H 2 M architects + engineers

CONTRACT AND SPECIFICATIONS

**TOWN OF RIVERHEAD**
**CALVERTON SEWER DISTRICT**
**SUFFOLK COUNTY, NEW YORK**

# UPGRADE OF THE SEWAGE TREATMENT PLANT
# ENTERPRISE PARK AT CALVERTON
# MODULE NO. 1 (0.100 MGD)

**CONTRACT G – GENERAL AND MECHANICAL CONSTRUCTION**

CONTRACT E – ELECTRICAL CONSTRUCTION

CONTRACT P – PLUMBING CONSTRUCTION

CONTRACT S – FORCE MAIN/RECHARGE BED CONSTRUCTION

Project No: CASD 1602

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**NOVEMBER 2018**

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**TOWN OF RIVERHEAD / CALVERTON SEWER DISTRICT**
**CONTRACT AND SPECIFICATIONS**
**FOR**
**UPGRADE OF THE SEWAGE TREATMENT PLANT – ENTERPRISE PARK AT CALVERTON**
**MODULE NO. 1 (0.100 MGD)**
**CONTRACT G – GENERAL AND MECHANICAL CONSTRUCTION**
**H2M PROJECT NO.: CASD 1602**


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The Town Board of Riverhead will receive bids for the following contracts:

**UPGRADE OF THE SEWAGE TREATMENT PLANT – ENTERPRISE PARK AT CALVERTON – MODULE NO. 1 (0.100 MGD)**

**CONTRACT G - GENERAL AND MECHANICAL CONSTRUCTION**
**CONTRACT P - PLUMBING CONSTRUCTION**
**CONTRACT E - ELECTRICAL CONSTRUCTION**
**CONTRACT S – FORCE MAIN/RECHARGE BED CONSTRUCTION**

**H2M PROJECT NO.: CASD 1602**

for the Calverton Sewer District at the Town Clerk's office, Town Hall, 200 Howell Avenue, Riverhead, New York 11901, at 11:00 AM prevailing time, on Wednesday December 19, 2018, at which time and place the bids will be publicly opened and read.

Plans and specifications may be examined on, or after, **Thursday**, **November 15, 2018** by visiting the Town of Riverhead website: townofriverheadny.gov and click on “Bid Requests”.

All bid documents are to be obtained from the Town of Riverhead Website. Separate registration of bid documents holder under the “Notifications” section of the Town of Riverhead website is required in order to receive updates or notices regarding this project, which will only be distributed via the website.

Each proposal must be accompanied by a bid bond in the amount of five percent (5%) of the total bid, or a certified check made payable to the TOWN OF RIVERHEAD as assurance that the bid is made in good faith.

The right is reserved to reject any or all bids, to waive any informalities, and to accept the lowest responsible bid.

BY ORDER OF THE TOWN BOARD
TOWN OF RIVERHEAD
SUFFOLK COUNTY, NEW YORK

ACTING AS THE GOVERNING BODY
OF THE CALVERTON SEWER DISTRICT

DIANE M. WILHELM, TOWN CLERK

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## 1. RECEIPT AND OPENING OF BIDS

Pursuant to Town Board Resolution, the Town of Riverhead invites bids on the forms herein provided for the UPGRADE OF THE SEWAGE TREATMENT PLANT – ENTERPRISE PARK AT CALVERTON – MODULE NO. 1 (0.100 MGD), CONTRACT G – GENERAL CONSTRUCTION, CONTRACT No. CASD 1602G, CONTRACT P – PLUMBING CONSTRUCTION, CONTRACT No. CASD 1602P, CONTRACT E – ELECTRICAL CONSTRUCTION, CONTRACT No. CASD 1602E, & CONTRACT S – FORCE MAIN AND RECHARGE BED CONSTRUCTION, CONTRACT No. CASD 1602S; 200 Howell Avenue, Riverhead, New York, time, date and place indicated in the Notice to Bidders.

## 2. PLAN DEPOSITS

Plan deposits are not required. No hard copies of the bid plans will be issued. All bid documents shall be obtained from the Town of Riverhead website in electronic PDF format.

## 3. PLANS AND SPECIFICATIONS

Complete sets of Plans and Specifications for the inspection of prospective bidders will be found on file with the Town Clerk, Town of Riverhead, Town Hall, 200 Howell Avenue, Riverhead, New York, and at the office of H2M architects + engineers, 538 Broad Hollow Road, 4th Floor East, Melville, New York.

All contractors must input their names, telephone numbers, fax numbers, and correct mailing addresses to access of the Plans and Specifications from the Town website.

## 4. VERBAL ANSWERS

The Town Board, its agents, servants or employees, or the Engineer, will not be responsible in any manner for verbal answers to any inquiries regarding the meaning of the Contract Drawings or Specifications given prior to the awarding of the contract.

## 5. EXAMINATION OF SITE

Bidders must satisfy themselves by personal examination of the location of the proposed work and of the actual conditions and requirements of the work and shall not, at any time after the submission of a proposal, dispute or complain of such estimate or assert that there was any misunderstanding in regard to the depth and character of excavation and extent of dewatering to be made or the nature of the work to be done.

## 6. FORM, PREPARATION AND PRESENTATION OF PROPOSAL

In submitting the bid, the bid sheets furnished are to be filled in but not detached from the Contract Form. In no case is the Contract Form to be filled in or signed by the bidder. All proposals and either the certified check or bid bond must be placed in a sealed opaque envelope bearing the Bidder's firm name and address and separately marked for each contract a bid is submitted for:

**"UPGRADE OF THE SEWAGE TREATMENT PLANT – ENTERPRISE PARK AT CALVERTON – MODULE NO. 1 (0.100 MGD), CONTRACT G – GENERAL CONSTRUCTION, CONTRACT No. CASD 1602G"**

**" UPGRADE OF THE SEWAGE TREATMENT PLANT – ENTERPRISE PARK AT CALVERTON – MODULE NO. 1 (0.100 MGD), CONTRACT P – PLUMBING CONSTRUCTION, CONTRACT No. CASD 1602P"**

**" UPGRADE OF THE SEWAGE TREATMENT PLANT – ENTERPRISE PARK AT CALVERTON – MODULE NO. 1 (0.100 MGD), CONTRACT E – ELECTRICAL CONSTRUCTION, CONTRACT No. CASD 1602E"**

**" UPGRADE OF THE SEWAGE TREATMENT PLANT – ENTERPRISE PARK AT CALVERTON – MODULE NO. 1 (0.100 MGD), CONTRACT S – FORCE MAIN AND RECHARGE BED CONSTRUCTION, CONTRACT No. CASD 1602S"**

but otherwise unmarked. All blank spaces for bid prices must be filled in, in ink, in both works and figures, with the total or gross sum for which the bid is made. Bids that contain any omission, erasure, alteration, addition or items not called for in the itemized bid form or that contract irregularities of any kind may be rejected. In case of discrepancy between the unit price and total amount bid for any item, the unit price, as expressed in words, shall govern.

The Proposal contained herein shall be used in making out bids. Any proposal not in accordance with these instructions or containing bids not asked for may be rejected. While separate prices are required for various items under this contract, it is understood that the contract will be awarded as a whole.

As the estimates of quantities of items stated in the Proposal are approximate only, bidders are required to submit their proposal upon and in the following express conditions, which shall apply and become part of every proposal received.

Bids will be compared by total amounts; said total amount being the sum of the products of the quantities multiplied by the unit prices bid for the various unit price items, with due consideration being given to the lump sum prices bid and stipulated amounts for any contingent or optional items. Unbalanced bids will not be accepted.

Each bidder shall fill out in ink, in both words and figures, in the spaces provided, its unit or lump sum bid, as the case may be, for each item in said Proposal for which it is submitting a bid. If there is any discrepancy between the prices in words and figures, the prices in words shall govern as unit and lump sum prices.

A bid may not be considered valid which does not include bids for all items in the Proposal.

Each bidder must state, in its proposal, its full name and business address, and the full name of every person, firm or corporation, interested in same, and the address of every person or firm, or president and secretary of every corporation, interested with it.

If the contract is not awarded by the Town Board within ninety (90) days after the receipt of bids, the obligation of the bidder under this Proposal may terminate at its option and it shall thereupon be entitled to a refund of its certified check or release of its bid bond furnished by it as security with its proposal.

## 7. BID SECURITY

(A) The bid must be accompanied by a certified check on the solvent bank or trust company with its principal place of business in New York State, or an acceptable bid bond, in an amount equal to not less than five percent (5%) of the total bid, made payable to the

Town of Riverhead (herein identified as the Town), as assurance that the bid is made in good faith. The certified checks or bid bonds will be returned after execution of the contract between the Town and the successful bidder; the certified check or bid bond of the successful bidder will be retained until filing and approval of the Performance Bond and until the completion of ten percent (10%) of the work under the contract.

(B) The successful bidder, upon his failure or refusal to execute and deliver the contract insurance and bonds required within fourteen (14) days after the date of notice of the acceptance of his bid, shall forfeit to the Town, as liquidated damages for such failure or refusal, the security deposited with his bid.

(C) Each proposal must also be accompanied by a Letter of Intent from a surety company acceptable to the Town, which letter shall assure the Town that the bidder, if awarded the Contract, will be able to secure from the surety the required bonds in the required amounts.

**8. QUALIFICATIONS OF BIDDERS**

(A) Forms or qualifications of bidders, giving evidence of sufficient facilities, equipment, experience and financial ability to insure completion of the work will be provided, and the three lowest bidders shall be prepared to file at the option of the Town said form, properly filled in and sworn to in the Office of the Town Clerk within seven (7) days after the opening of bids.

(B) Information contained in any statement of financial ability shall be not more than thirty (30) days old at the time of submission. If a financial statement is already on file with the Town Clerk, a new one need not be submitted provided the information contained therein is not more than thirty (30) days old at the time of the opening of bids and provided the contractor has not materially changed since submission of said statement.

**9. REJECTION OF BIDS**

(A) The Town Board reserves the right to waive any informalities in, or reject any bid if the evidence submitted in the qualifications statement or an investigation of such bidder fails to satisfy the Town Board that such bidder is reputable, reliable and responsible, and that they possess the necessary qualifications (financial, labor, equipment and otherwise properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. The Board reserves the right to reject any and all bids which do not conform to the Proposal. Conditional bids will not be accepted.

(B) The Town Board shall be the sole judge of the qualifications of the bidders and of the merits thereof and reserves the right to reject any bid if the record of the bidder in the performance of contracts, payment of bills and meeting of obligations to subcontractors, material men or employees is not satisfactory to the Town Board, or if the evidence submitted by, or the investigation of, such bidders fails to satisfy the Town Board that it is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein.

(C) The Town Board reserves the right to reject any and all bids, in whole or in part, to waive any information in any or all bids, and to accept the bid or part thereof which it deems most favorable to the Town after all bids have been examined and/or checked. No bid shall be withdrawn for a period of forty-five (45) days after being publicly opened and read.

(D) The Town Board reserves the right to reject any bids, in whole by a low bidder in which the owner of the low bidder has violated Prevailing Wage and Supplemental Payment Requirements of the Labor Law, and any other labor provisions, including but not limited to child labor violations, failure to pay wages, or unemployment insurance tax delinquencies within the past five (5) years. An owner is defined in this paragraph as an individual who owns more than 50% of a past or present company.

**10. WITHDRAWAL OF BID**

(A) Any bid may be withdrawn prior to the Bid Opening Date and Time specified above or authorized postponement.

(B) Bids may not be withdrawn before forty-five (45) days after the Bid Opening Date and Time, unless a clerical mistake or error is claimed by the Bidder.

(C) If a Bidder claims to have made a clerical mistake or error in his Bid, he shall notify the Owner within the time limitations set forth in General Municipal Law Section 103 (11) (a) together with all documentary evidence in support of the Bidder's claim of a bid mistake or error.

**11. BIDDER'S RESPONSIBILITY**

(A) The Bidder shall include the complete cost of furnishing all materials, labor and equipment necessary to complete the work in accordance with the plans and specifications, including all other expenses incidental thereto.

(B) Bidders must examine the plans and specifications and exercise their own judgment as to the nature and amount of the whole of the work to be done, and for the bid prices, must assume all risks of variance by whomever made in computation or statement of amounts or quantities necessary to fully complete the work in strict compliance with the contract documents.

(C) The contractor shall assume all risks and responsibility and shall complete the work in whatever material and under whatever conditions he may encounter or create, without extra cost to the Town.

(D) Attention is hereby particularly directed to the provisions of the contract whereby the Contractor will be responsible for any loss or damage that may happen to the work or any part thereof during its progress; and also whereby the Contractor shall make good any defects or faults that may occur during the progress of the work or within twelve (12) months after date of the Engineer's approval of the final payment request.

(E) No plea of ignorance or misunderstanding of conditions that exist or that may hereafter exist, or of conditions or difficulties that may be encountered in the execution of the work under this contract, as a result of failure to make the necessary examinations and investigations, will be to fulfill in every detail all of the requirements of the contract documents, or will be accepted as a basis for any claims whatsoever for extra compensation or for extension of time.

## 12. SIGNATURE OF CONTRACTOR

The bidder to whom a contract may be awarded shall appear at the office of the Town Board, with the surety documents offered by it, within seven (7) days, Saturdays and Sundays excepted, after date of notification of the acceptance of its proposal, and there sign the contract in quadripartite for the work and furnish approved security for its performance.

In case of failure to do so, the bidder shall be considered as having abandoned the same, and the check accompanying its proposal shall be forfeited to the Town Board, or the penalty of the bid bond shall be invoked.

## 13. CONSTRUCTION TERMS AND CONDITIONS

The successful bidder is warned that the work specified in the Conditions of Contract, together with the Information to Bidders, Form of Bid, Plans and Specifications and Instruction of the Town Engineer, or his duly authorized representative, will be strictly enforced.

## 14. SECURITY FOR FAITHFUL PERFORMANCE AND MAINTENANCE

The successful bidder shall be required to furnish at the execution of the contract an executed bond of a surety company authorized to do business in the State of New York and approved by the Town Board, in an amount equal to 100% of the total amount of the contract, guaranteeing to the Board the faithful performance of the contract and payment of all claims for materials, labor and wages in connection therewith. Prior to the release of the Performance Bond, the Contractor shall deliver to the Town a Maintenance Bond equal to 100% of the total contract price, including all extras which shall remain in effect for a period of one (1) year from the date of the Engineer's approval of the final payment request as a Guarantee Bond.

## 15. FOREIGN CONTRACTORS

Foreign contractors must comply with the provisions of Articles 9A and 16 of the Tax Law, as amended, prior to submission of a bid for the performance of this work. The certificate of the New York State Tax Commission to the effect that all taxes have been paid by the foreign contractor shall be conclusive proof of the payment of taxes. The term “foreign contractor” as used in this subdivision means in the case of an individual, a person who is a legal resident of another state or foreign country; and in the case of a foreign corporation, one organized under the laws of a state other than the State of New York.

## 16. LIEN LAW

Attention of all persons submitting bids is specifically called to the provisions of Section 25, Subdivision 5, Section 25A and 25B of the Lien Law, as amended, in relation to funds being received by a contractor for a public improvement declared to constitute trust funds in the hands of such contractor to be applied first to the payment of certain claims. Pursuant to Section 220-a of the Labor Law all contractors and subcontractors and subcontractors to subcontractors shall file an affidavit attesting to the payment to employees.

## 17. SUBCONTRACTORS AND SUPPLIERS

Within five days after receipt from the Town Engineer, or his representative, of notice to begin work, the contractor will furnish written notice of names of all subcontractors to be employed on the project and the general items of work to be dome by them. Simultaneously, the contractor shall furnish written notice of the names and suppliers of materials to be used on the project. The

town may disapprove, for good cause, any subcontractor or material supplier selected by the contractor by giving written notice of its disapproval within five (5) days after receiving the names of subcontractors and material suppliers, to the contractor who shall thereupon promptly notify the town of the names of the subcontractor or material supplier selected in replacement which shall again be subject to approval by the town.

## 18. PENAL LAW

Attention is called to Section 1918 of the Penal Law as follows:

Construction or blasting near pipe conveying combustible gas

No person shall discharge explosives in the ground, nor shall any person other than a state or county employee regularly engaged in the maintenance and repair thereof excavate in any then existing street, highway, or public place, unless notice thereof in writing shall have been given at least seventy-two (72) hours in advance to the person, corporation or municipality engaged in the distribution of gas in such territory. The person having direction or control of such work shall give such notice, and further he shall ascertain whether there is within one hundred (100) feet in such street, highway or public place, or in the case of a proposed discharge of explosives within a radius of two hundred (200) feet of such discharge, any pipe of any other person, corporation or municipality conveying combustible gas, and if thereby any such pipe, he shall also five such notice to any other such person, corporation or municipality. Provided, however, that in any emergency involving danger to life, health, or property it shall be lawful to excavate without using explosives if the notices prescribed herein are given as soon as reasonably possible, and to discharge explosives to protect a person or persons from an immediate and substantial danger of death or serious personal injury is such notices are given before any such discharge is undertaken. Any such work shall be performed in such manner as to avoid danger to any pipe conveying combustible gas. Any violation of the provisions of this section shall be a misdemeanor.

## 19. REFUSAL TO WAIVE IMMUNITY

Pursuant to the provisions of Section 103-A of the General Municipal Law, in the event that the bidder or any members, partner, director or officer of the bidder, should refuse when called before a grand jury to testify concerning any transaction or contract had with the State, any political subdivision thereof, a public authority or with any public department, agency or official of the State, of any political subdivision thereof or of an authority, to sign a waiver of immunity against subsequent criminal prosecution or to answer any relevant questions concerning such transaction or contract, such person, and any firm, partnership or corporation of which he is a member, partner, firm director or officer shall be disqualified from thereafter selling to or submitting bids to or receiving awards from or entering into any contracts with any municipal corporation or any public department, agency, or official thereof, for goods, work or services, for a period of five (5) years after such refusal, and any and all contracts made with any municipal corporation or any public department, agency or official thereof on or after the first day of July, 1959, by, such person and any firm, partnership or corporation of which he is a member, partner, director or officer may be canceled or terminated by the municipal corporation without incurring any penalty or damages on account of such cancellation of termination, but any monies owing by the municipal corporation for goods delivered or work done prior to the cancellation or termination shall be paid.

## 20. ADDENDA AND INTERPRETATIONS

Every request for information or interpretation of the Contract Documents or Drawings must be addressed in writing to Christopher A. Weiss, P.E., Discipline Director of Wastewater Engineering, H2M architects + engineers, 538 Broad Hollow Road, 4th Floor East, Melville, New York, 11747 and to be given any consideration, must be received at least five (5) days prior to the date fixed for the opening of bids. Request for information or interpretation of the Contract Documents or Drawings will only be evaluated and considered if made by registered plan holders as recorded on the Town's website. Any such interpretations or supplemental instructions will be in the form of written addenda, and will be posted on the Town's website for access by all prospective bidders/registered plan holders. The failure of any bidder to receive any such addenda will not relieve the bidders of any obligations under his bid as submitted. Any addenda so issued shall become part of the Contract Documents.

## 21. LIQUIDATED DAMAGES

Liquidated damages in the amount of One Thousand Dollars and 00 Cents ($1,000.00) will be assessed for each consecutive calendar day of delay not excusable as provided in the Contract Documents.

## 22. EXEMPTION FROM SALES AND USE TAXES

In accordance with Chapter 513 of the laws of 1974 adopted by the New York State Legislature, amending Section 1115(a) of the tax law, specifically paragraphs 15 and 16, political subdivisions, as described in subdivision (a) paragraph (L) of Section 1116 of the tax laws, of the State of New York are exempt from the payment of sales and use taxes imposed on tangible personal property within the limitations specified in tax law 115 (a) (15) and (16).

(15) Tangible personal property sold to a contractor, subcontractor or repairman for use in erecting structure or building of an organization described in subdivision (a) of Section 116, or adding to, altering or improving real property, property or land of such an organization, as the terms real property, property and land are defined in the real property tax law; provided, however, no exemption shall exist under this paragraph unless such tangible personal property is to become an integral component part of such structure, building or real property.

(16) Tangible personal property sold to a contractor or repairman for use in maintaining, servicing or repairing real property, or land of an organization described in subdivision (a) of Section 116, as the terms real property, property or land are defined in the real property tax law; provided, however, no exemption shall exist under this paragraph unless such tangible personal property is to become an integral component part of such structure, building or real property.

Contractors entering into contract with the Town of Riverhead shall be exempt from payment of sales and use tax described above. Procedures and forms are available to the contractor direct from the Instructions and Interpretations Unit, State of New York, Department of Taxation and Finance, State Campus, Albany, New York 12227.

## 23. METHOD OF AWARD

All bids will be compared based on the lowest bid price(s) submitted for the work to be done in addition to the qualifications of the bidder. Bidder may be requested to submit additional information such as references.

## 24. TIME FOR COMMENCEMENT OF WORK

The bidder, when submitting his bid, must be prepared to commence work not later than Twenty Eight (28) days after receiving a Notice to Proceed.

Work shall commence as stipulated in the construction schedule provided by the Town of Riverhead or alternate schedule provided by the Contractor which alternate schedule is acceptable to the Town and shall meet the stipulations of this contract. The entire work must be satisfactorily completed and the project improvements available for use within the completion time stipulated. For additional information see Conditions of Contract, Section 5, Time of Completion.

## 25. PAYMENT

Upon completion of the work under this contract, the contractor shall notify the Town Engineer of his completion. The Town Engineer will then make a final inspection and submit to the contractor a "punch list" if required. Upon final acceptance of the work by the Town Engineer, the contractor shall be paid one lump sum payment equal to the amount bid herein minus previous payments and plus or minus other contract approved charge orders. Contractor shall submit a Receipt on company letterhead in the amount billed, a signed Town of Riverhead Voucher, Certified Payroll Records, Wage Disclaimer and the No Lien Affidavit attesting to the payment of employees. Payment shall not be processed until all necessary paperwork is received.

## 26. NYS LABOR LAW

The contractor and each and every subcontractor performing work at the site of the project to which this contract relates shall comply with the applicable provisions of the Labor Law, as amended, of the State of New York.

## 27. NYS WAGE RATES

The rates of wages determined by the New York State Industrial Commissioner pursuant to the Labor Law, which are to be paid on this project, are set forth herein immediately following:

**PREVAILING WAGE RATES**

**CURRENT PREVAILING WAGE RATES SCHEDULE**
**PRESENTED ON THE PAGES DIRECTLY FOLLOWING THIS**
**INSTRUCTION TO BIDDERS SECTION**

## 28. FEDERAL LABOR LAW

If this project is being assisted by funding from the Federal Government of the United States of America under one or more current federal funding programs, and as such, the performance of all work contemplated under the terms and conditions of this set of plans, specifications and related documents must conform to certain basic and specific standards and requirements of both Federal and New York State governments.

## 29. FEDERAL WAGE RATES

The rates of wages determined by the Federal Government of the United State of America pursuant to the Labor Law, which are to be paid on this project, are set forth herein immediately following:

## 30. INSURANCE REQUIRED BY THE TOWN OF RIVERHEAD

The Contractor shall not commence any work until it has obtained and had approved by the Town all of the insurance specified and required by the Contract.

The successful bidder will be required to procure and pay for the following types of insurance, in accordance with the provisions of the Conditions of Contract:

(A) Workers' Compensation Insurance.
(B) Public Liability and Property Damage.
(C) Contractor's Liability and Contractor's Property Damage.
(D) Owner's Protective Public Liability and Property Damage.

Insurance documents meeting the requirements of Conditions of Contract, Section 38, Contractor's Insurance, shall be submitted within 14 calendar days from the date of award. Failure to provide acceptable insurance certificate(s) within this time frame shall result in the termination of Primary Contractor status.

The Contractor shall not permit any subcontractor to commence any operation on the site until satisfactory proof of carriage of the above required insurance has been posted with, and approved by, the Town Board.

## 31. TERM OF CONTRACT

The term of this contract shall be until the completion date set by the Notice to Proceed and the length of contract time (calendar days) as stipulated in the Proposal Form. The Town of Riverhead shall have the option of extending this contract upon good cause shown by the Contractor.

## 32. CERTIFIED PAYROLL RECORDS

State of New York Department of Labor

On September 10, 1997, Governor Pataki signed into law Assembly Bill 6394-B amending Article 8, Section 220, of the NYS labor Law to include the following language:

Every contractor and sub-contractor shall submit to the department of jurisdiction within thirty (30) days after issuance of its first payroll, and every thirty (30) days thereafter, a transcript of the original payroll record, as provided by this article, subscribed and affirmed as true under penalties of perjury. The DEPARTMENT OF JURISDICTION shall be required to receive and maintain such payroll records.

The original payrolls or transcripts shall be preserved for three years from the completion of the work on the awarded project.

This law took effect on November 9, 1997.

Form WH-347 Inst. is included in this package for contractor's convenience and must be completed, for the current payment request period, including all payroll information for all employees and subcontractor employees including but not limited to laborers, mechanics, foremen, supervisors, etc.

**FORM WH347 PRESENTED WITHIN THE ENVIRONMENTAL FACILITIES CORP. PROGRAM REQUIREMENTS AND BID PACKET ON THE PAGES FOLLOWING THE FORM OF CONTRACT**

PERSONAL PERFORMANCE FORM
STATEMENT TO BE SUBMITTED
WHEN WORK IS PERFORMED PERSONALLY
(SECTION 10001, TITLE 18, US CODE)

I, _____, hereby certify that I am the

_____ of _____
**Title** **Name of Firm Submitting Statement**

_____ for _____
**Prime Contractor or Subcontractor** **Nature of Work**

at _____, located in _____
**Name of Building work being done** **City and State**

under contract number _____
**Government Contract No. (See No. 3 Below)**

that _____
**State All Work or List the Specific Classes of Work**

was done personally by _____
**Names of Person(s) Performing Work & Their Connection w/ Firm**

_____

that no wages were received for the labor performed; that no mechanics or laborers were employed in the prosecution thereof; and that the work was done during the following periods: __

_____ to _____
**Beginning Date** **Ending Date**

Last date on which work was performed at the site was _____, _____

_____
**Signature**

_____
**Title**

Section 100001 of Title 18 of the United State Code (Criminal Code and Criminal Procedures) shall apply to such statements – 72 Stat 887, 18 U.S.C., among other things, provides that whoever knowingly and willfully makes or uses a document or writing containing any false, fictitious or fraudulent statement or entry, in any matter within the jurisdiction of any department or agency of the United State, shall be fined not more than $10,000 or imprisoned not more than five years, or both).

**Instructions for Submission of Statements of Work Performed Personally**

**1. Prime contractors or subcontractors who perform the work are required to submit in lieu of weekly statements of compliance and payrolls with respect to the payment of wages pursuant to the Copeland Anti-kickbacks regulations, a certified statement clearly showing (1) their contractual relationship,; (2) the scope and dates of work performed (3) that they received no wages; and (4) that no mechanics or laborers were employed in the prosecution of the work. The aforementioned sample form sets forth the wording described for such certified statements.**

**2. Prime contractors are responsible for the submission of the certified statements of subcontractors. Subcontractors' statement should be forwarded to the prime contractor for transmission to the Government contracting officer or his designated representative.**

**Statements of prime contractors and subcontractors should be submitted as soon as possible after the last date on which work was performed at the site.**

**3. To facilitate identification of the project involved, prime contractors should provide their subcontractors with the Government contract number (if exists) or project name as called for on statement form.**

**4. Prime contractors should furnish their subcontractors with copies of the sample statement form so as to facilitate submission of the necessary information.**

## 33. NO LIEN AFFIDAVIT & WAGE DISCLAIMER

State of New York Department of Labor

Pursuant to Section 220-a of the New York State Labor Law all contractors, subcontractors and subcontractors to subcontractors must file an affidavit pertaining to the payment of all laborers and mechanics, exclusive of supervisory employees.

Affidavit Form 220 and Town of Riverhead Wage Disclaimer Form is included in this package for contractor's convenience. Unless given at later date, leave project number blank.

NOTE: Bidders are advised that this is not a contract authorizing any work. It is the option of the Town to authorize work at any time of the year. Any Town department or agency can use this contract.

MUNICIPAL CORPORATION

TOWN OF RIVERHEAD
200 HOWELL AVENUE
RIVERHEAD, NY 11901

CONTRACT NAME: _____ PROJECT No.: _____

AFFIDAVIT

Pursuant to Section 220-a of the Labor Law and Town of Riverhead Requirements

Note: All contractors, subcontractors, and subcontractors of subcontractors must file this statement for each payment period requested.

I, _____, _____
Name Title

of _____ Contractor
Name of Firm _____ Subcontractor
Project No.: _____ With: _____
Contractor Name

for _____
Indicate Nature of Work

at _____ hereby certify that all laborers have been paid in full for period ended _____, 20 _____. and that there is now due and owning from it/me to any and all laborers (laborers include all laborers, mechanics, foremen and supervisory employees) for daily or weekly wages or supplements on account of labor performed upon the work under said contract, the following amounts to the persons whose names are set forth below opposite such amounts. (If none, so state.)

$ _____ due and owing to _____
$ _____ due and owing to _____
$ _____ due and owing to _____
$ _____ due and owing to _____
Use additional sheet if necessary.

I further certify that I have contracted with the firms listed below as subcontractors, for labor to be performed upon the work under said contract for the current pay period requested. (If none, so state.)

| Names and Address of Subcontractors | Type of Work |
|---|---|
| | |
| | |
| | |

Use additional sheet if necessary

_____
Signature

STATE OF NEW YORK
SS:
COUNTY OF: _____

On this _____ day of _____ 20____, personally appeared before me _____
to me known and known to me who being by me duly sworn said that he is _____
(Officer)
of _____ the _____
(Contractor or Subcontractor) (Corporation or Partnership)
for which he executed the foregoing statement, for and in behalf of the said _____
contractor; that he has read the said statement so signed by him and known to be the seal thereof and that the same is true and to his own knowledge.

_____ Dated: _____
Notary Public

Section 220-c Labor Law. Any Contractor or subcontractor who shall upon his oath verify any statement required to be filed under this act which is known by him to be false, shall be guilty of perjury and punishable as provided by Section One Thousand Six Hundred and Thirty Three of the Penal Law.

TOWN OF RIVERHEAD
WAGE DISCLAIMER

Note: All contractors, subcontractors, and subcontractor of subcontractors must file this statement for each payment period request.

DATE: _____

TO: TOWN OF RIVERHEAD

FROM: _____
(Contractor)

PROJECT: _____

To our knowledge, the laborers listed on the attached certified payrolls have been paid the prevailing wage rates as established by the Department of Labor.

_____
Signature

_____
Title

_____
Date

Andrew M. Cuomo, Governor

Roberta Reardon, Commissioner

Town of Riverhead

Timothy Nordberg, Project Engineer
538 Broadhollow Road
4th Floor East
Melville NY 11747

| | |
|---|---|
| Schedule Year | 2018 through 2019 |
| Date Requested | 11/05/2018 |
| PRC# | 2018013228 |

| | |
|---|---|
| Location | Calverton, NY |
| Project ID# | CASD 1602 |
| Project Type | Upgrade of Sewage Treatment Plant - Enterprise Park at Calverton - Module No. 1 (0.100 MGD) |

## PREVAILING WAGE SCHEDULE FOR ARTICLE 8 PUBLIC WORK PROJECT

Attached is the current schedule(s) of the prevailing wage rates and prevailing hourly supplements for the project referenced above. A unique Prevailing Wage Case Number (PRC#) has been assigned to the schedule(s) for your project.

The schedule is effective from July 2018 through June 2019. All updates, corrections, posted on the 1st business day of each month, and future copies of the annual determination are available on the Department's website www.labor.state.ny.us. Updated PDF copies of your schedule can be accessed by entering your assigned PRC# at the proper location on the website.

It is the responsibility of the contracting agency or its agent to annex and make part, the attached schedule, to the specifications for this project, when it is advertised for bids and /or to forward said schedules to the successful bidder(s), immediately upon receipt, in order to insure the proper payment of wages.

Please refer to the "General Provisions of Laws Covering Workers on Public Work Contracts" provided with this schedule, for the specific details relating to other responsibilities of the Department of Jurisdiction.

Upon completion or cancellation of this project, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

### NOTICE OF COMPLETION / CANCELLATION OF PROJECT

Date Completed: _____ Date Cancelled: _____

Name & Title of Representative: _____

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12240

# General Provisions of Laws Covering Workers on Article 8 Public Work Contracts

## Introduction

The Labor Law requires public work contractors and subcontractors to pay laborers, workers, or mechanics employed in the performance of a public work contract not less than the prevailing rate of wage and supplements (fringe benefits) in the locality where the work is performed.

## Responsibilities of the Department of Jurisdiction

A Department of Jurisdiction (Contracting Agency) includes a state department, agency, board or commission: a county, city, town or village; a school district, board of education or board of cooperative educational services; a sewer, water, fire, improvement and other district corporation; a public benefit corporation; and a public authority awarding a public work contract.

The Department of Jurisdiction (Contracting Agency) awarding a public work contract MUST obtain a Prevailing Rate Schedule listing the hourly rates of wages and supplements due the workers to be employed on a public work project. This schedule may be obtained by completing and forwarding a "Request for wage and Supplement Information" form (PW 39) to the Bureau of Public Work. The Prevailing Rate Schedule MUST be included in the specifications for the contract to be awarded and is deemed part of the public work contract.

Upon the awarding of the contract, the law requires that the Department of Jurisdiction (Contracting Agency) furnish the following information to the Bureau: the name and address of the contractor, the date the contract was let and the approximate dollar value of the contract. To facilitate compliance with this provision of the Labor Law, a copy of the Department's "Notice of Contract Award" form (PW 16) is provided with the original Prevailing Rate Schedule.

The Department of Jurisdiction (Contracting Agency) is required to notify the Bureau of the completion or cancellation of any public work project. The Department's PW 200 form is provided for that purpose.

Both the PW 16 and PW 200 forms are available for completion online.

## Hours

No laborer, worker, or mechanic in the employ of a contractor or subcontractor engaged in the performance of any public work project shall be permitted to work more than eight hours in any day or more than five days in any week, except in cases of extraordinary emergency. The contractor and the Department of Jurisdiction (Contracting Agency) may apply to the Bureau of Public Work for a dispensation permitting workers to work additional hours or days per week on a particular public work project. There are very few exceptions to this rule. Complete information regarding these exceptions is available on the "4 Day / 10 Hour Work Schedule" form (PW 30.1).

## Wages and Supplements

The wages and supplements to be paid and/or provided to laborers, workers, and mechanics employed on a public work project shall be not less than those listed in the current Prevailing Rate Schedule for the locality where the work is performed. If a prime contractor on a public work project has not been provided with a Prevailing Rate Schedule, the contractor must notify the Department of Jurisdiction (Contracting Agency) who in turn must request an original Prevailing Rate Schedule form the Bureau of Public Work. Requests may be submitted by: mail to NYSDOL, Bureau of Public Work, State Office Bldg. Campus, Bldg. 12, Rm. 130, Albany, NY 12240; Fax to Bureau of Public Work (518) 485-1870; or electronically at the NYSDOL website www.labor.ny.gov.

Upon receiving the original schedule, the Department of Jurisdiction (Contracting Agency) is REQUIRED to provide complete copies to all prime contractors who in turn MUST, by law, provide copies of all applicable county schedules to each subcontractor and obtain from each subcontractor, an affidavit certifying such schedules were received. If the original schedule expired, the contractor may obtain a copy of the new annual determination from the NYSDOL website www.labor.ny.gov.

The Commissioner of Labor makes an annual determination of the prevailing rates. This determination is in effect from July 1st through June 30th of the following year. The annual determination is available on the NYSDOL website www.labor.ny.gov.

## Payrolls and Payroll Records

Contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemporaneous, true, and accurate payroll records. Payrolls must show the following information for each person employed on a public work project: Name, Address, Last 4 Digits of Social Security Number, Classification(s) in which the worker was employed, Hourly wage rate(s) paid, Supplements paid or provided, and Daily and weekly number of hours worked in each classification.

The filing of payrolls to the Department of Jurisdiction is a condition of payment. Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury. The original payrolls or transcripts must be maintained for a period of at least (5) years, by the Department of Jurisdiction (Contracting Agency), from the project's date of completion. The Department of Jurisdiction (Contracting Agency) shall collect, review for facial validity, and maintain such payrolls.

In addition, the Commissioner of Labor may require contractors to furnish, with ten (10) days of a request, payroll records sworn to as their validity and accuracy for public work and private work. Payroll records include, by are not limited to time cards, work description sheets, proof that supplements were provided, cancelled payroll checks and payrolls. Failure to provide the requested information within the allotted ten (10) days will result in the withholding of up to 25% of the contract, not to exceed $100,000.00. If the contractor or subcontractor does not maintain a place of business in New York State and the amount of the contract exceeds $25,000.00, payroll records and certifications must be kept on the project worksite.

The prime contractor is responsible for any underpayments of prevailing wages or supplements by any subcontractor.

All contractors or their subcontractors shall provide to their subcontractors a copy of the Prevailing Rate Schedule specified in the public work contract as well as any subsequently issued schedules. A failure to provide these schedules by a contractor or subcontractor is a violation of Article 8, Section 220-a of the Labor Law.

All subcontractors engaged by a public work project contractor or its subcontractor, upon receipt of the original schedule and any subsequently issued schedules, shall provide to such contractor a verified statement attesting that the subcontractor has received the Prevailing Rate Schedule and will pay or provide the applicable rates of wages and supplements specified therein. (See NYS Labor Laws, Article 8 . Section 220-a).

## Determination of Prevailing Wage and Supplement Rate Updates Applicable to All Counties

The wages and supplements contained in the annual determination become effective July 1st whether or not the new determination has been received by a given contractor. Care should be taken to review the rates for obvious errors. Any corrections should be brought to the Department's attention immediately. It is the responsibility of the public work contractor to use the proper rates. If there is a question on the proper classification to be used, please call the district office located nearest the project. Any errors in the annual determination will be corrected and posted to the NYSDOL website on the first business day of each month. Contractors are responsible for paying these updated rates as well, retroactive to July 1st.

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. To the extent possible, the Department posts rates in its possession that cover periods of time beyond the July 1st to June 30th time frame covered by a particular annual determination. Rates that extend beyond that instant time period are informational ONLY and may be updated in future annual determinations that actually cover the then appropriate July 1st to June 30th time period.

## Withholding of Payments

When a complaint is filed with the Commissioner of Labor alleging the failure of a contractor or subcontractor to pay or provide the prevailing wages or supplements, or when the Commissioner of Labor believes that unpaid wages or supplements may be due, payments on the public work contract shall be withheld from the prime contractor in a sufficient amount to satisfy the alleged unpaid wages and supplements, including interest and civil penalty, pending a final determination.

When the Bureau of Public Work finds that a contractor or subcontractor on a public work project failed to pay or provide the requisite prevailing wages or supplements, the Bureau is authorized by Sections 220-b and 235.2 of the Labor Law to so notify the financial officer of the Department of Jurisdiction (Contracting Agency) that awarded the public work contract. Such officer MUST then withhold or cause to be withheld from any payment due the prime contractor on account of such contract the amount indicated by the Bureau as sufficient to satisfy the unpaid wages and supplements, including interest and any civil penalty that may be assessed by the Commissioner of Labor. The withholding continues until there is a final determination of the underpayment by the Commissioner of Labor or by the court in the event a legal proceeding is instituted for review of the determination of the Commissioner of Labor.

The Department of Jurisdiction (Contracting Agency) shall comply with this order of the Commissioner of Labor or of the court with respect to the release of the funds so withheld.

## Summary of Notice Posting Requirements

The current Prevailing Rate Schedule must be posted in a prominent and accessible place on the site of the public work project. The prevailing wage schedule must be encased in, or constructed of, materials capable of withstanding adverse weather conditions and be titled "PREVAILING RATE OF WAGES" in letters no smaller than two (2) inches by two (2) inches.

The "Public Work Project" notice must be posted at the beginning of the performance of every public work contract, on each job site.

Every employer providing workers. compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers. Compensation Board in a conspicuous place on the jobsite.

Every employer subject to the NYS Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers, notices furnished by the State Division of Human Rights.

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the NYS Department of Labor.

## Apprentices

Employees cannot be paid apprentice rates unless they are individually registered in a program registered with the NYS Commissioner of Labor. The allowable ratio of apprentices to journeyworkers in any craft classification can be no greater than the statewide building trade ratios promulgated by the Department of Labor and included with the Prevailing Rate Schedule. An employee listed on a payroll as an apprentice who is not registered as above, must be paid the prevailing journeyworker's wage rate for the classification of work the employee is actually performing.

NYSDOL Labor Law, Article 8, Section 220-3, require that only apprentices individually registered with the NYS Department of Labor may be paid apprenticeship rates on a public work project. No other Federal or State Agency of office registers apprentices in New York State.

Persons wishing to verify the apprentice registration of any person must do so in writing by mail, to the NYSDOL Office of Employability Development / Apprenticeship Training, State Office Bldg. Campus, Bldg. 12, Albany, NY 12240 or by Fax to NYSDOL Apprenticeship Training (518) 457-7154. All requests for verification must include the name and social security number of the person for whom the information is requested.

The only conclusive proof of individual apprentice registration is written verification from the NYSDOL Apprenticeship Training Albany Central office. Neither Federal nor State Apprenticeship Training offices outside of Albany can provide conclusive registration information.

It should be noted that the existence of a registered apprenticeship program is not conclusive proof that any person is registered in that program. Furthermore, the existence or possession of wallet cards, identification cards, or copies of state forms is not conclusive proof of the registration of any person as an apprentice.

## Interest and Penalties

In the event that an underpayment of wages and/or supplements is found:

- Interest shall be assessed at the rate then in effect as prescribed by the Superintendent of Banks pursuant to section 14-a of the Banking Law, per annum from the date of underpayment to the date restitution is made.
- A Civil Penalty may also be assessed, not to exceed 25% of the total of wages, supplements, and interest due.

## Debarment

Any contractor or subcontractor and/or its successor shall be ineligible to submit a bid on or be awarded any public work contract or subcontract with any state, municipal corporation or public body for a period of five (5) years when:

- Two (2) willful determinations have been rendered against that contractor or subcontractor and/or its successor within any consecutive six (6) year period.
- There is any willful determination that involves the falsification of payroll records or the kickback of wages or supplements.

## Criminal Sanctions

Willful violations of the Prevailing Wage Law (Article 8 of the Labor Law) may be a felony punishable by fine or imprisonment of up to 15 years, or both.

## Discrimination

No employee or applicant for employment may be discriminated against on account of age, race, creed, color, national origin, sex, disability or marital status.

No contractor, subcontractor nor any person acting on its behalf, shall by reason of race, creed, color, disability, sex or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates (NYS Labor Law, Article 8, Section 220-e(a)).

No contractor, subcontractor, nor any person acting on its behalf, shall in any manner, discriminate against or intimidate any employee on account of race, creed, color, disability, sex, or national origin (NYS Labor Law, Article 8, Section 220-e(b) ).

The Human Rights Law also prohibits discrimination in employment because of age, marital status, or religion.

There may be deducted from the amount payable to the contractor under the contract a penalty of $50.00 for each calendar day during which such person was discriminated against or intimidated in violation of the provision of the contract (NYS Labor Law, Article 8, Section 220-e(c) ).

The contract may be cancelled or terminated by the State or municipality. All monies due or to become due thereunder may be forfeited for a second or any subsequent violation of the terms or conditions of the anti-discrimination sections of the contract (NYS Labor Law, Article 8, Section 220-e(d) ).

Every employer subject to the New York State Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers notices furnished by the State Division of Human Rights.

## Workers' Compensation

In accordance with Section 142 of the State Finance Law, the contractor shall maintain coverage during the life of the contract for the benefit of such employees as required by the provisions of the New York State Workers' Compensation Law.

A contractor who is awarded a public work contract must provide proof of workers' compensation coverage prior to being allowed to begin work.

The insurance policy must be issued by a company authorized to provide workers' compensation coverage in New York State. Proof of coverage must be on form C-105.2 (Certificate of Workers' Compensation Insurance) and must name this agency as a certificate holder.

If New York State coverage is added to an existing out-of-state policy, it can only be added to a policy from a company authorized to write workers' compensation coverage in this state. The coverage must be listed under item 3A of the information page.

The contractor must maintain proof that subcontractors doing work covered under this contract secured and maintained a workers' compensation policy for all employees working in New York State.

Every employer providing worker's compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers' Compensation Board in a conspicuous place on the jobsite.

## Unemployment Insurance

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the New York State Department of Labor.

Town of Riverhead

Timothy Nordberg, Project Engineer
538 Broadhollow Road
4th Floor East
Melville NY 11747

Schedule Year 2018 through 2019
Date Requested 11/05/2018
PRC# 2018013228

Location Calverton, NY
Project ID# CASD 1602
Project Type Upgrade of Sewage Treatment Plant - Enterprise Park at Calverton - Module No. 1 (0.100 MGD)

## Notice of Contract Award

New York State Labor Law, Article 8, Section 220.3a requires that certain information regarding the awarding of public work contracts, be furnished to the Commissioner of Labor. One "Notice of Contract Award" (PW 16, which may be photocopied), **MUST** be completed for **EACH** prime contractor on the above referenced project.

Upon notifying the successful bidder(s) of this contract, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

### Contractor Information
All information must be supplied

Federal Employer Identification Number: _____

Name: _____

Address: _____

_____

City: _____ State: _____ Zip: _____

Amount of Contract: $_____

Approximate Starting Date: ____/____/____

Approximate Completion Date: ____/____/____

Contract Type:
[ ] (01) General Construction
[ ] (02) Heating/Ventilation
[ ] (03) Electrical
[ ] (04) Plumbing
[ ] (05) Other : _____

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12240

# IMPORTANT NOTICE

# FOR

# CONTRACTORS & CONTRACTING AGENCIES

## Social Security Numbers on Certified Payrolls

The Department of Labor is cognizant of the concerns of the potential for misuse or inadvertent disclosure of social security numbers. Identity theft is a growing problem and we are sympathetic to contractors' concerns with regard to inclusion of this information on payrolls if another identifier will suffice.

For these reasons, ***the substitution of the use of the last four digits of the social security number on certified payrolls submitted to contracting agencies on public work projects is now acceptable to the Department of Labor.***

**NOTE: This change does not affect the Department's ability to request and receive the entire social security number from employers during the course of its public work / prevailing wage investigations.**

**To all State Departments, Agency Heads and Public Benefit Corporations**
**IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND**

## Budget Policy & Reporting Manual

# B-610

### Public Work Enforcement Fund

*effective date December 7, 2005*

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## 1. Purpose and Scope:

This Item describes the Public Work Enforcement Fund (the Fund, PWEF) and its relevance to State agencies and public benefit corporations engaged in construction or reconstruction contracts, maintenance and repair, and announces the recently-enacted increase to the percentage of the dollar value of such contracts that must be deposited into the Fund. This item also describes the roles of the following entities with respect to the Fund:

- New York State Department of Labor (DOL),
- The Office of the State of Comptroller (OSC), and
- State agencies and public benefit corporations.

## 2. Background and Statutory References:

DOL uses the Fund to enforce the State's Labor Law as it relates to contracts for construction or reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law. State agencies and public benefit corporations participating in such contracts are required to make payments to the Fund.

Chapter 511 of the Laws of 1995 (as amended by Chapter 513 of the Laws of 1997, Chapter 655 of the Laws of 1999, Chapter 376 of the Laws of 2003 and Chapter 407 of the Laws of 2005) established the Fund.

## 3. Procedures and Agency Responsibilities:

The Fund is supported by transfers and deposits based on the value of contracts for construction and reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law, into which all State agencies and public benefit corporations enter.

Chapter 407 of the Laws of 2005 increased the amount required to be provided to this fund to .10 of one-percent of the total cost of each such contract, to be calculated at the time agencies or public benefit corporations enter into a new contract or if a contract is amended. The provisions of this bill became effective August 2, 2005.

**To all State Departments, Agency Heads and Public Benefit Corporations**
**IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND**

OSC will report to DOL on all construction-related ("D") contracts approved during the month, including contract amendments, and then DOL will bill agencies the appropriate assessment monthly. An agency may then make a determination if any of the billed contracts are exempt and so note on the bill submitted back to DOL. For any instance where an agency is unsure if a contract is or is not exempt, they can call the Bureau of Public Work at the number noted below for a determination. Payment by check or journal voucher is due to DOL within thirty days from the date of the billing. DOL will verify the amounts and forward them to OSC for processing.

For those contracts which are not approved or administered by the Comptroller, monthly reports and payments for deposit into the Public Work Enforcement Fund must be provided to the Administrative Finance Bureau at the DOL within 30 days of the end of each month or on a payment schedule mutually agreed upon with DOL.

Reports should contain the following information:

- Name and billing address of State agency or public benefit corporation;
- State agency or public benefit corporation contact and phone number;
- Name and address of contractor receiving the award;
- Contract number and effective dates;
- Contract amount and PWEF assessment charge (if contract amount has been amended, reflect increase or decrease to original contract and the adjustment in the PWEF charge); and
- Brief description of the work to be performed under each contract.

Checks and Journal Vouchers, payable to the "New York State Department of Labor" should be sent to:

Department of Labor
Administrative Finance Bureau-PWEF Unit
Building 12, Room 464
State Office Campus
Albany, NY 12240

Any questions regarding billing should be directed to NYSDOL's Administrative Finance Bureau-PWEF Unit at (518) 457-3624 and any questions regarding Public Work Contracts should be directed to the Bureau of Public Work at (518) 457-5589.

# Construction Industry
# Fair Play Act

## Required Posting For Labor Law
## Article 25-B § 861-d

Construction industry employers must post the "Construction Industry Fair Play Act" notice in a prominent and accessible place on the job site.

Failure to post the notice can result in penalties of up to $1,500 for a first offense and up to $5,000 for a second offense.

The posting is included as part of this wage schedule. Additional copies may be obtained from the NYS DOL website, www.labor.ny.gov.

If you have any questions concerning the Fair Play Act, please call the State Labor Department toll-free at 1-866-435-1499 or email us at: dol.misclassified@labor.state.ny.us .

New York State Department of Labor
Required Notice under Article 25-B of the Labor Law

**ATTENTION ALL EMPLOYEES, CONTRACTORS AND SUBCONTRACTORS:**
**YOU ARE COVERED BY THE**
**CONSTRUCTION INDUSTRY FAIR PLAY ACT**

**The law says that you are an employee unless:**

- You are free from direction and control in performing your job AND
- You perform work that is not part of the usual work done by the business that hired you AND
- You have an independently established business

Your employer cannot consider you to be an independent contractor unless all three of these facts apply to your work.

**IT IS AGAINST THE LAW FOR AN EMPLOYER TO MISCLASSIFY EMPLOYEES AS INDEPENDENT CONTRACTORS OR PAY EMPLOYEES OFF-THE-BOOKS.**

**Employee rights**. If you are an employee:

- You are entitled to state and federal worker protections such as
  - unemployment benefits, if unemployed through no fault of your own, able to work, and otherwise qualified
  - workers' compensation benefits for on-the-job injuries
  - payment for wages earned, minimum wage, and overtime (under certain conditions)
  - prevailing wages on public work projects
  - the provisions of the National Labor Relations Act and
  - a safe work environment
- It is a violation of this law for employers to retaliate against anyone who asserts their rights under the law. Retaliation subjects an employer to civil penalties, a private lawsuit or both.

**Independent Contractors:** If you are an independent contractor*:*

- You must pay all taxes required by New York State and Federal Law.

**Penalties** for paying off-the-books or improperly treating employees as independent contractors:

- **Civil Penalty** — First Offense: up to $2,500 per employee. Subsequent Offense(s): up to $5,000 per employee.
- **Criminal Penalty** — First Offense: Misdemeanor - up to 30 days in jail, up to a $25,000 fine and debarment from performing Public Work for up to one year. Subsequent Offense(s): Misdemeanor - up to 60 days in jail, up to a $50,000 fine and debarment from performing Public Work for up to 5 years.

**If you have questions about your employment status or believe that your employer may have violated your rights and you want to file a complaint, call the Department of Labor at 1(866)435-1499 or send an email to dol.misclassified@labor.state.ny.us. All complaints of fraud and violations are taken seriously and you can remain anonymous.**

**Employer Name:**

IA 999 (09/10)

# WORKER NOTIFICATION

(Labor Law §220, paragraph a of subdivision 3-a)

## *Effective February 24, 2008*

This provision is an addition to the existing prevailing wage rate law, Labor Law §220, paragraph a of subdivision 3-a. It requires contractors and subcontractors to provide written notice to all laborers, workers or mechanics of the *prevailing wage rate* for their particular job classification *on each pay stub**. It also requires contractors and subcontractors to *post a notice* at the beginning of the performance of every public work contract *on each job site* that includes the telephone number and address for the Department of Labor and a statement informing laborers, workers or mechanics of their right to contact the Department of Labor if he/she is not receiving the proper prevailing rate of wages and/or supplements for his/her particular job classification. The required notification will be provided with each wage schedule, may be downloaded from our website *www.labor.state.ny.us* or made available upon request by contacting the Bureau of Public Work at 518-457-5589.

* In the event that the required information will not fit on the pay stub, an accompanying sheet or attachment of the information will suffice.

(11.11)

New York State Department of Labor
Bureau of Public Work

# Attention Employees

**THIS IS A:**

# PUBLIC WORK PROJECT

If you are employed on this project as a **worker, laborer, or mechanic** you are entitled to receive the **prevailing wage and supplements rate** for the classification at which you are working.

Chapter 629 of the Labor Laws of 2007:

**These wages are set by law and must be posted at the work site. They can also be found at: www.labor.ny.gov**

If you feel that you have not received proper wages or benefits, please call our nearest office.*

| | | | |
|---|---|---|---|
| Albany | (518) 457-2744 | Patchogue | (631) 687-4882 |
| Binghamton | (607) 721-8005 | Rochester | (585) 258-4505 |
| Buffalo | (716) 847-7159 | Syracuse | (315) 428-4056 |
| Garden City | (516) 228-3915 | Utica | (315) 793-2314 |
| New York City | (212) 932-2419 | White Plains | (914) 997-9507 |
| Newburgh | (845) 568-5156 | | |

* For New York City government agency construction projects, please contact the Office of the NYC Comptroller at (212) 669-4443, or www.comptroller.nyc.gov – click on Bureau of Labor Law.

Contractor Name: _____

Project Location: _____

# OSHA 10-hour Construction

## Safety and Health Course – S1537-A

### *Effective July 18, 2008*

This provision is an addition to the existing prevailing wage rate law, Labor Law §220, section 220-h. It requires that on all public work projects of at least $250,000.00, all laborers, workers and mechanics working on the site, be certified as having successfully completed the OSHA 10-hour construction safety and health course. It further requires that the advertised bids and contracts for every public work contract of at least $250,000.00, contain a provision of this requirement.

***NOTE:*** ***The OSHA 10 Legislation only applies to workers on a public work project that are required, under Article 8, to receive the prevailing wage.***

# Where to find OSHA 10-hour Construction Course

1. NYS Department of Labor website for scheduled outreach training at:

   www.labor.state.ny.us/workerprotection/safetyhealth/DOSH_ONSITE_CONSULTATION.shtm

2. OSHA Training Institute Education Centers:

   **Rochester Institute of Technology OSHA Education Center**
   Rochester, NY
   Donna Winter
   Fax (585) 475-6292
   e-mail: dlwtpo@rit.edu
   (866) 385-7470 Ext. 2919
   www.rit.edu/~outreach/course.php3?CourseID=54

   **Atlantic OSHA Training Center**
   UMDNJ – School of Public Health
   Piscataway, NJ
   Janet Crooks
   Fax (732) 235-9460
   e-mail: crooksje@umdnj.edu
   (732) 235-9455
   https://ophp.umdnj.edu/wconnect/ShowSchedule.awp?~~GROUP~AOTCON~10~

   **Atlantic OSHA Training Center**
   University at Buffalo
   Buffalo, New York
   Joe Syracuse
   Fax (716) 829-2806
   e-mail:mailto:japs@buffalo.edu
   (716) 829-2125
   http://www.smbs.buffalo.edu/CENTERS/trc/schedule_OSHA.php

   **Keene State College**
   Manchester, NH
   Leslie Singleton
   e-mail: lsingletin@keene.edu
   (800) 449-6742
   www.keene.edu/courses/print/courses_osha.cfm

3. List of trainers and training schedules for OSHA outreach training at:

   www.OutreachTrainers.org

# Requirements for OSHA 10 Compliance

Chapter 282 of the Laws of 2007, codified as Labor Law 220-h took effect on July 18, 2008. The statute provides as follows:

The advertised specifications for every contract for public work of $250,000.00 or more must contain a provision requiring that every worker employed in the performance of a public work contract shall be certified as having completed an OSHA 10 safety training course. The clear intent of this provision is to require that all employees of public work contractors, required to be paid prevailing rates, receive such training "prior to the performing any work on the project."

The Bureau will enforce the statute as follows:

All contractors and sub contractors must attach a copy of proof of completion of the OSHA 10 course to the first certified payroll submitted to the contracting agency and on each succeeding payroll where any new or additional employee is first listed.

Proof of completion may include but is not limited to:

- Copies of bona fide course completion card (*Note: Completion cards do not have an expiration date*.)
- Training roster, attendance record of other documentation from the certified trainer pending the issuance of the card.
- Other valid proof

**A certification by the employer attesting that all employees have completed such a course is not sufficient proof that the course has been completed.

Any questions regarding this statute may be directed to the New York State Department of Labor, Bureau of Public Work at 518-485-5696.

# WICKS Reform 2008

(For all contracts advertised or solicited for bid on or after 7/1/08)

- Raises the threshold for public work projects subject to the Wicks Law requiring separate specifications and bidding for the plumbing, heating and electrical work. The total project's threshold would increase from $50,000 to: $3 million in Bronx, Kings, New York, Queens and Richmond counties; $1.5 million in Nassau, Suffolk and Westchester counties; and $500,000 in all other counties.

- For projects below the monetary threshold, bidders must submit a sealed list naming each subcontractor for the plumbing, HVAC and electrical work and the amount to be paid to each. The list may not be changed unless the public owner finds a legitimate construction need, including a change in specifications or costs or use of a Project Labor Agreement (PLA), and must be open to public inspection.

- Allows the state and local agencies and authorities to waive the Wicks Law and use a PLA if it will provide the best work at the lowest possible price. If a PLA is used, all contractors shall participate in apprentice training programs in the trades of work it employs that have been approved by the Department of Labor (DOL) for not less than three years. They shall also have at least one graduate in the last three years and use affirmative efforts to retain minority apprentices. PLA's would be exempt from Wicks, but deemed to be public work subject to prevailing wage enforcement.

- The Commissioner of Labor shall have the power to enforce separate specification requirements on projects, and may issue stop-bid orders against public owners for non-compliance.

- Other new monetary thresholds, and similar sealed bidding for non-Wicks projects, would apply to certain public authorities including municipal housing authorities, NYC Construction Fund, Yonkers Educational Construction Fund, NYC Municipal Water Finance Authority, Buffalo Municipal Water Finance Authority, Westchester County Health Care Association, Nassau County Health Care Corp., Clifton-Fine Health Care Corp., Erie County Medical Center Corp., NYC Solid Waste Management Facilities, and the Dormitory Authority.

- Reduces from 15 to 7 days the period in which contractors must pay subcontractors.

# IMPORTANT INFORMATION

## Regarding Use of Form PW30.1
## (Previously 30R)

**"Employer Registration for Use of 4 Day / 10 Hour Work Schedule"**

## To use the '4 Day / 10 Hour Work Schedule':

There MUST be a *Dispensation of Hours (PW30)* in place on the project

***AND***

You MUST register your intent to work 4 / 10 hour days, by completing the PW30.1 Form.

***REMEMBER…***

The '4 Day / 10 Hour Work Schedule' applies ONLY to Job Classifications and Counties listed on the PW30.1 Form.

Do not write in any additional Classifications or Counties.

(**Please note** : For each Job Classification check the individual wage schedule for specific details regarding their 4/10 hour day posting.)

# Instructions for Completing Form PW30.1

## (Previously 30R)

## "Employer Registration for Use of 4 Day / 10 Hour Work Schedule"

***Before completing Form PW30.1 check to be sure …***

- There is a *Dispensation of Hours* in place on the project.
- The 4 Day / 10 Hour Work Schedule applies to the Job Classifications you will be using.
- The 4 Day / 10 Hour Work Schedule applies to the County / Counties where the work will take place.

## Instructions (Type or Print legibly):

Contractor Information:

- Enter the Legal Name of the business, FEIN, Street Address, City, State, Zip Code; the Company's Phone and Fax numbers; and the Company's email address (if applicable)
- Enter the Name of a Contact Person for the Company along with their Phone and Fax numbers, and the personal email address (if applicable)

Project Information:

- Enter the Prevailing Rate Case number (PRC#) assigned to this project
- Enter the Project Name / Type (i.e. Smithtown CSD – Replacement of HS Roof)
- Enter the Exact Location of Project (i.e. Smithtown HS, 143 County Route #2, Smithtown,NY; Bldgs. 1 & 2)
- If you are a Subcontractor, enter the name of the Prime Contractor for which you work
- On the Checklist of Job Classifications -
  - Go to pages 2 and 3 of the form
  - Place a checkmark in the box to the right of the Job Classification you are choosing
  - Mark all Job Classifications that apply

    ****Do not write in any additional Classifications or Counties.****

Requestor Information:

- Enter the name of the person submitting the registration, their title with the company , and the date the registration is filled out

Return Completed Form:

- **Mail** the completed PW30.1 form to: NYSDOL Bureau of Public Work, SOBC – Bldg.12 – Rm.130, Albany, NY 12240 -***OR -***
- **Fax** the completed PW30.1 form to: NYSDOL Bureau of Public Work at (518)485-1870

Bureau of Public Work Harriman
State Office Campus
Building 12, Room 130
Albany, New York 12240
Phone: (518) 457-5589 | Fax: (518) 485-1870
www.labor.ny.gov

# Employer Registration for Use of 4 Day / 10 Hour Work Schedule

Before completing this form, make sure that:

- There is a **Dispensation of Hours** in place on the project.
- The 4 Day / 10 Hour Work Schedule applies to the Job Classifications you will be using.
- The 4 Day / 10 Hour Work Schedule applies to the County / Counties where the work will take place.

Please **type or print** the requested information and then **mail or fax** to the address above.

## Contractor Information

Company Name:_____ FEIN: _____

Address: _____

City:_____State: _____ Zip Code: _____

Phone No:_____ Fax No:_____ Email: _____

Contact Person: _____

Phone No:_____Fax No:_____ Email: _____

## Project Information

Project PRC#: _____ Project Name/Type: _____

Exact Location
of Project: _____ County: _____

(If you are Subcontractor)
Prime Contractor Name: _____

Job Classification(s) to Work 4/10 Schedule: *(Choose all that apply on Job Classification Checklist - Pages 3-8)*
**** Do not write in any additional Classifications or Counties****

## Requestor Information

Name: _____

Title: _____ Date: _____

Please use the list below with the number assigned to each county as a reference to the corresponding numbers listed in the following pages under **Entire Counties** & **Partial Counties**.

**1.** Albany County
**2.** Allegany County
**3.** Bronx County
**4.** Broome County
**5.** Cattaraugus County
**6.** Cayuga County
**7.** Chautauqua County
**8.** Chemung County
**9.** Chenango County
**10.** Clinton County
**11.** Columbia County
**12.** Cortland County
**13.** Delaware County
**14.** Dutchess County
**15.** Erie County
**16.** Essex County
**17.** Franklin County
**18.** Fulton County
**19.** Genesee County
**20.** Greene County
**21.** Hamilton County
**22.** Herkimer County
**23.** Jefferson County
**24.** Kings County (Brooklyn)
**25.** Lewis County
**26.** Livingston County
**27.** Madison County
**28.** Monroe County
**29.** Montgomery County
**30.** Nassau County
**31.** New York County (Manhattan)
**32.** Niagara County
**33.** Oneida County
**34.** Onondaga County
**35.** Ontario County
**36.** Orange County
**37.** Orleans County
**38.** Oswego County
**39.** Otsego County
**40.** Putnam County
**41.** Queens County
**42.** Rensselaer County
**43.** Richmond County (Staten Island)
**44.** Rockland County
**45.** Saint Lawrence County
**46.** Saratoga County
**47.** Schenectady County
**48.** Schoharie County
**49.** Schuyler County
**50.** Seneca County
**51.** Steuben County
**52.** Suffolk County
**53.** Sullivan County
**54.** Tioga County
**55.** Tompkins County
**56.** Ulster County
**57.** Warren County
**58.** Washington County
**59.** Wayne County
**60.** Westchester County
**61.** Wyoming County
**62.** Yates County

**Job Classification Checklist**

**(Place a checkmark by all classifications that will be using the 4/10 schedule)**

**** Do not write in any additional Classifications or Counties****

| Job Classification | Tag # | Entire Counties | Partial Counties | Check Box |
|---|---|---|---|---|
| Carpenter – Building | 276B-All | 7 | 2 ,5 | |
| Carpenter – Building | 276B-Cat | 15 | 5 | |
| Carpenter – Building | 276-B-LIV | 26, 28, 35, 59 | 61 | |
| Carpenter – Building | 276B-Gen | 19, 32, 37 | 61 | |
| Carpenter – Heavy & Highway | 276HH-All | 2, 5, 7 | | |
| Carpenter – Heavy & Highway | 276HH-Erie | 15 | | |
| Carpenter – Heavy & Highway | 276HH- Gen | 19, 32, 37, 61 | | |
| Carpenter – Heavy & Highway | 276HH-Liv | 26, 28, 35, 59 | | |
| Carpenter – Residential | 276R-All | 7 | 2, 5 | |
| Carpenter – Building | 277B-Bro | 4, 54 | | |
| Carpenter – Building | 277B-CAY | 6, 50, 62 | | |
| Carpenter – Building | 277B-CS | 8, 12, 49, 51, 55 | 2 | |
| Carpenter – Building | 277 JLS | 23, 25, 45 | | |
| Carpenter – Building | 277 omh | 22, 27, 33 | | |
| Carpenter – Building | 277 On | 34 | | |
| Carpenter – Building | 277 Os | 38 | | |
| Carpenter – Building | 277CDO Bldg | 9, 13, 39 | | |
| Carpenter – Heavy & Highway | 277CDO HH | 9, 13, 39 | | |
| Carpenter – Heavy & Highway | 277HH-BRO | 4, 6, 8, 12, ,22, 23, 25, 27, 33, 34, 38, 45, 49, 50, 51, 54, 55, 62 | | |
| Carpenter – Building | 291B-Alb | 1, 18, 20, 29, 42, 47, 48 | | |
| Carpenter – Building | 291B-Cli | 10, 16, 17 | | |
| Carpenter – Building | 291B-Ham | 21, 57, 58 | | |
| Carpenter – Building | 291B-Sar | 46 | | |
| Carpenter – Heavy & Highway | 291HH-Alb | 1, 10, 16, 17,18, 20, 21, 29, 42, 46, 47, 48, 57, 58 | | |
| Electrician | 25m | 30, 52 | | |
| Electrician – Teledata Cable Splicer | 43 | 12, 22, 27, 33, 38 | 6, 9, 34, 39, 55, 59 | |

**Job Classification Checklist**

**(Place a checkmark by all classifications that will be using the 4/10 schedule)**

**** Do not write in any additional Classifications or Counties****

| Job Classification | Tag # | Entire Counties | Partial Counties | Check Box |
|---|---|---|---|---|
| Electrician | 86 | 26, 28 | 19, 35, 37, 59, 61 | |
| Electrician | 840 Teledata and 840 Z1 | 62 | 6, 34, 35, 50, 59 | |
| Electrician | 910 | 10, 16, 17, 23, 25, 45 | | |
| Electrical Lineman | 1049Line/Gas | 30, 41, 52 | | |
| Electrical Lineman | 1249a | 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 33, 34, 35, 36, 37, 38, 39, 40, 42, 44, 46, 47, 48, 49, 50, 45, 51, 53, 54, 55, 56, 57, 58, 59, 61, 62 | | |
| Electrical Lineman | 1249a West | 60 | | |
| Electrical Lineman | 1249a-LT | 1, 2, 4, 5, 6, 7, 8, 9, 10, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 33, 34, 35, 37, 38, 39, 42, 46, 47, 48, 49, 50, 45, 51, 53, 54, 55, 57, 58, 59, 61, 62 | | |
| Electrical Lineman | 1249aREG8LT | 11, 14, 36, 40, 44, 56 | | |
| Electrical Lineman | 1249aWestLT | 60 | | |
| Elevator Constructor | 138 | 11, 14, 20, 36, 40, 53, 56 | 13, 44, 60 | |
| Elevator Constructor | 14 | 2, 5, 7, 15, 19, 32, 37, 61 | | |
| Elevator Constructor | 27 | 8, 26, 28, 35, 49, 50, 51, 59, 62 | | |
| Elevator Constructor | 35 | 1, 10, 16, 18, 21, 22, 29, 39, 42, 46, 47, 48, 57, 58 | | |
| Elevator Constructor | 62.1 | 4, 6, 9, 12, 23, 25, 27, 33, 34, 38, 45, 54, 55 | 13 | |
| Glazier | 201 | 1, 10, 11, 16, 17, 18, 20, 21, 29, 42, 46, 47, 48, 57, 58 | | |
| Glazier | 660r | 2, 5, 7, 15, 19, 32, 37, 61 | | |
| Glazier | 660 | 2, 5, 7, 15, 19, 32, 37, 61 | | |
| Glazier | 677.1 | 23, 25, 26, 28, 35, 45, 50, 59, 62 | | |
| Glazier | 677Z-2 | 6, 12, 22, 27, 33, 34, 38 | | |
| Glazier | 677z3 | 4, 8, 9, 13, 39, 49, 51, 54, 55 | | |
| Glazier | 677r.2 | 6, 12, 22, 27, 33, 34, 38 | | |
| Insulator – Heat & Frost | 30-Syracuse | 4, 6, 8, 9, 12, 22, 23, 25, 27, 33, 34, 38, 39, 49, 50, 45, 54, 55 | | |
| Laborer – Building | 621b | 2, 7 | 5 | |
| Laborer – Building | 633 bON | 34 | | |

**Job Classification Checklist**

**(Place a checkmark by all classifications that will be using the 4/10 schedule)**

**** Do not write in any additional Classifications or Counties****

| Job Classification | Tag # | Entire Counties | Partial Counties | Check Box |
|---|---|---|---|---|
| Laborer – Building | 633b Cay | 6 | | |
| Laborer – Building | 633bOS | 38 | | |
| Laborer – Building | 785(7) | 4 | 9, 13, 54 | |
| Laborer – Building | 785B-CS | 8, 51 | 49 | |
| Laborer – Building | 7-785b | 12, 55 | 49, 54 | |
| Laborers – Heavy & Highway | 157h/h | 47 | 18, 29, 46 | |
| Laborers – Heavy & Highway | 190 h/h | 1, 42, 58 | 11, 20, 46 | |
| Laborers – Heavy & Highway | 35/2h | 21, 22, 27, 33 | 18, 29 | |
| Laborer – Residential | 621r | 2, 7 | 5 | |
| Laborers – Tunnel | 157 | 47 | 18, 29, 46 | |
| Laborers – Tunnel | 35T | 21, 22, 27, 33 | 18, 29 | |
| Laborers – Tunnel | 190 | 1, 42, 58 | 11, 20, 46 | |
| Mason – Building | 2TS.1 | 1, 10,11, 16, 17, 18, 20, 21, 29, 42, 46, 47, 48, 57, 58 | | |
| Mason – Building | 2TS.2 | 22, 23, 25, 33, 45 | 27 | |
| Mason – Building | 2TS.3 | 6, 34, 38 | 27 | |
| Mason – Building | 2b-on | 34 | | |
| Mason – Building | 2b.1 | 1, 11, 18, 20, 21, 29, 42, 46, 47, 48, 58 | 57 | |
| Mason – Building | 2b.2 | 22, 33 | 25 | |
| Mason – Building | 2b.3 | 6, 34 | 27 | |
| Mason – Building | 2b.4 | 38 | | |
| Mason – Building | 2b.5 | 23 | 25 | |
| Mason – Building | 2b.6 | 45 | | |
| Mason – Building | 2b.8 | 10, 16, 17 | 57 | |
| Mason – Building | 3b-Co-Z2 | 8, 49, 51 | 2 | |
| Mason – Building | 3B-Z1 | 19, 26, 28, 35, 50, 59, 61, 62 | | |
| Mason – Building – Residential | 3B-Z1R | 19, 26, 28, 35, 50, 59, 61, 62 | | |
| Mason – Building | 3B-Bing-Z2 | 4, 9, 13, 39, 54 | | |
| Mason – Building | 3B-Ith-Z2 | 12, 55 | | |

**Job Classification Checklist**

**(Place a checkmark by all classifications that will be using the 4/10 schedule)**

**** Do not write in any additional Classifications or Counties****

| Job Classification | Tag # | Entire Counties | Partial Counties | Check Box |
|---|---|---|---|---|
| Mason – Building | 3B-Jam-Z2 | 7 | 2, 5 | |
| Mason – Building – Residential | 3B-Jam-Z2R | 2, 4, 8, 7, 9, 12, 39, 13, 49, 51, 54, 55 | 5 | |
| Mason – Building | 3B-Z3 | 15, 32 | 5 | |
| Mason – Building | 3B-Z3.Orleans | 37 | | |
| Mason – Residential | 3B-Z3R | 15, 32 | 5 | |
| Mason – Residential | 3B-z3R.Orleans | 37 | | |
| Mason - Heavy & Highway | 3h | 2, 4, 8, 7, 9, 12, 13, 19, 26, 28, 35, 37, 39, 49, 50, 51, 54, 55, 59, 61, 62 | 5, 15, 32 | |
| Mason – Tile Finisher | 3TF-Z1 | 19, 26, 28, 35, 50, 59, 61, 62 | | |
| Mason – Tile Finisher | 3TF-Z2 | 2, 4, 8, 7, 9, 12, 13, 39, 49, 51, 54, 55 | 5 | |
| Mason – Tile Finisher | 3TF-Z3 | 15, 32, 37 | 5 | |
| Mason – Tile Finisher | 3TF-Z1R | 19, 26, 28, 35, 50, 59, 61, 62 | | |
| Mason – Tile Finisher | 3TF-Z2R | 2, 4, 7, 9, 12, 13, 39, 49, 51, 54, 55 | 5 | |
| Mason – Tile Finisher | 3TF-Z3R | 15, 32, 37 | 5 | |
| Mason – Tile Setter | 3TS-Z1 | 19, 26, 28, 35, 50, 59, 61, 62 | | |
| Mason – Tile Setter Residential | 3TS-Z1R | 19, 26, 28, 35, 50, 59, 61, 62 | | |
| Mason – Tile Setter | 3TS-Z2 | 2, 4, 7, 8, 9, 12, 13, 39, 49, 51, 54, 55 | 5 | |
| Mason – Tile Setter Residential | 3TS-Z2R | 2, 4, 7, 8, 9, 12, 13, 39, 49, 51, 54, 55 | 5 | |
| Mason – Tile Setter | 3TS-Z3 | 15, 32, 37 | 5 | |
| Mason – Tile Setter Residential | 3TS-Z3R | 15, 32, 37 | 5 | |
| Mason – Building/Heavy & Highway | 780 | 3, 24, 30, 31, 41, 43, 52 | | |
| Operating Engineer - Heavy & Highway | 137H/H | 40, 60 | 14 | |
| Operating Engineer – Heavy & Highway | 158-832H | 2, 8, 26, 28, 35, 49, 51, 59, 62 | 19 | |
| Operating Engineer – Heavy & Highway | 158-H/H | 1, 4, 9, 10, 11, 14, 16, 17, 18, 20, 21, 22, 29, 39, 42, 46, 47, 48, 54, 57, 58 | | |
| Operating Engineer – Heavy & Highway | 158-545h | 6, 12, 23, 25, 27, 33, 38, 45, 50, 55 | | |
| Painter | 1456-LS | 1, 3, 10, 11, 14, 16, 17, 18, 20, 21, 24, 29, 30, 31, 36, 40, 41, 42, 43, 44, 46, 47, 48, 52, 53, 56, 57, 58, 60 | | |
| Painter | 150 | 28, 59, 62 | 26, 35 | |

**Job Classification Checklist**

**(Place a checkmark by all classifications that will be using the 4/10 schedule)**

**** Do not write in any additional Classifications or Counties****

| Job Classification | Tag # | Entire Counties | Partial Counties | Check Box |
|---|---|---|---|---|
| Painter | 178 B | 4, 9, 54 | | |
| Painter | 178 E | 8, 49 | 51 | |
| Painter | 178 I | 12, 55 | | |
| Painter | 178 O | 13, 39 | | |
| Painter | 31 | 6, 22, 27, 33, 34, 50 | 25, 35, 38 | |
| Painter | 38.O | | 38 | |
| Painter | 38.W | 23, 45 | 25 | |
| Painter | 4-Buf,Nia,Olean | 2, 15, 19, 32, 37, 61 | 5, 7, 26, 51 | |
| Painter | 4-Jamestown | | 5, 7 | |
| Sheetmetal Worker | 46 | 26, 28, 35, 50, 59, 62 | | |
| Sheetmetal Worker | 46r | 26, 28, 35, 50, 59, 62 | | |
| Teamsters – Heavy & Highway | 294h/h | 1, 11, 18, 20, 29, 42, 46, 47, 48, 58 | 57 | |
| Teamsters – Heavy & Highway | 317bhh | 6, 12, 50, 51, 55, 62 | 2 | |
| Teamsters - Building/Heavy & Highway | 456 | 40, 60 | | |

# Introduction to the Prevailing Rate Schedule

### Information About Prevailing Rate Schedule

This information is provided to assist you in the interpretation of particular requirements for each classification of worker contained in the attached Schedule of Prevailing Rates.

