working pressure but not less than 3 psig
Natural Gas Piping (In Schools)	Pneumatic		Working pressures up to 12” W.C. = 15 psig test pressure for 1 hour. Working pressures above 12” W.C. = 1.5 times the working pressure or a minimum of 50 psig for 1 hour.
Domestic Water Piping	Hydrostatic		1.5 times maximum working pressure, but not less than 100 psi
Condenser Water Supply & Return	Hydrostatic		1.5 times maximum working pressure, but not less than 100 psi
Heating Hot Water Supply & Return	Hydrostatic		1.5 times maximum working pressure, but not less than 100 psi

3.08 PAINTING

A. Upon completion of the installation, remove all protecting materials, thoroughly remove all scale and grease and leave in a clean condition for painting. Paint in accordance with the requirements of the “Painting” Specification Section.

END OF SECTION 232000

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. This Section describes the galvanized steel, flexible, and aluminum ductwork for HVAC duct systems in accordance with SMACNA Duct Construction Standards, except as otherwise specified.

B. The construction material for each ductwork system shall be as listed in the “Ductwork Material Schedule” at the end of this Section.

C. This Section also describes the fittings, access doors, hangers and supports, manual volume dampers and sealants for each ductwork system as required.

1.02 RELATED WORK

A. Section 230594 - Balancing of Air Systems.

1.03 REFERENCES

A. ASHRAE - Handbook Fundamentals; Latest Edition.

B. SMACNA - HVAC Duct Construction Standards Metal And Flexible (latest issue)

C. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

D. ASTM B 209 - Specifications for Aluminum and Aluminum-Alloy Sheet and Plate.

E. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

F. UL 555 S - Fire Dampers & Smoke Dampers.

G. NFPA 96 - Standard for Commercial Cooking Operations

H. New York State Mechanical Code.

1.04 REGULATORY REQUIREMENTS

A. Construct ductwork to NFPA 90A and New York State Mechanical Code standards.

1.05 SUBMITTALS

A. Ductwork shop drawings for approval:
   1. Coordinate layout duct drawings that differ from ductwork shown on the Drawings.
   2. The review of deviations will be for pressure drop only. The review will not address clearances or accessibility to maintain or balance the air systems. No dimensional or coordination check of the shop drawings will be made. The Contractor has the sole responsibility to review the Drawings, coordinate ductwork fabrication, and provide clearances and access for installation, maintenance and balancing of this work, and work of other trades. Unless specifically dimensioned, Drawings indicate approximate locations only. The Contractor has the sole responsibility to locate and route the ductwork.
   3. Deviations such as changing direction or transforming or dividing ductwork must maintain ductwork cross-sectional area and not exceed transformation taper of 15 degrees.
   4. Plans and section showing all equipment and accessories.

5. Minimum 3/8 in. scale, double line, showing sizes, transverse joints, transitions, elevations, clearances and accessories; sections where required.

B. Shop details and catalog cuts of:
1. Ductwork construction, including gauge and bracing schedule.
2. Supports.
3. Dampers.
4. Turning vanes.
5. Fire dampers.
6. Access doors.
7. Flexible connections.
8. Other accessories.

1.06 QUALITY ASSURANCE

A. Construct all ductwork in accordance with referenced SMACNA Standards, except as otherwise stated. Ductwork pressure classifications shall be in accordance with referenced SMACNA Standards, except as otherwise specified.

B. For all uninsulated ductwork casings and plenums located outdoors, the reinforcement members shall be galvanized steel or stainless steel.

C. Construction pressure classification of ductwork are shown on the Drawings. If not shown, the pressure classification shall be greater than or equal to the maximum operating static pressure (minimum 2" w.c. pressure classification).

D. All ductwork shall be free from pulsation, chatter, vibration and objectionable noise. If any of these defects appear after a system is in operation, correct by removing and replacing, or reinforcing the ductwork, at no additional cost to the Owner.

E. For all galvanized steel ductwork, zinc coating shall be minimum G90 per ASTM A 653.

PART 2 - PRODUCTS

2.01 GALVANIZED STEEL RECTANGULAR DUCTS AND FITTINGS

A. Construct ducts of galvanized sheet steel meeting ASTM A 653 with G90 coating designation, and in accordance with the latest SMACNA HVAC Duct Construction Standards Metal And Flexible and pressure classifications as stated on the Drawings (minimum 2" w.c. pressure classification).

B. Provide epoxy coated ductwork where indicated on the Drawings.

C. No ducts shall be less than No. 22 U.S. Gauge.

D. Piping, conduit and structure shall not penetrate ductwork. Where this condition cannot be avoided and with the written permission of the Architect/Engineer, follow SMACNA HVAC Duct Construction Standards Metal and Flexible, except that sides of transition sections shall slope a maximum of 15 degrees.

E. Provide 90-degree full-radius elbows with a centerline radius 1.5 times the duct width in the plane of the bend.

F. For elbows with centerline radius less than 1.5 times the width of the duct in the plane of the bend, provide turning vanes.

G. Provide square throat elbows with manufactured turning vanes.

H. All dissimilar metals shall be connected with flanged joints made up with fiber or neoprene gaskets to prevent contact between dissimilar metals. Flanges shall be fastened with bolts protected by ferrules and washers made of the same materials as the gaskets.

I. For split fittings, the split shall be proportional to the air flow. Construct per SMACNA HVAC Duct Construction Standards- Metal and Flexible.

J. Transitions and Offsets shall follow SMACNA HVAC Duct Construction Standards Metal and Flexible, except that sides of transitions shall slope a maximum of 15 degrees.

K. All branch take-offs perpendicular to the main shall be a 45 degree entry.

L. Longitudinal seams shall be of the Pittsburgh Lock type outlined in the SMACNA HVAC Duct Construction Standards Metal and Flexible.

M. Duct transverse joints shall be selected and used consistent with the static pressure class, applicable sealing requirements, materials involved, duct support intervals and other provisions for proper assembly of ductwork outlined in the SMACNA HVAC Duct Construction Standards - Metal and Flexible. Transverse joints T-25a, T-25b (Ductmate) shall only be used. Metal clips will only be allowed (NO PVC). Ductmate shall not be used for the following (use transverse joints T-15 through T-24 in these cases):
   1. The Ductmate '45' system shall not be used for applications with duct gauges heavier than 10 or lighter than 22.
   2. The Ductmate '35' system shall not be used for applications with duct gauges heavier than 16 GA. or lighter than 26 GA.
   3. The Ductmate '25' system shall not be used for application with duct gauges heavier than 20 GA. or lighter than 26 GA.

2.02 TURNING VANES

A. Manufactured with same material as ductwork that it is installed in and to the same pressure classification as ductwork that they are installed in.

B. Provide turning vanes in all square duct elbows and as noted on the Drawings.

C. Vanes shall be single thickness Small Vane as detailed in SMACNA HVAC Duct Construction Standards Metal and Flexible.

D. Where a rectangular duct changes in size at a square-throat elbow fitting, use single thickness turning vanes with trailing edge extensions aligned with the sides of the duct.

2.03 ACCESS DOORS

A. For access doors for use in ductwork receiving Fire Rated Blanket Insulation see Ductwork Insulation Section for requirements. Fabricate all other access doors in accordance with SMACNA Duct Construction Standards Metal And Flexible and as indicated.

B. For HVAC duct systems, construct doors of the same material as the ductwork. Minimum size of access doors shall be 8 inches by 8 inches, unless shown otherwise.

C. Provide walkthrough doors where shown. These doors shall have a minimum clear width of 18 inches. Provide doors with 8 inch square double pane wire glass windows. Locate windows not

to exceed 5 feet-6 inches to centerline above finished floor of installed casing. Walk-through doors shall be operable from both sides of the door.

D. Access doors shall be insulated same as duct.

E. Provide with continuous neoprene gaskets around perimeter of access doors for airtight seal.

F. Provide all access doors with cam lock latches.

G. Provide access doors with watertight gaskets in shower room exhaust ductwork. Doors shall be of extra-heavy stainless construction.

H. All access doors serving a fire damper shall be painted red and shall have a label with white letters not less than ½ inch high reading “FIRE DAMPER”. No external ductwork insulation shall conceal a fire damper access door unless there is a label attached to the insulation indicating the exact location of the access door.

I. Provide access doors in following locations:
   1. Heaters and coils in ducts: entering and leaving side.
   2. Automatic dampers: linkage side.
   3. Fire damper, on both sides of ducts.
   4. Smoke detection heads.
   5. On both sides of ducts where necessary to provide maintenance accessibility to equipment on either side.
   6. VAV boxes
   7. Heating and Cooling coils.
   8. Fan Plenums.
   9. In-Line Fans (suction and discharge sides)
   10. Other items requiring access for service/maintenance

J. Where duct access doors are concealed the Contractor shall furnish and pay for installation of access doors to be mounted in the fire rated walls and ductwork enclosures. The access doors must be fire resistive and minimum 6” larger on each side then the duct access door for the above mentioned applications.

2.04 MANUAL VOLUME DAMPER

A. Fabricate in accordance with SMACNA Duct Construction Standards Metal And Flexible, and as indicated.

B. Fabricate single blade dampers for duct sizes up to 6 inches in height.

C. Fabricate multi-blade damper of opposed blade pattern with maximum blade sizes of 4 inches for ducts above 6 inches in height. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.

D. Except in round ductwork 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.

E. Provide locking, indicating quadrant regulators on single and multi-blade dampers. Where rod lengths exceed 30 inches, provide regulator at both ends.

F. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.

G. Volume damper shall be provided at each duct branch and also where shown on the Drawings. Volume dampers must be installed at each branch even if they are not shown on the Drawing.

H. Approved Manufacturers:
   1. Ruskin Mfr. Co.
   2. Arrow Damper & Louver.
   3. Imperial Damper Co.

2.05 DUCT TEST HOLES

A. Cut or drill temporary test holes in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

B. Permanent test holes shall be factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

2.06 DUCT HANGERS AND SUPPORTS

A. Provide trapeze, strap or angle iron hangers meeting SMACNA HVAC Duct Construction Standards Metal and Flexible.

B. Materials of hangers, supports and fasteners shall conform to the manufacturer's load ratings.

C. Hangers, supports, upper attachments and inserts shall be hot-dip galvanized steel or stainless steel.

D. Fasteners for HVAC duct systems shall be hot-dip galvanized steel, cadmium-plated steel or stainless steel.

E. Secure ductwork hangers attached to concrete structures and slabs with embedded inserts, anchor bolts or concrete fasteners. A safety factor of 5 should be used in selection of all inserts and expansion bolts (if applicable safety factor shall be determined by analysis of seismic loads and the greater safety factor shall be used).

F. Provide hangers and supports not more than 12 inches from each face of a horizontal elbow.

G. Plenums shall be supported to permit personnel to enter the plenum. If no structural steel design is shown on the Drawings, it is the responsibility of the Contractor to provide the services of a licensed structural engineer in the in which the project is to be constructed to submit a structural design for review.

2.07 SEALANTS

A. Where ducts are not continuously welded or soldered, provide sealants and gaskets as required to meet the specified duct leakage allowance.

B. Provide Gaskets, Sealers, Mastics and Tapes as manufactured by Ductmate.

2.08 STANDARD FLEXIBLE CONNECTIONS

A. Provide fabric flexible duct connections.

B. Fabric shall be UL approved, fire-retardant, closely-woven glass, double coated with neoprene, and a minimum of 4 inches wide.

C. Shall be installed at duct connections to all ceiling hung fans and where vibration will be transmitted through ductwork.

D. Approved Manufacturers:
   1. “Ventglas” by Vent Fabrics, Inc.

PART 3 - EXECUTION

3.01 INSTALLATION - GENERAL

A. Install ductwork in accordance with applicable SMACNA Duct Construction Standards Metal And Flexible and approved submittals, and as shown on the Drawings. Duct sizes shown are inside clear dimensions. Where internal duct liners are used, duct sizes shown are inside clear of liner. For ductwork located outside, provide reinforcing sufficient to support wind and snow loads.

B. The Drawings indicate general locations of ducts. Make additional offsets or changes in direction as required at no additional cost to the Owner.

C. Wherever ductwork is divided, maintain the cross-sectional area.

D. Do not exceed 15-degree taper when constructing duct transitions.

E. Close the open ends of ducts during construction to prevent debris and dirt from entering.

F. Secure casings and plenums to curbs according to the requirements of the SMACNA HVAC Duct Construction Standards Metal and Flexible.