### Classification

It is the duty of the Commissioner of Labor to make the proper classification of workers taking into account whether the work is heavy and highway, building, sewer and water, tunnel work, or residential, and to make a determination of wages and supplements to be paid or provided. It is the responsibility of the public work contractor to use the proper rate. If there is a question on the proper classification to be used, please call the district office located nearest the project. District office locations and phone numbers are listed below.

Prevailing Wage Schedules are issued separately for "General Construction Projects" and "Residential Construction Projects" on a county-by-county basis.

General Construction Rates apply to projects such as: Buildings, Heavy & Highway, and Tunnel and Water & Sewer rates.

Residential Construction Rates generally apply to construction, reconstruction, repair, alteration, or demolition of one family, two family, row housing, or rental type units intended for residential use.

Some rates listed in the Residential Construction Rate Schedule have a very limited applicability listed along with the rate. Rates for occupations or locations not shown on the residential schedule must be obtained from the General Construction Rate Schedule. Please contact the local Bureau of Public Work office before using Residential Rate Schedules, to ensure that the project meets the required criteria.

Payrolls and Payroll Records

Contractors and subcontractors are required to establish, maintain, and preserve for not less that six (6) years, contemporaneous, true, and accurate payroll records.

Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury.

### Paid Holidays

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

### Overtime

At a minimum, all work performed on a public work project in excess of eight hours in any one day or more than five days in any workweek is overtime. However, the specific overtime requirements for each trade or occupation on a public work project may differ. Specific overtime requirements for each trade or occupation are contained in the prevailing rate schedules.

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays.

The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

### Supplemental Benefits

Particular attention should be given to the supplemental benefit requirements. Although in most cases the payment or provision of supplements is straight time for all hours worked, some classifications require the payment or provision of supplements, or a portion of the supplements, to be paid or provided at a premium rate for premium hours worked. Supplements may also be required to be paid or provided on paid holidays, regardless of whether the day is worked. The Overtime Codes and Notes listed on the particular wage classification will indicate these conditions as required.

### Effective Dates

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. The rate listed is valid until the next effective rate change or until the new annual determination which takes effect on July 1 of each year. All contractors and subcontractors are required to pay the current prevailing rates of wages and supplements. If you have any questions please contact the Bureau of Public Work or visit the New York State Department of Labor website (www.labor.state.ny.us) for current wage rate information.

### Apprentice Training Ratios

The following are the allowable ratios of registered Apprentices to Journey-workers.

For example, the ratio 1:1,1:3 indicates the allowable initial ratio is one Apprentice to one Journeyworker. The Journeyworker must be in place on the project before an Apprentice is allowed. Then three additional Journeyworkers are needed before a second Apprentice is allowed. The last ratio repeats indefinitely. Therefore, three more Journeyworkers must be present before a third Apprentice can be hired, and so on.

Please call Apprentice Training Central Office at (518) 457-6820 if you have any questions.

| Title (Trade) | Ratio |
|---|---|
| Boilermaker (Construction) | 1:1,1:4 |
| Boilermaker (Shop) | 1:1,1:3 |
| Carpenter (Bldg.,H&H, Pile Driver/Dockbuilder) | 1:1,1:4 |
| Carpenter (Residential) | 1:1,1:3 |
| Electrical (Outside) Lineman | 1:1,1:2 |
| Electrician (Inside) | 1:1,1:3 |
| Elevator/Escalator Construction & Modernizer | 1:1,1:2 |
| Glazier | 1:1,1:3 |
| Insulation & Asbestos Worker | 1:1,1:3 |
| Iron Worker | 1:1,1:4 |
| Laborer | 1:1,1:3 |
| Mason | 1:1,1:4 |
| Millwright | 1:1,1:4 |
| Op Engineer | 1:1,1:5 |
| Painter | 1:1,1:3 |
| Plumber & Steamfitter | 1:1,1:3 |
| Roofer | 1:1,1:2 |
| Sheet Metal Worker | 1:1,1:3 |
| Sprinkler Fitter | 1:1,1:2 |

If you have any questions concerning the attached schedule or would like additional information, please contact the nearest BUREAU of PUBLIC WORK District Office or write to:

New York State Department of Labor
Bureau of Public Work
State Office Campus, Bldg. 12
Albany, NY 12240

| District Office Locations: | Telephone # | FAX # |
|---|---|---|
| Bureau of Public Work - Albany | 518-457-2744 | 518-485-0240 |
| Bureau of Public Work - Binghamton | 607-721-8005 | 607-721-8004 |
| Bureau of Public Work - Buffalo | 716-847-7159 | 716-847-7650 |
| Bureau of Public Work - Garden City | 516-228-3915 | 516-794-3518 |
| Bureau of Public Work - Newburgh | 845-568-5287 | 845-568-5332 |
| Bureau of Public Work - New York City | 212-932-2419 | 212-775-3579 |
| Bureau of Public Work - Patchogue | 631-687-4882 | 631-687-4902 |
| Bureau of Public Work - Rochester | 585-258-4505 | 585-258-4708 |
| Bureau of Public Work - Syracuse | 315-428-4056 | 315-428-4671 |
| Bureau of Public Work - Utica | 315-793-2314 | 315-793-2514 |
| Bureau of Public Work - White Plains | 914-997-9507 | 914-997-9523 |
| Bureau of Public Work - Central Office | 518-457-5589 | 518-485-1870 |

## Suffolk County General Construction

### Asbestos Worker — 11/01/2018

**JOB DESCRIPTION** Asbestos Worker **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

**WAGES**

| Per Hour: | 07/01/2018 |
|---|---|
| Abestos Worker<br>Removal & Abatement Only* | $ 44.00 |

NOTE: *On Mechanical Systems that are NOT to be SCRAPPED.

**SUPPLEMENTAL BENEFITS**

| Per Hour: | |
|---|---|
| Abestos Worker<br>Removal & Abatement Only | $ 8.70 |

**OVERTIME PAY**
See (B, B2, *E, J) on OVERTIME PAGE
Hours worked on Saturdays are paid at time and one half only if forty hours have been worked during the week.

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Apprentice Removal & Abatement Only:
1000 hour terms at the following percentage of Journeyman's rates.

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| 78% | 80% | 83% | 89% |

SUPPLEMENTAL BENEFIT

| Per Hour: | |
|---|---|
| Apprentice<br>Removal & Abatement | $ 8.70 |

4-12a - Removal Only

### Boilermaker — 11/01/2018

**JOB DESCRIPTION** Boilermaker **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

**WAGES**

| Per Hour: | 07/01/2018 | 01/01/2019 |
|---|---|---|
| Boilermaker | $ 57.17 | $ 59.17 |
| Repairs & Renovations | $ 57.17 | $ 59.17 |

**SUPPLEMENTAL BENEFITS**

| Per Hour: | 07/01/2018 | 01/01/2019 |
|---|---|---|
| Boilermaker<br>Repair $ Renovations | 32% of hourly Wage Paid + $ 25.32 | 32% of hourly Wage Paid + $ 25.35 |

NOTE: "Hourly Wage Paid" shall include any and all premium(s) pay.

Repairs & Renovation Includes replacement of parts and repairs & renovation of existing unit.

**OVERTIME PAY**
See (D, O) on OVERTIME PAGE
Repairs & Renovation see (B,E,Q)

**HOLIDAY**

Paid: See (8, 16, 23, 24) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 12, 15, 16, 22, 23, 24, 25) on HOLIDAY PAGE
NOTE: *Employee must work in pay week to receive Holiday Pay.
**Employee gets 4 times the hourly wage rate for working Labor Day.

**REGISTERED APPRENTICES**
Wage per hour:
(1/2) Year Terms at the following pecentage of Boilermaker's Wage

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th |
|---|---|---|---|---|---|---|
| 65% | 70% | 75% | 80% | 85% | 90% | 95% |

Supplemental Benefits Per Hour:

| Apprentice(s) | 07/01/2018 32% of Hourly Wage Paid Plus Amount Below | 01/01/2019 32% of Hourly Wage Paid Plus Amount Below |
|---|---|---|
| 1st Term | $ 19.37 | $ 19.38 |
| 2nd Term | 20.22 | 20.24 |
| 3rd Term | 21.06 | 21.08 |
| 4th Term | 21.92 | 21.94 |
| 5th Term | 22.77 | 22.79 |
| 6th Term | 23.62 | 23.65 |
| 7th Term | 24.46 | 24.49 |

NOTE: "Hourly Wage Paid" shall include any and all premium(s)

4-5

**Carpenter** **11/01/2018**

**JOB DESCRIPTION** Carpenter **DISTRICT** 8

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

**WAGES**
Per hour: 07/01/2018

| | |
|---|---|
| Piledriver | $ 53.63 |
| Dockbuilder | $ 53.63 |

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journeyworker | $ 50.62 |

**OVERTIME PAY**
See (B, E2, O) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE.

Paid: for 1st & 2nd yr.
Apprentices See (5,6,11,13,25)

Overtime: See (5,6,11,13,25) on HOLIDAY PAGE.

**REGISTERED APPRENTICES**
Wages per hour
(1)year terms:

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $21.45 | $26.82 | $34.86 | $42.90 |

Supplemental benefits per hour:

All Terms: $ 33.49

8-1556 Db

**Carpenter** **11/01/2018**

**JOB DESCRIPTION** Carpenter **DISTRICT** 8

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester

**WAGES**
Per hour: 07/01/2018

Carpet/Resilient
Floor Coverer $ 50.50

INCLUDES HANDLING & INSTALLATION OF ARTIFICIAL TURF AND SIMILAR TURF INDOORS/OUTDOORS.

**SUPPLEMENTAL BENEFITS**
Per hour:
$ 45.85

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (18, 19) on HOLIDAY PAGE.

Paid for 1st & 2nd yr.
Apprentices See (5,6,11,13,16,18,19,25)
Overtime: See (5,6,11,13,16,18,19,25) on HOLIDAY PAGE.

**REGISTERED APPRENTICES**
Wage per hour - (1) year terms:

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $20.20 | $25.25 | $32.83 | $40.40 |

Supplemental benefits per hour - all apprentice terms:

$ 31.11

8-2287

**Carpenter** **11/01/2018**

**JOB DESCRIPTION** Carpenter **DISTRICT** 8

**ENTIRE COUNTIES**
Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

**WAGES**
Per Hour: 07/01/2018

Marine Construction:

Marine Diver $ 67.94
Marine Tender 48.24

**SUPPLEMENTAL BENEFITS**
Per Hour:

Journeyman $ 50.62

**OVERTIME PAY**
See (B, E, E2, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (18, 19) on HOLIDAY PAGE
Overtime: See (5, 6, 10, 11, 13, 16, 18, 19) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wages per hour:
One (1) year terms.

1st year $ 21.45
2nd year 26.82
3rd year 34.86
4th year 42.90

Supplemental Benefits
Per Hour:

All terms $ 33.49

8-1456MC

**Carpenter** **11/01/2018**

**JOB DESCRIPTION** Carpenter **DISTRICT** 8

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

**WAGES**
Per hour: 07/01/2018

Building
Millwright $ 52.70

**SUPPLEMENTAL BENEFITS**
Per hour:

Millwright $ 53.16

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (18,19) on HOLIDAY PAGE.

Overtime See (5,6,8,11,13,18,19,25) on HOLIDAY PAGE.

**REGISTERED APPRENTICES**
Wages per hour:

One (1) year terms:

| 1st. | 2nd. | 3rd. | 4th. |
|---|---|---|---|
| $28.33 | $33.48 | $38.63 | $48.93 |

Supplemental benefits per hour:

One (1) year terms:

| 1st. | 2nd. | 3rd. | 4th. |
|---|---|---|---|
| $34.23 | $37.83 | $42.08 | $48.64 |

8-740.1

**Carpenter** **11/01/2018**

**JOB DESCRIPTION** Carpenter **DISTRICT** 8

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

**WAGES**
Per Hour:
07/01/2018

Timberman $ 49.10

**SUPPLEMENTAL BENEFITS**
Per Hour:
07/01/2018

$ 49.92

**OVERTIME PAY**
See (B, E, E2, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE.

Paid: for 1st & 2nd yr.
Apprentices See (5,6,11,13,25)

Overtime: See (5,6,11,13,25) on HOLIDAY PAGE.

**REGISTERED APPRENTICES**
Wages per hour:
One ( 1 ) year terms:

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $19.64 | $24.55 | $31.92 | $39.28 |

Supplemental benefits per hour:
All terms $ 33.14

8-1556 Tm

## Carpenter 11/01/2018

**JOB DESCRIPTION** Carpenter **DISTRICT** 8

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Westchester

**PARTIAL COUNTIES**
Orange: South of but including the following, Waterloo Mills, Slate Hill, New Hampton, Goshen, Blooming Grove, Mountainville, east to the Hudson River.
Putnam: South of but including the following, Cold Spring, TompkinsCorner, Mahopac, Croton Falls, east to Connecticut border.
Suffolk: West of Port Jefferson and Patchogue Road to Route 112 to the Atlantic Ocean.

**WAGES**
Per hour: 07/01/2018

Core Drilling:
Driller $ 39.69

Driller Helper 31.62

Note: Hazardous Waste Pay Differential:
For Level C, an additional 10% above wage rate per hour
For Level B, an additional 10% above wage rate per hour
For Level A, an additional 10% above wage rate per hour
Note: When required to work on water: an additional $ 0.50 per hour.

**SUPPLEMENTAL BENEFITS**
Per hour: 07/01/2018

Driller and Helper $ 25.45

**OVERTIME PAY**
OVERTIME: See (B,E,K*,P,R**) on OVERTIME PAGE.

**HOLIDAY**
Paid: See (5,6) on HOLIDAY PAGE.
Overtime: * See (5,6) on HOLIDAY PAGE.
** See (8,10,11,13) on HOLIDAY PAGE.

8-1536-CoreDriller

## Carpenter - Building / Heavy&Highway 11/01/2018

**JOB DESCRIPTION** Carpenter - Building / Heavy&Highway **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**
Per Hour: 07/01/2018
Carpenter
(Building) $ 49.38
Carpenter
(Heavy Highway) $ 49.38

"NOTE" ADD 15% to straight time hourly wage for NEW YORK STATE D.O.T. and other GOVERMENTAL MANDATED Off-Shift Work.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday, with one-half (1/2) hour allowed for a lunch period.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| Both Carpenter Categories | $ 32.11 |

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
One(1) Year Terms at the following:
Per Hour:

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $ 23.73 | $ 27.86 | $ 29.93 | $ 34.06 |

Supplemental Benefits
Per Hour:

All Terms: $ 18.10

4-Reg.Council Nass/Suff

## Electrician — 11/01/2018

**JOB DESCRIPTION** Electrician **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**

| Per Hour: | 07/01/2018 | 04/27/2019 |
|---|---|---|
| Telephone and Intergrated Tele-Data System Electrician | $ 37.48 | $ 37.83 |

This rate classification applies to ALL Voice, Data & Video work.: Excluding Fire Alarm Systems and Energy Managment Systems (HVAC Controls), in those cases the regular Electrician rate applies. To ensure proper use of this rate please call Nassau Offices at (516)228-3912 or Suffolk Offices at (631)687-4882.

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | | |
|---|---|---|
| Tele-Data Electrican | 16% of Hourly Wage Paid + $18.49 | 16% of Hourly Wage Paid + $19.01 |

NOTE: "Hourly Wage Paid" shall include any and all premium(s) pay

**OVERTIME PAY**
See (B, E, E2, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16, 25) on HOLIDAY PAGE

4-25tela

## Electrician — 11/01/2018

**JOB DESCRIPTION** Electrician **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**

| Per Hour: | 07/01/2018 | 03/30/2019 |
|---|---|---|
| Electrician<br>Electrical Maintenance | $ 43.20 | $ 43.70 |
| Traffic Signal | $ 44.10 | $ 44.60 |

"PLEASE NOTE"
Applicable to "EXISTING ELECTRICAL SYSTEMS" including, but not limited to TRAFFIC SIGNALS & STREET LIGHTING. Not used for addons.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday, with one-half (1/2) hour allowed for a lunch period.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | | |
|---|---|---|
| Electrician | 12% of Hourly Wage Paid + $17.61 | 12% of Hourly Wage Paid + $18.37 |

NOTE: "Hourly Wage Paid" shall include any and all premium(s) pay

**OVERTIME PAY**
See (B, E2, K, P) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
One(1) Year Term(s) at the following Percentage of Journeyman(s) Wage:

| 1st | 2nd | 3rd | 4th | 5th | 6th |
|---|---|---|---|---|---|
| 40% | 50% | 60% | 70% | 80% | 90% |

Supplemental Benefits:

| | 07/01/2018 | 03/30/2019 |
|---|---|---|
| 1st | 3% + $3.50 | 3% + $3.50 |
| 2nd | 8% + $4.04 | 8% + $4.04 |
| 3rd | 9% + $5.05 | 9% + $5.05 |
| 4th | 10% + $ 6.81 | 10% + $ 6.81 |
| 5th | 11% + $10.76 | 11% + $10.76 |
| 6th | 12% + $13.86 | 12% + $13.86 |

NOTE: Percentages are on "Hourly Wage Paid"
NOTE: "Hourly Wage Paid" shall include any and all premium(s) pay

4-25m

**Electrician** **11/01/2018**

**JOB DESCRIPTION** Electrician **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**

| Per Hour: | 07/01/2018 |
|---|---|
| Electrician<br>Pump & Tank | $ 41.65 |

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| Electrician<br>Pump & Tank | 65.25% |

of *Wage
Paid

*Wage Paid includes any and all Premiums

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
1 Year Terms at the Following:

Per Hour:

| | |
|---|---|
| 1st Term | $ 12.50 |
| 2nd Term | $ 14.58 |
| 3rd Term | $ 16.66 |
| 4th Term | $ 18.74 |
| 5th Term | $ 24.99 |
| 6th Term | $ 29.16 |

SUPPLEMENTAL BENEFITS

Per Hour:

| | |
|---|---|
| All Terms | 65.25% of *Wage Paid |

*Wage Paid includes any and all Premiums

4-25 Pump & Tank

## Electrician — 11/01/2018

**JOB DESCRIPTION** Electrician **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**

| Per Hour: | 07/01/2018 | 10/27/2018 |
|---|---|---|
| Electrician/Wireman | $ 51.75 | $ 52.00 |
| HVAC Controls | 51.75 | 52.00 |
| Fire Alarms | 51.75 | 52.00 |

**SUPPLEMENTAL BENEFITS**

| Per Hour: | 07/01/2018 | 10/27/2018 |
|---|---|---|
| Electrcian/Wireman (all catagories) | 16% of Hourly Wage Paid + $25.26 | 16% of Hourly Wage Paid + $25.83 |

NOTE: "Hourly Wage Paid" shall include any and all premium[s]

**OVERTIME PAY**
See (B, E, E2, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
One(1) Year Terms at the following Percetage of Journeyman(s) Wage:

| 1st | 2nd | 3rd | 4th | 5th | 6th |
|---|---|---|---|---|---|
| 35% | 35% | 40% | 45% | 60% | 75% |

Supplemental Benefits Per Hour:

| 07/01/2018 | 10/27/2018 |
|---|---|

| | | |
|---|---|---|
| 1st | 3% + $2.71 | 3% + $2.71 |
| 2nd | 8% + $4.68 | 8% + $4.68 |
| 3rd | 9% + $5.85 | 9% + $5.85 |
| 4th | 10% + $7.99 | 10% + $7.99 |
| 5th | 13% + $10.82 | 13% + $10.82 |
| 6th | 14% + $17.08 | 14% + $17.08 |

NOTE: Percentages are on "Hourly Wage Paid"
NOTE: "Hourly Wage Paid" shall include any and all premium(s).

4-25

## Electrician — 11/01/2018

**JOB DESCRIPTION** Electrician **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**

| Per Hour: | 07/01/2018 |
|---|---|
| Tree Trimmer/Remover<br>Line Clearance Specialist | $ 32.72 |
| Groundman* | $19.63 |

These rates apply to all tree trimming/removal contracts including but not limited to "Electrical Line Clearance"/"Long Island Railroad Right of Ways".

All tree removal for heavy highway or building construction contracts MUST use Heavy Highway Laborer and Operating Engineer classifications.

* Note: Groundman is not to exceed 20% of the total company workforce

**SUPPLEMENTAL BENEFITS**

| Per Hour: | 07/01/2018 |
|---|---|
| Tree Trimmer/Remover<br>Line Clearance Specialist<br>and Groundman | 19.75% of Hourly<br>Wage Paid +<br>$9.82 |

NOTE: "Hourly Wage Paid" shall include any and all premium(s) paid

**OVERTIME PAY**
See (B, E, P, S) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 6, 8, 16, 23, 24, 25, 26) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 16, 23, 24, 25, 26) on HOLIDAY PAGE

4-1049/Tree

## Electrician Lineman — 11/01/2018

**JOB DESCRIPTION** Electrician Lineman **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Queens, Suffolk

**WAGES**
For Utility Distribution & Transmission Line Construction:

| Per Hour: | 07/01/2018 | 04/01/2019 |
|---|---|---|
| Lineman/Splicer | $ 55.60 | $ 57.41 |
| Material Man | 48.37 | 49.95 |
| Heavy Equip. Operator | 44.48 | 45.93 |
| Groundman | 33.36 | 34.45 |
| Flagman | 25.02 | 25.83 |

For Natural Gasline Construction:

| Per Hour: | 07/01/2018 | 06/01/2019 |
|---|---|---|
| Journeyman U.G.Mech. | $ 46.99 | $48.52 |

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

**SUPPLEMENTAL BENEFITS**
Per Hour:
Utility Distribution & Transmission Line Construction:

| | 07/01/2018 | 04/01/2019 |
|---|---|---|
| All Classifications | 32% of Hourly Wage Paid + $ 12.43 | 32% of Hourly Wage Paid + $ 13.09 |

NOTE: "Hourly Wage Paid" shall include any and all premium(s) pay

Natural Gasline Construction:

| Per Hour: | 07/01/2018 | 06/01/2019 |
|---|---|---|
| Journeyman U.G.Mech. | 26.0% of Hourly Wage Paid + $12.62 | 27% of Hourly Wage Paid + $13.28 |

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE
OVERTIME for Natural Gas Mechanic:(B,G,P)

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 16, 23, 25, 26) on HOLIDAY PAGE
Same as Above for Natural Gas Mechanic.

**REGISTERED APPRENTICES**
1000 hour Terms at the following Percentage of Journeyman's Wage.
(Lineman Only)

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th |
|---|---|---|---|---|---|---|
| 60% | 65% | 70% | 75% | 80% | 85% | 90% |

| SUPPLEMENTAL BENEFIT: | 07/01/2018 | 04/01/2019 |
|---|---|---|
| All Terms | 31% of Hourly Wage Paid + $12.43 | 31% of Hourly Wage Paid + $13.09 |

4-1049 Line/Gas

## Elevator Constructor — 11/01/2018

**JOB DESCRIPTION** Elevator Constructor **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

**PARTIAL COUNTIES**
Rockland: Entire County except for the Township of Stony Point
Westchester: Entire County except for the Townships of Bedford, Lewisboro, Cortland, Mt. Kisco, North Salem, Pound Ridge, Somers and Yorktown.

**WAGES**
Per hour:

| | 07/01/2018 |
|---|---|
| Elevator Constructor | $ 64.48 |
| Modernization & Service/Repair | 50.49 |

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| Elevator Constructor | $ 39.922 |
| Modernization & Service/Repair | 38.966 |

**OVERTIME PAY**
Constructor. See ( D, M, T ) on OVERTIME PAGE.

Modern./Service See ( B, F, S ) on OVERTIME PAGE.

**HOLIDAY**
Paid: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
WAGES PER HOUR:
*Note:1st Term is based on Average wage of Constructor & Modernization.
Terms 2 thru 4 Based on Journeyman's wage of classification Working in.

1 YEAR TERMS:

| 1st Term* | 2nd Term | 3rd Term | 4th Term |
|---|---|---|---|
| 50% | 55% | 65% | 75% |

SUPPLEMENTAL BENEFITS

| | |
|---|---|
| Elevator Constructor | |
| 1st Term | $ 32.04 |
| 2nd Term | 32.80 |
| 3rd Term | 34.038 |
| 4th Term | 35.277 |
| Modernization & Service/Repair | |
| 1st Term | $ 31.965 |
| 2nd Term | 32.406 |
| 3rd Term | 33.578 |
| 4th Term | 34.745 |



## Glazier — 11/01/2018

**JOB DESCRIPTION** Glazier **DISTRICT** 8

**ENTIRE COUNTIES**
Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

**WAGES**

| Per hour: | 07/01/2018 | 11/01/2018 |
|---|---|---|
| Glazier | $ 54.75 | + additional |
| *Scaffolding | 55.75 | $ 1.25 |
| Glass Tinting & Window Film | 28.16 | |
| **Repair & Maintenance | 28.16 | |

*Scaffolding includes swing scaffold, mechanical equipment, scissor jacks, man lifts, booms & buckets 24' or more, but not pipe scaffolding.

**Repair & Maintenance- All repair & maintenance work on a particular building,whenever performed, where the total cumulative contract value is under $100,000. All Glass tinting, window film, regardless of material or intended use, and all affixing of decals to windows or glass.

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journeyworker | $ 32.39 |
| Glass tinting & Window Film | 18.64 |
| Repair & Maintenance | 18.64 |

**OVERTIME PAY**
See (C*,D* E2, O) on OVERTIME PAGE. (Premium is applied to the respective base wage only.)

* If an optional 8th hour is required to complete the entire project, the same shall be paid at the regular rate of pay. If a 9th hour is worked, then both hours or more (8th & 9th or more) will be paid at double time rate of pay.

For 'Repair & Maintenance' see (B, B2, F, P) on overtime page.

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (4, 6, 16, 25) on HOLIDAY PAGE
For 'Repair & Maintenance' see (5, 6, 16, 25)

**REGISTERED APPRENTICES**
Wage per hour:
(1) year terms at the following wage rates:

| | 07/01/2018 | 11/01/2018 TBD |
|---|---|---|
| 1st term | $ 18.54 | |
| 2nd term | 26.84 | |
| 3rd term | 32.45 | |
| 4th term | 43.57 | |

Supplemental Benefits:
(Per hour)

| | |
|---|---|
| 1st term | $ 15.76 |
| 2nd term | 21.61 |
| 3rd term | 23.81 |
| 4th term | 27.96 |

8-1281 (DC9 NYC)

## Insulator - Heat & Frost — 11/01/2018

**JOB DESCRIPTION** Insulator - Heat & Frost **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

**WAGES**
Per Hour:

| | 07/01/2018 | 01/01/2019 |
|---|---|---|
| Insulators Heat & Frost | $ 67.11 | Additional $1.25 to be allocated |

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| Insulators Heat & Frost | $ 33.56 |

**OVERTIME PAY**
See (*C, **O, V) on OVERTIME PAGE
* 8th Hour paid at time and one half
** Triple time for Labor Day (If worked)

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wages:
1 year terms Per Hour:
Hired prior to 08/21/2017

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $26.84 | $33.55 | $40.27 | $50.33 |

Hired after 8/21/2017

| | | | |
|---|---|---|---|
| $23.49 | $30.20 | $36.91 | $43.62 |

Supplemental Benefits:
Hired prior to 08/21/2017

| | | | |
|---|---|---|---|
| $13.42 | $16.78 | $20.14 | $25.17 |

Hired after 08/21/2017

| | | | | |
|---|---|---|---|---|
| | $11.75 | $15.10 | $18.45 | $21.81 |

4-12

## Ironworker — 11/01/2018

**JOB DESCRIPTION** Ironworker **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

**PARTIAL COUNTIES**
Rockland: Southern section - south of Convent Road and east of Blue Hills Road.

**WAGES**

| Per hour: | 07/01/2018 | 07/01/2019 |
|---|---|---|
| Reinforcing & Metal Lathing | $ 56.28 | $ 2.00/Hr. to be Allocated |
| "Basic" Wage | $ 54.65** | |

**Overtime to be calculated on "Basic" wage

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Reinforcing & Metal Lathing | $ 35.30 |

**OVERTIME PAY**
See (B, E, Q, *X) on OVERTIME PAGE
*Only $22.00 per Hour for non worked hours

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 13, 18, 19, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
(1) year terms at the following wage rates:
Wages Per Hour:

| 1st term | 2nd term | 3rd term | 4th Term |
|---|---|---|---|
| $ 26.38 | $ 30.38 | $ 35.38 | $ 37.38 |

SUPPLEMENTAL BENIFITS
Per Hour:

| 1st term | 2nd term | 3rd term | 4th Term |
|---|---|---|---|
| $ 15.37 | $ 17.37 | $ 19.33 | $ 20.33 |

4-46Reinf

## Ironworker — 11/01/2018

**JOB DESCRIPTION** Ironworker **DISTRICT** 9

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

**WAGES**

| Per Hour: | 07/01/2018 |
|---|---|
| Ironworker Rigger | $ 62.84 |
| Ironworker Stone Derrickman | $ 62.84 |

**SUPPLEMENTAL BENEFITS**
Per hour: $ 39.79

**OVERTIME PAY**
See (B, D1, *E, Q, **V) on OVERTIME PAGE
*Time and one-half shall be paid for all work on Saturday up to eight (8) hours and double time shall be paid for all work thereafter.
** Benefits same premium as wages on Holidays only

**HOLIDAY**
Paid: See (18) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 25) on HOLIDAY PAGE

*Work stops at schedule lunch break with full day's pay.

**REGISTERED APPRENTICES**
Wage per hour:

1/2 year terms at the following hourly wage rate:

| | 1st | 2nd | 3rd | 4th | 5th | 6th |
|---|---|---|---|---|---|---|
| 07/01/2018 | $31.42 | $31.42 | $44.54 | $43.07 | $54.41 | $54.41 |

Supplemental benefits:

| | | | | | | |
|---|---|---|---|---|---|---|
| Per hour: | $19.97 | $19.97 | $30.02 | $30.02 | $30.02 | $30.02 |

9-197D/R

**Ironworker** **11/01/2018**

**JOB DESCRIPTION** Ironworker **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

**WAGES**

| Per Hour: | 07/01/2018 | 01/01/2019 |
|---|---|---|
| Ornamental | $44.65 | $1.25/hr. |
| Chain Link Fence | 44.65 | to be Allocated |
| Guide Rail | 44.65 | |

**SUPPLEMENTAL BENEFITS**
Per hour:
Journeyworker: $ 54.05

**OVERTIME PAY**
See (B, B1, E2, Q, V) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
1st term represents first 1-10 months, thereafter (1/2) year terms at the following percentage of Journeyman's wage.

| 1st | 2nd | 3rd | 4th | 5th |
|---|---|---|---|---|
| 50% | 55% | 60% | 70% | 80% |

Supplemental Benefits per hour:

| | |
|---|---|
| 1st Term | $ 41.37 |
| 2nd Term | 42.67 |
| 3rd Term | 43.91 |
| 4th Term | 46.44 |
| 5th Term | 48.98 |

4-580-Or

**Ironworker** **11/01/2018**

**JOB DESCRIPTION** Ironworker **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

**WAGES**
PER HOUR:

| | 07/01/2018 | 01/01/2019 | 07/01/2019 |
|---|---|---|---|
| Ironworker: | | Additional | Additional |
| Structural | $ 50.70 | $1.82/Hr. | $1.93/Hr. |
| Bridges | | to be allocated | to be allocated |
| Machinery | | | |

**SUPPLEMENTAL BENEFITS**
PER HOUR:

Journeyman $ 73.93

**OVERTIME PAY**
See (B, B1, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 18, 19) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
WAGES PER HOUR:

6 month terms at the following rate:

| | |
|---|---|
| 1st | $ 26.44 |
| 2nd | 27.04 |
| 3rd - 6th | 27.65 |

Supplemental Benefits
PER HOUR:
All Terms 52.68

4-40/361-Str

## Laborer - Building — 11/01/2018

**JOB DESCRIPTION** Laborer - Building **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**
WAGES
Per Hour: 07/01/2018

| | |
|---|---|
| Building Laborer | $ 39.40 |
| Asbestos Abatement Workers (Re-Roofing Removal see Roofer) | 36.00 |

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| Building Laborer | $ 29.56 |
| Asbestoes Abatment Worker | 16.45 |

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE
See also(H)for Fire Watch on OVERTIME PAGE
Asbestos Worker See (B, H)

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 25) on HOLIDAY PAGE
Asbestos Worker see (5,6,8 & 28)

**REGISTERED APPRENTICES**
Regular Hours Work Terms

| | |
|---|---|
| Term #1 | 1 hr to 1000hrs |
| Term #2 | 1001hrs to 2000hrs |
| Term #3 | 2001hrs to 3000hrs |
| Term #4 | 3001hrs to 4000hrs |

Wages per hour:

| | |
|---|---|
| 1st Term | $ 17.46 |
| 2nd Term | 20.55 |
| 3rd Term | 25.43 |
| 4th Term | 30.41 |

Benifits per hour

| | |
|---|---|
| 1st Term | $ 19.65 |
| 2nd Term | 22.44 |
| 3rd Term | 22.44 |
| 4th Term | 22.44 |

4-66

## Laborer - Heavy&Highway — 11/01/2018

**JOB DESCRIPTION** Laborer - Heavy&Highway **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**
Laborer (Heavy/Highway):
GROUP # 1: Asphalt Rakers, Concrete Curb Formsetters.
GROUP # 2: Asphalt Shovelers, Roller Boys and Tampers.
GROUP # 3: Basic Laborer, Power Tool(Jackhammer), Landscape Construction, Traffic Control Personnel(flaggers)

WAGES PER HOUR:

| | 07/01/2018 | 06/01/2019 |
|---|---|---|
| GROUP # 1 | | |
| Total Wage Paid | $ 51.43 | Additional |
| "Base Wage" | 44.68 | $ 2.45 |
| GROUP # 2 | | |
| Total Wage Paid | $ 50.11 | Additional |
| "Base Wage" | 43.36 | $ 2.45 |
| GROUP # 3 | | |
| Total Wage Paid | $ 46.10 | Additional |
| "Base Wage" | 39.35 | $ 2.29 |

NOTE: "Base Wage" for Premium/Overtime calculation Only. $6.75 is differance between "Base" and "Total"

**SUPPLEMENTAL BENEFITS**
Per Hour:
ALL GROUPS $ 29.87

After Forty (40)paid hours in a work week
OVERTIME PAY $ 18.74

**OVERTIME PAY**
OVERTIME PAY
See (B, E2, F) on OVERTIME PAGE
NOTES: Premium/Overtime Pay to be calculated on "Base Wage" ONLY
Example Group# 3: $39.35 X Time and One Half = $59.02 + $6.75 = $65.77
Premium Pay of 30% of base wage for all Straight time hours on all New York State, D.O.T. and other Goverment Mandated Off-Shift Work.
Hazardous Material Work add an Additional 10% of base wage

**HOLIDAY**
HOLIDAY
Paid: See (1) on HOLIDAY PAGE
Overtime: See (1) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
1000 hour(s) Terms at the following Pecentage of the "Base Wage" except
4th Term calculate at Total Wage Paid.

| | |
|---|---|
| 1st 0-1000/Hrs. | 60% |
| 2nd 1001-2000/Hrs. | 70% |
| 3rd 2001-3000/Hrs. | 80% |
| 4th 3001-4000/Hrs. | 90% |

Supplemental Benefits per hour:

| | |
|---|---|
| All APPRENTICES | $ 29.87 |
| After Forty(40) paid hours in a work Week | $ 18.74 |

4-1298

## Mason — 11/01/2018

**JOB DESCRIPTION** Mason **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

**WAGES**
Per Hour: 07/01/2018

Brick/Blocklayer $ 61.12

**SUPPLEMENTAL BENEFITS**
Per Hour:

Brick/Block Layer $ 27.30

**OVERTIME PAY**
See (A, E, E2, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
(800 hour) Terms at the following Percentage of Journeyworkers Wage:

| 1st | 2nd | 3rd | 4th | 5th |
|---|---|---|---|---|
| 50% | 60% | 70% | 80% | 90% |

Supplemental Benefits per hour:

All Apprentices $ 16.90

4-1Brk

## Mason - Building — 11/01/2018

**JOB DESCRIPTION** Mason - Building **DISTRICT** 9

**ENTIRE COUNTIES**
Nassau, Rockland, Suffolk, Westchester

**WAGES**
Per hour: 07/01/2018

Tile Finisher $ 43.36

**SUPPLEMENTAL BENEFITS**
Per Hour:
$ 28.99

**OVERTIME PAY**
See (B, E, Q, *V) on OVERTIME PAGE
Work beyond 10 hours on a Saturday shall be paid at double the hourly wage rate.

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

9-7/88A-tf

## Mason - Building — 11/01/2018

**JOB DESCRIPTION** Mason - Building **DISTRICT** 9

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

**WAGES**
Building:
07/01/2018
Wages per hour:

Mosaic & Terrazzo Mechanic $ 52.46
Mosaic & Terrazzo Finisher $ 50.86

**SUPPLEMENTAL BENEFITS**
Per hour:

Mosaic & Terrazzo Mechanic $ 34.06
Mosaic & Terrazzo Finisher $ 34.04

**OVERTIME PAY**
See (A, *E, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE
Easter Sunday is an observed holiday.Holidays falling on a Saturday will be observed on that Saturday. Holidays falling on a Sunday will be celebrated on the Monday.

**REGISTERED APPRENTICES**
Wages per hour:
(750 Hour) terms at the following wage rate.

| | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|---|
| 07/01/2018 | $ 26.23 | $ 28.85 | $ 31.48 | $ 34.10 | $ 36.72 | $ 39.35 | $ 44.59 | $ 49.84 |

Supplemental benefits per hour:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 07/01/2018 | $ 17.05 | $ 18.74 | $ 20.43 | $ 22.15 | $ 23.85 | $ 25.55 | $ 28.96 | $ 32.37 |

9-7/3

## Mason - Building — 11/01/2018

**JOB DESCRIPTION** Mason - Building **DISTRICT** 9

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

**WAGES**
Per hour: 07/01/2018

Building-Marble Restoration:

Marble, Stone & Terrazzo Polisher, etc $ 40.99

**SUPPLEMENTAL BENEFITS**
Per Hour:
Journeyworker:

Building-Marble Restoration:
Marble, Stone & Polisher $ 26.59

**OVERTIME PAY**
See (B, *E, Q, V) on OVERTIME PAGE
*ON SATURDAYS, 8TH HOUR AND SUCCESSIVE HOURS PAID AT DOUBLE HOURLY RATE.

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE
1ST TERM APPRENTICE GETS PAID FOR ALL OBSERVED HOLIDAYS.

**REGISTERED APPRENTICES**
WAGES per hour:

2701 hour term at the following wage:

| | 1st 1-900 | 2nd 901-1800 | 3rd 1801-2700 | 4th 2701 |
|---|---|---|---|---|
| 07/01/2018 | $28.63 | $32.75 | $36.87 | $40.99 |

Supplemental Benefits Per Hour:

| | | | | |
|---|---|---|---|---|
| 07/01/2018 | $ 24.24 | $ 25.02 | $ 25.81 | $ 26.59 |

9-7/24-MP

## Mason - Building — 11/01/2018

**JOB DESCRIPTION** Mason - Building **DISTRICT** 9

**ENTIRE COUNTIES**
Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

**WAGES**
Wages: 07/01/2018

Marble Cutters & Setters $ 58.63

**SUPPLEMENTAL BENEFITS**
Per Hour:

Journeyworker $ 36.12

**OVERTIME PAY**
See (B, E, Q, V) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wage Per Hour:

7500 hour terms at the following wage.

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th |
|---|---|---|---|---|---|---|---|---|---|
| 1-750 | 751-1500 | 1501-2250 | 2251-3000 | 3001-3750 | 3751-4500 | 4501-5250 | 5251-6000 | 6001-6751 | 6751-7500 |
| 07/01/2018 | | | | | | | | | |
| $23.34 | $26.29 | $29.22 | $32.16 | $35.11 | $38.05 | $40.98 | $43.93 | $49.82 | $55.68 |

Supplemental Benefits per hour:

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th |
|---|---|---|---|---|---|---|---|---|---|
| $25.69 | $26.55 | $27.44 | $28.30 | $29.16 | $30.03 | $30.91 | $31.77 | $33.50 | $35.26 |

9-7/4

## Mason - Building — 11/01/2018

**JOB DESCRIPTION** Mason - Building **DISTRICT** 9

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

**WAGES**
Per hour: 07/01/2018

Marble, Stone,etc.
Maintenance Finishers: $ 22.77

Note 1: An additional $2.00 per hour for time spent grinding floor using "60 grit" and below.
Note 2: Flaming equipment operator shall be paid an additional $25.00 per day.

**SUPPLEMENTAL BENEFITS**
Per Hour:

Marble, Stone, etc
Maintenance Finishers: $ 13.24

**OVERTIME PAY**
See (B, *E, Q, V) on OVERTIME PAGE
*Double hourly rate after 8 hours on Saturday

**HOLIDAY**
Paid: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE
1st term apprentice gets paid for all observed holidays.

**REGISTERED APPRENTICES**
WAGES per hour:
(750 hour)terms at the following percentage of journeyman''s wage 07/01/2018

rate:

| | |
|---|---|
| 1st term | $15.90 |
| 2nd term | $16.82 |
| 3rd term | $17.73 |
| 4th term | $18.65 |
| 5th term | $20.02 |
| 6th term | $21.85 |
| 7th term | $22.77 |

Supplemental Benefits:
Per hour:

| | |
|---|---|
| 1st term | $ 13.14 |
| 2nd term | $ 13.15 |
| 3rd term | $ 13.17 |
| 4th term | $ 13.18 |
| 5th term | $ 13.20 |
| 6th term | $ 13.20 |
| 7th term | $ 13.24 |

9-7/24M-MF

## Mason - Building — 11/01/2018

**JOB DESCRIPTION** Mason - Building **DISTRICT** 9

**ENTIRE COUNTIES**
Nassau, Rockland, Suffolk, Westchester

**WAGES**
Per hour: 07/01/2018

Tile Setters $ 56.13

**SUPPLEMENTAL BENEFITS**
Per Hour:

$ 33.29

**OVERTIME PAY**
See (B, E, Q, V) on OVERTIME PAGE
* This portion of benefits subject to same premium rate as shown for overtime wages.
Work beyond 10 hours on Saturday shall be paid at double the hourly wage rate.

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wage per hour:

Tile Setters:
(750 hour) term at the following wage rate:

| Term: 1st 1-750 | 2nd 751-1500 | 3rd 1501-2250 | 4th 2251-3000 | 5th 3001-3750 | 6th 3751-4500 | 7th 4501-5250 | 8th 5251 6000 |
|---|---|---|---|---|---|---|---|
| $29.13 | $33.57 | $36.69 | $40.13 | $43.77 | $47.22 | $50.15 | $53.93 |

Supplemental Benefits per hour:

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|
| $ 15.70 | $ 15.75 | $ 17.70 | $ 18.15 | $ 18.98 | $ 20.03 | $ 21.57 | $ 26.76 |

9-7/52A

## Mason - Building / Heavy&Highway — 11/01/2018

**JOB DESCRIPTION** Mason - Building / Heavy&Highway **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

**WAGES**

NOTE: Shall include but not limited to Precast concrete slabs (London Walks)Marble and Granite pavers 2'x 2' or larger.
Per Hour:

| | 07/01/2018 |
|---|---|
| Stone Setter | $ 64.42 |
| Stone Tender | $ 44.89 |

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| Stone Setter | $ 33.30 |
| Stone Tender | $ 19.40 |

**OVERTIME PAY**
See (*C, **E, Q) on OVERTIME PAGE
* On weekdays the eighth (8th) and ninth (9th) hours are time and one-half all work thereafter is paid at double the hourly rate.
** The first nine (9) hours on Saturday is paid at time and one-half all work thereafter is paid at double the hourly rate.

**HOLIDAY**
Paid: See (*18) on HOLIDAY PAGE
Overtime: See (5, 6, 10) on HOLIDAY PAGE
Paid: *Must work first 1/2.

**REGISTERED APPRENTICES**
Per Hour:

Stone Setter(800 hour) terms at the following Percentage of Stone Setters wage rate per hour:

| 1st | 2nd | 3rd | 4th | 5th | 6th |
|---|---|---|---|---|---|
| 50% | 60% | 70% | 80% | 90% | 100% |

Supplemental Benefits:
All Apprentices $ 20.44

4-1Stn

**Mason - Building / Heavy&Highway** **11/01/2018**

**JOB DESCRIPTION** Mason - Building / Heavy&Highway **DISTRICT** 9

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

**WAGES**
Per hour:

| | 07/01/2018 |
|---|---|
| Marble-Finisher | $ 46.76 |

**SUPPLEMENTAL BENEFITS**
Journeyworker:
per hour

| | |
|---|---|
| Marble- Finisher | $ 33.93 |

**OVERTIME PAY**
See (B, E, Q, V) on OVERTIME PAGE

**HOLIDAY**
Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE
* Work beyond 8 hours on a Saturday shall be paid at double the rate.
** When an observed holiday falls on a Sunday, it will be observed the next day.

9-7/20-MF

**Mason - Building / Heavy&Highway** **11/01/2018**

**JOB DESCRIPTION** Mason - Building / Heavy&Highway **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

**WAGES**

| Per Hour: | 07/01/2018 |
|---|---|
| Cement Mason | $ 51.97 |

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| Cement Mason | $ 33.71 |
| Overtime Rate* | $ 54.42 |

**OVERTIME PAY**
See (*B1, Q, V) on OVERTIME PAGE
* Applies to 9th and 10th hours and up to the 10th hour on Saturday

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 13, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
( 1 ) year terms at the following Percentage of Journeyworkers Wage.

| | |
|---|---|
| 1st Term | 50% |
| 2nd Term | 60% |
| 3rd Term | 70% |

Supplement Benefits per hour paid:

| | |
|---|---|
| 1st Term | $ 16.86 OT Rate $ 27.22 |
| 2nd Term | $ 20.23 OT Rate $ 32.66 |
| 3rd Term | $ 23.60 OT Rate $ 38.10 |

4-780

## Mason - Heavy&Highway — 11/01/2018

**JOB DESCRIPTION** Mason - Heavy&Highway **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

**WAGES**
Per Hour: 07/01/2018

| | |
|---|---|
| Pointer, Caulkers & Cleaners | $ 53.67 |

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| Pointer, Cleaners & Caulkers | $ 27.14 |

**OVERTIME PAY**
See (B, E2, H) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 25, 26) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wages per hour:

One (1) year terms at the following wage rates.

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $ 26.36 | $ 29.42 | $ 34.80 | $ 41.93 |

Apprentices Supplemental Benefits:
(per hour paid)

| | | | |
|---|---|---|---|
| $ 14.30 | $ 18.24 | $ 20.99 | $ 21.99 |

4-1PCC

## Operating Engineer - Building — 11/01/2018

**JOB DESCRIPTION** Operating Engineer - Building **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**
BUILDING CATEGORIES:

CLASS " AA "CRANES:
ABI Machine (150,000lbs and over or 149,999lbs and under when driving steel sheet piles),Crane, Truck Crane, Derrick, Dragline, Dredge, Crawler Crane, Tower Crane & Pile Driver, Vertical Drill Rig (115,000lbs and over and 114,999lbs and under).

CLASS "A":
ABI Machine (149,999 and under used for augering and drilling), Asphalt Spreader, Backhoe Crawler(360 swing), Barrier Machine, CAP (ice machine), Cherrypicker CAP (over 70 tons), CMI or Maxim Spreader, Concrete Pump, Directional Boring, GradAll, Grader, Hydraulic Cherrypicker/Crane (2seats), Hoist (3drum or multi platform), Laser Screed, Loading Machine (Bucket/CAP 10yrds or more), Milling Machine (Large), Pipeline Welder, Plant Engineer, Power Winch (stone setting/structural steel), Powerhouse, Scoop Carry-All Scraper (in tandem), Sideboom Tractor (includes tank work), Track Alignment Machine, Stone Spreader (self propelled), Striping Machine (long line/truck mounted), Tree Grapple, Zamboni.

CLASS "B":
Backhoe (other than 360), Belt Screte, Boom Truck, Bulldozer, Boring Machine/Auger, Cherry Picker(under 70 Tons), Conveyor-Multi, Curb Machine (asphalt or concrete), Dinky Locomotive, Drill Rig (dowels)Fork Lift, Hoist (2 Drum), Loading Machine & Front End Loader, Mechanical Compactors (machine drawn), Mulch Machine(Machine Fed), Post Hole/Auger, Power Wincher (Not Included in Class "A"), Asphalt Roller, Hydraulic Pump with Boring Machine, Scoop, Carryall/Scaper, Skid Loader/Skid Steer/Bobcat, Trenching Machine, Vermeer Cutter, Work Boat, Inspection/Safety Boat.

CLASS "C":
Concrete Finish/Saw/Spreader, Dirt Roller, Hoist (1 drum), Interior Hoist, Milling Machine (small), Oiler Truck Crane (pile work), Power Broom, Vactor Truck, VacAll.

CLASS "D":
Boiler (thermoplastic), Concrete Breaker, Conveyer, Curing Machine, Fork Lift or Walk Behind (power operated), Generator, Hydra Hammer, Compactors (mechanical or hand operated), Maintenance Engineer (small equipment/well point/welding & burning), Mechanic (field man), Micro-Trap with Compressor, Oiler (Truck Crane Boom 100ft or more) Power Winch Truck Mounted (Stone Setter/Struct.Steel), Pin Puller, Portable Heaters, Power Buggies, Pump (double action diaphragm), Pump (4 inch or over), Pump (hydraulic/submersible) Jet Pump, Pulvi-Mixer, Ridge Cutter, Shot Blaster.

CLASS "E":
Batching Plant, Compressor (structural steel/2 or more battery), Generator (small), Grinder, Ground Heater, Power Grinder, Mixer with Skip, Mulching Machine (hand fed), Oiler, Pipeline Welder Helper, Power Washer, Pumps (up to 3 inch/single action 1 to 3 inches), Pump (gypsum), Root Cutter, Stump Chipper, Track Tamper, Tractor (caterpillar or wheel), Trenching Machine (hand), Welding Machine (pile work/structural steel), Deckhand on Work/Inspection/Safety Boat.

| | 07/01/2018 |
|---|---|
| Class "AA" | $ 75.40 |
| Cranes: Boom length over 100 feet add | $ 1.00 per hour |
| " " " 150 " " | $ 1.50 " " |
| " " " 250 " " | $ 2.00 " " |
| " " " 350 " " | $ 3.00 " " |
| Class "A" | $ 62.53 |
| Add $3.50 for Hazardous Waste Work | |
| Class "B" | $ 59.27 |
| Add $2.50 for Hazardous Waste Work | |
| Class "C" | $ 57.09 |
| Add $1.50 for Hazardous Waste Work | |
| Class "D" | $ 42.98 |
| Add $1.00 for Hazardous Waste Work | |
| Class "E" | $ 41.03 |

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| All Classes | $ 37.80 |

Overtime Rate 32.35

**OVERTIME PAY**
See (D, O) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 6, 15, 16, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16, 25) on HOLIDAY PAGE
"NOTE" Employee must be Employed day before
and day after Holiday to recieve Holiday Pay.

**REGISTERED APPRENTICES**
One(1) Year Terms at the following Rate:

| | |
|---|---|
| 1st Term | $ 21.94 |
| 2nd Term | 22.80 |
| 3rd Term | 23.48 |

Supplemental Benefits per hour:

| | |
|---|---|
| All Apprentices | $ 15.64 |
| Overtime Rate | 5.60 |

4-138

## Operating Engineer - Building / Heavy&Highway — 11/01/2018

**JOB DESCRIPTION** Operating Engineer - Building / Heavy&Highway **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**

| Per Hour: | 07/01/2018 | 08/01/2018 |
|---|---|---|
| Well Driller | $ 36.07 | $ 37.33 |
| Well Driller Helper | $ 31.39 | $ 32.49 |
| Hazardous Waste Differential Added to Hourly Wage: | | |
| Level A | $ 3.00 | $3.00 |
| Level B | 2.00 | 2.00 |
| Level C | 1.00 | 1.00 |
| Monitoring Well Work Add to Hourly Wage: | | |
| Level A | $ 3.00 | $3.00 |
| Level B | 2.00 | 2.00 |

**SUPPLEMENTAL BENEFITS**

| Per Hour: | 07/01/2018 | 08/01/2018 |
|---|---|---|
| Well Driller & Helper | 10% of straight time rate plus $ 12.20 | 10% of straight time rate plus $ 12.20 |

Additional $ 4.00 for Premium Time

**OVERTIME PAY**
See (B, E, G, P) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 6, 16, 23) on HOLIDAY PAGE
Overtime: See (5, 6, 16, 23) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Apprentices at 12 Month Terms

| Wages Per Hour: | 07/01/2018 | 08/01/2018 |
|---|---|---|
| 1st Term | $ 21.94 | $21.94 |
| 2nd Term | $ 22.80 | $22.80 |
| 3rd Term | $ 23.48 | $23.48 |

SUPPLEMENTAL BENIFITS
Per Hour:

| | |
|---|---|
| 1st Term | 10% of Wage + $ 5.10 |
| 2nd Term | 10% of Wage + $ 5.60 |
| 3rd Term | 10% of Wage + $ 6.60 |

BENEFITS AT PREMIUM TIME
Per Hour:

| | |
|---|---|
| 1st Term | 10% of Wage + $ 5.85 |
| 2nd Term | 10% of Wage + $ 6.60 |
| 3rd Term | 10% of Wage + $ 8.10 |

4-138well

## Operating Engineer - Heavy&Highway — 11/01/2018

**JOB DESCRIPTION** Operating Engineer - Heavy&Highway **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**
Party Chief - One who directs a survey party
Instrument Man - One who runs the instrument and assists Party Chief
Rodman - One who holds the rod and in general, assists the survey party
Categories cover GPS & Under Ground Surveying

| Per Hour: | 07/01/2018 |
|---|---|
| Heavy Highway/Building | |
| Party Chief | $ 67.76 |
| Instrument Man | 51.66 |
| Rodman | 44.30 |

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| Heavy Highway/Building | $ 34.23 |
| Premium*: | |
| Heavy Highway/Building | $ 43.40 |
| Premium**: | |
| Heavy Highway/Building | $ 52.56 |

* Applies to instances where 1-1/2 regular rate are paid
**Applies to instances where 2 times the rate are paid.

**OVERTIME PAY**
See (B, *E, Q) on OVERTIME PAGE
* Doubletime paid on the 9th hour on Saturday.

**HOLIDAY**

| | |
|---|---|
| Paid: | See (5, 6, 9, 11, 12, 15, 25) on HOLIDAY PAGE |
| Overtime: | See (5, 6, 9, 11, 12, 15, 25) on HOLIDAY PAGE |

4-15D-N/S co.

## Operating Engineer - Heavy&Highway — 11/01/2018

**JOB DESCRIPTION** Operating Engineer - Heavy&Highway **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**
HEAVY and HIGHWAY CATEGORIES:

CLASS "AA" CRANES:
ABI Machine (150,000lbs and over), ABI Machine (149,000lbs and under driving steel sheets), Crane, Truck Crane, Derrick, Dragline, Dredge, Crawler Crane, Tower Crane, Pile Driver.

CLASS "A":
ABI Machine (149,000lbs and under for Augering or Drilling), Asphalt Spreader, Backhoe Crawler (360 Swing & over 150,000lbs), Backhoe Crawler (360 Swing & under 149,000lbs), Barrier Machine, Cherrypicker Cap (over 70 tons), CMI or Maxim Spreader, Concrete Pump, Directional Boring, Grader, Gradall, Hoist (3 drum or multi-platform), Hydraulic Cherrypicker/crane (2 seats), Loading Machine (bucket 10 yds. or more), Laser Screed, Milling Machine (Large), Pipeline Welder, Plant Engineer. Power Winch-Stone Setting/Structural Steel or Truck Mounted, Powerhouse, Scoop-Carryall-Scaper in Tandem, Side Boom Tractor, Side Boom Tractor (Tank Work), Stone Spreader(self propelled), Striping Machine (long line/truck mounted), Tree Grapple, Tank Work, Track Alignment Machine.

CLASS "B":
Backhoe (other than 360), Belt Screte, Boom Truck, Bulldozer, Boring Machine/Auger, Cherry Picker (under 70 tons), Convetor-Multi, Curb Machine Asphalt/Concrete, Dinky Locomotive, Drill Rig for Dowels, Field Mechanic, Fork Lift, Hoist (2 Drum), Loading Machine, Loading Machine (Front End), Mechanical Compactors (Machine Drawn), Mulching Machine (Machine Fed), Post Hole/Auger, Power Winch (other than structural steel), Pump Hydraulic (with boring machine), Asphalt Roller, Scoop (carry-all, scraper), Skid Loader/Steer, Vermeer Cutter, Work Boat, Inspection & Safety Boat.

CLASS "C":
Concrete Finish/Saw/Spreader Machines, Dirt Roller, Hoist (1 drum), Interior Hoist, Oiler Truck Crane(Pile work), Power Broom, Small Milling Machine, Vactor Truck/VacAll Truck.

CLASS "D":
Boiler (Thermoplastic), Concrete Breaker, Conveyor, Curing Machine, Fireman, Fork lift (walk behind), Generator, Hydra Hammer, Maintenance Engineer (small equipment/Well Point/Welding & Burning), Compactors (hand operated), Pin Puller, Portable Heaters, Power Buggies, Pulvi Mixer, Pumps (double action/4 inch and over/Hydraulic/Submersible & Jet), Ridge Cutter, Robotic Unit Operator(Trenchless Pipe Rehab-Cleaning & Television of Sewers/CCTV Inspection), Shotblaster.

CLASS "E":
Batching Plant (On Job Site), Compressor (structural steel/2 or more in battery), Generator(small), Grinder, Ground Heater(boilers), Power Grinder, Mixer (with skip), Mulching Machine (hand feed), Oiler, Pipeline Welder Helper, Power Washer, Pump(up to 3 inches/Gypsum/Single action 1 to 3 inches), Root Cutter, Stump Grinder, Track Tamper, Tractor (caterpillar or wheel), Trenching Machine (hand), Welding Machine (Pile Work/Structural Steel), Deckhand (on Work/Inspection/Safety Boat).

| | 07/01/2018 |
|---|---|
| Class "AA" | $ 74.69 |
| Cranes: Boom Length over 100 feet add | $ 1.00 per hour |
| " " " 150 " " | $ 1.50 " " |
| " " " 250 " " | $ 2.00 " " |
| " " " 350 " " | $ 3.00 " " |
| Class "A" | $ 66.00* |
| *Add $3.50 for Hazardous Waste Work. | |
| Class "B" | $ 61.00* |
| *Add $2.50 for Hazardous Waste Work. | |
| Class "C" | $ 59.37* |
| *Add $1.50 for Hazardous Waste Work | |
| Class "D" | $ 44.88 |
| *Add $1.00 for Hazardous Waste Work | |
| Class "E" | $ 42.92 |

"NOTE": ADD 30% to straight time hourly wage for NEW YORK STATE D.O.T. and other GOVERNMENTAL MANDATED off-shift work.

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| ALL CLASSES | $ 38.05 |
| Note: OVERTIME AMOUNT | $ 32.35 |

**OVERTIME PAY**
See (D, O) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 6, 7, 8) on HOLIDAY PAGE
Overtime: See (5, 6, 7, 8) on HOLIDAY PAGE
"Note" Employee must be employed day before and day after

a holiday to receive holiday pay.

**REGISTERED APPRENTICES**
Wage per hour:
REGISTERED APPRENTICES
One(1) Year Terms at the following Rate:

| | |
|---|---|
| 1st Term | $ 21.94 |
| 2nd Term | 22.80 |
| 3rd Term | 23.48 |

SUPPLEMENTAL BENEFITS:

| | |
|---|---|
| APPRENTICES | $ 15.64 |
| Note: Overtime Amount | $ 5.60 |

4-138

## Operating Engineer - Marine Dredging — 11/01/2018

**JOB DESCRIPTION** Operating Engineer - Marine Dredging **DISTRICT** 4

**ENTIRE COUNTIES**
Albany, Bronx, Cayuga, Chautauqua, Clinton, Columbia, Dutchess, Erie, Essex, Franklin, Greene, Jefferson, Kings, Monroe, Nassau, New York, Niagara, Orange, Orleans, Oswego, Putnam, Queens, Rensselaer, Richmond, Rockland, St. Lawrence, Suffolk, Ulster, Washington, Wayne, Westchester

**WAGES**
These wages do not apply to Operating Engineers on land based construction projects. For those projects, please see the Operating Engineer Heavy/Highway Rates. The wage rates below for barge mounted cranes and other equipment are only for marine dredging work in navigable waters found in the counties listed above.

Per Hour:

| | |
|---|---|
| DREDGING OPERATIONS | 07/01/2018 |
| CLASS A | |
| Operator, Leverman, Lead Dredgeman | $ 38.18 |
| CLASS A1 Dozer,Front Loader Operator | To conform to Operating Engineer Prevailing Wage in locality where work is being performed including benefits. |
| CLASS B | |
| Barge Operator Spider/Spill Tug Operator(over1000hp), OperatorII, Fill Placer, Derrick Operator, Engineer, Chief Mate, Electrician, Chief Welder, Maintenance Engineer | $ 33.02 |
| Certified Welder, Boat Operator(licensed) | $ 31.09 |
| CLASS C | |
| Drag Barge Operator, Steward, Mate, Assistant Fill Placer, | $ 30.24 |
| Welder (please add) | $ 0.06 |
| Boat Operator | $ 29.26 |
| CLASS D | |
| Shoreman, Deckhand, Rodman, Scowman, Cook, Messman, Porter/Janitor | $ 24.30 |
| Oiler(please add) | $ 0.09 |

**SUPPLEMENTAL BENEFITS**
Per Hour:
THE FOLLOWING SUPPLEMENTAL BENEFITS APPLY TO ALL CATEGORIES

| | 07/01/2018 |
|---|---|
| All Classes A & B | $11.23 plus 8% of straight time wage, Overtime hours add $ 0.63 |
| All Class C | $10.93 plus 8% of straight time wage, Overtime hours add $ 0.48 |
| All Class D | $10.63 plus 8% of straight time wage, Overtime hours add $ 0.33 |

**OVERTIME PAY**
See (B, F, R) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 15, 26) on HOLIDAY PAGE

4-25a-MarDredge

## Operating Engineer - Survey Crew - Consulting Engineer — 11/01/2018

**JOB DESCRIPTION** Operating Engineer - Survey Crew - Consulting Engineer **DISTRICT** 9

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Suffolk, Westchester

**PARTIAL COUNTIES**
Dutchess: That part in Duchess County lying South of the North City line of Poughkeepsie.

**WAGES**
Feasibility and preliminary design surveying, any line and grade surveying for inspection or supervision of construction.

| Per hour: | 07/01/2018 |
|---|---|
| Survey Classifications | |
| Party Chief | $ 43.10 |
| Instrument Man | 36.01 |
| Rodman | 31.54 |

**SUPPLEMENTAL BENEFITS**
Per Hour:

All Crew Members: $ 18.50

**OVERTIME PAY**
OVERTIME:.... See ( B, E*, Q, V ) ON OVERTIME PAGE.
*Doubletime paid on the 9th hour on Saturday.

**HOLIDAY**
Paid: See (5, 6, 7, 11, 16) on HOLIDAY PAGE
Overtime: See (5, 6, 7, 11, 16) on HOLIDAY PAGE

9-15dconsult

## Operating Engineer - Trenchless Pipe Rehab — 11/01/2018

**JOB DESCRIPTION** Operating Engineer - Trenchless Pipe Rehab **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**

IMPORTANT NOTE: This Category & Classifications are now located in Operating Engineers/Heavy Highway & Laborers/ Heavy Highway.

Per Hour:

| | 07/01/2018 (SEE) |
|---|---|
| Robotic Unit Operator | Operator(class D) |
| Technician/Boiler, Generator | Operator(classes C&D) |
| AM Liner/Hydra Seal | Laborer(Grp#3) |
| Hobas Pipe, Polyethyene Pipe or Pull and Inflate Liner | Laborer(Grp#3) |

**OVERTIME PAY**

**HOLIDAY**

4-138TrchPReh

## Painter — 11/01/2018

**JOB DESCRIPTION** Painter **DISTRICT** 8

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Suffolk, Westchester

**WAGES**

| Per hour: | 07/01/2018 |
|---|---|
| Brush | $ 46.85* |
| Abatement/Removal of lead based or lead containing paint on materials to be repainted. | 46.85* |
| Spray & Scaffold | $ 49.85* |
| Fire Escape | 49.85* |
| Decorator | 49.85* |
| Paperhanger/Wall Coverer | 50.03* |

*Subtract $ 0.10 to calculate premium rate.

**SUPPLEMENTAL BENEFITS**

| Per hour: | 07/01/2018 |
|---|---|
| Paperhanger | $ 28.19 |
| All others | 26.72 |
| Premium | 29.22** |

**Applies only to "All others" catergory,not paperhanger journeyman.

**OVERTIME PAY**
See (A, H) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
One ( 1 ) year terms at the following wage rate.

| Per hour: | 07/01/2018 |
|---|---|
| Appr 1st term... | $ 17.85* |
| Appr 2nd term... | 23.26* |
| Appr 3rd term... | 28.14* |
| Appr 4th term... | 37.52* |

*Subtract $ 0.10 to calculate premium rate.

Supplemental benefits:

| Per Hour: | 07/01/2018 |
|---|---|
| Appr 1st term... | $ 13.81 |
| Appr 2nd term... | 16.82 |
| Appr 3rd term... | 19.42 |
| Appr 4th term... | 24.56 |

8-NYDC9-B/S

## Painter — 11/01/2018

**JOB DESCRIPTION** Painter **DISTRICT** 8

**ENTIRE COUNTIES**
Putnam, Suffolk, Westchester

**PARTIAL COUNTIES**
Nassau: All of Nassau except the areas described below: Atlantic Beach, Ceaderhurst, East Rockaway, Gibson, Hewlett, Hewlett Bay, Hewlett Neck, Hewlett Park, Inwood, Lawrence, Lido Beach, Long Beach, parts of Lynbrook, parts of Oceanside, parts of Valley Stream, and Woodmere. Starting on the South side of Sunrise Hwy in Valley Stream running east to Windsor and Rockaway Ave., Rockville Centre is the boundary line up to Lawson Blvd. turn right going west all the above territory. Starting at Union Turnpike and Lakeville Rd. going north to Northern Blvd. the west side of Lakeville road to Northern blvd. At Northern blvd. going east the district north of Northern blvd. to Port Washington Blvd. West of Port Washington blvd.to St.Francis Hospital then north of first traffic light to Port Washington and Sands Point, Manor HAven, Harbour Acres.

**WAGES**

| Per hour: | 07/01/2018 |
|---|---|
| Drywall Taper | $ 46.85* |

*Subtract $ 0.10 to calculate premium rate.

**SUPPLEMENTAL BENEFITS**

| Per hour: | 07/01/2018 |
|---|---|
| Journeyman | $ 26.72 |

**OVERTIME PAY**
See (A, H) on OVERTIME PAGE

**HOLIDAY**

| Paid: | See (1) on HOLIDAY PAGE |
|---|---|
| Overtime: | See (5, 6, 16, 25) on HOLIDAY PAGE |

**REGISTERED APPRENTICES**
Wages - Per Hour: 07/01/2018

1500 hour terms at the following wage rate:

| | |
|---|---|
| 1st term | $ 17.85* |
| 2nd term | $ 23.26* |
| 3rd term | $ 28.14* |
| 4th term | $ 37.52* |

*Subtract $ 0.10 to calculate premium rate.

Suppemental Benefits - Per hour:
One year term (1500 hours) at the following dollar amount.

| | |
|---|---|
| 1st year | $ 13.81 |
| 2nd year | $ 16.82 |
| 3rd year | $ 19.42 |
| 4th year | $ 24.56 |

8-NYDCT9-DWT

## Painter - Bridge & Structural Steel — 11/01/2018

**JOB DESCRIPTION** Painter - Bridge & Structural Steel **DISTRICT** 8

**ENTIRE COUNTIES**
Albany, Bronx, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Kings, Montgomery, Nassau, New York, Orange, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

**WAGES**
Per Hour:
STEEL:

| Bridge Painting: | 07/01/2018 | 10/01/2018 |
|---|---|---|
| | $ 49.50 | $ 49.50 |
| | + 6.38* | + 6.38* |

ADDITIONAL $6.00 per hour for POWER TOOL/SPRAY, whether straight time or overtime.

NOTE: All premium wages are to be calculated on base rate per hour only.

* For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (no cap).

NOTE: Generally, for Bridge Painting Contracts, ALL WORKERS on and off the bridge (including Flagmen) are to be paid Painter"s Rate; the contract must be ONLY for Bridge Painting.

**SUPPLEMENTAL BENEFITS**

Per Hour:

| Journeyworker: | 07/01/2018 | 10/01/2018 |
|---|---|---|
| | $ 8.25 | $ 9.50 |
| | + 24.35* | + 26.05* |

* For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (no cap).

**OVERTIME PAY**

See (A, F, R) on OVERTIME PAGE

**HOLIDAY**

Paid: See (1) on HOLIDAY PAGE
Overtime: See (4, 6) on HOLIDAY PAGE

**REGISTERED APPRENTICES**

Wage - Per hour:

Apprentices: (1) year terms

| | 07/01/2018 | 10/01/2018 |
|---|---|---|
| 1st year | $ 22.65 | $ 23.13 |
| 2nd year | 33.98 | 34.73 |
| 3rd year | 45.30 | 46.30 |

Supplemental Benefits - Per hour:

| | | |
|---|---|---|
| 1st year | $ 12.76 | $ 13.44 |
| 2nd year | 19.14 | 20.16 |
| 3rd year | 25.52 | 26.88 |

8-DC-9/806/155-BrSS

## Painter - Line Striping — 11/01/2018

**JOB DESCRIPTION** Painter - Line Striping **DISTRICT** 8

**ENTIRE COUNTIES**

Albany, Bronx, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Kings, Montgomery, Nassau, New York, Orange, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

**WAGES**

Per hour:

| Painter (Striping-Highway): | 07/01/2018 |
|---|---|
| Striping-Machine Operator* | $ 29.93 |
| Linerman Thermoplastic | $ 36.06 |

Note: * Includes but is not limited to: Positioning of cones and directing of traffic using hand held devices. Excludes the Driver/Operator of equipment used in the maintenance and protection of traffic safety.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day.

NOTE - In order to use the '4 Day/10 Hour Work Schedule,' as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

**SUPPLEMENTAL BENEFITS**

| Per hour paid: | 07/01/2018 |
|---|---|
| Journeyworker: | |
| Striping-Machine operator | $ 7.44 |
| Linerman Thermoplastic | $ 7.44 |

**OVERTIME PAY**
See (B, B2, E2, F, S) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 20) on HOLIDAY PAGE
Overtime: See (5, 20) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
One (1) year terms at the following wage rates:

| | 07/01/2018 |
|---|---|
| 1st term | $ 11.97 |
| 2nd term | 17.96 |
| 3rd term | 23.94 |
| Supplemental Benefits per hour: | |
| 1st term | $ 7.44 |
| 2nd term | 7.44 |
| 3rd term | 7.44 |

8-1456-LS

## Painter - Metal Polisher — 11/01/2018

**JOB DESCRIPTION** Painter - Metal Polisher **DISTRICT** 8

**ENTIRE COUNTIES**
Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

**WAGES**

| | 07/01/2018 |
|---|---|
| Metal Polisher | $ 30.58 |
| Metal Polisher* | 31.53 |
| Metal Polisher** | 34.08 |

*Note: Applies on New Construction & complete renovation
** Note: Applies when working on scaffolds over 34 feet.

**SUPPLEMENTAL BENEFITS**

| Per Hour: | 07/01/2018 |
|---|---|
| Journeyworker: | |
| All classification | $ 7.72 |

**OVERTIME PAY**
See (B, E, P, T) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE
Overtime: See (5, 6, 9, 11, 15, 16, 25, 26) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wages per hour:
One (1) year term at the following wage rates:

| | 07/01/2018 | 01/01/2019 |
|---|---|---|
| 1st year | $ 13.00 | $ 15.00 |
| 2nd year | 13.00 | 15.00 |

| | | |
|---|---|---|
| 3rd year | 15.75 | 15.75 |
| | | |
| 1st year* | $ 15.39 | $ 17.39 |
| 2nd year* | 15.44 | 17.44 |
| 3rd year* | 16.29 | 18.29 |
| | | |
| 1st year** | $ 17.50 | 19.50 |
| 2nd year** | 17.50 | 19.50 |
| 3rd year** | 18.25 | 20.25 |

*Note: Applies on New Construction & complete renovation
** Note: Applies when working on scaffolds over 34 feet.

Supplemental benefits:
Per hour:

| | | |
|---|---|---|
| 1st year | $ 5.52 | $ 5.52 |
| 2nd year | 5.52 | 5.52 |
| 3rd year | 5.52 | 5.52 |

8-8A/28A-MP

## Plasterer — 11/01/2018

**JOB DESCRIPTION** Plasterer **DISTRICT** 9

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

**WAGES**
Per hour:

| | 07/01/2018 | 08/01/2018 |
|---|---|---|
| Building: | | |
| Plasterer/Traditional & Spraying Fireproofing | $ 45.58 | $ 45.58 |

**SUPPLEMENTAL BENEFITS**
Per hour:

| | | |
|---|---|---|
| Journeyworker | $ 26.27 | $ 26.52 |

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wages:
(per hour)
800 hours term:

| | 07/01/2018 | 08/1/2018 |
|---|---|---|
| 1st term | $18.33 | $18.33 |
| 2nd term | $20.62 | $20.62 |
| 3rd term | $25.21 | $25.21 |
| 4th term | $27.50 | $27.50 |
| 5th term | $32.08 | $32.08 |
| 6th term | $34.37 | $34.37 |

Supplemental Benefits:
(per hour):
(800) hours term:

| | 07/01/2018 | 08/01/2018 |
|---|---|---|
| 1st term | $ 13.83 | $ 13.88 |
| 2nd term | $ 14.31 | $ 14.36 |
| 3rd term | $ 16.28 | $ 16.44 |
| 4th term | $ 17.36 | $ 17.53 |
| 5th term | $ 19.53 | $ 19.72 |
| 6th term | $ 20.61 | $ 20.81 |

9-262

## Plumber — 11/01/2018

**JOB DESCRIPTION** Plumber **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**

| Per Hour: | 07/01/2018 |
|---|---|
| Plumber/ PUMP & TANK | $ 44.49 |

**SUPPLEMENTAL BENEFITS**

| Per Hour: | |
|---|---|
| Plumber | $ 26.98 |

**OVERTIME PAY**
See (B, Q, *V) on OVERTIME PAGE
(V) For Sundays & Holidays if Worked Only

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
One(1) Year Terms at the Following Percentage of Journeymans wage:

| | |
|---|---|
| 1st Term | 30% |
| 2nd Term | 40% |
| 3rd Term | 50% |
| 4th Term | 60% |
| 5th Term | 70% |
| 6th Term | 85% |

Supplemental Benifits Per Hour:

| | |
|---|---|
| 1st Term | $15.06 |
| 2nd Term | $15.70 |
| 3rd Term | $16.52 |
| 4th Term | $17.40 |
| 5th Term | $20.13 |

4-200 Pump & Tank

## Plumber 11/01/2018

**JOB DESCRIPTION** Plumber **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**

| Per Hour: | 07/01/2018 | 11/01/2018 | 05/01/2019 |
|---|---|---|---|
| Plumber | $ 52.48 | $ 52.48 | $52.48 |

**SUPPLEMENTAL BENEFITS**

| Per Hour: | | | |
|---|---|---|---|
| Plumber | $ 41.48 | $ 41.98 | $ 42.98 |

**OVERTIME PAY**
See (A, E, Q, *V) on OVERTIME PAGE
CODE "V" is only for SUNDAYS and HOLIDAYS THAT ARE WORKED

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
One(1) Year Terms at the following percentage of Plumbers Rate:

| 1st Term | 2nd Term | 3rd Term | 4th Term | 5th Term |
|---|---|---|---|---|
| 30% | 40% | 50% | 60% | 70% |

Supplemental Benefits per hour:

| | 07/01/2018 | 11/01/2018 | 05/01/2019 |
|---|---|---|---|
| 1st Term | $ 27.96 | $ 28.46 | $ 29.46 |
| 2nd Term | 30.27 | 30.77 | 31.77 |
| 3rd Term | 31.64 | 32.14 | 34.14 |
| 4th Term | 33.13 | 33.63 | 34.63 |
| 5th Term | 34.71 | 35.21 | 36.21 |

4-200

## Plumber — 11/01/2018

**JOB DESCRIPTION** Plumber **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**
Per Hour:

| | 07/01/2018 |
|---|---|
| Plumber | |
| MAINTENANCE ONLY | $ 30.80 |

Maintenance: Correction of problem(s)with the existing fixture or group of fixtures, preventive repairs or servicing of said fixtures

**SUPPLEMENTAL BENEFITS**
SUPPLEMENTAL BENEFITS
Per Hour:

| | |
|---|---|
| Plumber | |
| Maintenance | $ 15.65 |

**OVERTIME PAY**
See (B, J) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16) on HOLIDAY PAGE

4-200 Maintance

## Roofer — 11/01/2018

**JOB DESCRIPTION** Roofer **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**

| Per Hour | 07/01/2018 | 05/01/2019 |
|---|---|---|
| ROOFER/Waterproofer | | |
| Total Wage to be Paid | $ 45.00 | $1.50 Per Hour to be allocated |
| "Base" Wage | 41.00** | |

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| ROOFER/Waterproofer | $ 32.12 |

**OVERTIME PAY**
Per Hour:
NEW ROOF SEE (B,E,Q)
RE-ROOF SEE (B,E,E2,Q)
NOTE:** Overtime Pay to be calculated on "BASE" Wage then add $4.00.
(Example: $41.00 x time and one half = $61.50 + $4.00 = $65.50)

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 13, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
(1) Year terms at the following Percentage of Roofers/Waterproofers Wage.

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| 40% | 50% | 70% | 80% |

Supplemental Benefits per hour:

| | 07/01/2018 |
|---|---|
| 1st Term | $ 9.08 |
| 2nd Term | 11.22 |
| 3rd Term | 22.69 |
| 4th Term | 25.85 |

4-154

## Sheetmetal Worker — 11/01/2018

**JOB DESCRIPTION** Sheetmetal Worker **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester

**WAGES**

| Per Hour: | 07/01/2018 | 08/01/2018 |
|---|---|---|
| Sign Erector | $ 47.67 | Additional $1.95/hr. |

NOTE: Structurally Supported Overhead Highway Signs(See STRUCTURAL IRON WORKER CLASS)

**SUPPLEMENTAL BENEFITS**

| Per Hour: | 07/01/2018 | 08/01/2018 |
|---|---|---|
| Sign Erector | $ 44.44 | Additional $1.64/hr |

**OVERTIME PAY**
See (A, F, S) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Per Hour:
6 month Terms at the following percentage of Sign Erectors wage rate:

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th |
|---|---|---|---|---|---|---|---|---|---|
| 35% | 40% | 45% | 50% | 55% | 60% | 65% | 70% | 75% | 80% |

SUPPLEMENTAL BENEFITS
Per Hour:

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th |
|---|---|---|---|---|---|---|---|---|---|
| $13.11 | $14.85 | $16.59 | $18.34 | $25.56 | $27.80 | $30.76 | $33.07 | $35.36 | $37.65 |

4-137-SE

## Sheetmetal Worker — 11/01/2018

**JOB DESCRIPTION** Sheetmetal Worker **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

**WAGES**

| Per Hour: | 07/01/2018 |
|---|---|
| Sheetmetal Worker | $ 53.22 |
| Temporary Operation or Maintenace of Fans | 42.58 |

**SUPPLEMENTAL BENEFITS**
Per Hour:

Sheetmetal Worker
$ 45.04
Maintenance Worker
45.04

**OVERTIME PAY**
See (B, E, E2, Q, V) on OVERTIME PAGE
For Maintenance See Codes B,E, Q & V

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Per Hour:Wages

Six(6) Month Terms As Follows:

| | |
|---|---|
| 1st & 2nd Term | $ 18.67 |
| 3rd & 4th Term | 23.98 |
| 5th & 6th Term | 29.29 |
| 7th Term | 37.28 |
| 8th Term | 39.83 |
| 9th Term | 42.59 |

Per Hour: Supplemental Benifits

| | |
|---|---|
| 1st & 2nd Term | $ 16.49 |
| 3rd & 4th Term | 22.75 |
| 5th & 6th Term | 26.79 |
| 7th Term | 32.84 |
| 8th Term | 34.88 |
| 9th Term | 36.84 |

4-28

**Steamfitter** **11/01/2018**

**JOB DESCRIPTION** Steamfitter **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

**WAGES**
Per Hour: 07/01/2018

AC Service/Heat Service $ 41.50
Steamfitter Maintenance

Refrigeration, A/C, Oil Burner and Stoker Service and Repair.
Refrigeration Compressor installation.
Air Condition / Heating Compressor installation up to 15hp (combined).

**SUPPLEMENTAL BENEFITS**
Per Hour

AC Service/Heat Service $ 13.50
Steamfitter Maintenance

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 6, 11, 15, 25, 26) on HOLIDAY PAGE

4-638B-StmFtrRef

**Steamfitter** **11/01/2018**

**JOB DESCRIPTION** Steamfitter **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

**WAGES**
Per Hour: 07/01/2018 12/26/2018

| | | |
|---|---|---|
| Sprinkler/Steam Fitter | $64.06 | $0.75/hr. to be Allocated |
| Temporary Heat & AC Fitter | $48.70 | |

Note: Add 15% to Hourly Wage for "Contracting Agency" Mandated Off Shift Work.

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| Sprinkler/Steam Fitter | $ 49.18 |
| Temporary Heat & AC Fitter | $ 40.23 |

Note: Add 15% to Hourly Benefit for "Contracting Agency" Mandated Off Shift Work.

**OVERTIME PAY**
See (C, *D, O, **V) on OVERTIME PAGE
(D*) Only for Temporary Heat & AC Fitter.

(V**) Benefit Amount to be paid:
Sprinkler/Steam $75.30
Temp Heat/AC $57.60

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
1 year Terms at the Following:

WAGES per hour:

| 1st Term | 2nd Term | 3rd Term | 4th Term | 5th Term |
|---|---|---|---|---|
| $ 25.66 | $ 32.07 | $ 41.66 | $ 51.26 | $ 54.46 |

SUPPLEMENTAL BENEFIT per hour:

| 1st Term | 2nd Term | 3rd Term | 4th Term | 5th Term |
|---|---|---|---|---|
| $ 20.20 | $ 24.04 | $ 32.28 | $ 39.52 | $ 41.94 |
| Premium Time Amounts: | | | | |
| $30.12 | $37.66 | $48.96 | $60.24 | $64.02 |

4-638A-StmSpFtr

## Teamster - Asphalt Delivery — 11/01/2018

**JOB DESCRIPTION** Teamster - Asphalt Delivery **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**
Per Hour:

Heavy Construction Work:
Shall include the supply of Asphalt for construction, improvement and modification of all or any part of Streets, Highways, Bridges, Tunnels,Railroads, Canals, Dams, Airports, Schools, Power Generation Plants, where distance between project and asphalt plant is not more than 50 miles.

TRUCK DRIVER

| | 07/01/2018 |
|---|---|
| Asphalt Delivery | $ 37.545 |

Light Construction Work:

Shall include the supply of Asphalt for construction of Single & Multi Family Homes, Town Houses, Apartment Buildings, including Driveways, Streets and Curbs within those projects. Parking Lots, Office Buildings, where distance between project and asphalt plant is not more than 50 miles.

TRUCK DRIVER

| | 07/01/2018 |
|---|---|
| Asphalt Delivery | $ 32.16 |

**SUPPLEMENTAL BENEFITS**
Per Hour:

Heavy Construction Work
TRUCK DRIVER

| | 07/01/2018 |
|---|---|
| Asphalt Delivery | $ 46.6825 |

Light Construction Work
TRUCK DRIVER

| | 07/01/2018 |
|---|---|
| Asphalt Delivery | $ 13.05 |

**OVERTIME PAY**
See (B, *B2, E, **I, P, ***R, ****U) on OVERTIME PAGE
(NOTE) PREMIUM PAY of 25% on straight time hours for New York State D.O.T. and or other GOVERNMENTAL MANDATED off shift work.
Note: (B,E,P,T&*U) Apply to Heavy Construction.
Note: (B2,I,T&*U) Apply to Light Construction.
Note: (*U) Only applies after 8 hours worked on holiday.

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, *16, **25) on HOLIDAY PAGE
NOTE:(*16) Paid at Double if Worked; (**25) Paid at Double if Worked.

4-282

## Teamster - Building — 11/01/2018

**JOB DESCRIPTION** Teamster - Building **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**
Per Hour:
Truck Driver (Building Demolition & Debris)

| | 07/01/2018 |
|---|---|
| Trailers | $ 33.61* |
| Straight Jobs | $ 33.31* |

* Plus an additional $2.14/hr. to be allocated

**SUPPLEMENTAL BENEFITS**
Per Hour:

All Classifications

| 07/01/2018 |
|---|
| $ 33.20 |

**OVERTIME PAY**
See (B, E, S1) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 12, 15, 25, 26) on HOLIDAY PAGE

4-282

## Teamster - Delivery of Concrete — 11/01/2018

**JOB DESCRIPTION** Teamster - Delivery of Concrete **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**
Per Hour:

Heavy Construction Work:
Shall Include the supply of Ready-Mix Concrete for construction, improvement and modification of all or any part of Streets, Highways, Bridges, Tunnels, Railroads, Canals, Dams, Airports, Schools & Power Generation Plants, where distance between project and asphalt plant is not more than 50 miles.

TRUCK DRIVER

| | 07/01/2018 |
|---|---|
| Concrete Delivery | $ 39.775 |

Light Construction Work:
Shall include the supply of Ready-Mix Concrete for construction of Single & Multi Family Homes, Town Houses, Apartment Buildings, including Driveways, Streets and Curbs within those projects. Parking Lots and Office Buildings, where distance between project and asphalt plant is not more than 50 miles.

TRUCK DRIVER

| | 07/01/2018 |
|---|---|
| Concrete Delivery | $ 35.705 |

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| Heavy Construction Work | 07/01/2018 |
| Concrete Delivery | $ 42.665 |
| Light Construction Work | 07/01/2018 |
| Concrete Delivery | $ 14.83 |

**OVERTIME PAY**
NOTE: Heavy Construction:B2,I
Light Construction:B,E,P

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, *16, **25) on HOLIDAY PAGE
NOTE:(*16) Paid at Double if Worked. (**25) Paid at Double if Worked.

4-282ns

## Teamster - Heavy&Highway — 11/01/2018

**JOB DESCRIPTION** Teamster - Heavy&Highway **DISTRICT** 4

**ENTIRE COUNTIES**
Nassau, Suffolk

**WAGES**
Per Hour:

Heavy Construction Work:
Shall include the construction, improvement or modification of all or any part of Streets, Highways, Bridges, Tunnels, Railroads, Canals, Dams, Airports, Schools, Power Generation Plants.

| | 07/01/2018 |
|---|---|
| Site Excavating (Chauffeurs) | $ 38.155 |

Light Construction Work:
Shall include the construction, improvment and modification of Single & Multi Family Homes, Town Houses, Apartment Buildings, including Driveways, Streets and Curbs within those projects. Parking Lots and Office Buildings.

| | 07/01/2018 |
|---|---|
| Site Excavating (Chauffeurs) | $ 33.66 |

**SUPPLEMENTAL BENEFITS**
Per Hour: 07/01/2018

| | |
|---|---|
| Heavy Construction Work Chauffeurs | $ 46.0725 |
| Light Construction Work Chauffeurs | $ 11.55 |

**OVERTIME PAY**
See (B, *B2, E, **I, P, ***R, ****U) on OVERTIME PAGE
(NOTE) PREMIUM PAY of 25% on straight time hours for NEW YORK STATE D.O.T. and or other GOVERMENTAL MANDATED off shift work.
Note: (B,E,P,T & *U) Apply to Heavy Construction.
Note: (B2,I,T & *U) Apply to Light Construction.
Note: (*U) Only applies after 8 hours work on holiday

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, *16, **25) on HOLIDAY PAGE
NOTE:(*16) Paid at Double if Worked. (**25) Paid at Double if Worked.

4-282

## Welder 11/01/2018

**JOB DESCRIPTION** Welder **DISTRICT** 1

**ENTIRE COUNTIES**
Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

**WAGES**
Per hour 07/01/2018

Welder: To be paid the same rate of the mechanic performing the work.*

*EXCEPTION: If a specific welder certification is required, then the 'Certified Welder' rate in that trade tag will be paid.

**OVERTIME PAY**

**HOLIDAY**

1-As Per Trade

## Overtime Codes

Following is an explanation of the code(s) listed in the OVERTIME section of each classification contained in the attached schedule. Additional requirements may also be listed in the HOLIDAY section.

NOTE: Supplemental Benefits are 'Per hour worked' (for each hour worked) unless otherwise noted

| | |
|---|---|
| ( AA ) | Time and one half of the hourly rate after 7 and one half hours per day |
| ( A ) | Time and one half of the hourly rate after 7 hours per day |
| ( B ) | Time and one half of the hourly rate after 8 hours per day |
| ( B1 ) | Time and one half of the hourly rate for the 9th & 10th hours week days and the 1st 8 hours on Saturday. Double the hourly rate for all additional hours |
| ( B2 ) | Time and one half of the hourly rate after 40 hours per week |
| ( C ) | Double the hourly rate after 7 hours per day |
| ( C1 ) | Double the hourly rate after 7 and one half hours per day |
| ( D ) | Double the hourly rate after 8 hours per day |
| ( D1 ) | Double the hourly rate after 9 hours per day |
| ( E ) | Time and one half of the hourly rate on Saturday |
| ( E1 ) | Time and one half 1st 4 hours on Saturday; Double the hourly rate all additional Saturday hours |
| ( E2 ) | Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather |
| ( E3 ) | Between November 1st and March 3rd Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather, provided a given employee has worked between 16 and 32 hours that week |
| ( E4 ) | Saturday and Sunday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather |
| ( E5 ) | Double time after 8 hours on Saturdays |
| ( F ) | Time and one half of the hourly rate on Saturday and Sunday |
| ( G ) | Time and one half of the hourly rate on Saturday and Holidays |
| ( H ) | Time and one half of the hourly rate on Saturday, Sunday, and Holidays |
| ( I ) | Time and one half of the hourly rate on Sunday |
| ( J ) | Time and one half of the hourly rate on Sunday and Holidays |
| ( K ) | Time and one half of the hourly rate on Holidays |
| ( L ) | Double the hourly rate on Saturday |
| ( M ) | Double the hourly rate on Saturday and Sunday |
| ( N ) | Double the hourly rate on Saturday and Holidays |
| ( O ) | Double the hourly rate on Saturday, Sunday, and Holidays |
| ( P ) | Double the hourly rate on Sunday |
| ( Q ) | Double the hourly rate on Sunday and Holidays |
| ( R ) | Double the hourly rate on Holidays |
| ( S ) | Two and one half times the hourly rate for Holidays, if worked |

( S1 ) Two and one half times the hourly rate the first 8 hours on Sunday or Holidays One and one half times the hourly rate all additional hours.

( T ) Triple the hourly rate for Holidays, if worked

( U ) Four times the hourly rate for Holidays, if worked

( V ) Including benefits at SAME PREMIUM as shown for overtime

( W ) Time and one half for benefits on all overtime hours.

( X ) Benefits payable on Paid Holiday at straight time. If worked, additional benefit amount will be required for worked hours. (Refer to other codes listed.)

## Holiday Codes

PAID Holidays:

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

OVERTIME Holiday Pay:

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays. The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Following is an explanation of the code(s) listed in the HOLIDAY section of each classification contained in the attached schedule. The Holidays as listed below are to be paid at the wage rates at which the employee is normally classified.

| | |
|---|---|
| ( 1 ) | None |
| ( 2 ) | Labor Day |
| ( 3 ) | Memorial Day and Labor Day |
| ( 4 ) | Memorial Day and July 4th |
| ( 5 ) | Memorial Day, July 4th, and Labor Day |
| ( 6 ) | New Year's, Thanksgiving, and Christmas |
| ( 7 ) | Lincoln's Birthday, Washington's Birthday, and Veterans Day |
| ( 8 ) | Good Friday |
| ( 9 ) | Lincoln's Birthday |
| ( 10 ) | Washington's Birthday |
| ( 11 ) | Columbus Day |
| ( 12 ) | Election Day |
| ( 13 ) | Presidential Election Day |
| ( 14 ) | 1/2 Day on Presidential Election Day |
| ( 15 ) | Veterans Day |
| ( 16 ) | Day after Thanksgiving |
| ( 17 ) | July 4th |
| ( 18 ) | 1/2 Day before Christmas |
| ( 19 ) | 1/2 Day before New Years |
| ( 20 ) | Thanksgiving |
| ( 21 ) | New Year's Day |
| ( 22 ) | Christmas |
| ( 23 ) | Day before Christmas |
| ( 24 ) | Day before New Year's |
| ( 25 ) | Presidents' Day |
| ( 26 ) | Martin Luther King, Jr. Day |
| ( 27 ) | Memorial Day |
| ( 28 ) | Easter Sunday |

**New York State Department of Labor - Bureau of Public Work**
**State Office Building Campus**
**Building 12 - Room 130**
**Albany, New York 12240**

# REQUEST FOR WAGE AND SUPPLEMENT INFORMATION

As Required by Articles 8 and 9 of the NYS Labor Law

Fax (518) 485-1870 or mail this form for new schedules or for determination for additional occupations.

**This Form Must Be Typed**

Submitted By: (Check Only One) ☐ Contracting Agency ☐ Architect or Engineering Firm ☐ Public Work District Office Date:

## A. Public Work Contract to be let by: (Enter Data Pertaining to Contracting/Public Agency)

1. Name and complete address ☐ (Check if new or change)

Telephone: ( ) Fax: ( )
E-Mail:

2. NY State Units (see Item 5)

- ☐ 01 DOT
- ☐ 02 OGS
- ☐ 03 Dormitory Authority
- ☐ 04 State University Construction Fund
- ☐ 05 Mental Hygiene Facilities Corp.
- ☐ 06 OTHER N.Y. STATE UNIT
- ☐ 07 City
- ☐ 08 Local School District
- ☐ 09 Special Local District, i.e., Fire, Sewer, Water District
- ☐ 1O Village
- ☐ 11 Town
- ☐ 12 County
- ☐ 13 Other Non-N.Y. State (Describe)

3. SEND REPLY TO ☐ check if new or change)
Name and complete address:

Telephone:( ) Fax: ( )
E-Mail:

4. SERVICE REQUIRED. Check appropriate box and provide project information.

- ☐ New Schedule of Wages and Supplements.
  APPROXIMATE BID DATE :
- ☐ Additional Occupation and/or Redetermination

PRC NUMBER ISSUED PREVIOUSLY FOR THIS PROJECT :

OFFICE USE ONLY

## B. PROJECT PARTICULARS

5. Project Title _____

Description of Work _____

Contract Identification Number _____

Note: For NYS units, the OSC Contract No. _____

6. Location of Project:
Location on Site _____

Route No/Street Address _____

Village or City _____

Town _____

County _____

7. Nature of Project - Check One:

- ☐ 1. New Building
- ☐ 2. Addition to Existing Structure
- ☐ 3. Heavy and Highway Construction (New and Repair)
- ☐ 4. New Sewer or Waterline
- ☐ 5. Other New Construction (Explain)
- ☐ 6. Other Reconstruction, Maintenance, Repair or Alteration
- ☐ 7. Demolition
- ☐ 8. Building Service Contract

8. OCCUPATION FOR PROJECT :

- ☐ Construction (Building, Heavy Highway/Sewer/Water)
- ☐ Tunnel
- ☐ Residential
- ☐ Landscape Maintenance
- ☐ Elevator maintenance
- ☐ Exterminators, Fumigators
- ☐ Fire Safety Director, NYC Only
- ☐ Guards, Watchmen
- ☐ Janitors, Porters, Cleaners, Elevator Operators
- ☐ Moving furniture and equipment
- ☐ Trash and refuse removal
- ☐ Window cleaners
- ☐ Other (Describe)

9. Has this project been reviewed for compliance with the Wicks Law involving separate bidding? YES ☐ NO ☐

10. Name and Title of Requester

**Signature**



SEE PAGE TWO FOR LAWS RELATING TO PUBLIC WORK CONTRACTS

NEW YORK STATE DEPARTMENT OF LABOR
Bureau of Public Work - Debarment List

# LIST OF EMPLOYERS INELIGIBLE TO BID ON OR BE AWARDED ANY PUBLIC WORK CONTRACT

Under Article 8 and Article 9 of the NYS Labor Law, a contractor, sub-contractor and/or its successor shall be debarred and ineligible to submit a bid on or be awarded any public work or public building service contract/sub-contract with the state, any municipal corporation or public body for a period of five (5) years from the date of debarment when:

- Two (2) final determinations have been rendered within any consecutive six-year (6) period determining that such contractor, sub-contractor and/or its successor has WILLFULLY failed to pay the prevailing wage and/or supplements;
- One (1) final determination involves falsification of payroll records or the kickback of wages and/or supplements.

The agency issuing the determination and providing the information, is denoted under the heading 'Fiscal Officer'. DOL = New York State Department of Labor; NYC = New York City Comptroller's Office; AG = New York State Attorney General's Office; DA = County District Attorney's Office.

**Debarment Database:** To search for contractors, sub-contractors and/or their successors debarred from bidding or being awarded any public work contract or subcontract under NYS Labor Law Articles 8 and 9, or under NYS Workers' Compensation Law Section 141-b, access the database at this link: https://applications.labor.ny.gov/EDList/searchPage.do

**For inquiries where WCB is listed as the "Agency", please call 1-866-546-9322**

## NYSDOL Bureau of Public Work Debarment List 11/07/2018

Article 8

| AGENCY | Fiscal Officer | FEIN | EMPLOYER NAME | EMPLOYER DBA NAME | ADDRESS | DEBARMENT START DATE | DEBARMENT END DATE |
|---|---|---|---|---|---|---|---|
| DOL | DOL | *****0996 | A-1 CONSTRUCTION & RENOVATION INC | | 1973 81ST ST - SUITE A-5 BROOKLYN NY 11214 | 01/08/2015 | 01/08/2020 |
| DOL | NYC | | ABDUL KARIM | | C/O NORTH AMERICAN IRON W 1560 DECATUR STREETRIDGEWOOD NY 11385 | 05/15/2015 | 05/15/2020 |
| DOL | DOL | *****8018 | ACCURATE MECHANICAL LLC | | 9547 BUSTLETON AVENUE PHILADELPHIA PA 19115 | 02/05/2014 | 02/05/2019 |
| DOL | DOL | | ACCURATE MECHANICAL OF PHILADELPHIA LLC | | 9547 BUSTLETON AVENUE PHILADELPHIA PA 19115 | 02/05/2014 | 02/05/2019 |
| DOL | DOL | *****3344 | ACT INC | | 6409 LAND O LAKES BLVD LAND O LAKES FL 34638 | 11/10/2015 | 11/10/2020 |
| DOL | NYC | | ADRIANA SELA | C/O COLONIAL ROOFING COMPANY INC | 247 48TH STREET BROOKLYN NY 11220 | 02/05/2014 | 02/05/2019 |
| DOL | DOL | *****1687 | ADVANCED SAFETY SPRINKLER INC | | 261 MILL ROAD P O BOX 296EAST AURORA NY 14052 | 07/29/2015 | 07/29/2020 |
| DOL | NYC | *****6775 | ADVENTURE MASONRY CORP. | | 1535 RICHMOND AVENUE STATEN ISLAND NY 10314 | 12/13/2017 | 12/13/2022 |
| DOL | DOL | | AJ TORCHIA | | 10153 ROBERTS RD SAUQUOIT NY 13456 | 08/09/2016 | 08/09/2021 |
| DOL | DOL | *****3344 | ALL CATASTROPHE CONSTRUCTION TEAM INC | ACT INC | 6409 LAND O LAKES BLVD LAND O LAKES FL 34638 | 11/10/2015 | 11/10/2020 |
| DOL | DOL | *****8740 | ALLSTATE ENVIRONMENTAL CORP | | C/O JOSE MONTAS 27 BUTLER PLACEYONKERS NY 10710 | 03/18/2011 | 03/19/2020 |
| DOL | DOL | | AMADEO J TORCHIA | TORCHIA'S HOME IMPROVEMEN T | 10153 ROBERTS RD SAUQUOIT NY 13456 | 08/09/2016 | 08/09/2021 |
| DOL | NYC | | ANISUL ISLAM | | C/O RELIANCE GENERAL CONS 644 OCEAN PARKWAYBROOKLYN NY 11230 | 09/02/2015 | 09/02/2020 |
| DOL | DOL | *****7004 | ANNEX CONTRACTING LTD | | 3005 WYNSUM AVENUE MERRICK NY 11566 | 08/18/2014 | 08/18/2019 |
| DOL | DOL | *****7004 | ANNEX GENERAL CONTRACTING INC | | 3005 WYNSUM AVENUE MERRICK NY 11566 | 08/18/2014 | 08/18/2019 |
| DOL | DA | | ANTHONY CARDINALE | | 58-48 59TH STREET MASPETH NY 11378 | 05/16/2012 | 05/08/2020 |
| DOL | DOL | | ANTHONY J MINGARELLI JR | | C/O T & T CONCRETE INC 2560 HAMBURG TURNPIKELACKAWANNA NY 14218 | 07/08/2015 | 07/08/2020 |
| DOL | DOL | | ANTHONY PERGOLA | | 3 WEST MAIN ST/SUITE 208 ELMSFORD NY 10323 | 01/23/2017 | 01/23/2022 |
| DOL | DOL | | ANTONIO ESTIVEZ | | 442 ARMONK RD MOUNT KISCO NY 10549 | 06/12/2018 | 06/12/2023 |
| DOL | DOL | *****3020 | APCO CONTRACTING CORP | | 24 SOUTH MARYLAND AVENUE PORT WASHINGTON NY 11050 | 09/24/2012 | 09/02/2020 |
| DOL | DOL | *****3219 | APOLLO CONSTRUCTION SERVICES CORP | APOLLO PAINTING CO | 157 TIBBETTS ROAD YONKERS NY 10705 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | | APOLLO PAINTING CO | | 157 TIBBETTS ROAD YONKERS NY 10705 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | *****3295 | APOLLO PAINTING CORP | | 3 ALAN B SHEPART PLACE YONKERS NY 10705 | 03/12/2014 | 03/12/2019 |
| DOL | AG | *****0194 | APPLIED CONSTRUCTION INC | | 46 RUGBY ROAD WESTBURY NY 11590 | 11/20/2013 | 11/20/2018 |
| DOL | NYC | *****8403 | AQUA JET PAINTING CORP | | 10 VIKING DRIVE WEST ISLIP NY 11795 | 04/16/2014 | 04/16/2019 |
| DOL | NYC | *****9232 | ARKAY CONSTRUCTION INC | | 102-104 GREYLOCK AVENUE BELLEVILLE NJ 07109 | 07/15/2015 | 07/15/2020 |
| DOL | DOL | *****3953 | ASCAPE LANDSCAPE & CONSTRUCTION CORP | | 634 ROUTE 303 BLAUVELT NY 10913 | 07/26/2012 | 11/19/2018 |
| DOL | NYC | *****4779 | ASTORIA GENERAL CONTRACTING CORP | | 35-34 31ST STREET LONG ISLAND CITY NY 11106 | 09/02/2015 | 09/02/2020 |
| DOL | NYC | *****7217 | ASTRO COMMUNICATIONS OF NY CORP | | 79 ALEXANDER AVE- STE 36A BRONX NY 10454 | 10/30/2015 | 10/30/2020 |
| DOL | NYC | *****6046 | ATLANTIC SUN CONTRUCTION CORP | | 58-46 59TH AVENUE MASPETH NY 11378 | 05/08/2015 | 05/08/2020 |
| DOL | NYC | *****6683 | ATLAS RESTORATION CORP. | | 35-12 19TH AVENUE ASTORIA NY 11105 | 08/02/2017 | 08/02/2022 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DOL | NYC | | AUDLEY O'BRIEN | | 1273 NORTH AVENUE/#1 CP NEW ROCHELLE NY 10804 | 04/07/2015 | 04/07/2020 |
| DOL | DOL | | AVIS R HILL | | 3510 HICKORY WALK LANE ELLENWOOD GA 32094 | 01/22/2015 | 01/22/2020 |
| DOL | AG | | AVTAR SINGH | | 116-24 127TH STREET SOUTH OZONE PARK NY 11420 | 12/22/2015 | 12/22/2020 |
| DOL | AG | | BALDEV SINGH | | 116-24 127TH STREET SOUTH OZONE PARK NY 11420 | 12/22/2015 | 12/22/2020 |
| DOL | DOL | | BARBARA CASSIDY | | 7 BLENIS PLACE VALHALLA NY 10595 | 04/02/2015 | 04/02/2020 |
| DOL | DOL | | BARRY KINNEY | | 6409 LAND O LAKES BLVD LAND O LAKES FL 34638 | 11/10/2015 | 11/10/2020 |
| DOL | NYC | *****3915 | BEACON RESTORATION INC | | SUITE B-8 782 PELHAM PARKWAY SOUTHBRONX NY 10462 | 04/21/2016 | 04/21/2021 |
| DOL | DOL | | BEVERLY F WILLIAMS | | 1238 PRESIDENT STREET BROOKLYN NY 11225 | 11/18/2013 | 11/18/2018 |
| DOL | DOL | | BIAGIO CANTISANI | | | 06/12/2018 | 06/12/2023 |
| DOL | DOL | *****8551 | BRANDY'S MASONRY | | 216 WESTBROOK STREET P O BOX 304SAYRE PA 18840 | 08/09/2016 | 08/09/2021 |
| DOL | NYC | *****6555 | BROOKLYN WELDING CORP | | 1273 NORTH AVENUE/ #1 CP NEW ROCHELLE NY 10804 | 04/07/2015 | 04/07/2020 |
| DOL | DOL | *****1449 | BRRESTORATION NY INC | | 140 ARCADIA AVENUE OSWEGO NY 13126 | 09/12/2016 | 09/12/2021 |
| DOL | DOL | | BRUCE MORSEY | | C/O KENT HOLLOW SIDING LL 29A BRIDGE STREETNEW MILFORD CT 06776 | 01/15/2016 | 01/15/2021 |
| DOL | DOL | | BRUCE P. NASH JR. | | 5841 BUTTERNUT ROAD EAST SYRACUSE NY 13057 | 09/12/2018 | 09/12/2023 |
| DOL | DOL | *****6156 | C & J LANDSCAPING & MAINTENANCE INC | | 520 PINE HILL ROAD CHESTER NY 10940 | 06/23/2014 | 06/23/2019 |
| DOL | DOL | *****8809 | C.B.E. CONTRACTING CORPORATION | | 310 MCGUINESS BLVD GREENPOINT NY 11222 | 03/07/2017 | 03/07/2022 |
| DOL | DOL | | CANTISANI & ASSOCIATES LTD | | 442 ARMONK RD MOUNT KISCSO NY 10549 | 06/12/2018 | 06/12/2023 |
| DOL | DOL | | CANTISANI HOLDING LLC | | | 06/12/2018 | 06/12/2023 |
| DOL | DOL | | CARIBBEAN POOLS | | C/O DOUGLAS L MALARKEY 64 VICTORIA DRIVEBINGHAMTON NY 13904 | 02/04/2016 | 02/04/2021 |
| DOL | DOL | *****3812 | CARMODY "2" INC | | | 06/12/2018 | 06/12/2023 |
| DOL | DOL | *****1143 | CARMODY BUILDING CORP | CARMODY CONTRACTIN G AND CARMODY CONTRACTIN G CORP. | 442 ARMONK RD MOUNT KISCO NY 10549 | 06/12/2018 | 06/12/2023 |
| DOL | DOL | | CARMODY CONCRETE CORPORATION | | | 06/12/2018 | 06/12/2023 |
| DOL | DOL | | CARMODY ENTERPRISES, LTD. | | 442 ARMONK RD MOUNT KISCO NY 10549 | 06/12/2018 | 06/12/2023 |
| DOL | DOL | | CARMODY INC | | 442 ARMONK RD MOUNT KISCO NY 10549 | 06/12/2018 | 06/12/2023 |
| DOL | DOL | *****3812 | CARMODY INDUSTRIES INC | | | 06/12/2018 | 06/12/2023 |
| DOL | DOL | | CARMODY MAINTENANCE CORPORATION | | 442 ARMONK RD MOUNT KISCO NY 10549 | 06/12/2018 | 06/12/2023 |
| DOL | DOL | | CARMODY MASONRY CORP | | 442 ARMONK RD MOUNT KISCO NY 10549 | 06/12/2018 | 06/12/2023 |
| DOL | NYC | *****9172 | CASSIDY EXCAVATING INC | | 14 RAILROAD AVENUE VALHALLA NY 10595 | 05/15/2014 | 04/02/2020 |
| DOL | DOL | *****6745 | CATSKILL FENCE INSTALLATIONS INC | | 5445 ROUTE 32 CATSKILL NY 12414 | 08/22/2014 | 08/22/2019 |
| DOL | DOL | *****8809 | CBE CONTRACTING CORP | | 142 EAST MARKET STREET LONG BEACH NY 11561 | 03/07/2017 | 03/07/2022 |
| DOL | AG | | CESAR J. AGUDELO | | 81-06 34TH AVENUE APT. 6EJACKSON HEIGHTS NY 11372 | 02/07/2018 | 02/07/2023 |
| DOL | DOL | *****7655 | CHAMPION CONSTRUCTION SERVICES CORP | | 2131 SCHENECTADY AVENUE BROOKLYN NY 11234 | 11/18/2015 | 11/18/2020 |
| DOL | NYC | | CHARLES CASSIDY JR | | 14 RAILROAD AVENUE VALHALLA NY 10595 | 05/15/2014 | 04/02/2020 |
| DOL | DOL | | CHARLES ZIMMER JR | | 216 WESTBROOK STREET P O BOX 304SAYRE PA 18840 | 08/09/2016 | 08/09/2021 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DOL | DOL | | CHRISTINE J HEARNE | | C/O CJ-HEARNE CONSTRUCTIO<br>131 PONCE DE LEON AVE<br>NEATLANTA GA 30308 | 12/01/2015 | 12/01/2020 |
| DOL | DOL | | CHRISTOPHER J MAINI | | 19 CAITLIN AVE<br>JAMESTOWN NY 14701 | 09/17/2018 | 09/17/2023 |
| DOL | DOL | *****3360 | CITY LIMITS GROUP INC | | 2279 HOLLERS AVENUE<br>BRONX NY 10475 | 01/07/2014 | 06/23/2019 |
| DOL | DOL | *****0671 | CJ-HEARNE CONSTRUCTION CO | | SUITE 204<br>131 PONCE DE LEON AVENUEATLANTA GA 30308 | 12/01/2015 | 12/01/2020 |
| DOL | NYC | *****2905 | COLONIAL ROOFING COMPANY INC | | 247 48TH STREET<br>BROOKLYN NY 11220 | 02/05/2014 | 02/05/2019 |
| DOL | NYC | *****3182 | COLORTECH INC | | 5990 58TH AVENUE<br>MASPETH NY 11378 | 11/18/2013 | 11/18/2018 |
| DOL | DOL | *****2703 | CONKLIN'S TECH-MECHANICAL INC | | 5 PARKER AVENUE<br>POUGHKEEPSIE NY 12601 | 03/25/2014 | 03/25/2019 |
| DOL | DOL | *****1927 | CONSTRUCTION PARTS WAREHOUSE, INC. | CPW | 5841 BUTTERNUT ROAD<br>EAST SYRACUSE NY 13057 | 09/12/2018 | 09/12/2023 |
| DOL | NYC | *****4468 | CRAFT CONTRACTING GROUP INC | | 3256 BRUNER AVENUE<br>BRONX NY 10469 | 07/29/2014 | 07/29/2019 |
| DOL | NYC | *****8507 | CRAFT FENCE INC | | 3256 BRUNER AVENUE<br>BRONX NY 10469 | 07/29/2014 | 07/29/2019 |
| DOL | NYC | *****2164 | CREATIVE TRUCKING INC | | 58-83 54TH STREET<br>MASPETH NY 11378 | 02/26/2016 | 02/26/2021 |
| DOL | DOL | *****7761 | D L MALARKEY CONSTRUCTION | | 64 VICTORIA DRIVE<br>BINGHAMTON NY 13904 | 02/04/2016 | 02/04/2021 |
| DOL | DOL | *****7888 | D L MALARKEY CONSTRUCTION INC | | 64 VICTORIA DRIVE<br>BINGHAMTON NY 13904 | 02/04/2016 | 02/04/2021 |
| DOL | DOL | *****5629 | DAKA PLUMBING AND HEATING LLC | | 2561 ROUTE 55<br>POUGHQUAG NY 12570 | 02/19/2016 | 02/19/2021 |
| DOL | DOL | | DANICA IVANOSKI | | 61 WILLETT ST.<br>PASSAIC NJ 07503 | 10/26/2016 | 10/26/2021 |
| DOL | DOL | | DARYL T RIEKS | | C/O RIEKS CONTRACTING LLC<br>4804 GAHWILER ROADAUBURN NY 13021 | 05/01/2015 | 05/01/2020 |
| DOL | NYC | *****7707 | DASSLE CONTRACTING INC | | 213-37 39TH AVE/SUITE 120<br>BAYSIDE NY 11360 | 05/08/2015 | 05/08/2020 |
| DOL | DOL | | DAVID MARTINEZ | | C/O EMPIRE TILE INC<br>6 TREMONT COURTHUNTINGTON STATION NY 11746 | 03/08/2016 | 03/08/2021 |
| DOL | NYC | | DAWN AVILA AKA DAWN BECHTOLD | | 1ST FLOOR STORE FRONT<br>88-10 LITTLE NECK PARKWAYFLORAL PARK NY 11001 | 06/24/2014 | 06/24/2019 |
| DOL | NYC | | DAWN BECHTOLD AKA DAWN AVILA | | 1ST FLOOR STORE FRONT<br>88-10 LITTLE NECK PARKWAYFLORAL PARK NY 11001 | 06/24/2014 | 06/24/2019 |
| DOL | DOL | | DEBBIE STURDEVANT | | 29 MAPLEWOOD DRIVE<br>BINGHAMTON NY 13901 | 02/21/2017 | 02/21/2022 |
| DOL | AG | | DEBRA MARTINEZ | | 31 BAY ST<br>BROOKLYN NY 11231 | 03/28/2018 | 03/28/2023 |
| DOL | NYC | *****3865 | DECOMA BUILDING CORPORATION | | 134 EVERGREEN PL/STE 101<br>EAST ORANGE NJ 07018 | 12/30/2013 | 12/30/2018 |
| DOL | DOL | | DEDA GAZIVODAN | | C/O DAKA PLUMBING AND H<br>2561 ROUTE 55POUGHQUAG NY 12570 | 02/19/2016 | 02/19/2021 |
| DOL | DOL | | DENNIS SCHWANDTNER | | C/O YES SERVICE AND REPAI<br>145 LODGE AVEHUNTINGTON STATION NY 11476 | 08/09/2016 | 08/09/2021 |
| DOL | DOL | *****9868 | DESANTIS ENTERPRISES | | 161 OSWEGO RIVER ROAD<br>PHOENIX NY 13135 | 09/24/2013 | 11/18/2018 |
| DOL | DOL | | DF CONTRACTORS OF ROCHESTER, INC. | | 1835 DAANSEN RD.<br>PALMYRA NY 14522 | 05/16/2017 | 05/16/2022 |
| DOL | DOL | | DF CONTRACTORS, INC. | | 1835 DAANSEN RD.<br>PALMYRA NY 14522 | 05/16/2017 | 05/16/2022 |
| DOL | DOL | *****9252 | DI BERNARDO TILE AND MARBLE CO INC | | 15 WALKER WAY<br>ALBANY NY 12205 | 03/21/2014 | 03/21/2019 |
| DOL | NYC | | DIMITRIOS KOUTSOUKOS | | C/O ASTORIA GENERAL CONTR<br>35-34 31ST STREETLONG ISLAND CITY NY 11106 | 09/02/2015 | 09/02/2020 |
| DOL | NYC | | DIMITRIOS TSOUMAS | | 35-12 19TH AVENUE<br>ASTORIA NY 11105 | 08/02/2017 | 08/02/2022 |
| DOL | DOL | *****3242 | DONALD R. FORSAY | DF LAWN SERVICE | 1835 DAANSEN RD.<br>PALMYRA NY 14522 | 05/16/2017 | 05/16/2022 |

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| DOL | DOL | | DONALD R. FORSAY | | 1835 DAANSEN RD.<br>PALMYRA NY 14522 | 05/16/2017 | 05/16/2022 |
| DOL | DOL | | DORIS SKODA | | C/O APCO CONTRACTING CORP<br>24 SOUTH MARYLAND AVENUEPORT WASHINGTON NY 11050 | 09/24/2012 | 09/02/2020 |
| DOL | NYC | *****7404 | DOSANJH CONSTRUCTION CORP | | 9439 212TH STREET<br>QUEENS VILLAGE NY 11428 | 02/25/2016 | 02/25/2021 |
| DOL | DOL | | DOUGLAS L MALARKEY | MALARKEY CONSTRUCTION | 64 VICTORIA DRIVE<br>B INGHAMTON NY 13904 | 02/04/2016 | 02/04/2021 |
| DOL | DOL | *****6982 | DUFOUR GROUP INC | DUFOUR MASONRY | 353 WEST 56TH STREET #7M<br>NEW YORK NY 10019 | 06/10/2014 | 06/10/2019 |
| DOL | DOL | | DUFOUR MASONRY | | 353 WEST 56TH ST #7M<br>NEW YORK NY 10019 | 06/10/2014 | 06/10/2019 |
| DOL | DOL | | DUFOUR MASONRY & RESTORATION INC | | 123<br>ALBANY NY | 06/10/2014 | 06/10/2019 |
| DOL | DOL | *****5840 | DYNA CONTRACTING INC | | 363 88TH STREET<br>BROOKLYN NY 11209 | 11/18/2013 | 11/18/2018 |
| DOL | DOL | | E C WEBB | | 6409 LAND O LAKES BLVD<br>LAND O LAKES FL 34638 | 11/10/2015 | 11/10/2020 |
| DOL | DOL | | EARL L WILSON | WILSON BROTHER DRYWALL CONTRACTORS | 36 ABERSOLD STREET<br>ROCHESTER NY 14621 | 08/31/2015 | 08/31/2020 |
| DOL | DOL | *****1496 | EAST COAST DRYWALL INC | | 1238 PRESIDENT STREET<br>BROOKLYN NY 11225 | 11/18/2013 | 11/18/2018 |
| DOL | DOL | | EAST COAST PAVING | | 2238 BAKER RD<br>GILLETT PA 16923 | 03/12/2018 | 03/12/2023 |
| DOL | NYC | | EDWARD MENKEN | | C/O AQUA JET PAINTING<br>10 VIKING DRIVEWEST ISLIP NY 11795 | 04/16/2014 | 04/16/2019 |
| DOL | NYC | *****0900 | EF PRO CONTRACTING INC | | 147 BROOME AVENUE<br>ATLANTIC BEACH NY 11509 | 03/03/2014 | 03/03/2019 |
| DOL | NYC | | EFSTRATIOS BERNARDIS | | 23-73 48TH STREET<br>LONG ISLAND CITY NY 11103 | 04/24/2014 | 04/24/2019 |
| DOL | DOL | | ELIZABETH RAMADANI | | C/O RAMADA CONSTRUCTION<br>80 SAVO LOOPSTATEN ISLAND NY 10309 | 01/07/2014 | 01/07/2019 |
| DOL | DOL | | ELLEN DESANTIS | DESANTIS ENTERPRISES | 161 OSWEGO RIVER ROAD<br>PHOENIX NY 13135 | 09/24/2013 | 11/18/2018 |
| DOL | DOL | *****0780 | EMES HEATING & PLUMBING CONTR | | 5 EMES LANE<br>MONSEY NY 10952 | 01/20/2002 | 01/20/3002 |
| DOL | AG | | EMILIO FRANZA | | 90 JUNIUS STREET<br>BROOKLYN NY 11212 | 01/23/2014 | 01/23/2019 |
| DOL | DOL | | EMPIRE CONCRETE SERVICES LLC | | 101 SULLYS TRAIL/SUITE 20<br>PITTSFORD NY 14534 | 11/18/2013 | 01/07/2019 |
| DOL | DOL | *****0511 | EMPIRE CONCRETE SYSTEMS LLC | | 101 SULLYS TRAIL/ SUITE 2<br>PITTSFORD NY 14534 | 11/18/2013 | 01/07/2019 |
| DOL | DOL | *****2353 | EMPIRE CONSTRUCTORS LLC | | 101 SULLYS TRAIL/SUITE 20<br>PITTSFORD NY 14534 | 11/18/2013 | 01/07/2019 |
| DOL | DOL | | EMPIRE PRECAST LLC | | 101 SULLYS TRAIL/SUITE 20<br>PITTSFORD NY 14534 | 11/18/2013 | 01/07/2019 |
| DOL | DOL | *****3270 | EMPIRE TILE INC | | 6 TREMONT COURT<br>HUNTINGTON STATION NY 11746 | 03/08/2016 | 03/08/2021 |
| DOL | NYC | | EVERTON CARLESS | | 134 EVERGREEN PL/STE 101<br>EAST ORANGE NJ 07018 | 12/30/2013 | 12/30/2018 |
| DOL | DOL | *****7403 | F & B PAINTING CONTRACTING INC | | 2 PARKVIEW AVENUE<br>HARRISON NY 10604 | 09/26/2016 | 09/26/2021 |
| DOL | DOL | | F KALAFATIS | | 2279 HOLLERS AVENUE<br>BRONX NY 10475 | 01/07/2014 | 06/23/2019 |
| DOL | DOL | | FANTASTIC PAINTING | | 493 LANSING ROAD<br>FULTONVILLE NY 12072 | 11/18/2013 | 11/18/2018 |
| DOL | DOL | | FAY MATTHEW | | C/O CHAMPION CONSTRUCTION<br>2131 SCHENECTADY AVENUEBROOKLYN NY 11234 | 11/18/2015 | 11/18/2020 |
| DOL | DOL | | FAZIA GINA ALI-MOHAMMED | C/O CHAMPION CONSTRUCTION | 2131 SCHENECTADY AVENUE<br>BROOKLYN NY 11234 | 11/18/2015 | 11/18/2020 |
| DOL | DOL | | FRAN MICELI | | 2279 HOLLERS AVENUE<br>BRONX NY 10475 | 01/07/2014 | 06/23/2019 |
| DOL | DOL | | FRANCES KALAFATIS | | 2279 HOLLERS AVENUE<br>BRONX NY 10475 | 01/07/2014 | 06/23/2019 |

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| DOL | DOL | | FRANCES KALAFATIS-MICELI | | 2279 HOLLERS AVENUE BRONX NY 10475 | 01/07/2014 | 06/23/2019 |
| DOL | DOL | | FRANK BENEDETTO | | 19 CATLIN AVE JAMESTOWN NY 14701 | 09/17/2018 | 09/17/2023 |
| DOL | DOL | | FRANK BENEDETTO | | C/O F & B PAINTING CONTRA 2 PARKVIEW AVENUEHARRISON NY 10604 | 09/26/2016 | 09/26/2021 |
| DOL | DOL | *****4722 | FRANK BENEDETTO AND CHRISTOPHER J MAINI | B & M CONCRETE | 19 CAITLIN AVE JAMESTOWN NY 14701 | 09/17/2018 | 09/17/2023 |
| DOL | DOL | | FRANK DEMARTINO | | 101-61 99TH STREET OZONE PARK NY 11416 | 02/15/2017 | 02/15/2022 |
| DOL | DOL | | FRANK DEMARTINO | | 101-61 99TH STREET OZONE PARK NY 11416 | 02/15/2017 | 02/15/2022 |
| DOL | DOL | | FRANK J MERCANDO | | 134 MURRAY AVENUE YONKERS NY 10704 | 12/11/2009 | 02/03/2019 |
| DOL | DOL | *****2724 | FRESH START PAINTING CORP | | 157 TIBBETS ROAD YONKERS NY 10705 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | | G FUCCI CONSTRUCTION SERVICES | | 3 ALAN B SHEPARD PLACE YONKERS NY 10705 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | *****6767 | G FUCCI PAINTING INC | | C/O SPIEGEL & UTRERA 1 MAIDEN LANE - 5TH FLNEW YORK NY 10038 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | *****4546 | GAF PAINTING LLC | | 157 TIBBETS ROAD YONKERS NY 10705 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | | GALINDA ROTENBERG | | C/O GMDV TRANS INC 67-48 182ND STREETFRESH MEADOWS NY 11365 | 06/24/2016 | 06/24/2021 |
| DOL | DOL | | GARDEN STATE PAINTING | | 157 TIBBETTS ROAD YONKERS NY 10705 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | | GEORGE DI BERNARDO | | C/O DI BERNARDO TILE 15 WALKER WAYALBANY NY 12205 | 03/21/2014 | 03/21/2019 |
| DOL | DA | | GEORGE LUCEY | | 150 KINGS STREET BROOKLYN NY 11231 | 01/19/1998 | 01/19/2998 |
| DOL | DOL | *****5674 | GMDV TRANS INC | | 67-48 182ND STREET FRESH MEADOWS NY 11365 | 06/24/2016 | 06/24/2021 |
| DOL | NYC | | GREAT ESTATE CONSTRUCTION, INC. | | 327 STAGG ST BROOKLYN NY 11206 | 10/10/2017 | 10/10/2022 |
| DOL | DOL | | GREGORY A FUCCI | | C/O PAF PAINTING SERVICES 157 TIBBETTS ROADYONKERS NY 10705 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | | GREGORY FUCCI JR | | C/O APOLLO CONSTRUCTION 157 TIBBETTS ROADYONKERS NY 10705 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | | GREGORY S. OLSON | | P.O BOX 100 200 LATTA BROOK PARKHORSEHEADS NY 14845 | 03/08/2018 | 03/08/2023 |
| DOL | NYC | *****0346 | H N H CONTRACTORS CORP | | 4558 BROADWAY # 6 NEW YORK NY 10040 | 08/04/2014 | 08/04/2019 |
| DOL | NYC | | HAMEEDUL HASAN | | 240 HOME STREET TEANECK NJ 07666 | 08/04/2014 | 08/04/2019 |
| DOL | NYC | | HARMEL SINGH | | 15 CLINTON LANE HICKSVILLE NY 11801 | 02/25/2016 | 02/25/2021 |
| DOL | NYC | | HAROLD KUEMMEL | | 58-83 54TH STREET MASPETH NY 11378 | 02/26/2016 | 02/26/2021 |
| DOL | AG | | HARVINDER SINGH PAUL | | 90 JUNIUS STREET BROOKLYN NY 11212 | 01/23/2014 | 01/23/2019 |
| DOL | DOL | | HENRY VAN DALRYMPLE | | 2663 LANTERN LANE ATLANTA GA 30349 | 12/01/2015 | 12/01/2020 |
| DOL | DOL | *****6370 | HILLIANO CONSTRUCTION & ELECTRICAL INC | | 354 MAGNOLIA STREET ROCHESTER NY 14611 | 01/22/2015 | 01/22/2020 |
| DOL | DOL | *****8282 | IDEMA DEVELOPMENT INC | | 91 COLLEGE AVENUE POUGHKEEPSIE NY 12603 | 12/04/2015 | 12/04/2020 |
| DOL | DOL | *****8282 | IDEMA GENERAL CONTRACTORS INC | | 91 COLLEGE AVENUE POUGHKEEPSIE NY 12603 | 12/04/2015 | 12/04/2020 |
| DOL | DOL | *****7001 | INTEGRATED CONSTRUCTION & POWER SYSTEMS INC | | SUITE 100 2105 W GENESEE STREETSYRACUSE NY 13219 | 01/06/2016 | 01/06/2021 |
| DOL | DOL | *****5131 | INTEGRITY MASONRY, INC. | M&R CONCRETE | 722 8TH AVE WATERVLIET NY 12189 | 06/05/2018 | 06/05/2023 |
| DOL | AG | | J A M CONSTRUCTION CORP | | SUITE 125 265 SUNRISE HIGHWAYROCKVILLE CENTRE NY 10457 | 04/07/2016 | 04/07/2021 |
| DOL | DOL | *****7598 | J M RICH LLC | | P O BOX 268 STILLWATER NY 12170 | 09/16/2013 | 03/21/2019 |

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| DOL | DOL | *****3478 | J N P CONSTRUCTION CORP | | 50 LOUIS COURT<br>P O BOX 1907SOUTH<br>HACKENSACK NY 07606 | 03/21/2014 | 03/21/2019 |
| DOL | DOL | | J N RICH LLC | | P O BOX 268<br>STILLWATER NY 12170 | 09/16/2013 | 03/21/2019 |
| DOL | DOL | *****4910 | J V MAGIC TOUCH CORPORATION | | 94-25 57TH AVENUE, APT 5G<br>ELMHURST NY 11373 | 01/12/2015 | 01/12/2020 |
| DOL | DOL | | J.A. HIRES CADWALLADER | | P.O BOX 100<br>200 LATTA BROOK<br>PARKHORSEHEADS NY 14845 | 03/08/2018 | 03/08/2023 |
| DOL | DOL | | JAMES B RHYNDERS | | 91 COLLEGE AVENUE<br>POUGHKEEPSIE NY 12603 | 12/04/2015 | 12/04/2020 |
| DOL | DOL | | JAMES BOYCE | | C/O EMPIRE CONCRETE SYST<br>101 SULLYS TRAIL/SUITE<br>20PITTSFORD NY 14534 | 11/18/2013 | 01/07/2019 |
| DOL | DOL | | JAMES C. DELGIACCO | | 722 8TH AVE<br>WATERVLIET NY 12189 | 06/05/2018 | 06/05/2023 |
| DOL | DOL | | JAMES E RHYNDERS | | 91 COLLEGE AVENUE<br>POUGHKEEPSIE NY 12603 | 12/04/2015 | 12/04/2020 |
| DOL | AG | | JAMES FALCONE | | SUITE 125<br>265 SUNRISE<br>HIGHWAYROCKVILLE CENTRE<br>NY 10457 | 04/07/2016 | 04/07/2021 |
| DOL | DOL | | JAMES LIACONE | | 9365 WASHINGTON ST<br>LOCKPORT IL 60441 | 07/23/2018 | 07/23/2023 |
| DOL | DOL | | JAMES RACHEL | | 9365 WASHINGTON ST<br>LOCKPORT IL 60441 | 07/23/2018 | 07/23/2023 |
| DOL | DOL | | JAMES RHYNDERS SR | | 91 COLLEGE AVENUE<br>POUGHKEEPSIE NY 12603 | 12/04/2015 | 12/04/2020 |
| DOL | DOL | | JAMES SICKAU | | 3090 SHIRLEY ROAD<br>NORTH COLLINS NY 14111 | 04/19/2011 | 07/08/2020 |
| DOL | DOL | | JASON M RICH | | P O BOX 268<br>STILLWATER NY 12170 | 09/16/2013 | 03/21/2019 |
| DOL | DOL | | JASON W MILLIMAN | | C/O ROCHESTER ACOUSTICAL<br>P O BOX 799HILTON NY 14468 | 02/19/2016 | 02/19/2021 |
| DOL | DOL | *****5368 | JCH MASONRY & LANDSCAPING INC. | | 35 CLINTON AVE<br>OSSINING NY 10562 | 09/12/2018 | 09/12/2023 |
| DOL | DOL | | JEFF P BRADLEY | | 520 PINE HILL ROAD<br>CHESTER NY 10940 | 06/23/2014 | 06/23/2019 |
| DOL | NYC | | JEFFREY CASSIDY | | 14 RAILROAD AVENUE<br>VALHALLA NY 10595 | 05/15/2014 | 04/02/2020 |
| DOL | DOL | | JEROME LACITIGNOLA | | C/O CATSKILL FENCE INSTAL<br>5445 ROUTE 32 CATSKILL NY<br>12414 | 08/22/2014 | 08/22/2019 |
| DOL | DOL | | JESSICA WHITESIDE | | C/O BRRESTORATION NY INC<br>140 ARCADIA<br>AVENUEOSWEGO NY 13126 | 09/12/2016 | 09/12/2021 |
| DOL | AG | | JOHN ANTHONY MASSINO | | 36-49 204TH STREET<br>BAYSIDE NY 11372 | 02/07/2018 | 02/07/2023 |
| DOL | DOL | | JOHN F. CADWALLADER | | 200 LATTA BROOK PARK<br>HORSEHEADS NY 14845 | 03/08/2018 | 03/08/2023 |
| DOL | DOL | *****4612 | JOHN F. CADWALLADER, INC. | THE GLASS COMPANY | P.O BOX 100<br>200 LATTA BROOK<br>PARKHORSEHEADS NY 14845 | 03/08/2018 | 03/08/2023 |
| DOL | AG | *****0600 | JOHNCO CONTRACTING, INC. | | 36-49 204TH STREET<br>BAYSIDE NY 11372 | 02/07/2018 | 02/07/2023 |
| DOL | DOL | | JON E DEYOUNG | | 261 MILL ROAD<br>P O BOX 296EAST AURORA<br>NY 14052 | 07/29/2015 | 07/29/2020 |
| DOL | DOL | | JORGE VILLALOBOS | | 94-25 57TH AVENUE - APT 5<br>ELMHURST NY 11373 | 01/12/2015 | 01/12/2020 |
| DOL | DOL | | JOSE CHUCHUCA | | 35 CLINTON AVE<br>OSSINING NY 10562 | 09/12/2018 | 09/12/2023 |
| DOL | DOL | | JOSE MONTAS | | 27 BUTLER PLACE<br>YONKERS NY 10710 | 03/18/2011 | 03/19/2020 |
| DOL | AG | | JOSEPH FALCONE | | SUITE 125<br>265 SUNRISE<br>HIGHWAYROCKVILLE CENTRE<br>NY 10457 | 04/07/2016 | 04/07/2021 |
| DOL | DOL | *****9273 | JOSEPH M LOVETRO | | P O BOX 812<br>BUFFALO NY 14220 | 08/09/2016 | 08/09/2021 |
| DOL | NYC | | JOSEPH MARTINO | | 1535 RICHMOND AVENUE<br>STATEN ISLAND NY 10314 | 12/13/2017 | 12/13/2022 |
| DOL | DOL | | JOSHUA DEBOWSKY | | 9547 BUSTLETON AVENUE<br>PHILADELPHIA PA 19115 | 02/05/2014 | 02/05/2019 |
| DOL | DOL | | JUANA MARTINEZ | | C/O LEAD CONSTRUCTION<br>27 BUTLER PLACEYONKERS<br>NY 10710 | 03/19/2015 | 03/19/2020 |

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| DOL | DOL | *****4340 | JUBCO SITE DEVELOPMENT LLC | | 462 LAKEVIEW AVENUE VALHALLA NY 10595 | 12/16/2013 | 12/16/2018 |
| DOL | DOL | | JULIUS AND GITA BEHREND | | 5 EMES LANE MONSEY NY 10952 | 11/20/2002 | 11/20/3002 |
| DOL | DOL | *****5062 | K R F SITE DEVELOPMENT INC | | 375 LAKE SHORE DRIVE PUTNAM VALLEY NY 10579 | 01/23/2017 | 01/23/2022 |
| DOL | NYC | | KATHLEEN SELA | C/O COLONIAL ROOFING COMPANY INC | 247 48TH STREET BROOKLYN NY 11220 | 02/05/2014 | 02/05/2019 |
| DOL | DOL | | KATIE BURDICK | | 2238 BAKER RD GILLETT PA 16923 | 03/12/2018 | 03/12/2023 |
| DOL | DOL | | KENNETH FIORENTINO | | 375 LAKE SHORE DRIVE PUTNAM VALLEY NY 10579 | 01/23/2017 | 01/23/2022 |
| DOL | DOL | *****9732 | KENT HOLLOW SIDING LLC | | 29A BRIDGE STREET NEW MILFORD CT 06776 | 01/15/2016 | 01/15/2021 |
| DOL | DOL | | KEVIN BABCOCK JR | | P O BOX 46 THOMPSON RIDGE NY 10985 | 08/22/2014 | 08/22/2019 |
| DOL | DOL | | KEVIN M BABCOCK | | P O BOX 46 THOMPSON RIDGE NY 10985 | 08/22/2014 | 08/22/2019 |
| DOL | DOL | | KIM SOROCENSKI | | C/O SOLUTION MATTERS INC 198 NORWOOD ROADPORT JEFFERSON NY 11776 | 11/19/2015 | 11/19/2020 |
| DOL | DOL | *****3490 | L & M CONSTRUCTION/DRYWALL INC. | | 1079 YONKERS AVE YONKERS NY 10704 | 08/07/2018 | 08/07/2023 |
| DOL | DA | *****8816 | LAKE CONSTRUCTION AND DEVELOPMENT CORPORATION | | 150 KINGS STREET BROOKLYN NY 11231 | 08/19/1998 | 08/19/2998 |
| DOL | DOL | *****6224 | LAKESIDE FIRE SPRINKLERS LLC | | 125 CHAUTAUQUA AVENUE LAKEWOOD NY 14750 | 06/24/2015 | 06/24/2020 |
| DOL | AG | *****4643 | LALO DRYWALL, INC. | | 221 OLD FORD ROAD NEW PLATZ NY 12561 | 05/20/2016 | 05/20/2021 |
| DOL | DOL | *****4505 | LARAPINTA ASSOCIATES INC | | 29 MAPLEWOOD DRIVE BINGHAMTON NY 13901 | 02/21/2017 | 02/21/2022 |
| DOL | DOL | | LAVERN GLAVE | | 161 ROBYN RD MONROE NY 10950 | 09/15/2014 | 09/15/2019 |
| DOL | DOL | | LAVERN GLAVE | | 161 ROBYN RD MONROE NY 10950 | 01/30/2018 | 01/30/2023 |
| DOL | DOL | | LAWRENCE J RUGGLES | | P O BOX 371 ROUND LAKE NY 12151 | 05/12/2014 | 05/12/2019 |
| DOL | DOL | *****1364 | LEAD CONSTRUCTION SERVICES INC | | 3 ALAN B SHEPARD PLACE YONKERS NY 10705 | 03/19/2015 | 03/19/2020 |
| DOL | DOL | *****4388 | LEN.J CONSTRUCTION, LLC | | PO BOX 10007 ALBANY NY 12201 | 06/24/2016 | 09/19/2022 |
| DOL | DOL | *****4388 | LEN.J CONSTRUCTION, LLC | | PO BOX 10007 ALBANY NY 12201 | 06/24/2016 | 09/19/2022 |
| DOL | DOL | *****4388 | LEN.J CONSTRUCTION, LLC | | PO BOX 10007 ALBANY NY 12201 | 09/19/2017 | 09/19/2022 |
| DOL | DOL | *****4388 | LEN.J CONSTRUCTION, LLC | | PO BOX 10007 ALBANY NY 12201 | 09/19/2017 | 09/19/2022 |
| DOL | DOL | *****4388 | LEN.J CONSTRUCTION, LLC | | PO BOX 10007 ALBANY NY 12201 | 01/17/2017 | 09/19/2022 |
| DOL | DOL | *****4388 | LEN.J CONSTRUCTION, LLC | | PO BOX 10007 ALBANY NY 12201 | 09/19/2017 | 09/19/2022 |
| DOL | DOL | *****4388 | LEN.J CONSTRUCTION, LLC | | PO BOX 10007 ALBANY NY 12201 | 09/19/2017 | 09/19/2022 |
| DOL | DOL | *****4388 | LEN.J CONSTRUCTION, LLC | | PO BOX 10007 ALBANY NY 12201 | 08/14/2017 | 09/19/2022 |
| DOL | AG | | LEONID FRIDMAN | | APT 5 200 BRIGHTON, 15TH STBROOKLYN NY 11235 | 01/23/2014 | 01/23/2019 |
| DOL | DOL | | LEROY NELSON JR | | PO BOX 10007 ALBANY NY 12201 | 09/19/2017 | 09/19/2022 |
| DOL | DOL | | LEROY NELSON JR | | PO BOX 10007 ALBANY NY 12201 | 09/19/2017 | 09/19/2022 |
| DOL | DOL | | LEROY NELSON JR | | PO BOX 10007 ALBANY NY 12201 | 09/19/2017 | 09/19/2022 |
| DOL | DOL | | LEROY NELSON JR | | PO BOX 10007 ALBANY NY 12201 | 09/19/2017 | 09/19/2022 |
| DOL | DOL | | LEROY NELSON JR | | PO BOX 10007 ALBANY NY 12201 | 08/14/2017 | 08/14/2022 |
| DOL | DOL | | LEROY NELSON JR | | PO BOX 10007 ALBANY NY 12201 | 01/17/2017 | 09/19/2022 |
| DOL | DOL | | LINDSEY R CRILL | | 143 FILLMORE AVENUE BUFFALO NY 14210 | 01/08/2015 | 01/08/2020 |
| DOL | DA | *****4460 | LONG ISLAND GLASS & STOREFRONTS, LLC | | 4 MANHASSET TRL RIDGE NY 11961 | 09/06/2018 | 09/06/2023 |

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| DOL | AG | *****4216 | LOTUS-C CORP. | | 81-06 34TH AVENUE APT. 6EJACKSON HEIGHTS NY 11372 | 02/07/2018 | 02/07/2023 |
| DOL | AG | | LUIS MARTINEZ | LALO DRYWALL | 211 MAIN ST. NEW PALTZ NY 12561 | 05/20/2016 | 05/20/2021 |
| DOL | DOL | | M ANVER BEIG | | 142 EAST MARKET STREET LONG BEACH NY 11561 | 03/07/2017 | 03/07/2022 |
| DOL | AG | *****6957 | M B DIN CONSTRUCTION INC | | 8831 20TH AVENUE/SUITE 6E BROOKLYN NY 11214 | 11/17/2015 | 11/17/2020 |
| DOL | NYC | *****6317 | M S QUALITY CONSTRUCTION LLC | | 27 MAPLEWOOD AVENUE COLONIA NJ 07067 | 02/04/2015 | 02/04/2020 |
| DOL | DOL | | M. ANVER BEIG | | 142 EAST MARKET STREET LONG BEACH NY 11561 | 03/07/2017 | 03/07/2022 |
| DOL | NYC | | MACIEJ SONTOWSKI | | 27 MAPLEWOOD AVENUE COLONIA NJ 07067 | 02/04/2015 | 02/04/2020 |
| DOL | NYC | *****9590 | MACK GLASSNAUTH IRON WORKS INC | | 137 LIBERTY AVENUE BROOKLYN NY 11212 | 12/21/2015 | 12/21/2020 |
| DOL | NYC | *****3141 | MACKEY REED ELECTRIC INC | | 1ST FLOOR STORE FRONT 88-10 LITTLE NECK PARKWAYFLORAL PARK NY 11001 | 06/24/2014 | 06/24/2019 |
| DOL | DOL | *****1784 | MADISON AVE CONSTRUCTION CORP | | 39 PENNY STREET WEST ISLIP NY 11795 | 11/02/2016 | 11/02/2021 |
| DOL | DOL | | MALARKEY'S BAR & GRILL LLC | | 64 VICTORIA DRIVE BINGHAMTON NY 13904 | 02/04/2016 | 02/04/2021 |
| DOL | DOL | *****0705 | MALARKEY'S PUB & GRUB LLC | | 64 VICTORIA DRIVE BINGHAMTON NY 13904 | 02/04/2016 | 02/04/2021 |
| DOL | DA | | MANUEL P TOBIO | | 150 KINGS STREET BROOKLYN NY 14444 | 08/19/1998 | 08/19/2998 |
| DOL | DA | | MANUEL TOBIO | | 150 KINGS STREET BROOKLYN NY 11231 | 08/19/1998 | 08/19/2998 |
| DOL | DOL | | MARIACHI'S PIZZERIA | | C/O DOUGLAS L MALARKEY 64 VICTORIA DRIVEBINGHAMTON NY 13904 | 02/04/2016 | 02/04/2021 |
| DOL | DOL | | MARK MIONIS | | 6409 LAND O LAKES BLVD LAND O LAKES FL 34638 | 11/10/2015 | 11/10/2020 |
| DOL | DOL | | MARVIN A STURDEVANT | | 29 MAPLEWOOD DRIVE BINGHAMTON NY 13901 | 02/21/2017 | 02/21/2022 |
| DOL | DOL | | MASONRY CONSTRUCTION, INC. | | 442 ARMONK RD MOUNT KISCO NY 10549 | 06/12/2018 | 06/12/2023 |
| DOL | DOL | *****3333 | MASONRY INDUSTRIES, INC. | | 442 ARMONK RD MOUNT KISCO NY 10549 | 06/12/2018 | 06/12/2023 |
| DOL | DOL | | MATTHEW IDEMA GENERAL CONTRACTORS INC | | 91 COLLEGE AVENUE POUGHKEEPSIE NY 12603 | 12/04/2015 | 12/04/2020 |
| DOL | DOL | | MAURICE GAWENO | | 442 ARMONK RD MOUNT KISCO NY 10549 | 06/12/2018 | 06/12/2023 |
| DOL | DOL | *****6416 | MCCALL MASONRY | | P O BOX 304 SAYRE PA 18840 | 08/09/2016 | 08/09/2021 |
| DOL | DOL | *****4259 | MERCANDO CONTRACTING CO INC | | 134 MURRAY AVENUE YONKERS NY 10704 | 12/11/2009 | 02/03/2019 |
| DOL | DOL | *****0327 | MERCANDO INDUSTRIES LLC | | 134 MURRAY AVENUE YONKERS NY 10704 | 12/11/2009 | 02/03/2019 |
| DOL | NYC | *****5330 | METRO DUCT SYSTEMS INC | | 1219 ASTORIA BOULEVARD LONG ISLAND CITY NY 11102 | 04/16/2014 | 11/19/2020 |
| DOL | DOL | *****3368 | MICEK CONSTRUCTION CO INC | | 20 CROSS STREET FALCONER NY 14733 | 12/02/2014 | 12/02/2019 |
| DOL | DOL | | MICHAEL A PASCARELLA | | SUITE 100 2105 WEST GENESEE STREET SYRACUSE NY 13219 | 01/06/2016 | 01/06/2021 |
| DOL | NYC | | MICHAEL HIRSCH | | C/O MZM CORP 163 S MAIN STREETNEW CITY NY 10956 | 01/28/2016 | 01/28/2021 |
| DOL | DOL | | MICHAEL KTISTAKIS | | 363 88TH STREET BROOKLYN NY 11209 | 11/18/2013 | 11/18/2018 |
| DOL | DOL | | MICHAEL LENIHAN | | 1079 YONKERS AVE UNIT 4YONKERS NY 10704 | 08/07/2018 | 08/07/2023 |
| DOL | AG | | MICHAEL RIGLIETTI | | 31 BAY ST BROOKLYN NY 11231 | 03/28/2018 | 03/28/2023 |
| DOL | DOL | | MICHAEL WILSON | WILSON BROTHER DRYWALL CONTRACTORS | 36 ABERSOLD STREET ROCHESTER NY 14621 | 08/31/2015 | 08/31/2020 |
| DOL | NYC | | MILANCE HADZIC | | 22 CALIFORNIA AVE - STE 1 PATERSON NJ 07503 | 03/11/2015 | 03/11/2020 |
| DOL | AG | | MOHAMMAD RIAZ | | 46 RUGBY ROAD WESTBURY NY 11590 | 11/20/2013 | 11/20/2018 |