G. Make changes in direction with long radius bends.

H. All unused portions of HVAC supply air and exhaust louvers shall be blanked off with Louver Blank Off Panels, see Ductwork Insulation Section.

I. All welded and scratched galvanized steel surfaces shall be touched up with zinc-rich paint.

J. 2 Hr. rated wall penetration: Where small size duct (up to 6 inches x 6 inches) is penetrating a 2 Hr wall the duct shall be constructed of 16 gauge galvanized sheet metal.

K. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

L. Patch and repair all wall penetrations.

M. Insulation: Where Drawings and Specifications indicate that ducts are to be insulated make provisions for neat insulation finish around damper operating quadrants, splitter adjusting clamps, access doors, and similar operating devices. Metal collar equivalent in depth to insulation thickness and of suitable size to which insulation may be finished to be mounted on duct.

3.02 FITTING INSTALLATION

A. Use minimum of four sheet metal screws per joint.

B. Apply approved sealant on duct-to-duct joint before assembly. Apply additional sealant after assembly to make joint airtight.

3.03 HANGER AND SUPPORT INSTALLATION

A. Support ductwork hung from building structure using trapeze, strap or angle iron hangers conforming to SMACNA HVAC Duct Construction Standards Metal and Flexible. Provide supplemental structural steel to span joists where required.

B. Do not support ductwork from furring, hung ceilings, metal floor deck, metal roof deck or from another duct or pipe.

C. Do not hang lighting fixtures or piping from ductwork.

D. Do not use perforated band iron.

E. Support ductwork at each change in direction.

F. Where duct connects to or terminates at masonry openings or at floors where concrete curbs are not used, provide a continuous 1 ½ inch by 1 ½ inch by 3/16 inch galvanized steel angle support around the ductwork. Bolt and seal the supports to the building construction using expansion bolts and caulking compound. Seal shall be watertight at floor or wall and duct such that a spill will no pass down through the opening.

G. Fasten plenums and casings connected to concrete curbs using continuous 1 ½ inch by 1 ½ inch by ¼ inch galvanized steel angle support. Set the angle support in a continuous bead of caulking compound and anchor it to the curb with 3/8 inch diameter anchors on 16 inch centers. Terminate sheet metal at curb and bolt to angle support. Seal sheet metal to curb with a continuous bead of caulking.

H. For insulated ductwork, install hangers on the outside of the insulation. To maintain the insulation value, inset a piece of 1 inch thick, 6 pcf fiberglass board with a foil/scrim/kraft (FSK) jacket at these supports.

3.04 SEALING

A. Where ductwork is not continuously welded, soldered or gasketed, make seams and joints airtight with sealants.

B. Install the sealants in accordance with the sealant manufacturer’s instructions and recommendations.

C. Seal all ductwork seams, joints, fastener penetrations and fittings connections with sealants in accordance with SMACNA Seal Classifications as required by SMACNA Duct Pressure Classification. All ductwork, regardless of pressure classification, shall have a minimum Seal Class B.

D. Completely fill all voids when liquid sealing ductwork. Several applications may be necessary to fill voids caused by shrinkage or runout of sealant.

3.05 DUCT-MOUNTED DEVICES AND ACCESS DOORS

A. Install all dampers, coils, airflow measuring stations, humidifiers and other duct-mounted devices, specified in other sections of the specifications or as shown and provide transformations to dimensions as required. Install devices in accordance with manufacturer’s recommendations. Install dampers and coils a minimum of 4 feet away from changes indirection or transitions. Allow five (5) equivalent diameters of straight ductwork upstream and one (1) equivalent diameter of straight ductwork downstream of airflow measuring devices.

B. Install access doors in ductwork, plenums and where specified and as shown. Provide access doors for inspection and cleaning automatic dampers, at fire dampers, and elsewhere as indicated. Provide minimum 18 x 18 inch size for shoulder access and as indicated. Install access doors in the bottom of the ductwork unless they are inaccessible in this location; then install the access doors in either the side or top of the ductwork, whichever is more accessible.

C. Provide fire damper at locations indicated, and where outlets pass through fire rated components and where required by authorities having jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway, duct connections, corrosion resistant springs, bearings, bushings and hinges.

D. Demonstrate re-setting of fire dampers to authorities having jurisdiction and Engineer.

E. Provide flexible connections immediately adjacent to equipment in ducts associated with motorized equipment. Cover connections to medium pressure fans with leaded vinyl sheet, held in place with metal straps.

F. Pilot Ports: Locate pilot ports for measuring airflow in each main supply duct at the downstream end of the straightest run of the main and before the first branch take-off. Form pilot ports by drilling 7/16 inches holes in the duct, lined up perpendicular to airflow on maximum 8-inch centers and at least three to a duct, evenly spaced. Holes to be plugged with plastic plugs. Provide access to these for future rebalancing.

3.06 CONTROL DAMPER INSTALLATION

A. Duct openings shall be free of any obstruction or irregularities that might interfere with blade or linkage rotation or actuator mounting. Duct openings shall measure 1/4" larger than damper dimensions and shall be square, straight, and level.

B. Individual damper sections, as well as entire multiple section assemblies, must be completely square and free from racking, twisting, or bending. Measure diagonally from upper corners to opposite lower corners of each damper section. Both dimensions must be equal ±1/8".

C. Follow manufacturer's instructions for field installation of control dampers. Unless specifically designed for vertical blade application, dampers must be mounted with blade axis horizontal.

D. Install extended shaft or jackshaft per manufacturer's instructions. (Typically, a sticker on the damper face shows recommended extended shaft location. Attach shaft on labeled side of damper to that blade.)

E. Damper blades, axles, and linkage must operate without binding. Before system operation, cycle damper after installation to assure proper operation. On multiple section assemblies, all sections must open and close simultaneously.

F. Provide a visible and accessible indication of damper position on the drive shaft end.

G. Support ductwork in area of damper when required to prevent sagging due to damper weight.

H. After installation of low-leakage dampers with seals, caulk between frame and duct or opening to prevent leakage around perimeter of damper.

I. Dampers that are to be installed with air flow measuring stations shall be installed in duct runs with a minimum amount of straight duct upstream and downstream of the damper to allow accurate flow readings by the air flow measuring station. The Contractor shall verify with the manufacturer the length of straight duct runs required.

3.07 SMOKE DAMPER INSTALLATION

A. Install dampers in accordance with manufacturer's UL Installation Instructions, labeling, and NFPA 90A at locations indicated on the Drawings.

B. Dampers shall be accessible to allow inspection, adjustment, and replacement of components. Access doors in ductwork, plenums, walls, ceilings, or other general building construction shall be provided. Coordinate with other trades.

C. Where a damper is installed within a duct, a smoke detector shall be installed in the duct within 5 feet of the damper with no air outlets or inlets between the detector and the damper. The detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate.

D. Where a damper is installed above smoke barrier doors in a smoke barrier, a spot-type detector listed for releasing service shall be installed on either side of the smoke barrier door opening.

E. Where a damper is installed within an unducted opening in a wall, a spot-type detector listed for releasing service shall be installed within 5 feet horizontally of the damper.

F. Where a damper is installed in a corridor wall or ceiling, the damper shall be permitted to be controlled by a smoke detection system installed in the corridor.

G. Where a total-coverage smoke detector system is provided within areas served by an HVAC system, dampers shall be permitted to be controlled by the smoke detection system.

3.08 DUCTWORK AND EQUIPMENT LEAK TESTING

A. Leak test each ductwork system within ten working days of ductwork installation and before ductwork is insulated and concealed.

B. All HVAC ductwork shall be tested. Follow general procedures and use apparatus as outlined in the SMACNA HVAC Air Duct Leakage Test Manual.

C. Test all ductwork at 100 percent of the pressure classifications indicated.

D. Air testing during erection shall include separate leakage air tests of air riser, horizontal distribution system, and, after all ductwork is installed and the central stations apparatus is erected, leakage testing of the whole system.

E. Use Appendix C in the SMACNA HVAC Air Duct Leakage Test Manual to determine allowable leakage rates for each duct section tested.

F. All devices, including access doors, airflow measuring devices, sound attenuators, damper casings, sensors, test ports, etc. that are furnished and/or installed in duct systems shall be included as part of the duct system leakage allowance. All joints shall be inspected and checked for audible leakage, repaired, if necessary, and retested. Duct leakage shall be limited to the following:

Average Size of Run Diameter or Equivalent	***A/100 ft. Run**
12 inches or less	10
20 inches or less	15
30 inches or less	25

Average Size of Run Diameter or Equivalent	*A/100 ft. Run
40 inches or less	30
50 inches or less	30
* (A) = Permissible loss in cfm	

G. Total system leakage shall not exceed 10 percent of the scheduled design capacity of the system when tested as per SMACNA testing methods.

3.09 DUCTWORK AND EQUIPMENT LEAK TESTING - WATER LEAK PROOF DUCTWORK

A. Prior to use, covering or concealment of any ductwork perform a leakage test in the presence of the Owner and Authority Having Jurisdiction.

B. Perform a light test or other approved test to determine that all welded or brazed joints are liquid tight.

C. Light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of duct to be tested.
   1. The lamp shall be open so as to emit light in all directions.

D. Repair any visible light leakage.

3.10 PAINTING

A. Upon completion of the installation, remove all protecting materials, thoroughly remove all scale and grease and leave in a clean condition for painting. Ductwork to be painted shall be as shown on the Drawings. Painting shall be in accordance with the requirements of the “Painting” Specification Section.

3.11 DUCTWORK MATERIAL SCHEDULE

AIR SYSTEM	DUCTWORK MATERIAL
Supply, Outside Air & Exhaust Ductwork	Galvanized Steel
Kitchen Exhaust	Black Iron
Shower Room Exhaust	Aluminum
Ductwork Exposed to Weather	Aluminum
Dishwasher Hood Exhaust	Type 302 or 304 Stainless Steel
Laboratory Exhaust Fume Hood	Type 316 Stainless Steel
Clothes Dryer Exhaust	Rigid Metal

END OF SECTION 233113

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Provide exhaust fans, as specified herein, of sizes and capacities scheduled and in locations shown on drawings.

1.02 REFERENCE CODES AND STANDARDS

A. AMCA 99 - Standards Handbook

B. AMCA 210 - Laboratory Methods of Testing Fans for Rating

C. AMCA 300 - Reverberant Room Method for Sound Testing of Fans

D. ASHRAE Handbook, HVAC Applications Volume “Sound and Vibration Control”

E. UL listed and labeled.

1.03 SUBMITTALS

A. Shop Drawings - Show fan layout, housing, materials, gauges, dimensions, weights and installation details

B. Product data - Manufacturer’s fan performance (data includes cfm, rpm, bhp, motor nameplate data, tip speed, outlet velocity and static pressure) and sound performance (data includes sound power level ratings by octave bands) as tested in accordance with AMCA Standards 210 and 300.

C. Fan performance curves - Submit curves for all fans with system performance shown, and for plus or minus 10 percent and plus or minus 20 percent change in fan rpm. Curves shall include plotted rpm, horsepower, cfm, static pressure, and fan surge line and operating point.

D. Certified AMCA Ratings - Submit ratings for air and sound performance.

E. UL Listing - Submit listing if specified.

1.04 QUALITY ASSURANCE

A. Factory balance each fan statically and dynamically, test run before shipment, and key fan wheel to fan shaft. Fans shall operate quietly and without pulsation or vibration. Conduct sound power level tests for each type fan at the factory in accordance with AMCA 300.

B. Fans shall operate in the stable range of their performance curves.

C. The fan external static pressures shown in the schedules are those required by the ductwork and apparatus, and do not include the internal and intake fan losses, inlet vanes or integral outlet dampers, inlet screens, outlet velocity heads or drive losses.

D. Factory performance test each fan assembled in or as part of apparatus specified to be performance tested. Test shall display scheduled performance characteristics, using certified, calibrated testing instruments provided by the manufacturer of the apparatus.

E. All fan performance ratings shall be based up on factory tests performed in accordance with AMCA 210. One fan of each type specified shall have actual factory performance tests performed prior to shipment. All fans shall be certified by AMCA and carry its seal.

PART 2 - PRODUCTS

2.01 CENTRIFUGAL FANS

A. Roof mounted exhaust fans shall be of the direct drive type.

B. The fan housing shall fan housing shall consist of the motor cover, shroud, curb cap and lower windband, and shall be constructed of heavy-gauge aluminum. Housing shall have a rigid internal support structure and leakproof design. The fan shroud shall be one-piece with a rolled bead for extra strength, which directs exhaust air downward. The low windband shall be one piece with formed edges for added strength and the curb cap shall include prepunched mounting holes to ensure correct attachment to the roof.

C. The fan wheel shall be centrifugal, non overload, backward-inclined, constructed of aluminum and shall include a wheel cone carefully matched to the inlet cone for precise running tolerances. Wheels shall be statically and dynamically balanced.

D. Motors shall be permanently lubricated and carefully matched to the fan loads. Motors shall be readily accessible for maintenance. Motors shall be mounted on true vibration isolators, out of the airstream. Each vibration isolator shall be sized to match the weight of each fan.

E. A NEMA 1 disconnect switch shall be provided as standard. Factory wiring shall be provided from motor to the handy box.

F. All fans shall bear the AMCA Certified Ratings Seal for both sound and air performance.

G. Each fan shall bear a permanently affixed manufacturer's nameplate containing the model number and individual serial number for future identification.

H. Fans shall be manufactured by Greenheck or approved equal.

2.02 ELECTRONIC COMMUTATION MOTORS

A. Motor to be an electronic commutation (EC) motor specifically designed for fan applications as noted on contract drawings. AC induction type motors are not acceptable.

B. Motors shall be permanently lubricated with heavy-duty ball bearing to match the fan load and prewired to the specific voltage and phase.

C. Internal motor circuitry shall convert AC power supplied to the fan to DC power to operate the motor.

D. Motor shall be speed controllable down to 20% of fully speed (80% turndown). Speed shall be controlled by a 0-10 VDC signal.

E. Motor shall be a minimum of 85% efficient at all speeds.

F. Motors shall be Vari-Green Motor as manufactured by Greenheck or approved equal.

PART 3 - EXECUTION

3.01 GENERAL

A. Install fans, including all necessary structural supports and bracing as scheduled and located on the contract drawings in accordance with manufacturer’s instructions and approved submittals.

B. Connect duct to fans to allow for straight and smooth air flow.

C. Provide flexible connections (minimum of 4”) between fan and duct.

D. Install fan level: +/- 5 degrees vertical. Final installation shall be free of all leaks from both fan and associated ductwork.

3.02 START-UP, TESTING, DEMONSTRATION

A. Start-up fans after checkout to insure proper alignment and phased electrical connections.

B. Test fans individually and as part of system.

C. Insure fans are properly interlocked with supply fans and with control system.

D. Demonstrate operation to Owner and instruct maintenance personnel in operation of equipment.

END OF SECTION 233416

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. This Section describes the air terminals as specified herein, with capacities, distribution patterns and connection sizes as scheduled on the Drawings.

B. Products listed in Part 2 of this Section include:
   1. Grilles and Registers.
   2. Ceiling Diffusers.

1.02 RELATED WORK

A. Section 233113: Sheet Metal Work

1.03 REFERENCES

A. ADC 1062 GRD - Test Code for Grilles, Registers and Diffusers

B. ASHRAE 70 - Method of Testing for Rating the Airflow Performance of Outlets and Inlets.

C. ASHRAE 113 - Method of Testing Room Air Diffusion

D. ASTM C423 - Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

E. ARI 880 - Air Terminals

F. ARI 885 - Procedure for Estimating Occupied Space Sound Levels in the Application of Air Terminals and Air Outlets.

G. NFPA 90A - Installation of Air Conditioning and Ventilation Systems

H. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.

I. Mechanical Code of New York State

1.04 QUALITY ASSURANCE

A. Air Terminals will not be accepted until acoustical test results have been submitted and approved.

1.05 SUBMITTALS

A. Product data - Submit catalog cuts and installation instructions for all products specified, including standard color samples.

B. Submit published manufacturer’s performance data for all of the different types of diffusers, registers and grilles, based on testing in accordance with ASHRAE Standard 70, latest edition.

C. Performance data - For each size and type of air terminal , submit the following:
   1. Inlet static pressure in inches w.g.
   2. Maximum and minimum airflow in cfm.
   3. Throw in feet at maximum cfm (and 25 percent of cfm) for terminal velocities of 50 and 100 fpm.

4. Noise Criteria (NC) curve at maximum air terminal cfm rating with blades in full-open and closed positions.

PART 2 - PRODUCTS

2.01 RETURN GRILLES

A. Furnish and install return grilles of the type and size as shown on the Drawings. Construct the grilles with 45 degree deflection fixed blades and frames that have reinforced mitered corners.

B. Provide an opposed blade damper operable from the face of the grille for grilles connected to ductwork.

C. Manufacture grilles with trim to allow for recessed mounting into ceiling grids or for surface mount in other ceiling types. Provide concealed mounting using concealed mounting straps or concealed screw holes in neck. Countersunk screw holes in the frame face are not acceptable or frame face-mounting screws.

D. Construct the units of extruded aluminum or corrosion resistant steel as shown on the Drawings.

E. Manufacturer: Nailor Industries Inc, Model Series 6145H-O or approved equal.

F. Coordinate color with Owner.

G. Grilles shall be epoxy coated where indicated on the Drawings.

2.02 SUPPLY GRILLES

A. Furnish and install supply grilles of the type and size as shown on the Drawings. Construct the grilles with a dual set of streamlined shaped, roll-formed, corrosion-resistant blades that are adjustable, and spaced on ¾” centers and frame with reinforced mitered corners.

B. Manufacture grilles with trim to allow for recessed mounting into ceiling grids or for surface mount in other ceiling types. Provide concealed mounting using concealed mounting straps or concealed screw holes in neck. Countersunk screw holes in the frame face are not acceptable nor are frame face-mounting screws.

C. Construct the units of extruded aluminum or corrosion resistant steel as shown on the Drawings.

D. Manufacturer: Nailor Industries Inc., Model Series 61DH-O or approved equal.

E. Coordinate color with Owner.

F. Grilles shall be epoxy coated where indicated on the Drawings.

2.03 TRANSFER GRILLES

A. Furnish and install supply grilles of the type and size as shown on the Drawings. Grilles shall be sight proof.

B. Construct the units of extruded aluminum or corrosion resistant steel as shown on the Drawings.

C. The grille shall have inverted “V” shaped blades and frames. The grille shall be sight-proof.

D. Manufacturer: Nailor Industries Inc., Model Series 61DGS or approved equal.

E. Coordinate color with Owner.

F. Grilles shall be epoxy coated where indicated on the Drawings.

PART 3 - EXECUTION

3.01 DIFFUSER, REGISTER AND GRILLE APPLICATION

A. See the Drawings for types, sizes, materials and installation requirements.

3.02 INSTALLATION

A. Install diffusers, grilles and registers in locations shown on the Drawings.

B. Consult the Drawings for type of ceiling in which the terminals are to be installed and match air outlet edge trim to the requirements of the ceiling type in which they are installed.

C. Install equalizing grids flush with take-off collar connection to supply duct with vanes perpendicular to air flow approaching diffuser.

D. Install in accordance with manufacturer's published recommendations as well as applicable sections of SMACNA manual and as specified above.

E. Install ceiling mounted grilles and registers with the blade deflection facing away from the line of sight.

F. Coordinate with other work, including ductwork and ductwork accessories, as necessary to interface installation of air outlets and inlets with other work

END OF SECTION 233713

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Outdoor roof curb mounted, electronically controlled, unit utilizing gas combustion for heating duty. Units shall discharge supply air horizontally as shown on contract drawings.

1.02 RELATED SECTIONS

A. Sheet Metal Work: Section 233113.

B. Division 26.

1.03 SUBMITTALS

A. Shop Drawings: Submit drawings for each size of factory fabricated roof curb.

B. Product Data: Manufacturer’s catalog sheets, brochures, performance charts, standard schematic drawings, specifications and installation instructions for each size unit.

C. Contract Closeout Submittals - Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Owner's Representative.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Unit shall be factory tested and the design, construction and installation shall be in accordance with the following: ARI Standard 210, NFPA, ASHRAE 15 (latest edition), Safety Code for Mechanical Refrigeration, and all State and Local codes or regulations having jurisdiction.
   2. Unit shall be listed by ETL as a total package.
   3. Rate cooling capacities in accordance with ARI Standard 210.
   4. Electrical components shall be UL listed.
   5. Gas heat equipped units shall be designed to conform with ANSI Standard Z21.47, Gas-Fired Central Furnaces.
   6. Roof curb shall be designed to NRCA criteria per Bulletin B-1986.
   7. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

1.05 PRODUCT DELIVERY

A. Unit shall be stored and handled as per manufacturer's recommendations.

B. Deliver each unit as an integral factory packaged assembly.

1.06 MAINTENANCE

A. Maintenance Service: A fully equipped authorized service organization capable of guaranteeing response within 8 hours to service calls shall be available 24 hours a day, 7 days a week to service the completed Work.

B. Extra Materials: Provide with each unit, one spare set of air filters. Suitable box and label spare filters as to their usage.

PART 2 - PRODUCTS

2.01 EQUIPMENT

A. A. General Specification
   1. Furnish and install a dedicated outdoor air system for the treatment of 100% constant outside air per plans and specifications. Unit(s) shall be completely factory assembled, tested, internally wired, and shipped in one piece.
   2. Unit(s) shall consist of insulated weather-tight casing with field installed outdoor intake hood, gas fired heat exchanger, direct drive supply fan, factory installed VFD, and unit controls.
   3. Packaged units shall carry an ETL listing. Manufacturer must have at least 20 years experience in manufacturing makeup air equipment.

B. Gas Heat (Natural)
   1. Heating shall be provided by a gas-fired heating section designed to provide a 5:1 power vented modulation with a minimum 80% thermal efficiency throughout the modulated range. The system shall modulate the gas and combustion air to maintain temperature setpoint and thermal efficiency.
   2. The heat exchanger shall be capable of 100 degree temperature rise for 100% outside air treatment. The heating system shall be factory installed and design certified to ANSI Standard Z83.8/CSA 2.6. The heat exchanger shall be tubular design constructed of 409 stainless steel.
   3. The gas burner shall be direct spark, multi-try, with a flame sensing circuit monitored by an electronic flame supervision system with 100% lockout via an integrated circuit board that incorporates LED diagnostics. Diagnostic codes shall include failed ignition.
   4. Certifications: The gas heat sections shall be approved to ANSI Z83.8/CSA 2.6. The packaged unit shall be certified to UL-1995 - UL Standards for Safety Heating & Cooling Equipment Second Edition: CAN/CSA C22.2 NO. 236-95. Safety Features: All heat sections for said unit shall feature factory installed:
      a. Automatic discharge air limit control
      b. Air proving pressure switch
      c. Color coded wiring and matching terminal blocks
      d. Circuit breaker protected transformers

C. Cabinet
   1. Outer casing is fabricated from G90 galvanized steel substrate with 60 gloss painted finish coat. Structural members shall be 18 gauge with double-wall foamed construction panel for all exterior surfaces.
   2. The unit shall have an overall R13 insulation value.
   3. The cabinet design shall prevent condensation forming on the outside of the unit casing in operation. Fully gasketed, hinged doors of double-wall foam construction shall provide access to filters, dampers, evaporator coils section, supply fan section, energy recovery wheel and exhaust fan. Provide hinged single wall construction doors for the heater section and control section. The unit shall have lockable door access.
   4. The unit control panel section shall be laid out to provide separation of high and low voltage components per UL standards. High voltage wiring shall be touch safe utilizing power distribution rails, race ways and wiring harnesses. The control panels shall be hinged for easy access to the unit controls. For ease of service, all electrical components will be clearly identified with 1/2” diameter self adhesive labels to match the unit specific wiring diagram. The low voltage and unit controller access electrical panel shall be physically isolated from the high voltage section. The open door to the control section will reveal the wiring diagrams, DDC programming instructions and all manuals and literature protected and permanently attached to the cover. All control transformers will incorporate integral, resettable circuit breaker protection.

5. An optional weatherproof convenience outlet will be accessible from the outside of the unit without the removal of any doors or access panels.