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| DOL | AG | | MOHAMMED N CHATHA | | 8831 20TH AVENUE/SUITE 6E BROOKLYN NY 11214 | 11/17/2015 | 11/17/2020 |
| DOL | DOL | *****2737 | MOUNTAIN'S AIR INC | | 2471 OCEAN AVENUE- STE 7A BROOKLYN NY 11229 | 09/24/2012 | 09/18/2020 |
| DOL | AG | | MSR ELECTRICAL CONSTRUCTION CORP. | | 31 BAY ST BROOKLYN NY 11231 | 03/28/2018 | 03/28/2023 |
| DOL | DOL | | MUHAMMAD BEIG | | 142 EAST MARKET STREET LONG BEACH NY 11561 | 03/07/2017 | 03/07/2022 |
| DOL | DOL | | MUHAMMAD BEIG | | 142 EAST MARKET STREET LONG BEACH NY 11561 | 03/07/2017 | 03/07/2022 |
| DOL | DOL | | MUHAMMAD PERVAIZ | | C/O CHAMPION CONSTRUCTION 2131 SCHENECTADY AVENUEBROOKLYN NY 11234 | 11/18/2015 | 11/18/2020 |
| DOL | NYC | *****3613 | MZM CORP | | 163 S MAIN STREET NEW CITY NY 10956 | 01/28/2016 | 01/28/2021 |
| DOL | NYC | *****1284 | NEW AMERICAN RESTORATION INC | | 22 CALIFORNIA AVE - STE 1 PATERSON NJ 07503 | 03/11/2015 | 03/11/2020 |
| DOL | DA | *****6988 | NEW YORK INSULATION INC | | 58-48 59TH STREET MASPETH NY 11378 | 05/16/2012 | 05/08/2020 |
| DOL | NYC | *****4839 | NEW YORK RIGGING CORP | | 58-83 54TH STREET MASPETH NY 11378 | 02/26/2016 | 02/26/2021 |
| DOL | NYC | | NICHOLAS PROVENZANO | | 147 BROOME AVENUE ATLANTIC BEACH NY 11509 | 03/03/2014 | 03/03/2019 |
| DOL | NYC | | NICHOLAS PROVENZANO | | 147 BROOME AVENUE ATLANTIC BEACH NY 11509 | 03/03/2014 | 03/03/2019 |
| DOL | NYC | *****1968 | NORTH AMERICAN IRON WORKS INC | | 1560 DECATUR STREET RIDGEWOOD NY 11385 | 05/15/2015 | 05/15/2020 |
| DOL | DOL | *****6966 | NORTH COUNTRY DRYWALL AND PAINT | | 23167 COUNTY ROUTE 59 DEXTER NY 13634 | 10/24/2016 | 10/24/2021 |
| DOL | DOL | *****0065 | NORTHEAST LANDSCAPE AND MASONRY ASSOC | | 3 WEST MAIN ST/SUITE 208 ELMSFORD NY 10523 | 01/23/2017 | 01/23/2022 |
| DOL | DOL | *****1845 | OC ERECTERS, LLC A/K/A OC ERECTERS OF NY INC. | | 1207 SW 48TH TERRACE DEERFIELD BEACH FL 33442 | 01/16/2018 | 01/16/2023 |
| DOL | NYC | *****8337 | OPTIMUM CONSTRUCTION INC | | 23-73 48TH STREET LONG ISLAND CITY NY 11103 | 04/24/2014 | 04/24/2019 |
| DOL | NYC | | ORSON ARROYO | | C/O METRO DUCT SYSTEMS 12-19 ASTORIA BOULEVARDLONG ISLAND CITY NY 11102 | 04/16/2014 | 11/19/2020 |
| DOL | DOL | *****4546 | PAF PAINTING CORP | | 161 TIBBETTS ROAD YONKERS NY 10705 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | *****5242 | PAF PAINTING SERVICES INC | GARDEN STATE PAINTING | 157 TIBBETTS ROAD YONKERS NY 10103 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | | PAF PAINTING SERVICES OF WESTCHESTER INC | | C/O SPIEGEL & UTRERA 1 MAIDEN LANE - 5TH FLNEW YORK NY 10038 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | *****8802 | PAT'S HEATING AND AIR CONDITIONING LTD | | P O BOX 371 ROUND LAKE NY 12151 | 05/12/2014 | 05/12/2019 |
| DOL | DOL | | PATRICIA M RUGGLES | | P O BOX 371 ROUND LAKE NY 12151 | 05/12/2014 | 05/12/2019 |
| DOL | NYC | *****9422 | PELIUM CONSTRUCTION, INC. | | 22-33 35TH ST. ASTORIA NY 11105 | 12/30/2016 | 12/30/2021 |
| DOL | DOL | | PETER M PERGOLA | | 3 WEST MAIN ST/SUITE 208 ELMSFORD NY 10523 | 01/23/2017 | 01/23/2022 |
| DOL | NYC | | PETER TRITARIS | | 5990 58TH AVENUE MASPETH NY 11378 | 11/18/2013 | 11/18/2018 |
| DOL | DOL | | PIERRE LAPORT | | 224 COUNTY HIGHWAY 138 BROADALBIN NY 12025 | 03/07/2017 | 03/07/2022 |
| DOL | DOL | *****1543 | PJ LAPORT FLOORING INC | | 224 COUNTY HIGHWAY 138 BROADALBIN NY 12025 | 03/07/2017 | 03/07/2022 |
| DOL | DOL | *****2989 | PROFESSIONAL ESTIMATING & BUSINESS CORP | | 157 TIBBETS ROAD YONKERS NY 10705 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | *****6895 | PROLINE CONCRETE OF WNY INC | | 3090 SHIRLEY ROAD NORTH COLLINS NY 14111 | 04/19/2011 | 07/08/2020 |
| DOL | DA | *****6817 | QUADRANT METAL BUILDINGS LLC | | 2740 SW MARTIN DOWNS BLVD PALM CITY FL 34990 | 08/25/2016 | 08/25/2021 |
| DOL | DOL | *****0015 | RAMADA CONSTRUCTION CORP | | 80 SAVO LOOP STATEN ISLAND NY 10309 | 01/07/2014 | 01/07/2019 |
| DOL | NYC | | RAMESHWAR ASU | | 137 LIBERTY AVENUE BROOKLYN NY 11212 | 12/21/2015 | 12/21/2020 |
| DOL | DOL | | RANA A KAHN | | 1973 81ST ST - SUITE A-5 BROOKLYN NY 11214 | 01/08/2015 | 01/08/2020 |
| DOL | NYC | | RANTIK PARIKH | | 13 LORIANN ROAD WARREN NJ 07059 | 07/15/2015 | 07/15/2020 |

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| DOL | DOL | *****2633 | RAW POWER ELECTRIC CORP | | 3 PARK CIRCLE<br>MIDDLETOWN NY 10940 | 09/16/2013 | 09/15/2019 |
| DOL | DOL | *****2633 | RAW POWER ELECTRIC CORP | | 3 PARK CIRCLE<br>MIDDLETOWN NY 10940 | 01/30/2018 | 01/30/2023 |
| DOL | NYC | | RAYMOND PEARSON | | P O BOX 957<br>PORT JEFFERSON STA NY 11776 | 03/12/2014 | 03/12/2019 |
| DOL | AG | *****7015 | RCM PAINTING INC. | | 69-06 GRAND AVENUE<br>2ND FLOORMASPETH NY 11378 | 02/07/2018 | 02/07/2023 |
| DOL | DOL | | REGINALD WARREN | | 161 ROBYN RD<br>MONROE NY 10950 | 09/15/2014 | 09/15/2019 |
| DOL | DOL | | REGINALD WARREN | | 161 ROBYN RD<br>MONROE NY 10950 | 01/30/2018 | 01/30/2023 |
| DOL | NYC | *****3461 | RELIANCE GENERAL CONSTRUCTION INC | | 644 OCEAN PARKWAY<br>BROOKLYN NY 11230 | 09/02/2015 | 09/02/2020 |
| DOL | DOL | | REVOLUTIONARY FLOORS LLC | | P O BOX 268<br>STILLWATER NY 12170 | 09/16/2013 | 03/21/2019 |
| DOL | DOL | | RHINO CONCRETE LLC | | 101 SULLYS TRAIL/SUITE 20<br>PITTSFORD NY 14534 | 11/18/2013 | 01/07/2019 |
| DOL | DA | | RIANN MULLER | | 2740 SW MARTIN DOWNS BLVD<br>PALM CITY FL 34990 | 08/25/2016 | 08/25/2021 |
| DOL | DOL | | RICHARD MACONE | | 8617 THIRD AVE<br>BROOKLYN NY 11209 | 09/17/2018 | 09/17/2023 |
| DOL | DOL | | RICHARD WILSON | | C/O DUFOUR GROUP INC<br>353 WEST 56TH STREET #7MNEW YORK NY 10019 | 06/10/2014 | 06/10/2019 |
| DOL | DOL | *****8618 | RIEKS CONTRACTING LLC | | 4804 GAHWILER ROAD<br>AUBURN NY 13021 | 05/01/2015 | 05/01/2020 |
| DOL | DOL | | ROBBYE BISSESAR | | 89-51 SPRINGFIELD BLVD<br>QUEENS VILLAGE NY 11427 | 01/11/2003 | 01/11/3003 |
| DOL | DOL | | ROBERT BRUNO | | 3 GAYLORD ST<br>AUBURN NY 13021 | 11/15/2016 | 11/15/2021 |
| DOL | DOL | *****1855 | ROBERT D BISHOP JR | ROBERT D BISHOP JR | P O BOX 112<br>MORRISSONVILLE NY 12962 | 07/15/2014 | 07/15/2019 |
| DOL | DOL | | ROBERT D BISHOP JR | | P O BOX 112<br>MORRISONVILLE NY 12962 | 07/15/2014 | 07/15/2019 |
| DOL | NYC | | ROBERT GUIDO | | 3256 BRUNER AVENUE<br>BRONX NY 10469 | 07/29/2014 | 07/29/2019 |
| DOL | DOL | | ROBERT TORDELLA | | 125 CHAUTAUQUA AVENUE<br>LAKEWOOD NY 14750 | 06/24/2015 | 06/24/2020 |
| DOL | DOL | *****3859 | ROCHESTER ACOUSTICAL CORP | | P O BOX 799<br>HILTON NY 14468 | 02/19/2016 | 02/19/2021 |
| DOL | DOL | | RODERICK PUGH | | 404 OAK ST<br>SUITE 101SYRACUSE NY 13203 | 07/23/2018 | 07/23/2023 |
| DOL | DOL | *****4880 | RODERICK PUGH CONSTRUCTION INC. | | 404 OAK ST<br>SUITE 101SYRACUSE NY 13203 | 07/23/2018 | 07/23/2023 |
| DOL | NYC | | RODNEY SCOTT | | 201 HEMPSTEAD AVENUE<br>WEST HEMPSTEAD NY 11552 | 10/30/2015 | 10/30/2020 |
| DOL | DOL | | ROMEO WARREN | | 161 ROBYN RD<br>MONROE NY 10950 | 09/16/2013 | 09/15/2019 |
| DOL | DOL | | ROMEO WARREN | | 161 ROBYN RD<br>MONROE NY 10950 | 01/30/2018 | 01/30/2023 |
| DOL | DOL | | ROSEANNE CANTISANI | | | 06/12/2018 | 06/12/2023 |
| DOL | DOL | | RYAN ALBIE | | 21 S HOWELLS POINT ROAD<br>BELLPORT NY 11713 | 02/21/2017 | 02/21/2022 |
| DOL | DOL | *****3347 | RYAN ALBIE CONTRACTING INC | | 21 S HOWELLS POINT ROAD<br>BELLPORT NY 11713 | 02/21/2017 | 02/21/2022 |
| DOL | NYC | | SABIR MUHAMMED | | SUITE B-8<br>782 PELHAM PARKWAY<br>SOUTHBRONX NY 10462 | 04/21/2016 | 04/21/2021 |
| DOL | NYC | | SAEED HASAN | | 4558 BROADWAY #6<br>NEW YORK NY 10040 | 08/04/2014 | 08/04/2019 |
| DOL | NYC | *****2117 | SCOTT ELECTRICAL LLC | | 201 HEMPSTEAD AVENUE<br>WEST HEMPSTEAD NY 11552 | 10/30/2015 | 10/30/2020 |
| DOL | DOL | *****9751 | SCW CONSTRUCTION | | 544 OLD ROUTE 23<br>ACRE NY 12405 | 02/14/2017 | 02/14/2022 |
| DOL | DOL | | SEAN BURBAGE | C/O SEAN BURBAGE CORP | 445 ROOSA GAP ROAD<br>BLOOMINGBURG NY 12721 | 04/14/2014 | 04/14/2019 |
| DOL | DOL | *****6586 | SEAN BURBAGE CORP | | 445 ROOSA GAP ROAD<br>BLOOMINGBURG NY 12721 | 04/14/2014 | 04/14/2019 |
| DOL | AG | | SERGIO RAYMUNDO | | 109 DUBOIS RD.<br>NEW PALTZ NY 12561 | 05/20/2016 | 05/20/2021 |

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| DOL | DOL | *****1961 | SHANE BURDICK | CENTRAL TRAFFIC CONTROL, LLC. | 2238 BAKER ROAD GILLETT PA 16923 | 03/12/2018 | 03/12/2023 |
| DOL | DOL | | SHANE BURDICK | | 2238 BAKER ROAD GILLETT PA 16923 | 03/12/2018 | 03/12/2023 |
| DOL | DOL | | SHANE NOLAN | | 9365 WASHINGTON ST LOCKPORT IL 60441 | 07/23/2018 | 07/23/2023 |
| DOL | DOL | *****0816 | SOLAR ARRAY SOLUTIONS, LLC | | 9365 WASHINGTON ST LOCKPORT IL 60441 | 07/23/2018 | 07/23/2023 |
| DOL | DOL | *****4025 | SOLUTION MATTERS INC | | 198 NORWOOD ROAD PORT JEFFERSON NY 11776 | 11/19/2015 | 11/19/2020 |
| DOL | NYC | *****4934 | SPHINX CONTRACTING CORP | | 240 HOME STREET TEANECK NJ 07666 | 08/04/2014 | 08/04/2019 |
| DOL | DOL | *****3496 | STAR INTERNATIONAL INC | | 89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427 | 08/11/2003 | 08/11/3003 |
| DOL | DOL | | STEPHEN BIANCHI | | 462 LAKEVIEW AVENUE VALHALLA NY 10595 | 12/16/2013 | 12/16/2018 |
| DOL | DOL | *****9751 | STEPHEN C WAGAR | | 544 OLD ROUTE 23 ACRE NY 12405 | 02/14/2017 | 02/14/2022 |
| DOL | DOL | | STEPHEON SHELDON | FANTASTIC PAINTING | 493 LANSING ROAD FULTONVILLE NY 12072 | 11/18/2013 | 11/18/2018 |
| DOL | DOL | | STEVEN P SUCATO | | 15-68 208TH STREET BAYSIDE NY 11360 | 06/23/2016 | 06/23/2021 |
| DOL | DOL | | STEVEN SAGGESE | | 3005 WYNSUM AVENUE MERRICK NY 11566 | 08/18/2014 | 08/18/2019 |
| DOL | DOL | | STEVEN TESTA | | 50 SALEM STREET - BLDG B LYNNFIELD MA 01940 | 01/23/2017 | 01/23/2022 |
| DOL | DOL | | STUART CHAITIN | | 634 ROUTE 303 BLAUVET NY 10913 | 07/26/2012 | 11/19/2018 |
| DOL | NYC | *****9432 | SUBLINK LTD | | 346 THIRD AVENUE PELHAM NY 10803 | 11/19/2015 | 11/19/2020 |
| DOL | DOL | *****7441 | T & T CONCRETE INC | | 2560 HAMBURG TURNPIKE P O BOX 367LACKAWANNA NY 14218 | 07/08/2015 | 07/08/2020 |
| DOL | DOL | *****7417 | TADCO CONSTRUCTION | | 101-61 99TH STREET OZONE PARK NY 11416 | 02/15/2017 | 02/15/2022 |
| DOL | DOL | | TADCO CONSTRUCTION | | 101-61 99TH STREET OZONE PARK NY 11416 | 02/15/2017 | 02/15/2022 |
| DOL | DOL | *****7417 | TADCO CONSTRUCTION CORP | | 101-61 99TH STREET OZONE PARK NY 11416 | 02/15/2017 | 02/15/2022 |
| DOL | DOL | | TALAILA OCAMPA | | 1207 SW 48TH TERRACE DEERFIELD BEACH FL 33442 | 01/16/2018 | 01/16/2023 |
| DOL | DOL | | TAMMY LACITIGNOLA | | C/O CATSKILL FENCE INSTAL 5445 ROUTE 32CATSKILL NY 12414 | 08/22/2014 | 08/22/2019 |
| DOL | DOL | *****9852 | TAP STEEL INC | | ROUTE 26 3101 P O BOX 457CONSTABLEVILLE NY 13325 | 01/28/2016 | 01/28/2021 |
| DOL | DOL | | TECH-MECHANICAL FAB DC INC | | 5 PARKER AVENUE POUGHKEEPSIE NY 12601 | 03/25/2014 | 03/25/2019 |
| DOL | DOL | *****5570 | TESTA CORP | | 50 SALEM STREET - BLDG B LYNNFIELD MA 01940 | 01/23/2017 | 01/23/2022 |
| DOL | DOL | *****0887 | THE BRINSON PAINTING CORPORATION | | 72 TAUNTON PLACE BUFFALO NY 14216 | 04/14/2015 | 04/14/2020 |
| DOL | DOL | *****8174 | THE DALRYMPLE CORPORATION | | UNIT 278 541 10TH STREET NWATLANTA GA 30318 | 12/01/2015 | 12/01/2020 |
| DOL | DOL | *****8174 | THE DALRYMPLE GROUP LLC | | 289 JONESBORO RD/ STE 216 MCDONOUGH GA 30253 | 12/01/2015 | 12/01/2020 |
| DOL | DOL | *****9243 | THE WELCOME MAT PROPERTY MANAGEMENT LLC | | P O BOX 268 STILLWATER NY 12170 | 09/16/2013 | 03/21/2019 |
| DOL | DOL | | THOMAS DESANTIS | DESANTIS ENTERPRISES | 161 OSWEGO RIVER ROAD PHOENIX NY 13135 | 09/24/2013 | 11/18/2018 |
| DOL | NYC | | THOMAS SCARINCI | | 130-43 92ND AVENUE RICHMOND HILLS NY 11418 | 11/27/2013 | 11/27/2018 |
| DOL | DOL | | TIMOTHY A PALUCK | | C/O TAP STEEL INC RTE 26 3101/ P O BOX 457CONSTABLEVILLE NY 13325 | 01/28/2016 | 01/28/2021 |
| DOL | NYC | *****1523 | TM MECHANICAL CORP | | 130-43 92ND AVENUE RICHMOND HILLS NY 11418 | 11/27/2013 | 11/27/2018 |
| DOL | DOL | *****0600 | TOMSON ALLOYS RECYCLING INC | | 143 FILLMORE AVENUE BUFFALO NY 14210 | 01/08/2015 | 01/08/2020 |
| DOL | DOL | *****3453 | TORCHIA'S HOME IMPROVEMENT | | 10153 ROBERTS RD SAUQUOIT NY 13456 | 08/09/2016 | 08/09/2021 |

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| DOL | DOL | *****6914 | TRI-COUNTY RESTORATIONS & CONSTRUCTION INC | | 13 SUMMERSET DRIVE WALLKILL NY 12589 | 08/22/2014 | 08/22/2019 |
| DOL | DOL | | TRI-COUNTY RESTORATIONS INC | | 392 ROCK CUT ROAD WALDEN NY 12586 | 08/22/2014 | 08/22/2019 |
| DOL | DOL | *****8311 | TRIPLE B FABRICATING, INC. | | 61 WILLETT ST. PASSAIC NJ 07503 | 10/26/2016 | 10/26/2021 |
| DOL | DOL | *****9407 | TURBO GROUP INC | | 15-68 208TH STREET BAYSIDE NY 11360 | 06/23/2016 | 06/23/2021 |
| DOL | AG | *****6490 | UNIVERSAL STEEL FABRICATORS INC | | 90 JUNIUS STREET BROOKLYN NY 11212 | 01/23/2014 | 01/23/2019 |
| DOL | NYC | *****7174 | V&R CONTRACTING | | P O BOX 957 PORT JEFFERSON STA NY 11776 | 03/12/2014 | 03/12/2019 |
| DOL | DOL | *****6392 | V.M.K CORP. | | 8617 THIRD AVE BROOKLYN NY 11209 | 09/17/2018 | 09/17/2023 |
| DOL | NYC | | VALERIE VISCONTI | | 346 THIRD AVENUE PELHAM NY 10803 | 11/19/2015 | 11/19/2020 |
| DOL | NYC | | VEAP SELA | C/O COLONIAL ROOFING COMPANY INC | 247 48TH STREET BROOKLYN NY 11220 | 02/05/2014 | 02/05/2019 |
| DOL | NYC | | VICK CONSTRUCTION | | 21 DAREWOOD LANE VALLEY STREAM NY 11581 | 12/31/2013 | 12/31/2018 |
| DOL | NYC | | VICKRAM MANGRU | VICK CONSTRUCTI ON | 21 DAREWOOD LANE VALLEY STREAM NY 11581 | 12/31/2013 | 12/31/2018 |
| DOL | DOL | | VICTOR ROTENBERG | | C/O GMDV TRANS INC 67048 182ND STREETFRESH MEADOWS NY 11365 | 06/24/2016 | 06/24/2021 |
| DOL | NYC | | VINCENT PIZZITOLA | | P O BOX 957 PORT JEFFERSON STA NY 11776 | 03/12/2014 | 03/12/2019 |
| DOL | NYC | | VITO GARGANO | | 1535 RICHMOND AVE STATEN ISLAND NY 10314 | 12/13/2017 | 12/13/2022 |
| DOL | DOL | | WAYNE LIVINGSTON JR | NORTH COUNTRY DRYWALL AND PAINT | 23167 COUNTY ROUTE 59 DEXTER NY 13634 | 10/24/2016 | 10/24/2021 |
| DOL | DOL | | WHITE PLAINS CARPENTRY CORP | | 442 ARMONK RD | 06/12/2018 | 06/12/2023 |
| DOL | DOL | | WILLIAM CONKLIN | | 5 PARKER AVENUE POUGHKEEPSIE NY 12601 | 03/25/2014 | 03/25/2019 |
| DOL | DOL | | WILLIAM DEAK | | C/O MADISON AVE CONSTR CO 39 PENNY STREETWEST ISLIP NY 11795 | 11/02/2016 | 11/02/2021 |
| DOL | DOL | | WILLIAM MAZZELLA | | 134 MURRAY AVENUE YONKERS NY 10704 | 02/03/2014 | 02/03/2019 |
| DOL | DOL | | WILLIE BRINSON | | 72 TAUNTON PLACE BUFFALO NY 14216 | 04/14/2015 | 04/14/2020 |
| DOL | DOL | *****6195 | WILSON BROTHER DRYWALL CONTRACTORS | | 36 ABERSOLD STREET ROCHESTER NY 14621 | 08/31/2015 | 08/31/2020 |
| DOL | DOL | *****4043 | WINDSHIELD INSTALLATION NETWORK, INC. | | 200 LATTA BROOK PARK HORSEHEADS NY 14845 | 03/08/2018 | 03/08/2023 |
| DOL | DOL | *****7345 | YES SERVICE AND REPAIRS CORPORATION | | 145 LODGE AVE HUNTINGTON STATION NY 11476 | 08/09/2016 | 08/09/2021 |
| DOL | DOL | | YURIY IVANIN | | C/O MOUNTAIN'S AIR INC 2471 OCEAN AVENUE-STE 7ABROOKLYN NY 11229 | 09/24/2012 | 09/18/2020 |
| DOL | NYC | | ZAKIR NASEEM | | 30 MEADOW ST BROOKLYN NY 11206 | 10/10/2017 | 10/10/2022 |
| DOL | NYC | *****8277 | ZHN CONTRACTING CORP | | 30 MEADOW ST BROOKLYN NY 11206 | 10/10/2017 | 10/10/2022 |

TO THE TOWN BOARD, TOWN OF RIVERHEAD, 200 HOWELL AVENUE, SUFFOLK COUNTY, NEW YORK, ACTING FOR AND ON BEHALF OF THE CALVERTON SEWER DISTRICT:

For all work included under the following contract:

UPGRADE OF THE SEWAGE TREATMENT PLANT – ENTERPRISE PART AT CALVERTON – MODULE NO. 1 (0.100 MGD)
_____ CONSTRUCTION
CONTRACT NO. CASD 1602__.

Made this ____day of _____, 201_, by

_____

(BIDDER'S NAME)

BIDDER'S DECLARATION: The undersigned, as Bidder, declares that the only person or persons interested in this bid or proposal as principal or principals is or are named herein; and that no other person than herein named has any interest in this proposal or in the contract proposed to be taken; that this bid or proposal is made without any connections with any other person or persons making a bid or proposal for the same purpose; that the bid or proposal is in all respects fair and without collusion or fraud; that it has examined the site of the work, the Contract and Specifications and the Drawings referred to; and has read the Notice to Bidders, Information for Bidders and General Conditions hereto attached and fully understands all the same; and it proposes and agrees, if this proposal is accepted, it will contract with the TOWN BOARD of the TOWN OF RIVERHEAD in the Contract accompanying this bid to perform all the work required in accordance with the Plans and as mentioned in said foregoing Information for Bidders, General Conditions, Notice to Bidders, Contract and Specifications; and it will accept in full payment therefor the following sums to wit:

**NOTE: THIS FORM MUST BE COMPLETED BY BIDDER**

TOWN OF RIVERHEAD / CALVERTON SEWER DISTRICT
UPGRADE OF THE SEWAGE TREATMENT PLANT – ENTERPRISE PARK AT CALVERTON
MODULE NO. 1 (0.100 MGD)
CONTRACT No. CASD 1602G
GENERAL AND MECHANICAL CONSTRUCTION

Gentlemen:

The undersigned hereby offers to furnish all labor, equipment, materials, and appurtenances for the **Upgrade of the Sewage Treatment Plant – Enterprise Park at Calverton – Module No. 1 (0.100 MGD), Contract G: General and Mechanical Construction** all in accordance with the plans and specifications prepared by H2M architects + engineers.

---

**TOTAL BASE BID:**

For all work shown, specified and described in the Contract Documents, for the **Upgrade of the Sewage Treatment Plant – Enterprise Park at Calverton – Module No. 1 (0.100 MGD), Contract G: General and Mechanical Construction**, Contract No. CASD 1602G, General and Mechanical Construction for the Town of Riverhead, on behalf of the Calverton Sewer District, complete and ready for operation, including the total of the cash allowances of Eighty-Five Thousand Dollars and Zero Cents ($85,000.00) as specified in Section 012100 – Allowances (Contract G), plus the total for the unit price bid items specified in Section 012110 – Unit Prices, based on unit prices listed below:

**Unit Price Item #1**: For Concrete Crack Repair (Section 030130.71)

Basis of bid quantity = 500 linear feet

Unit Bid Price:_____Dollars _____Cents (per linear foot)

Amount Bid Price:_____Dollars_____Cents

(IN WORDS)

(_____)

**Unit Price Item #2**: For Concrete Spall Repair (Section 030130.71)

Basis of bid quantity = 500 square feet

Unit Bid Price:_____Dollars _____Cents (per square foot)

Amount Bid Price:_____Dollars_____Cents

(IN WORDS)

(_____)

for the Total Base (including total of Unit Price Item #1 and #2) of:

_____Dollars and_____Cents.
(IN WORDS)

(_____)

The Bidder shall list the name of the manufacturer for the following materials that was used to prepare the bid and that will be furnished and installed for this project if the Bidder is awarded the project:

1. Membrane Treatment System: _____
2. Submersible Sewage Pumps:_____
3. Aeration Blowers:_____
4. Rotating Drum Screens: _____
5. Air Conditioning Systems: _____

**NOTE: THIS FORM MUST BE COMPLETED BY BIDDER**

ALL WORK SHOWN AND SPECIFIED IN THE CONTRACT DOCUMENTS & INCLUDED IN THE BASE BID SHALL BE COMPLETED WITHIN FIVE HUNDRED FIFTY (550) CONSECUTIVE CALENDAR DAYS (SATURDAYS, SUNDAYS AND HOLIDAYS INCLUDED) STARTING TEN DAYS AFTER THE DATE THE OWNER EXECUTED THE CONTRACT. THE COMPLETION DATE WILL BE SET IN THE NOTICE TO PROCEED.

A NOTICE TO PROCEED WILL BE ISSUED AFTER THE CONTRACT HAS BEEN EXECUTED BY THE OWNER.

FAILURE OF THE CONTRACTOR TO COMPLETE ALL WORK SHOWN AND SPECIFIED IN THE CONTRACT DOCUMENTS, BY THE ABOVE SPECIFIED TIME, SHALL SUBJECT HIM/HER TO LIQUIDATED DAMAGES, AS SET FORTH IN ARTICLE 7 OF THE CONTRACT, IN THE SUM OF ONE THOUSAND DOLLARS AND ZERO CENTS ($1,000.00) PER CALENDAR DAY.

THE TOWN BOARD RESERVES THE RIGHT TO AWARD THIS CONTRACT OR TO REJECT ANY AND ALL BIDS.

## EXCESS COSTS FOR ENGINEERING & INSPECTION

SPECIFIC DAMAGES WILL BE ASSESSED AND DEDUCTED FROM AMOUNTS OTHERWISE DUE THE CONTRACTOR FOR ADDITIONAL INSPECTION AND CONTRACT MANAGEMENT TIME REQUIRED BEYOND THE CONTRACT COMPLETION PERIOD SPECIFIED ABOVE. SUCH DEDUCTION SHALL BE NO LESS THAN SIXTY FIVE DOLLARS ($65.00) PER HOUR AND NO MORE THAN ONE TWO HUNDRED DOLLARS ($200.00) PER HOUR IN ACCORDANCE WITH THE ENGINEER'S STANDARD BILLING RATE SCHEDULE IN EFFECT WITH THE OWNER AT THE TIME BASED ON CLASSIFICATION OF STAFF.

IN ADDITION, THE OWNER WILL CHARGE TO THE CONTRACTOR, AND WILL DEDUCT FROM THE PARTIAL AND FINAL PAYMENTS DUE THE CONTRACTOR, ALL EXCESS ENGINEERING, INSPECTION, LEGAL AND TESTING CHARGES AND EXPENSES INCURRED BY THE DISTRICT AS STIPULATED BELOW:

1. SERVICES AND OTHER SIMILAR CHARGES AS A RESULT OF THE CONTRACTOR'S AND SUBCONTRACTOR'S ERRORS, OMISSIONS OR FAILURE TO CONFORM TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

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 EVALUATION 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, HORSEPOWERS, 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 THREE (3) TIMES FOR THE SAME PRODUCT OR PORTION OF THE WORK.
8. SERVICES AND OTHER SIMILAR CHARGES IN CONNECTION WITH ANY WORK PERFORMED PAST THE SPECIFIED WORKING HOURS WHICH WILL BE INVOICED TO THE OWNER AT 1.15 TIMES THE ENGINEER'S STANDARD HOURLY BILLING RATE.
9. ENGINEERING AND LEGAL SERVICES, AND SIMILAR CHARGES AS A RESULT OF THE CONTRACTOR NOT COMPLETING ALL THE WORK WITHIN THE SPECIFIED COMPLETION TIME WHICH SHALL NOT BE CONSIDERED AS PART OF THE LIQUIDATED DAMAGES SPECIFIED ABOVE.

INSPECTION AND CONTRACT MANAGEMENT TIME REQUIRED BEYOND THE CONTRACT COMPLETION PERIOD SPECIFIED ABOVE. SUCH DEDUCTION SHALL BE NO LESS THAN SIXTY FIVE DOLLARS ($65.00) PER HOUR AND NO MORE THAN ONE TWO HUNDRED DOLLARS

($200.00) PER HOUR IN ACCORDANCE WITH THE ENGINEER'S STANDARD BILLING RATE SCHEDULE IN EFFECT WITH THE OWNER AT THE TIME BASED ON CLASSIFICATION OF STAFF.

**EXCESS COSTS FOR FINES AND PENALTIES FROM THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

SPECIFIC DAMAGES WILL BE ASSESSED AND DEDUCTED FROM AMOUNTS OTHERWISE DUE THE CONTRACTOR FOR ALL FINES AND/OR PENALTIES INCURRED BY THE TOWN FOR NOT ADHERING TO THE STRICT TEMPORARY DISCHARGE PERMIT LIMITATIONS DURING CONSTRUCTION DUE TO THE CONTRACTOR NOT STARTING AND COMPLETING THE REQUIRED TREATMENT SYSTEM MBR CONVERSION WORK WITHIN THE NYSDEC STIPULATED TEMPORARY DISCHARGE PERMIT LIMITS PERIOD OF OCTOBER THROUGH APRIL OF ANY PARTICULAR CALENDAR YEAR. SUCH DISCHARGE PERMIT LIMITATION WILL REQUIRE THAT THE CONTRACTOR START AND COMPLETE, READY FOR COMPLETE FACILITY OPERATIONS, ALL WORK INVOLVING THE SINGLE EXISTING SBR TRAIN OPERATION AND NEW SINGLE TRAIN MBR CONVERSION DURING THESE TEMPORARY PERMIT LIMITATION MONTHS.

ADDITIONAL WORK RESTRICTIONS AND PROJECT COORDINATION REQUIREMENTS ARE LISTED IN THE CONTRACT DOCUMENTS INCLUDING SECTION 013100 – PROJECT ADMINISTRATION AND COORDINATION (I.E., COMPLETION OF PRE-EQUALIZATION SYSTEM AND HEADWORKS UPGRADE BEFORE MBR SYSTEM OPERATION, COMPLETION OF NEW EMERGENCY POWER STANDBY GENERATOR SYSTEM FOR NEW MANDATORY EMERGENCY USE EQUIPMENT LOADS PRIOR TO OPERATION OF THE NEW SYSTEMS, ETC.)

**BIDDER'S PRINTED NAME & SIGNATURE:**

_____

( Print Name )

_____

( Signature )

**NOTE: THIS FORM MUST BE COMPLETED BY BIDDER**

THE UNDERSIGNED HEREBY ACKNOWLEDGES RECEIPT OF THE FOLLOWING ADDENDA (IF ANY):

| Addendum No. | Dated |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Signature of person, firm or corporation making this proposal:

_____
(Contractor)

_____
(Title)

Mail Address: _____

Telephone No.:_____ Dated:_____

The full names and address of all persons interested in the Proposal or principals are as follows:

| Name | Address |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

**NOTE: THIS FORM MUST BE COMPLETED BY BIDDER (IF NONE WERE RECEIVED THEN WRITE THE WORD "NONE").**

The Town Board reserves the right to award this contract to the lowest qualified bidder and to reject and declare invalid any or all bids deemed not in the best interest of the Town. In awarding this contract, the Town is not bound by the quantities stated in the Bid Form. It is emphasized that the quantities are approximations only. No guarantee is made for any quantities stated nor is a guarantee made as to the total bid. Such total bid is for the purpose of guidance in awarding the contract only. Payment shall be on the basis of actual work done at the bid prices quoted.

On acceptance of this bid, the undersigned binds himself or themselves to enter into a written contract with the Town not later than fourteen (14) days after the date of notice of the acceptance of his bid and to furnish the required security for faithful performance of the terms of said contract and the insurance as required by the Conditions of contract, and to process the work diligently so as to complete all the work required under this contract within the time frame as dictated by the Town Board or their representative.

## PROPOSAL CERTIFICATION

THIS BID IS HEREBY SUBMITTED BY:

DATED: _____

NAME OF BIDDER: _____

BIDDER'S ADDRESS: _____

_____

_____

SIGNED BY: _____

PRINTED NAME & TITLE: _____

BIDDER'S TELEPHONE NO.: (DAY): _____

(NIGHT): _____

FAX: _____

FEDERAL ID NO. OR SOCIAL SECURITY No.: _____

**NOTE: THIS FORM MUST BE COMPLETED BY BIDDER**

Enclose certified check or bid bond for five percent (5%) of the bid total as stipulated in the foregoing Information for Bidders.

The Bidder hereby agrees to enter into a Contract within fourteen (14) days (Saturdays and Sundays excepted) after due notice from the Town Board, Town of Riverhead, that the Contract has been awarded to it and is ready for signature; such notice to be given in writing within ninety (90) days of opening of the bids and, on the signing of such Contract by the Bidder, to furnish the indemnifying bonds as provided in the Contract.

The Bidder hereby further agrees that in the event of its failure or refusal to enter into a contract in accordance with this bid within fourteen (14) days after due notice from the Town Board that the Contract has been awarded to it and is ready for signature, as given in accordance with the Information for Bidders and/or its failure to execute and deliver the bond for the full amount of the Contract price, as provided in said Information for Bidders, the Bidder's check or bid bond which is herewith deposited with the Town Board shall (at the option of said Board) become due and payable as ascertained and liquidated damages for such default; otherwise, said check or bid bond will be returned to the undersigned.

The full names and residences of all persons and parties interested in the foregoing bid as principals are as follows:

| NAME | ADDRESS |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

NAME OF BIDDER:

BUSINESS ADDRESS OF BIDDER:

DATED AT: _____THE _____ DAY OF _____, 201____

**NOTE: THIS FORM MUST BE COMPLETED BY BIDDER**

**FORM OF BID BOND, PAYMENT BONDS AND PERFORMANCE BONDS**

The Form of Bid Bond shall be AIA Document A310.

The Form of Labor and Material Payment Bond shall be AIA Document A311.

The Form of Performance Bond and Payment Bond shall be AIA Document A312.

NON-COLLUSIVE BIDDING CERTIFICATE

As per Chapter 751 of the Laws of 1965, an amendment to the General Municipal Law sponsored by the New York State Department of Law, all bids, proposals and contracts awarded or accepted by a municipality must contain a statement of non-collusion. By submission of this bid or proposal, the bidder certifies that:

(A) This bid or proposal has been independently arrived at without collusion with any other bidder or with any competitor or potential competitor;

(B) This bid or proposal has not been knowingly disclosed and will not be knowingly disclosed prior to the opening of bids or proposals for this project to any other bidder, competitor or potential competitor;

(C) No attempt has been or will be made to induce any other person, partnership or corporation to submit or not to submit a bid or proposal;

(D) The person signing this bid or proposal certifies that he has fully informed himself regarding the accuracy of the statements contained in this certification and under the penalties of perjury, affirms the truth thereof such penalties being applicable to the bidder as well as to the person signing in its behalf;

(E) That attached hereto (if corporation bidder) is a certified copy of resolution authorizing the execution of this certificate by the signature of this bid or proposal in behalf of the corporate bidder.

Resolved that _____be authorized
(Name of Corporation)

to sign and submit the bid or proposal of this corporation for the following project:

_____

_____
(Describe Project)

and to submit in such bid or proposal the certificate as to non-collusion required by Section One Hundred Three D (103-D) of the General Municipal Law as the act and deed of such corporation and for any inaccuracies or misstatements in such certificates, this corporate bidder shall be liable under the penalties of perjury.

The following is a true and correct copy of the resolution adopted by:

_____

Corporation at a meeting of its Board of Directors on the _____day of _____, 201 ___.

(Seal of Corporation)

_____
Secretary

Legal name of person, firm or corporation making this Bid:

_____

Dated:_____

(Bidder's Seal)

NOTES:

(1) Where a bidder is a firm, the bid must be signed in the name of the firm by a member of the firm who must sign his own name immediately thereunder as _____, Partner.

(2) Where a bidder is a corporation, the bid must be signed in the name of the corporation by a duly authorized officer or agent thereof having knowledge of the matters stated in the bid and such officer or agent shall also subscribe his own name, the office he holds, and the seal of the corporation must be affixed.

(3) The bid must be sworn to by the person signing it, using one of the appropriate forms of acknowledgement that follow.

(4) The bidders shall date the Form of Affidavit, fill in all blank spaces and complete the "Questionnaire" which follows as part of the bid.

(5) In case of any discrepancy in the bidder's extensions or total, the Town Engineer's computation of extensions and totals will govern.

**FORM OF AFFIDAVIT WHERE BIDDER IS AN INDIVIDUAL**

STATE OF_____)

) ss.:

COUNTY OF_____)

_____, being duly sworn, deposes and says: I am the person described in and who executed the foregoing bid and the several matters therein state are in all respects true.

_____
(Signature of person who signed bid)

Subscribed and sworn to before me this
_____ day of _____, 201___.

_____
(Notary Public)

**FORM OF AFFIDAVIT WHERE BIDDER IS A FIRM**

STATE OF_____)

) ss.:

COUNTY OF_____)

_____ being duly sworn, deposes and says: I am a member of _____, the firm described in and which executed the foregoing bid. I subscribed the name of the firm thereto on behalf of said firm, and the several matters therein stated in all respects are true.

_____

(Signature of person who signed bid)

Subscribed and sworn to before me:

this _____ day of _____, 201__.

_____

(Notary Public)

**FORM OF AFFIDAVIT WHERE BIDDER IS A CORPORATION**

STATE OF_____)

) ss.:

COUNTY OF_____)

_____being duly sworn, deposes and says: I am the _____ of _____ the above named corporation, whose name is subscribed to and which executed the foregoing bid. I reside at _____, State of _____. I have knowledge of the several matters therein stated and they are in all respects true.

_____

(Signature of person who signed bid)

Subscribed and sworn to before me this _____

day of _____, 201___.

_____

(Notary Public)

**BIDDER MUST SIGN THIS FORM BEFORE A NOTARY PUBLIC**

Bid or Contract Number _____

STATE OF_____)

) ss.:

COUNTY OF_____)

That in connection with the above bid or contract of _____ I _____ the *(applicable herein), (an officer or agent of the corporate applicant, namely its _____), swears or affirms under the penalties of perjury, that no other person will have any direct or indirect interest in this proposal except _____ (in case of a corporation, all officers of the corporation and stockholders owning more than 5% of the corporation and stock must be listed. Use separate sheet in necessary.)

That *(none of the officers or stockholders are) related to any officer or employee of the Town of Riverhead except _____
_____.

That there is not any state or local officer or employee or a member of a board of commissioners of a local public authority or other public corporation within the county (exclusive of a volunteer fireman or civil defense volunteer) interested in such application.

_____
(Signature)

Sworn to before me this _____
day of _____, 201____.

_____
(Notary Public)

*Cross out phrase not appropriate.

NOTE: It is not forbidden that individuals working for the Town of Riverhead or other municipality bid on contracts but only that such interest be revealed when they do bid.

**NOTE: THIS FORM MUST BE COMPLETED BY BIDDER**

**CALVERTON SEWER DISTRICT**

**TOWN OF RIVERHEAD** **NEW YORK**

The District may make such investigations as the District deems necessary to determine the responsibility of any Bidder or to determine the ability of any Bidder to perform the Work. Bidders shall furnish to the District all information and data required by the District, including complete financial data, within the time and in the form and manner required by the District. The District reserves the right to reject any bid if the evidence required by the District is not submitted as required or if the evidence submitted by or the investigation of any Bidder fails to satisfy the District that the Bidder is responsible, or is able or qualified to carry out the obligations of the Contract or to complete the Work as contemplated.

**At the discretion of the District, the Bidder may be required to complete and submit the enclosed New York State Uniform Contracting Questionnaire to assist in determining the Bidder's qualifications. If requested, it shall be submitted within five (5) working days from notice.**

*The bidder shall complete the following list. The list shall include projects of similar size and nature (i.e. construction and equipment installations type, prime contract dollar amount) and type (i.e. municipal wastewater treatment plants and active facilities that must be maintained during construction). The list of projects shall demonstrate the Bidder's experience with construction methods, and construction procedures. The list shall only include projects which have been completed by the Bidder as the prime contractor, and which have been in operation for a period of not less than one year. A minimum of five such projects shall be provided. At least one (1) of the listed projects shall demonstrate the Bidder's experience with maintenance and protection of existing water or wastewater treatment facilities. List this project as project no.1 and describe the sequence used to phase the project.*

**Project No. 1** (This project must show experience with existing water or wastewater treatment facilities.)

Project Title: _____

Owner: _____

Owner Contact Name and Phone Number: _____

Location: _____

Engineer's Name and Telephone Number: _____

General Description: _____

Contract Amount: _____

**Project No. 2**

Project Title: _____

Owner: _____

Owner Contact Name and Phone Number: _____

Location: _____

Engineer's Name and Telephone Number: _____

General Description: _____

Contract Amount: _____

**Project No. 3**

Project Title: _____

Owner: _____

Owner Contact Name and Phone Number: _____

Location: _____

Engineer's Name and Telephone Number: _____

General Description: _____

Contract Amount: _____

**Project No. 4**

Project Title: _____

Owner: _____

Owner Contact Name and Phone Number: _____

Location: _____

Engineer's Name and Telephone Number: _____

General Description: _____

Contract Amount: _____

**Project No. 5**

Project Title: _____

Owner: _____

Owner Contact Name and Phone Number: _____

Location: _____

Engineer's Name and Telephone Number: _____

General Description: _____

Contract Amount: _____

The Owner reserves the right to reject any and all bids which do not include a completed qualifications section and/or do not meet the necessary qualifications criteria, for both prime contractor and subcontractors, as described within this qualifications section, for construction work to be performed and completed as required by the Contract Documents.

**BIDDER**

BIDDER NAME: _____

PREPARED BY: _____

SIGNED BY: _____

TITLE: _____

**NOTE: THIS FORM MUST BE COMPLETED BY BIDDER**

## Instructions for New York State Vendor Responsibility Questionnaires

The New York State Vendor Responsibility Questionnaire Is intended to elicit information based on vendor type (For-Profit or Not-for-Profit) and activity (Construction or Non-Construction). The For-Profit Construction (CCA-2) questionnaire follows this page.

Business Entities may print the PDF version of a questionnaire form and complete it annually or may obtain the MS Word version from New York State and complete the questionnaire on a computer. Completing the questionnaire in MS Word allows the questionnaire to be saved on the user's computer and updated in the event that the vendor's information changes.

The person(s) completing the vendor responsibility questionnaire must be knowledgeable about the vendor's business and operations. The certification at the end of each questionnaire must be completed by an owner or officer of the Business Entity and must be notarized to be complete.

Business Entities must answer every question contained in the selected questionnaire. Most questions require "Yes" or "No" answers and request additional information where necessary. For paper submissions, responses that require additional information must include an attachment containing this information. A Business Entity must provide all relevant information which can be obtained within the limits of the law. The Business Entity is not required to provide information regarding a determination or finding made in error which was subsequently corrected.

If the submitting Business Entity is a Joint Venture, one questionnaire must be submitted for the Joint Venture plus each Business Entity comprising the Joint Venture must also submit separate questionnaires.

If the Business Entity uses a Social Security Number (SSN) as its identification number, providing the SSN on the questionnaire is optional. Individuals and Sole Proprietors may use an SSN but are encouraged to obtain and use an Employer Identification Number.

# NEW YORK STATE VENDOR RESPONSIBILITY QUESTIONNAIRE
# FOR-PROFIT CONSTRUCTION (CCA-2)

You have selected the For-Profit Construction questionnaire, commonly known as the "CCA-2," which may be printed and completed in this format or, **for your convenience**, **may be completed online using the New York State VendRep System.**

## COMPLETION & CERTIFICATION

The person(s) completing the questionnaire must be knowledgeable about the vendor's business and operations. An owner or official must certify the questionnaire and the signature must be notarized.

## NEW YORK STATE VENDOR IDENTIFICATION NUMBER (VENDOR ID)

The Vendor ID is a ten-digit identifier issued by New York State when the vendor is registered on the Statewide Vendor File. This number must now be included on the questionnaire. If the business entity has not obtained a Vendor ID, contact the IT Service Desk at ITServiceDesk@osc.state.ny.us or call 866-370-4672.

## DEFINITIONS

All underlined terms are defined in the "New York State Vendor Responsibility Definitions List," found at http://www.osc.state.ny.us/vendrep/documents/questionnaire/definitions.pdf. These terms may not have their ordinary, common or traditional meanings. Each vendor is strongly encouraged to read the respective definitions for any and all underlined terms. By submitting this questionnaire, the vendor agrees to be bound by the terms as defined in the "New York State Vendor Responsibility Definitions List" existing at the time of certification.

## RESPONSES

Every question must be answered. Each response must provide all relevant information which can be obtained within the limits of the law. However, information regarding a determination or finding made in error which was subsequently corrected or overturned, and/or was withdrawn by the issuing government entity, is not required. Individuals and Sole Proprietors may use a Social Security Number but are encouraged to obtain and use a federal Employer Identification Number (EIN).

**NYS VENDOR ID: _____**

# NEW YORK STATE VENDOR RESPONSIBILITY QUESTIONNAIRE FOR-PROFIT CONSTRUCTION (CCA-2)

| **BUSINESS ENTITY INFORMATION** | | |
|---|---|---|
| Legal Business Name | EIN<br>_____ | |
| Address of the Principal Place of Business (street, city, state, zip code) | New York State Vendor Identification Number | |
| | Telephone<br>ext. | Fax |
| | Website | |
| Authorized Contact for this Questionnaire | | |
| Name | Telephone<br>ext. | Fax |
| Title | Email | |

Additional Business Entity Identities: If applicable, list any other DBA, Trade Name, Former Name, Other Identity, or EIN used in the last five (5) years, the state or county where filed and the status (active or inactive).

| Type | Name | EIN | State or County where filed | Status |
|---|---|---|---|---|
| | | | | |
| | | | | |

| **I. BUSINESS CHARACTERISTICS** | | |
|---|---|---|
| 1.0 Business Entity Type – Check appropriate box and provide additional information: | | |
| a) ☐ Corporation (including PC) | Date of Incorporation | |
| b) ☐ Limited Liability Company (LLC or PLLC) | Date Organized | |
| c) ☐ Limited Liability Partnership | Date of Registration | |
| d) ☐ Limited Partnership | Date Established | |
| e) ☐ General Partnership | Date Established | County (if formed in NYS) |
| f) ☐ Sole Proprietor | How many years in business? | |
| g) ☐ Other | Date Established | |
| If Other, explain: | | |
| 1.1 Was the Business Entity formed in New York State? | | ☐ Yes ☐ No |
| If "No," indicate jurisdiction where the Business Entity was formed: | | |
| ☐ United States | State | |
| ☐ Other | Country | |

**NYS VENDOR ID: _____**

# NEW YORK STATE VENDOR RESPONSIBILITY QUESTIONNAIRE
# FOR-PROFIT CONSTRUCTION (CCA-2)

## I. BUSINESS CHARACTERISTICS

| | |
|---|---|
| 1.2 Is the Legal Business Entity publicly traded? | ☐ Yes ☐ No |
| If "Yes," provide the CIK code or Ticker Symbol: | |
| 1.3 Is the Business Entity currently registered to do business in New York State?<br>*Note: Select "Not Required" if the Business Entity is a Sole Proprietor or General Partnership* | ☐ Yes ☐ No<br>☐ Not Required |
| If "No," explain why the Business Entity is not required to be registered to do business in New York State: | |
| 1.4 Is the responding Business Entity a Joint Venture? Note: If the submitting Business Entity is a Joint Venture, also submit a separate questionnaire for each Business Entity comprising the Joint Venture. | ☐ Yes ☐ No |
| 1.5 If the Business Entity's Principal Place of Business is not in New York State, does the Business Entity maintain an office in New York State?<br>*(Select "N/A" if Principal Place of Business is in New York State.)* | ☐ Yes ☐ No<br>☐ N/A |
| If "Yes," provide the address and telephone number for one office located in New York State. | |
| 1.6 Is the Business Entity a New York State certified Minority-Owned Business Enterprise, or Women-Owned Business Enterprise, or New York State Small Business, or federally certified Disadvantaged Business Enterprise? | ☐ Yes ☐ No |
| If "Yes," check all that apply:<br>☐ New York State certified Minority-Owned Business Enterprise (MBE)<br>☐ New York State certified Women-Owned Business Enterprise (WBE)<br>☐ New York State Small Business<br>☐ Federally certified Disadvantaged Business Enterprise (DBE) | |

1.7 Identify each person or business entity that is, or has been within the past five (5) years, Principal Owner of 5.0% or more of the firm's shares; a Business Entity Official; or one of the five largest shareholders, if applicable. *(Attach additional pages if necessary.)*

Joint Ventures: Provide information for all firms involved.

| Name *(For each person, include middle initial)* | Title | Percentage of ownership (Enter 0%, if not applicable) | Employment status with the firm |
|---|---|---|---|
| | | | ☐ Current ☐ Former |
| | | | ☐ Current ☐ Former |
| | | | ☐ Current ☐ Former |
| | | | ☐ Current ☐ Former |

**NYS VENDOR ID: _____**

# NEW YORK STATE VENDOR RESPONSIBILITY QUESTIONNAIRE FOR-PROFIT CONSTRUCTION (CCA-2)

## II. AFFILIATE and JOINT VENTURE RELATIONSHIPS

| | |
|---|---|
| 2.0 Are there any other construction-related firms in which, now or in the past five years, the submitting Business Entity or any of the individuals or business entities listed in question 1.7 either owned or owns 5.0% or more of the shares of, or was or is one of the five largest shareholders or a director, officer, partner or proprietor of said other firm? *(Attach additional pages if necessary.)* | ☐ Yes ☐ No |

| Firm/Company Name | Firm/Company EIN (If available) | Firm/Company's Primary Business Activity |
|---|---|---|
| | | |

| |
|---|
| Firm/Company Address |
| Explain relationship with the firm and indicate percent of ownership, if applicable (enter N/A, if not applicable): |

| | |
|---|---|
| Are there any shareholders, directors, officers, owners, partners or proprietors that the submitting Business Entity has in common with this firm? | ☐ Yes ☐ No |

| Individual's Name *(Include middle initial)* | Position/Title with Firm/Company |
|---|---|
| | |

| | |
|---|---|
| 2.1 Does the Business Entity have any construction-related affiliates not identified in the response to question 2.0 above? *(Attach additional pages if necessary.)* | ☐ Yes ☐ No |

| Affiliate Name | Affiliate EIN (If available) | Affiliate's Primary Business Activity |
|---|---|---|
| | | |

| |
|---|
| Affiliate Address |
| Explain relationship with the affiliate and indicate percent of ownership, if applicable *(enter N/A, if not applicable)*: |

| | |
|---|---|
| Are there any shareholders, directors, officers, owners, partners or proprietors that the submitting Business Entity has in common with this affiliate? | ☐ Yes ☐ No |

| Individual's Name *(Include middle initial)* | Position/Title with Firm/Company |
|---|---|
| | |

| | |
|---|---|
| 2.2 Has the Business Entity participated in any construction-related Joint Ventures within the past three (3) years? *(Attach additional pages if necessary.)* | ☐ Yes ☐ No |

| Joint Venture Name | Joint Venture EIN (If available) | Identify parties to the Joint Venture |
|---|---|---|
| | | |

**NYS VENDOR ID: _____**

# NEW YORK STATE VENDOR RESPONSIBILITY QUESTIONNAIRE
# FOR-PROFIT CONSTRUCTION (CCA-2)

| **III. CONTRACT HISTORY** | |
|---|---|
| 3.0 Has the Business Entity completed any construction contracts? | ☐ Yes ☐ No |
| *If "Yes," list the ten most recent construction contracts the Business Entity has completed using Attachment A – Completed Construction Contracts, found at www.osc.state.ny.us/vendrep/documents/questionnaire/ac3294s.doc.*<br>*If less than ten, include most recent subcontracts on projects up to that number.* | |
| 3.1 Does the Business Entity currently have uncompleted construction contracts? | ☐ Yes ☐ No |
| *If "Yes," list all current uncompleted construction contracts by using Attachment B – Uncompleted Construction Contracts, found at www.osc.state.ny.us/vendrep/documents/questionnaire/ac3295s.doc.*<br>*Note: Ongoing projects must be included.* | |

| **IV. INTEGRITY – CONTRACT BIDDING**<br>***Within the past five (5) years, has the Business Entity, an affiliate, or any predecessor company or entity:*** | |
|---|---|
| 4.0 Been suspended or debarred from any government contracting process or been disqualified on any government procurement? | ☐ Yes ☐ No |
| 4.1 Been subject to a denial or revocation of a government prequalification? | ☐ Yes ☐ No |
| 4.2 Had any bid rejected by a government entity for lack of qualifications, responsibility or because of the submission of an informal, non-responsive or incomplete bid? | ☐ Yes ☐ No |
| 4.3 Had a proposed subcontract rejected by a government entity for lack of qualifications, responsibility or because of the submission of an informal, non-responsive or incomplete bid? | ☐ Yes ☐ No |
| 4.4 Had a low bid rejected on a government contract for failure to make good faith efforts on any Minority-Owned Business Enterprise, Women-Owned Business Enterprise or Disadvantaged Business Enterprise goal or statutory affirmative action requirements on a previously held contract? | ☐ Yes ☐ No |
| 4.5 Agreed to a voluntary exclusion from bidding/contracting with a government entity? | ☐ Yes ☐ No |
| 4.6 Initiated a request to withdraw a bid submitted to a government entity or made any claim of an error on a bid submitted to a government entity? | ☐ Yes ☐ No |
| *For each "Yes," provide an explanation of the issue(s), the Business Entity involved, the relationship to the submitting Business Entity, the government entity involved, project(s), relevant dates, any remedial or corrective action(s) taken and the current status of the issue(s). Provide answer(s) below or attach additional sheets with numbered responses.* | |

| **V. INTEGRITY – CONTRACT AWARD**<br>***Within the past five (5) years, has the Business Entity, an affiliate, or any predecessor company or entity:*** | |
|---|---|
| 5.0 Defaulted on or been suspended, cancelled or terminated for cause on any contract? | ☐ Yes ☐ No |
| 5.1 Been subject to an administrative proceeding or civil action seeking specific performance or restitution (except any disputed work proceeding) in connection with any government contract? | ☐ Yes ☐ No |
| 5.2 Entered into a formal monitoring agreement, consent decree or stipulation settlement as specified by, or agreed to with, any government entity? | ☐ Yes ☐ No |
| 5.3 Had its surety called upon to complete any contract whether government or private sector? | ☐ Yes ☐ No |
| 5.4 Forfeited all or part of a standby letter of credit in connection with any government contract? | ☐ Yes ☐ No |

**NYS VENDOR ID: _____**

# NEW YORK STATE VENDOR RESPONSIBILITY QUESTIONNAIRE FOR-PROFIT CONSTRUCTION (CCA-2)

## V. INTEGRITY – CONTRACT AWARD

***Within the past five (5) years, has the Business Entity, an affiliate, or any predecessor company or entity:***

*For each "Yes," provide an explanation of the issue(s), the Business Entity involved, the relationship to the submitting Business Entity, the government entity/owners involved, project(s), contract number(s), relevant dates, any remedial or corrective action(s) taken and the current status of the issue(s). Provide answer(s) below or attach additional sheets with numbered responses.*

## VI. CERTIFICATIONS/LICENSES

***Within the past five (5) years, has the Business Entity, an affiliate, or any predecessor company or entity:***

| | | |
|---|---|---|
| 6.0 | Had a revocation or suspension of any business or professional permit and/or license? | ☐ Yes ☐ No |
| 6.1 | Had a denial, decertification, revocation or forfeiture of New York State certification of Minority-Owned Business Enterprise, Women-Owned Business Enterprise or a federal certification of Disadvantaged Business Enterprise status, for other than a change of ownership? | ☐ Yes ☐ No |

*For each "Yes," provide an explanation of the issue(s), the Business Entity involved, the relationship to the submitting Business Entity, the government entity involved, relevant dates, any remedial or corrective action(s) taken and the current status of the issue(s). Provide answer(s) below or attach additional sheets with numbered responses.*

## VII. LEGAL PROCEEDINGS/GOVERNMENT INVESTIGATIONS

***Within the past five (5) years, has the Business Entity, an affiliate, or any predecessor company or entity:***

| | | |
|---|---|---|
| 7.0 | Been the subject of a criminal investigation, whether open or closed, or an indictment for any business-related conduct constituting a crime under local, state or federal law? | ☐ Yes ☐ No |
| 7.1 | Been the subject of: | |
| | (i.) An indictment, grant of immunity, judgment or conviction (including entering into a plea bargain) for conduct constituting a crime; or | ☐ Yes ☐ No |
| | (ii.) Any criminal investigation, felony indictment or conviction concerning the formation of, or any business association with, an allegedly false or fraudulent Minority-Owned Business Enterprise, Women-Owned Business Enterprise, or a Disadvantaged Business Enterprise? | ☐ Yes ☐ No |
| 7.2 | Received any OSHA citation, which resulted in a final determination classified as serious or willful? | ☐ Yes ☐ No |
| 7.3 | Had a government entity find a willful prevailing wage or supplemental payment violation? | ☐ Yes ☐ No |
| 7.4 | Had a New York State Labor Law violation deemed willful? | ☐ Yes ☐ No |
| 7.5 | Entered into a consent order with the New York State Department of Environmental Conservation, or a federal, state or local government enforcement determination involving a violation of federal, state or local environmental laws? | ☐ Yes ☐ No |

# NEW YORK STATE VENDOR RESPONSIBILITY QUESTIONNAIRE
# FOR-PROFIT CONSTRUCTION (CCA-2)

## VII. LEGAL PROCEEDINGS/GOVERNMENT INVESTIGATIONS

***Within the past five (5) years, has the Business Entity, an affiliate, or any predecessor company or entity:***

| | | |
|---|---|---|
| 7.6 | Other than previously disclosed, been the subject of any citations, notices or violation orders; a pending administrative hearing, proceeding or determination of a violation of:<br>• Federal, state or local health laws, rules or regulations;<br>• Federal, state or local environmental laws, rules or regulations;<br>• Unemployment insurance or workers compensation coverage or claim requirements;<br>• Any labor law or regulation, which was deemed willful;<br>• Employee Retirement Income Security Act (ERISA);<br>• Federal, state or local human rights laws;<br>• Federal, state or local security laws? | ☐ Yes ☐ No |

*For each "Yes," provide an explanation of the issue(s), the Business Entity involved, the relationship to the submitting Business Entity, the government entity involved, relevant dates, any remedial or corrective action(s) taken and the current status of the issue(s). Provide answer(s) below or attach additional sheets with numbered responses.*

*Note: Information regarding a determination or finding made in error, which was subsequently corrected or overturned, and/or was withdrawn by the issuing government entity, is not required.*

## VIII. LEADERSHIP INTEGRITY

***If the Business Entity is a Joint Venture Entity, answer "N/A - Not Applicable" to questions in this section.***

***Within the past five (5) years has any individual previously identified or any individual currently or formerly having the authority to sign, execute or approve bids, proposals, contracts or supporting documentation on behalf of the Business Entity with any government entity been:***

| | | |
|---|---|---|
| 8.0 | Sanctioned relative to any business or professional permit and/or license? | ☐ Yes ☐ No ☐ N/A |
| 8.1 | Suspended, debarred or disqualified from any government contracting process? | ☐ Yes ☐ No ☐ N/A |
| 8.2 | The subject of a criminal investigation, whether open or closed, or an indictment for any business-related conduct constituting a crime under local, state or federal law? | ☐ Yes ☐ No ☐ N/A |
| 8.3 | Charged with a misdemeanor or felony, indicted, granted immunity, convicted of a crime or subject to a judgment for:<br>(i.) Any business-related activity, including but not limited to fraud, coercion, extortion, bribe or bribe-receiving, giving or accepting unlawful gratuities, immigration or tax fraud, racketeering, mail fraud, wire fraud, price-fixing or collusive bidding; or<br>(ii.) Any crime, whether or not business-related, the underlying conduct of which related to truthfulness, including but not limited to the filing of false documents or false sworn statements, perjury or larceny | ☐ Yes ☐ No ☐ N/A |

*For each "Yes," provide an explanation of the issue(s), the individual involved, the relationship to the submitting Business Entity, the government entity involved, relevant dates, any remedial or corrective action(s) taken and the current status of the issue(s). Provide answer(s) below or attach additional sheets with numbered responses.*

**NYS VENDOR ID: _____**

# NEW YORK STATE VENDOR RESPONSIBILITY QUESTIONNAIRE FOR-PROFIT CONSTRUCTION (CCA-2)

## IX. FINANCIAL AND ORGANIZATIONAL CAPACITY

| | |
|---|---|
| 9.0 Within the past five (5) years, has the Business Entity or any affiliate received any formal unsatisfactory performance assessment(s) from any government entity on any contract? | ☐ Yes ☐ No |
| *If "Yes," provide an explanation of the issue(s), the Business Entity involved, the relationship to the submitting Business Entity, the government entity involved, relevant dates, any remedial or corrective action(s) taken and the current status of the issue(s). Provide answer below or attach additional sheets with numbered responses.* | |
| *9.1* Within the past five (5) years, has the Business Entity or any affiliate had any liquidated damages assessed over $25,000? | ☐ Yes ☐ No |
| *If "Yes," provide an explanation of the issue(s), the Business Entity involved, the relationship to the submitting Business Entity, relevant dates, the contracting party involved, the amount assessed and the current status of the issue(s). Provide answer below or attach additional sheets with numbered responses.* | |
| 9.2 Within the past five (5) years, has the Business Entity or any affiliate had any liens, claims or judgments over $25,000 filed against the Business Entity which remain undischarged or were unsatisfied for more than 90 days? (*Note: Including but not limed to tax warrants or liens. Do not include UCC filings.)* | ☐ Yes ☐ No |
| *If "Yes," provide an explanation of the issue(s), the Business Entity involved, the relationship to the submitting Business Entity, relevant dates, the Lien holder or Claimants' name(s), the amount of the lien(s) and the current status of the issue(s). Provide answer below or attach additional sheets with numbered responses.* | |
| 9.3 In the last seven (7) years, has the Business Entity or any affiliate initiated or been the subject of any bankruptcy proceedings, whether or not closed, or is any bankruptcy proceeding pending? | ☐ Yes ☐ No |
| *If "Yes," provide the Business Entity involved, the relationship to the submitting Business Entity, the bankruptcy chapter number, the court name and the docket number. Indicate the current status of the proceedings as "Initiated," "Pending" or "Closed." Provide answer below or attach additional sheets with numbered responses.* | |

| | |
|---|---|
| 9.4 What is the Business Entity's Bonding Capacity? | |
| a. Single Project | b. Aggregate (All Projects) |
| 9.5 List Business Entity's Gross Sales for the previous three (3) Fiscal Years: | |

| | | |
|---|---|---|
| 1st Year (Indicate year )<br>Gross Sales | 2nd Year (Indicate year )<br>Gross Sales | 3rd Year (Indicate year )<br>Gross Sales |
| 9.6 List Business Entity's Average Backlog for the previous three (3) fiscal years:<br>(Estimated total value of uncompleted work on outstanding contracts) | | |
| 1st Year (Indicate year )<br>Amount | 2nd Year (Indicate year )<br>Amount | 3rd Year (Indicate year )<br>Amount |
| 9.7 Attach Business Entity's most recent annual financial statement and accompanying notes or complete Attachment C – Financial Information, found at www.osc.state.ny.us/vendrep/documents/questionnaire/ac3296s.xls.<br>*(This information must be attached.)* | | |

**NYS VENDOR ID: _____**

# NEW YORK STATE VENDOR RESPONSIBILITY QUESTIONNAIRE FOR-PROFIT CONSTRUCTION (CCA-2)

| **X. FREEDOM OF INFORMATION LAW (FOIL)** | |
|---|---|
| 10.0 Indicate whether any information provided herein is believed to be exempt from disclosure under the Freedom of Information Law (FOIL).<br>*Note: A determination of whether such information is exempt from FOIL will be made at the time of any request for disclosure under FOIL. Attach additional pages if necessary.* | ☐ Yes ☐ No |
| *If "Yes," indicate the question number(s) and explain the basis for the claim.* | |

**NYS VENDOR ID: _____**

# NEW YORK STATE VENDOR RESPONSIBILITY QUESTIONNAIRE FOR-PROFIT CONSTRUCTION (CCA-2)

## Certification

The undersigned: (1) recognizes that this questionnaire is submitted for the express purpose of assisting New York State government entities (including the Office of the State Comptroller (OSC)) in making responsibility determinations regarding award or approval of a contract or subcontract and that such government entities will rely on information disclosed in the questionnaire in making responsibility determinations; (2) acknowledges that the New York State government entities and OSC may, in their discretion, by means which they may choose, verify the truth and accuracy of all statements made herein; and (3) acknowledges that intentional submission of false or misleading information may result in criminal penalties under State and/or Federal Law, as well as a finding of non-responsibility, contract suspension or contract termination.

**The undersigned certifies that he/she:**

- is knowledgeable about the submitting Business Entity's business and operations;
- has read and understands all of the questions contained in the questionnaire;
- has not altered the content of the questionnaire in any manner;
- has reviewed and/or supplied full and complete responses to each question;
- to the best of his/her knowledge, information and belief, confirms that the Business Entity's responses are true, accurate and complete, including all attachments, if applicable;
- understands that New York State government entities will rely on the information disclosed in the questionnaire when entering into a contract with the Business Entity; and
- is under an obligation to update the information provided herein to include any material changes to the Business Entity's responses at the time of bid/proposal submission through the contract award notification, and may be required to update the information at the request of the New York State government entities or OSC prior to the award and/or approval of a contract, or during the term of the contract.

Signature of Owner/Official _____

Printed Name of Signatory _____

Title _____

Name of Business _____

Address _____

City, State, Zip _____

Sworn to before me this _____ day of _____, 20___;

_____ Notary Public

**CALVERTON SEWER DISTRICT**

**TOWN OF RIVERHEAD** **NEW YORK**

The Bidder shall list the subcontractors, if any, to be used for this project. Provide the required information for each proposed subcontractor. Make appropriate copies of this form should the Bidder propose more than five (5) subcontractors. List at least five projects for each subcontractor that demonstrates the subcontractor's qualifications to perform the work of the project. The projects shall be similar in size and complexity and have been completed within the last five (5) years by the subcontractor.

**Subcontractor Name:** _____

**Type of Work:** _____

| Owner | Contact Name | Phone Number | Location | Contract Amount |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Subcontractor Name:** _____

**Type of Work:** _____

| Owner | Contact Name | Phone Number | Location | Contract Amount |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Subcontractor Name:** _____

**Type of Work:** _____

| Owner | Contact Name | Phone Number | Location | Contract Amount |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Subcontractor Name:** _____

**Type of Work:** _____

| Owner | Contact Name | Phone Number | Location | Contract Amount |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Subcontractor Name:** _____

**Type of Work:** _____

| Owner | Contact Name | Phone Number | Location | Contract Amount |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**NOTE: THIS FORM MUST BE COMPLETED BY BIDDER**

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## 1. CONTRACT DOCUMENTS AND DEFINITIONS

The Notice to Bidders, Instructions to Bidders, Proposal Form, Form of Bond, Conditions of Contract, General Conditions, Specifications, Form of Contract, Construction Drawings, together with any Addenda, shall form part of this Contract, and the provisions thereof shall be as binding upon the parties hereto, as if they were herein fully set forth. The table of contents, titles, heading, headlines, and marginal notes contained herein are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light upon the interpretation of the provisions to which they refer. Whenever the term "Contract Documents" is used, it shall mean and include the Notice to Bidders, Instructions to Bidders, Proposal Form, Form of Bond, Conditions of Contract, General Conditions, Plans & Specifications, Form of Contract and any Addenda. In case of any conflict or inconsistency between the provisions of the contract and those of the Specifications, the provisions of this contract shall govern.

Extra Work: The term "extra work" as used herein, refers to and includes all work required by the Town, which in the judgment of the Town Engineer involves changes in or additions to work required by the Specifications and any Addenda in their present form and which is not covered by the price in the Form of Bid.

Subcontractor: The term "subcontractor" shall mean any person, firm, or corporation supplying labor and material for work at the site of the project but not including the parties to this contract.

Notice: The term "notice" as used herein, shall mean and include written notice. Written notice shall be deemed to have been duly served when delivered to, or at last known business address of, the person, firm or corporation for who intended, or his, their, or its duly authorized agents, representatives, or officer, or when enclosed in a postage prepaid wrapper or envelope addressed to such person, firm or corporation at his, their or its last known business address and deposited in a United States mailbox.

Directed, Required, Approved, Acceptable: Whenever the Contract Documents refer to the work or its performance, "directed", "required", "permitted", imply the direction, requirement, permission, order, designation or prescription of the Town Engineer, or his representative, and "approved", "satisfied", or "satisfactory", "in the judgment of", and words of like import, shall mean approved, or acceptable to, or satisfactory to, or in the judgment of the Town Engineer, or his representative.

## 2. SCOPE OF SERVICES

The contractor will furnish all labor, materials, suppliers, equipment and other facilities necessary or proper for, or incidental to, the work contemplated by this contract as required by, and in strict accordance with the applicable Plans and Specifications and Addenda prepared by the Town Engineer and/or required by, and in strict accordance with, such changes as are ordered and approved pursuant to this contract, and will perform all other obligations imposed on him by this contract. It is specifically understood that this contract does not guarantee any minimum or maximum quantities of work. Quantities will be as ordered by the Town from time to time, and unit bid prices will govern. The quantities in the proposal are for bidding purposes only.

## 3. COMPENSATION TO BE PAID TO THE CONTRACTOR

(A) Agreed Prices: It is understood and agreed that the contractor will accept as payment in full the summation of the products of the actual quantities in place upon the completion of the work, as determined by the Town Engineer's measurements, by the unit prices bid, no allowances being made for anticipated profit or for reasons of variations from the estimated quantities set forth in the Form of Bid.

(B) Extra Work: The town may, at any time, by a written order and without notice to the sureties, require the performance of such extra work or changes in the work as it may find necessary or desirable. The amount of compensation to be paid to the contract for any extra work, as so ordered, shall be determined as follows:

1. By such applicable unit prices, if any, as set forth in the contract; or
2. If no such unit prices are set forth, then by unit price or by a lump sum mutually agreed upon by the town and the contractor; and
3. If no such unit prices are set forth and if the parties cannot agree upon unit prices or a lump sum; then by actual net cost in money to the contractor of the materials, permits, wages of applied labor, premiums for Worker's Compensation Insurance, payroll taxes required by law, rental for plant and equipment used (excluding small tools) to which total cost will be added twenty (20) percent as full compensation for all other items of profit costs and expenses, including administration, overhead, superintendency, insurance, insurance other than Workers' Compensation Insurance, materials used in temporary structures, allowances made by the contractor to subcontractors, additional premiums upon the performance bond of the contractor and the use of small tools.

## 4. TIME OF ESSENCE

Inasmuch as the provisions of the contract relating to the time of performance and completion of the work are for the purpose of enabling the town to proceed with the construction of a public improvement in accordance with a predetermined program, such provisions are of the essence of this contract.