D. Air Side
1. The packaged unit shall allow fan inlet differential pressure readings inside the control panel to measure supply fan CFM with an accuracy of +/-5%.
2. The fan system shall be made of galvanized steel. The impeller shall have RAL 5002 coating, directional arrows marketing. The fan sled shall allow up to 176°F (80°C) for the impeller and the motor shall allow ambient temperatures -4°F to 104°F (-20°C to 40°C). The impeller and motor shall be designed for continuous operation.
3. The variable frequency drive shall be factory installed with line reactor, ECM Filter and all necessary wiring per UL standard. The drive shall have built in menu drive display with test, start-up, maintenance and diagnostic assistant. The drive shall be factory programmed for 30 second soft start. The drive shall have the following protection and alarms: single phase, over-voltage trip limit, under voltage trip limit, over temperature, microprocessor fault, motor stall protection, motor over temperature.
4. The unit shall meet the schedule performance. The unit control system shall have test and balance function to allow permanent setting of the airflow(s) as shown in the mechanical schedule.

E. Controls
1. The unit control panel section shall be laid out to provide separation of high and low voltage components per UL Standards. The primary control panel shall be hinged for easy access. Controls shall be factory configured for the design application with both the required hardware, operating parameters, and typical default control setpoints.
2. The controller is factory mounted on the unit and is pre-wired to the unit controls. The controller shall have visual (LED) status of power, running, and errors. LED indicators for each of the inputs/outputs. The unit shall be furnished and isntalled with a removed mounted display capable of providing full access to all commission variables, setpoints, alarms and diagnostic functions.
3. Each unit shall be equipped with an air-proving switch to ensure proper blower operation prior to enabling heating functions.
4. The alarm functionality shall include high temperature, low temperature, sensor failure, smoke alarm, power failure, heating failure and supply fan failure. The failures shall protect the unit and displays a code at the unit's display and the remote wall mounted display.
5. The unit will have test and diagnostics routines for services and start-up. The control system shall be able to provide temperature control per the sequence of operation shown.

F. Outdoor Air Section
1. Units shall be available with fully integrated factory installed 100% motorized outdoor air damper. The motorized damper shall be spring return for closure during unit shutdown or power interruption. The outsider air dampers shall be controlled occupied and unoccupied positions. Outdoor air inlet hood shall include 1" permanent filters. Units designed for 100% outside air intake only shall include an integrated transition section (without return air opening) designed specifically for 100% outside air introduction to allow uniform coil velocity and filter loading.

G. Filters
1. Filters shall mount integral within unit casing and be accessible through hinged access panel. Filters shall be 4" disposable pleated MERV13.

H. Full Perimeter Curbs
1. The curbs available from the manufacturer shall be designed to meet the National Roofing Contractors Association August 1985 guidelines for roof mounted installations. The roof curbs shall be 12 gauge zinc coated steel with a 2" x 6" nailer. Factory curb shall be required for systems requiring horizontal discharge or return air connection. The curb is to

be shipped knocked down with assembly instructions. The curb shall incorporated energy recovery options.

I. Options and Accessories
   1. Refer to equipment schedules on drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Roof Curbs:
   1. Install curbs in complete accordance with the manufacturer's printed instructions, and as indicated.
   2. Deliver roof curbs to construction contractor for installation.

B. Air Conditioners:
   1. Install equipment on roof curbs in complete accordance with the manufacturers' printed instructions, and as indicated.
   2. Provide all piping, electrical and ductwork connections to equipment through roof curb openings under units.

3.02 FIELD QUALITY CONTROL

A. Preliminary Requirements: Employ the services of a Company Field Advisor of the rooftop air conditioner manufacturer for the following:
   1. Inspect air conditioner installations prior to start-up.
   2. Supervise initial start-up of machine.
   3. Instruction of Owner's Personnel.
   4. Service.

B. Pre-Start-Up, Start-Up and Instruction: Upon completion of the installation of the air conditioner, to the satisfaction of the Company Field Advisor, start-up and preliminary testing shall be accomplished under the Company Field Advisor's supervision. When all necessary adjustments have been made and air conditioner is properly operating, the Company Field Advisor shall instruct Owner's Personnel in the operation and maintenance of the air conditioner and accessories.

END OF SECTION 237433

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Wiring devices.

1.02 RELATED WORK

A. Field painting, except such painting as is required to maintain shop coat painting and factory finish painting.

B. Cutting and patching for electrical work, except for errors and omissions under this Division.

1.03 QUALITY ASSURANCE

A. It is understood that the rights and benefits given the Owner by the guarantees found in the technical specifications are in addition to and not in derogation of any rights or benefits found in the special and general provisions of the contract.

B. Electrical equipment provided under this Division shall be turned over in operating condition. Instruction on further operation and maintenance shall be included in the operating and maintenance instructions.

1.04 REFERENCES

A. Perform work in accordance with standards listed below. Where these specifications are more stringent, they take precedence. In case of conflict, obtain a decision from the Engineer.
   1. NFPA-70: National Electrical Code
   2. International Building Code
   3. Applicable Town Ordinances.

1.05 PERMITS AND FEES

A. The Contractor shall obtain and pay for all permits, construction charges, fees, licenses, certificates, inspections and other use charges required in connection with the work.

B. Such permits include, but are not limited to:
   1. Electrical Inspectors, Inc., or a pre-approved electrical inspection agency.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. All materials and equipment used in carrying out these specifications shall have UL listing and label. Specifications and drawings indicate name, type, or catalog numbers of materials and equipment to be used as standards. Proposals shall be based on these standards. Contractor may use materials and equipment equivalent to those specified, subject to Engineer's approval.

PART 3 - EXECUTION

3.01 COORDINATION

A. Carefully examine specifications, drawings and project site to be thoroughly familiar with items which require electrical connections and coordination. Electrical drawings are diagrammatic and shall not be scaled for exact sizes.

B. Notify other Contractors of any deviations or special conditions necessary for the installation of work. Interferences between work of various contractors to be resolved prior to installation. Work installed not in compliance with specifications and drawings and without properly checking and coordinating as specified above shall, if necessary, be removed and properly reinstalled without additional cost to the Owner. Engineer to be mediating authority in all disputes arising on project.

C. Equipment shall be installed in accordance with manufacturer's recommendation. Where conflicts occur between contract documents and these recommendations, a clarification shall be requested of the Engineer for decision before preceding with such work.

3.02 CUTTING AND PATCHING

A. Repair or replace routine damage caused by cutting in performance of work under this Division.

B. Correct unnecessary damage caused due to installation of electrical work, brought about through carelessness or lack of coordination.

C. Repairs to be performed with materials which match existing materials and to be installed in accordance with appropriate sections of these specifications.

3.03 TESTS

A. On completion of work, installation shall be completely operational and entirely free from ground, short circuits, and open circuits. Perform a thorough operational test in presence of the Engineer. Balance all circuits so that feeders to panels are not more than 10% out of balance between phases with all available load energized and operating. Furnish all labor, materials and instruments for above tests.

B. Furnish Engineer with a copy of such tests including identification of each circuit and readings recorded, also the main service ground resistance test as described in Section 260526 of these specifications. Test information to include ampere readings of all panels and major circuit breakers, isolation resistance reading of motors and transformers.

3.04 IDENTIFICATION OF EQUIPMENT

A. Properly identify the following:
   1. Disconnect switches.
   2. Individually mounted circuit breakers.

B. Use permanently attached black phenolic plates with 1/4-inch white engraved lettering on the face of each, attached with two sheet metal screws.

3.05 INSTALLATION

A. The Contractor shall carefully move and replace existing equipment, appliances and all related items, as required to conduct proposed work.

B. Install and conduct all work per applicable NEC, State and local codes.

END OF SECTION 260000

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Electrical demolition.

1.02 RELATED SECTIONS

A. Section 011100 - Summary of Work

1.03 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Shop Drawings: Indicate demolition and removal sequence and location of salvageable items; location and construction of temporary work.

1.04 REGULATORY REQUIREMENTS

A. Conform to applicable code for demolition work, safety of structure and dust control.

B. Obtain required permits from authorities.

C. Notify affected utility companies before starting work and comply with their requirements.

D. Do not close or obstruct egress width to exits.

E. Do not turn off electric equipment without authorization from Owner.

F. Conform to procedures applicable when discovering hazardous or contaminated materials.

1.05 SCHEDULING

A. Schedule Work to coincide with new construction.

PART 2 - PRODUCTS

2.01 NOT USED.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify all field circuiting arrangements at Buildings.

B. Verify that abandoned wiring and equipment serve only abandoned facilities.

C. Demolition drawings are based on visual field observation. Report discrepancies to the Engineer before disturbing existing installation.

D. Beginning of demolition means installer accepts existing condition.

3.02 PREPARATION

A. Provide power, wiring and connections to maintain all existing power, control and telemetry systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Remove, relocate, and extend existing installations to accommodate new construction, as indicated on drawings.

B. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

C. Repair adjacent construction and finishes damaged during demolition and extension work.

D. Provide caps and filler plates/plugs for all openings in equipment and enclosures after removal of conduits.

E. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

F. Remove demolished materials from site as work progresses.

G. Completely remove and dispose of all electrical power, control, and telemetry feeds including conduits, conductors, boxes and supports not scheduled to remain after new construction is tested and operational.

H. Where existing devices and equipment are called to be removed, Contractor shall maintain circuit continuity to all existing devices and equipment remaining on that circuit. Contractor shall provide all required conduit, conductors and boxes as required.

3.04 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

B. Remove temporary work.

END OF SECTION 260010

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Wires and cables.

B. In general, the wires and cables included under this Section shall include, but not be limited to, the following:
   1. 600V power and control cable

C. All conductors to be continuous from origin to panel or equipment termination without splices.

1.02 REFERENCES

A. ANSI/NFPA 70 - National Electric Code.

B. NECA Standard of Installations.

1.03 SUBMITTALS

A. Submit product data under provisions of Section 013300.

1.04 QUALITY ASSURANCE

A. Products used in the work of this Section shall be produced by manufacturers regularly engaged in the manufacturing, installing and servicing of similar items with a history of successful production acceptable to the Engineer as specified herein and in accordance with the General Conditions.

B. Contractor shall submit the following information pertaining to the manufacturer(s):
   1. Complete literature, performance, and technical data describing the proposed equipment and listing of items made by the manufacturer.
   2. Location of closest service office from which this equipment shall be serviced.
   3. Location of closest parts inventory for item installation.

1.05 COORDINATION

A. Coordination:
   1. Coordinate wire and cable required with the equipment being furnished by others for the satisfactory operation of the equipment or system.
   2. Review installation procedures under other sections and contracts and coordinate them with the work specified herein.
   3. Notify other prime contractors in advance of the installation of the work included to provide them with sufficient time for installation and coordination of interrelated items that are included in their contracts and that must be installed in conjunction with the work included in this Section.

1.06 PROJECT CONDITIONS

A. Conductor sizes are based on copper at 75°C.

B. Wire and cable routing shown on Drawings is approximate unless dimensioned or specifically called for such as where conduit is to be embedded in concrete or masonry. Route wire and cable as required to meet project conditions and shall be routed above ceilings, directly under joists, in pipe trenches, where available, and in masonry. Where exposed conduit is permitted, it shall be run to maximize wall space.

C. Field verify destination location to determine cable routing.

D. Where wire and cable routing is not shown for proposed destination, determine exact routing and lengths required. Routing shall be reviewed with the Engineer.

PART 2 - PRODUCTS

2.01 CONDUCTORS

A. Install products in accordance with manufacturer's recommendations.

B. Single copper conductors with 600-volt insulation.

C. Minimum size of feeder conductors and grounds shall be No. 12 AWG.

D. Insulation: No. 12 AWG and No. 10 AWG, provide ANSI/NFPA 70, Type THWN-2.

E. Use solid conductor for feeder and branch circuits, 10 AWG and smaller.

F. All conductors shall include complete set of manufacturer's markings for insulation and conductor size.

G. Manufacturers shall be ANACONDA, TRIANGLE, ROME, or approved equal.

H. For single phase voltage, provide white colored neutral conductors; provide black, color coded phase conductors; provide green colored ground conductors.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:
   1. Make terminations in accordance with cable manufacturers instructions for the particular type of wire and cable.
   2. All splices shall be in made in terminal boxes.

B. Wire and Cable Sizes: The sizes of wire and cable shall be as shown on the Contract Drawings, or if not shown, as approved by the Engineer. Minimum size wire shall be No. 12 AWG for all power, lighting and receptacle circuits. Wires for control circuits shall be No. 14 AWG minimum. If due to field routing the voltage drop exceeds 2.5%, the size of conductors shall be increased such that 2.5% is the maximum voltage drop incurred.

C. Number of Wires: The number of wires indicated on the Contract Drawings for the various control, indications, and metering circuits were determined for general schemes of control and for particular indication and metering systems. Coordinate wiring schemes with equipment schematics.

D. Wiring Identification: All wiring shall have a unique wire number and be labeled at both ends. Wire numbers shall correspond with the equipment terminal wire numbers. Where no wire numbers are indicated, the Contractor shall assign wire numbers. Wire numbers shall not be duplicated.

E. Cable Identification Tags: The Contractor shall furnish all labor and materials and affix in a permanent way to each cable in manholes, cable compartments and vaults, junction boxes, pull boxes and points of termination, a laminated plastic tag, bearing clearly printed, the cable

number indicated on the Contract Drawings or some other approved identification number or symbol. All cables shall be temporarily tagged with its full ID number immediately after it has been pulled.

F. Wiring Supplies: Only electrical wiring supplies manufactured under high standards of production and meeting the approval of the Engineer shall be used. Friction tape shall be in accordance with ASTM D69.

G. Training of Cable: Furnish all labor and material required to train cables around cable vaults within buildings and in manholes in any outdoor underground duct system. Sufficient length of cable shall be provided in each manhole and vault so that the cable can be trained and racked in an approved manner. In training or racking, the radius of bend of any cable shall be not less than the manufacturer's recommendation. All manhole cables shall be arc and fireproofed.

H. Pulling Temperature: Cable shall not be flexed or pulled when the temperature of the insulation or of the jacket is such that damage will occur due to low temperature embrittlement. When cable will be pulled with an ambient temperature within a three day period prior to pulling of 40°F or lower, cable reels shall be stored during the three day period prior to pulling in a protected storage with an ambient temperature not lower than 55 degrees F and pulling shall be completed during the work day for which the cable is removed from the protected storage.

I. Color Coding:
   1. Conductor jacket shall be color coded as follows:

AC POWER

480V/277 Volt 3 phase	208Y/120 Volt 3 phase (PSEGLI)	208Y/120 Volt 3 phase (NEC)	240/120 Volt 3 phase (PSEGLI)	240/120 Volt 3 phase (NEC)
Phase A Brown	Phase A Blue	Phase A Black	Phase A Blue	Phase A Black
Phase B Orange	Phase B Black	Phase B Red	Phase B Black	Phase B Orange (HiLeg)
Phase C Yellow	Phase C Red	Phase C Blue	Phase C Orange	Phase C Blue
Neutral White	Neutral White	Neutral White	Neutral White	Neutral White
Ground Green	Ground Green	Ground Green	Ground Green	Ground Green

   2. Control (Per ICEA Method 1, K-2):

WIRE NUMBER	COLOR
1	Black
2	Red
3	Blue
4	Orange
5	Yellow
6	Brown
7	Red With Black
8	Blue With Black
9	Orange With Black
10	Yellow With Black

WIRE NUMBER	COLOR
11	Brown With Black
12	Black With Red
13	Blue With Red
14	Orange With Red
15	Yellow With Red
16	Brown With Red
17	Black With Blue
18	Red With Blue
19	Orange With Blue

3. Equipment Ground - GREEN

3.02 IDENTIFICATION

A. Identify wire and cable under provisions of Section 260553.

B. Identify each conductor with its circuit number.

3.03 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Section 014500.

B. Inspect wire and cable for physical damage and proper connection.

C. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.

D. Field Testing:
1. Wires and cables shall be tested before being connected to motors, devices or terminal blocks.
2. If tests reveal defects or deficiencies, the Contractor shall make the necessary repairs or shall replace the cable as directed by the Engineer, without additional cost to the Owner.
3. All tests shall be made by and at the expense of the Contractor who shall supply all testing equipment.

E. Continuity Tests: All cables, wires and shields shall be tested for continuity. Testing for continuity shall be by test light or buzzer.

F. Insulation-Resistance Tests:
1. 600V power and control cables and wires shall be tested for their insulation-resistance values. Test shall utilize a megohmmeter with applied voltage to be 1000VDC for one (1) minute. Insulation-resistance test shall be performed on each conductor with all other conductors grounded. The resistance value shall be 20 megohms or greater.
2. 300V instrumentation signal cable shall be tested from conductor to conductor, conductor to ground, and conductor to shield using a digital volt-ohm meter. The resistance value shall be 10 megohms or greater.

END OF SECTION 260519

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Equipment grounding conductors.

B. Bonding.

1.02 REFERENCES

A. ANSI/NFPA 70 - National Electric Code.

1.03 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc.

PART 2 - PRODUCTS

2.01 COMPONENTS

A. Raceways, conductors, outlet boxes, pull and junction boxes to be furnished in accordance with applicable sections of these specifications.

B. Wire: Copper, sized to meet NFPA 70 requirements.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:
   1. Clean all conductive surfaces on equipment to be grounded, to assure good electrical continuity.
   2. Effectively bond all grounding conductors to equipment enclosures and ground busses.
   3. Locate all grounding attachments away from areas subject to physical damage. Provide protective covering as required.

B. Feeder/Branch Circuits:
   1. All circuits shall have a separate green grounding conductor in conduit sized in accordance with NFPA 70. Minimum size of conductor shall be No. 12 AWG.
   2. Flexible conduit will not be approved as achieving continuity of ground. All flexible conduit to have a jumper wire sized to ampacity of branch breaker and to be connected to conduit system on both ends; this applies to fixtures, motors, controls, etc.

3.02 TEST

A. Test ground on main service. Ground system resistance shall be no greater than 10 ohms using test equipment similar to a "Biddle" test. Test data to be submitted to the Engineer for approval and such approved test data to become a part of the Record Documents.

END OF SECTION 260526

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. System of supporting devices and hangers for support or bracing for conduit, electrical equipment, safety switches, outlet boxes, junction boxes and cabinets.

1.02 RELATED SECTIONS

A. Section 260533 - Raceways and Boxes for Electrical Systems.

1.03 REFERENCES

A. ANSI/NFPA 70 - National Electric Code.

1.04 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc.

PART 2 - PRODUCTS

2.01 EQUIPMENT REQUIREMENTS

A. Provide appropriate corrosion-resistant supporting devices and hangers for electrical equipment, as manufactured by ERICO PRODUCTS, INC., CADDY FASTENERS, STEEL CITY, MINERALLAC or equivalent.
   1. "Z" purlin clips.
   2. Conduit clips.
   3. Beam clamps (universal and vertical flange).
   4. Beam clamps (set screw type).
   5. Combination push-in conduit clips.
   6. Combination conduit hanger clamps.
   7. Flexible conduit clips.
   8. Special combination conduit clips.
   9. One hole steel straps.
   10. Conduit hangers.

B. Provide materials, sizes and types of anchors, fasteners and supports to carry the loads of equipment, wire in conduit and conduit.

2.02 CHANNEL SUPPORT SYSTEM

A. Channel systems and supports shall be manufactured by KINDORF/THOMAS & BETTS, or approved equal.

B. Channels shall be 1-1/2" x 1-1/2".

C. Channels and all associated accessories and bolts shall be hot dipped galvanized.

D. Channels shall have 9/16" bolt holes on 1-1/2" centers.

E. Provide end caps for all channels.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Secure conduits to within 3 feet of each outlet box, junction box, cabinet, fitting, etc., and at intervals not to exceed 10 feet in accordance with currently effective edition of the National Electric Code.

B. In seismic zones, support conduits 1 inch and smaller at 6 foot intervals.

C. Install clamps secured to structure for feeder and other conduits routed against structure. Use drop rods and hangers to support conduits run apart from the structure.

D. Provide and install suitable angle iron, channel iron or steel metal framing with accessories to support or brace electrical equipment including safety switches, etc.

E. Paint all supporting metal not otherwise protected, with rust inhibiting primer and then with a finish coat if appropriate to match the surrounding metal surfaces. Prepainted or galvanized support material is not required to be painted or repainted.

F. Do not use chains, perforated iron, baling wire or tie wire for supporting conduit runs. Use of clips to support conduit to top of t-bar ceiling grid will not be permit-ted.

G. Obtain permission from Engineer before drilling or cutting structural members.

H. Install surface mounted cabinets with a minimum of four anchors.

I. Do not fasten supports to pipes, ducts, mechanical equipment and conduit.

J. Install products in accordance with manufacturer's instructions.

END OF SECTION 260529

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Conduit system with associated couplings, connectors and fittings. Conduits to be mechanically and electrically continuous from outlet to outlet and from outlets to cabinets, pull or junction boxes.
   1. Conduit Use - Rigid Galvanized Conduit:
      a. All exterior circuits above and below ground.
   2. Conduit Use - Electrical Metallic Tubing (EMT) Conduit:
      a. All interior circuits above ground.
      b. All circuits concealed in CMU walls.
   3. Conduit Use - Flexible Liquid-tight Metal Conduit:
      a. Connecting motors, generators and other equipment subject to vibration, maximum length - 3 feet.
      b. Passing through building expansion joints.

B. Pull boxes, junction boxes and wire troughs

1.02 REFERENCES

A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.

B. ANSI/NFPA 70 - National Electric Code.

C. NECA Standard of Installation.

D. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

E. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.

F. NEMA 250 - Enclosures for electrical equipment (1000 volts maximum).

1.03 SUBMITTALS

A. Submit product data under provisions of Section 013300.

B. Working Drawings:
   1. Prior to equipment submission, submit a list of proposed manufacturers with the products they produce proposed for the contract.
   2. Manufacturer’s catalog cuts for the conduit, boxes, fittings and supports proposed for use.
   3. Construction details of conduit racks and other conduit support systems with seismic restraint details and calculations signed by a licensed Engineer.
   4. Scaled working drawings showing proposed routing of all conduits, inclusive of conduits routed above grade on exterior support structures, embedded in structural concrete and conduits directly buried in earth. Drawings shall show locations of pull and junction boxes and all penetrations in walls and floor slabs.

1.04 REGULATORY REQUIREMENTS

A. Furnish products listed and classified by Underwriters Laboratories, Inc.

B. Conform to requirements of ANSI/NFPA 70.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 017839.

B. Accurately record actual routing of all conduits.

1.06 FIELD SAMPLES

A. Provide under provisions of Section 014500.

B. Provide field sample of conduit two each at 2 feet in length.

C. Provide field sample of expansion/deflection fitting, two each.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect, and handle products in accordance with manufacturers' recommendations.

B. Accept conduit on site. Inspect for damage.

C. Protect conduit from corrosion and entrance of debris by storing abovegrade. Provide appropriate covering.

1.08 PROJECT CONDITIONS

A. Verify all conduit routings by field measurements.

B. Verify routing and termination locations of conduit prior to rough-in.

C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system. Provide all required sweeps, boxes and fittings.

PART 2 - PRODUCTS

2.01 RIGID GALVANIZED CONDUIT

A. Rigid conduit shall be hot dipped, galvanized, or electro-galvanized steel by Wheatland, Triangle, Republic or approved equal.

B. Associated couplings, connectors and fittings shall be as manufactured by THOMAS & BETTS CORP., O.Z. GEDNEY CO., EFCOR or approved equal. Catalog numbers used below are those of THOMAS & BETTS CORP. based on 3/4-inch size and are considered standards by which equivalents are to be judged.

C. ERICKSON couplings, Series 676 or approved equal, shall be used where neither length of conduit can be rotated.

D. Conduit connectors shall be threaded type. Set screw and compression type connections ARE NOT acceptable.

E. Sealing fitting locknuts shall be Series 142SL.

F. Steel or malleable iron insulated bullet hub, Series 370-379, complete with sealing "O" ring. DO NOT use "die cast" material.