## 5. TIME OF COMPLETION

The town shall assign a construction schedule indicating a start date and a completion date. The contractor shall have a minimum of fourteen (14) days from the date of receipt of construction schedule to the earliest start date on the assigned construction schedule. If said schedule is not acceptable to the contractor, the contractor shall notify the town in writing, postmarked within three (3) working days from date of receipt of construction schedule. This notification shall include an alternative construction schedule. The alternative construction schedule completion date shall not exceed twenty-eight (28) calendar days from the original completion date assigned by the town. Failure to comply with time of completion shall constitute liquidated damages and termination of primary contractor.

## 6. LIQUIDATED DAMAGES

The time limit being essential to and of the essence of this contract, the primary contractor hereby agrees that the Town shall be and is hereby authorized to deduct and retain out of the money which may be due or may become due to said contractor under this agreement, the sum of the cost of completing the work by the secondary contractor, including overhead charges, services, inspector's wages, and interest on the money invested that the Town will suffer by reason of such default. The Town shall have the right to extend the time for the completion of said work.

## 7. TERMINATION OF PRIMARY CONTRACTOR

Termination of primary contractor shall include all work in progress and pending. All existing and pending purchase orders pertaining to work issued through the Town-wide Construction Contract shall be hereby considered void. All items previously awarded to terminated contractor shall be hereby awarded to corresponding secondary contractors. Termination of primary contractor shall extend the duration of the contract. At the discretion of the Town of Riverhead, termination of contractor shall warrant disqualification from awarding specific items or all items in succeeding Town-wide construction contracts Capital Improvement Projects, etc.

**8. EXTENSIONS OF TIME. NO WAIVER.**

If the contractor shall be delayed in the completion of his work by reason or by reasons of unforeseeable causes beyond his control and without his fault or negligence, including but not restricted to; acts of God, the public enemy, fires, floods, epidemics, quarantine restrictions, strikes, riots, civil commotion or freight embargoes, the period herein specified for completion of his work shall be extended by such time as shall be fixed by the Town.

No such extension of time shall be considered a waiver by the Town of its right to terminate the contract for abandonment or delay by the contractor as hereinafter provided, or relive the contractor from full responsibility for performance of his obligations hereunder.

**9. WEATHER**

During unsuitable weather, all work must stop when such work would be subject to injury and the contractor shall transfer his men and materials to those parts of the work where weather conditions will not have any effect on the workmanship to any damages on account of such damages or suspension, and he must protect any work that might be injured by the elements and make good any work that is injured.

**10. CONTRACT SECURITY**

The contractor shall furnish, at the request of the Town, a Performance Bond equal to 100% of the estimated value of individual projects completed under this contract at the discretion of the Town Engineer. Each individual project to be completed under the contract will be evaluated by the Town Engineer or his representative to determine the need for bonding. If bonding is deemed necessary, the contractor will be required to submit documentation confirming the actual cost of such bonding to the Town Engineer for approval. Upon approval, the Town will reimburse the contractor for 100% of the cost of any required bonding. The contractor is advised not to include the cost of bonding in bid submittals.

Additional or Substitute Bond: If at any time the Town shall be or become dissatisfied with any surety or sureties then upon the Performance Bond, or if for any other reason such bond shall cease to be adequate security to the Town, the contractor shall within five (5) days after notice from the Town to do so, substitute an acceptable bond in such form and sum and signed by such other surety as may be satisfactory to the Town. The premiums on such bonds shall be made until the new surety shall have been qualified.

**11. LAWS AND ORDINANCES**

In the execution of the contract, the contractor will be required to observe and obey all federal, state, county and local laws, ordinances, codes and regulations relating to the performance of the contract including but not limiting labor employed thereon, materials supplied, obstructing streets and highways, maintaining signals, storing, handling and use of explosives and all other general ordinances and state statutes affecting him or his employees of his work hereunder in his relations with the municipality or any other persons, and also all laws, codes, ordinances controlling or limiting the contractor while engaged in executing the work under the contract.

As a condition of the contract, the contractor shall and does hereby agree to comply with all requirements of the Labor Laws of the State of New York.

The contractor shall comply with the provisions of Sections 291-299 of the Executive Law and Civil Rights Law, shall furnish all information and reports deemed necessary by the State Commission for Human

Rights, the Attorney General and the Industrial Commissioner for purposes of investigation to ascertain compliance with such sections of the Executive Law and Civil Rights Law.

The contract may be forthwith canceled, terminated or suspended, in whole or in part, by the contracting agency upon the basis of a finding made by the State Commissioner for Human Rights that the contractor has not complied with these laws.

The contract hereby expressly agrees to comply with all the provisions of the Labor Law and any and all amendments thereto, insofar as the same are applicable to the contract. The Labor Law, as amended, provides that no laborer, worker or mechanic in the employ of the contractor, subcontractor or other person doing or contracting to do the whole or a part of the work contemplated by this contract, shall be permitted or required to work more than eight (8) hours in any one (1) calendar day, except in cases of extraordinary emergency caused by fire, flood or danger to life or property; that no such person shall be employed more than eight (8) hours in any day or more than five (5) days in any week except in such emergency; that the wages to be paid for a legal day's work as herein before defined, to laborers, workmen or mechanics upon the work called for under this contract or upon any materials used upon, or in connection therewith, shall not be less than the prevailing rate for a day's work in the same trade or occupation in the locality within the State where such work is to be done and each laborer, worker or mechanic employed by the contractor, subcontractor or other person about or upon the work shall be paid the wages herein provided; that employees engaged in the construction maintenance, and repair of highways and in water works construction outside the limits of cities and villages are no longer exempt from the provisions of the labor Law which require that payment of the prevailing rate of wages and the eight (8) hour day.

Section 222 of the Labor Law, as amended by Chapters 556 and 557 of the Laws of 1933, provides that preference in employment shall be given to citizens of the State of New York who have been residents of Suffolk County for at least six (6) consecutive months immediately prior to the commencement of their employment. Each person so employed shall furnish satisfactory proof of residence in accordance with rules adopted by the Industrial Commissioner. Person other than citizens of the State of New York shall be employed only when such citizens are not available. Section 222 further provides that upon the demand of the State Industrial Commissioners, the contractor shall furnish a list of names and addresses of all his subcontractors and further provides that a violation of this section shall constitute a misdemeanor and shall be punishable by a fine of not less than Fifty Dollars ($50.00) nor more than Five Hundred Dollars ($500.00) or by imprisonment for not less than thirty nor more than ninety days, or both fine and imprisonment.

Section 220-A of the Labor Law, as amended by Chapter 472 of the Laws of 1932, provides that before payment is made by or on behalf of the State or any city, county, town or village or other civil division of the state of any sums due on account of a contract for a public improvement, it is the duty of the comptroller or the financial officer of the municipal corporation to require the contractor and each and every subcontractor to file a certified statement in writing, in satisfactory form, certifying to the amount then due and owing to any and all laborers for daily or weekly wages on account of labor performed upon the work of the contractor, setting forth herein the names of the persons whose wages are unpaid and the amount due each respectively.

Section 220-B of the Labor Law, as so amended, provides that any interested person who shall have previously filed a protest in writing objecting to the amounts due or to become due to him for daily or weekly wages for labor performed on the public improvement for which the contract was entered into, or if for any reason, it may be deemed advisable, the comptroller of the state or financial officer of the municipal corporation may deduct from the whole amount of any payment on account thereof of the sums or sum admitted by any contractor or subcontractor in such statement or statements so filed to be due and owing by him on account of labor performed and may withhold the amount so deducted for the benefit of

the laborers for daily work, weekly wages, whose wages are unpaid as shown by the verified statements filed by any contractor or subcontractor and may pay directly to any person the amount or amounts so shown to be due for such wages.

Section 220-C of the Labor Law, as so amended, provides the penalty for making of a false oath or verification.

Section 220-D of the Labor Law provides that the advertised specifications for every contract for the construction, reconstruction, maintenance and/or repair of highways to which the state, county, town and/or village is a party shall contain a provision stating the minimum rate of hourly wage that can be paid, as shall be designated by the Industrial Commissioner, to the laborers employed in the performance of the contract whether by the contractor, subcontractor or other person doing or contracting to do the whole or part of the work completed by the laborers shall be paid not less than such hourly minimum rate of wage. Any person or corporation that willfully pays, after entering into such contract, less than such stipulated minimum hourly wage scale shall be guilty of a misdemeanor and upon conviction, shall be punished for a first offense by a fine of Five Hundred Dollars ($500.00) or by imprisonment; for a second offense by a fine of One Thousand Dollars ($1,000.00) and in addition thereto, the contract on which the violation has occurred shall be forfeited, and no such person or corporation shall be entitled to receive any sum nor shall any officer, agent or employee of the state pay the same or authorize its payment from the funds under his charge or control to any person or corporation for work done upon any contract, on which the contractor has been convicted or a second offense in violation of the provisions of this section.

The minimum wage rates established by the Industrial Commissioner, State of New York, for this contract are set forth herein above as part of “Instructions to Bidders, Section 21 “NYS Wage Rates”

## 12. QUALIFICATIONS FOR EMPLOYMENT

No person under the age of sixteen (16) years and no person currently serving sentence in a penal or correctional institution shall be employed to perform any work on the project under this contract. No person whose age or physical condition is such as to make his employment dangerous to his health or safety or to the health or safety of others, shall be employed to perform any work on this project; provided, however, that such restrictions shall not operate against the employment of physically handicapped persons, otherwise employable, where each person may be safely assigned to work which they can ably perform.

## 13. NONDISCRIMINATION

There shall be no discrimination because of race, creed, or color in the employment of persons for work under this contract, whether performed by the contractor or any subcontractor. Neither shall the contractor or subcontractor or any person acting on behalf of the contractor or subcontractor discriminate in any manner against or intimidate any employee hired for the performance of work under this contract on account of race, creed, or color.

## 14. PAYMENTS OF EMPLOYEES

The contractor and each of his subcontractors shall pay each of his employees engaged in work on the project under this contract in full (less deductions made mandatory by law) not less often than once each week. Certified payrolls shall be submitted to the Town Engineer before payment to the contractor is processed. Affidavit attesting to payment or amount owed to employees shall be submitted before payment to contractor is processed.

## 15. ESTIMATES AND PAYMENTS

Upon successful completion of all work, the contractor shall submit an invoice to the Town Engineer for approval. Upon approval by the Town Engineer, payment will be made to the contractor within thirty (30) calendar days provided the payment request is correct and complete.

(A) Monthly: At the end of each calendar month during the progress of the work, the Town Engineer shall make an approximate estimate of the work satisfactorily completed, based upon the prices set forth in the Form of Bid. In consideration of the work completed, the Town will pay or cause to be paid to the contractor the amount estimated by the Town Engineer as due him less five (5%) percent.

The making of any such estimate or payment made thereon shall not be taken or construed as an acceptance by the Town of any work so estimated and paid for. The five (5%) percent of the amount of the monthly estimate remaining unpaid will be retained by the Town as a guarantee that the contractor will faithfully and completely fulfill all obligations imposed by the contract and specifications, and against any damages caused the Town by reason of any failure on the part of the contractor to fulfill all conditions and obligations herein contained.

(B) Final Estimate: One month after the completion and acceptance of the work specified and contracted for, the Town Engineer will make a final estimate of all the work done. Thereafter, the Town will pay the full amount, less prior payments, less any amounts retained to complete the work according to the provisions of the specifications, less any money paid by the Town by reasons of said contractor having failed to carry out faithfully and completely all the obligations and requirements herein contained. Upon final settlement, according to the conditions herein specified and not until such settlement shall have been made, will the contractor be relieved from the obligations assumed in the contract.

(C) Measurement for Payment: The Town Engineer shall make due measurement of work completed during the progress of the work and his estimate shall be final and conclusive evidence of the amounts of work performed by the contractor under and by virtue of this agreement and shall be taken as full measure of compensation to be received by the contractor.

(D) No payments will be made for materials delivered to the site which have not been incorporated into the work.

## 16. ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE

The acceptance by the contractor of final payment shall be, and shall operate as a release to the Town from all claims and all liabilities to the contractor for all the things done or furnished in connection with this work and for every act and neglect of the Town and others relating to or arising out of, this work, excepting to the contractor's claims for interest upon the final payment, if this payment be improperly delayed. No payment, however, final or otherwise, shall operate to release the contractor or his sureties from any obligations under this contract or the performance bond or maintenance bond.

## 17. CONSTRUCTION REPORTS

The contractor shall submit to the Town Engineer prior to commencing any work under this contract, a detailed schedule and plan of operations indicating the manner in which the contractor proposes to prosecute the work and a time schedule therefor. Such schedules are not intended to bind the contractor to a predetermined plan or procedure, but rather to enable the Town Engineer to coordinate the work of the contractor with work required of and to be performed by others. The detailed schedule shall include a list of the subcontractors and material suppliers he proposes to use on the work.

## 18. INSPECTION AND TESTS

All material and workmanship shall be subject to inspection, examination and test by the Town Engineer, or his representative, at any time during the construction and at any and all places where manufacturing of materials used and/or construction is carried on.

If at any time before final acceptance of the entire work, the Town Engineer, or his representative, considers necessary or advisable an examination of any portion of the work already completed, by removing the same, the contractor shall upon request, furnish promptly all necessary facilities, labor and materials for such examination. If such work is found to be defective in any material respect, due to the fault of the contractor or any subcontractor, contractor shall be liable for the expense for such examination and of satisfactory reconstruction.

If, however, such approval and consent shall have been given and such work is found to meet the requirements of this contract, the contractor shall be recompensed for the expense of such examination and reconstruction in the manner herein provided for the payment of cost of extra work.

The selection of laboratories and/or agencies for the inspection and tests of supplies, materials or equipment shall be subject to the approval of or designated by the Town. Satisfactory documentary evidence that the material has passed the required inspection and tests must be furnished to the Town Engineer prior to the incorporation of the material in the work.

Any rejected work will be removed from the site of the project completely at the expense of the contractor.

## 19. PLANS AND SPECIFICATIONS: INTERPRETATIONS

The contractor shall keep at the site of the work one copy of the plans and specifications. Bidding of this contract shall be based on the information and data contained herein. Materials of construction and component installation shall conform to the general requirements of the specifications and details contained at the end of the specifications. The Town Engineer will provide plans and directions for specific drainage projects as projects arise. System configurations, arrangements, elevations, materials and methods are to be as directed by the Town Engineer on a specific project basis.

## 20. SUPERINTENDENCY BY CONTRACTOR

At the site of the work, the contractor shall give his constant, personal attention to the work or employee a construction superintendent or foreman who shall have full authority to act for the contractor. It is understood that such representative shall be acceptable to the town Engineer, or his representative, and shall be one who can be contained in that capacity for the particular job involved unless he ceases to be on the contractor's payroll. The contractor's superintendent and foreman must be able to read and speak the English language.

## 21. CONTRACTOR'S TITLE TO MATERIALS

No materials or supplies for the work shall be purchased by the contractor or any subcontractor subject to a chattel mortgage or under a conditional sale or other agreement by which an interest is retained by the seller. The contractor warrants that he has good title to all materials and supplies used by him in the work.

## 22. PROTECTION OF WORK, PERSONS AND PROPERTY

Precaution shall be exercised at all times for the proper protection of all persons, property and work the contractor shall give notice to the owners of utilities which may serve the area and request their assistance

in predetermining the location and depth of various pipes, conduits, manholes, and other underground facilities. The safety provisions of applicable laws and building and construction codes shall be observed. Machinery, equipment and all hazards shall be guarded or eliminated in accordance with the safety provisions of the manual of Accident Prevention in Construction published by the Associated General Contractors of America, to the extent that such provisions are not in contravention of applicable law. The contractor shall furnish entirely at his own expense any and all additional safety measures deemed necessary by the Town to adequately safeguard the traveling public.

**23. REPRESENTATIONS OF CONTRACTOR**

The contractor represents and warrants:

(A) That he is financially solvent and that he is experienced in, and competent to, perform the type of work involved under this contract and able to furnish the plant, materials, supplies and/or equipment to be furnished for the work; and

(B) That he is familiar with all federal, state and municipal law, ordinances and regulations which may in any way affect the work of those employed thereunder, including but not limited to any special acts relating to the work; and

(C) That such work required by these contract documents as is to be done by him can be satisfactorily constructed and used for the purpose for which is intended and that such construction will not injure any person or damage any property; and

(D) That he has carefully examined the specifications and project site and that from his own investigations he has satisfied himself as to the nature of the work, the character of equipment and other facilities needed for the performance of the work, and the general local conditions which may in any way affect the work or its performance.

**24. AUTHORITY OF THE ENGINEER**

In the performance of the work, the contractor shall abide by all orders and directions and requirements of the Town Engineer, or his representative, and shall perform work to the satisfaction of the Town Engineer, or his representative, at such time and places, by such methods, and in such manner and sequence as he may require. The Town Engineer, or his representative, shall determine the amount, quality, acceptability, and fitness of all parts of the work, shall interpret the plans, specifications, contract documents and any extra work orders and shall decide all other questions in connection with the work. Upon request, the Town Engineer, or his representative, shall confirm in writing any oral orders, directions, requirements or determinations. The enumeration herein or elsewhere in the contract documents of particular instance in which the opinion, judgment, discretion or determination of the Town Engineer, or his representative, shall control or in which work shall be performed to his satisfaction or subject to his approval or inspection, shall not imply that only matters similar to those enumerated shall be so governed and performed, but without exception all the work shall be governed and so performed.

**25. CHANGES AND ALTERATIONS**

The Town Engineer reserves the right to make alterations in locations, line, grade, plan, form or dimensions of the work, or any part thereof, either before or after the commencement of construction. If such alteration diminishes the amount of work to be done, no claim for damages or anticipated profits will be warranted on the work which may be dispensed with. If such alterations increase the amount of work, such increases shall be paid for according to the quantity of work actually done and at the prices for such work as contained in the schedule of prices.

## 26. CORRECTION OF WORK

All work and all materials whether incorporated into the work or not, all processes of manufacture and all methods of construction shall be at all times and places subject to the inspection of the Town Engineer, or his representative, who shall be the final judge of quality, materials, processes of manufacture and methods of construction suitable for the purpose for which they are used. Should they fail to meet his approval, they shall be forthwith reconstructed, made good and replaced and/or corrected as the case may be, by the contractor, at his own expense.

If, in the opinion of the Town Engineer, or his representative, it is not desirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the contract documents, the compensation to be paid to the contractor thereunder shall be reduced by such amount as in the judgment of the Town Engineer, or his representative, shall be equitable. The contractor expressly warrants that his work shall be free from any defects in materials or workmanship and agrees to correct any defects which may appear within one year following the final completion of the work. Neither the acceptance of the completed work nor payment therefor shall operate to release the contractor or his sureties from any obligations under or upon this contract or the performance bond.

## 27. WEATHER CONDITIONS

In the event of temporary suspension of work or during inclement weather or whenever the Town Engineer, or his representative, shall direct, the contractor will, and will cause his subcontractor to sufficiently protect his and their work and materials against damage or injury from the weather. If, in the opinion of the Town Engineer, or his representative, any work or material shall have been damaged or injured by reason of failure on the part of the contractor or any of his subcontractors to protect his or their work, such work and materials shall be removed and replaced at the expense of the contractor.

## 28. THE TOWN'S RIGHT TO WITHHOLD PAYMENTS

The Town may withhold from the contractor so much of any approved payments due him as may, in the judgment of the Town be necessary:

(A) To assure the payment of just claims then due and unpaid of any persons supplying labor or materials for the work;

(B) To protect the Town from loss due to defective work not remedied; or

(C) To protect the Town from loss due to injury to persons or damage to the work or property of other contractors or subcontractors or others, caused by the act or neglect of the contractor or any of his subcontractors. The Town shall have the right, as agent for the contractor, to apply such amounts so withheld in such manner as the town may deem proper to satisfy such claims or to secure such protection. Such applications of such money shall be deemed payments for the account of the contractor.

## 29. THE TOWN'S RIGHT TO TERMINATE CONTRACT

The Town of Riverhead may terminate this contract if:

(A) the contractor shall be adjudged bankrupt or make an assignment for the benefit of creditors; or

(B) a receiver or liquidator shall be appointed for the contractor for any of his property and shall not be dismissed within 20 days after such appointment, or the proceedings in connection therewith shall not be stayed on appeal within the said 20 days; or

(C) the contractor shall refuse or fail, after notice or warning from the Town Engineer, or his representative, to supply enough properly skilled workmen or proper materials to the job; or

(D) the contractor shall refuse or fail to prosecute the work or any part thereof with such diligence as will insure its completion within the period herein specified (or any duly authorized extension thereof) or shall fail to complete the work within said period; or

(E) the contractor shall fail to make prompt payments to persons supplying labor or materials for the work; or

(F) the contractor shall fail or refuse to regard laws, ordinances or the instruction of the Town Engineer, or his representative or otherwise be guilty of a substantial violation of any provisions of this contract.

Upon the determination by the Town of Riverhead to terminate this contract, and in any such event, the Town, without prejudice to any other rights or remedy it may have, may give seven (7) days notice to the contractor, terminate the employment of the contractor and his rights to proceed with as to the entire work or (or at the option of the Town) as to any portion thereof as to which delay shall have occurred, and may take possessions of the work and complete the work by contract, secondary contractor or otherwise, as the Town may deem appropriate. In such case, the contractor will not be entitled to receive any further payment until the work is finished. If the unpaid balance of the compensation to be paid to the contractor thereunder shall exceed the expense of so completing the work (including compensation for additional managerial, administrative and inspection services and any damages for delay), such excess shall be paid to the contractor. If such expense shall exceed such unpaid balance, the contractor and his sureties shall be liable to the Town for such excess. If the right of the contractor to proceed with the work is so terminated, the Town may take possession of and utilize in completing the work, such materials, appliances, supplies, plant and equipment as may be on the site of the work and necessary thereof.

## 30. CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

If the work shall be stopped by order of the court or other public authority for a period of three (3) months without act or fault of the contractor or any of his agents, servants, employees or subcontractors, the contractor may, upon ten (10) days notice to the town, discontinue his performance of the work and/or terminate the contract; in which event, the liability of the Town immediately preceding (Paragraph 31), the contractor shall not be obligated to pay to the Town any excess of the expense of completing the work over the unpaid balance of the compensation to be paid to the contractor thereunder.

## 31. RESPONSIBILITY FOR WORK

The contractor agrees to be responsible for the entire work embraced in this contract until its completion and final acceptance by the Town of Riverhead. The contractor further agrees that any imperfect and/or damaged work that may be discovered at any time before the completion and acceptance of work shall be removed and/or replaced in conformity with the requirements of this contract without charge to the Town. Such removal and replacement will be performed as soon as practicable following receipt of written notice from the Town Engineer that the work is imperfect and/or damaged. The contractor further agrees that the inspection of the work by the Town Engineer of his or her designee shall not relieve him of any obligation to do sound and reliable work. Furthermore, such inspection and/or partial payment for work shall not preclude the Town Engineer from requiring removal and/or replacement at a later time. Neither shall such inspection or partial payment be deemed to be acceptance of any work.

## 32. USE OF PREMISES AND REMOVAL OF DEBRIS

The contractor expressly undertakes at his own expense:

(A) To store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any of his subcontractors;

(B) To frequently clean up all refuse, rubbish, scrap materials and debris caused by the operations to the end that at all times, the site of the work shall present a neat, orderly and workmanlike appearance;

(C) Before final payment hereunder to remove all surplus material, temporary structures, plants of any descriptions and debris of every nature resulting from his operations.

## 33. SUITS OF LAW

The contractor shall indemnify and save harmless the Town and its employees from and against all suits, claims, demands or actions for any injury sustained or alleged to be sustained by any party or parties in connection with the construction of the work or any part thereof, or any commission or omission of the contractor, his employees or agents of any subcontractor, and in case of any such action shall be brought against the Town, the contractor shall immediately take charge of and defend the same at his own cost and expense.

## 34. POWER OF THE CONTRACTOR TO ACT IN AN EMERGENCY

In case of an emergency which threatens loss or injury to property and/or safety of life, the contractor will be permitted to act as he sees fit without previous instructions from the Town Engineer, or his representative. He shall notify the Town Engineer, or his representative thereof immediately and any compensation claimed by the contractor due to extra work made necessary because of his acts in such emergency shall be submitted to the town Engineer, or his representative, for approval.

Where the contractor has not taken action but has notified the Town Engineer, or his representative, of an emergency indicating injury to persons or damage to adjoining property or to the work being accomplished under this contract, then upon authorization from the Town Engineer, or his representative to prevent such threatened injury or damage, he shall act as instructed by the Town Engineer, or his representative. The amount of reimbursement claimed by the contractor on account of any such action shall be determined in the manner provided herein for the payment of extra work.

## 35. PROVISION REQUIRED BY LAW DEEMED INSERTED

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

## 36. SUBLETTING – SUCCESSOR AND ASSIGNS

The contractor shall not sublet any part of the work under this contract nor assign any money due him hereunder without first obtaining the written consent of the town. This contract shall insure the benefit of and shall be binding upon the parties hereunder and upon their respective successors and assigns, but neither party shall assign or transfer his interest herein in whole or in part without consent of the other.

## 37. GENERAL MUNICIPAL LAW CLAUSE

Pursuant to the provisions of Section 103-a of the General Municipal Law, in the event that the bidder or any member, partner, director or officer of the bidder, should refuse, when called before a grand jury to testify concerning any transaction or contract had with the state, any political subdivision thereof, a public authority or any public department, agency or official of the state or of any political subdivision thereof or of a public authority, to sign a waiver of immunity against subsequent criminal prosecution or to answer any relevant question concerning such transaction or contract, such person, and any firm, partnership, or corporation of which he is a member, partner, director or officer shall be disqualified from thereafter selling to or submitting bids to or receiving awards from or entering into any contracts with any municipal corporation or any public department, agency or official thereof for goods, work or services for a period of five (5) years after such refusal, and any and all contracts made with any municipal corporation or any public department, agency or official thereof on or after the first day of July, 1959, by such person, and by any firm, partnership or corporation of which he is a member, partner, director or officer may be canceled or terminated by the municipal corporation without incurring any penalty or damages on account of such corporation for goods delivered or work done prior to the cancellation or termination shall be paid.

## 38. CONTRACTOR'S INSURANCE

The contractor shall not commence any work until he has obtained, and had approved by the Town, all the insurance required under this contract as enumerated herein:

Workers' Compensation Insurance
Public Liability and Property Damage Insurance
Contractor's Protective Liability and Property Damage Insurance
Owner's Protective Public Liability and Property Damage Insurance
Automobile Public Liability and Property Damage Insurance

The contractor shall not permit any subcontractor to commence any operation on the site until satisfactory proof of carriage of the above-required insurance has been posted with and approved by the Town.

(A) Workers' Compensation Insurance: The contractor shall take out and maintain, during the life of this contract, Workers' Compensation Insurance for all his employees employed at the site of the project, and in case of any of the work being sublet, the contractor shall require all subcontractors similarly to provide Workers' Compensation Insurance for all the latter's employees unless such employees are covered by the protection afforded by the contractor. Limits: statutory for Workers' Compensation, One Million Dollars ($1,000,000) Employers Liability.

(B) Public Liability and Property Damage Insurance: The contractor shall take out and maintain during the life of this contract such Public Liability and Property Damage Insurance as shall protect him or any subcontractor performing work covered by this contract from claims for damages for personal injury including accidental death as well as from claims for property damage which may arise from operations under this contract, whether such operations be completed by the contractor or by any subcontractor, or by anyone directly or indirectly employed by either of them, and the amounts of such insurance shall be as follows:

Public Liability Insurance in an amount not less than One Million Dollars ($1,000,000) combined single limit for bodily injuries, including wrongful death, and property damage. The Town of Riverhead must be named as an additional insured.

(C) Liability and Property Damage Insurance: the above policies for Public Liability and Property Damage Insurance must be so written as to include Contractor's Protective Liability and Property

Damage Insurance to protect the contractor against claims arising from the operations of any subcontractor. The Town of Riverhead shall be named as additional insured.

(D) Owner's Protective Public Liability and Property Damage Insurance: The contractor shall furnish to the Town, with respect to the operations he or any of his subcontractors perform, a regular Protective Public Liability Insurance policy for, and in behalf of the Town, providing for a limit of not less than One Million Dollars ($1,000,000) for all damages arising out of bodily injuries to, or death of, one person and subject to that limit for each person, a total limit of One Million Dollars ($1,000,000) for all damages arising out of bodily injuries to, or death of, two or more persons in any one accident; and regular Protective Property Damage Insurance providing for a limit of not less than One Million Dollars ($1,000,000) for damages arising out of injury to, or destruction of, property during the liability of the Town. The coverage provided under this policy must not be affected if the Town performs work in connection with the project either for or in cooperation with the contractor or as an aid thereto whether the same be a part of the contract or separate therefrom, by means of its own employees or agents, or if the Town directs or supervises the work to be performed by the contractor.

(E) Automobile Public Liability and Property Damage Insurance: The contractor shall take out and maintain during the life of the contract such Automobile Public Liability and Property Damage Insurance as shall protect him and any subcontractor performing work covered by this contract from claims for damages for personal injury, including accidental death as well as form claims for property damage which may arise from operations under this contract, whether such operations be by himself or by a subcontractor or by anyone directly or indirectly employed by either of them and the amounts of such insurance shall be as follows:

Automobile Public Liability Insurance in an amount not less than One Million Dollars ($1,000,000) combined single limit for bodily injuries, including wrongful death, and property damage. The Town of Riverhead must be named as an additional insured.

Automobile Property Damage Insurance in an amount of not less than One Million Dollars ($1,000,000) for damages on account of any accident and in an amount of not less than One Million Dollars ($1,000,000) for damages on account of all accidents.

**38A. HOLD HARMLESS CLAUSE**

To the fullest extent permitted by law, the contractor shall indemnify and hold harmless the Owner and their agents and employees from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from the performance of the work, provided that any such claim, damage, loss or expense (i) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) including the loss of use resulting therefrom and (ii) is caused in whole or in part by any negligent act or omission of the contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in the paragraph.

**39. CLAIMS AGAINST TOWN OFFICIALS AND EMPLOYEES**

The Contractor expressly agrees and represents that the contractor shall make no claim and shall bring no action pursuant to any federal or state laws, including, but not limited to 42 U.S.C. § 1983, against any Town official or employee in his/her individual or personal capacity for any act, omission, or statement made or done relating to, or arising out of, this contract and expressly waives its rights to bring such a claim pursuant to any federal or state laws, including, but not limited to 42 U.S.C. § 1983.

## 40. PROOF OF CARRIAGE OF INSURANCE

The contractor shall furnish the Town with certificates of each insurer insuring the contractor under this contract except with respect to subdivision “D”. In respect to this paragraph, the contractor shall furnish the Town with the original insurance policy.

Both certificates, as furnished, and the insurance policy, as required, shall bear the policy numbers, the expiration date of the policy and the limits of liability thereunder. Both the certificates and the policy shall be endorsed to provide the Town with any notice of cancellation at least five (5) days prior to the actual date of such cancellation.

The insurance company utilized must have a minimum AM Best Rating of “A-VII”.

## 41. TERM OF CONTRACT

The term of this contract shall be until the completion date set by the Notice to Proceed and the length of contract time (calendar days) as stipulated in the Proposal Form. The Town of Riverhead shall have the option of extending this contract in six-month intervals up to a maximum of one additional year when mutually agreed upon by the Town and the contractor.

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## 1. DEFINITIONS

The "General Conditions" are hereby made part of these Specifications and are attached herein.

Where any article of the General Conditions is supplemented hereby, the provisions of such article shall remain in effect. All the supplemental provisions shall be considered as added thereto. Where any such article is amended, voided or superseded thereby, the provisions of such article not so specifically amended, voided or superseded shall remain in effect.

Work, materials, plant, labor and other requirements of the General Conditions shall be furnished by the Contractor. No direct payment will be made for these General Conditions, and payment shall be deemed to be included in the Contract price or various items of the entire Contract.

The words "or approved equal", as hereinafter used, shall refer to the use of an equal product that has received prior approval by the Consulting Engineer for the District.

### 1.1. DEFINITION OF TERMS

Whenever the following words and expressions are used in the Specifications, it is understood that they have the meaning defined below:

Plans: All official drawings or reproductions of drawings pertaining to the work or to any structure connected therewith.

Specifications: The body of directions, requirements, descriptions, etc. contained in this document, together with all documents of any description and agreements made (or to be made) pertaining to the methods or manner of performing the work and/or to the quantities and quality of materials to be furnished and accepted under this contract.

Town: Town Board of the Town of Riverhead.

Engineer: H2M architects + engineers, Consulting Engineer for the District.

Contract: Collectively, the contract executed by the Town and the contract, Notice to Bidders, Instruction to Bidders, Proposal Form, Form of Bond, Conditions of Contract, General Conditions, Specifications, Addenda, Performance Bonds, and all supplemental agreements made or to be made.

Inspector: An authorized representative of the Town assigned to make any and all necessary inspections of the work performed and the materials furnished by the contractor.

Materials: Any approved materials acceptable to the Town and conforming to the requirements of these specifications.

Work: All of the work proposed to be accomplished at the site of the project, and all such other work as is in any manner required to accomplish the complete project. This includes all plant, labor, materials, supplies, equipment and other facilities and acts necessary or proper or incidental to the carrying out and completion of other terms of this contract. The term “work performed” shall be construed to include the materials delivered to and suitably stored at the site of the project.

## 2. STANDARDS OF WORKMANSHIP

The apparent silence of the specifications as to any detail or and apparent omission from them of a detailed description concerning any work to be done and materials to be furnished shall be regarded as

meaning that only the best general practice observed in the latest current construction work is to prevail and that only material and workmanship of first quality is to be used in this connection and all interpretations of these specifications shall be made upon this basis.

## 3. SAMPLES

The contractor shall furnish for approval, all samples as directed. The work shall be in accordance with approved samples. Samples shall be submitted in ample time so as to prevent delay in fabrication or ordering of materials, allowing for a reasonable time for the Town Engineer, or his representative, to consider the samples submitted, and is necessary, to permit a re-submission of samples to the Town, or its representative, until approval is given.

Work and material shall be furnished and executed in accordance with approved samples, in every aspect. Each sample shall be labeled, bearing material, name and quality, contractor's name, date and other pertinent data. Unless otherwise specified, samples shall be in duplicate and of adequate size to show quality, type, color, range and finish and texture of material. Materials shall not be ordered until approval is received in writing from the Town, or its representative.

## 4. MANUFACTURED MATERIALS

Where several materials are specified by name, the Town, or its representative, shall have the right, before execution of the contract, to require any and all bidders to state the materials upon which they based their bid. Where any materials are specified by name or trade name, or by catalog number of a company or companies, the contractor shall furnish the article mentioned unless approval of the Town, or itis representative, is obtained in writing for a substitution. Should the contractor desire to substitute other materials for one or more specified by name, he shall apply in writing for such permission and state credit or extra involved. He shall also provide supporting data and samples for the consideration of the Town.

Unless particularly specified otherwise, all manufactured articles, materials and equipment shall be applied, assembled, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer and including the necessary preparation to properly install the work. Where reference is made to manufacturer's directions, the contractor shall submit such directions to the Town or its representative as required.

The materials used in construction shall be disposed so as not to endanger the work, and so that full access may at all times be had to partly completed work and structures and they shall be so disposed as to cause no injury to those having access to the work or any of the units.

All labor shall be performed in the best and most workmanlike manner by mechanics skilled in their respective trades. Standards of work required throughout shall be of such grades as will bring first-class results only. The type of labor employed by the contractor shall be such as will insure the uninterrupted continuity of the entire work, without conflict of any kind.

## 5. LABORATORY

Laboratories shall be approved by the Town, or its representative, for testing the materials to be used under the contract. Where tests are made, two certified copies showing correctly the chemical analysis and physical tests shall be furnished to the Town, or its representative.

## 6. SHOP DRAWINGS

The contractor shall submit to the Town Engineer, electronic submittals in accordance with Section 013300 – Submittals and two (2) hard copies of all shop drawings and schedules and no work shall be fabricated until his approval has been given. All shop drawings submitted to the Town Engineer must bear the contractor's stamp of approval evidencing that the drawings have been checked.

The contractor will make any corrections in the drawings required by the Town or its representative and will file with the Town or its representative an electronic and two (2) corrected hard copies. Approval by the Town Engineer of such drawings or schedules shall not relieve the contractor from responsibility for:

(a) Errors of any sort in shop or setting drawings or schedules;
(b) Deviations from Plans and Specifications unless the contractor, at the time of submission of said drawings and schedules, has given notice to the Town or its representative of any such deviations.

## 7. PERMITS

7.1 Municipal: All work in connection with the installation of pipes or other underground structures of a like nature either within or without the limits of the highway, shall follow all the provisions as contained herein together with the provisions, as they apply, of the Highway Law, Road Openings, Section 149 and Section 198 of Town law, with all subsequent changes, additions or corrections thereto.

7.2 Suffolk County: All permits required for opening country roads and making connections with county drains will be obtained by the Contractor unless otherwise stated in the Contract documents. A copy of the permit must be kept on the job site at all times. The contractor will not be permitted to open any county road or make any connection to any county drain until he has obtained required permits.

7.3 State of New York: The contractor shall obtain all necessary New York State highway permits whenever the contract requires any work to be done within or upon existing state highway right-of-ways. These permits shall be obtained from the District Office in Hauppauge prior to the performance of the work. Upon application for the permit, the contractor will be required to supply the following:

(1) Three (3) copies of a sketch or print showing description and location of the proposed work. These prints will be supplied to the contractor by the Town or its representative.

(2) Contingent liability insurance for the state (in addition to his own liability insurance) shall be furnished in amounts and manner as required by the State of New York. The contingent protective liability and complete operations liability insurance policy to cover:

"The people of the State of New York and/or the Highway Superintendent covering liability arising with respect to all operations through highway permits by permitted by anyone acting by, through or for the permitted, including omissions and supervisor acts of the State", in the amount of personal injury (including death) and property damage as required.

7.4 State of New York Department of Conservation: The contractor shall obtain all necessary New York State DEC dewatering permits whenever the contract requires any work to be done requiring continuous dewatering facilities or a discharge quantity requiring said permit from the NYSDEC. These permits shall be obtained from the NYSDEC Regional Office in Stony Brook prior to the performance of the work. Upon application for the permit, the contractor will be required to supply the following:

(1) Copies of a sketch or print showing description and location of the proposed dewatering system. These prints will be supplied by the contractor to the Town or its representative.

## 8. CONTRACT DOCUMENTS

The Contract Documents include, but are not limited to, the General Conditions, General Specifications, Detailed Specifications, Plans, Proposal, Contract and other sections as either cited on the Index page(s) or actually included in the bound documents.

Each section of the Contract Documents is intended to be complementary to the other sections.

It is intended that they include all items of labor and materials and everything required and necessary to complete the work, even though some items of work or materials may not be particularly mentioned in every section or may have been inadvertently omitted from the Drawings or Specifications or both.

The contractor will be furnished with five (5) sets of Plans and Specifications giving all the details and dimensions necessary for carrying out the work. One copy of Plans and Specifications furnished to the contractor must be kept constantly at the site. Anything shown on the Plans and not mentioned in the Specifications or mentioned in the Specifications and not shown on the Plans and all work and materials necessary for the completion of the work according to the intent and meaning of the contract shall be furnished, performed and done as if the same were both mentioned in the Specifications and shown on the Drawings. Any conflict or inconsistency between the figures and scale of Drawings shall be submitted by the contractor to the Town Engineer, or his representative, whose decisions hereon shall be conclusive.

In the event the meaning of any portion of the Specifications or Drawings or any supplementary drawings or instructions of the Town Engineer, or his representative, is doubtful, the same shall be understood to call for the best type of construction, both as to materials and workmanship, which reasonably can be interpreted.

All materials and workmanship must be strictly in accordance with the Plans and Specifications.

Additional copies of Plans and Specifications, when requested will be furnished to the contractor at cost of reproduction.

The contractor shall furnish to each of the subcontractors and materials men such copies of the Contract Documents as may be required for their work.

## 9. ERRORS, OMISSIONS AND DISCREPANCIES

If any errors, omissions or discrepancies appear in the drawings, specifications or other documents, the contractor shall, within ten (10) days from receiving such drawings, specifications or documents, notify the Town, or its representative, in writing of such errors or omissions. In the event of the contractor's failing to give such notice, he will be held responsible for the results of any such errors or omissions and the cost of rectifying the same.

If, in the opinion of the contractor, any work is shown on drawings, or details, or is specified in such a manner as will make it impossible to produce a first class piece of work, or should discrepancies appear between the drawings and/or specifications, he shall refer the same to the Town, or its representative, for interpretation before proceeding with the work. If the contractor fails to make such references to the Town, or its representative, no excuse will thereafter be entertained for failure to carry out the work in a satisfactory manner as directed.

Should a conflict occur in or between the drawings and specifications and/or existing conditions, the contractor shall be deemed to have estimated on the more expensive way of doing the work, unless he shall have asked for and obtained the decision in writing from the Town Engineer or his representative, before the submission of bids, as to which method or materials will produce the results to the best interests of the Town.

## 10. TEMPORARY TOILET

The contractor shall provide and maintain a sanitary temporary toilet where directed by the Town, or its representative. The temporary toilet shall be enclosed, weatherproof and kept in a sanitary condition at all times. Upon removal of the temporary outside toilet, and all evidence of the toilet shall be removed from the site.

## 11. CUTTING, PATCHING AND DIGGING

The contractor shall do all cutting, fitting or patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors shown upon or reasonably implied by Drawings and Specifications for the completed structure, and he shall make good after them as the Town, or its representative may direct. Any cost caused by defective or ill-timed work shall be borne by the party responsible therefore.

The contractor shall not endanger any work by cutting, digging or otherwise, and shall not cut or alter the work of any other contractor except with the consent of the Town, or its representative.

## 12. PROPER METHOD OF WORK AND PROPER MATERIALS

The Town, or its representative, shall have the power in general to direct the order and sequence of the work, which shall be such as to permit the entire work under this contract to be begun and to proceed as rapidly as possible and such as to bring the several parts of the work to a successful completion at about the same time.

If at anytime before the commencement or during the progress of the work the materials and appliances used or to be used appear to the Town Engineer, or his representative, as insufficient or improper for assuring the quality of the work required, or the required rate of progress, he may order the contractor to increase their efficiency of to improve their character, and the failure of the Town, or its representative, to demand any increase of such efficiency or improvement shall not release the contractor from his obligation to secure the quality of work or the rate of progress specified.

During freezing or inclement weather, no work shall be done except such as can be done satisfactorily and in a manner to secure first class construction throughout. All work shall be done in such a manner as will properly protect and support existing permanent structures, pipe lines, etc.

## 13. INSPECTION

Inspectors shall be authorized to inspect all work done and materials furnished. Such inspections may extend to all parts of the work and to the preparation or manufacture of the materials to be used. In case of any dispute arising between the contractor and the inspector as to materials furnished or the manner of performing the work, the inspector shall have the authority to reject material or suspend the work until the question at issue shall be referred to and decided by the Town, or its representative. The inspector shall not be authorized to revoke, alter, enlarge, relax or release any requirements of these specifications; nor approve or accept any portion of the work; nor issue instruction contrary to the plans and specifications.

The inspector shall in no case act as foreman or perform other duties for the contractor or interfere with the management of the work by the latter.

Any advice which the inspector may give the contractor shall in no way be construed as binding the Town, or its representative, nor the Town in any way, nor releasing the contractor from the fulfillment of the terms of the contract.

The contractor shall be conclusively presumed to be acquainted with all existing conditions and to guarantee that all work and materials shall, upon final completion of the work, be turned over to the Town in a complete and perfect condition and the contractor shall be responsible for the proper care, maintenance and protection of all work and material until his entire contract is completed and all work and materials found in good condition and accepted. The contractor will be held responsible for the entire work until completed and accepted by the Town.

The contractor shall, at all times, provide the Town, and its representative, assistants and inspectors under him with necessary facilities for determining both on the job and at the places of manufacture, that all work being performed and all materials being manufactured are strictly in accordance with the contract.

Until acceptance of work by the Town, the contractor shall be responsible for all damages to the work including action of the elements or any other cause whatsoever. The contractor shall continuously and adequately protect the work against damage from any cause.

## 14. WAIVER

Neither the inspection by the Town, its representative or any part of their employees, nor any order, measurement or certificate by the Town, or its representative, nor any order by the Town for the payment of any money, nor any payment for or acceptance of, the whole or any part of the work by the Town, its representative, or the Town, nor any extension of time, nor any possession taken by the Town or its employees shall operate as a waiver of any provision of this contract or of any power herein reserved to the Town or any right to damages herein provided; nor shall any waiver of any breach of the contract constitute a waiver of any subsequent breach. Any remedy provided in this contract shall be construed as cumulative in addition to each and every remedy herein provided.

## 15. WATER AND ELECTRIC POWER

All water and electric power supply for construction purposes must be provided by the contractor. The cost shall be borne by the contractor.

## 16. MACHINERY AND EQUIPMENT

All machinery, equipment, trucks and vehicles used in the prosecution of the work or in connection therewith, shall at all times be in proper working condition.

The contractor shall be responsible for curtailing noise, smoke, fumes, or any other nuisance resulting from his operations. He shall, upon written notification from the Town, or its representative, make any repairs, replacements, adjustments, and additions and furnish mufflers when necessary to fulfill these requirements.

## 17. RIGHT TO USE WORK

The Town may enter upon and use the whole or any portion of the work, which may be in condition to use any time previous to its final acceptance by the Town. Such use shall not constitute or be evidence of

acceptance by the Town of the whole or any part of the material furnished or work performed under the contract.

**18. NOTICE OF WARNING**

If the contractor shall fail to make prompt payment to persons supplying labor or materials for the work, or refuse or fail to supply enough properly skilled workmen or proper materials or refuse or fail to prosecute the work or any part thereof with such diligence as will insure its completion within the period herein specified (or any duly authorized extension thereof) or fail to complete the work within said period or refuse or fail to regard laws, ordinances, codes, instruction of the Town, or its representative, then the Town shall forward by registered mail to the contractor, at the address given in the contract, a Notice of Warning, and in the event the contractor fails to comply with said Notice of Warning within five (5) days from receipt thereof, the Town shall have the right to terminate the contract.

**19. WARNING SIGNS**

Contractor shall provide and maintain proper luminous warning and detour signs where directed by the Town, or its representative.

Obstruction, such as stored materials, equipment and excavations shall be marked with no less than two (2) lights which shall be no more than four (4) feet apart.

All lights shall be kept burning from one-half hour before sunset until one-half hour after sunrise.

**20. ACCIDENT PREVENTION**

During the performance of the work, the contractor shall exercise all reasonable precautions for the protection of persons and property. The safety provisions of applicable laws, building and construction codes shall be observed. Machinery, equipment and all other physical hazards shall be guarded in accordance with the safety provisions of the Manual of Accident Prevention in Construction published by the Associated General Contractors of America to the extent that such provisions are not inconsistent with federal, state or municipal laws or regulations.

If any operation, practice or condition is deemed by the Town, or its representative, to be unsafe, he shall notify the contractor in writing to take corrective action. Where in the opinion of the Town, or its representative, any operation, practice or condition shall be promptly discontinued and before the affected part of the work is resumed, remedial action taken.

The Town reserves the right to remedy any neglect on the part of the contractor as regards the protection of the work which may come to its attention, after twenty-four (24) hours notice in writing; except that in cases of emergency, it shall have the right to remedy any neglect without notice, and in either case to deduct the cost of such remedy from money due the contractor.

Nothing in the foregoing paragraphs shall be construed as relieving the contractor from full responsibility at all times for safe prosecution of the work.

**21. DAMAGES**

The contractor shall pay and make good all losses or damages arising out of any cause connected with the contract and shall indemnify and save harmless the Town, and its representatives, from any and all claims and any and all liability or responsibility of every nature against the Town or any of its officers or agents, by reason of, or connected with the work or materials furnished under the contract and shall pay

all costs and expenses of every kind, character, and nature whatsoever, occurring upon or arising out of the contract.

All damages, direct or indirect, of whatever nature either resulting from the performance of or resulting to the work under this Contract during its progress from whatever cause shall be borne and sustained by the Contractor, and all work shall be solely at its risk until the date of the final payment request, as prepared by the Engineer.

## 22. MAINTENANCE OF TRAFFIC

All work under this contract is to be completed within the time indicated in the Contract Agreement or as extended by the Town. If in the meantime it should become necessary, because of the lateness of the season, or any other reason to stop work, the contractor shall at his own expense, open proper drainage ditches, erect temporary structures where necessary, prepare the roads so there will be minimum interference with traffic, set up and maintain a competent organization as directed by the Town, or its representative, to keep the highways in first class condition for traffic, and take every precaution to prevent any damage or unreasonable deterioration of the work during the time it is closed.

## 23. PROTECTION OF LAND MARKERS, TREES, SHRUBS, AND PROPERTY:

Wherever in the conduct of the work, a monument making a point of public or private survey is encountered or brought to view by excavation, the fact shall at once be communicated to the Town, or its representative. In no case shall the contractor remove the same until the location for resetting shall have been made by the Town, or its representative. All monuments or land markings exposed to view when the work is first undertaken shall be carefully preserved and the greatest care exercised to prevent injury to or disturbance of position of the monument.

The unit price of all items shall include the cost of restoring to its former condition any sidewalks or curbs, as well as restoring any trees, shrubs or lawns that may be damaged during this construction. No additional payment will be made.

The contractor is required at his own expense to obtain any and all permits for use of private property if he uses such property for storage, transportation or accomplishment of the work under the contract. Private property shall be cleaned up neatly, any damage repaired and premises restored to their original condition.

## 24. PROTECTION OF UTILITIES

The contractor shall familiarize himself with the existence of structures of municipal and other public service corporations on or adjoining the site of the work, for the area within the scope of the contractors work. The contractor shall be responsible for calling for a mark out given reasonable opportunity to work in cooperation with the owners of these utilities in the work, reconstruction or alteration of these structures. Such reconstruction and alteration shall be so conducted as to delay or interfere as little as practicable with the work of the contractor. Any additional cost of various items or work because of these utilities shall be included in the price bid for these items.

The Town, or its representative, shall direct the public utility corporations to shift or remove those utility structures that may be necessary to permit the contractor to carry out the work in accordance with the plans. The contractor shall not remove or cause to be removed, any structure or part of a structure owned by a public utility corporation without the approval of the Town, or its representative.

The contractor shall cooperate with the public utility corporation whose structures (aerial, surface or subsurface) are within the limits of or along the outside of the right-of-way, to make it possible for them to

maintain uninterrupted service. The contractor shall conduct his operations in such a way as not to delay or interfere as little as practicable with the work of the utility corporation.

## 25. APPROVAL OF SUBCONTRACTORS AND MATERIALS

Prior to commencing any work under this Contract, the Contractor shall submit to the Engineer for approval a list of all the subcontractors and material suppliers it proposes to use for this Contract.

No subcontractor or material supplier will be permitted to deliver materials or perform any work on this Contract until it has been approved by the Engineer.

## 26. INTERPRETATION OF DRAWINGS, ETC.

In the event of discrepancies between the Drawings and the Specifications, the following order shall be given preference when making interpretations:

a. Addenda (later dates to take precedence over earlier dates).

b. Drawings (schedules or notes to take precedence over other data shown on Drawings).

c. Detailed Specifications

d. General Specifications

On all Plans, Drawings, etc., the figure dimensions shall govern in the case of discrepancy between the scales and figures.

The Contractor shall take no advantage of any error or omission in the Plans, or of any discrepancy between the Plans and Specifications, and the Engineer shall make such corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the Specifications and of the Plans as construed by him, and his decision shall be final.

All work that may be called for in the Specifications and not shown on the Plans, or work shown on the Plans and not called for in the Specifications, shall be furnished and executed by the Contractor as if designated in both. Should any work or material be required which is not denoted in the Plans and Specifications, either directly or indirectly, but which is necessary for the proper carrying out of the intent thereof, it is understood and agreed that the same is implied and required, and that the Contractor shall perform such work and furnish such materials as if they were completely delineated and described.

## 27. ADDITIONAL WORK

Additional work, if required to be performed under this Contract, shall be in accordance with the applicable paragraphs of the Contract. The Town will be the sole judge as to whether such work was intended as part of the Contract or is in addition thereto.

## 28. OCCUPATIONAL SAFETY AND HEALTH ACT

The Contractor shall meet all standards of the Occupational Safety and Health Act of 1970 and subsequent revisions. This shall include, but not be limited to, the following areas:

Sanitation, noise, radiation, gases, vapors, fumes, mists, dust, illumination, ventilation, protective equipment, fire protection, waste disposal, electrical hazards, scaffolds and ladders, floor holes and wall openings, heavy equipment and permit-required confined spaces.

All specific requirements of the Act shall be adhered to.

## 29. SAFETY PROVISIONS

The Contractor shall take every precaution and shall provide such equipment and facilities as are necessary or required for the safety of its employees. In case of an accident, first aid shall be administered to any who may be injured in the progress of the work. In addition, the Contractor shall also be prepared for the removal to the hospital for treatment of any employee either seriously injured or ill.

## 30. SANITARY REGULATIONS

In addition to compliance with the Occupational Safety and Health Act, the Contractor shall erect and maintain necessary sanitary conveniences for the use of employees on the work. Such conveniences shall be properly secluded from observation, and their use shall be strictly enforced. Such sanitary conveniences shall be constructed in compliance with all laws, ordinances or regulations governing these facilities. The contents of same shall be removed with sufficient frequency to prevent nuisance, and disposed of to the satisfaction of the Town, or its representative.

The Contractor shall obey and enforce such other sanitary regulations and orders and shall take such precautions against infectious diseases as may be deemed necessary. In case any infectious diseases occur among its employees, it shall arrange for the immediate removal of the patient from the work and his isolation from all persons connected with the work.

The building of shanties or other structures for housing the workers, tools, machinery or supplies will be permitted only at approved places, and the sanitary condition of the grounds in and at such shanties or other structures must, at all times, be maintained in a satisfactory manner.

## 31. RESPONSIBILITY OF ENGINEER AND CONTRACTOR DURING CONSTRUCTION

The Engineer is responsible solely for the general and/or detailed inspection of the work being performed. Such inspection will be periodic and strictly to assure conformance of the Contractor with the Plans and Specifications, such that the end product will conform to the Plans and Specifications.

The Contractor is responsible for complete conformance to the Plans and Specifications, proper construction procedures, coordination with subcontractors, other contractors and utilities, and safe working conditions for its employees.

## 32. LABOR

All contractors and subcontractors employed upon the work shall and will be required to conform to the Labor Laws of the State of New York and the various acts amendatory and supplementary thereto; and to all other laws, ordinances and legal requirements applicable thereto.

All labor shall be performed in the best and most workmanlike manner by mechanics skilled in their respective trades. The standards of the work required throughout shall be of such grade as will bring results of the first class only.

## 33. CONTRACTOR'S REPRESENTATIVE

The Contractor, in case of his absence from the work, shall have a competent representative or foreman present, who shall follow without delay all instructions of the Engineer or his assistants in the prosecution

and completion of the work, in conformity with this Contract, and shall have full authority to supply labor and material immediately. The Contractor shall also have a competent representative available to receive telephone messages and provide a reasonable reply as soon as possible, but not later than 24 hours.

## 34. SCHEDULE OF VALUES (LUMP SUM CONTRACTS)

Before the first partial payment under this Contract becomes due, the Contractor shall prepare a Schedule of Values which totals the amount of the Contract and submit it to the Engineer for approval. The Contractor shall make such revisions as may be required to make this Schedule conform to the true value of work as jointly agreed upon by the Engineer and the Contractor. The Contractor shall submit the Schedule of Values in accordance with the requirements contained in Section 012973.

## 35. INCOMPETENT EMPLOYEES

The Contractor shall employ only competent, skilled and faithful workers to do the work. Upon request of the Engineer in writing, the Contractor shall suspend or discharge from the work any disobedient, disorderly or incompetent person or persons employed thereon, and will not again employ any person so suspended or discharged without the consent of the Engineer.

This requirement shall not be made on the basis of any claim for compensation or damages against the District or any of its officers or agents.

## 36. CLAIMS OR PROTESTS

If the Contractor considers any work required of it to be outside the requirements of the Contract or considers any record or ruling of the Engineers or Inspectors as unfair, it shall ask for written instructions or decisions immediately, and then file a written protest with the District against the same within five (5) days thereafter, or be considered as having accepted the record or ruling.

## 37. NOTIFICATION, INTERFERENCE AND INJURY TO UTILITIES

The Contractor shall cooperate in every way with the utility companies.

All excavation shall be done in compliance with Article 36 of the General Business Law and notices given as provided by CLS General Business Law, Part 761.

All conduits, water mains and gas mains encountered in the construction shall be properly and safely taken care of by the Contractor, who shall, upon encountering same, notify the public corporation to whom they belong in order that they may be changed in such a manner as not to interfere with the final construction.

In case any damage shall result to any service pipe for water or gas, or any private or public sewer or conduit, by reason of negligence on the part of the Contractor, the Contractor shall, without delay and at its own expense, repair the same to the satisfaction of the Engineer. If such repairs are not made promptly or satisfactorily, the District may have the repairs made by another Contractor or otherwise, and deduct the cost of same from any monies due or to become due the Contractor.

## 38. INFRINGEMENT OF PATENTS

The Contractor further agrees to hold itself responsible for any claims made against the District for any infringement of patents by the use of patented articles in any one phase of construction of the work and the completion of same, or any process connected with the work agreed to be performed under this Contract or of any materials used upon said work, and to save harmless and indemnify the District from all

costs, expenses and damages which the District shall be obliged to pay by reason of any infringement of patents used in the construction and completion of the work.

## 39. GUARANTEE/WARRANTY

The Contractor shall guarantee and warrant its work and that of its subcontractors against defects in workmanship and/or materials for a period of one (1) year from the date of the final payment request, as prepared by the Engineer, except as otherwise specified. Upon written notification from the Engineer, the Contractor shall repair, replace or reconstruct such defects to the satisfaction of the Engineer, at no cost to the District.

## 40. STANDARDIZATION

The Detailed and General Specifications indicate specific manufacturers and/or catalog numbers, etc., for the purpose of standardization within the District in order to minimize stockpiling of replacement parts.

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THE TOWN OF RIVERHEAD

**UPGRADE OF THE SEWAGE TREATMENT PLANT – ENTERPRISE PARK AT CALVERTON**

**MODULE NO. 1 (0.100 MGD)**

**_____CONSTRUCTION CONTRACT CASD1602___**

RIVERHEAD, NEW YORK

CONTRACT DATED_____, 201 ___ BY AND BETWEEN THE TOWN OF RIVERHEAD (HEREIN CALLED THE "OWNER" AND _____
(HEREIN CALLED THE "CONTRACTOR")

WITNESSETH, the Town and the Contractor, in consideration of the premises and of the mutual covenants, considerations and agreements contained, agree as follows:

The Notice to Bidders, Instruction to Bidders, Proposal Form, Form of Bond, Conditions of Contract, General Conditions, Specifications, Form of Contract, Construction Drawings, and Plans, together with any Addenda, shall form part of this contract, and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The Table of Contents, title, heading, headlines and marginal notes contained herein are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or case light upon the interpretation of the provisions to which they refer. Whenever the term "Contract Documents" is used, it shall mean and include the Notice to Bidders, Instruction to Bidders, Proposal Form, Form of Bond, Conditions of Contract, General Conditions, Specifications, Form of Contract, Construction Drawings, and any Addenda. In case of any conflict or inconsistency between the provisions of the conditions of this contract shall govern.

IN WITNESS THEROF, the parties hereunto set their hands and seals, and such of them as are corporations have caused these presents to be signed by their duly authorized officers.

NOTE: Quantities of any or all items may be increased, decreased or eliminated in their entirety at the option of the Town prior to or after award of the contract.
Total Bid

_____Dollars_____
(written in words) (figures)

ATTEST: TOWN OF RIVERHEAD

_____
SUPERVISOR

_____
CONTRACTOR

_____
TITLE

STATE OF NEW YORK

)

)ss:

COUNTY OF _____ )

On this _____ day of _____, 201____ before me personally appeared

_____.

(Town Supervisor)

The duly elected and qualified Supervisor of the Town of Riverhead, the corporation described in and which executed the foregoing instrument, to me known and known to me to be such Supervisor of the Town of Riverhead; and he being by me duly sworn did depose and say; that he is the Supervisor of the Town of Riverhead; that he resided at

_____, Suffolk County, New York; that he knows the corporation seal of said Town of Riverhead; that the seal affixed to said instrument is such corporate seal; and that he executed the same as such Supervisor for the purpose herein mentioned.

_____

Notary Public

Acknowledgement by Contractor if a PARTNERSHIP

STATE OF NEW YORK )

)ss:

COUNTY OF _____ )

On this _____ day of _____ 201 __, before me personally appeared _____ to me known to by the person described in and who executed the foregoing instrument and who acknowledged to me that he executed the same.

_____

Notary Public

Acknowledgement by Contractor if a PARTNERSHIP

STATE OF NEW YORK )

)ss:

COUNTY OF _____ )

On this _____ day of _____, 201 __ before me personally came _____ to be known and known to be to a member of

_____ the firm described in and which executed the foregoing instrument and he acknowledged to me that he subscribed the name of said firm thereto on behalf of said firm for the purpose therein mentioned.

_____

Notary Public

Acknowledgement by Contract if a CORPORATION

STATE OF NEW YORK )

)ss:

COUNTY OF _____ )

On this _____ day of _____, 201 __, before me personally came _____ to me known, who being by me duly sworn, did depose and say that he resides at _____of

_____in the state of _____ that he is the _____of the _____ the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said Corporation; and that he signed his name thereto by like order.

_____

Notary Public

NEW YORK STATE OF OPPORTUNITY. Environmental Facilities Corporation

**ANDREW M. CUOMO**
Governor

**SABRINA M. TY**
President and CEO

# Program Requirements and Bid Packet for Construction Contracts

(For Treatment Works and Drinking Water projects funded with NYS Clean Water State Revolving Fund or Drinking Water State Revolving Fund)

Effective October 1, 2017

**New York State Environmental Facilities Corporation**
**625 Broadway, Albany, NY 12207-2997**
**P: (518) 402-6924 F: (518) 402-7456**
**www.efc.ny.gov**

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# PART 1:

# HOW TO USE THIS DOCUMENT

The New York State Environmental Facilities Corporation ("EFC") implements the New York State Revolving Fund ("SRF") for both Clean Water and Drinking Water projects.

This Program Requirements and Bid Packet for Construction Contracts document contains (1) a brief description of New York State and federal program requirements for Contracts and Subcontracts funded in whole or part by the New York State Clean Water and Drinking Water SRFs, (2) required language for such Contracts and Subcontracts to satisfy the SRF program requirements, including required forms, and (3) guidance materials to assist entities in complying with these requirements.

**PROGRAM REQUIREMENTS**

The following requirements apply to Treatment Works and Drinking Water projects funded with the NYS Clean Water State Revolving Fund or Drinking Water State Revolving Fund:

- Participation of Minority- and Women-Owned Business Enterprises ("MWBE") and Equal Employment Opportunities ("EEO") pursuant to New York State Executive Law, Article 15-A and New York Code of Rules and Regulations, Title 5 (5 NYCRR) Parts 140-145 (Regulations of the Commissioner of Economic Development);

- Participation by Disadvantaged Business Enterprises ("DBE") in United States Environmental Protection Agency ("EPA") Programs pursuant to 40 Code of Federal Regulations (CFR) Part 33;

- Equal Employment Opportunities pursuant to Titles VI and VII of the Civil Rights Act of 1964, 40 CFR Part 7, and 41 CFR Part 60-1 Subpart A;

- Affirmative Action requirements pursuant to 41 CFR Part 60-4;

- Non-discrimination requirements pursuant to Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972;

- Encouragement of participation of Service-Disabled Veteran-Owned Business Enterprises ("SDVOB") in accordance with New York State Executive Law, Article 17-B and 9 NYCRR Part 252;

- American Iron and Steel ("AIS") pursuant to P.L. 113-76, Consolidated Appropriates Act, 2014; WRRDA Section 608 of the Federal Water Pollution Control Act, as revised;

- Davis Bacon Related Acts ("DBRA") consisting of the following: The Davis Bacon Act; Copeland Act (40 U.S.C. § 3145); Reorganization Plan No. 14; Department of Labor 29 CFR Parts 1, 3, and 5; Contract Work Hours and Safety Standards Act;

- Requirements regarding suspension and debarment pursuant to 2 CFR Part 180, 2 CFR Part 1532, 29 CFR § 5.12, State Labor Law § 220-b, and State Executive Law § 316; and,

- Restrictions on Lobbying pursuant to 40 CFR Part 34.

EFC or its authorized representatives, and other governmental entities as applicable, reserve the right to conduct occasional site inspections to monitor compliance with SRF program requirements.

**This document is not intended to be inclusive of all applicable legal requirements and there may be other legal requirements that need to be included in a particular Contract or Subcontract that are not set forth here. Accordingly, EFC recommends that Recipients, Contractors, Subcontractors, and any other involved entities consult their legal counsel for advice on compliance will all applicable laws, including but not limited to local laws. This document is not intended to be legal advice.**

Refer to the EFC website at www.efc.ny.gov for the latest version of the bid packet to ensure that the most recent forms and contract language are being used.

## REQUIRED CONTRACT LANGUAGE

Part 2 of this document is the Required Contract Language. All of the language in Part 2 must be inserted in to all Contracts and Subcontracts funded in whole or in part with SRF funds, in order for SRF Recipients, Contractors, and Subcontractors to comply with the above-listed SRF program requirements.

## GUIDANCE MATERIALS

Part 3 of this document sets forth Guidance Materials intended to assist SRF Recipients, Contractors, and Subcontractors in complying with the foregoing SRF program requirements, as applicable.

**The Guidance Materials are for informational purposes only and are not intended to be used as contractual language. Please do not incorporate the Guidance Materials into any Contracts or Subcontracts.**

## COMMONLY USED TERMS

The following commonly used terms are defined herein as follows:

**"Contract"** means an agreement between a Recipient and a Contractor.

**"Contractor"** means all bidders, prime contractors, Service Providers, and consultants as hereinafter defined, unless specifically referred to otherwise.

**"Service Provider"** means any individual or business enterprise that provides one or more of the following: legal, engineering, financial advisory, technical, or other professional services, supplies, commodities, equipment, materials, or travel.

**"Subcontract"** means an agreement between a Contractor and a Subcontractor.

**"Subcontractor"** means any individual or business enterprise that has an agreement, purchase order, or any other contractual arrangement with a Contractor.

**"Recipient"** means the party, other than EFC, to a grant agreement or a project finance agreement with EFC through which funds for the payment of amounts due thereunder are being paid in whole or in part.

**"State"** means the State of New York.

**"Treatment Works"** is defined in Clean Water Act (CWA) Section 212.

**"Nonpoint Source Projects"** and **"Green Infrastructure Projects"** are defined in CWA Section 319.

**"Estuary Management Program Project"** is defined in CWA Section 320.

# PART 2:

# REQUIRED CONTRACT LANGUAGE

## SECTION 1 REQUIREMENTS AND PROCEDURES FOR BUSINESS PARTICIPATION OPPORTUNITIES FOR FEDERAL DISADVANTAGED BUSINESS ENTERPRISES AND NEW YORK STATE CERTIFIED MINORITY- AND WOMEN-OWNED BUSINESS ENTERPRISES AND EQUAL EMPLOYMENT OPPORTUNITIES FOR MINORITY GROUP MEMBERS AND WOMEN

The Equal Employment Opportunities requirements of this section apply to Contracts and Subcontracts greater than $10,000, with the exception of the EEO Workforce Employment Utilization Report requirement which applies to construction Contracts and Subcontracts greater than $50,000.

The Minority- and Women- Owned Business Enterprises ("MWBE") and Disadvantaged Business Enterprises ("DBE") requirements of this section apply to Contractors and Subcontractors working pursuant to: (1) construction Contracts greater than $100,000; (2) Contracts that are initially under this threshold but subsequent change orders or contract amendments increase the Contract value to above $100,000; and, (3) change orders greater than $25,000.

Disregard this section if it does not apply to this Contract or Subcontract.

### I. General Provisions

A. Contractors and Subcontractors are required to comply with the following provisions:

1. New York State Executive Law Article 15-A and 5 NYCRR Parts 140-145 ("MWBE Regulations") for all State contracts as defined therein, with a value (1) in excess of $25,000 for labor, services (including, but not limited to, legal, financial, and other professional services), supplies, equipment, materials, or any combination of the foregoing, or (2) in excess of $100,000 for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon.
2. 40 CFR Part 33 ("Federal DBE Regulations") for contracts under EPA financial assistance agreements, as those terms are defined therein.
3. Title VI of the Civil Rights Act of 1964 and 40 CFR Part 7 ("Title VI") for any program or activity receiving federal financial assistance, as those terms are defined therein.
4. Title VII of the Civil Rights Act of 1964 and 41 CFR Part 60-1 Subpart A ("Title VII") for construction contracts related to any government programs providing federal financial assistance, as those terms are defined therein.
5. 41 CFR Part 60-4 ("Federal Affirmative Action Regulations") for federal or federally assisted construction contracts in excess of $10,000, as those terms are defined therein.
6. Section 504 of the Rehabilitation Act of 1973 ("Section 504") for any program or activity receiving federal financial assistance, as those terms are defined therein.
7. The Age Discrimination Act of 1975 ("Age Discrimination Act") for any program or activity receiving federal financial assistance, as those terms are defined therein.
8. Section 13 of the Federal Water Pollution Control Act ("Clean Water Act") Amendments of 1972 ("Section 13") for any program or activity receiving federal financial assistance under the Clean Water Act, as those terms are defined therein.

B. The Contractor and Subcontractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this Contract. The Contractor and Subcontractor shall carry out applicable requirements of 40 CFR Part 33 in the award and administration of contracts awarded under EPA

financial assistance agreements. Failure by the Contractor and Subcontractor to carry out these requirements is a material breach of this Contract which may result in the termination of this Contract or other legally available remedies.

C. Contractors and Subcontractors shall have instituted grievance procedures to assure the prompt and fair resolution of complaints when a violation of Title VI of the Civil Rights Act of 1964 or Title 40 CFR Part 7 is alleged.

D. Failure to comply with all of the requirements herein may result in a finding by the Recipient that the Contractor is non-responsive, non-responsible, and/or has breached the Contract, leading to the withholding of funds or such other actions, liquidated damages pursuant to subsection III(F) of this section, or enforcement proceedings as allowed by the Contract.

E. If any terms or provisions herein conflict with Executive Law Article 15-A, the MWBE Regulations, Federal DBE Regulations, Title VI, Title VII, or Federal Affirmative Action Regulations, such law and regulations shall supersede these requirements.

F. Upon request from the Recipient's Minority Business Officer ("MBO") and/or EFC, Contractor will provide complete responses to inquiries and all MWBE and EEO records available within a reasonable time. For purposes of this section, MBO means the duly authorized representative of the SRF Recipient for MWBE and EEO purposes.

**II. Equal Employment Opportunities (EEO)**

A. Each Contractor and Subcontractor performing work on the Contract shall undertake or continue existing EEO programs to ensure that minority group members and women are afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status. For these purposes, EEO shall apply in the areas of recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, or termination and rates of pay or other forms of compensation.

B. Contractor represents that it has submitted an EEO policy statement to Recipient prior to the execution of this Contract.

C. Contractor represents that it's EEO policy statement includes the following language:

1. The contractor will not discriminate on the basis of race, creed, color, national origin, sex, age, disability, or marital status against any employee or applicant for employment, will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination and will make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force on Contracts relating to SRF projects.
2. The Contractor shall state in all solicitations or advertisements for employees that, in the performance of the Contract relating to this SRF project, all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status.
3. The Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union, or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status, and that such union or representative will affirmatively cooperate in the implementation of the Contractor's obligations herein.

D. The Contractor will include the provisions of Subdivisions II(A), II(C), and II(E) in every Subcontract in such a manner that the requirements of these subdivisions will be binding upon each Subcontractor as to work in connection with the Contract.

E. The Contractor shall comply with the provisions of the Human Rights Law (Executive Law Article 15), Title VI, Title VII, the Federal Affirmative Action Regulations, Section 504, Age Discrimination

Act, Section 13, and all other State and Federal statutory and constitutional non-discrimination provisions. The Contractor and Subcontractors shall not discriminate against any employee or applicant for employment because of race, creed (religion), color, sex, national origin, sexual orientation, military status, age, disability, predisposing genetic characteristic, marital status or domestic violence victim status, and shall also follow the requirements of the Human Rights Law with regard to non-discrimination on the basis of prior criminal conviction and prior arrest.

F. The Contractor shall display the EEO poster at the project site in a visible location. The EEO poster can be found at https://www.dol.gov/ofccp/regs/compliance/posters/pdf/eeopost.pdf.

G. Required EEO Form

1. EEO Workforce Employment Utilization Report ("Workforce Report")

   a. The Contractor shall submit a Workforce Report, and shall require each of its Subcontractors to submit a Workforce Report to the Recipient, in such format as shall be required by EFC on a monthly basis during the term of the Contract.
   b. Separate forms shall be completed by Contractor and any Subcontractor.
   c. In limited instances, the Contractor may not be able to separate out the workforce utilized in the performance of the Contract from the Contractor's and/or Subcontractor's total workforce. When a separation can be made, the Contractor shall submit the Workforce Report and indicate that the information provided related to the actual workforce utilized on the Contract. When the workforce to be utilized on the Contract cannot be separated out from the Contractor's and/or Subcontractor's total workforce, the Contractor shall submit the Workforce Report and indicate that the information provided is the Contractor's total workforce during the subject time frame, not limited to work specifically under the Contract.

## III. Business Participation Opportunities for MWBEs

A. Contract Goals

1. For purposes of this Contract, EFC establishes the following goals for New York State certified MWBE participation ("MWBE Combined Goals") based on the current availability of qualified MBEs and WBEs.

| **Program** | MWBE Combined Goal* |
|---|---|
| CWSRF, DWSRF, & Green Innovation Grant Program | 20% |
| NYS Water Infrastructure Improvement Act Grants (also receiving EFC loan) | Clean Water project 23%<br>Drinking Water project 26% |
| NYS Intermunicipal Grants (also receiving EFC loan) | Clean Water project 24%<br>Drinking Water project 24% |
| NYS financial assistance only | 30% |
| Engineering Planning Grant | 30% |

*May be any combination of MBE and/or WBE participation

2. For purposes of providing meaningful participation by MWBEs on the Contract and achieving the MWBE Contract Goals established in Section III-A hereof, the Contractor should reference the directory of New York State Certified MBWEs found at the following internet address: https://ny.newnycontracts.com.
3. The Contractor understands that only sums paid to MWBEs for the performance of a commercially useful function, as that term is defined in 5 NYCRR § 140.1, may be applied towards achievement of applicable MWBE participation goals. For construction Contracts or Subcontracts, the portion of the Contract or Subcontract with an MWBE serving as a supplier, and so designated in ESD's Directory, that shall be deemed to represent the commercially useful function performed by the MWBE shall be 60% of the total value of

the Contract or Subcontract. The portion of a Contract or Subcontract with an MWBE serving as a broker, as denoted by NAICS code 425120, that shall be deemed to represent the commercially useful function performed by the MWBE shall be the monetary value for fees, or the markup percentage, charged by the MWBE.

4. Where MWBE Contract Goals have been established herein, pursuant to 5 NYCRR § 142.8, the Contractor must document "good faith efforts" to provide meaningful participation by MWBEs as Subcontractors or suppliers in the performance of the Contract.
5. In accordance with Section 316-a of Article 15-A and 5 NYCRR § 142.13, the Contractor acknowledges that if it is found to have willfully and intentionally failed to comply with the MWBE participation goals set forth in the Contract, such a finding constitutes a breach of Contract and the Contractor shall be liable to the Recipient for liquidated or other appropriate damages, as set forth herein.

B. MWBE Utilization Plan

1. The Contractor represents and warrants that Contractor has submitted an MWBE Utilization Plan to the Recipient prior to the execution of this Contract.
2. The Contractor agrees to use such MWBE Utilization Plan for the performance of MWBEs on the Contract pursuant to the prescribed MWBE goals set forth in Section III-A of this section.
3. The Contractor further agrees that a failure to submit and/or use such MWBE Utilization Plan shall constitute a material breach of the terms of the Contract. Upon the occurrence of such a material breach, the Recipient shall be entitled to any remedy provided herein, including but not limited to, a finding that the Contractor is not responsive.
4. Contractor must report any changes to the Utilization Plan after Contract award and during the term of the Contract to the Recipient's MBO. Contractor shall indicate the changes to the MBO in the next Monthly MWBE Contractor Compliance Report after the changes occurred. At EFC's discretion, an updated MWBE Utilization Plan form and good faith effort documentation may be required to be submitted. When a Utilization Plan is revised due to execution of a change order, the change order should be submitted to the MBO with the revised Utilization Plan.
5. The Contractor shall submit copies of all fully executed subcontracts, agreements, and purchase orders that are referred to in the MWBE Utilization Plan to the MBO within 30 days of their execution.

C. Requests for Waiver

1. If the Contractor, after making good faith efforts, is unable to comply with MWBE goals, the Contractor may submit a Request for Waiver to the Recipient documenting good faith efforts by the Contractor to meet such goals. If the documentation included with the waiver request is complete, the Recipient shall forward the request to EFC for evaluation, and EFC will issue a written notice of acceptance or denial within twenty (20) days of receipt.
2. If the Recipient, upon review of the MWBE Utilization Plan and updated Quarterly MWBE Contractor Compliance Reports determines that the Contractor is failing or refusing to comply with the MWBE Contract Goals and no waiver has been issued in regards to such non-compliance, the Recipient may issue a notice of deficiency to the Contractor. The Contractor must respond to the notice of deficiency within seven (7) business days of receipt. Such response may include a request for partial or total waiver of MWBE Contract Goals.

D. Monthly MWBE Contractor Compliance Report ("Monthly MWBE Report")

The Contractor agrees to submit a report to the Recipient by the third business day following the end of each month over the term of this Contract documenting the payments made and the progress towards achievement of the MWBE goals of the Contract. The Monthly MWBE Report must be supplemented with proof of payment by the Contractor to its Subcontractors (e.g., copies of both sides of a cancelled check) and proof that Subcontractors have been paid within 30 days of receipt of payment from the Recipient. The final Monthly MWBE Report must reflect all Utilization Plan

revisions and change orders.

E. Required Federal DBE Forms

1. EPA Form 6100-3 - DBE Subcontractor Performance Form
   Contractor represents that it has submitted the Form 6100-3 to all of its Subcontractors, all of its Subcontractors have completed the form, and that Contractor submitted such completed forms to Recipient with its bid submission.
2. EPA Form 6100-4 - DBE Subcontractor Utilization Form
   Contractor represents that it has completed the Form 6100-4 and submitted such completed form to Recipient with its bid submission.
3. EPA Form 6100-2 - DBE Subcontractor Participation Form
   Contractor represents that it has distributed a Form 6100-2 to its MWBE Subcontractors for completion prior to execution of this Contract.

F. Liquidated Damages - MWBE Participation

In accordance with Section 316-a of Article 15-A and 5 NYCRR §142.13, if it has been determined by the Recipient or EFC that the Contractor has willfully and intentionally failed to comply with the MWBE participation goals, the Contractor shall be obligated to pay to Recipient liquidated damages or other appropriate damages, as specified herein and as determined by the Recipient or EFC.

Liquidated damages shall be calculated as an amount not to exceed the difference between:

1. All sums identified for payment to MWBEs had the Contractor achieved the approved MWBE participation goals; and,
2. All sums actually paid to MWBEs for work performed or materials supplied under this Contract.

The Recipient and EFC reserve the right to impose a lesser amount of liquidated damages than the amount calculated above based on the circumstances surrounding the Contractor's non-compliance.

In the event a determination has been made by the Recipient or EFC which requires the payment of damages identified herein and such identified sums have not been withheld, Contractor shall pay such damages to the Recipient within sixty (60) days after they are assessed unless prior to the expiration of such sixtieth day, the Contractor has filed a complaint with the Empire State Development Corporation – Division of Minority and Women's Business Development ("ESD") pursuant to Subdivision 8 of Section 313 of the Executive Law in which event the damages shall be payable if the Director of ESD renders a decision in favor of the Recipient.

## SECTION 2 PARTICIPATION OPPORTUNITIES FOR NEW YORK STATE CERTIFIED SERVICE-DISABLED VETERAN-OWNED BUSINESSES

New York State Executive Law Article 17-B and 9 NYCRR Part 252 provide for more meaningful participation in public procurement by certified Service-Disabled Veteran-Owned Businesses ("SDVOBs"), thereby further integrating such businesses into New York State's economy. EFC recognizes the need to promote the employment of service-disabled veterans and to ensure that certified service-disabled veteran-owned businesses have opportunities for maximum feasible participation in the performance of EFC contracts.

In recognition of the service and sacrifices made by service-disabled veterans and in recognition of their economic activity in doing business in New York State, Contractors are strongly encouraged and expected to consider SDVOBs in the fulfillment of the requirements of the Contract. Such participation may be as Subcontractors or suppliers, as protégés, or in other partnering or supporting roles.

Contractor is encouraged to make good faith efforts to promote and assist in the participation of SDVOBs

on the Contract for the provision of services and materials. The directory of New York State Certified SDVOBs can be viewed at: http://ogs.ny.gov/Core/SDVOBA.asp

Contractor is encouraged to contact the Office of General Services' Division of Service-Disabled Veteran's Business Development at 518-474-2015 or VeteransDevelopment@ogs.ny.gov to discuss methods of maximizing participation by SDVOBs on the Contract.

# SECTION 3 AMERICAN IRON AND STEEL (AIS) REQUIREMENT

The requirements of this section apply to (1) all construction Contracts and Subcontracts for DWSRF projects and CWSRF treatment works projects and (2) all contracts for the purchase of iron and steel products for a DWSRF project or CWSRF treatment works project. Disregard this section if it does not apply to this Contract or Subcontract.

The Contractor acknowledges to and for the benefit of the Recipient of the Clean Water State Revolving Fund ("CWSRF") or the Drinking Water State Revolving Fund ("DWSRF") financial assistance that the Contractor understands the goods and services under this Agreement are being funded with monies made available by the New York State Environmental Facilities Corporation ("EFC") through the CWSRF or the DWSRF and that such funding is subject to certain statutory restrictions requiring that certain iron and steel products used in the project be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Contractor pursuant to this Agreement.

The Contractor hereby represents and warrants that:

(a) the Contractor has reviewed and understands the American Iron and Steel Requirement,
(b) all of the iron and steel products covered by the American Iron and Steel Requirement used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and
(c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Recipient.

Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Recipient to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Recipient resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the EFC or any damages owed to the EFC by the Recipient). While the Contractor has no direct contractual privity with the EFC, as a lender to the Recipient for the funding of this project, the Recipient and the Contractor agree that the EFC is a third-party beneficiary and neither this paragraph, nor any other provision of this Agreement necessary to give this paragraph force or effect, shall be amended or waived without the prior written consent of the EFC.

# SECTION 4 DAVIS-BACON (DB) PREVAILING WAGE REQUIREMENTS

The requirements of this section apply to all construction Contracts and Subcontracts greater than $2000 for either DWSRF projects or CWSRF treatment works projects. Disregard this section if it does not apply to this Contract or Subcontract.

**For Contracts in Excess of $2,000:**

1. Minimum Wages

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a

part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis–Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (1)(ii) of this section) and the Davis–Bacon poster (WH–1321) shall be posted at all times by the Contractor and its Subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. The Davis-Bacon poster (WH-1321) can be found at https://www.dol.gov/whd/regs/compliance/posters/davis.htm. Wage determinations may be obtained from the US Department of Labor's website, www.dol.gov.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the Contract shall be classified in conformance with the wage determination. The contracting officer shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

1. The work to be performed by the classification requested is not performed by a classification in the wage determination;
2. The classification is utilized in the area by the construction industry; and,
3. The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

(C) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (1) (ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this Contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the Contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly

cash equivalent thereof.

(iv) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program *provided* that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis–Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding. The Recipient shall upon its own action or upon written request of the EPA Award Official or an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this Contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis–Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any Subcontractor the full amount of wages required by the Contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the Contract, the Recipient may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis–Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR § 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis–Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The Contractor shall submit weekly for each week in which any Contract work is performed a copy of all payrolls to the Recipient. Such documentation shall be available on request of EFC or EPA. As to each payroll copy received, the Recipient shall provide written confirmation in a form satisfactory to EFC indicating whether or not the project is in compliance with the requirements of 29 CFR § 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR § 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/whd/forms/index.htm or its successor site. The prime Contractor is responsible for the submission of copies of payrolls by all Subcontractors. Contractors and Subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the Recipient, for transmission to EFC, EPA if requested by EPA, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of

compliance with prevailing wage requirements. It is not a violation of this section for a prime Contractor to require a Subcontractor to provide addresses and social security numbers to the prime Contractor for its own records, without weekly submission to the Recipient (or the applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or Subcontractor or his or her agent who pays or supervises the payment of the persons employed under the Contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR § 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR § 5.5 (a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the Contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the Contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the Contractor or Subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The Contractor or Subcontractor shall make the records required under paragraph (3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the Recipient, EFC, EPA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or Subcontractor fails to submit the required records or to make them available, the Recipient, EFC, or EPA may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR § 5.12.

4. Apprentices and trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates

(expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or Subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR § 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

5. Compliance with Copeland Act Requirements. The Contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this Contract.

6. Subcontracts. The Contractor or Subcontractor shall insert in any Subcontracts the clauses contained in 29 CFR § 5.5(a)(1) through (10) and such other clauses as the Recipient may by appropriate instructions require, and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any Subcontractor or lower tier subcontractor with all the Contract clauses in 29 CFR § 5.5.

7. Contract Termination: Debarment. A breach of the contract clauses in 29 CFR § 5.5 may be grounds for termination of the Contract, and for debarment as a Contractor and a Subcontractor as provided in 29 CFR § 5.12.

8. Compliance with Davis–Bacon and Related Act requirements. All rulings and interpretations of the Davis–Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this Contract.

9. Disputes Concerning Labor Standards. Disputes arising out of the labor standards provisions of this Contract shall not be subject to the general disputes clause of this Contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6,

and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its Subcontractors) and the Recipient, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. § 1001.

**For Contracts in Excess of $100,000:**

1. Overtime requirements. No Contractor or Subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section the Contractor and any Subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and Subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of $25 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

3. Withholding for unpaid wages and liquidated damages. The Recipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any monies payable on account of work performed by the Contractor or Subcontractor under any such Contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or Subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

4. Subcontracts. The Contractor or Subcontractor shall insert in any Subcontracts the clauses set forth in paragraphs (1) through (4) of this section and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for compliance by any Subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

5. In any Contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR § 5.1, the Contractor or Subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the Contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the records to be maintained under this paragraph shall be made available by the Contractor or Subcontractor for inspection, copying, or transcription by authorized representatives of the Recipient and the Department of Labor, and the Contractor or Subcontractor will permit such representatives to interview employees during working hours on the job.

# SECTION 5 REQUIREMENTS REGARDING SUSPENSION AND DEBARMENT

The requirements of this section apply to all Contracts and Subcontracts.

Contractor and any Subcontractors shall comply with, Subpart C of 2 CFR Part 180 as implemented and supplemented by 2 CFR Part 1532. The Contractor is not a debarred or suspended party under 2 CFR

Part 180 or 2 CFR Part 1532, or 29 CFR § 5.12. Neither the Contractor nor any of its Subcontractors have contracted with, or will contract with, any debarred or suspended party under the foregoing regulations.

The Contractor and any Subcontractors have not been deemed ineligible to submit a bid on or be awarded a public contract or subcontract pursuant to Article 8 of the State Labor Law, specifically Labor Law § 220-b. In addition, neither the Contractor nor any Subcontractors have contracted with, or will contract with, any party that has been deemed ineligible to submit a bid on or be awarded a public contract or subcontract under Labor Law § 220-b.

In addition, the Contractor and any Subcontractors have not been deemed ineligible to submit a bid and have not contracted with and will not contract with any party that has been deemed ineligible to submit a bid under Executive Law § 316.

## SECTION 6 RESTRICTIONS ON LOBBYING

The requirements of this section apply to all Contracts and Subcontracts greater than $100,000. Disregard this section if it does not apply to this Contract or Subcontract.

The Contractor and any Subcontractor executing a Contract or Subcontract in excess of $100,000 agree to provide to the Recipient an executed Certification Regarding Lobbying pursuant to 40 CFR Part 34 (“Lobbying Certification”) in the form attached hereto as Attachment 9, consistent with the prescribed form provided in Appendix A to 40 CFR Part 34.

# PART 3:

# GUIDANCE MATERIALS

## APPLICABILITY OF PROGRAM REQUIREMENTS

This chart contains a listing of the SRF program requirements contained within this document, as well as the following details regarding each requirement: (1) its applicability, i.e., what types of contracts/subcontracts, particular monetary thresholds if applicable; (2) a section reference to the Required Contract Language that applies from Part 2; and (3) a section reference to the Guidance that applies from this Part.

| Requirement | Applicability | Section of Required Contract Language from Part 2 | Section of Appropriate Guidance from Part 3 |
|---|---|---|---|
| Minority- and Women- Owned Business Enterprises (MWBE) and Disadvantaged Business Enterprises (DBE) | Contractors and Subcontractors working pursuant to: (1) Construction Contracts greater than $100,000 (2) Contracts that are initially under this threshold but subsequent change orders or Contract amendments increase the Contract value above $100,000 (3) Change orders greater than $25,000 | 1 | 1 |
| Equal Employment Opportunities (EEO) | Contracts and Subcontracts greater than $10,000, with the exception of the EEO Workforce Employment Utilization Report requirement which applies to construction Contracts and Subcontracts greater than $50,000 | 1 | 1 |
| Service-Disabled Veteran-Owned Businesses (SDVOB) | Not required, but strongly encouraged | 2 | 2 |
| American Iron and Steel (AIS) | All construction Contracts and Subcontracts for DWSRF projects and CWSRF treatment works projects | 3 | 3 |
| Davis-Bacon (DB) Prevailing Wages | All construction Contracts and Subcontracts greater than $2000 for either DWSRF projects or CWSRF treatment works projects | 4 | 4 |
| Suspension and Debarment | All Contracts and Subcontracts | 5 | 5 |
| Restrictions on Lobbying | All Contracts and Subcontracts greater than $100,000 | 6 | 6 |

# SECTION 1 GUIDANCE FOR THE REQUIREMENTS AND PROCEDURES FOR BUSINESS PARTICIPATION OPPORTUNITIES FOR FEDERAL DISADVANTAGED BUSINESS ENTERPRISES AND NEW YORK STATE CERTIFIED MINORITY- AND WOMEN-OWNED BUSINESS ENTERPRISES AND EQUAL EMPLOYMENT OPPORTUNITIES FOR MINORITY GROUP MEMBERS AND WOMEN

## I. Summary of EEO, MWBE, and DBE Forms

A. Forms to be Submitted Prior to Contract Execution

1. **EEO Policy Statement**
   To be submitted by the Contractor to the Recipient's Minority Business Officer ("MBO") prior to Contract execution. The "MBO" refers to the duly authorized representative of the SRF Recipient for MWBE and EEO purposes. This form is attached hereto as Attachment 1. See Required Contract Language, Section 1(II).

2. **EPA Form 6100-3 – DBE Subcontractor Performance Form**
   To be submitted by the Contractor to the MBO with its bid submission. This form is attached hereto as Attachment 7. See Required Contract Language, Section 1(III)(E).

3. **EPA Form 6100-4 – DBE Subcontractor Utilization Form**
   To be submitted by the Contractor to the MBO with its bid submission. This form is attached hereto as Attachment 8. See Required Contract Language, Section 1(III)(E).

4. **EPA Form 6100-2 – DBE Subcontractor Participation Form**
   To be submitted by the Subcontractors to the MBO prior to Contract execution. The Contractor must provide the form to the Subcontractors for completion. The Contractor should also submit documentation (e.g., email, letter, certified mail receipt) to the MBO that the 6100-2 form was made available to the MWBE Subcontractors. This form is attached hereto as Attachment 6. See Required Contract Language, Section 1(III)(E).

5. **MWBE Utilization Plan**
   To be submitted by the Contractor to the MBO after the bid opening, but in no case more than ten (10) business days after the Contractor receives notice from the Recipient that the Contractor has submitted a low bid. This form is attached hereto as Attachment 4. See Required Contract Language, Section 1(III)(B).

B. Forms to be Submitted During the Term of the Contract

1. **EEO Workforce Employment Utilization Report ("Workforce Report")**
   To be submitted by the Contractor to the MBO on a monthly basis during the term of the Contract. An exemplar form with instructions is attached hereto as Attachment 2. The actual Excel fillable form for Contractors and Subcontractors to complete will be e-mailed to MBOs by EFC at the start of the Contract term. See Required Contract Language, Section 1(II)(G).
2. **Request for Partial or Total Waiver**
   If applicable, to be submitted by the Contractor to the MBO at any time during the term of the Contract, but not later than prior to the submission of a request for final payment on the Contract. This form is attached hereto as Attachment 5. See Required Contract Language, Section 1(III)(C).
3. **Monthly MWBE Contractor Compliance Report ("Monthly MWBE Report")**
   To be submitted by the Contractor to the MBO by the third business day following the end of each month over the term of the Contract. This form is attached hereto as Attachment 3. See Required Contract Language, Section 1(III)(D).

## II. Equal Employment Opportunities (EEO)

Pursuant to 41 CFR Part 60-4, the United States Department of Labor has established EEO goals for the employment of minorities and women. For federal and federally assisted construction Contractors, goals for minorities and females are established as a percentage participation rate. These goals are applicable to all of a Contractor's construction work sites (whether or not these sites are also the result of a federal Contract or are federally assisted). The goals are applicable to each nonexempt Contractor's total onsite construction workforce, regardless of whether or not part of that workforce is performing work on a federal, federally assisted or non-federally related project Contract or Subcontract. Contractors should apply to each work site the goal for the geographical area that each particular work site is located in. These goals, and further information, are available at:
https://www.dol.gov/ofccp/TAguides/TAC_FedContractors_JRF_QA_508c.pdf.

## III. Business Participation Opportunities for MWBEs

A. Contract Goals

The goals provided herein (Required Contract Language, Section 1(III)(A)) are effective as of October 1, 2017. MWBE participation goals for a contract will be based on the goals in place at the time of the execution date of each respective contract, unless otherwise specified. In certain instances, the goals may vary, such as with projects co-funded by EFC and other state/federal agencies. With some co-funded projects, EFC may defer to the MBE and WBE participation goals and program established by those agencies.

Please contact EFC if you have any questions about the applicable MWBE participation goals for your contract.

B. Good Faith Efforts

The Contractor must make good faith efforts to develop an adequate MWBE Utilization Plan and must continue such good faith efforts in order to meet applicable MWBE participation goals. The Contractor shall maintain documentation of good faith efforts to solicit participation of MWBE firms for SRF-funded projects. If a Contractor is unable to meet contract MWBE participation goals, and submits a Request for Waiver, documentation of such good faith efforts must accompany the request. See Required Contract Language, Section 1(III)(C).

Contractor should also continue good faith efforts to seek opportunities for MWBE participation during the life of the contract even if proposed goals have been achieved.

Examples of documentation of good faith efforts are set forth below:

- Information on the scope of work related to the contract, such as a copy of the schedule of values from the bid submission, and specific steps taken to reasonably structure the scope of work to break out tasks or equipment needs for the purpose of providing opportunities for subcontracting with, or obtaining supplies or services from, MBEs or WBEs.

- Printed screenshots of the directory of Certified Minority- and Women- Owned Business Enterprises (“MWBE directory”) on ESD’s website on a Statewide basis, if appropriate, for both MBEs and WBEs that provide the services or equipment necessary for the contract. Contact the MBO for assistance in performing a proper search including identifying a sufficient number of solicitations to show that good faith effort was made.

- Copies of timely solicitations and documentation (e.g., faxes and emails) that the Contractor offered relevant plans, specifications, or other related materials to MBE and WBE firms on ESD’s MWBE directory to participate in the work, with the responses.

- A log prepared by the Contractor in a sortable spreadsheet documenting the Contractor's solicitation of MBEs and WBEs for participation as Subcontractors or suppliers pursuant to a contract. The log should consist of the list of MBE and WBE firms solicited, their contact information, the type of work they were solicited to perform (or equipment to provide), how the solicitation was made (fax, phone, email) and the contact information, the contacts name and the outcome. If a bid was received, the bid price should also be included in the log. See a sample log format below:

| Date | M/WBE Type | Company | Scope of work | Contact Name | Phone/ Email | Solicitation Format | MWBE Response | Negotiation Required? | Selected? If not, Explain |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

If no response was received to an initial solicitation, at least one follow-up solicitation should be made in a different format than the first, e.g. fax followed by phone call. Any bids received from non-MWBE firms for the same areas MWBEs were solicited should also be tracked on the log.

- Copies of the EPA 6100-3 and 6100-4 forms that are required with the bid submission. A properly completed EPA 6100-3 form is good indication of a contact to an MWBE and their response to the contact. If solicitations do not result in obtaining sufficient participation of MWBE firms due to non-responsiveness, please contact the MBO or EFC MWBE representative for support.

- Copies of any advertisements of sufficient duration to effectively seek participation of certified MBE and WBEs timely published in appropriate general circulation, trade and MWBE oriented publications, together with listing and dates of publication of such advertisements. EFC recommends the use of the NYS Contract Reporter that is free to all Contractors - https://www.nyscr.ny.gov/. A log should be kept of the responses to the ads, similar to the log for MWBE firm solicitation and should include the non-MWBE firms that responded and the bid prices. Any negotiations should be documented in the log.

- Documents demonstrating that insufficient MBEs or WBEs are reasonably available to perform the work.

- A written demonstration that the Contractor offered to make up any inability to meet the project MWBE participation goals in other contracts and/or agreements performed by the Contractor on another SRF funded project.

- The date of pre-bid, pre-award, or other meetings scheduled by the Recipient, if any, and the contact information of any MBEs and WBEs who attended and are capable of performing work on the project.

- Any other information or documentation that demonstrates the Contractor conducted good faith efforts to provide opportunities for MWBE participation in their work. For instance, Prime Contractors and MBOs should develop a list of MWBE firms that have expressed interest in working on SRF-funded projects

- The use of certified DBE and small businesses certified through the US Small Business Administration (SBA) may be considered as a demonstration of Good Faith Efforts.

C. MWBE Utilization Plan

1. The MWBE Utilization Plan must be submitted to the Recipient's MBO after the bid opening, but in no case more than ten (10) business days after the Contractor receives notice from the Recipient that the Contractor has submitted a low bid.

2. The MBO will evaluate a completed MWBE Utilization Plan. If the MBO finds the Utilization Plan sufficient, it will be forwarded to EFC for review. If the MBO finds the Utilization Plan insufficient, the MBO will work with the Contractor to address deficiencies before submitting to EFC for review. A written notice of acceptance or deficiency will be issued by EFC within 20 business days of receipt of the Utilization Plan. Upon receipt of a notice of deficiency from either the MBO or EFC, the Contractor shall respond with a written remedy to such notice within seven (7) business days of receipt.
3. In coordination with the MBO, EFC will accept an MWBE Utilization Plan upon consideration of many factors, including the following:

    a. The MWBE Utilization Plan indicates that the proposed goals for the project will be achieved;
    b. A Contractor, who is a certified MBE or WBE, will be credited for up to 100% of the category of their certification. However, good faith efforts to seek participation in the other category are also required; and,
    c. Adequate documentation to demonstrate good faith efforts and/or support a specialty equipment/services waiver as described below in Section III(E).

4. EFC reserves the right to request additional information and/or documentation to support the adequacy of the MWBE Utilization Plan.
5. Within 10 days of EFC's acceptance of a MWBE Utilization Plan, EFC will post the approved Utilization Plan on the EFC website.
6. In coordination with the MBO, EFC may issue conditional acceptance of Utilization Plans pending submission of additional documentation that demonstrates there will be an increase in MWBE participation.

D. Eligibility for MWBE Participation Credit

1. To receive MWBE participation credit, Contractors or Subcontractors performing work that have been identified in an approved MWBE Utilization Plan must be certified as an MBE or WBE by ESD.
2. Prime Contractors may also include second or lower tier Subcontractors (Subcontractors hired by Subcontractors) on their MWBE Utilization Plan.
3. Credit for MWBE participation shall be granted only for MWBE firms performing a commercially useful business function according to custom and practice in the industry.
    a. Factors to be used in assessing whether an MWBE is performing a commercially useful function include:
        i. The amount of work subcontracted;
        ii. Industry practices;
        iii. Whether the amount the MWBE is to be paid under the contract is commensurate with the work it is to perform;
        iv. The credit claimed towards MWBE utilization goals for the performance of the work by the MWBE; and,
        v. Any other relevant factors.

    b. "Commercially useful functions" normally include:
        i. Providing technical assistance to a purchaser prior to a purchase, during installation, and after the supplies or equipment are placed in service;
        ii. Manufacturing or being the first tier below the manufacturer of supplies or equipment;
        iii. Providing functions other than merely accepting and referring requests for supplies or equipment to another party for direct shipment to a Contractor; or,
        iv. Being responsible for ordering, negotiating price, and determining quality and quantity of materials and supplies.
    c. For construction Contracts or Subcontracts, the following rules apply when calculating MWBE utilization:
        i. The portion of a Contract or Subcontract with an MWBE serving as a manufacturer that shall be deemed to represent the commercially useful

function performed by the MWBE shall be 100% of the total value of the Contract or Subcontract.

ii. the portion of a Contract or Subcontract with an MWBE serving as a supplier (as denoted by a NAICS code beginning with 423 or 424, or a NIGP code that does not begin with the number 9), and so designated in ESD's Directory, that shall be deemed to represent the commercially useful function performed by the MWBE shall be 60% of the total value of the Contract or Subcontract.

iii. the portion of a Contract or Subcontract with an MWBE serving as a broker (as denoted by NAICS code 425120) that shall be deemed to represent the commercially useful function performed by the MWBE shall be the monetary value for fees, or the markup percentage, charged by the MWBE.

4. No credit will be granted for MWBEs that do not perform a commercially useful function. An MWBE does not perform a commercially useful function if its role adds no substantive value and is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of participation.

E. Requests for Waiver

1. If the Contractor's application of good faith efforts does not result in the utilization of MWBE firms to achieve the aforementioned goals or a specialty equipment/service waiver is requested, the Contractor may request a full or partial waiver of MWBE participation goals by completing a Request for Waiver form, attaching appropriate documentation of good faith efforts, and submitting same to the MBO. See also Required Contract Language, Section 1(III)(C). Even if an MWBE waiver is granted, EEO information must still be submitted.
2. The MBO and EFC will review each waiver request based on the good faith effort criteria presented above and the documentation submitted with the waiver request. EFC will not issue any automatic waivers from MWBE responsibilities.
3. In cases where EFC accepts a full or partial waiver of MWBE participation goals, the waiver request will be posted to EFC's website.
4. Specialty Equipment/Service Waiver: A specialty equipment/service waiver may be granted in cases where:

    a. equipment is made by only one non-MWBE manufacturer,
    b. the technical specifications call for equipment that is not available through an MWBE supplier;
    c. the equipment is constructed on site by specially trained non-MWBE labor;
    d. the service is not available through an MWBE (such as work done by National Grid);
    e. the service is proprietary in nature (such as use of certain computer software necessary for control systems); or,
    f. the service cannot be subcontracted (such as litigation services).

    If the contract includes specialty equipment or services, and documentation is submitted demonstrating that there are no MWBE firms capable of completing this portion of the contract, the specialty amount of the contract may be deducted from the total contract amount to determine the MWBE Eligible Amount and the goals will be applied to the MWBE Eligible Amount. This determination is made at the discretion of the MBO and EFC.

    Example:
    $200,000 - $50,000 = $150,000
    (Contract) (Specialty equipment/service) (MWBE Eligible Amount)
    The MWBE goal is applied to the MWBE Eligible Amount.

    A request for this specialty equipment/service deduction can be completed by filling out a Request for Waiver form and submitting it to the MBO. The request must include a copy of the page from the contract where the equipment/ service is described and the cost of each item. For construction contracts, the schedule of values or bid tabulation sheet

should also be submitted. Additional documentation may be requested by the MBO or EFC.

### IV. Subcontractor's Responsibilities

Subcontractors should:

1. Maintain their MWBE certifications, and notify the Contractor and MBO of any change in their certification status.
2. Notify the Contractor of any MWBE Subcontractors they hire so they may be included on the Contractor's Utilization Plan.
3. Respond promptly to solicitation requests by completing and submitting bid information in a timely manner.
4. Maintain business records that should include, but not be limited to, contracts/agreements, records of receipts, correspondence, purchase orders, and canceled checks.
5. Complete and submit the EPA Form 6100-3 - DBE Subcontractor Performance Form to the Contractor prior to submission of the Contractor's bid to the Recipient.
6. Complete and return EPA Form 6100-2 - DBE Subcontractor Participation Form to the Recipient prior to Contractor's execution of the contract.
7. Ensure that a required EEO Policy Statement and applicable MWBE requirements are included in each subcontract.
8. Notify the MBO and EFC when contract problems arise, such as non-payment for services or when the Subcontractor is not employed as described in the MWBE Utilization Plan.

### V. Protests/Complaints

Contractors or Subcontractors who have any concerns, issues, or complaints regarding the implementation of the SRF MWBE & EEO Program, or wish to protest should do so in writing to the MBO and EFC. The MBO, in consultation with EFC, will review the circumstances described in the submission, investigate to develop additional information, if warranted, and determine whether action is required. If the Contractor or Subcontractor believes the issue has not been resolved to their satisfaction, they may appeal in writing to EFC for consideration.

### VI. Waste, Fraud and Abuse

Subcontractors, Contractors, or Recipients who know of or suspect any instances of waste, fraud, or abuse within the MWBE & EEO Program should notify the project MBO and EFC immediately. Additionally, suspected fraud activity should be reported to the USEPA – Office of Inspector General Hotline at (888) 546-8740, the New York State Office of Inspector General at (800) 367-4448, or the ESD Compliance Office at (212) 803-3266.

# SECTION 2 GUIDANCE FOR NEW YORK STATE CERTIFIED SERVICE-DISABLED VETERAN-OWNED BUSINESS ENTERPRISES ("SDVOB") PARTICIPATION OPPORTUNITIES

Contractor may contact the Office of General Services' Division of Service-Disabled Veteran's Business Development at 518-474-2015 or VeteransDevelopment@ogs.ny.gov to discuss methods of maximizing participation by SDVOBs on the Contract. The directory of New York State Certified SDVOBs can be viewed at: http://ogs.ny.gov/Core/SDVOBA.asp

Please contact EFC if you have any questions about utilizing SDVOBs on the Contract.

# SECTION 3 GUIDANCE FOR AMERICAN IRON AND STEEL ("AIS") REQUIREMENT

Since 2014, if a Recipient uses CWSRF or DWSRF financial assistance to fund all or a part of the construction, alteration, maintenance or repair a public water system or treatment works, the Recipient must use iron and steel products that are produced in the United States for the whole project.

The AIS requirement does not apply to:

1. a project for which engineering plans and specifications were submitted for review by the responsible State agency before January 17, 2014 and approved by that agency before April 15, 2014; or
2. a project funded by a financial assistance agreement with EFC that was signed before January 17, 2014.

The term "iron and steel products" means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, construction materials. For one of the listed products to be considered subject to the AIS requirement, it must be made of greater than 50% iron and steel, measured by material cost (with the exception of reinforced precast concrete products).

The term "produced in the United States" means that all manufacturing processes of the iron or steel, including application of coatings, take place in the United States, with the exception of metallurgical processes involving refinement of steel additives. All manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, fabricating and coating. Further, if a domestic iron and steel product is taken out of the US for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement and the material(s), if any, being applied as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-iron and steel components do not have to be of domestic origin.

The EPA may waive the AIS requirement for a treatment works project if:

1. applying the requirement would be inconsistent with the public interest;
2. iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
3. inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

A request for a waiver to use foreign iron or steel products must include adequate information for EPA's evaluation of the request, including:

1. A description of the foreign and domestic iron, steel, and/or manufactured goods;
2. Unit of measure;
3. Quantity;
4. Cost;
5. Time of delivery or availability;
6. Location of the project;
7. Name and address of the proposed supplier; and,
8. A detailed justification for use of foreign iron or steel products.

Requests for AIS waivers are to be submitted to EFC. Upon review, EFC will submit AIS waiver requests to EPA. When EPA receives a request for a waiver, EPA will publish the request and any accompanying material on EPA's official public Internet site, allowing informal public input on the request for at least 15 days before granting or denying the waiver request.

Additionally, EPA has the authority to issue waivers that are national in scope. National waivers may be for specific products or in the public's interest. These waivers can be found at EPA's website at: https://www.epa.gov/cwsrf/american-iron-and-steel-requirement-approved-national-waivers-0
The "De Minimis Waiver" is noteworthy. The waiver permits the use of iron and steel products when they occur in de minimis incidental components of DWSRF or CWSRF projects, as long as:

1. the funds used for the de minimis incidental components cumulatively comprise no more than 5% of the total cost of the materials used in a project; and,
2. the cost of an individual item does not exceed 1% of the total cost of the materials used in the project.

Items covered by the de minimis waiver are:

1. essential, but incidental to the construction;
2. incorporated into the physical structure of the project; and,
3. often low-cost and bought in bulk.

Examples of "de minimis" items include: washers, screws, nuts, bolts, fasteners, miscellaneous wire, corner bead, ancillary tubing, etc.

Examples of items that are NOT incidental and therefore are not considered "de minimis" include: process fittings, tees, elbows, flanges, brackets, valves, sewer or water pipes for distribution, treatment or storage tanks, large structural support systems, etc.

To use the de minimis waiver, Contractors should prepare a record in spreadsheet form that tracks the cost of all materials incorporated into the project. This spreadsheet can be either project specific or contract specific. If it is contract specific, a material tracking record for each construction contract should be prepared and items that are subject to the AIS de minimis waiver should be highlighted. There should be a clear calculation available to indicate that the cost of the de minimis iron and steel items is 5% or less of the total cost of all materials.

Additional information, guidance and Questions and Answers about the State Revolving Fund American Iron and Steel (AIS) requirement can be found at EPA's website: https://www.epa.gov/cwsrf/state-revolving-fund-american-iron-and-steel-ais-requirement

# SECTION 4 GUIDANCE FOR APPLICABLE LABOR STANDARDS

## I. Davis-Bacon Act

The Davis-Bacon Act requires Contractors and Subcontractors performing construction, alteration and repair work under Contracts in excess of $2,000 funded from SRF monies, to pay their laborers and mechanics not less than the prevailing wage and fringe benefits for the geographic location.

For purposes of this section, "State Recipient" means EFC.

A. Requirements for Recipients.

This guidance describes how Recipients assist EPA in meeting its Davis-Bacon (DB) responsibilities when DB applies to EPA awards of financial assistance under the Water Resources Reform and Development Act of 2014 (WRRDA) with respect to State Recipients and Recipients. Recipients with questions about when DB applies, obtaining the correct DB wage determinations, DB provisions, or compliance monitoring should contact the State Recipient. Recipients can also obtain guidance from DOL's web site at http://www.dol.gov/whd/

1. Applicability of the Davis- Bacon (DB) prevailing wage requirements. Under the Water Resources Reform and Development Act of 2014 (WRRDA), DB prevailing wage requirements apply to the construction, alteration, and repair of treatment works carried out in whole or in part with assistance made available by a State water pollution control revolving fund. If a Recipient encounters a unique situation at a site that presents uncertainties regarding DB applicability, the

Recipient must discuss the situation with the State Recipient before authorizing work on that site.

2. Obtaining Wage Determinations.

(a) Recipients must obtain the wage determination for the locality in which a covered activity subject to DB will take place prior to issuing requests for bids, proposals, quotes or other methods for soliciting contracts (solicitation) for activities subject to DB. These wage determinations must be incorporated into solicitations and any subsequent Contracts. Prime Contracts must contain a provision requiring that Subcontractors follow the wage determination incorporated into the prime Contract.

(i) While the solicitation remains open, the Recipient must monitor www.wdol.gov weekly to ensure that the wage determination contained in the solicitation remains current. Recipients must amend the solicitation if DOL issues a modification more than 10 days prior to the closing date (i.e. bid opening) for the solicitation. If DOL modifies or supersedes the applicable wage determination less than 10 days prior to the closing date, the Recipient may request a finding from the State Recipient that there is not a reasonable time to notify interested Contractors of the modification of the wage determination. The State Recipient will provide a report of its findings to the Recipient.

(ii) If the Recipient does not award the contract within 90 days of the closure of the solicitation, any modifications or supersedes DOL makes to the wage determination contained in the solicitation shall be effective unless the State Recipient, at the request of the Recipient, obtains an extension of the 90 day period from DOL pursuant to 29 CFR 1.6(c)(3)(iv). The Recipient shall monitor www.wdol.gov on a weekly basis if it does not award the Contract within 90 days of closure of the solicitation to ensure that wage determinations contained in the solicitation remain current.

(b) If the Recipient carries out activity subject to DB by issuing a task order, work assignment or similar instrument to an existing Contractor (ordering instrument) rather than by publishing a solicitation, the Recipient must insert the appropriate DOL wage determination from www.wdol.gov into the ordering instrument.

(c) Recipients must review all Subcontracts subject to DB entered into by prime Contractors to verify that the prime Contractor has required its Subcontractors to include the applicable wage determinations.

(d) As provided in 29 CFR 1.6(f), DOL may issue a revised wage determination applicable to a Recipient's Contract after the award of a Contract or the issuance of an ordering instrument if DOL determines that the Recipient has failed to incorporate a wage determination or has used a wage determination that clearly does not apply to the Contract or ordering instrument. If this occurs, the Recipient must either terminate the Contract or ordering instrument and issue a revised solicitation or ordering instrument or incorporate DOL's wage determination retroactive to the beginning of the Contract or ordering instrument by change order. The Recipient's Contractor must be compensated for any increases in wages resulting from the use of DOL's revised wage determination.

B. Additional requirements for Recipients that are not governmental entities

Recipients that are not governmental entities must submit their proposed DB wage determinations to the State Recipient for approval prior to including the wage determinations in any solicitation, Contract or issuing task orders, work assignments, or similar instruments to existing Contractors, as well as ordering instruments unless subsequently directed otherwise by the State Recipient award official as identified below.

Recipients must obtain proposed wage determinations for specific localities at www.wdol.gov. After the Recipient obtains its proposed wage determination, it must submit the wage determination to the State Recipient award official at: Timothy Burns, P.E., Director, Engineering and Program Management, New York State Environmental Facilities Corporation, at 518-402-7396 or at the following email address: Timothy.Burns@efc.ny.gov.

C. Compliance Verification

(a) The Recipient must periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that Contractors or Subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The Recipient must use Standard Form 1445 or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.

(b) The Recipient must establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by Contractors or Subcontractors and the duration of the Contract or Subcontract. Recipients must increase the frequency of the interviews if the initial interviews or other information indicates that there is a risk that the Contractor or Subcontractor is not complying with DB. Recipients must immediately conduct necessary interviews in response to an alleged violation of the prevailing wage requirements. All interviews must be conducted in confidence.

(c) The Recipient must periodically conduct spot checks of a representative sample of weekly payroll data to verify that Contractors or Subcontractors are paying the appropriate wage rates. The Recipient must establish and follow a spot check schedule based on its assessment of the risks of noncompliance with DB posed by Contractors or Subcontractors and the duration of the Contract or Subcontract. At a minimum, the Recipient must spot check payroll data within two weeks of each Contractor or Subcontractor's submission of its initial payroll data and two weeks prior to the completion date the Contract or Subcontract. Recipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the Contractor or Subcontractor is not complying with DB. In addition, during the examinations the Recipient must verify evidence of fringe benefit plans and payments thereunder by Contractors and Subcontractors who claim credit for fringe benefit contributions.

(d) The Recipient must periodically review Contractors' and Subcontractors' use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that Contractors and Subcontractors are not using disproportionate numbers of laborers, trainees and apprentices. These reviews must be conducted in accordance with the schedules for spot checks and interviews described in Item (b) and (c) immediately above.

(e) Upon the request of EFC, the Recipient must provide EFC with a written certification indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies from Contractors/Subcontractors for the specified week.

(f) Recipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at www.wdol.gov.

**II. Applicable State and Local Labor Standards**

Contractors and Subcontractors working under a public works contract subject to DBRA may also be subject to additional labor standards, including but not limited to prevailing wage requirements, under State and local laws. When preparing the bid for SRF project, the Contractor, and any Subcontractors, must use the higher of the prevailing federal, state, or applicable local wage rates paid to each trade.

**III. Responsibilities of Contractors and Subcontractors**

After execution of any SRF eligible Contracts, the Contractor and Subcontractor have the following responsibilities:

1. Post Davis Bacon Wage Poster and applicable federal, state, and local wages in a visible area at the construction site. This poster may be found on the EFC website under the Resource Library. (Refer to the attached required forms)
2. Make your employees available for wage interviews if necessary. Wage interviews must be conducted confidentially and using Labor Standard Interview Form (SF-1445). (Refer

to the attached required forms)

3. Use federal payroll form WH-347 and complete the certifications on the back. If another form is being used, inform the Recipient and obtain a determination that the form is equivalent to the federal form. (Refer to the attached required forms)
4. Pay the higher of applicable prevailing federal, state, or local wages, including benefits (fringe & holidays), to each trade and overtime not less than one and one-half times the basic rate of pay for hours in excess of forty hours on Contracts in excess of $100,000. The wage rates apply to Subcontractor trades as well.
5. Maintain proof of apprentice and trainee ratios for both Contractor and Subcontractor and certifications onsite.
6. Pay wages to your employees and your Subcontractors on a weekly basis. Ensure that your Subcontractors are paying their employees weekly.
7. Ensure that the Subcontracts contain the Davis Bacon contract language, the applicable federal, state, or local wage determinations and equal employment opportunity language. This language is provided in the Part 2: Required Contract Language. Federal wage determinations are available at www.wdol.gov.
8. Provide payroll forms and apprentice and trainee certifications to the Recipient for their records.
9. Report potential waste, fraud and abuse violations to the EPA Davis Bacon Contact and DOL Wages and Hours District Office found on their website. www.wdol.gov/. Any violations in payroll reporting or unpaid wages are subject to a daily monetary penalty.

## SECTION 5 GUIDANCE FOR REQUIREMENTS REGARDING SUSPENSION AND DEBARMENT

A list of debarred and suspended contractors, pursuant to 2 CFR Parts 180 and 1532 and 29 CFR § 5.12, is available on the US Department of Labor's website at https://www.sam.gov/portal/public/SAM/.

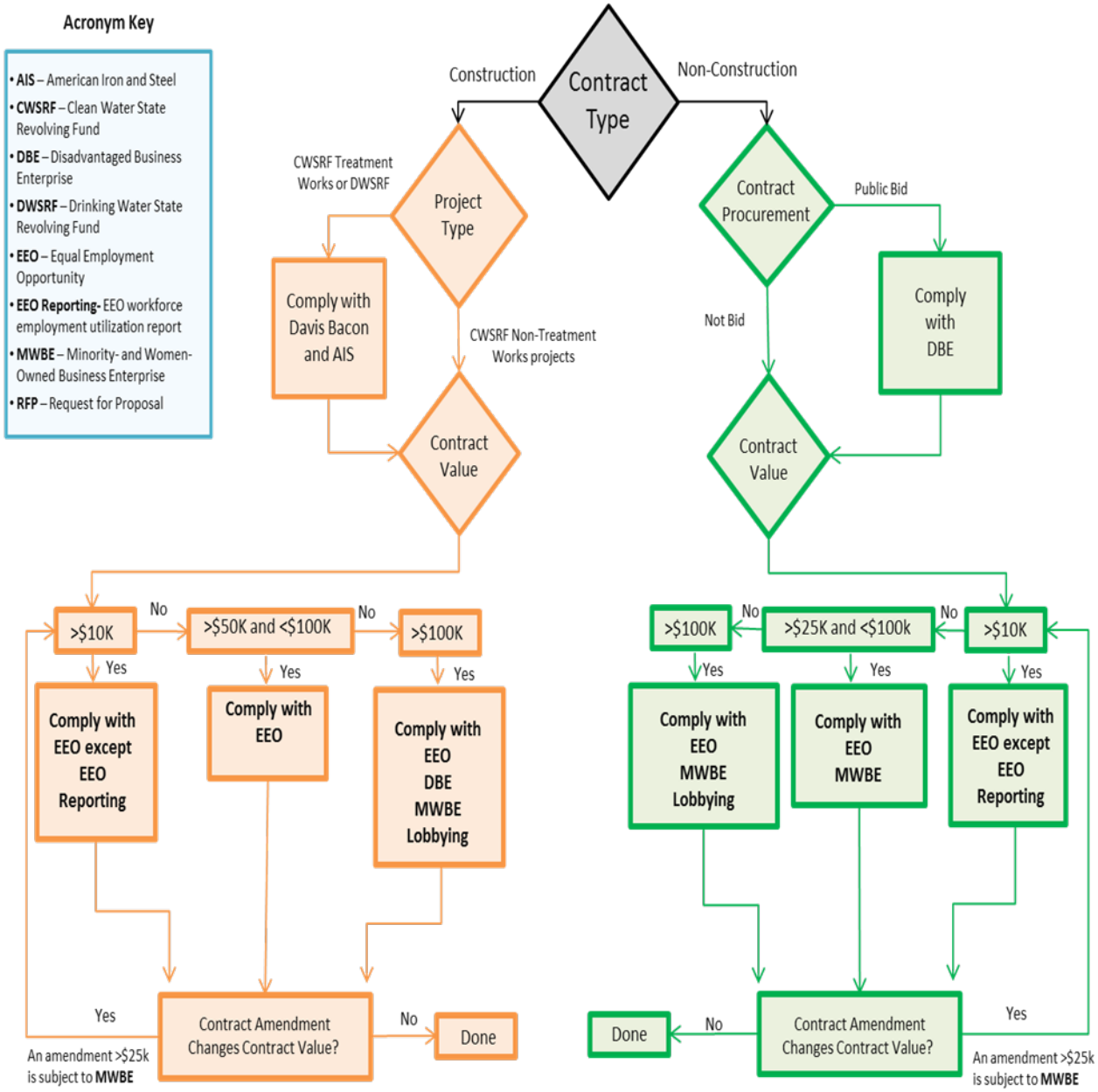
A list of contractors and subcontractors deemed ineligible to submit a bid on or be awarded a public contract or subcontract, pursuant to Article 8 of the State Labor Law, is available on the New York State Department of Labor's website at http://labor.ny.gov/workerprotection/publicwork/PDFs/debarred.pdf

A list of contractors deemed ineligible to submit a bid is maintained by Empire State Development's Division of Minority and Women's Business Development.

## SECTION 6 GUIDANCE FOR RESTRICTIONS ON LOBBYING

Each Contractor and any Subcontractor that has a Contract or Subcontract exceeding $100,000 shall provide to the Recipient a completed Certification Regarding Lobbying pursuant to 40 CFR Part 34 ("Lobbying Certification") in the form attached hereto as Attachment 9 consistent with the prescribed form provided in Appendix A to 40 CFR Part 34. The form provides a certification that the Contractor or Subcontractor will not expend appropriated federal funds to pay any person for influencing or attempting to influence an officer or employee of any agency, Member of Congress, officer or employee of Congress or any employee of any Member of Congress in accordance with the provisions of 40 CFR Part 34, and to maintain such certification for their own records. It is noted that disbursement of funds may be withheld until the Lobbying Certification form has been received by the Recipient.

# SECTION 7 PROGRAM CONTRACT REQUIREMENT DECISION TREE



# SECTION 8 SUMMARY OF CONTRACTOR REQUIREMENTS FOR SRF-FUNDED PROJECTS

Forms can be found as attachments to this document or online at www.efc.ny.gov

Forms should be submitted electronically via email or through EFC's dropbox

| | Refer to Part 3 Guidance Section |
|---|---|
| **To be submitted with this bid:** | |
| ☐ EEO Policy Statement | Section 1 |
| ☐ Documented Proof that EPA Form 6100-2 - DBE Subcontractor Participation Form was given to MWBE Subcontractors | Section 1 |
| ☐ EPA Form 6100-3 - DBE Subcontractor Performance Form | Section 1 |
| ☐ EPA Form 6100-4 - DBE Subcontractor Utilization Form | Section 1 |
| ☐ Lobbying Certification | Section 6 |
| ☐ AIS Contractor's Certification | Section 3 |
| **To be submitted prior to or upon Contract award:** | |
| ☐ Executed Contracts, Subcontracts, agreements, and purchase orders | |
| ☐ MWBE Utilization Plan and/or Waiver Request | Section 1 |
| **Tasks for construction start:** | |
| ☐ Ensure that all Subcontracts contain Part 2: Required Contract Language | |
| ☐ Post EEO Poster | Section 1 |
| ☐ Pay the higher of prevailing federal, state, or local wages including benefits | Section 4 |
| ☐ Post Davis Bacon Wage Poster AND Wage Rates | Section 4 |
| ☐ Use Federal Payroll Form (WH-347) | Section 4 |
| ☐ Obtain apprentice and trainee certifications | Section 4 |
| ☐ Obtain AIS Manufacturer's Certifications for all iron & steel products | Section 3 |
| **Ongoing documentation & tasks:** | |
| ☐ EEO Workforce Utilization Report | Section 1 |
| ☐ Submit Monthly MWBE Reports to MBO | Section 1 |
| ☐ Maintain weekly certified payrolls for all Prime & Subcontractors | Section 4 |
| ☐ Maintain proof of payments for MWBE Subcontractors | Section 1 |
| ☐ Maintain AIS Manufacturer's Certifications | Section 3 |

**Attachment 1**
**New York State Environmental Facilities Corporation**
**EQUAL EMPLOYMENT OPPORTUNITY POLICY STATEMENT**
NEW YORK STATE REVOLVING FUND (SRF)

I, _____, am the authorized representative of _____.
Name of Representative Name of Contractor/Service Provider
I hereby certify that _____ will abide by the equal employment
Name of Contractor/Service Provider
opportunity (EEO) policy statement provisions outlined below.

(i) The Contractor will not discriminate on the basis of race, creed, color, national origin, sex, age, disability, or marital status against any employee or applicant for employment, will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination and will make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force on Contracts relating to SRF projects.

(ii) The Contractor shall state in all solicitations or advertisements for employees that, in the performance of the Contract relating to this SRF project, all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status.

(iii) The Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union, or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status, and that such union or representative will affirmatively cooperate in the implementation of the Contractor's obligations herein.

(iv) The Contractor shall comply with the provisions of the Human Rights Law (Article 15 of the Executive Law), including those relating to non-discrimination on the basis of prior criminal conviction and prior arrest, and with all other State and federal statutory and constitutional non-discrimination provisions, including Titles VI and VII of the Civil Rights Act of 1964, 40 CFR Part 7, 41 CFR Part 60-1 Subpart A, 41 CFR Part 60-4, Section 504 of the Rehabilitation Act of 1973, and the Age Discrimination Act of 1975. The Contractor and Subcontractors shall not discriminate against any employee or applicant for employment because of race, creed (religion), color, sex, national origin, sexual orientation, military status, age, disability, predisposing genetic characteristic, marital status or domestic violence victim status.

(v) The Contractor will include the provisions of subdivisions (i) through (iv) in every Subcontract in such a manner that the requirements of these subdivisions will be binding upon each Subcontractor as to work in connection with the Contract.

X _____

Contractor/Service Provider Representative

# Attachment 2
# Instructions for Completing and Submitting the Equal Employment Opportunity Workforce Utilization Report

The Equal Employment Opportunity ("EEO") Workforce Utilization Report ("Report") is used by contractors and subcontractors to report the actual workforce utilized in the performance of the contract broken down by job title for a particular reporting period. When the workforce utilized in the performance of the contract can be separated out from the contractor's and/or subcontractor's total workforce, the contractor and/or subcontractor shall submit a Report of the workforce utilized on the contract. When the workforce to be utilized on the contract cannot be separated out from the contractor's and/or subcontractor's total workforce, information on the contractor's and/or subcontractor's total workforce shall be included in the Report.

**Instructions for Completing the Report**

1. **Reporting Entity.** Check off the appropriate box to indicate if the entity completing the Report is the contractor or a subcontractor.

2. **Federal Employer Identification Number ("FEIN").** Enter the FEIN assigned by the Internal Revenue Service ("IRS") to the contractor or subcontractor for which the Report has been prepared. If the contractor or subcontractor uses a social security number instead of a FEIN, leave this field blank. The contractors and subcontractors for recipients of a grant only (such as an Engineering Planning Grant (EPG), a Water Infrastructure Improvement Act (WIIA) grant, or an Intermunicipal Grant Program (IMG) grant) do not need to fill out this section of the Report.

3. **Name.** Enter the name of the contractor or subcontractor for which the Report has been prepared.

4. **Address.** Enter the address of the contractor or subcontractor for which the Report has been prepared.

5. **Contract Number.** Enter the number of contract that the Report applies to, if applicable.

6. **Reporting Period / Month.** Check off the box that corresponds to the applicable quarterly or monthly (not both) reporting period for this Report. The Report is to be submitted on a monthly basis for construction contracts, and a quarterly basis based on the calendar quarter for all other contracts, during the life of the contract.

7. **Workforce Identified in Report.** Check off the appropriate box to indicate if the workforce being reported is just for the contract or the contractor's or subcontractor's total workforce.

8. **Preparer's Name, Preparer's Title, Date.** Enter the name and title for the person completing the Report, enter the date upon which the Report was completed, and check the box accepting the name entered into the Report as the digital signature of the preparer.

9. **Occupation Classifications (SOC Major Group) and SOC Job Title.** First, enter the applicable Occupation Classification (SOC Major Group) so a dropdown menu appears under SOC Job Title. Choose the SOC Job Title that best describes the worker.

10. **EEO Job Title and SOC Job Code.** The EEO Job Title and the SOC Job Code will automatically populate in the spreadsheet based upon the Occupation Classifications (SOC Major Group) and SOC Job Title selected. Please do not modify the information populated in these fields.

11. **Race/Ethnic Identification**. Race/ethnic designations do not denote scientific definitions of anthropological origins. For the purposes of this Report, an employee must be included in the group to which he or she appears to belong, identifies with, or is regarded in the community as belonging. However, no person should be counted in more than one race/ethnic group. The race/ethnic categories for this Report are:

    - **WHITE** (not of Hispanic origin) all persons having origins in any of the original peoples of Europe, North Africa, or the Middle East.
    - **BLACK/AFRICAN AMERICAN** a person, not of Hispanic origin, who has origins in any of the black racial groups of the original peoples of Africa.
    - **HISPANIC/LATINO** a person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race.
    - **ASIAN, NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER** a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent or the Pacific Islands.
    - **NATIVE AMERICAN/ALASKAN NATIVE** a person having origins in any of the original peoples of North America, and who maintains cultural identification through tribal affiliation or community recognition.

12. **Number of Employees and Number of Hours.** Enter the number of employees and the total number of hours worked by such employees for each SOC Job Title under the columns corresponding to the gender and racial/ethnic groups with which the employees most closely identify.

13. **Total Compensation.** Enter the total compensation paid to all employees for each SOC Job Title, each gender, and each racial/ethnic group. Contractors and subcontractors should report only compensation for work on the contract paid to employees during the period covered by the Report. Compensation should include only sums which must be reported in Box 1 of IRS Form W-2. The contractors and subcontractors for recipients of a grant only (such as an EPG, a WIIA, or an IMG grant) do not need to fill out this section of the Report.

14. **For EFC Use Only.** This section is for EFC use only and does not need to be filled out by the contractor/subcontractor.

**Instructions for Submitting the Report**

The Report is to be submitted on a monthly basis for construction contracts, and a quarterly basis based on the calendar quarter for all other contracts, during the life of the contract.

EFC will provide a Report form in Excel format to the Recipient's Minority Business Officer ("MBO"). The Recipient's MBO is responsible for providing the Report form to all contractors. Each contractor is responsible for providing the Report form to all subcontractors.

Reports are to be submitted electronically in Excel format, using the Report form provided, within ten (10) days of the end of each month or quarter, whichever is applicable. For example, the January monthly Report for a construction contract is due by February 10th and the January – March quarterly Report for a non-construction contract is due by April 10th.

Once the Report form has been completed, each contractor/subcontractor must submit the Report form to EFC and the Recipient's MBO. The Report form must be submitted to EFC according to the following instructions:

1. Go to www.efc.ny.gov/eeoreporting.
2. Enter the requested information pursuant to the instructions on the page. Make sure to choose the correct applicable funding program (Clean Water State Revolving Fund (SRF), Drinking Water SRF, non-SRF Grant Only (e.g. EPG, WIIA, IMG)) and the correct reporting period (reporting

quarter for non-construction OR reporting month for construction). Enter the reporting period of the data, not the date it's submitted.

3. Submit your Report(s) pursuant to the instructions on the page.
4. If you are a contractor, use the naming convention provided by EFC (in the "For EFC Use Only" section of the Report form) for naming the file for upload (i.e., Funding Program – Project Number– Contractor short name (up to fifteen characters) – MWBE ID). The funding programs include CW (clean water SRF), DW (drinking water SRF), and GO (non-SRF grant only). If you are a subcontractor, use the naming convention provided by EFC and replace the contractor's short name with the first fifteen characters of the subcontractor's name, omitting any spaces or special characters.

**Questions**

If you have questions about or require assistance completing or submitting the Report, please contact EFC at mwbe@efc.ny.gov or 518-402-6924.

# NYSEFC EEO Workforce Utilization Report

Reporting Entity ☐ Contractor ☐ Subcontractor

FEIN

Contractor Name

Contractor Address

Contract Number

Reporting Period - Select One

| | |
|---|---|
| ☐ January 1 - March 31 | ☐ April 1 - June 30 |
| ☐ July 1 - September 30 | ☐ October 1 - December 31 |

Reporting Month - Select One

| | | | | |
|---|---|---|---|---|
| ☐ January | | ☐ February | | ☐ March |
| ☐ April | | ☐ May | | ☐ June |
| ☐ July | | ☐ August | | ☐ September |
| ☐ October | | ☐ November | | ☐ December |

Workforce Identified in Report

☐ Workforce Utilized in Performance of Contract
☐ Contractor/Subcontractor's Total Workforce

Preparer's Name:

Preparer's Title:

Date:

☐ By checking this box, I certify that I personally completed this document and I adopt the name typed above as my electronic signature under the NYS Electronic Signatures and Records Act, with like legal force and effect as if I had physically signed the document.

| Occupation Classifications (SOC Major Group) | SOC Job Title | EEO Job Title | SOC Job Code | Number of Employees and Hours Worked by Race/Ethnic Identification During Reporting Period | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | White | | | | | | Black/African American | | | | | | Hispanic/Latino | | | | | | Asian/Native Hawaiian or Other Pacific Islander | | | | | | Native American/Alaskan Native | | | | | |
| | | | | Male | | | Female | | | Male | | | Female | | | Male | | | Female | | | Male | | | Female | | | Male | | | Female | | |
| | | | | No. of Employees | No. of Hours | Total Compensation | No. of Employees | No. of Hours | Total Compensation | No. of Employees | No. of Hours | Total Compensation | No. of Employees | No. of Hours | Total Compensation | No. of Employees | No. of Hours | Total Compensation | No. of Employees | No. of Hours | Total Compensation | No. of Employees | No. of Hours | Total Compensation | No. of Employees | No. of Hours | Total Compensation | No. of Employees | No. of Hours | Total Compensation | No. of Employees | No. of Hours | Total Compensation |
| | | #N/A | #N/A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Attachment 3**
**New York State Environmental Facilities Corporation**
**Monthly Minority- & Women- Owned Business Enterprise (MWBE) Contractor Compliance Report**
**("Monthly MWBE Report")**

**Instructions:**

- Contractors are to complete the report in Word version and email to the Recipient's Minority Business Officer ("MBO") on a monthly basis.
- If you require additional pages, you may find them on EFC's website at www.efc.ny.gov.
- **All** MWBE Subcontractors for this contract **MUST** be listed on the form regardless of whether they were paid this month.
- Please save Report as "*MReport – (Project No). – (Municipality) – (Firm Name) – (Date)*" and send the Word version of this document.
- Proofs of payment in the amounts shown below must be transmitted to the MBO with the report.

| | | | | |
|---|---|---|---|---|
| Municipality: | County: | Contract ID: | Month: | Year: |
| Project No.: | GIGP/EPG No: | Registration No. (NYC only): | | |

| | | | |
|---|---|---|---|
| Prime Contractor/Service Provider: | Award Date: | Start Date: | **Date all MWBE subs paid in full:** |

**Signature of Contractor:** ☐ I certify that the information submitted herein is true, accurate and complete to the best of my knowledge and belief. Date:

| | | | |
|---|---|---|---|
| Last Month's Contract **Amt:** $<br>Revised Contract Amt: $ | **MWBE Eligible Amt**: $<br>(Goals are applied to this amount and includes eligible change orders, amendments & waivers) | **EFC MWBE Goals**<br>MBE: % MBE Amt: $<br>WBE: % WBE Amt: $<br>Total: % Total Amt: $ | **Total Paid to Prime**<br>Total Paid this Month: $<br>Total Paid to Date: $ |

| NYS Certified M/WBE Contractor & Subcontractor | Please Specify Any Revisions this Month. | Subcontractor Total Amount | | Payments this Month | Previous Payments | Total Payments Made to Date |
|---|---|---|---|---|---|---|
| | | Original | Revised | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |

**Attachment 3**
**New York State Environmental Facilities Corporation**
**Monthly Minority- & Women- Owned Business Enterprise (MWBE) Contractor Compliance Report**
**("Monthly MWBE Report")**

| NYS Certified M/WBE Contractor & Subcontractor | Please Specify Any Revisions this Month. | Subcontractor Contract Amount | | Payments this Month | Previous Payments | Total Payments Made to Date |
|---|---|---|---|---|---|---|
| | | Original | Revised | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |

**Attachment 3**
**New York State Environmental Facilities Corporation**
**Monthly Minority- & Women- Owned Business Enterprise (MWBE) Contractor Compliance Report**
**("Monthly MWBE Report")**

| NYS Certified M/WBE Contractor & Subcontractor | Please Specify Any Revisions this Month. | Subcontractor Total Amount | | Payments this Month | Previous Payments | Total Payments Made to Date |
|---|---|---|---|---|---|---|
| | | Original | Revised | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |

**Attachment 3**
**New York State Environmental Facilities Corporation**
**Monthly Minority- & Women- Owned Business Enterprise (MWBE) Contractor Compliance Report**
**("Monthly MWBE Report")**

| | | | | | | |
|---|---|---|---|---|---|---|
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Name:<br>Fed. Employer ID#:<br>Select Only One:<br>☐ MBE ☐ WBE ☐ Other:<br>Select Only One:<br>☐ Broker __% ☐Supplier ☐ N/A | ☐ Subcontractor is REMOVED<br>☐ NEW Subcontractor<br>☐ Subcontract Amt. INCREASED<br>☐ Subcontract Amt. DECREASED | | | | | |
| Additional Pages can be found at www.efc.ny.gov<br>TOTAL | | | | | | |

**Please explain any revisions and note the scope of work that new subcontractors will be providing. Please note that change orders over $25K may require that good faith efforts be made to obtain additional MWBE participation**:

**Attachment 4**
**NYS Environmental Facilities Corporation**
**Minority- & Women- Owned Business Enterprise (MWBE) Utilization Plan**

**Instructions for Contractors & Service Providers:**

Contractors and Service Providers must complete Sections 2 and 3. **Submit the completed, signed (electronic signature box checked and dated) form in Microsoft Word format to the Recipient's designated Minority Business Officer (MBO) no later than the date of contract execution.** Incomplete forms will be found deficient. If more than 10 subcontractors are used, additional pages for Section 3 can be found on EFC's website.

**If the prime contract is being performed by the parties to a Joint Venture, Teaming Agreement, or Mentor-Protégé Agreement that includes a certified MWBE, please contact EFC for assistance.**

MWBE firms must be certified by the NYS Empire State Development Corporation (ESD) in order to be counted towards satisfaction of MWBE participation goals. The utilization of certified MWBEs for non-commercially useful functions may not be counted towards utilization of certified MWBEs in the Utilization Plan. Please note whether a firm is serving as a broker or supplier on the contract. A broker is denoted by NAICS code 425120 and is designated as a broker in ESD's MWBE Directory. A supplier is denoted by a NAICS code beginning with 423 or 424, or a NIGP code that does not begin with the number 9, and is designated as a supplier in ESD's MWBE Directory. If a firm is serving as a broker, please additionally provide the percentage of the broker's commission on the contract.

See the Bid Packet at www.efc.ny.gov or consult your designated MBO for further guidance.

**Instructions for Minority Business Officers (MBO):**

The MBO must complete Section 1. The MBO may designate an Authorized Representative to complete and submit quarterly payment reports on its behalf, and, if so designated, the MBO's Authorized Representative must also complete Section 1. The Authorized Representative may only submit quarterly payment reports on behalf of the MBO and may not submit any other required forms or reports for the MBO. The MBO must complete Section 1 even if designating an Authorized Representative. **Submit the completed, signed (electronic signature box checked and dated) form in Microsoft Word format via e-mail to your EFC MWBE Representative.**

The subject heading of the e-mail to the EFC MWBE Representative should follow the format "UP, Project Number, Contractor." EFC will review the Utilization Plan and notify the MBO via e-mail of its acceptance or denial.

Within 10 days of EFC's acceptance of a Utilization Plan, EFC will post the approved Utilization Plan on the EFC website.

**Attachment 4**
**NYS Environmental Facilities Corporation**
**Minority- & Women- Owned Business Enterprise (MWBE) Utilization Plan**

| **SECTION 1: MUNICIPAL INFORMATION** | | | | |
|---|---|---|---|---|
| **Recipient/Municipality:** | | | **County:** | |
| **Project No.:** | **GIGP/EPG No.:** | **Contract ID:** | **Registration No. (NYC only):** | |
| **Minority Business Officer:** | | **Email:** | **Phone #:** | |
| **Address of MBO:** | | | | |
| **Electronic Signature of MBO:** ☐ I certify that the information submitted herein is true, accurate and complete to the best of my knowledge and belief. | | | | **Date:** |
| ***Complete if applicable:*** | | | | |
| **Authorized Representative:** | | **Title:** | | |
| **Authorized Rep. Company:** | | **Email:** | **Phone #:** | |
| **Electronic Signature of Authorized Rep.:** ☐ I certify that the information submitted herein is true, accurate and complete to the best of my knowledge and belief. | | | | **Date:** |

| **SECTION 2: PRIME CONTRACTOR / SERVICE PROVIDER INFORMATION** | | | | |
|---|---|---|---|---|
| **Firm Name:** | | | **Contract Type:** ☐ Construction ☐ Other Services | |
| **Prime Firm is Certified as:** ☐ MBE ☐ WBE ☐ N/A ☐ Other: Please repeat information in the Utilization Plan below (Section 3). If dual certified, you must select either MBE or WBE. | | | | |
| **Address:** | | **Phone #:** | **Fed. Employer ID #:** | |
| **Description of Work:** | | | | |
| **Award Date:** | **Start Date:** | **Completion Date:** | **MWBE GOAL Total** | **PROPOSED MWBE Participation** |
| **Total Contract Amount:** $<br>**MWBE Eligible Contract Amount:** $<br>(MWBE Goals are applied to this amount and includes all change orders, amendments, & waivers) | | | **MBE:** % $<br>**WBE:** % $<br>**Total:** % $ | **MBE:** % $<br>**WBE:** % $<br>**Total:** % $ |

**Attachment 4**
**NYS Environmental Facilities Corporation**
**Minority- & Women- Owned Business Enterprise (MWBE) Utilization Plan**

| **SECTION 3: M/WBE SUBCONTRACTOR INFORMATION** | | | | |
|---|---|---|---|---|
| **This Submittal is:** ☐ The First/Original Utilization Plan ☐ Revised Utilization Plan #: | | | | |
| **NYS Certified M/WBE Subcontractor Info** | | **Contract Amount:** | | **For EFC Use:** |
| | | **MBE ($)** | **WBE ($)** | |
| **Name:** | **Fed. Employer ID#:** | | | |
| **Address:** | **Phone #:** | | | |
| **Scope of Work:** | **Email:** | | | |
| **Select Only One**: ☐ MBE ☐ WBE ☐ Other: | **Start Date:** | | | |
| **Select Only One:** ☐ Broker __% ☐ Supplier ☐ N/A | **Completion Date:** | | | |
| **Full Contract Amount: $** | | | | |
| | | | | |
| **Name:** | **Fed. Employer ID#:** | | | |
| **Address:** | **Phone #:** | | | |
| **Scope of Work:** | **Email:** | | | |
| Select Only One: ☐ MBE ☐ WBE ☐ Other: | **Start Date:** | | | |
| **Select Only One:** ☐ Broker __% ☐ Supplier ☐ N/A | **Completion Date:** | | | |
| **Full Contract Amount: $** | | | | |
| | | | | |
| **Name:** | **Fed. Employer ID#:** | | | |
| **Address:** | **Phone #:** | | | |
| **Scope of Work:** | **Email:** | | | |
| Select Only One: ☐ MBE ☐ WBE ☐ Other: | **Start Date:** | | | |
| **Select Only One:** ☐ Broker __% ☐ Supplier ☐ N/A | **Completion Date:** | | | |
| **Full Contract Amount: $** | | | | |
| | | | | |
| **Name:** | **Fed. Employer ID#:** | | | |
| **Address:** | **Phone #:** | | | |
| **Scope of Work:** | **Email:** | | | |
| Select Only One: ☐ MBE ☐ WBE ☐ Other: | **Start Date:** | | | |
| **Select Only One:** ☐ Broker __% ☐ Supplier ☐ N/A | **Completion Date:** | | | |
| **Full Contract Amount: $** | | | | |

**Attachment 4**
**NYS Environmental Facilities Corporation**
**Minority- & Women- Owned Business Enterprise (MWBE) Utilization Plan**

| **SECTION 3: M/WBE SUBCONTRACTOR INFORMATION continued** | | | | |
|---|---|---|---|---|
| **Name:** | **Fed. Employer ID#:** | | | |
| **Address:** | **Phone #:** | | | |
| **Scope of Work:** | **Email:** | | | |
| Select Only One: ☐ MBE ☐ WBE ☐ Other: | **Start Date:** | | | |
| **Select Only One:** ☐ Broker __% ☐ Supplier ☐ N/A | **Completion Date:** | | | |
| **Full Contract Amount: $** | | | | |
| | | | | |
| **Name:** | **Fed. Employer ID#:** | | | |
| **Address:** | **Phone #:** | | | |
| **Scope of Work:** | **Email:** | | | |
| Select Only One: ☐ MBE ☐ WBE ☐ Other: | **Start Date:** | | | |
| **Select Only One:** ☐ Broker __% ☐ Supplier ☐ N/A | **Completion Date:** | | | |
| **Full Contract Amount: $** | | | | |
| | | | | |
| **Name:** | **Fed. Employer ID#:** | | | |
| **Address:** | **Phone #:** | | | |
| **Scope of Work:** | **Email:** | | | |
| Select Only One: ☐ MBE ☐ WBE ☐ Other: | **Start Date:** | | | |
| **Select Only One:** ☐ Broker __% ☐ Supplier ☐ N/A | **Completion Date:** | | | |
| **Full Contract Amount: $** | | | | |
| | | | | |
| **Name:** | **Fed. Employer ID#:** | | | |
| **Address:** | **Phone #:** | | | |
| **Scope of Work:** | **Email:** | | | |
| Select Only One: ☐ MBE ☐ WBE ☐ Other: | **Start Date:** | | | |
| **Select Only One:** ☐ Broker __% ☐ Supplier ☐ N/A | **Completion Date:** | | | |
| **Full Contract Amount: $** | | | | |

| **SIGNATURE** | |
|---|---|
| **Electronic Signature of Contractor:** ☐ I certify that the information submitted herein is true, accurate and complete to the best of my knowledge and that all MWBE subcontractors will perform a commercially useful function.<br>**Name** (Please Type)**:** | **Date:** |

**Attachment 4**
**NYS Environmental Facilities Corporation**
**Minority- & Women- Owned Business Enterprise (MWBE) Utilization Plan**

**Attachment 5**
**New York State Environmental Facilities Corporation**
**Minority & Women Owned Business Enterprise (MWBE) Waiver Request Form**

**Instructions for Contractors & Service Providers:**
Contractors and Service Providers must complete Sections 2, 3, and 4. **Submit the completed, signed (electronic signature box checked and dated) form in Microsoft Word format to the Recipient's designated Minority Business Officer (MBO).** Incomplete forms will be found deficient.

See the Bid Packet at www.efc.ny.gov or consult your designated MBO for further guidance.

**Instructions for Minority Business Officers (MBO):**
The MBO must complete Section 1. **Submit the completed, signed (electronic signature box checked and dated) form in Microsoft Word format via e-mail to your EFC MWBE Representative.** The subject heading of the e-mail to the EFC MWBE Representative should follow the format "Waiver Request, Project Number, Contractor." EFC will review and notify the MBO via e-mail of its acceptance or denial.