G. Entrance ells shall be Series 1491 or approved equal.

H. Combination coupling shall be Series 531 for connecting rigid galvanized conduit to electrical metallic tubing.

2.02 ELECTRICAL METALLIC TUBING (EMT)

A. Electrical metallic tubing shall be WHEATLAND, TRIANGLE, REPUBLIC, or approved equal.

B. Associated couplings, connectors and fittings shall be as manufactured by THOMAS & BETTS CORP., O.Z. GEDNEY CO., EFCOR, or approved equal. Catalog numbers used below are those of THOMAS & BETTS CORP. based on 3/4-inch size and are considered standards by which equivalents are to be judged.

C. EMT connectors shall be TC-2125C compression type with threaded locknut. Set screw connectors will not be acceptable.

D. EMT couplings shall be TK-2125C compression type. Set screw connectors will not be acceptable.

2.03 DUCT SEAL

A. RectorSeal or approved equal.

B. Model #: 81881

2.04 FLEXIBLE LIQUID-TIGHT METAL CONDUITS AND FITTINGS

A. Liquid-tight flexible metal conduit shall be ANACONDA or approved equal.

B. Description: Interlocked steel construction with PVC jacket.

C. Provide flexible liquid-tight conduits and fittings as manufactured by THOMAS & BETTS CORP., O.Z. GEDNEY CO. or approved equal. Catalog numbers used below are those of the THOMAS & BETTS CORP., based on 3/4" size and are to be considered as standards by which equivalents are to be judged. All conduit shall be liquid-tight flexible type, UL type UA, or suitable for exposure to continuous or intermittent moisture.

D. Flexible liquid-tight connectors shall be Series 5333 or approved equal.

2.05 PULL BOXES

A. All pull boxes used for this project shall be minimum LIPA B-3-6 or specifically approved equal for all customer installed power and control circuits.

B. Provide H-20 Cast-Iron Traffic Load Cover. Cover shall have 3” high logo “Electric”.

2.06 JUNCTION BOXES

A. Acceptable Manufacturers: RACO, GENERAL ELECTRIC or approved equal.

B. Sheet metal boxes: NEMA OS1, galvanized steel.

C. Covers: Galvanized steel.

2.07 WIRE TROUGH

A. Wireways shall be manufactured by Square D, Class 526, rain tight trough or approved equal.

B. Wireway shall be completely enclosed with removable covers.

C. Construction: 16 Gauge Galvanized Steel. 8-inch and 12-inch wire trough shall be 14-gauge galvanized steel.

D. Finish: ANSI-49 epoxy paint applied by cathodic electro-deposition paint process over a corrosion resistant phosphate preparation.

E. UL listed.

2.08 ELECTRICALLY CONDUCTIVE CORROSION-RESISTANT THREAD COMPOUND

A. KOPR-SHIELD or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION OF CONDUITS

A. Minimum size of conduits shall be 3/4-inch.

B. Minimum conduit depth shall be 24" below grade, measured to the top of the conduit on exterior underground installations.

C. Conduit joints shall be cut square, threaded, reamed smooth, and drawn up tight so conduit ends will butt in couplings, connectors and fittings.

D. All threaded conduits and fittings shall have KOPR-SHIELD compound applied to all threads prior to assembly.

E. Make bends or offsets with standard ells or field bends with an approved bender.

F. Run concealed conduits in direct line with long sweep bends or offsets. Run exposed conduits parallel to and at right angles to building lines. Group multiple conduit runs in banks.

G. Secure conduits to all boxes and cabinets with double locknuts and bushings so system will be electrically continuous from service to all outlets.

H. Install conduit in accordance with NECA Standard of Installation.

I. Cap ends of conduits to prevent entrance of water and other foreign material during construction.

J. Complete all conduit systems before pulling conductors.

K. Support conduits under provisions of Section 260529.

L. Provide approved expansion joints or fittings and bonding jumpers where conduits in concrete pass through building expansion joints.

M. Provide cable supports in conduits rising vertically in accordance with the National Electric Code, Article 300-19.

N. Provide No. 12 AWG copper pull wires or nylon cord in all empty conduits. Steel wire not acceptable as pull wire.

O. Install conduit to preserve fire resistance rating of partitions and other elements.

P. Ground and bond conduit under provisions of Section 260526.

Q. Where neither length of conduit can be rotated, ERICKSON couplings Series 676 shall be used.

R. Where conduits running overhead pass through building expansion joints, install flexible liquid tight conduit of same size with sufficient slack to allow conduits on either side of expansion joint to move a minimum of 3-inches in any direction. Provide supports as required on each side of expansion joint, all in accordance with seismic requirements of specific area.

S. Failure to route conduit through building without interfering with other equipment and construction shall not constitute a reason for an extra charge. Equipment, conduit and fixtures shall fit into available spaces in building and shall not be introduced into building at such times and manner as to cause damage to structure. Equipment requiring servicing shall be readily accessible.

T. Arrange supports to prevent misalignment during wiring installation.

U. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

V. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.

W. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.

X. Do not attach conduit to ceiling support wires.

Y. Arrange conduit to maintain headroom and present neat appearance.

Z. Route exposed conduit parallel and perpendicular to walls.

AA. Route conduit installed above accessible ceilings parallel and perpendicular to walls.

AB. Maintain adequate clearance between conduit and piping.

AC. Maintain 12-inch clearance between conduit and surfaces with temperatures exceeding 104°F (40°C).

AD. Bring conduit to shoulder of fittings; fasten securely.

AE. Use conduit hubs with sealing locknuts to fasten conduit in damp and wet locations.

AF. Install no more than equivalent of three 90-degree bends on interior locations between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows for bends in metal conduit larger than 2-inch size.

AG. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

AH. Do not use dissimilar strap or clamp supports. Provide dielectric tape, fittings, straps, and bushings where dissimilar metals are used.

AI. Where fittings for liquid-tight flexible conduit are brought into an enclosure with a knockout, a gasket assembly, consisting of one piece "O" ring, with a Buna-R sealing material, Series 5200, shall be installed on outside of box. Fittings shall be made of either steel or malleable iron only, and shall have insulated throats or insulated bushings.

AJ. A copper ground wire sized in accordance with NEC shall be installed on the inside of the conduit as a jumper around flexible conduit to assure a continuity of ground.

AK. Install a copper jumper across all flexible conduit including lighting fixtures, controls and other utilization equipment.

AL. Install liquid-tight flexible conduit in such a manner as to prevent liquids from running on surface toward fittings.

AM. Allow sufficient slack conduit to reduce the effect of vibration.

AN. Complete all conduit systems before pulling the conductors.

AO. Support in accordance with requirements of National Electric Code.

3.02 INSTALLATION OF PULL BOXES, JUNCTION BOXES AND WIRE TROUGHS

A. Provide junction boxes as shown on Drawings and otherwise where required, sized according to number of conductors in box or type of service to be provided. Minimum junction box size 4-inch square and 2-1/8-inches deep. Provide screw covers for junction boxes.

B. Install boxes in conduit runs wherever necessary to avoid long runs or too many bends. Do not exceed 100-foot runs without pull boxes. Install pull boxes at all 90-degree bends.

C. Rigidly secure boxes to walls or ceilings. Conduit runs will not be considered adequate support.

D. Install boxes with covers in accessible locations. Size boxes in accordance with the National Electric Code.

E. Do not install pull boxes or junction boxes for joint use of line voltage and signal or low voltage controls unless all conductors are insulated for the highest voltage being used in the same box.

3.03 CONDUIT LOCATIONS

A. Conduits runs in utility rooms shall be surface mounted. Conduits shall be installed in walls in finished spaces. Exposed horizontal conduit runs shall not be permitted. All horizontal runs shall be installed above finished ceilings.

B. Contractor shall not route conduits over pump motors, roof hatches and trolly beams which would prevent removal of pump motors.

END OF SECTION 260533

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Nameplates and labels.

B. Wire and cable markers.

C. Conduit markers.

1.02 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.03 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Provide catalog data for nameplates, labels and markers.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Underwriters Laboratories, Inc. Include instructions for storage, handling, protection, examination, preparation and installation of product.

1.04 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PART 2 - PRODUCTS

2.01 NAMEPLATES AND LABELS

A. Nameplates: Engraved three-layer laminated plastic, white letters on black background.

B. Locations:
   1. All Disconnect and control switches.

C. Letter Size:
   1. Use 1/4 inch (6 mm) letters for identifying all control pilot lights.

D. Labels: Embossed adhesive tape, with 3/16” (5mm) white letters on black background. Use for identifying existing equipment, distribution panels, switchboards, disconnect switches, and individual electrical devices.

2.02 WIRE MARKERS

A. Manufacturers:
   1. 3M ELECTRICAL SPECIALTY DIV., Product Scotch Code.
   2. THOMAS & BETTS CORP., Product E-Z Code.
   3. Substitutions shall be permitted only after receiving written approval from the Engineer.

B. Description: Epoxy film tape type wire markers.

C. Locations: Each conductor at panelboards, auxiliary gutters, pull boxes, outlet and junction boxes, circuit breakers and each load connection.

D. Legend:
   1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.
   2. Control Circuits: Control wire number indicated on interconnection diagrams on drawings.

2.03 CONDUIT MARKERS

A. Manufacturers:
   1. THOMAS & BETTS CORP.
   2. Substitutions shall be permitted only after receiving written approval from the Engineer.

B. Description: Self-sticking vinyl; black letters on orange background.

C. Location: Furnish markers for each conduit longer than 6 feet (1.8 m).

D. Spacing: 20 feet (6 m) on center.

PART 3 - EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

3.02 APPLICATION

A. Install nameplate and label parallel to equipment lines.

B. Secure nameplate to equipment front using screws, rivets or adhesive.

C. Secure nameplate to inside surface of door on panelboard that is recessed in finished locations.

D. Apply conduit markers at 20 foot (6 m) intervals.

3.03 ELECTRICAL EQUIPMENT IDENTIFICATION

A. The Contractor shall identify all existing circuits in existing distribution panels, switchboards and disconnect switches to remain.

B. Label all circuits identifying the load served including all individual circuit breakers.

C. Label all new circuit breakers and switches used for new feeder and branch circuits.

D. Contractor shall furnish a minimum of 5 custom engrave three-layer laminated plastic labels with up to 20 words per label as directed by the engineer/owner in addition to the required labels for all disconnect switches.

END OF SECTION 260553

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Disconnect switches.

B. Panel Circuit Breakers.

1.02 REFERENCES

A. NEMA KS-1 - Enclosed Switches.

B. FS W-S 865 - Switch, Box (Enclosed), Surface Mounted.

C. NEMA AB1 - Molded Case Circuit Breakers.

1.03 SUBMITTALS

A. Submit product data under provisions of Section 013300.

B. Include outlet drawings with dimensions and equipment ratings for voltage, capacity, horsepower and short circuit current ratings.

1.04 RELATED SECTION

A. Section 260553 - Identification for Electrical Systems.

1.05 COORDINATION

A. Coordinate layout and installation of switches and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.01 DISCONNECT SWITCHES

A. Disconnect switches shall be GENERAL ELECTRIC, heavy-duty Type DU or approved equal.

B. 75ºC conductor ratings.

C. Ratings: 600VAC

D. Quick-break, quick-make, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.

E. UL listed for Class R 200,000 RMS amps, symmetrical IC.

F. Enclosures: Refer to drawings.

PART 3 - EXECUTION

3.01 INSTALLATION REQUIREMENTS

A. Install individual wall-mounted switches with tops at uniform height unless otherwise indicated.

B. Temporary Lifting Provisions: Removed temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

C. Provide switches/panel circuit breakers at locations as indicated on drawings.

D. Refer to drawings for ampacity ratings, number of poles and enclosure ratings.

E. Install engraved nameplates on each switch identifying the following:
   1. Switch designated.
   2. Load served.
   3. Power origination.

3.02 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION 262816

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Disinfection of potable water piping, valves, pumping and treatment units.

1.02 REFERENCES

A. ANSI/AWWA B300 - Standard for Hypochlorites

B. ANSI/AWWA B301 - Standard for Liquid Chlorine

C. ANSI/AWWA C651 - Standard for Disinfection of Water Mains

D. ANSI/AWWA C652 - Standard for Disinfection of Water Storage Facilities

E. ANSI/AWWA C653 - Standard for Disinfection of Water Treatment Plants

1.03 SUBMITTALS

A. Submit proposed method for introducing disinfectant into the treatment unit. If media must be disinfected, obtain method for disinfecting from supplier.