If a partial MWBE waiver is requested, an MWBE Utilization Plan must also be submitted for the amount of proposed MWBE participation.

| **SECTION 1: MUNICIPAL INFORMATION** | | | |
|---|---|---|---|
| **Recipient/Municipality:** | | **County:** | |
| **Project No.:** | **GIGP/EPG No.:** | **Contract ID:** | **Registration No. (NYC only):** |
| **Minority Business Officer (MBO):** | | **Email:** | **Phone #:** |
| **Address of MBO:** | | | |
| **Signature of MBO:** ☐ I certify that the information submitted herein is true, accurate and complete to the best of my knowledge and belief. | | | **Date:** |

| **SECTION 2: PRIME CONTRACTOR / SERVICE PROVIDER INFORMATION** | | | |
|---|---|---|---|
| **Firm Name:** | | | **Contract Type:** ☐ Construction ☐ Other Services |
| **Prime Firm is Certified as:** ☐ MBE ☐ WBE ☐ N/A ☐ Other: | | | |
| **Address:** | | **Phone #:** | **Fed. Employer ID #:** |
| **Contact Information of Firm Representative Authorized to Discuss Waiver Request:** **Name:** **Title:** **Phone #:** **E-mail:** | | | |
| **Description of Work:** | | | **EFC MWBE GOAL Total** |
| **Award Date:** | **Start Date:** | **Completion Date:** | **MBE:** % $ |
| **Total Contract Amount:** $ **MWBE Eligible Contract Amount:** $ (MWBE Goals are applied to this amount and includes all change orders, amendments, & waivers) | | | **WBE:** % $ |
| | | | **Total:** % $ |

**Attachment 5**
**New York State Environmental Facilities Corporation**
**Minority & Women Owned Business Enterprise (MWBE) Waiver Request Form**

| **SECTION 3: TYPE OF MWBE WAIVER REQUESTED** |
|---|
| 1. ☐ **Full Waiver** (No MWBE participation)<br><br>2. ☐ **Partial Waiver** (Less than the MWBE goals; indicate below the proposed MWBE participation)<br><br>**PROPOSED MWBE Participation**<br><br>**MBE:** % $<br><br>**WBE:** % $<br><br>**Total:** % $<br><br>3. ☐ **Specialty Equipment/Services Waiver** (Must be of SIGNIFICANT cost - list of equipment and cost must be attached in addition to the supporting documentation outlined below) |

| **SECTION 4: SUPPORTING DOCUMENTATION** |
|---|
| To be considered, the Request for Waiver Form must be accompanied by the documentation requested in items 1 – 9, as listed below. If a Specialty Equipment Waiver is requested, it must be accompanied by the documentation requested in items 1 - 13. If a Specialty Services Waiver is requested, it must be accompanied by the items requested in items 1 – 9 and item 14. Copies of the following information and all relevant supporting documentation must be submitted along with the request. Please contact EFC for assistance, including sample documentation. |
| 1. A letter of explanation setting forth your basis for requesting a partial or total waiver and detailing the good faith efforts that were made.<br><br>2. Copies of advertisements in any general circulation, trade association, and minority- and women-oriented publications in which you solicited MWBEs for the purposes of complying with your participation goals, with the dates of publication.<br><br>3. Screenshots of search results (by business description or commodity code) from Empire State Development Corporation's (ESD) MWBE Directory of all certified MWBEs that were solicited for purposes of complying with your MWBE participation goals.<br><br>4. Copies of faxes, letters, or e-mails sent to MWBE firms to solicit participation and their responses.<br><br>5. A log of solicitation results, consisting of the list of MWBE firms solicited for the contract and the outcome of the solicitations. The log should be broken out into separate areas for each task that is solicited (e.g., trucking, materials, electricians) and clearly provide a rationale for firms included on the completed Utilization Plan as well as for those not chosen. The log should show: that each MWBE firm was contacted twice by two different methods (e.g., fax and phone); who was spoken to; what was said; and the final outcome of the solicitation.<br><br>6. A description of any contract documents, plans, or specifications made available to MWBEs for purposes of soliciting their bids and the date and manner in which these documents were made available. Specifically, include information on the scope of work in the contract and a breakout of tasks or equipment, such as |

a schedule of values for a construction contract or a proposal or excerpt from a professional services agreement.

7. Documentation of any negotiations between you, the Contractor, and the MWBEs undertaken for purposes of complying with your MWBE participation goals.

8. Any other information you deem relevant which may help us in evaluating your request for a waiver. Examples may include sign-in sheets from any pre-bid meetings where MWBE firms were invited, attendance at MWBE forums, etc.

9. EFC and the MBO reserve the right to request additional information and/or documentation.

**Additional Documentation for Requests for Specialty Equipment Waivers:**

10. Copies of the appropriate pages of the technical specification related to the equipment showing the choices for manufacturers or other information that limits the choice of vendor.

11. Letter, e-mail or screenshot of website from the manufacturer listing their distributors in NYS and the locations.

12. Screenshots of ESD's MWBE Directory searches for the manufacturer and distributor showing that they are not found in the Directory.

13. An invoice or purchase order showing the value of the equipment.

**Additional Documentation for Requests for Specialty Service Waivers:**

14. A letter of explanation containing information about the scope of work and why no MWBE firms could be subcontracted to provide that service.

**Note:** Unless a Total Waiver has been granted, Firms will be required to submit all reports and documents pursuant to the provisions set forth in the procurement and/or contract, as deemed appropriate by EFC, to determine MWBE compliance. In cases where EFC accepts a full or partial waiver of MWBE participation goals, the waiver request will be posted to EFC's website.

| **SIGNATURE** | |
|---|---|
| **Electronic Signature of Contractor:**<br>☐ I certify that the information submitted herein is true, accurate and complete to the best of my knowledge.<br>**Name:** (Please Type)**:** | **Date:** |

United States Environmental Protection Agency

OMB Control No: 2090-0030
Approved: 8/13/2013
Approval Expires: 8/31/2015

**Disadvantaged Business Enterprise (DBE) Program**
**DBE Subcontractor Participation Form**

An EPA Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE[1] subcontractor[2] the opportunity to describe work received and/or report any concerns regarding the EPA-funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the EPA DBE Coordinator at any time during the project period of performance.

| | | |
|---|---|---|
| Subcontractor Name | Project Name | |
| Bid/ Proposal No. | Assistance Agreement ID No. (if known) | Point of Contact |
| Address | | |
| Telephone No. | Email Address | |
| Prime Contractor Name | Issuing/Funding Entity: | |

| Contract Item Number | Description of Work Received from the Prime Contractor Involving Construction, Services , Equipment or Supplies | Amount Received by Prime Contractor |
|---|---|---|
| | | |

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

United States Environmental Protection Agency

OMB Control No: 2090-0030
Approved: 8/13/2013
Approval Expires: 8/31/2015

**Disadvantaged Business Enterprise (DBE) Program**
**DBE Subcontractor Participation Form**

Please use the space below to report any concerns regarding the above EPA-funded project:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

| Subcontractor Signature | Print Name |
|---|---|
| | |
| **Title** | **Date** |
| | |

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

United States Environmental Protection Agency

OMB Control No: 2090-0030
Approved: 8/13/2013
Approval Expires: 8/31/2015

**Disadvantaged Business Enterprise (DBE) Program**
**DBE Subcontractor Performance Form**

This form is intended to capture the DBE[1] subcontractor's[2] description of work to be performed and the price of the work submitted to the prime contractor. An EPA Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractors bid or proposal package.

| | | |
|---|---|---|
| Subcontractor Name | Project Name | |
| Bid/ Proposal No. | Assistance Agreement ID No. (if known) | Point of Contact |
| Address | | |
| Telephone No. | Email Address | |
| Prime Contractor Name | Issuing/Funding Entity: | |

| Contract Item Number | Description of Work Submitted to the Prime Contractor Involving Construction, Services , Equipment or Supplies | Price of Work Submitted to the Prime Contractor |
|---|---|---|
| | | |

| | |
|---|---|
| DBE Certified By: ☐ DOT ☐ SBA<br>☐ Other: _____ | Meets/ exceeds EPA certification standards?<br>☐ YES ☐ NO ☐ Unknown |

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

United States Environmental Protection Agency

OMB Control No: 2090-0030
Approved: 8/13/2013
Approval Expires: 8/31/2015

**Disadvantaged Business Enterprise (DBE) Program**
**DBE Subcontractor Performance Form**

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

| Prime Contractor Signature | Print Name |
|---|---|
| | |
| **Title** | **Date** |
| | |

| Subcontractor Signature | Print Name |
|---|---|
| | |
| **Title** | **Date** |
| | |

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

United States Environmental Protection Agency

OMB Control No: 2090-0030
Approved: 8/13/2013
Approval Expires: 8/31/2015

**Disadvantaged Business Enterprise (DBE) Program**
**DBE Subcontractor Utilization Form**

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE[1] subcontractors[2] and the estimated dollar amount of each subcontract. An EPA Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

| | | |
|---|---|---|
| Prime Contractor Name | | Project Name |
| Bid/ Proposal No. | Assistance Agreement ID No. (if known) | Point of Contact |
| Address | | |
| Telephone No. | | Email Address |
| Issuing/Funding Entity: | | |

| | | |
|---|---|---|
| I have identified potential DBE certified subcontractors | ○ YES | ◉ NO |
| If yes, please complete the table below. If no, please explain: | | |
| | | |

| **Subcontractor Name/ Company Name** | **Company Address/ Phone/ Email** | **Est. Dollar Amt** | **Currently DBE Certified?** |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Continue on back if needed

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

United States Environmental Protection Agency

OMB Control No: 2090-0030
Approved: 8/13/2013
Approval Expires: 8/31/2015

**Disadvantaged Business Enterprise (DBE) Program**
**DBE Subcontractor Utilization Form**

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

| Prime Contractor Signature | Print Name |
|---|---|
| | |
| **Title** | **Date** |
| | |

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

**Attachment 9**
**New York State Environmental Facilities Corporation**
**CERTIFICATION REGARDING LOBBYING**
**FOR**
**CONTRACTS, GRANTS, LOANS, AND**
**COOPERATIVE AGREEMENTS**
**40 CFR Part 34**

**SRF Project No.: _____**

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

By: _____
Name: _____
Title: _____
Date: _____
Contract ID: _____

**Attachment 10**
**New York State Environmental Facilities Corporation**
**Contractor's American Iron and Steel (AIS) Certifications**

To be completed by prime contractors for all construction contracts

AIS CONTRACTOR CERTIFICATION

FOR CONSTRUCTION CONTRACTS PAID FOR WITH FUNDS FROM

THE NYS CLEAN WATER STATE REVOLVING FUND OR

THE NYS DRINKING WATER STATE REVOLVING FUND VIA THE

NYS ENVIRONMENTAL FACILITIES CORPORATION

Project Title: _____

Contractor's Name: _____

Contract ID: _____

SRF Project #: _____

SRF Recipient Name: _____

I certify that the iron and steel products that will be permanently incorporated into the public water system or wastewater treatment works project under this construction contract will have been produced in the United States, in accordance with the requirements of the US Environmental Protection Agency. I will also develop and maintain at the project location the necessary documentation to demonstrate that the iron and steel products incorporated into the project were produced in the United States, and make such documentation available to The NYS Environmental Facilities Corporation or their authorized representatives, upon request.

Signature: _____

Name (print): _____

Title: _____

Date: _____

**Attachment 11**
**New York State Environmental Facilities Corporation**
**Manufacturer's American Iron and Steel (AIS) Certifications**

1. The following information is provided as a manufacturer's sample letter of **step** certification for AIS compliance. Documentation must be provided on company letterhead.

   *Date*

   *Company Name*

   *Company Address*

   *City, State Zip*

   *Subject: American Iron and Steel Step Certification for Project (XXXXXXXXXX)*

   *I, (company representative), certify that the (melting, bending, coating, galvanizing, cutting, etc.) process for (manufacturing or fabricating) the following products and/or materials shipped or provided for the subject project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.*

   *Item, Products and/or Materials:*

   *1. Xxxx*

   *2. Xxxx*

   *3. Xxxx*

   *Such process took place at the following location:* _____

   *If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.*

   *[Signed by company representative]*

2. The following information is provided as a manufacturer's sample letter of certification for AIS compliance. Documentation must be provided on company letterhead.

   *Date*

   *Company Name*

   *Company Address*

   *City, State Zip*

   *Subject: American Iron and Steel Certification for Project (XXXXXXXXXX)*

   *I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.*

   *Item, Products and/or Materials:*

   *1. Xxxx*

   *2. Xxxx*

   *3. Xxxx*

   *Such process took place at the following location: _____*

   *If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.*

   *[Signed by company representative]*

**U.S. Department of Labor**
Wage and Hour Division

# PAYROLL

**(For Contractor's Optional Use; See Instructions at www.dol.gov/whd/forms/wh347instr.htm)**

*Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.*

U.S. Wage and Hour Division

Rev. Dec. 2008

OMB No.: 1235-0008
Expires: 02/28/2018

| NAME OF CONTRACTOR ☐ OR SUBCONTRACTOR ☐ | ADDRESS | |
|---|---|---|
| PAYROLL NO. | FOR WEEK ENDING | PROJECT AND LOCATION / PROJECT OR CONTRACT NO. |

| (1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER | (2) NO. OF WITHHOLDING EXEMPTIONS | (3) WORK CLASSIFICATION | OT. OR ST. | (4) DAY AND DATE — HOURS WORKED EACH DAY | (5) TOTAL HOURS | (6) RATE OF PAY | (7) GROSS AMOUNT EARNED | (8) DEDUCTIONS: FICA | WITH-HOLDING TAX | | | OTHER | TOTAL DEDUCTIONS | (9) NET WAGES PAID FOR WEEK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
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While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

**Public Burden Statement**

We estimate that is will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

Date _____

I, _____ _____
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by

_____ on the
(Contractor or Subcontractor)

_____; that during the payroll period commencing on the
(Building or Work)

_____ day of _____, _____, and ending the _____ day of _____, _____,

all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said

_____ from the full
(Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

_____

_____

_____

_____

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ – in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ – Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

| EXCEPTION (CRAFT) | EXPLANATION |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

REMARKS:

| NAME AND TITLE | SIGNATURE |
|---|---|
| | |

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.

## 1.0 - INDEMNITY

The Contractor and all subcontractors performing work in connection with this Contract shall HOLD HARMLESS, INDEMNIFY and DEFEND the Owner and Engineer, their consultants and each of their officers, agents and employees from any liability, claims, losses or damage including reasonable costs of defense arising out of or alleged to arise from the Contractor's or subcontractor's negligence in the performance of the work described in the Contract Documents, but not including liability that may be due to the sole negligence of the Owner, the Engineer or their officers, agents and employees.

## 2.0 - LIMITATION OF LIABILITY

The Contractor and all subcontractors agree to limit the liability of the Owner and the Engineer due to the Engineer's professional negligent errors or omissions such that the total aggregate liability of the Engineer to those named shall not exceed Fifty Thousand Dollars ($50,000) or five percent (5%) of the Contract award amount, whichever is greater.

## 3.0 - NO CLAIM FOR DELAY

The Contractor and all subcontractors agree to HOLD HARMLESS from any and all claims for loss or damages of any nature against the Owner or Engineer for delays in commencement, performance or completion of the Contract, regardless of whether said delays are, or may be, caused by the Owner, Engineer or any governmental agency.

It is the Contractor's responsibility to inform the Engineer in advance when a situation arises that forces the Contractor to cancel work for a given day. For example, if the Contractor informs the Engineer that he will be on the job on a certain day and then has to cancel the appointment because he cannot obtain certain labor, materials or equipment, it is the Contractor's responsibility to inform the Engineer of these latest developments and to let him know that construction observation services will not be needed for that day.

In the event that the Engineer is not given ample warning of such a cancellation and, as a result, unnecessary time is spent sending field personnel out to the project site to observe the previously scheduled construction, sufficient funds will be deducted from monies due the Contractor to reimburse the Engineer for this wasted time.

Similarly, sufficient funds will be deducted from monies due the Contractor to reimburse the Engineer for any services rendered in the field or in the office regarding work that had to be performed a second time due to substandard work on the part of the Contractor on the original work.

## PART 1 - GENERAL

### 1.01 - BRIEF PURPOSE OF PROJECT / GENERAL

A. The purpose of the project is to eliminate the existing surface water outfall to the Peconic Estuary and relocate it for disposal on land of the Calverton Sewer District, which is located north of the groundwater divide, so as to comply with the recommendations of the Peconic Estuary Comprehensive Management Plan and the 2007 Total Maximum Daily Load (TMDL) requirements issued by USEPA, by upgrading the existing Calverton Sewer District sewage treatment plant to achieve groundwater discharge standards so that the plant can be permitted by NYSDEC to discharge to new recharge beds constructed within the Sewer District boundary.

B. This Section provides an abbreviated summary of the work for the Construction Contracts associated with the Owner's program to construct the project.

C. Each Contractor has been provided with copies of all relevant construction technical specifications and drawings for all related construction contracts whose work may directly effect and impact the work under this Contract.

1. Each Contractor shall provide a complete and operational project in anticipation of these affects and impacts.

2. It is each Contractor's responsibility to investigate the work that will be performed by others and consider such in the conduct of his/her work.

### 1.02 - NOMENCLATURE

A. The terms "Contractor" and/or "Prime Contractor" where used within the body of a specific Construction Contract, (i.e.; Contract G, Contract P, Contract E, & Contract S), shall refer to the individual or company who has entered into an agreement with the Owner to perform the work contained within those Contract Documents. The lack of word capitalization shall be incidental.

B. The GENERAL CONSTRUCTION CONTRACTOR may be referred to as the "General Contractor", "Prime General Contractor", "Contract G Contractor" or similar wording. The lack of word capitalization shall be incidental. This Construction Contract shall be known as Contract G.

C. The PLUMBING CONSTRUCTION CONTRACTOR may be referred to as the "Plumbing Contractor", "Prime Plumbing Contractor", "Contract P Contractor" or similar wording. The lack of word capitalization shall be incidental. This Construction Contract shall be known as Contract P.

D. The ELECTRICAL CONSTRUCTION CONTRACTOR may be referred to as the “Electrical Contractor”, “Prime Electrical Contractor”, “Contract E Contractor” or similar wording. The lack of word capitalization shall be incidental. This Construction Contract shall be known as Contract E.

E. The SEWER CONSTRUCTION CONTRACTOR may be referred to as the “Sewer Contractor”, “Prime Sewer Contractor”, “Contract S Contractor” or similar wording. The lack of word capitalization shall be incidental. This Construction Contract shall be known as Contract S.

**1.03 - ABBREVIATED SUMMARY OF CONTRACT G 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. Each contractor shall coordinate, through the Owner/Engineer, the work of their contract with the work by others.

B. This abbreviated work summary is provided 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. Portions of tree removal, site clearing, grubbing, sheeting, bracing, excavation, soil erosion protection, slope protection, earth movement, subgrade preparation, removal of excess and/or unsuitable excavated material, dewatering, and import of suitable material, as necessary to install and construct all the work defined within the Contract Documents, as noted.

2. Portions of site work for the sewage treatment plant including, but not limited, drainage control, rough and final grading, curbing, paving, and fences, as noted.

3. Construction of cast-in-place concrete for new process tanks, slabs, chambers, and wet wells.

4. Demolition and removals as noted and shown on the Drawings.

5. Tank pressure washing, cleaning, disposal of liquid waste materials generated during pressure washing and cleaning activities and process tank conversions.

6. Conversion of existing building usage and equipment.

7. Stormwater collection system piping, inlets, manholes and drainage basins.

8. Portions of exposed process piping, valves, fittings and appurtenances, as noted.

9. Yard piping, buried valves and fittings.

10. Potable and/or reuse water service within the facility to the extent shown on the Drawings.

11. Installation of natural gas piping to the extent shown on the Drawings for new emergency generator.

12. Portions of manholes, flow control boxes and associated piping, as noted.

13. Portions of air piping, headers, diffusers, and pipe insulation, as noted.

14. Portions of aeration valves, fittings and appurtenances.

15. Installation of all process equipment including, but not limited to: headworks fine screen equipment, MBR system equipment, aeration blowers, misc. pumps, portions of primary level elements as noted.

16. Furnish and install pressure and flow primary elements and aeration blower intake filters, unless noted for installation by the Prime Plumbing Contractor.

17. Portions of pipe support systems for exposed piping and thrust blocks for buried piping, as noted.

18. Furnish and install wall exhaust fans, louvers, (with and without motorized operators), ductwork, registers, and thermostats.

19. Furnish and install new climate control for new electrical room.

20. Furnish and install electric unit heaters with connections to wall mounted thermostats for electric service connection to each unit heater by Contract E.

21. Miscellaneous metals including railing, grating, and supports.

22. Miscellaneous FRP including railing, grating and supports.

23. Erection of structural steel canopies and aluminum platforms, stairways and ladders.

24. Painting of misc. metals, concrete or masonry, as noted.

25. Leak testing and startup participation for the various equipment and systems of the project and provide complete service to troubleshoot and assist manufacturer service representatives in obtaining a completely functional installation.

26. Project closeout submittals.

D. All other work shown and specified within the Contract Documents for Contract G.

**1.04 - ABBREVIATED SUMMARY OF CONTRACT P 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. Each contractor shall coordinate, through the Owner/Engineer, the work of their contract with the work by others.

B. This following abbreviated summary is provided 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. Portions of air piping and headers, as noted.

2. Installation of process equipment provided by others including, but not limited to: pressure and flow primary elements and aeration blower intake filters.

3. Pipe support systems for exposed piping.

4. Potable and/or reuse water service within the facility control building to the extent shown on the Drawings.

5. Leak testing and startup participation for the various equipment and systems of the project and provide complete service to troubleshoot and assist manufacturer service representatives in obtaining a completely functional installation.

6. Project closeout submittals.

D. All other work shown and specified in the Contract Documents for Contract P.

**1.05 - ABBREVIATED SUMMARY OF CONTRACT E 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. Each Contractor shall coordinate, through the Owner/Engineer, the work of their contract with the work by others.

B. This following abbreviated summary is provided 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. Portions of tree removal, site clearing, grubbing, sheeting, bracing, excavation, soil erosion protection, slope protection, earth movement, subgrade preparation, removal of excess and/or unsuitable excavated material, dewatering, and import of suitable material, as necessary to install and construct all the work defined within the Contract Documents, as noted.

2. Portions of site work for the sewage treatment plant including, but not limited, drainage control and rough and final grading, as noted.

3. Demolition and removals as noted and shown on the Drawings.

4. Provide, install, maintain, and repair, if necessary, temporary power and light throughout the site and to the Owner/Engineer's field office. Temporary power shall be provided as needed at location(s) selected by the engineer based on input from the other Contractors.

5. Provide, install, maintain, and repair, if necessary, temporary power as needed to maintain existing treatment process systems and equipment during conversion and installation of new systems and reconnection of new power systems to existing process systems.

6. Arrange for and install new primary electric service.

7. Main secondary feeders, power distribution, and instrumentation control wiring. Provide, mount, and install electrical conduit, wire, fittings, boxes, panels, and electrical accessories.

8. All clearing, excavation, filling, and backfilling associated with the installation of underground conduit, duct bank, or wiring.

9. Emergency stand-by generators including the construction of foundations and concrete slabs, as noted.

10. Motor control centers, local control stations, transfer switches, power distribution panels, breakers, lights, and switches, as noted.

11. Furnish, install and power process equipment control panels, level and pressure monitoring equipment, and install interconnecting wiring as noted. Furnish and power primary flow element transmitters. Installation of primary flow elements shall be done by installing contractor of that pipeline.

12. Electrical connections (final termination) to all equipment, control panels, ventilating equipment and electrical devices.

13. Startup participation for the various equipment and systems of the project and provide complete service to troubleshoot and assist manufacturer service representatives in obtaining a completely functional installation.

14. Project closeout submittals.

D. All other work shown and specified in the Contract Documents for Contract E.

**1.06 - ABBREVIATED SUMMARY OF CONTRACT S 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. Each contractor shall coordinate, through the Owner/Engineer, the work of their contract with the work by others.

B. This following abbreviated summary is provided 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. Portions of tree removal, site clearing, grubbing, sheeting, bracing, excavation, soil erosion protection, slope protection, earth movement, subgrade preparation, removal of excess and/or unsuitable excavated material, dewatering, and import of suitable material, as necessary to install and construct all the work defined within the Contract Documents, as noted.

2. Removals as noted and shown on the Drawings.

3. Furnish and install sanitary sewer force main including all pipe, fittings, valves, and appurtenances as defined by the contract documents.

4. Testing off all force main components as indicated in the Contract Documents.

5. Site clearing, grubbing, grading, removal of excess fill materials and offsite disposal or excess fill materials to construct the new effluent recharge basins as shown on drawings.

6. Project closeout submittals.

D. All other work shown and specified in the Contract Documents for Contract S.

**1.07 - 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 is not limited to, the following:

1. Adherence to work restrictions as specified in Section 011400. Such restrictions include, but is not limited to:

a. Guidelines and requirements of the “Owner”, Calverton Sewer District, in accordance with the Calverton Sewer District Sewer Use Oridinance.

b. Guidelines and requirements of the Suffolk County Department of Health Services (SCDHS)

c. Guidelines and requirements of the New York State Department of Environmental Conservation (NYSDEC)

d. Local laws and ordinances of the Town of Riverhead

2. Each Contractor shall comply with MBE/WBE requirements as contained in the Contract Documents.

B. The General, Electrical and Sewer Contractors shall comply with the requirements of Section 312333 – Trenching. The cost associated with test holes and utility mapping shall be as specified therein and is subject to change based on conditions existing at the time of construction.

**1.08 - PARTIAL LISTING OF OVERALL CONTRACT REQUIREMENTS**

A. The Contract Documents detail the work included in each Prime Contract. Related requirements and conditions covered by each Prime Contract include, but is not limited to, the following:

1. Debris removal and daily and final cleaning up.

2. Coordination with the Owner and other contractors who have been awarded work by the Owner.

3. Coordination with utility companies' necessary to schedule connection of services, and management of the installation as noted on drawings.

4. Site utilization and management so as not to disrupt the Owner's ability to operate the existing facilities in a safe and efficient manner.

5. Maintain the Owner's ability to operate the facility at all times during the construction period.

6. 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.

7. Product and equipment storage and handling requirements.

8. Starting and adjusting of the equipment and systems required under the project.

9. Site safety in accordance with all applicable federal, state, and local regulations.

10. Project submittals, meetings, professional photographs, testing services, work plans, 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.

11. Provide and maintain, at all times, temporary roadways for site access to all parties involved with the project.

12. Sequence and schedule the construction so that new facilities come on-line before pre-existing facilities are demolished, dismantled or taken offline.

13. Temporary facilities and controls necessary to construct the project and to maintain permit levels of sewage treatment at all time.

14. Site utilization and management so as to allow other prime contractors to perform work in conjunction with this project and to afford them equal opportunity and space to complete their contractual obligations with the Owner as solely defined by the Engineer.

15. To not hinder the Owner's ability to maintain permit levels of sewage treatment at all times.

B. The Owner has or will award other construction contracts associated with this project.

C. It is anticipated that work of all the contracts will coincide with work of this Contract.

D. Each Contractor shall coordinate the work between the various construction contracts, through the Owner/Engineer, as required to complete the contract requirements in accordance with the requirements contained in Section 013100.

**1.09 - OWNER SUPPLIED PRODUCTS AND UTILITIES**

A. The Owner will not be supplying equipment, labor, or tools for the project.

B. The Owner will pay for electricity usage. The restrictions on electrical usage shall be as follows:

1. Power tool usage will only be permitted during specified working hours.

2. Power for dewatering, bypass pumping utilizing electric pumps with motors greater than 1/3 horsepower and portable heaters will not be permitted.

3. Sump pumps, if less than 1/3 horsepower will be allowed. Only two (2) sump pumps will be permitted to operate at the same time.

4. Power to the Owner/Engineer's office, if applicable.

5. Power to help cure concrete or painting systems will not be permitted.

6. Power to the Contractor's trailer will be permitted if suitable available from existing STP power distribution system is located as approved by the Owner. All connection costs shall be borne by the Contractor(s).

C. 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.

**1.10 - EXISTING CONDITIONS**

A. The Drawings show certain information that has been obtained by the Owner regarding various pipelines, utilities, and structures 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**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Site access and control of areas outside of site.

B. Contractor use of 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. All contractors 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 commercial neighborhood. The Owner intends to be a good neighbor. The Contractor shall not close any road for any period of time. The Contractor shall take whatever measures are necessary to not cause any inconvenience to the area's residents and businesses.

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 be found to 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 vehicles on 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.

**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 other Prime Contractors to install their work and complete their contractual obligations in the time period specified,

3. 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,

4. To allow for the stockpiling of excavated soil and imported fill, when called for, without any significant hardship, as defined by the Owner’s Construction Representative, on the Owner or other contractors,

5. To allow utility companies to install their work,

6. To allow for the delivery of equipment and materials by independent trucking companies by leaving enough space for backing in and out of areas,

7. To allow for the safe, unimpeded travel way of the Owners vehicles, Owner's Construction Representative's vehicles, Architect's and Engineer's vehicles, construction vehicles and heavy construction equipment about the entire site.

C. Contractors 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 responsibly of the Contractor.

D. Contractors 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. Contractor(s) shall be responsible for protecting Owners 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. 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 area(s) 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 General 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 General and Sewer Contractors shall be required to mechanically sweep paved roadway surfaces along Burman Blvd and the access drive between the intersection of Grumman Blvd and Jan Way that are impacted by the installation of their work as well as daily access to the site. The General and Sewer Contractors shall perform this mechanical sweeping work at a minimum frequency of once per week and a maximum frequency of once per day, or as directed by the Owner's Construction Representative. This sweeping service is not to be considered an extra cost by the General and Sewer Contractors and must be an anticipated expense that shall be considered at the time of bid.

L. Due to the limited site area available for construction, staging areas shall be relocated several times during the various stages of construction. Additional compensation for relocating staging areas, equipment and material storage, and trailers are not to be considered an extra cost to the Contractor as this is an anticipated expense that shall be considered at the time of the bid.

M. Contractors are 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 contractor(s) being back charged for the cleaning cost plus construction administration fees.

N. Use of the existing building facilities during construction is prohibited including but not limited to: toilet rooms, telephone and water fountains. Contractor(s) shall be fined $250 per occurrence if their employee (or subcontractor's employee) is observed disregarding these rules.

O. Should it become necessary to access the existing building during construction hours for measurements or other non-disruptive work, the contractor shall be escorted by an Owner's Construction Representative.

P. Refer to Section 015000 - Temporary Facilities and Controls for minimum rubbish removal requirements.

Q. Do not discard or dispose of any waste on-site.

R. Open fires will not be permitted on the site.

S. Contractors shall employ erosion control measures to protect the work where shown on the Drawings and as required by regulatory agencies. The Contractors shall confine storm water runoff to the site.

T. Dewatering may be encountered. Comply with the requirements contained in Section 312319 – Dewatering.

U. The General Contractor shall be responsible for managing dust as specified in Section 015719.

**1.04 - CONTRACTOR STORAGE, PARKING AND DELIVERIES**

A. Contractors must provide exterior storage containers when required. Final location of storage container shall be determined by the Owner.

B. 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.

C. 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.

D. No storage materials will be permitted within the buildings at any time during construction.

E. Storage of chemicals and paint shall be outside the existing or new structures and shall follow manufacturer's guidelines.

F. 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.

G. Contractor shall provide minimum of 48 hours advance written notice on working days to the Owners Construction Representative for deliveries of materials, site visits by inspectors, manufacturers 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.

H. 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.

I. 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.

J. 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 - 3:30 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 or Owner’s employees.

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 $200 per hour, which shall be used to compute the overtime hourly charge.

C. It is the Contractor’s responsibility to determine the dollar amount to be included in the bid to pay for the services of one (1) inspector to be present during the entire time work is being performed beyond a normal 8-hour day. If the Owner elects to have more than one representative present, then the cost of the additional inspector(s) will not be paid for by the Contractor. The maximum hourly billing rate applies for all instances where excess engineering is performed beyond a normal 8-hour work day.

D. The Contractor will be allowed to work early morning hours if a planned tie-in must be performed. Early morning work is required since it is a low flow period. Provide 72 hours advanced notice to the Engineer for all early morning work together with a written plan as to the steps necessary to

construct the work. The overtime salary costs for early morning tie-in work associated with having the operations staff of the treatment facility present shall be paid by the Contractor. This cost will be eligible for reimbursement payment as specified in Section 012100 – Allowances.

E. Maintenance of Treatment:

1. The designated operator of the Treatment Plant is required by law to maintain the discharge limits specified in the SPDES permit. The permit levels of treatment shall be provided at all times during the construction of the facility.

2. The Contractor shall be responsible for all fines resulting from the discharge of inadequately treated sewage if the cause of the violation was due to the direct or indirect construction action of the Contractor or any of his/her employees, subcontractors, vendors or material suppliers.

3. When it becomes necessary to alter the existing plant operations in any way, the Contractor shall provide at least 72 hours working days advance written notice to the Engineer and Owner. The notice shall indicate the reason for altering the process together with measures necessary to maintain treatment.

4. The Contractor shall not open, close, start or stop any valve, piece of equipment or any other component at the existing facility without first providing written notice. Only licensed operators designated by the Owner shall be permitted to alter the operation of the plant.

5. The Contractor shall employ bypass pumping from one tank to another in order to take process tanks off-line, perform required modifications and demolitions and to complete the work. All equipment, labor, materials, and fuel or source of power used for bypass operations shall be furnished and installed by the Contractor.

6. Where existing electrical facilities require modifications or abandonment, then the electrical contractor shall first decommission them.

7. The Contractor shall conduct all physical work necessary to alter plant flows and install whatever measures are required to perform the work safely.

**1.07 – SUGGESTED CONSTRUCTION SEQUENCE**

A. The following is a suggested general, not all-inclusive, sequence of construction that may be used to complete all work under the Contract within the time specified. Since permit levels of treatment must be maintained during construction, certain existing process equipment and units cannot be taken offline until new facilities are placed into permanent, fault free operation.

B. Work restrictions may be noted throughout the suggested sequence provided below. The Contractor shall comply with all noted work restrictions that appear.

C. The following suggested sequence is provided for information only:

1. Establish site utilization - set up all required field offices and temporary utilities for construction.

2. Construct new/modified process treatment systems: The listed work must be completed, tested, checked out by equipment manufacturer and acceptable to the Resident Engineer/Owner prior to starting the next phase.

**PHASE I**

A. Maintain process with existing pump station Aeration Tank #1 and Settling Tank #1 while performing the following work of Phase 1:

1. Empty and clean Aeration Tank #2 and Settling Tank #2

2. Remove equipment from cleaned tanks.

3. Conversion of existing tanks:

a. Aeration Tank #2 to MBR/Anoxic Trains 1 and 2

i. Add new walls and piping.

ii. Install new equipment in MBR/Anoxic tanks.

b. Settling Tank #2 to Pre-Equalization Tank #1 and Pre-Equalization Pump Station

i. Add new walls and piping.

ii. Install new pumps and aeration diffusers.

c. Conversion of Influent PS

i. Remove Pump #3 from dry well and piping as necessary to create new wet well.

ii. Build divider wall and install new wet well equipment.

4. Concurrent to conversion of tanks, install new Screenings Channel and new discharge piping with valves in position to continue with flow to existing Influent Wet Well.

5. Conversion of Operations Building, including installation of all new blowers and permeate pumps, with temporary setup for existing blowers to maintain existing treatment process.

6. Install new Rotary Drum Screen #1 with successful startup prior to diverting flow to new Influent Wet Well, and prior to startup of Influent Pump Station and Pre-Equalization systems.

7. Complete Influent PS, Pre-Equalization Tank #1 and Pre-Equalization Pump Station. These systems must be online prior to introducing flow to new MBR/Anoxic tanks.

PHASE II

1. Complete installation and startup of Rotary Drum Screen #2

2. Complete new MBR/Anoxic systems and place online

3. Send effluent through Chlorine Contact Tank temporarily to maintain disinfection by diverting permeate effluent piping to existing settling tank effluent trough on east side of process tankage.

PHASE III

4. Clean and empty Settling Tank #1 and Aeration Tank #1

5. Convert Settling Tank #1 to Effluent PS and Pre-Equalization Tank #2

6. Convert Aeration Tank #1 to new Sludge Holding Tanks

7. Concurrent to all work, but should be complete before completion of Effluent Pump Station, install effluent force main and recharge beds (Contract S).

8. Place new Effluent Pump Station, Sludge Holding Tanks, and Pre-Equalization Tank #2 online.

PHASE IV

1. Final demolition including cleaning and emptying of existing Sludge Holding Tanks and decommissioning of existing Chlorine Contact Tank and outfall.

2. Site Rehabilitation

3. Complete all remaining contract work.

**PART 2 – PRODUCTS**

Not Used

**PART 3 – EXECUTION**

Not Used

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Site Utilization Plan requirements

### 1.02 – SITE UTILIZATION PLAN REQUIREMENTS

A. The General Contractor shall prepare a Site Utilization Plan (SUP) showing staging areas, parking areas, stockpile areas, debris container areas, unloading areas, and trailer areas for review by the Owner's Construction Representative, Architect, Engineer, and other prime contractors. The length and amount of meetings necessary to develop and adopt a SUP shall be as required.

B. Meeting(s) will be held at the site with all concerned parties to assist the General Contractor in developing the criteria for the plan. During these meeting(s), all parties will present their needs and requirements for site utilization. As a minimum, each Prime Contractor shall be allocated the same amount of staging/parking/material storage area regardless of the dollar amount of their construction contract. Representatives from the local municipality or utility companies may be attending. The requirements of the local municipality and utility companies shall be incorporated into the SUP.

C. The General Contractor shall then prepare a draft site plan that attempts to incorporate the needs of all concerned parties. Another meeting will then be held at the site to review and present the plan. The plan shall then be revised at that meeting and adopted for use if it is acceptable to all relevant parties. If all parties cannot agree on an acceptable plan, then the Owner's Construction Representative will establish the Site Utilization Plan without any claims from any contractor.

D. The Contractor, by submitting a bid, understands the importance of a workable Site Utilization Plan and also understands that the Owner's Construction Representative may be required to select a plan for all contractors to adopt that is not ideal to the planned construction activities anticipated before the bid was submitted. There shall be no claims for damages associated with site utilization.

E. If the General Contractor fails to prepare the Site Utilization Plan as stipulated above, then the Owner reserves the right to back charge the General Contractor for the costs associated with having a Site Utilization Plan developed.

F. If a Prime Contractor fails to participate or attend the meetings scheduled to develop the Site utilization Plan then the Prime Contractor will forfeit any right to comment on the plan that is developed.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - DESCRIPTION

A. Work under this Section specifies the procedures used to process partial and final payments. It also includes the procedure for issuance of the Certificate of Substantial Completion and the Final Payment.

B. If there are any discrepancies between this Section of the Contract Documents and the Contract, General Conditions, then the Contract and General Conditions shall govern.

### 1.02 - RELATED SECTIONS

A. Section 012973 - Schedule of Values

### 1.03 - TIME FOR COMPLETION

A. Since 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 in as much 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 in the *Notice To Proceed*. The Contractor shall prosecute the Work with diligence from day to day, and complete it at the time fixed.

D. For the purpose of defining completion date, the Project will be considered complete when all work covered by the Contract has been performed.

### 1.04 - PARTIAL COMPENSATION

A. At the Owner's discretion, the Contractor may receive compensation for materials, equipment, and products delivered to the site yet not installed provided:

1. A cancelled check or paid bill from the supplier is submitted to the Engineer/Architect indicating that the Contractor has paid the supplier for the material or equipment.

2. A certificate of insurance is provided specifically insuring the piece of equipment for full value in the event of loss, vandalism, fire, and act of God.

3. A bill of material is delivered to the Engineer/Architect at the time of delivery itemizing the subject material or equipment.

4. The Engineer/Architect has agreed to the pre-purchasing of the materials.

B. Payment will be made for on-site material and/or equipment for 80% of the gross amount of the paid invoice, less the normal contract retainage.

C. The Contractor will not receive compensation for materials, equipment, and products stored in the Contractor's yard or shop.

D. The Contractor will not receive compensation for material, equipment, and products stored on site if it has not been stored in accordance with the manufacturer's requirements and the requirements specified elsewhere within these specifications.

E. Payment(s) made under this paragraph do(es) not relieve the Contractor from his/her responsibilities under the terms of this Contract.

**1.05 - PAYMENT TO CONTRACTOR**

A. Submit with each and every voucher for payment for work completed under this Contract, a statement as to the amounts due and owing by the Contractor to labor, subcontractors and materialmen and a certificate relative to payments now due.

1. All statements shall be signed by the Contractor's authorized representative and witnessed by a notary public.

2. A Specimen of the required statement is attached and made a part of this Section of the Contract Documents.

B. Every application for payment shall consist (and be in the order of) the following properly prepared and executed documents:

1. Transmittal letter or memo describing the exact contents of the payment application

2. Signed invoice on company letterhead

3. Owner's voucher executed by the Contractor (if required)

4. Schedule of Values showing derivation of the invoiced amount, consistent with the proposal form(s)

5. AIA Documents as specified in Section 012973

6. Certified payroll records prepared in accordance with standard accounting procedures in a form acceptable to the Owner

7. Payment affidavits (Specimen forms provided herein this Section and as specified above)

8. Invoices and required backup information for payment to be made out of cash allowance(s)

C. The Engineer/Architect will not process partial payment applications until the required documents are submitted in the prescribed form as may be discussed at the pre-construction conference or as may be required by the Owner.

D. Payment requests shall not be submitted more than once per month.

**1.06 - SUBSTANTIAL COMPLETION AND FINAL PAYMENT REQUEST**

A. Substantial Completion:

1. Upon Substantial Completion of the Work as defined herein and acceptance thereof by the Engineer/Architect/Owner, and as soon thereafter as practicable, the Engineer/Architect will prepare a Certificate of Substantial Completion.

a. The Engineer/Architect will establish the date of Substantial Completion when the project is accepted and ready for operation for the intended purpose, and no large, major or important items of work are as yet outstanding; thus the Owner has gained *Beneficial Use* of the project.

b. The Certificate of Substantial Completion will indicate the value of work performed, materials and equipment furnished, and otherwise show the exact aggregate amount equal to one hundred percent (100%) of the total compensation to which the Contractor is entitled for the performance of the Contract, less the amount of previous payments, less the sum as stipulated below for remaining Punchlist work.

c. All documents as specified in Sections 017800, 017823, and 017839 shall be submitted and approved prior to Substantial Completion.

d. The Certificate of Substantial Completion will be submitted to the Owner and a copy furnished to the Contractor.

e. Upon approval of the Certificate of Substantial Completion by the Owner, and as soon as practicable thereafter, the Owner will pay the Contractor.

2. Attached to the Certificate of Substantial Completion will be a Punchlist itemizing the items of work remaining.

a. The Punchlist will include "minor" items only, as so defined solely by the Engineer/Architect.

b. Any prior punchlists, which include "major" or significant items, as defined by the Engineer/Architect, shall not be criteria in establishing the date of Substantial Completion.

c. This Punchlist shall not be considered all-inclusive and any outstanding contract requirements discovered by the Owner or the Engineer/Architect shall be installed, repaired, replaced and corrected prior to the final inspection. The Engineer/Architect will provide written notice of such additional outstanding work items.

d. The Engineer/Architect will calculate and itemize, in the Certificate of Substantial Completion, the value of the Punchlist work as being the larger sum of either:

1) Two times the sum of money which, in the Engineer/Architect's opinion, would be necessary to expend if the Owner were to contract with others for the final completion of the work and satisfaction of all Punchlist items, *or*

2) The sum of money represented in the Contractor's bid schedule or Schedule of Values for the Punchlist items.

3. The Certificate of Substantial Completion shall fix the time for the Contractor to finish all Punchlist work.

4. The Contractor shall prepare a Substantial Completion partial payment application as specified in paragraph 1.05 herein, which shall be made a part of the Certificate of Substantial Completion.

5. The warranties/guarantees for all equipment, products and services required by the Contract Documents shall commence on the date that the Owner accepted/executed the Certificate of Substantial Completion.

6. The warranties/guarantees for all equipment, products and services represented on the Substantial Completion Punchlist will begin on the date that the Owner accepted the Final Payment Request as hereinafter specified.

7. Removal of the Contractor's plant and equipment and other inconsequential adjustments which do not prevent *Beneficial Use* of the Project, will not be a factor in establishing the date of Substantial Completion.

8. Only the Final Payment Request will be processed after Substantial Completion has been reached.

B. Final Completion:

1. Upon receipt of written notice that the work of the Contract is ready for final inspection and upon receipt of a Final Payment Request, the Engineer/Architect will make a *formal inspection*.

2. An amount of **$1,000.00 (ONE THOUSAND DOLLARS AND ZERO CENTS)** will be deducted from the Contractor's Final Payment for each *formal inspection* where uncompleted work of the Contract was found by the Engineer.

3. All spare parts shall have been delivered prior to a final inspection.

4. Upon Final Completion of the Work in accordance with the Contract and acceptance thereof by the Owner, and as soon thereafter as practicable, the Engineer/Architect will process the Contractor's Final Payment Request.

   a. The Final Payment Request will indicate the value of the work performed, materials and equipment furnished, and otherwise the exact aggregate amount of compensation to which the Contractor will become entitled under the terms of the Contract.

   b. Upon approval of the Final Payment Request by the Owner, and as soon as practicable thereafter, the Owner will pay the Contractor an amount equal to one hundred percent (100%) of the total compensation to which the Contractor is entitled for the performance of the Contract, less the amount of all previous payments.

5. The issuance of the Final Payment Request and payment in full to the Contractor shall be contingent and conditioned upon submission by the Contractor of a *Maintenance Bond.*

    a. The Bond shall be in a form approved by the Owner and issued by a surety acceptable to the Owner in its sole and absolute discretion.

    b. The Bond shall remain in effect as specified elsewhere in the Contract Documents.

**1.07 - 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/her, the Contractor shall return such copy to the Owner together with a statement of his/her objections to such payment request and of any claim for damages or compensation in excess of the amounts shown on the Final Payment Request.

B. The acceptance by the Contractor of the Final Payment Request as approved by the Owner shall constitute a release and shall discharge the Owner and Engineer/Architect 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.

**1.08 - RELEASE OF RETAINAGE & REINSPECTION OF WORK**

A. Retainage will be released as specified in the Contract Documents.

B. During the last month of the *Maintenance Bond* period, the Owner may make, or cause to be made, a reinspection of the Work. If the Work is found satisfactory and in accordance with the Contract Documents, the Owner will approve the termination of the Contract.

C. In the event the inspection discloses the existence of defects in the materials, equipment or workmanship or other noncompliance with the Contract Documents, the Contractor shall be required to immediately make good and rectify all defects.

    1. Any item of equipment that has failed to maintain the performance or other salient requirements of these specifications, shows undue wear, or other deleterious defects, will be considered defective.

    2. If the Contractor shall fail or neglect to satisfy the requirements of the Owner with respect to making the necessary corrections, then the Owner may proceed to have the work

executed by others and the cost and expense thereof will be borne by the Contractor and his Sureties.

3. Correction of defects and noncompliance and payment for such by the Contractor or his Sureties shall terminate the Contract and release all parties hereunder.

**1.09 - 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.

B. 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/Architect shall be the sole judge, and the Contractor shall be liable to the Owner for failure to do so.

**1.10 - RIGHT TO WITHHOLD PAYMENTS**

A. The Owner may withhold from the Contractor the amount of any payments due him as may in the judgment of the Owner be necessary:

1. To assure the payment of any lien, stop notice or claim filed with the Owner for work, labor or materials, done, performed, or delivered and used in the prosecution of the Work herein provided for (whether in strictly legal form or otherwise); or

2. To protect the Owner from loss due to defective work not remedied or through any improper or defective machinery, implements or appliances used by the Contractor or for failure of the Contractor to fully comply with all requirements of the Contract; or

3. To protect the Owner from loss due to injury to persons or damage to the work or property of other contractors, subcontractors, or others, caused by the act or neglect of the Contractor or any of his subcontractors.

B. The Owner shall have the right as agent for the Contractor to apply any amounts so withheld in such manner as it may deem proper to satisfy such claims or secure such protection. Such application of such money shall be deemed payments for the account of the Contractor.

C. Before release to the Contractor of any funds retained under this provision, the Contractor shall furnish satisfactory written evidence to the Owner that the claim or claims have been fully paid or satisfied.

**PART 2 - PRODUCTS**

Not Used.

**PART 3 - EXECUTION**

Not Used

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**SPECIMEN**

**STATEMENTS AS TO AMOUNTS DUE AND OWING BY CONTRACTOR TO LABORERS, SUBCONTRACTORS AND MATERIALMEN. THIS DOCUMENT SHALL BE SUBMITTED WITH EACH AND EVERY VOUCHER.**

STATE OF )
) ss.:
COUNTY OF )

_____, being duly sworn, deposes and say that he is an Officer of _____furnishing labor and materials in connection with a public improvement for **Calverton Sewer District Upgrade of the Sewage Treatment Plan – Enterprise Park at Calverton Module No. 1 (0.100 MGD)** project for _____ work and that to his knowledge all laborers for daily or weekly wages employed by _____ have been paid in full and to the best of his knowledge all laborers with daily or weekly wages employed by subcontractors of _____on such employment have been paid in full, except as follows:

_____

_____

And, that to his knowledge, all subcontractors for labor and/or materials engaged by _____and material dealers engaged by it have been paid by it in the amount of money due them or not less than the amount paid by the Owner to the Contractor on account of their labor and/or materials in accordance with previous requisitions.

This statement is made pursuant to all applicable provisions of the Labor Law of the State of New York.

By: _____

**Note: The Contractor shall retype this document on company letterhead or use the form provided by the Owner.**

STATE OF )
) ss.:
COUNTY OF )

_____, being duly sworn, deposes and says that deponent is an Officer of _____ the corporation named in this action; that deponent has read the foregoing Statement and knows the contents thereof; and that the same is true to deponent's own knowledge, except as to the matters therein stated to be alleged upon information and belief and to those matters deployment believes it to be true. This verification is made by deponent because _____ is a corporation. Deponent is an officer of the company.

By:_____
Officer

Sworn to before me this_____
day of _____, 20___

_____
Notary Public

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Allowance pricing for the following items:

1. Overtime Salary Account.
2. Independent Laboratory Testing Allowance.
3. Contingency Account.
4. Computer System Account.
5. Tree Trimming Allowance.
6. Natural Gas Utility Allowance

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 (Base 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 the lump sum base bid.

### 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/Architect 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 - CHANGES TO STIPULATED (CASH) ALLOWANCE**

A. If the actual cost of services differs from the cash allowance, then the Contract Price will be adjusted accordingly.

**1.04 - PAYMENTS TO BE MADE OUT OF OVERTIME SALARY ACCOUNT**

A. Include the cash allowance of **$10,000.00 (TEN THOUSAND DOLLARS AND ZERO CENTS)** in the amount bid for use upon the Owner's instructions.

B. Funds will be drawn from this account to pay for overtime hours worked by Owner's operations staff associated with project required after hour tie-in and tank bypass work as specified in **Section 011400**.

1. Overtime hours worked by the Contractor's employees are not eligible for payment under this allowance item.

2. Overtime hours worked by the Architect/Engineer's representative(s), as a result of the Contractor's operations, shall be paid for by the contractor as provided under other terms and conditions contained in the Contract and General Conditions at the Engineer/Architect's billing rate as specified in **Section 011400 – Work Restrictions**.

C. Funds remaining at project closeout shall be credited to the Owner.

**1.05 - PAYMENTS TO BE MADE OUT OF TESTING ALLOWANCE**

A. Include the cash allowance of **$10,000 (TEN THOUSAND DOLLARS AND ZERO CENTS)** in the amount bid for independent testing laboratory services specified in **Section 014500**.

B. The actual invoiced charges of the testing laboratory, including toning companies where called for, incurred for field and laboratory tests, as specified *only* in **Section 014500 - Quality Control**, shall be paid for out of the cash allowance.

1. Any other requirement specified herein throughout these specifications for providing the services of an independent testing laboratory, underground utility location company, or similar outside independent service are to be borne by the Contractor.

2. All costs for quality control services are to be included as part of the Contract Price (as-bid).

C. One (1) week prior to each partial payment, submit a certified invoice from each company listing and detailing the total costs incurred since the last invoice.

1. The invoice shall be on company letterhead signed by an authorized representative of the company and shall include man-hours, tests conducted, date of tests and associated costs and fees.

2. Payment for costs will not be made unless the information is provided and certified. Payment for costs will not be made unless the typed test data reports have been received by the Engineer.

3. In the case of pipe toning, flags must be set to delineate the route of underground pipes and utilities prior to submission of partial payment request.

D. If in the event test results (provided by the independent testing laboratory) show non-compliance with these specifications, then at the option of the Contractor and only with the approval of the Owner, he may re-test samples to verify the original test results at his/her own expense.

E. Costs for re-testing failed components of the work, when ordered by the Engineer/Architect, will not be paid for out of the cash allowance and will be directly borne by the Contractor.

**1.06 - PAYMENTS TO BE MADE OUT OF CONTINGENCY ACCOUNT**

A. Include the cash allowance of **$25,000 (TWENTY-FIVE THOUSAND DOLLARS AND ZERO CENTS)** in the amount bid for use upon the Owner's instructions.

B. The Owner will draw funds from the contingency account only upon prior approval by the Owner's Construction Field Representative and Architect/Engineer.

C. Funds remaining at project closeout shall be credited to the Owner.

**1.07 - PAYMENTS TO BE MADE OUT OF COMPUTER SYSTEM ACCOUNT**

A. Include the cash allowance of **$5,000 (FIVE THOUSAND DOLLARS AND ZERO CENTS)** in the amount bid for use upon the Owner's instructions.

B. Funds will be drawn from this account to pay for a computer system to be used by the Owner/Engineer/Architect as specified in **Section 015213**.

C. Funds remaining at project closeout shall be credited to the Owner.

**1.08 - PAYMENTS TO BE MADE OUT OF TREE TRIMMING ALLOWANCE**

A. Include the cash allowance of **$5,000 (FIVE THOUSAND DOLLARS AND ZERO CENTS)** in the amount bid for professional tree trimming services as specified in **Section 311000 – Site Clearing**.

B. The actual invoiced charges of the tree trimming company incurred for field trimming, as specified in **Section 311000**, shall be paid for out of the cash allowance.

C. Funds remaining at project closeout shall be credited to the Owner.

**1.09 - PAYMENTS TO BE MADE OUT OF GAS SERVICE ALLOWANCE**

A. Include the cash allowance of **$30,000 (THIRTY THOUSAND DOLLARS AND ZERO CENTS)** in the amount bid for use upon the Owner's instructions.

B. The actual invoiced charges of National Grid incurred in connection with relocating existing service(s) and the installation of new services shall be paid for out of the cash allowance.

C. Funds remaining at project closeout shall be credited to the Owner.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - GENERAL

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 will be performed.

C. Items not specified to be measured or paid for (for which no specific pay item exists in the Price Schedule) will be included in an appropriate unit price item or in a lump-sum item.

D. Comply with the requirements contained in Section 030130.71 for the requirements pertaining to the restoration of all surfaces, which may or may not be paid for under a separate unit price item, and which will 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 will 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, or materials generated by work, Contractor shall be required to 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 will contain spaces for Contractor’s and Engineer’s signatures plus additional space for comments.

4. An original and a carbon copy will be made for all notes and one copy will be turned over to Engineer daily.

5. The Engineer's signature will not be constituted as an acceptance of the work, or the measurements made, but will 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 will 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**

A. Perform all measuring required under this Section.

B. Record all measurements and calculated quantities on the Record Drawings.

C. No measurement will be made for work performed within the limits of Lump Sum Items.

| ITEM NO. | QTY | ITEM DESCRIPTION AND MEASUREMENTS |
|---|---|---|
| **1** | **500 LF** | **Concrete Crack Repair -** Measure the actual linear length of concrete cracks that are repaired as directed by Engineer in the field. Measurement will be made along the entire length of continuous cracks to be repaired. |
| **2** | **500 SF** | **Concrete Spall Repair -** Measure the actual square footage of concrete spalls that are repaired as directed by Engineer in the field. Measurement will be made along the entire area of each surface spall that is repaired. |

## PART 4 - PAYMENTS

### 4.01 - 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 will be included in one or more of the pay items, as appropriated.

C. Each pay item will 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. restoration of surfaces not scheduled to be paid for by bid items

9. 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.

**4.02 - PAY ITEMS**

A. The name, as shown below or on the bid Proposal form, will 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.

| ITEM NO. | QTY | PAYMENT |
|---|---|---|
| **1** | **500 LF** | **Concrete Crack Repair -** Payment will be made at the unit price bid per linear foot of crack repaired and accepted. Include costs for routing existing cracks, debris removal and disposal, transmission of water for surface cleaning, repair materials, application of coatings and mortar, and all work incidental thereto and necessary therefore. |
| **2** | **500 SF** | **Concrete Spall Repair -** Payment will be made at the unit price bid per square foot of spalls repaired and accepted. Include costs for debris removal and disposal of loose materials to sound substrate, transmission of water for surface cleaning, repair materials, application of coatings, and all work incidental thereto and necessary therefore. |

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Submission procedures.

B. Documentation of changes to Contract Sum/Price and Contract Time.

### 1.02 - RELATED SECTIONS

A. Proposal Form.

B. Other sections referencing this section.

C. All contractual requirements outlined in the documents.

### 1.03 - SUBMISSION REQUIREMENTS

A. Submit Alternates on Proposal Forms identifying the effect on adjacent or related components.

B. Alternates will be reviewed and accepted or rejected at the Owner's option.

C. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

### 1.04 - SELECTION AND AWARD OF ALTERNATES

A. Indicate variation of Bid Price for Alternates listed on the PROPOSAL FORM. This form requests a "difference" in Bid Price by adding to or deducting from the base Bid Price.

B. Alternates quoted on PROPOSAL FORM will be reviewed and accepted or rejected at Owner’s option.

C. Accepted alternates will be identified in Owner-Contractor Agreement.

D. Bids will be evaluated on the base bid price, plus any combination of alternate items.

### 1.05 - WORK FOR ALTERNATES

A. Work for alternate items selected shall include all related materials, labor, equipment and operations necessary to conduct and complete the alternate work and all other affected work or adjacent areas.

B. There shall be no change in time or completion date for the selected alternates, unless specified herein or approved in writing by the Engineer/Architect and Owner.

C. Alternates and associated work shall meet all standards and specifications delineated in the Contract Documents.

D. Contractor shall coordinate pertinent related Work and modify surrounding Work as required to complete the project under each alternate selected by the Owner.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

A. Work for each alternate, related items and collateral work shall be completed in their entirety.

B. If alternate items are not selected, work for the base bid and collateral work shall be completed in their entirety.

**END OF SECTION**

## PART 1 – GENERAL

### 1.01 – SECTION INCLUDES

A. This Section includes the requirements for substitution of specified products during construction.

B. The Engineer/Architect 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/Architect 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/Architect.

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.

4. Waives claims for additional costs or time extension that may subsequently become apparent.

5. Shall reimburse the Owner and the Engineer/Architect for review or redesign services associated with re-approval by authorities.

6. Shall reimburse the Owner for all additional engineering and/or architectural services claimed by the Engineer/Architect for extra services associated with the review of the Contractor's substituted item since it could not have been originally included in the Engineer/Architect's professional 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 three (3) copies of 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/Architect 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 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: | Substitution Request Number: |
| Contractor: | |
| Address: | |
| To: | Date: |
| H2M Project Number: | Owner: |
| 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. The undersigned will pay for changes to building design, including Architectural and Engineering design, detailing, and construction costs caused by requested Substitution.

4. Proposed Substitution will have no adverse affect on the construction schedule, or specified warranty requirements.

5. Maintenance and service parts will be locally available for proposed substitution.

6. 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 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.

4. Waives claims for additional costs or time extension that may subsequently become apparent.

5. Shall reimburse the Owner and the Engineer/Architect for review or redesign services associated with re-approval by authorities.

6. Shall reimburse the Owner for all additional engineering/architectural services claimed by the Engineer/Architect for extra services associated with the review of the Contractor's substituted item since it could not have been originally included in the Engineer/Architect's professional 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**

## 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/Architect for review and approval within thirty (60) 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/Architect.

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/Architect, 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. In addition to the above, provide a separate line item cost for each of the following items which shall be supported by proof where specified below:

1. Performance and payment bonds. (Submit proof of this amount.)
2. Insurance. (Submit proof of this amount.)
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.
9. Construction photographs as specified in Section 013233. (Submit proof of this amount.)
10. All Cash Allowance items as contained in Section 012100.
11. On-site, full time superintendent starting on the date of the Notice To Proceed and ending on the date that all punch list items are completed, which for the purposes of the Schedule of Values, shall be the contract completion date.
12. Exploratory digging as specified in Section 312333.
13. Underground utility mapping services as specified in Section 312333.
14. Engineer's Office Equipment. (Submit proof of this amount.)
15. Surveyor used for layout. (Submit proof of this amount.)
16. Record Drawing retainage amount specified in Section 017839.
17. 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**

## 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. Coordination of work with other Contractors, utility companies, and the Owner/Engineer
5. Communication and coordination requirements
6. 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/Architect may not respond to any requests unless the form is used.

C. The Engineer/Architect'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 of the form will be accepted. The original of the form must be signed and provided to the Engineer/Architect's project manager.

E. The Engineer/Architect will respond in writing to the request as soon as possible.

### 1.03 - COORDINATION BETWEEN CONTRACTORS

A. During the progress of the Work, other Contractors may be engaged in performing other work or may be awarded other contracts for other work on this Project. Each Contractor shall coordinate all the work to be done with the work of each Contractor(s) through the Owner.

B. Each Contractor shall fully cooperate with each other Contractor(s) and carefully fit its own work to that provided under other contracts as shown or specified in the Contract Documents and as may be coordinated by the Owner/Engineer/Architect.

C. Each Contractor shall not commit or permit any act that will interfere with the timely performance of work by any other Contractor.

D. The Contractor shall conduct his/her own operations, and to cooperate with such other parties, so as to cause as little interference as possible with the work by others.

E. The Contractor agrees to make no claim against the Owner/Engineer/Architect for additional payment due to delays or other conditions created by the operation of others.

F. If there is a difference of opinion as to the respective project rights of each Contractor doing the work, within the limits of or adjacent to the Project, the Owner/Engineer/Architect shall decide as to the respective rights of the various parties involved in order to secure completion of the work in a satisfactory manner. The Owner/Engineer/Architect's decision shall be final and binding on each Contractor.

G. If any portion of the work of the Contractor, or any of his/her subcontractors, depends upon the proper execution of the work by others, the Contractor shall promptly give written notice to the Engineer/Architect of all purported defects in the installed work as renders it unsuitable for proper execution and completion of his own work. The Contractor shall further notify the Engineer/Architect of all supposed delays, in the performance of his/her work, as will affect the timely performance of his own work or the project.

H. The Contractor's lack of notice shall constitute an acceptance by him/her that the work of others is fit and proper for the reception of the Contractor's own work, except as to defects developing in the work that could not have been reasonably foreseen.

I. The Contractor's lack of notice shall also constitute an acceptance by him/her and an acknowledgement of the timely performance of work by other Contractors or the Owner and that no claims for additional compensation may result.

J. If the Owner/Engineer/Architect determines that the Contractor is failing to coordinate his own work with the work of others, then the Owner shall have the right to enforce the provisions of the Contract as related to non-performance.

K. The Owner/Engineer/Architect shall not be liable for any damages suffered by this Contractor by reason of any other Contractor's failure to comply with the directions so issued by the Owner/Engineer/Architect, or by reason of another Contractor's default in performance; it being

understood that the Owner does not guarantee the continued efficiency or work production of any Contractor and by execution of the Contract, the Contractor fully understood the potential coordination problems associated with projects involving multiple prime construction contracts.

L. The Contractor's attention is specifically directed to the fact that he may not have exclusive occupancy of the work area within the limits of the Contract. Each Contractor shall afford the Owner, other Contractors, and utilities reasonable opportunity for the storage of their materials and equipment, and the execution of their work, and shall connect and coordinate his work with theirs as required by the Contract Documents.

**1.04 - 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. Each 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.

**1.05 - UTILITY COORDINATION**

A. Comply with the requirements of 16 NYCRR Part 753 – Protection of Underground Facilities. Submit a letter stating the case number.

B. Comply with the utility coordination requirements contained in the General Conditions.

**1.06 - PUBLIC/PRIVATE UTILITIES**

A. Notify all public and private utilities in accordance with Article 20, Section 322-a of the New York State General Business Law 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.

**1.07 - SPECIFIC COORDINATION REQUIREMENTS**

A. 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. Schedule work with all trades throughout the project to prevent interference.

2. Accomplish work in coordination with the other Contractors in a manner that will allow each Contractor adequate time (at the proper stage of construction as determined by the Owner/Engineer/Architect) to perform and complete the work of their contract.

3. 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 the area of potential conflict so as to alert the reviewer.

4. Each prime Contractor shall provide the Engineer/Architect with a list of shop drawings that they may require to properly coordinate the work. If a list is not provided to the Engineer within fifteen (15) calendar days from the date of the Notice to Proceed, then it shall be taken that shop drawings of other prime Contractors are not required. Each prime Contractor shall be responsible for providing the list within the time specified.

5. In case of conflicts due to improper coordination by any Contractor, the Owner/Engineer/Architect’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.

6. 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.

7. 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.

B. Shop Drawings and Submittals Coordination Procedure:

1. The Engineer/Architect will forward copies of relevant shop drawings to all prime Contractors, whose work may be subject to that of others, as solely determined by the Engineer.

2. The Contractor shall then, within five (5) calendar days of receipt, review said shop drawings provided by the Engineer/Architect for the purposes of resolving field and fabrication problems and as a way to coordinate the work.

3. Immediately notify the Engineer/Architect should a purported conflict in the work be discovered so that the Engineer/Architect can investigate and take appropriate action.

4. If a shop drawing was so provided by the Engineer/Architect and a conflict in the work was not brought to the attention of the Engineer/Architect, then the conflict shall be immediately corrected by the Contractor submitting the shop drawing.

C. Each Contractor shall also coordinate the work by complying with the following:

1. Construction Schedule: Each 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, each Contractor shall fax or email a typed memo addressed to the Engineer/Architect/Owner's resident field engineer/inspector and designated office project manager summarizing the work for the following two weeks. The memo shall also be faxed or emailed to each Prime Contractor's home office and the Owner. The memo shall briefly itemize the planned activities for the coming weeks. 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: 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.

4. Email List: Each Contractor, within five (5) calendar days from the Notice To Proceed, 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.

5. W/MBE Utilization Plans: All Contractors shall provide a W/MBE Utilization Plan in accordance with the requirements contained in other portions of the Contract Documents, but in no case more than thirty (30) calendar days from the date of the Notice To Proceed.

6. Work Plan: All Contractors shall within fifteen (15) calendar days from the date of the Notice to Proceed, submit to the Engineer a type written work plan in bullet format of the sequence of construction activities from start to finish of construction. A facsimile will not be accepted. All work plans shall include a description of the different major phases of construction as pertaining to the individual construction contract. As a minimum each work plan shall include the tasks and subtasks specified in Section 013216 for the project schedule.

   a. Each Prime Contractor's work plan shall be complete and shall address every phase of the scope of the Contract.

   b. The Engineer/Architect will forward all work plans to all other Prime Contractors.

   c. Each Prime Contractor shall then prepare a construction schedule as specified below using the work plans prepared by others and his/her own.

7. Equipment and Startup Schedule: All Contractors shall also submit a preliminary equipment delivery schedule and a preliminary startup schedule for all equipment and systems being furnished under the Contract. This schedule shall be submitted within 30 calendar days from the date of the Notice To Proceed.

   a. Include an early and late date for each item.

   b. Indicate the time necessary to physically install and ready each item so that other work can be completed by other Prime Contractors.

   c. The Engineer/Architect may waive this schedule if the Contractor has adequately shown the information on the construction schedule, in the opinion of the Engineer/Architect.

D. Project Coordination Meetings: All Contractors shall participate in and attend the Project Coordination Meetings as specified below:

1. Up to five (5) project coordination meetings will be held at the Engineer/Architect's or Owner's office as specified herein and in Section 013216.

2. The meetings will be held when so called for by the Engineer/Architect.

3. Each meeting may last up to eight (8) hours with one hour for lunch.

4. The Engineer/Architect will prepare the final agreed version of the schedule and distribute it to all Contractors.

5. The Engineer/Architect reserves the right not to hold these meetings if in his/her opinion they are not needed.

6. All Prime Contractors shall be required to attend the meetings.

7. The time associated with attendance at the meetings shall be included in the lump sum bid and be subject to a credit of $150 per hour for each unused hour that the Contractor does not attend.

**1.08 - CONTRACTOR'S JOB SITE SUPERINTENDENT**

A. Each Contractor shall employ an on-site superintendent as specified herein below. He/She shall be a full-time employee of the Contractor.

B. Each Contractor shall name the job site superintendent within five (5) days of the Notice To Proceed. A letter to the Engineer/Architect 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. Each Superintendent shall have a minimum of five (5) years of experience as a job site superintendent for projects of equal size and complexity.

E. Contract G superintendent shall not be a foreman or crew supervisor and shall be qualified and experienced person who shall act to schedule and sequence the work on a daily basis.

F. Contract E superintendent may be a foreman or crew supervisor.

G. Contract S superintendent shall not be a foreman or crew supervisor and shall be a qualified and experienced person who shall act to schedule and sequence the work on a daily basis.

H. Contract P superintendent shall not be a foreman or crew supervisor and shall be qualified and experienced person who shall act to schedule and sequence the work on a daily basis.

I. Each superintendent shall be qualified to perform the duties so required to successfully complete the work in accordance with the Contract Documents.

J. The superintendent for Contract G, P & S shall be on the site for each work day, full time, starting within twenty-one (21) calendar days from the date of the Notice To Proceed or initial site mobilization, based on which occurs last, through the date of Final Completion, ***including*** all punch list items.

K. All other construction superintendents shall be on the project site while work under his/her contract is being performed, either by direct forces or by subcontractors as stipulated above for subcontractor coordination.

L. Each superintendent shall also visit the site daily when work is not being performed under their Contract for coordination purposes, through the Owner/Engineer. He/She shall remain on the site for a minimum of one (1) hour, if work is being performed by others. He shall telephone the Engineer/Architect's designated field representative to advise him/her that they are on the site to discuss matters related to coordination.

M. Each superintendent shall speak English. If required by the Engineer/Architect, 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/Architect 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)**

**TOWN OF RIVERHEAD/CALVERTON SEWER DISTRICT**
**UPGRADE OF THE SEWAGE TREATMENT PLANT – ENTERPRISE PARK AT CALVERTON MODULE NO. 1 (0.100 MGD)**
**CONSTRUCTION CONTRACT NO. CASD 1602**

| | | | |
|---|---|---|---|
| **Product, Item, or System:** | | | |
| **Request Date:** | | **RFI No.:** | |
| **Specification Section:** | | **Paragraph Reference:** | |
| **Contract Drawing Reference(s):** | | | |
| **Describe Request:** | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Signed:** | ☐ See Contractor's Attachments for Additional Description for Information | | |
| **Owner/Engineer Response:** | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Engineer (Printed):** | ☐ See Engineer/Architect'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**

## 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 one (1) month 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 next upcoming meeting will be set during an on-going progress meeting.

C. Attendance at progress meetings shall be mandatory for the Contractor. An amount of $1,000 shall be deducted from the Contract Amount for each announced meeting not attended by the Contractor.

D. The Contractor shall be represented at each announced progress meeting by either an owner, partner, or corporate officer representing the Contractor. The job site superintendent and office project manager for the 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.

1. The minimum agenda will cover 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. The Contractor shall 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 or Engineer and 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 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**

## 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.

C. Refer to Section 013100 regarding the requirements for attendance at Project Coordination Meetings and additional requirements concerning the submission of other project coordination and sequencing information.

### 1.02 - SCHEDULE PREPARATION MILESTONE DATES & REQUIREMENTS

A. Each Contractor shall prepare Draft #1 Construction Schedule for presentation and discussion during *Project Coordination Meeting No. 1*.

1. The Engineer/Architect will provide at least seven (7) calendar days written notice regarding the date of the first meeting.

2. At the Engineer/Architect's discretion, *Project Coordination Meeting No. 1* may immediately take place on the same date and directly following the *Pre-Construction Conference*. The *Notice To Proceed* will contain information regarding the *Pre-Construction Conference* and *Project Coordination Meeting No. 1* should it be so decided by the Engineer.

3. Draft #1 Construction Schedule shall be prepared as specified hereinafter.

a. The schedule shall show all the major and subordinate tasks necessary to complete the project in the specified time and interim milestones.

b. It shall allow adequate time for other Prime Contractors to complete their related work as best estimated by the Contractor. It being understood that the Contractor's allotted time for others to perform their work is non-binding and does not relieve the Contractor from completing all the work in the specified contract completion time in accordance with the Contract Documents. It also being understood that this is the Contractor's realistic best estimate of the time needed for others to complete their related work.

c. The schedule shall also show the dependencies and time allocated for each task.

4. The date, place, and time for *Project Coordination Meeting No. 2* shall be established at the first meeting, but in no case be more than fourteen (14) calendar days from the date of the first meeting.

B. As a result of the first meeting, a better understanding of each Contractor's time requirements will have been achieved. Within five (5) working days of the date of *Project Coordination Meeting No. 1*, each Contractor shall prepare Draft #2 Construction Schedule and submit it to the Engineer/Architect and each other Prime Contractor for review. Each Contractor shall mail his/her schedule to all parties via Overnight Mail with a Return Receipt Requested.

1. *Project Coordination Meeting No. 2* shall be attended by all Prime Contractors for the purpose of jointly developing a Combined Construction Schedule. The meeting shall focus on the time needed to complete each task and subordinate task and for establishing task dependencies.

2. All Contractors shall deliver to the Engineer and General Contractor the electronic file of his/her Draft #2 Construction Schedule at the meeting. The General Contractor will use the data files to prepare the Draft Combined Construction Schedule.

3. The date, place, and time for *Project Coordination Meeting No. 3* shall be established at the meeting.

C. The purpose of *Project Coordination Meeting No. 3* is to review the General Contractor's Draft Combined Construction Schedule and to make minor adjustments as are needed.

D. The Engineer/Architect, after the third meeting and as soon as possible, will make the agreed upon changes and provide final versions to all other Prime Contractors for adoption as the Final Combined Construction Schedule.

1. The final schedule shall be implemented by all Prime Contractors on a daily basis. All tasks and subordinate tasks shall be completed on schedule.

2. Each Contractor shall increase resources as are needed to comply with the established milestone dates should the schedule start to lag.

E. The decisions regarding the time allotted for a given task shall be final and each Contractor shall apply necessary resources to accomplish the work. Submission of a bid shall be intended to mean that the Contractor agrees that the determination is binding.

**1.03 - PRIME CONTRACTOR(S) SCHEDULE TYPES**

A. The General Contractor shall prepare a Gantt Chart type schedule as specified hereinafter.

B. Contractor P shall prepare a Gantt Chart type schedule as specified hereinafter.

C. Contractor E shall prepare a Gantt Chart type schedule as specified hereinafter.

D. Contractor S shall prepare a Gantt Chart type schedule as specified hereinafter.

**1.04 - 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. Each construction schedule shall be properly coordinated with all Contracts, completed, submitted, and deemed received by the Engineer prior to the first payment application.

D. The schedule, when approved by the Engineer/Architect 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.

F. Coordinate the construction schedule with the proposed schedules of the equipment suppliers and subcontractors.

G. 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. Each Contractor shall arrange to have it plotted on a color plotter suitable for the intended application.