B. Test Reports: Indicate results comparative to specified requirements.

C. Certificate: Certify that cleanliness of filter tanks, towers and clearwell meets or exceeds specified requirements.

1.04 PROJECT RECORD DOCUMENTS

A. Prepare and submit a disinfection report containing the following:
   1. Type and form of disinfectant used.
   2. Date and time of disinfectant injection start and time of completion.
   3. Test and injection locations.
   4. Initial and 24-hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
   5. Date and time of flushing start and completion.
   6. Disinfectant residual after flushing in ppm for each outlet tested.

B. Prepare and submit complete water analysis results with the following information:
   1. Date issued, project name and testing laboratory name, address and telephone number.
   2. Time and date of water sample collection.
   3. Name of person collecting samples.
   4. Test locations.
   5. Initial and 24-hour disinfectant residuals in ppm.
   6. Coliform bacteria and chemical test results.
   7. Certification that water conforms or fails to conform to New Jersey State Drinking Water Standards.
   8. Laboratory Director's signature and authority.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with ANSI/AWWA C651, ANSI/AWWA C652 and ANSI/AWWA C653.

1.06 QUALIFICATIONS

A. Water Treatment Firm: Company specializing in disinfecting potable water systems specified in this Section with minimum three (3) years experience.

B. Testing Firm: Sea Girt Borough approved laboratory, Aquatic Services Labs.

1.07 REGULATORY REQUIREMENTS

A. Conform to Recommended Standards for Water Works and applicable codes or regulations for performing the work of this Section.

B. Provide Engineer three (3) days advanced notification of proposed sampling date. Sampling shall be conducted in accordance with N.J.A.C. 7:12.11.

PART 2 - MATERIALS

2.01 DISINFECTION CHEMICALS

A. ANSI/AWWA B300, Hypochlorite

B. ANSI/AWWA B301, Liquid Chlorine

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that all piping systems and treatment units have been cleaned, inspected and pressure tested.

3.02 EXECUTION

A. Provide required equipment to perform the work of this Section. The Owner will provide the water required for the initial disinfection and filling of the piping, and valves, etc. The Contractor shall pay for the water required for any subsequent filling of these systems based on the Owner's retail water rate.

B. Disinfect system in accordance with Section 4.1 or Section 4.3 of AWWA C651.

C. Iron removal system water quality sampling procedures:
   1. The contractor shall disinfect each vessel after all interior vessel work is complete, with the exception of media placement, and provide two (2) consecutive 24 hour micro-bacteriological tests on the effluent of each vessel. Tests shall be performed prior to obtaining written authorization from the engineer to place media in the vessel.
   2. After loading of the media, the contractor shall provide two (2) consecutive 24 hour micro-bacteriological tests on the tank influent and effluent, one (1) organic compount analysis on each vessel effluent, one (1) inorganic compound analysis on each vessel influent and effluent, and one (1) additional test for iron and manganese on each vessel effluent. All tests shall be performed prior to obtaining written authorization from the engineer to place vessel into service. Organic and inorganic testing, at a minimum, shall include the following compounds:
      a. Benzene
      b. Chlorobenzene
      c. Ethylbenzene
      d. Toluene

e. Styrene
f. Vinyl Chloride
g. m-,o-,p-xylene
h. Alkalinity, total
i. Heavy metals, including antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury
j. Iron
k. Manganese
l. Hardness, total and calcium

D. Collect samples 48 hours after flushing disinfectant and refilling with potable water. Samples shall not be collected if chlorine residual is greater than 0.1 mg/L, or greater than distribution system residual, if chlorinated system water is used for testing.

E. Chemical tests shall include bacteriological, inorganic chemicals, volatile halogenated organics, non-volatile organics, heavy metals and any other tests required by the NJDEP.

F. If water quality in system does not meet the bacteriological requirements of the NJDEP for potable water, the Contractor, at no additional cost to the owner, shall re-chlorinate or take other steps necessary to provide acceptable water quality. Samples shall be collected and analyzed after each attempt. All costs associated with subsequent sampling shall be borne directly by the Contractor.

G. Neutralize residual chlorine to less than 1 mg/l with a suitable quantity of sodium bisulfite, sodium sulfide or sodium thiosulfate prior to disposal.

H. For this project, a minimum of six (6) sets of bacteriological samples for plant/site distribution water main will be required. Take samples at the appropriate time intervals as required by the NJDEP. Verify sampling location with the Engineer.

3.03 QUALITY CONTROL

A. Provide analysis and testing of treated water in vessels and clearwell.

B. Test samples in accordance with ANSI/AWWA C652 and C653 and the New Jersey Administrative Code Chapter 7:10-12.11

C. Test samples in accordance with ANSI/AWWA C652 and C653 and the local health department.

END OF SECTION 331140

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Large interior piping systems.

1.02 RELATED SECTIONS

A. Section 331140 - Disinfection of Water Facilities

1.03 REFERENCES

A. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings

B. ANSI/AWWA C104 - Cement-Mortar Lining for Ductile Iron Pipe and Fittings

C. ANSI/AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids

D. ANSI/AWWA - C115/A21.15 - American National Standard for Flanged Ductile Iron Pipe with Threaded Flanges

E. ANSI/AWWA C150/A21.50 - American National Standard for Thickness Design of Ductile Iron Pipe

F. ANSI/AWWA C600 - Installation of Ductile Iron Water Mains and Appurtenances

G. ANSI B18.2.1 - Square and Hex Bolts and Screws Inch Series Including Hex Cap Screws and Lag Screws

H. ANSI B18.2.2 - Square and Hex Nuts (Inch Series)

I. ASTM A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength

1.04 SUBMITTALS

A. Submit product data under provisions of Section 013300.

B. Product Data: Provide data on pipe material, pipe fittings, and accessories. Provide manufacturer's catalog information.

PART 2 - PRODUCTS

2.01 DUCTILE IRON PIPE AND FITTINGS

A. ANSI/AWWA C151/A21.51; double thickness cement lining minimum 3/16" in accordance with ANSI/AWWA C104/A21.04, bituminous coating inside; and epoxy primer outside; flanged joint for exposed pipe, thickness Class 52 minimum for all pipe diameters.
   1. Fittings: ANSI/AWWA C110, Ductile iron, standard thickness.
   2. Flanged Joints: ANSI B16.1, Class 125 with full face, 1/8" thick rubber gaskets.
   3. Bolts: ANSI B18.2.1 and ASTM A307 Grade B.
   4. Nuts: ANSI B18.2.2 and ASTM A307 Grade B.
   5. Lubricant for Joints: Nontoxic; shall not support growth of bacteria; shall have no deteriorating effects on gasket or pipe material.
   6. Manufacturer: TYLER UNION, SIGMA, U.S. PIPE & FOUNDRY CO., GRIFFIN PIPE PRODUCTS or specifically approved equal.

B. Flanged Adapters: Dresser Industries, Inc., Style 127 for plain end steel or cast iron pipe with all bolts, rings, gaskets and accessories.

C. Restrained Flange Adapters: EBAA Iron Inc., Style 2100 Megaflange.

D. Couplings: Dresser Industries, Inc., Style 38 for plain end steel or cast iron pipe with all bolts, rings, gaskets and accessories.

E. Piping extending outside buildings shall be mechanical joint.

2.02 PIPE ACCESSORIES

A. Joint Restrainers: Joint restrainers shall be Style 442 with tiebolts for flanged piping as manufactured by STAR NATIONAL PRODUCTS.

B. Pipe Supports: Pipe supports shall be manufactured by MATERIAL RESOURCES:
   1. Pipe Saddle Support: Standon Model S92. Minimum Quantity: Two (2)/10'
   2. Pipe Flange Support: Standon Model S89. Minimum Quantity: Two (2)/10'

PART 3 - EXECUTION

3.01 INSTALLATION

A. Clean inside of pipe before installation. Keep installed piping clean and protect ends from foreign matter by capping or plugging.

B. Install pipe so that it does not interfere with opening of doors or apparatus, access to equipment or any portion of electrical equipment. Group piping whenever practical at common elevations.

C. Run pipes in straight lines and square with building. Install rise plumb. Make offsets only where indicated and where necessary.

D. Install pipes so that expansion and contraction will not cause undue stress or strain to pipes or equipment. Provide loops, offsets and expansion joints as shown on drawings. If, in contractor's opinion, inadequate loops or offsets are shown, contact Engineer for instructions.

E. Provide flanges and unions throughout the pipe systems to make installation and removal of piping and equipment convenient. Make provisions for servicing and removal of equipment without dismantling piping.

F. Label piping after testing.

G. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

H. Install valves with stems upright or horizontal, not inverted.

I. Core drill through existing walls and floors to provide clearance around pipe to be installed and install link seals.

J. Install ductile iron piping and fittings to ANSI/AWWA C600.

K. Install flanged adapters and couplings in accordance with manufacturer's installation instructions. Drawings show minimum required adapters and couplings. Contractor shall install additional coupling and adapters as required for installation and disassembly of the piping systems.

L. Install pipe saddle supports and pipe flange supports to brace piping systems in locations shown on contract plan or as directed by Engineer. Installation shall be in accordance with manufacturer's installation instructions.

3.02 PIPE JOINTING

A. Preparing pipe ends: Cut pipe ends square with pipe cutters only. Do not use hacksaws or torch. Ream pipe ends, after cutting, to full diameter. Where pipe is to be threaded, die-cut right hand, pipe stand, clean cut full depth, taper threads. Make threaded joints so that they will be leak proof without caulking. Apply a thin coat of approved pipe lubricant to make threads only.

B. Bracing joints: Provide braces and bridle rods as required to reinforce joints. Where large pipes underground are subject to shock because of sudden changes in liquid flow rate, provide concrete "kicker" blocks at joints, fittings and changes of pipe direction.

C. Flanged ductile iron pipe joints: Clean face of flange of all sand, grease, grit or other foreign matter. Center gasket before assembling joints. After alignment has been completed insert bolts and hand tighten nuts. Keep gap between flanges approximately uniform while tightening. Tighten bolts to required torque in several steps, alternating from one side to the other.

3.03 RECHECKING AND REPAIRING

A. Before piping is concealed, recheck it for leaks.

B. Rework or replace defective and leaking joints, and joints which are otherwise unsatisfactory. Peening, caulking and doping are not permitted.

END OF SECTION 402323

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Air Vacuum Valves

1.02 RELATED SECTIONS

A. Section 331140 - Disinfection of Water Facilities

B. Section 402323 - Potable Water Process Piping

1.03 REFERENCES

A. ASME/ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings

B. ASME/ANSI B16.34 - 2004 Valves Flanged, Threaded and Welding End

C. ASTM A126 - Grey Iron Castings for Valves, Flanges and Pipe Fittings

D. ASTM A536 - Ductile Iron Castings

E. AWWA C550 - Protective Epoxy Interior Coatings for Valves and Hydrants

F. ANSI/NSF Standard 61, Drinking Water System Components

1.04 SUBMITTALS

A. Submit product data under provisions of Section 013300.

B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

C. Submit the following:
   1. Technical descriptive data for the valves showing model number, size, capacity, weight, materials, accessories and other similar information. Catalog cuts are acceptable if they contain the necessary information.
   2. Storage, handling and installation instructions for the valves.
   3. Warranty Certificate prepared in accordance with paragraph 1.03 herein.

D. Operations and Maintenance Manuals prepared in accordance with the requirements contained in Section 017823 - Operating and Maintenance Data shall be provided.

1.05 PROJECT RECORD DOCUMENTS

A. Submit product data under provisions of Section 017839.

B. Accurately record actual locations of valves, connections, and invert elevations.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with the local water utility company requirements.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

C. All brass valves and fittings installed on a potable water supply line shall be made of "low-lead" materials and have a maximum lead content of 0.25 percent by weight. All low lead brass

fittings shall be stamped or embossed with a mark indicating that the product is manufactured from low-lead alloys.

D. Consideration will only be given to suppliers who can demonstrate that their valve complies with these specifications having had successful and documented experience of the size, quality, performance and reliability to that specified, and who can successfully demonstrate this criteria to the Engineer.

E. Each manufacturer shall have at least ten (10) years of experience in the design and manufacture of the specified valve.

1.07 WARRANTY

A. Provide a Warranty Certificate typed on company letterhead and signed by an authorized officer of the manufacturer.

B. The instrument manufacturer shall guarantee all components to be furnished under this section to be free from defects in design, materials and workmanship for a period of twenty-four (24) months commencing on the date the instrument was placed in permanent and consistent operation.

C. During the guarantee period, if any part or equipment component is defective or fails to perform when operating at design conditions and if the equipment has been installed and is being operated and maintained in accordance with the written instructions provided by the manufacturer; the manufacturer shall repair or exchange at the discretion of the Owner such defective part(s) free of any and all charges. The cost of labor and all other expenses resulting from the repair or replacement of the defective part(s) and from installation of part(s) furnished by this Warranty shall be borne solely by the manufacturer.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Sections 016100 and 016500.

B. Deliver and store valves in shipping containers with labeling in place.

1.09 FIELD SERVICES

A. Supply and credit to the Owner field services as specified in Section 014500 - Quality Control.

1.10 SERVICE CONDITIONS

A. All components of the control instruments shall be designed for continuous duty.

B. Provisions shall be made for adjustments or replacements of all parts.

PART 2 - PRODUCTS

2.01 AIR VACUUM VALVE

A. Manufacturers:
   1. Cla-Val, Series 36
   2. Approved equal.

B. Threaded-end combination air release and vacuum valve shall provide the dual function of releasing air and preventing vacuum in one housing.

C. Valve body shall be ductile iron per ASTM A536 65-45-12, with stainless steel float, stainless steel plug, and stainless steel internal parts. Rated for 150 psig working pressure.

D. The inlet and outlet of the valve shall have the same cross-sectional area.

E. The float shall be guided by a stainless steel guide shaft and seat drip tight against a synthetic rubber seal.

PART 3 - EXECUTION

3.01 GENERAL

A. Install control valves and components in accordance with the written and/or verbal instructions provided by the manufacturer.

B. All components shall be fully tested and verified for service by the manufacturer. Each manufacturer shall provide a MSR as specified in Section 017500 - Starting and Adjusting.

3.02 INSTALLATION

A. All valves and valve accessories shall be installed by workers thoroughly experienced in such work and all valve work shall be properly supported and aligned and present a neat and workmanlike appearance. All other required temporary or permanent supports for the valves shall be included in this contract to the approval of the Engineer.

B. Set valves in a plumb or level position, as applicable.

C. Assemble flanged joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly with a torque wrench.

D. All flanged valves shall be furnished and installed with a Style 128 flange adapter by Dresser Industries, Inc. or equal.

E. Before each valve is installed, pipe lines should be flushed of all chips, scale, and foreign matter.

3.03 INSPECTION, HANDLING AND STORAGE

A. Inspection - All valves and accessories are subject to inspection by the Engineer at the point of delivery for manu-facturer, direction of opening, freedom of operation, tightness of pressure-containing bolt, cleanliness of valve ports and especially seating surfaces, handling damage, cracks and any other damage.

B. Valves found to be either defective or damaged shall be rejected and immediately removed from the job site.

C. Handling - All valves shall be loaded and unloaded by lifting with hoists or skidding under control with ropes in order to avoid shock or damage. Under no circumstances shall valves and boxes be dropped.

D. Storage - Valves, joint accessories and other appurtenances, if stored, shall be kept safe from damage. The interior of the valve and the joint accessories shall be kept free from dirt or foreign matter at all times.

END OF SECTION 402324

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Propeller flow meter

1.02 RELATED SECTIONS

A. Section 402323 - Potable Water Process Piping.

1.03 REFERENCES

A. NFPA 70 - National Electric Code

1.04 SYSTEM DESCRIPTION

A. Flow monitoring devices for potable water.

1.05 SUBMITTALS

A. Submit product data under provisions of Section 013300.

B. Provide catalog cuts indicating materials, ratings and descriptive data and accessories.

C. Provide installation instructions and calibration data.

1.06 OWNERS INSTRUCTIONS

A. Provide the services of a manufacturers trained representative on operation and maintenance of equipment

1.07 WARRANTY

A. Provide manufacturer's standard 2-year warranty.

PART 2 - PRODUCTS

2.01 PROPELLER FLOW METER

A. Manufacturers:
   1. Sparling Flow Meter, or approved equal.

B. Wafer-style meter, stainless steel.

C. O-Rings: Neoprene.

D. Mount: 304SS mountain bolts.

E. Operating Velocity Flow Range: 0.3 to 20 ft/s.

F. Linearity: +/- 1 percent of maximum range.

G. Repeatability: +/-0.1 percent full scale.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install equipment in accordance with manufacturer's installation instructions.

B. Calibrate flow sensor/controller/meter based on flow level.

C. Mount transmitters in vertical position.

D. Provide vent and drain valves in accordance with meter manufacturer's installation instructions.

E. Contractor shall provide a portable clamp on flow meter and differential pressure gauge to calibrate new flow transmitters and to verify calibrations.

3.02 FIELD QUALITY CONTROL

A. Verify installation is leak free.

B. Demonstrate performance and operation of installed equipment.

C. Calibrate all sensors, transmitters, and control equipment.

END OF SECTION 409123

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall furnish and install filter media as detailed on the Drawings, specified herein or as may be required by the Filter System Manufacturer. It shall be the bidder's responsibility to ascertain the scope of the work associated with this Section of the technical specifications and submit a bid price accordingly.

1.02 RELATED SECTIONS

A. Section 331140 – Disinfection of Water Facilities

1.03 QUALITY ASSURANCE

A. The iron removal filter media system shall be furnished by one single Supplier (Manufacturer). This requires the Supplier to be responsible for the development, design, fabrication, assembly, delivery to achieve a filter effluent water quality, as contained in paragraph 1.05 herein. This does not require that all system equipment and accessories be the products of one single manufacturer.

B. Consideration will only be given to Suppliers who can demonstrate that their system complies with these Specifications. The Supplier shall have had successful and documented experience of the size, quality, performance and reliability to that specified, and who can successfully demonstrate these criteria to the Engineer.

C. The system shall be, furnished, and installed to achieve the conditions of service specified in paragraph 1.05 herein.

D. The Supplier shall have at least ten (10) years of experience in the design and manufacturing of iron removal systems. The iron removal system shall be manufactured by:
   1. Hungerford and Terry, Inc. – GreensandPlus.
   2. Specifically approved equal. Approved equal shall be submitted and approved by the Engineer in accordance with Section 016300.

1.04 DELIVERY, STORAGE AND HANDLING

A. The system supplier and the Contractor shall comply with the requirements contained in Section 016500 - Product Delivery, Storage and Handling.

1.05 PERFORMANCE AND DESIGN REQUIREMENTS OF EXISTING SYSTEM

A. The iron removal system has been designed, fabricated, and constructed to meet the following requirements:
   1. Influent iron concentration (design) - 3.0 milligrams per liter (mg/l)
   2. Design flow per vessel - 500 gallons per minute (gpm)
   3. Maximum flow per vessel – 1,000 gpm (one vessel offline)
   4. Number of filter vessels – 2 (8'Ø x 23')
   5. Number of filter cells - 2 per filter vessel
   6. Facility design flow - 1,000 gpm
   7. Minimum filtration rate – 3.17 gpm per square foot (sf) (all vessels online)
   8. Maximum filtration rate – 6.35 gpm per sf (one vessel offline)
   9. Maximum backwash rate - 750 gpm (10.0 gpm per sf) per cell for 10 minutes
   10. Maximum rinse rate - 700 gpm per cell for 3 minutes
   11. Normal operating pressure – 100 pounds per square inch (psi)

12. The system shall achieve effluent water quality requirements with one (1) filter vessel out-of-service and the remaining one (1) filter handling the facility design flow.

1.06 FIELD SERVICES

A. The Supplier shall supply and credit to the Owner field services as specified in Section 014500 - Quality Control.

B. The following field services shall be provided as a minimum in accordance with the requirements contained in Section 017500 - Starting and Adjusting:
   1. Six (6) days totaling three (3) trips for the purpose of providing installation supervision to the Contractor. The Contractor shall be responsible for all costs associated with having the manufacturer present should the Contractor require more than six (6) days to install the media and vessel internals, if any.
   2. Two (2) non-consecutive days, approximately three (3) and six (6) months after system startup to review the operation with the Owner and the Engineer and to make system adjustments as necessary.

1.07 SUBMITTALS

A. Comply with the requirements contained in Section 013300 - Submittals. The following documents shall be submitted:
   1. Storage, handling and installation instructions.
   2. Manufacturer Start-up Report (MSR) in accordance with paragraph 3.01 herein.
   3. Operations and Maintenance Manual prepared in accordance with the requirements contained in Section 017820 - Operating and Maintenance Data. In addition to the Section 017820 requirements, provide a type written check list procedure for manually backwashing the filters.

1.08 SERVICE CONDITIONS

A. All components of the system shall be designed for continuous duty.

B. Provisions shall be made for lubrication, adjustments, or replacement of all parts. Corresponding parts of multiple units shall be interchangeable.

PART 2 – PRODUCTS

2.01 SUPPORTING BEDS

A. A gravel support bed shall be incorporated in the bottom of each vessel, consisting of four (4) layers of graded gravel, with the largest size gravel loaded into the filter first and the succeeding smaller sizes placed on top. The gravel bed shall be graded as follows:

Layer and Minimum Depth	Gravel Size
Top 3"	0.8 - 1.2mm
Next 3"	1/4" - 1/8"
Next 3"	1/2" - 1/4"
Bottom 3"	3/4" - 1/2"

B. The gravel shall be free from clay, loam, dirt, calcareous, or other foreign material and shall consist of round or angular particles being relatively free of flat or elongated particles. The gravel shall be washed and screened, and shipped in clearly marked 100-pound bags, palletized, and stretch wrapped. Gravel must meet the requirements of the AWWA B-100-96 specification.

C. All gravel is to be field installed.

2.02 FILTER MEDIA

A. Filter sand shall meet all requirements of AWWA B100. The layer of sand shall be 18-inches deep (after washing) and consist of sand with an effective size between 0.3 and 0.35 mm and a uniformity coefficient of 1.6.

Layer and Depth	Media Type
Top 18"	0.6 - 0.8mm anthracite
Next 18"	0.30 - 0.35mm filter sand

B. Filter anthracite shall meet all requirements of AWWA B100. The layer of anthracite shall be 18-inches deep (after washing) and consist of anthracite with an effective size between 0.6 – 0.8 mm and a uniformity coefficient less than 1.6

C. The total filter sand and anthracite bed depth shall total 36 inches.

D. Filter media shall be accepted under Standard 61 of the National Sanitation Foundation. A NSF sheet on the filter media must be provided to indicate that the media is NSF 61 certified.

E. Filter media shall be loaded into the filters and conditioned in accordance with the filter manufacturer's recommendations.

F. All filter media is to be field installed.

PART 3 – EXECUTION

3.01 GENERAL

A. All components of the iron removal system shall be installed in accordance with the written instructions provided by the system supplier.

B. All components shall be fully tested and verified for service by the manufacturer. The manufacturer shall provide a MSR as specified in Section 017500 - Starting and Adjusting. An amount equal to 1.00 % of the scheduled value for the work of this Section shall be retained until the report has been furnished.

3.02 INSTALLATION

A. All equipment of this Section shall be installed by the Contractor unless noted on the Drawings.

B. The Contractor shall pressure test all vessels to demonstrate to the Engineer that all vessels are leak free.

C. The Contractor shall perform water quality sampling on the vessels, prior to and after the media has been installed. Perform all sampling in accordance with Section 331140.

D. The Contractor shall take measures to protect the exterior coating during transport, setting, and media placement. Damage to the exterior protective coating shall be repaired as directed by the Engineer.

E. The Contractors placing media shall utilize personal protective equipment to prevent the transport of foreign matter into the filter vessel. Utilize Tyvek suits and booties or equal.

3.03 FIELD QUALITY CONTROL

A. The Engineer will inspect the vessel interior, including, piping system, sand valves, etc.

B. The Engineer reserves the right to accept each phase of the work before further work may be conducted, to halt all Work deemed to be improper or not in compliance with project specifications, and to require the contractor to promptly correct all improper practices or deficient work. Contractor shall notify the Engineer/representative 24 hours minimum prior to the following:
   1. Prior to the removal of the existing media.
   2. Prior to and/or after abrasive blasting.
   3. Prior to installation of new vessel media.
   4. Prior to system start-up.

END OF SECTION 466125