H. Prepare the schedule in a manner so that the actual progress of the work can be recorded and compared with the expected progress.

I. The schedule shall use the following convention:

1. Tasks for the General Contractor in blue ink.

2. Task links/task dependency in blue ink.

3. Tasks for the Plumbing Contractor in green ink.

4. Tasks for the Electrical Contractor in red ink.

5. Tasks for the Sewer Contractor in black ink.

6. Milestone dates (zero duration) by a red diamond.

7. The end date for each task and subtask at the end of a bar.

8. The description of all major tasks within the bar. The bar shall be red.

9. Critical path.

J. The construction schedule shall also show the following:

1. Critical sequence items where new units must come on-line before existing facilities go off-line, if applicable to the project.

2. Engineer's construction office set up, as specified.

3. Computer delivery, if so specified elsewhere.

4. Telephone service and high speed internet cable installation.

5. Lead time for control panels that are packaged as systems.

**1.05 - 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. Each Contractor shall arrange to have it plotted on a color plotter suitable for the intended application.

**1.06 - REVISION OF PROJECT PROGRESS SCHEDULE**

A. Each Prime Contractor shall evaluate, coordinate with other Contractors, and provide updated construction schedules monthly in accordance with job requirements. Each update shall be submitted to the Engineer/Architect for information purposes and be provided by the last Friday of every month.

B. Each Contractor shall modify his construction schedule to accommodate coordination of the construction contracts by the Owner/Engineer/Architect without claims for additional compensation or delay.

C. The General Contractor will provide an electronic version of the Final Combined Construction Schedule for use in keeping the schedule up to date.

D. From time to time, and at stages deemed appropriate by the Engineer/Architect, the Engineer/Architect may request updated schedules to reflect the project's status. The percent complete for each task may be shown, as determined by the Engineer/Architect.

**PART 2 – PRODUCTS**

Not Used

**PART 3 – EXECUTION**

Not Used

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Project record documents shall be prepared as specified herein.

### 1.02 - QUALITY ASSURANCE

A. The Contractor shall employ a land surveyor licensed in the State where the project is located. The surveyor shall be acceptable to the Engineer in terms of experience and qualifications.

1. Submit evidence of the surveyor's errors and omissions (professional liability) insurance coverage in the form of an insurance certificate.

2. The surveyor shall maintain a minimum coverage of $1,000,000 for professional liability.

3. The Owner, Engineer, and Contractor shall be named as insurance certificate holders.

4. A thirty-day cancellation notice shall be provided.

5. Physical work shall not be performed until the certificate is provided and approved by the Owner.

B. All instruments used on the project shall be of professional quality and in first class condition.

1. All instruments shall have been calibrated by a manufacturer’s service station within the last month from the date of first use on the job site.

2. Submit certificate of calibration or paid invoice showing that the unit has been calibrated, if so required by the Engineer/Architect.

### 1.03 - SUBMITTALS FOR REVIEW

A. Submit name, address, and telephone number of Surveyor before starting survey work.

B. Surveyor’s professional liability insurance certificate.

C. On request, submit documentation verifying accuracy of survey work.

D. Submit a copy of the site drawing signed by the land surveyor showing locations of other benchmarks set by the surveyor, baseline location and offset hubs. If requested, the Engineer will provide a reproducible drawing or a drawing in digital format for use by the surveyor.

**1.04 - EXAMINATION**

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Engineer/Architect of any discrepancies discovered.

**1.05 - SURVEY REFERENCE POINTS**

A. The Contractor's surveyor shall locate and protect survey control and reference points located throughout the project site.

B. Control datum for survey is that indicated on the Drawings or will be provided by the Engineer.

C. The Contractor shall protect survey control points prior to starting any site work. Preserve permanent reference points during construction.

D. Promptly report to the Engineer/Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

1. The surveyor shall replace dislocated survey control points based on original survey control when directed by the Engineer/Architect.

2. Make no changes without prior written notice to Engineer/Architect.

E. The surveyor shall set control lath for rough and final grading purposes. Lath shall be placed at sufficient intervals to control grade or as directed by the Engineer/Architect.

F. All new structures, pits, chambers, drainage pools, curbs, roads, swales, and other physical elements shall be located by survey control.

G. Underground pipelines need not be located using survey control but shall be located using standard survey equipment operated by persons experienced in their operation.

**1.06 - SURVEY REQUIREMENTS**

A. The Engineer/Architect will provide one (1) benchmark.

B. The Contractor shall, with his own forces, obtain working or construction lines or grades as needed subject to the check of the surveyor. The surveyor shall set offsets.

C. Establish elevations, lines, offsets and levels. Locate and lay out by instrumentation and similar appropriate means:

1. Site improvements including pavements, stakes for grading, curbs, fill and topsoil placement, utility locations, slopes and invert elevations.

2. Grid or axis for structures.

3. Building foundation, column locations, ground floor elevations, and equipment foundations.

D. Provide tie distances on record drawings to all underground structures, valves, pipes, and utilities installed as work of this Contract.

E. General Contractor's surveyor shall locate all proposed new structures to be constructed or installed on the treatment plan site for all of the project contracts (Contract E, P & S) as required by each Prime Contractor. Contract S shall be responsible for the complete survey of all off-site installations, including but not limited to, force main, cleanouts, recharge bed, etc.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Pre and post-construction photography.

B. Aerial photography.

### 1.02 – PHOTOGRAPHY

A. Provide color photographs of the site (pre and post-construction) produced by a professional photographer acceptable to the Engineer who is regularly engaged in this type of service. Photographs taken by the Contractor will not be accepted.

B. Preconstruction Photographs: Provide photographs, taken within the limits of the work, to document existing conditions. Engineer will designate the date and location of the exposures that will generally be taken just prior to the construction operations. The minimum number of photographs required shall be sixty-four (64). Two (2) duplicate CD sets of all photos in JPEG format shall be provided.

C. Progress Photographs: The Engineer will take progress photographs for the Owner's record. Each Contractor shall secure his/her own progress photographs that can be requested by the Owner or Engineer at any time throughout the duration of Contract work.

D. Final Photographs: Provide post-construction photographs, taken within the limits of the work, to document the final project and the conditions at final payment and issuance of the Final Certificate. The Final Payment will not be processed until such time as the photographs are provided and are of an acceptable quality to the Engineer. Engineer will designate the date and location of the exposures that will be taken. The minimum number of photographs required shall be sixty-four (64). Two (2) duplicate CD sets of all photos in JPEG format shall be provided

E. Annotate the following in each photo file:

1. Project name and number.

2. Photographer's identification, address, and telephone number.

3. Date and time picture was taken.

4. Location of picture relative to a specific location on the site, (for example, "10 ft. southeast of Operations Building").

5. Direction in which camera was aimed.

6. Description of what is depicted in each photo.

**1.04 - PHOTO FILES**

A. Minimum 5 mega pixel resolution, JPEG format.

B. Landscape frame position.

C. JPEG files shall be turned over to the Owner with all rights for use and reproduction of the photos files for the Owner's own use.

**1.05 - TECHNIQUE**

A. Provide factual presentation. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

**1.06 - SUBMITTALS**

A. Deliver prints within seven (7) working days after exposure with transmittal letter in accordance with the requirements of Section 013300.

**1.07 – AERIAL PHOTOGRAPHY (CONTRACT G ONLY)**

A. Provide pre- and post-construction aerial color photographs of the site, effluent force main route and recharge bed location produced by an aerial photography company who is professionally and regularly engaged in this type of service. Photographs taken by the Contractor will not be accepted.

B. Preconstruction Photographs: Provide aerial photographs, taken of the limits of the work, to document existing conditions separately of the Calverton STP site and the effluent recharge bed site. Photograph shall be oriented directly over the center of the project site at an elevation such that the limits of the project site shall fill the frame at suitable detail resolution. Submit a minimum of 12 aerial photos for selection by the Engineer/Owner. The Engineer shall be permitted to request cropping and/or enhancement of the selected photo as suited the final posters printing. Provide three (3) poster board size aerial photographs mounted on foam board; the same photo with 3 prints. One photograph shall be framed. The minimum size of the photograph shall be approximately 24" by 36".

C. Post-construction Photographs: Provide aerial photographs, taken of the limits of the work, to document existing conditions separately the Calverton STP site, and effluent recharge bed site.

Photograph shall be oriented directly over the center of the project site at an elevation such that the limits of the project site shall fill the frame as suitable detail resolution. Submit a minimum of 12 aerial photos for selection by the Engineer/Owner. The Engineer shall be permitted to request cropping and/or enhancement of the selected photo as suited the final posters printing. Provide five (5) poster board size aerial photographs mounted on foam board; may select up to three different photos with 5 prints total . All prints shall be framed in plastic. The minimum size of the photograph shall be approximately 24” by 36”.

D. Take pre-and post-construction aerial photographs at the same elevation. The scales shall be the same.

E. JPEG files shall be turned over to the Owner with all rights for use and reproduction of the photos files for the Owner’s own use.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

## 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/Architect 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: 03300.01-1

1. The Section number for which the submittal applies, followed by a period, shall be indicated, "03300.".

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/Architect 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/Architect.

E. Every submittal shall also be accompanied by a Transmittal Letter (or "Speed Form") addressed to the Engineer/Architect's Project Manager as hereinafter defined.

**1.03 - COORDINATION OF SUBMITTALS**

A. Prior to submitting to the Engineer/Architect, 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/Architect 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/Architect will review submittals in a manner as expedient as possible, and will generally send a written response to the Contractor within ten (10) 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*** equipment and materials submittals requiring Engineer/Architect's review (except operations manuals and coordination shop drawings) as required under the technical specifications of these documents shall be submitted within **NINETY (90)** 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/Architect's review.

E. Operation and maintenance manuals shall be submitted at least **THIRTY (30)** 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/Architect, 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/Architect'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/Architect's resident engineer/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.

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. You 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.

D. Two (2) hard copies of each submittal and other submissions, such as material samples or other items as instructed by the Engineer, shall be sent to the Engineer/Architect's office as follows:

**H2M architects + engineers**
**538 Broad Hollow Road, 4th Floor East**
**Melville, New York 11747 - 5076**
**Attention: H2M Project Manager (Named at Pre-Construction Conference or in the Notice to Proceed)**

**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 or blueprinting machines.

B. All electronic submittals shall be AutoCAD or Adobe Acrobat files produced with a minimum resolution of 400 dpi.

C. Groups 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/Architect'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/Architect will not review submittals that have not yet been reviewed and approved by the Contractor.

**1.08 - ENGINEER/ARCHITECT'S REVIEW**

A. Engineer/Architect will review and comment on each submission conforming to the requirements of this Section.

1. Engineer/Architect'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/Architect'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/Architect 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/Architect 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/Architect and has been found in general to be in compliance with the Contract Documents. The notations made on the submittal by the Engineer/Architect 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/Architect 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/Architect's comments and resubmitted to the Engineer/Architect 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/Architect 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/Architect 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/Architect,

3. has been made and stamped “Make Corrections Noted”, but contractor has not complied with Engineer/Architect’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 a 3-inch by 5-inch space for the Engineer/Architect’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/Architect, which did not appear on the previous submissions.

**1.10 - CONTRACTOR’S RESPONSIBILITIES**

A. Engineer/Architect’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/Architect 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/Architect 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/Architect 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 G805, 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 - SAFETY DATA SHEETS (SDS)**

A. Comply with “Right to Know” requirements of Chapter 551 of Laws of New York, 1980, 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/Architect by the Contractor’s submission of a standard Safety Data Sheet (SDS) in accordance with “Right To Know” requirements.

C. Products will not be permitted to be kept on site without a SDS.

**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/Architect in the form of two (2) prints.

1. After the submittal has been reviewed by the Engineer/Architect, the transparency will be annotated, prints will be made for Engineer/Architect’s and Owner’s use, records, and distribution.

2. Engineer/Architect will return the transparency to the Contractor.

3. Send one print to the Owner as specified above.

C. **Submit one (1) electronic copy, in PDF format, of each standard drawing, catalog cut, or other material and two (2) hard copies of each shop dwg. Samples shall be delivered directly to the office of the Engineer/Architect. The Engineer/Architect will return an electronic copy only 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/Architect 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/Architect. All costs associated with correcting errors in the field due to negligence in confirming existing conditions or obtaining correct measurements prior to installation shall be borne solely by the Contractor.

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/Architect, 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/Architect, 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/Architect 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/Architect.

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/Architect’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/Architect 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/Architect 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/Architect 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/Architect 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/Architect'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

**END OF SECTION**

CONTRACTOR'S COMPANY NAME:_____
ADDRESS:_____

## SUBMITTAL TRANSMITTAL FORM – CONTRACT G/P/E/S

## TOWN OF RIVERHEAD / CALVERTON SEWER DISTRICT
## UPGRADE OF THE SEWAGE TREATMENT PLANT
## AT CALVERTON MODULE NO. 1 (0.100 MGD)
## CONTRACT NO. CASD 1602

| | |
|---|---|
| Contractor Submittal No.: | |
| Name of Item Submitted: | |
| General Location Point of Use: | |
| Date of Submission: | |
| Number of Times Submitted (incl. this one): | |
| Date of Previous Submission: | |
| Name of Subcontractor: | |
| Supplier Name and Number: | |
| Manufacturer Name and Number: | |
| This Item is a Substitution (Y/N): | |
| Specification Section No.: | |
| Drawing Sheet No.: | |
| Remarks/Deviations: | |

**CONTRACTOR'S CERTIFICATION STATEMENT:**

**By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data and I have reviewed and approved this submittal and checked and coordinated each item with the other applicable approved Shop Drawings and all Contract requirements.**

| Contractor's Approval Stamp | H2M Shop Drawing Review Stamp |
|---|---|
| | |

## 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. Conform to the requirements of the Electrical Code of the City of New York 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. New York State Energy Code

9. County Department of Health

10. Town Codes, Rules, Laws and Ordinances

11. Sewer District Sewer Use Code

12. Local Water District

13. Electric utility

14. 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. Dewatering Permit

2. Water service permits

3. Clearing and tree removal

4. Transportation and disposal of construction debris

5. 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.

6. Obtain a New York Board of Fire Underwriters inspection and certificate.

**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.

B. Pay the utility company's charges in connection with the installation of the incoming service.

C. An allowance for the utility company's charges is included in Section 012100.

D. Comply with the utility company requirements for the incoming electric service.

**1.08 – COORDINATION WITH GAS UTILITY COMPANY**

A. Comply with the utility company requirements for the incoming gas service.

B. Pay the utility company's charges in connection with the installation of the incoming service.

C. An allowance for the utility company's charges is included in Section 012100.

D. Comply with the utility company requirements for the incoming gas 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.

B. Make necessary connections to existing public water mains under supervision of the water utility representative. Connections to existing public water mains will be made by the water utility.

C. Pay the water department's charges for the connections.

**1.10 – COORDINATION WITH SANITARY SEWER UTILITY**

A. Comply with the public utility requirements for the connection of sanitary sewer lines to the public utility services. Obtain and pay for all necessary permits from public sewer department. Obtain authority to connect to their existing sanitary sewers.

B. Make necessary connections to existing public sewer lines under the supervision of sewer department's representative. Connections to the existing public sanitary sewer will be made by the public sewer department.

C. Pay the sewer department's charges for the connections.

**1.11 – COORDINATION WITH TELEPHONE UTILITY COMPANY**

A. Comply with the utility company requirements for the incoming telephone service. Pay the utility company's charges in connection with the installation of the incoming service. An allowance for the utility company's charges is included in Section 012100.

B. Contact the local telephone company and arrange for the removal and relocation of existing telephone equipment.

C. Pay charges associated with relocation of telephone equipment by the utility.

**PART 2 – PRODUCTS**
Not Used

**PART 3 – EXECUTION**
Not Used

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - ABBREVIATED SUMMARY

A. This Section explains the format of the specifications.

### 1.02 - SPECIFICATION FORMAT

A. The Specifications are generally arranged according to the Construction Specifications Institute (CSI) format. Most of the technical requirements are specified in the technical specifications of the document, which are grouped into forty-eight (48) major divisions (Not all divisions used). Most of the legal and administrative requirements are included in Division 1, General Conditions, Information For Bidders, and the Contract (agreement).

B. Technical sections are arranged in numerical order, however section numbers may not be consecutive from section to section.

C. Page numbering is subordinate to each section.

D. Most sections are generally broken down into three (3) parts:

1. PART 1 - GENERAL

2. PART 2 - PRODUCTS

3. PART 3 - EXECUTION

E. Not all these parts may be used and in some cases, the title of some of the parts may be different than listed above. Paragraph numbers are subordinate to each part.

F. The Contractor is advised that the format described here is flexible in nature.

1. There is some overlapping of specified information between various portions of the Specifications.

2. In all cases, the entire requirements of the Contract Documents for the project shall apply.

G. Explanations:

1. Many technical sections begin with a paragraph titled “SECTION INCLUDES”, “DESCRIPTION”, or similar wording.

a. In these paragraphs, a brief listing of the specified products may appear or a brief description of the work generally specified in that section is presented.

b. These descriptions or listings are not all inclusive, but merely are provided as an aid in locating subject matter.

c. In some cases special cost related items of work are called to the attention of the Contractor in these opening paragraphs.

2. "RELATED SECTIONS" or "RELATED WORK" or similar wording paragraphs list or reference related work specified elsewhere in the Contract Documents. Such listing is not all inclusive, rather, they are merely an aid to the Contractor in locating some of the other Specification Sections wherein work is specified which has a particularly close interrelationship with the work specified in that section.

a. It shall be understood that all of the Work, and all of the Specifications and other portions of the Contract Documents, are interrelated, and that the total of all requirements set forth in all of the Contract Documents shall be met.

b. Equipment suppliers and manufacturers shall be advised of the requirements for making submittals and delivering products, as specified in Division 1 sections, even if said sections are not referenced therein that section.

3. "REGULATORY REQUIREMENTS" or "REFERENCES" or similar wording paragraphs describe standards, laws, guidelines, regulations, and standards related to workmanship and installation of the products specified which shall be followed by the Contractor in completing the work specified therein that section as if it was written there in that section. All such requirements and references shall be latest issue in effect at the time of the bid opening.

4. When a "GUARANTEE" or "WARRANTY" paragraph appears in the section it is calling attention to a guarantee which extends beyond the period of the Contractor's Guarantee called for in the administrative portion of the Contract Documents or it states special requirements specific to the equipment, systems or products specified in that section.

H. Multiple Contract Book Format.

1. A single contract book has been prepared for this project that incorporates all the specifications sections for all four (4) prime contracts. Each section is designated as pertaining to one or more of the prime contracts, (i.e CONTRACT – G; or ALL CONTRACTS; etc.).

2. If the section indicates multiple contract references then each prime contract has all, or partial responsibility of items/work as stipulated within that section. Partial responsibility will be detailed specifically. If partial responsibility is not specifically noted, then each prime contract contractor is to assume all portions of the specification section pertain to the work of their contract equally.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Work of this Section includes the requirements for pre-installation meetings.

### 1.02 – PRE-INSTALLATION MEETINGS

A. The Contractor shall convene a pre-installation meeting at the site prior to commencing work of the installing new equipment.

B. Pre-installation meetings are to be convened at least one week prior to commencing work on the section. The contractor shall arrange and require attendance of Owner/Engineer and parties directly affecting, or affected by, work of the specific section.

1. At least seven (7) calendar days advance notice is to be given.

2. The contractor shall prepare agenda and preside at meeting. At a minimum the following items are to be discussed:

a. Review conditions of installation, preparation and installation procedures.

b. Review coordination with related work.

## PART 2 - PRODUCTS

Not Used

## PART 3 - EXECUTION

Not Used

**END OF SECTION**

## 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 C1077 - Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

B. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

C. ASTM D4561 - Practice for Quality Control Systems for an Inspection and Testing Agency for Bituminous Paving Materials.

D. 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/Architect.

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/Architect 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, including half day rates.

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. Mail reports directly to Engineer/Architect 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/Architect 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/Architect 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/Architect. 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/Architect. 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 - TESTING REQUIREMENTS**

A. Dry Paint Thickness Measurement: Perform dry paint thickness using calibrated SSPC Type 2 fixed probe gages.

B. Compaction Testing - Soil:

1. Perform compaction testing in accordance with ASTM D2922, Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth) or ASTM D1556 Density and Unit Weight of Soil In Place by the Sand Cone Method.

2. Perform tests and analysis of fill material in accordance with ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb. Rammer and 12-inch Drop.

C. Compaction Testing - Asphaltic Concrete Pavement:

1. Perform asphaltic concrete compaction testing in accordance with ASTM D2950 - Standard Test Method of Density of Bituminous Concrete in Place by Nuclear Methods.

2. Calibrate nuclear density measurement equipment based on theoretical maximum specific gravity of asphaltic concrete pavement material.

3. Perform test to determine theoretical maximum specific gravity in accordance with ASTM D2041 Theoretical Maximum Specific Gravity of Bituminous Pavement Mixtures. Perform test on mix at plant prior to delivery. Collect sample at plant in accordance with ASTM D979 - Sampling Bituminous Paving Mixtures and perform test in approved laboratory if plant does not have necessary equipment.

D. Concrete Testing:

1. Collect samples in accordance with ASTM C172, Practice for Sampling Freshly Mixed Concrete.

2. Make test cylinders in accordance with ASTM C31, Standard Practice for Making and Curing Concrete Test Specimens in the Field.

3. Test concrete cylinders in accordance with ASTM C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

4. Test slump and air entrainment.

E. Asphalt Testing:

1. Collect samples at point of delivery in accordance with ASTM D979, Standard Practice for Sampling Bituminous Paving Mixtures.

2. Perform extraction test in accordance with ASTM D2172, Standard Test Methods for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures.

3. Perform gradation test in accordance with ASTM C136, Method for Sieve Analysis of Fine and Coarse Aggregates.

**1.09 - TESTING SCHEDULE**

A. Dry Paint Thickness Measurement:

1. Make five (5) separate spot measurements spaced evenly over 100 square feet of area.

2. For structures exceeding 1000 square feet of finished surface, three 100 square feet areas shall be randomly selected by the engineer plus one 100 square foot area for each additional 1000 square feet of finished surface. This requirement shall be subject to change as required by the Engineer.

B. Compaction Testing of Soil:

1. Pipe Installation: As directed by the Engineer/Architect.

2. Concrete flatwork: As directed by the Engineer/Architect.

3. Pavement subgrade: As directed by the Engineer/Architect.

C. Concrete Testing: Make six (6) concrete test cylinders for each 50 c.y. or fraction thereof.

1. Test two (2) cylinders at 7 days.

2. Test two (2) cylinders at 28 days.

3. The remaining cylinders shall be tested at a time to be determined by the Engineer. This requirement shall be subject to change as required by the Engineer.

D. Asphalt Testing: As directed by the Engineer/Architect.

E. Compaction Testing of Pavement: As directed by the Engineer/Architect.

### 1.10 - FIELD OBSERVATION OF CONTRACTOR'S WORK

A. The Engineer will provide periodic observation of the Contractor's work in accordance with the General Conditions of the Contract.

## 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/Architect. 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**

## 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 Contractors for this project as it is specified herein.

C. This Section is made a part of all Construction Contracts associated with the project. It contains specific references to the particular Contractor supplying said product or service. If no reference is provided then the requirement applies to all Prime Construction Contractors.

### 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. Each Contractor shall comply with all requirements of the Act.

B. Each 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, the Contractor shall 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. Each Contractor shall provide a list of contact numbers as follows:

1. Contractor’s superintendent and office project manager (home, beeper, 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. Each 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 at least (2) other 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 General 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).

C. Update contact list and provide to Engineer for any changes throughout the course of the project.

**1.05 - CONTRACTOR'S RESPONSIBILITY**

A. Each 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 to 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 to 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 each 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. Each 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 process tank exfiltration testing will not be paid for by the Owner. The General Contractor shall include the costs for all water for this purpose in the price as-bid.

D. Each Contractor shall provide material and labor and secure necessary permits to 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. Each 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 General Contractor shall provide and maintain temporary toilet facilities and enclosures for the duration of the project for use by all other Prime Contractors.

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 and be shown on the General Contractor's Site Utilization Plan.

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 Owner's sanitary facilities will not be available for use by any Contractor.

G. Comply with the requirements also contained in Section 015719 – Temporary Environmental Controls

**2.04 - HEAT**

A. Each 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 General Contractor shall heat buildings/structures to properly apply paint in accordance with Section 099100 requirements of Contract G.

C. The Plumbing Contractor shall heat buildings/structures to properly apply paint to piping in accordance with Section 099100.

D. Each Contractor shall maintain minimum ambient temperature of 40 degrees F in areas where construction is in progress, unless indicated otherwise in specifications or as required by proposed working conditions and manufacturer's installation/application instructions.

**2.05 - VENTILATION**

A. Each 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 General and Plumbing Contractors shall ventilate buildings to safely apply paint in accordance with Section 099100 requirements.

**2.06 - BARRIERS AND PROTECTION**

A. Each 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. Each Contractor is responsible for performance compliance with OSHA standards.

B. Each 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.

**2.08 - TEMPORARY HANDRAILS AND SCAFFOLDS**

A. All temporary handrailing and scaffolds shall be designed and erected in compliance with OSHA standards. Each 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 protect all openings in building/structures of any type such as shafts, deck openings, and other building related chases.

**2.09 - EROSION CONTROL**

A. Each Contractor shall provide measures to keep the ground surface well drained, but avoid erosion of embankments, excavations, the project site, and adjacent areas.

B. Each 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 General Contractor shall install and maintain erosion control measures as shown on the Drawings.

D. Comply with the requirements also contained in Section 015719 – Temporary Environmental Controls.

**2.10 - DUST CONTROL**

A. Each 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 General Contractor shall provide general dust control all roadways and construction areas throughout the project site.

F. The Sewer Contractor shall provide general dust control all roadways and construction areas throughout the project site.

**2.11 - RUBBISH REMOVAL**

A. The General Contractor shall be responsible for overall rubbish removal.

B. Burning of rubbish and trash will not be permitted.

C. The General 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 General 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 ten (10) 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 General 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 Contactor.

**2.12 – SNOW REMOVAL**

A. The General Contractor shall be responsible for maintaining roads, walkways, sidewalks, and parking areas/lots free of snow.

B. Provide snow plowing during and after each snow fall equal to or greater than 1.0 inch as reported by the local weather service.

C. Any damage resulting from the Contractor's snow clearing operations shall be immediately repaired at no additional cost to the Owner.

**2.13 - ENCLOSURES**

A. Each Contractor shall provide and maintain temporary enclosures, sheds, or fenced-in areas to accommodate protection for products, material and equipment.

B. Store equipment that cannot be exposed to outdoors in accordance with Section 016500 - Product Delivery, Storage and Handling.

**2.14 - SECURITY**

A. Each 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. Each Contractor has full responsibility for the working area until final acceptance and payment.

D. The General 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.

**2.15 - PARKING**

A. The General Contractor shall provide an area suitable for parking at least three (3) vehicles adjacent to each field office by leveling the surface and installing 3 inches of QPS over the level surface.

B. Do not allow heavy construction vehicle parking on existing pavement, if existing pavement is not scheduled for replacement or restoration.

C. Provide and maintain access to fire hydrants, building entrances, process tanks, doors and the work in general.

D. Each Contractor shall have his or her employees and subcontractors park in areas designated by the Owner/Engineer/Architect.

E. If designated on the Contract Drawings, then only use those areas for parking.

F. Where trades work from their trucks, then coordinate the parking of trucks with other prime contactors.

G. If a Site Utilization Plan has been specified, then parking shall be as sited in the plan.

**2.16 - DAMAGES**

A. Each Contractor, with the prior approval of the Owner/Engineer/Architect, 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.

**2.17 - FIRST AID FACILITIES & EMERGENCY TELEPHONE NUMBERS**

A. Each 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 and provide updates as necessary for any changes.

### 2.18 - 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.

### 2.19 - 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/Architect.

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/Architect.

**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**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. The Work of this Section includes the furnishing of the Engineer/Architect's Field Office (Trailer).

1. The Engineer/Architect's Field Office shall be furnished by the General Contractor.

2. It shall be provided within the time period specified hereinafter.

B. The General Contractor shall also furnish the following to the Owner/Engineer all in accordance with the specifications contained herein as follows:

1. Miscellaneous equipment and supplies

2. Materials

3. Computer system with associated peripheral computer related equipment

4. Services as may be specified herein.

C. This Section also specifies the requirements for Field Offices to be established by all Prime Contractors for the exclusive use of the respective Prime Contractor.

### 1.02 - CARE AND PLACEMENT

A. Field offices shall be placed where directed by the Engineer/Architect in accordance with site utilization requirements.

B. All field offices shall be installed to meet all standards of the Occupational Safety and Health Act of 1970 and subsequent revisions.

C. In the event of damage to existing facilities, including but not limited to: tanks, driveways, walks, pavement, buildings, pipes, conduits, valves, and electrical 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.

**1.04 - SUBMITTALS**

A. The General Contractor shall submit the following:

1. Computer system quotation for Engineer/Architect's approval prior to placing order.

a. The Engineer will provide the specifications for all components of the computer system, including model number and manufacturer, prior to the submission of this item.

b. Submit two quotations if so required by the Engineer/Architect.

2. Catalog cuts of miscellaneous equipment and supplies if they are different from that specified.

B. The Contractor shall also provide a listing of the companies providing specified services with telephone number and contact name. Provide references for each company when requested.

**PART 2 - PRODUCTS**

**2.01 – TEMPORARY LIGHT AND ELECTRICITY (CONTRACT E)**

A. Provide100-amp temporary power to the Engineer's trailer.

**2.02 - SANITARY CONNECTION**

A. Each Contractor shall install an approved Suffolk County Department of Health Services on-site sanitary disposal system for their trailer, if required.

B. The on-site system shall have a minimum capacity of 300 gallons per day.

C. The restroom facilities provided, as part of the trailer shall be connected by a licensed plumber to the on-site sewage disposal system.

**2.03 - OFFICE OF PRIME CONTRACTORS**

A. The General, Plumbing and Electrical Contractors shall provide and maintain during the life of this contract separate and suitable offices at the site that shall be used as the Contractor's superintendent office.

B. Provide adequate facilities for maintaining record documents, for holding small meetings and a telephone upon which calls may be received from Owner, Engineer/Architect and others. The telephone shall be equipped with a fax machine and an answering machine.

C. Each Contractor shall install, maintain, and repair if necessary, temporary electric and telephone to their own field office.

**2.04 – MATERIALS, EQUIPMENT AND SERVICES FURNISHED TO THE OWNER BY THE GENERAL CONTRACTOR**

A. The General Contractor shall provide the following computer system, to be paid for out of the cash allowance stipulated herein, consisting of the following:

1. Computer

2. Printer

3. Scanner

4. Digital camera

5. Tablet Computer

B. The Engineer/Architect will provide specifications for each component of the computer system that shall then be ordered by the General Contractor after the various quotations have been submitted for Engineer's review.

C. The computer shall be furnished to the Owner within 30 days from the date the Engineer provided the computer system specifications.

D. The General Contractor shall include the cash allowance as specified in Section 012100 in the lump sum bid for the computer and computer accessories to be provided under this paragraph.

1. The initial equipment purchase shall be paid for out of this cash allowance.

2. Paper for the printer shall not be eligible under this cash allowance.

3. Printer replenishable supplies shall not be eligible under this cash allowance.

E. The General Contractor shall also furnish the following equipment and services that shall not be eligible under any cash allowance. All items specified herein shall be new and remain the property of the Owner unless otherwise stated. The following shall be furnished:

1. Two (2) Texas Instruments advanced scientific calculators equal to TI-36X Pro or equal.

2. One (1) new digital answering system with two (2) cordless handsets by AT&T model CRL82212 or equal.

3. 36 inch x 48 inch new plastic sheet protectors designed specifically for protecting contract drawings, Quantity: Twenty four (24)

4. Three (3) 23-gallon plastic wastepaper basket.

5. One large set of triangles and one each of engineer's scale and architect's scale.

6. New 50-person industrial first aid station, OSHA approved, by Acme United or equal, order no. ACM-1403 (Huntington Business Products) or equal.

7. Thermometer, with indoor and outdoor sensing bulbs, and high, low instantaneous reading, with magnetic reset function by Radio Shack or equal.

8. Four (4) outdoor thermometers for recording curing temperatures of placed cold weather concrete (TAYLOR Model No. 6096-N)

9. One (1) infrared temperature thermometer (EXTECH Model #42509)

10. Two U.L. and F.M. approved fire extinguishers with a minimum rating of 4A-60B:C.

11. Dry type color photocopier with all necessary equipment and supplies.

    a. Model shall be capable of reproducing 8½" x 11", 8½" x 14" and 11" x 17" size papers.

    b. Two sided copy feeder and printer.

    c. Automatic original feeder

    d. Photocopier shall remain the property of the Contractor.

    e. Manufacturer support through project completion.

12. Standard manufacturer operating manuals for all equipment supplied.

13. Two (2) 30" x 60" desks with 4 side drawers and a locking center drawer.

14. Two (2) new swivel task chairs for use with desk equal to order no. ALEEL42ME10B by Alera (Huntington Business Products).

15. Four (4) guest chairs.

16. Two (2) drafting style stools for use with the drafting table.

17. One (1) new rolling stand with top, Model No.506 by Safco with six (6) 24”x36” clamps, or equal.

18. Two (2) 48” x 60” reference tables.

19. Five (5) folding chairs.

20. One (1) drafting tables constructed in the office.

21. One (1) new electronic professional labeler, model PT-D400AD with AC adapter by Brother.

    a. Supply ½ inch laminated, adhesive back TZ Series tape cartridges.

    b. Eight (8) each of the following shall be furnished:

        1) black on white,

        2) red on white,

        3) white on black.

22. One (1) adjustable, heavy-duty three hole punch, by Master, order no. MATMP40 (Huntington Business Products or equal).

23. One (1) 40 sheet capacity heavy-duty two hole punch, by Master, order no. MATMP250 or equal. (Huntington Business Products)

24. One electric (AC) pencil sharpener.

25. Three (3) rechargeable flashlights, Maglight® Magcharger model.

26. Bottled water cooler with hot water that shall remain the property of the Contractor.

27. Refrigerator that shall remain the property of the Contractor. Provide 10 cu.ft. unit with separate freezer section..

28. K-cup style coffee maker that shall remain the property of the Owner.

29. One 1200 watt microwave with turntable.

30. One (1) 3’x 5’ cork bulletin board with wall mounting hardware.

31. One (1) 3'x 5' white board with wall mounting hardware and dry erase marker set (Four (4) colors).

32. Two (2) 3 foot x 6 foot metal book shelves

33. Filing Cabinets - Provide three - four (4) drawer, legal size, fireproof filing cabinets with lock and keys.

    a. Cabinets shall be Global Business Furniture., or equal.

    b. Provide with legal size hangers and with 60 legal size-hanging folders all the same color.

34. Two (2) Boot brushes, mounted at exterior entrance staircases

35. One (1) Mud Mats, one at each office doorway

36. Three (3) clipboards

37. Five (5) coat hooks or coat rack

38. Three (3) Surge protection power strips, five receptacles minimum each

39. Two (2) chair mats, one for each desk area

40. One (1) 12 inch diameter wall clock, battery operated

41. Two (2) battery back-up units for desk top computer system: CyberPower Intelligent LCD Battery Backup, 825VA/450 Watts

42. Five (5) extension cords, minimum three plug each, three prong type

F. Cellular Service – Provide one (1) mobile telephone with unlimited calling and text messaging services until the date of substantial completion and submission of Record Drawings. Provide Apple model iPhone 8 cell phone with holster, protective case, station charger, and car charger or latest comparable model.

G. Janitorial Services - Provide janitorial services one (1) time each week. Thoroughly clean and dust entire office and leave in a condition satisfactory to Engineer. Provide this service through final completion.

H. Bottled Water Service – Provide bottled water service on a continuous basis through final completion.

I. Coffee Service – Provide coffee service including cups, stirrers, sugar, sugar substitute and non-dairy creamer on a continuous basis through final completion.

J. Supplies - Provide on a continual basis through substantial completion and release of retainage, as required: Paper for computer printer, copier and calculator and all required supplies for facsimile and copier, two (2) desk staplers and staples, large and small paper clips, two (2) tape dispensers and tape rolls, two (2) desk scissors pairs and necessary replacement batteries for all equipment supplied.

K. Ownership of Furnishings - All items to be provided by Contractor under this paragraph shall remain the property of the Owner unless otherwise stated.

L. Phone and Internet Access Service - The General Contractor shall also pay for monthly phone and internet access fees at a cost not to exceed $60.00 per month for the length of the contract up to the date of final completion.

1. This cost shall be included in the price as bid and shall be billed directly to the General Contractor.

2. The service provider shall be selected by the Engineer. The General Contractor shall arrange for the service.

3. Internet access will be used by the Engineer and the Owner to send email to manufacturers, vendors, Engineer's home office, the Contractor's home office, other prime Contractors, regulatory agencies and the like.

4. Cable high speed internet service shall be provided if available, the monthly service charge will be paid by the Contractor.

5. The Contractor may use this service at the discretion of the Engineer. Only project related transmissions will be allowed.

6. The Contractor may elect to combine the cable internet service with the required telephone service.

M. All items specified herein are subject to the approval of the Engineer.

N. Equipment shall be delivered to the site and turned over to the Engineer via a type written transmittal form.

O. All equipment that is to remain the property of the Contractor shall be new.

1. Equipment that is to remain the property of the Owner shall also be new and be provided in it's factory packaging, unopened until delivered to the Owner (Engineer).

2. Maintenance of all supplied equipment shall be the Contractor's responsibility up to substantial completion.

P. All items shall be delivered prior to the first application for payment, but no later than the day the Engineer's Trailer is delivered.

**2.05 - TELEPHONE SERVICE**

A. Provide on-site telephone line and service, answering machine, and fax machine in Contractor's field office.

**2.06 - REMOVALS**

A. Remove all items provided under this Section except as otherwise specified.

**PART 3 - EXECUTION**

**3.01 - REMOVAL OF UTILITIES, FACILITIES AND CONTROLS**

A. Remove temporary above grade or buried utilities, equipment, facilities and materials.

B. Remove underground installations to a minimum depth of 2 feet or as specified elsewhere.

C. Regrade area to existing slope and elevation and restore the surface to its existing condition or to the condition shown on the Contract Drawings.

D. The General Contractor shall inventory all equipment that has been turned back to the Contractor prior to agreeing to final payment.

E. All equipment and furnishings that require assembly shall be assembled for the Owner's/Engineer's use by the Contractor.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Control of environmental pollution and damage that the Contractor must consider for air, water, and land resources in preparing a bid and while constructing the project. This Section includes management of site aesthetics, noise, solid and liquid waste and wastewater, and other pollutants that may be generated by the Contractor.

B. Include all costs associated with environmental protection as specified herein and as specified in other Sections of these specifications in the total price bid.

C. General Contractor shall provide and install erosion control measures as detailed on the contract plans. All Contractors shall abide by the intent of this section to prevent environmental pollution and damage through the course of their work.

### 1.02 – DEFINITIONS

A. Environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which:

1. Adversely effect human health or welfare,

2. Unfavorably alter ecological balances of importance to human life,

3. Impact wetlands,

4. Effect other species of importance to man, or;

5. Degrade the utility of the environment for aesthetic, cultural, and historical purposes.

B. Definitions of Pollutants:

1. Sediment: Soil and other debris that has been eroded and transported by runoff water.

2. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations and from community activities.

3. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass and crockery, metal and lumber scrap, tin cans, and bones.

4. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.

5. Chemical Waste: Petroleum products, bituminous materials, salts, acids, alkalies, herbicides, pesticides, organic chemicals, and inorganic wastes.

C. Sanitary Wastes:

1. Sewage: Domestic sanitary sewage and human and animal waste.

2. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

**1.03 - SUBMITTALS**

A. Submit the following under provisions of Section 013300:

1. Environmental Protection Plan / Erosion Control Plan: After the Contract is awarded and prior to the commencement of the work, meet with the Engineer to discuss the proposed Environmental Protection Plan and to develop mutual understanding relative to details of environmental protection. Not more than twenty (20) days after the meeting, prepare and submit to the Engineer for approval, a written and/or graphic Environmental Protection Plan including, but not limited to, the following:

2. Methods for protection of features to be preserved within authorized work areas including trees, shrubs, vines, grasses, ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, and archeological and cultural resources.

3. Permits, licenses, and the location of the solid waste disposal area(s).

4. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials.

B. Prepare an Erosion Control Plan describing and showing methods for erosion control that shall be employed by the Contractor to protect adjoining wetlands.

C. Prepare a Work Area Plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan shall include measures for marking the limits of use areas. This plan may be incorporated within the Erosion Control Plan.

D. Approval of the Contractor's Environmental Protection Plan / Erosion Control Plan will not relieve the Contractor of responsibility for adequate and continued control of pollutants and other environmental protection measures.

## PART 2 – PRODUCTS

Not Used

## PART 3 - EXECUTION

### 3.01 - PROTECTION OF ENVIRONMENTAL RESOURCES

A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire period of this Contract. Confine activities to areas defined by the Contract Documents.

B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without permission from the Engineer. Do not fasten or attach ropes, cables, or guys to trees for anchorage unless specifically authorized, or where special emergency use is permitted.

C. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this Contract. Mark or fence isolated areas within the general work area that are to be saved and protected. Protect monuments, works of art, and markers before construction operations begin. Convey to all personnel the purpose of marking and protecting all necessary objects.

D. Protection of Landscape: Protect trees, shrubs, vines, grasses, land forms, and other landscape features shown on the drawings to be preserved by marking, fencing, or using any other approved techniques.

1. Box and protect from damage existing trees and shrubs to remain on the construction site.

2. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.

3. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.

E. Reduction of Exposure of Unprotected Erodible Soils: Plan and conduct earthwork to minimize the duration of exposure of unprotected soils. Clear areas in reasonably sized increments only as needed to use. Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.

1. Temporary Protection of Disturbed Areas: Construct diversion ditches and berms to retard and divert runoff from the construction site to protected wetlands areas as defined in the Clean Water Act and federal, state and local regulations

2. Erosion and Sedimentation Control Devices:

   a. Construct or install all temporary and permanent erosion and sedimentation control features as shown or specified in the Contract Documents and as required by the Owner pursuant to direction of the regulatory authority.

   b. Maintain temporary erosion and sediment control measures such as berms, dikes, drains, hay bales, erosion control fencing, sedimentation basins, grassing, and mulching, until permanent drainage and erosion control facilities are completed and operative.

3. Manage borrow areas on and off Owner property to minimize erosion and to prevent sediment from entering nearby property, watercourses and local streets.

4. Manage and control spoil areas on and off Owner property to limit spoil to areas shown on the Environmental Protection Plan and prevent erosion of soil or sediment from entering nearby property, watercourses or streets.

5. Protect adjacent areas from degradation by temporary excavations and embankments.

F. Handle and dispose of solid wastes in such a manner that will prevent contamination of the environment.

1. Place solid wastes (excluding clearing debris) in containers that are emptied on a regular schedule.

2. Transport all solid waste off Owners' property and dispose of waste in compliance with Federal, State, and local requirements.

3. Store chemical waste away from the work areas in corrosion resistant containers and dispose of waste in accordance with Federal, State, and local regulations.

4. Handle discarded materials other than those included in the solid waste category as directed by the Engineer.

G. Protection of Water Resources: Keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters and sewer systems. Implement

management techniques to control water pollution by the listed construction activities that are included in this Contract.

H. Washing and Curing Water: Do not allow wastewater directly derived from construction activities to enter water areas. Collect and place wastewater in retention ponds allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.

I. Control movement of materials and equipment during construction to prevent violation of water pollution control standards of the Federal, State, or local government.

J. Monitor water areas affected by construction.

K. Protection of Fish and Wildlife Resources:

1. Keep construction activities under surveillance, management, and control to minimize interference with, disturbance of, or damage to fish and wildlife.

L. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources.

1. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State and Federal emission and performance laws and standards.

2. Maintain ambient air quality standards set by the Environmental Protection Agency and State, for those construction operations and activities specified.

M. Particulates: Control dust particles, aerosols, and gaseous by-products from all construction activities, processing, and preparation of materials (such as from asphaltic batch plants) at all times, including weekends, holidays, and hours when work is not in progress.

N. Particulates Control: Maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause a hazard or a nuisance. Sprinkle, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators, or other methods are permitted to control particulates in the work area.

O. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal and State allowable limits.

P. Odors: Control odors of construction activities and prevent obnoxious odors from occurring.

Q. Reduction of Noise: Minimize noise using every action possible. Perform noise-producing work in less sensitive hours of the day or week as directed by the Engineer. Maintain noise-produced work at or below the decibel levels and within the time periods specified in accordance with OSHA and local ordinances, whichever is more restrictive.

1. Perform construction activities involving repetitive, high-level impact noise only between 8:00 a.m. and 5:00 p.m unless otherwise permitted by local ordinance or by the Engineer.

2. Repetitive impact noise on the property shall not exceed the following dBA limitations:

| Noise Level (dBA) | Maximum Exposure Period per 24 hours |
|---|---|
| 85 | 8 hours |
| 88 | 4 hours |
| 91 | 2 hours |
| 94 | 1 hour |
| 97 | 30 min |
| 100 | 15 min |
| <140 | NO EXPOSURE |

3. Provide sound-deadening devices on equipment and take noise abatement measures that are necessary to comply with the requirements of this Contract, consisting of, but not limited to, the following:

a. Use shields or other physical barriers to restrict noise transmission.

b. Provide soundproof housings or enclosures for noise-producing machinery.

c. Use efficient silencers on equipment air intakes.

d. Use and maintain efficient intake and exhaust mufflers on internal combustion engines.

e. Line hoppers and storage bins with sound deadening material.

f. Conduct truck loading, unloading, and hauling operations so that noise is kept to a minimum.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 – SECTION INCLUDES

A. Temporary system of pumps, pipes and appurtenances to convey sanitary wastewater to allow the work to be performed.

B. Standby equipment for the temporary sanitary wastewater conveyance system to assure continuous operation.

### 1.02 – SYSTEM DESCRIPTION

A. Contract G shall provide temporary bypass pumping systems as needed to implement the work of their contract.

B. Each temporary pump shall be capable of conveying the design operating flow rate.

1. Refer to the hydraulic profile for design flow information.

2. The flow varies throughout the day.

3. The lowest flow typically occurs between the hours of 1:00 a.m. and 6:00 a.m.

4. Flow will be higher during precipitation.

C. Provide pump control elements such as floats to prevent surcharging of wastewater into the piping system and overflow from structures.

D. Pumps handling raw and partially treated wastewater shall be capable of passing a sphere of at least 3-inches in diameter.

E. Pump suction and discharge openings shall be at least 4-inches in diameter.

F. Maintain sanitary conditions to allow work to be performed. Protect equipment, suction piping and discharge piping main from inclement weather, freezing conditions and traffic.

G. Prevent leakage and spillage of wastewater.

H. Provide walkways over obstructions on sidewalks to maintain pedestrian traffic.

I. Provide ramps or below grade piping to maintain vehicular traffic.

J. Provide alarm system to indicate increase above normal operating liquid level in wet well / tank/ sewer lines.

K. Electrical system and components in sewers and raw wastewater wet wells shall comply with the National Electric Code requirements for Class I, Group D, Division 1 locations.

L. Noise levels shall not exceed the levels indicated in Section 015719.

M. Provide spare suction and discharge piping at the project site.

N. For temporary sanitary wastewater conveyance systems located in roadways, provide signs and traffic controls in accordance with the State Manual of Uniform Traffic Control Devices.

O. Obtain confined space entry permit as needed, from Owner.

**1.03 – SUBMITTALS**

A. Submit under provisions of Section 013300.

B. Provide a written plan of the proposed temporary sanitary wastewater conveyance system to the Engineer at least two weeks prior to the need for the system.

1. The written plan shall include number size and type of pumps, material, diameter and proposed route of piping and/or hoses, control system, back-up and spare equipment, and estimated duration of bypass operation.

2. Provide a schematic diagram of the system if so requested by the Engineer.

**PART 2 - PRODUCTS**

**2.01 – PRODUCTS**

A. Provide close coupled centrifugal pump with vacuum priming compressor mounted to a diesel engine or electric motor on skid base or two-wheeled highway trailer, or submersible pump.

B. Provide solids handling ball type check valve with flexible rubber seat and quick release access feature with centrifugal pumps.

C. Provide compact unit mounted on skid base or two-wheeled highway trailer. Either option shall include overnight running fuel tank.

D. Engines shall be equipped with critical silencers and be housed to minimize noise during operation.

E. Provide suction hose from source to pump.

F. Provide plugs in the upstream manholes/tanks to prevent flow from the upstream sanitary sewer/tanks through the sewers/pipelines in the work location.

**PART 3 – EXECUTION**

**3.01 – INSTALLATION**

A. Furnish all labor, materials, equipment and appliances necessary to maintain both vehicular and pedestrian traffic, to protect the public from all damage to person and property and to minimize inconveniences to the facilities adjacent to the work areas for the duration of the use of the temporary sanitary wastewater conveyance system in accordance with the Contract and the appropriate State, County or local agency.

B. Install, operate and maintain bypass pumping system in accordance with manufacturer's instructions.

C. Install plugs or other devices to prevent flow into out of service facilities.

D. Test temporary conveyance system to the satisfaction of the Engineer prior to usage.

E. System shall require low level of maintenance, typically confined to checking engine oil levels and seal cavity oil levels.

F. Provide full-time personnel to continuously operate the bypass system to assure continuous wastewater conveyance for entire time use of the system is required.

G. Conduct work to minimize duration of bypass pumping system operation.

H. Electrical power required for bypass systems, if needed, shall be provided by the Contractor. If suitable electrical power is not available, provisions for for extending power to the equipment location or providing a back-up power supply shall be arranged for and provided by the Contractor at no additional cost to the Owner.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Project sign

B. This section covers the fabrication and installation of a project identification sign for projects receiving funding through the New York Clean Water State Revolving Fund Program.

### 1.02 - GENERAL

A. The project sign shall be fabricated and erected within 21 days following the notice to proceed and shall be maintained by the Contractor until completion of construction and the Owner's acceptance of the work.

B. For projects which include greater than one funding source, the information specified for CWSRF projects may be combined with other project signage requirements onto one sign, as allowed and approved by the funding agencies.

C. There shall be one (1) project sign. Locate sign as directed by the Engineer.

D. Refer to attached figure titled "CWSRF Project Sign Elevation" for typical layout of a sign. The size and spacing of the lettering on the sign may change to accommodate the addition of other funding agencies

### 1.03 - REFERENCES

A. Lumber Standard: American Softwood Lumber Standard; U.S. Department of Commerce Product Standard PS1.

B. Softwood Plywood Standard: Construction and Industrial; U.S. Department of Commerce Product Standard PS1.

### 1.04 - SUBMITTALS

A. Submit under provision of Section 013300.

B. Submit proof sheet of sign.

C. Color samples: match specified colors.

**1.04 – QUALITY ASSURANCE**

A. Painter's Qualifications: Sign shall be prepared by a professional sign painter.

**PART 2 – PRODUCTS**

**2.01 – MATERIALS**

A. Framing and Posts: Standard Grade Douglas Fir, Hem-Fir, White Pine or Southern Pine: S4S; preservative treated.

B. Sign Panel: The sign panel shall be constructed of 3/4-inch APA rated, A-B grade exterior plywood rabbeted into a 2" x 4" nominal frame or other suitable materials and construction capable of withstanding typical weather conditions common to the project site

C. Fasteners: All fasteners used in the fabrication of the sign shall be rust-proof.

D. Select finishes to withstand weathering, fading and chipping for duration of sign placement.

**2.02 – FABRICATION**

A. Sign and structure shall be designed to withstand 100 mile per hour wind velocity.

B. Coating: All paint or exterior coverings used shall be exterior grade coating suitable for use on wood or the material of construction. The sign shall be prepared as follows

C. Sign Face: The sign face background shall be white and shall consist of a minimum two coats of paint.

D. Supports and Trim: The supports and trim shall be white and shall consist of a minimum of two coats of paint. The front facing surface of the 2" x 4" frame shall be royal blue color.

E. Lettering and Emblem: The lettering shall be of the size and color as specified on the attached figure. The size and spacing of the lettering on the sign may change to accommodate the addition of other funding agencies. The emblem shall be of the size specified on the attached figure in royal blue.

## PART 3 - EXECUTION

### 3.01 - INSTALLATION

A. Sign shall be in place from the start of construction until 90 days after substantial completion. The signs shall be removed and remain the property of the Contractor. Fill post holes when sign is removed.

B. Set posts plumb, 4 feet minimum into the ground.

C. Embed posts in concrete and compact.

D. Fasten sign in a level position securely to posts with heavy-duty stainless steel fasteners. Provide at least three (3) equally spaced lag bolts into each post.

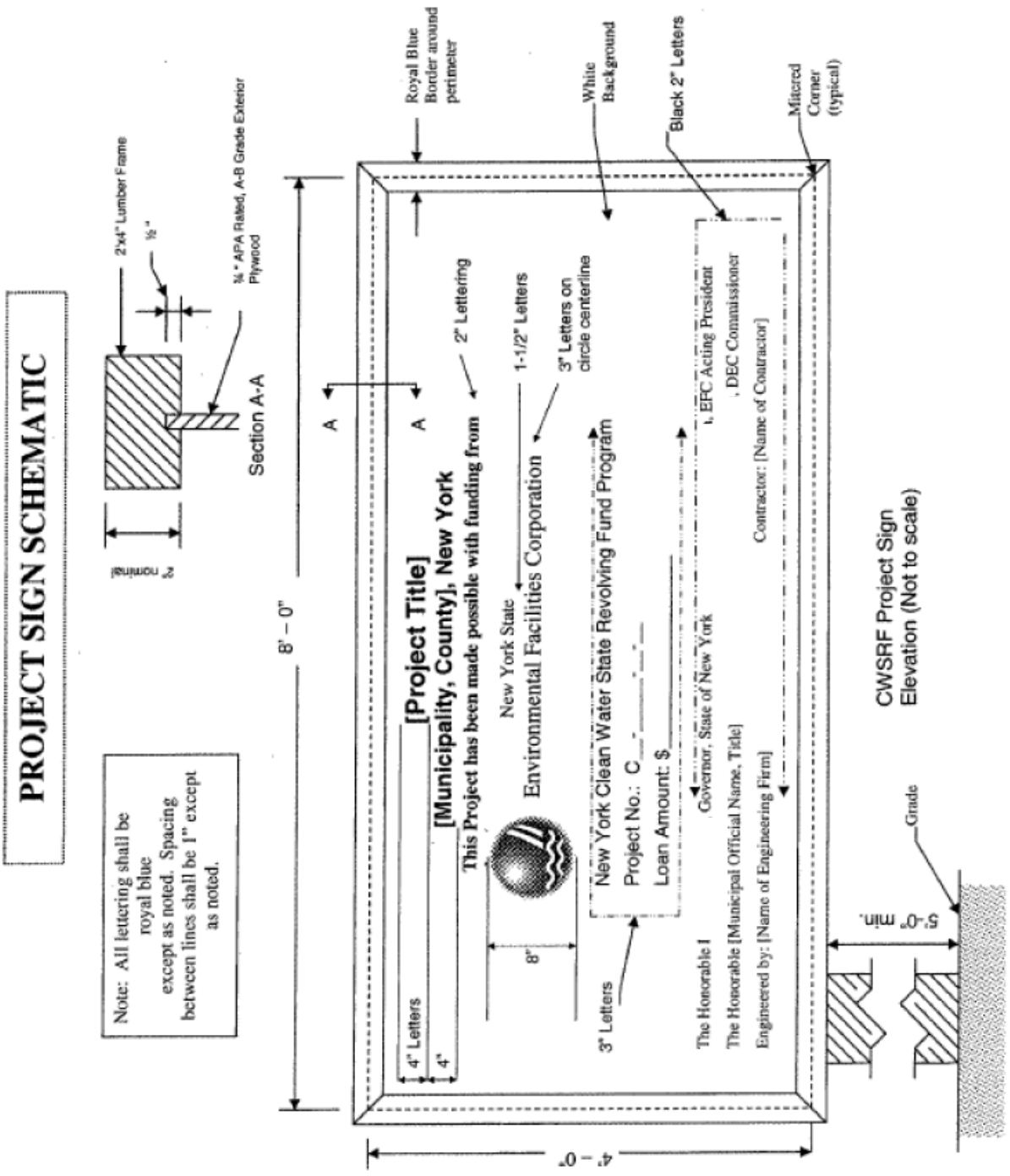
E. Provide bracing between posts.

### 3.02 – PROTECTION

A. Maintain the sign clean, plumb and level.

B. Repair deterioration and damage.

C. When directed after project closeout, remove sign from site.




**END OF SECTION**

## 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/Architect in carrying out such checks.

1. Such checking by the Engineer/Architect 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/Architect 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/Architect, 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/Architect.

**2.02 – CONTROL PANELS, MCC'S AND SWITCHBOARDS**

A. All control panels, motor control centers, and switchboards shall be fabricated with pilot lights, selector switches, PLC, graphics display panels, elapsed time meters and other components that shall match.

1. This does not require that all components be one manufacturer, but does require that the like components be of the same manufacturer.

2. The Contractor shall coordinate the shop drawing submittals to indicate that all components have been selected on this basis.

3. This requires the Contractor to advise each control panel supplier that product options are limited in this regard.

B. Replacement of unlike products delivered to the job site shall be the responsibility of the Contractor.

C. All costs associated with the replacement shall be borne by the Contractor.

**2.05 – PROGRAMMING SOFTWARE REQUIREMENTS**

A. The Contractor shall require that ALL equipment suppliers that are providing equipment with microprocessor/PLC control systems provide a copy of the microprocessor/PLC programming software on CD/DVD for the Owner's use.

1. Minimum requirements:

a. Suitable for Microsoft windows based operating system laptop use.

b. Provide CD/DVD with write protected version of final accepted program after system start up and O & M training.

c. Provide CD/DVD with copy of programming software for the purpose of modifying the existing control logic as desired by the Owner. Provide software use manual in PDF format along with programming software.

d. Cable(s) required to connect laptop computer to microprocessor/PLC."

B. All control panels with UPS units shall provide programming as necessary to detect the UPS as the power source during a power failure and reinitiate/acquire all motor start signals from running motors when emergency power or normal power is activated. Adjustable loss of signal time delays may be utilized to cover the power transfer time only while the UPS is detected as the sole power source.

C. Manufacturer to verify that all I/O for the system shall not be protected via a single common fuse, such that one fuse failure would shut down the entire system operation.

D. Control panel supplier/manufacturer shall coordinate the programming of the PLC with the System Integrgator/SCADA programmer to provide access to the all system data residing therein as well

as access to adjust any operator adjustable set points via the SCADA system, as the Owner desires.

E. Control panels shall be provided with an Ethernet switch suitable for both copper and fiber optic connection for use by Owner's SCADA integration supplier. Fiber optic connection shall be SC type.

**2.03 - 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.

**2.04 - 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 work of all other prime trades and verify that all such work is in conformance with the Contract Documents and 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/Architect.

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/Architect 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/Architect 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/Architect, 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/Architect's direction to uncover the work if tie distances were not obtained.

C. If any work has been covered with Engineer/Architect's consent and Engineer/Architect 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**

## 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 it’s 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. All control panels shall be wood crated.

1. All sides of the control panel shall be covered with 3/4" plywood.

2. The control panel number or name shall be printed on all sides of the crate in 1' high black lettering.

3. The manufacturer's name, Contractor's name and project name shall also be printed on the front of the crate.

4. All control panels and centers shall be packaged with three (3) copies of the approved wiring diagram inside the control panel enclosure in a separate plan holder attached to the inside door. The words "APPROVED FOR CONSTRUCTION" shall be indicated on each page of the wiring diagram.

G. Delicate instruments and devices, reagents, chemicals, and glassware shall be shipped in packaging normally provided by the manufacturer.

H. 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 by the designated Contractor.

1. Only noted or specified products shall be furnished under each 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 designated Contract.

B. The Contractor shall furnish these products to the Owner. These products shall be stored as specified above.

C. The Owner/Engineer 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/Architect 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/Architect.

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/Architect in writing. The Engineer/Architect 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/Architect 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**

## 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.

B. Perform final cleaning at least five (5) days before the date set for ceremonies to dedicate the new facility wherein the Owner will provide tours to the general public and/or dignitaries. The site shall be clean, organized, and totally free of construction debris, tools, and equipment.

## 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 of wet and/or slippery floor conditions 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, rust, 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. Vacuum clean acoustic ceilings.

6. Repair, patch, and touch-up marred surfaces to specified finish and to match adjacent surfaces.

7. Remove foreign material from brick.

8. Replace all broken and scratched glass and mirrors.

9. Replace all damaged insect screens.

10. 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.

11. Polish bright metal by damp wiping and drying with a suitable cloth. If a polished appearance is not thereby produced, apply appropriate metal polish.

12. Clean and polish all stainless steel surfaces, including control panels supplied under this Contract.

13. Clean furniture and equipment in accordance with manufacturers instructions.

14. 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.

15. Repair or repaint damaged pavement markings.

16. 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.

17. Clean supply vents and exhaust grilles. Clean gutters and downspouts.

18. Remove all rust spots and stains from new and pre-existing concrete, painted surfaces, and all other surfaces.

19. Clean and polish all new toilet facilities constructed under this project.

20. Clean and disinfect all pre-existing toilet facilities that were entered upon and used by the Contractor during the project.

21. Replace damaged existing toilet fixtures, such as sinks, toilet bowls, urinals, and mirrors, with in-kind units if so directed by the Engineer.

22. Wash all existing floors that were in any way impacted by the construction operations.

23. Rake clean landscaped surfaces. Final mow all areas grassed and sodded during the work.

24. 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.

25. Polish all new handrail installed as work of this contract with a commercially available aluminum cleaner recommended by the railing manufacturer.

26. Clean dirt that has accumulated between grating and grating angles/supports.

27. Vacuum the inside of all control panels provided under this Contract after the panel has been wired.

28. Pressure wash curbs, walks and concrete platforms on new and existing process tankage.

29. Fill in all holes in concrete that remain after temporary handrail is removed. Non-shrink grout shall be used.

30. Thoroughly clean all pits, galleries, manholes, pipes, channels, tanks, wells and all structures entered upon.

**END OF SECTION**

## 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

B. Work of this Section also includes stipulated man-hours that shall be provided by the **Prime Electrical Construction Contractor** for startup participation of equipment and systems.

### 1.02 - STARTING SYSTEMS

A. Each 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/Architect at least 14 calendar days prior to the start-up of each item or system so that he can schedule the startup with the Owner, utilities, and other Prime Contractors.

D. Verify that each piece of equipment or system has been checked for proper:

1. lubrication,
2. drive rotation,
3. belt tension,
4. motor starter heater size,
5. fuse size,
6. water pressures,
7. terminal connections,
8. control sequence

9. 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.

## 1.03 - STIPULATED STARTUP PARTICIPATION FOR PRIME ELECTRICAL CONSTRUCTION CONTRACTOR

A. The **Prime Electrical Construction Contractor** shall provide the services of the job site foreman or superintendent who shall participate in the startup of equipment or systems that were furnished by others so as to achieve proper and sustained service.

B. The **Prime Electrical Construction Contractor** shall include in the Contract price **ONE HUNDRED SIXTY (160)** man-hours of participation service exclusively dedicated for providing startup services for equipment furnished by other Contractors.

1. The Owner reserves the right to receive a credit for each unused hour at the prevailing wage in effect at the time, said amount not being less than **SEVENTY FIVE DOLLARS ($75)** per hour in any case.

2. This service shall be provided when directed by the Engineer. Sufficient advance notice will be provided.

C. The **Prime Electrical Construction Contractor** shall provide a separate line item in the Schedule of Values for this service.

1. Provide with each requisition for payment, concerning this stipulated amount, a field report documenting the equipment item or system, date(s) of service, name of Contractor's worker(s), hour(s) worked, brief description of work performed during startup, and the prevailing wage rate paid them.

2. The field report shall be signed by the Engineer's field representative.

D. Requisitions for payment out of this stipulated amount will not be processed without an executed field report unless proof of manhours expended can be proved otherwise.

**PART 2 - PRODUCTS**

Not Used

**PART 3 – EXECUTION**

Not Used

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SUMMARY

A. Testing of piping.

B. Testing of tanks vented to atmosphere.

C. Pipe leakage testing shall comply with the conditions noted in the Schedule.

D. All piping shall be tested by the installing contractor, coordinate with engineer and other contractors for limits of testing.

E. All tanks shall be tested by Contract G.

### 1.02 - DEFINITIONS

A. Leakage (or exfiltration) - The quantity of water to be supplied into the newly laid pipe, any valved section thereof, manhole, or other appurtenance, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.

B. Infiltration - The quantity of water that enters into any pipe, manhole, or other appurtenance when the static groundwater elevation is at the maximum elevation above the pipe or appurtenance as specified hereinafter.

### 1.03 - QUALITY ASSURANCE

A. Prior to Substantial Completion, pressure pipes and non-pressure pipes shall meet specific leakage requirements. These leakage requirements shall be satisfied by the basic materials alone. Where joint fillers and the like have been specified, primarily to protect jointing materials, and secondarily to provide a factor of safety, they shall not be applied until after leakage tests have been completed and have been accepted by Engineer.

B. Engineer will witness all tests. Tests not witnessed will be considered as not having been performed.

C. Do not close or cover up work until it has been observed for proper and satisfactory construction and installation in compliance with the Contract Documents. Should incomplete or unacceptable work be covered, the Contractor shall, at his/her own expense, uncover all work so that it may be properly observed. After such observations, repair and replace the work that was found defective, unsatisfactory, and not in accordance with the Contract Documents. After such repair and replacement, bring all work to completeness and status as it was before it was closed and

covered, all at the Contractor's own expense. Submit for review and approval proposed corrective action to correct failed systems.

D. Successful completion of required tests shall be in no way interpreted as relieving the Contractor of responsibility for defects that become apparent subsequent to the time of testing. It shall be the sole right of the Engineer/Architect to determine whether defects exist. Retest all portions of the work deemed necessary by the Engineer/Architect prior to Substantial Completion.

**1.04 - SUBMITTALS**

A. Submit under provisions of Section 013300.

B. Provide details and specifications on testing apparatus.

C. Provide certified test results on forms approved by the Engineer/Architect.

**1.05 - SEQUENCING AND SCHEDULING**

A. Notify Engineer/Architect and governing agencies, if necessary, at least 48 hours in advance of a scheduled test so that the test may be witnessed.

B. Test underground pipe prior to backfilling.

C. At Engineer/Architect's discretion, additional sections of pipelines may be required to be tested as soon as pipe is laid and prior to backfilling when working conditions or the standard of workmanship have been altered.

**PART 2 - PRODUCTS**

**2.01 - TESTING APPARATUS**

A. Provide labor, plugs, measuring equipment, and other apparatus, complete, to perform testing.

B. Provide clean water, air, nitrogen, and other materials as required to accomplish testing.

C. Provide plugs and caps capable of withstanding test pressures.

D. Provide temporary flanges, plugs, bulkheads, thrust blocks, weighing, bracing and other items necessary to prevent joints from separating, and to prevent injuries or damage.

## PART 3 - EXECUTION

### 3.01 - PREPARATION

A. Plug open ends, adequately block bends, tees, ends, and other fittings, and do whatever is necessary to brace piping system so that it will safely withstand the pressures developed under the tests and so that no damage or injury shall occur to the pipeline, people or property.

B. Before tests are conducted, isolate, or remove any regulator, gauge, trap, or other apparatus or equipment that may be damaged by test pressures.

### 3.02 - GENERAL

A. Trapped Air: Trapped air may cause a false indication of the rate of leakage. Points of concern include ends of lines, stubs, house connections and high points in pipelines. No credit will be made for this condition and no adjustment will be made to the allowable leakage. When trapped air is suspected of causing a test failure, do whatever is necessary to evacuate the air and repeat tests until the actual leakage is equal to or less than allowable rate of leakage.

B. Water Absorption: No credit will be given for absorption of water in pipe and manhole walls. If necessary, fill pipes and manholes with water well in advance of testing and allow them to soak in order to eliminate or minimize the effects of absorption.

### 3.03 - TESTS FOR NON-PRESSURE PIPING

A. General:

1. Leakage shall be determined by exfiltration testing. The Engineer/Architect reserves the right to also require infiltration testing.

2. Air testing is not permitted.

3. Leakage testing shall include the main non-pressure pipe, house connections, and appurtenances on the section of pipeline being tested.

4. Limit pipeline test sections to runs between adjacent structures. Manholes may be tested simultaneously with pipes.

5. Adequately plug ends of house connections, stubs, and openings from which water may escape.

6. Use clean water for exfiltration tests.

7. Determine groundwater levels by installing piezometers, test holes or test pits at intervals not to exceed 1,000 feet.

B. Pipe Exfiltration Test:

1. The minimum water level required for testing is 4 feet above the crown of the upstream (highest) end of the pipe being tested or 2 feet above the maximum groundwater level along the test section, whichever is greater.

2. Install a watertight plug in the downstream end of the manhole pipe.

3. Fill upstream manhole with water and conduct test for six (6) hours.

4. Upon satisfactorily completing the test, remove the downstream plug in the presence of Engineer/Architect. Do not touch nor remove anything until approved by Engineer/Architect.

5. Maximum allowable exfiltration is one hundred (100) gallons per inch diameter per mile per day.

C. Pipe Infiltration Test:

1. The minimum head of groundwater required for infiltration testing is 2 feet above the crown of the pipe at the upstream end but must in all cases reach its normal level.

2. Infiltration may be measured with an approved graduated container capable of intercepting all inflow, by a pipeline V-notch weir, or by other approved methods. When using instream type measuring devices, do not measure flows until steady state conditions are established.

3. Maximum allowable infiltration is one hundred (100) gallons per inch diameter per day per mile of pipe.

4. Where groundwater level is at least 2 feet above the highest manhole joint, manholes may be included in the test. No visible leakage will be permitted in manholes.

**3.04 - TESTS FOR PRESSURE PIPES**

A. Leakage testing shall include the main exiting pipe, service connections, and other appurtenances on the section of pipeline being tested.

B. Test pipes prior to applying insulation and before they are concealed or furred-in.

C. Provide all necessary gauges. Gauges shall be standard pressure type with a minimum 6 inch diameter dial and a pressure range not in excess of 150% of the maximum required test pressure.

D. Provide and maintain at the site a gauge stand with an approved laboratory calibrated test gauge. Periodically check test gauge used for testing against the test gauge, and whenever requested by Engineer.

E. Where it is necessary for testing, tap pipes and insert approved plugs after testing is completed.

F. Provide a hand or motor driven compressor to maintain the required test pressure constant throughout the duration of the test. If a water pump is used, pump water from a container with a known volume of water. If an air or inert gas pump is used, leakage shall be determined and calculated by the cycling of the pump.

G. Provide test gauges at each end of the line being tested.

H. Conduct leakage test in accordance with the requirements contained in the Schedule.

**3.05 - ALLOWABLE LEAKAGE**

A. The maximum allowable leakage for the various piping systems is presented in the schedule.

B. It is the intent of this Contract to secure piping systems without leakage.

1. Each section of pipe and within each structure shall not exceed the allowable leakage.

2. It is also the intent to secure a piping system free from visible drips, streams and leaks. Therefore, even if a portion of the system meets the requirements for allowable leakage, visible leaks are not permitted and shall be repaired.

C. Leakage tests will be considered satisfactorily passed when the rate of leakage is equal to or less than the stipulated allowances, there is no evidence of visible leaks, and there is no evidence of other system defects.

**3.06 – TEST FOR TANKS VENTED TO ATMOSPHERE**

A. Prior to testing liquid holding tanks open to the atmosphere, backfill to finished grade. Piping and equipment within the tank that might affect the watertightness of the tank shall be completely installed and operable.

B. Isolate each individual tank for testing.

1. Fill with clean, potable water to the maximum operating level.

2. After a suitable stabilization period, the maximum operating level shall be reestablished and a twenty-four (24) hour leakage test shall be performed.

3. During the test, no water shall be added to or taken from the tank. The drop in the water level shall be recorded at the end of the period.

4. The allowable loss is no more than 1/4-inch per eight hours and no running leaks shall be visible.

5. Leaks shall be repaired by methods and materials approved by the Engineer prior to the start of the corrective action.

6. Leakage shall be corrected prior to the performance of equipment testing.

7. During the testing of each individual tank, as outlined in this paragraph, all immediately adjacent tanks shall be empty of water.

C. After each individual tank has passed the leakage test, all tanks within each complex shall be filled with water to the normal operation level to check complex structural integrity and the hydraulics of operation.

**3.07 - RETESTING**

A. Pipes, tanks and manholes not passing the tests shall have all defects corrected with methods approved by the Engineer/Architect to the inspection and satisfaction of Engineer/Architect, and shall be retested and re-corrected as often as is necessary until the test requirements have been met.

B. It is the intent of this Contract to obtain work meeting test requirements on their own and solely through the use of the normal integral sealing components.

1. Joint leaks shall not be stopped using concrete, caulking, mortar, or other patching materials.

2. Leaking pipe joints shall be re-jointed and leaking manhole joints shall have joints reset, or replaced if necessary.

C. Methods other than rejoining, resetting or replacing joint seals shall require the written approval of Engineer/Architect.

**3.08 - SCHEDULE**

**LEAKAGE TESTING REQUIREMENTS**

| SERVICE | FLUID | PRESSURE | DURATION (Hrs.) | ALLOWABLE LEAKAGE (Note 1) | | |
|---|---|---|---|---|---|---|
| | | | | UNDERGROUND | | EXPOSED |
| | | | | Infil. | Exfil. | |
| Non-Pressure Piping | Water | *4ft.* | 6 | 100 | 100 | **None** |
| Pressure Piping | Water | **(Note 2)** | **(Note 2)** | 0 | 0 | 0 |

**SCHEDULE NOTES:**

1. Maximum allowable leakage in gallons/day/inch diameter per mile of pipe, or gallons/day/inch diameter/mile for manholes. Where a percentage is shown, the loss shall not exceed the percentage of the starting test pressure.

2. Maintain 100 psi or two times operating pressure, whichever is greater, for 2 hours.

**END OF SECTION**

## 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 secured by the Prime **Electrical Contractor**.

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/Architect's acknowledgment of receipt or approval.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

## 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 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/Architect, 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. For systems being furnished with control panels, each manual shall contain a catalog cut for every electrical device installed inside the control panel or motor control center.

I. 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.

J. Where manuals are prepared for treatment systems for water or wastewater, 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.

K. Each manual shall contain the following as a minimum:

1. Table of contents

2. Final version of the warranty statement approved by the Engineer/Architect

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.

L. Submit two (2) copies of a preliminary draft manual at least fourteen (14) calendar days prior to the date set for start-up.

1. The Engineer/Architect 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. One (1) manual will be used at start-up, to record changes that should be made to the final manual.

4. This copy of the manual will be retained on the site until such time as the final, updated manual is provided.

M. Engineer/Owner will select up to ten (10) different operations/procedures from the basic and emergency operations of the equipment that shall be made into individual “Quick Reference Sheets”. Each “Quick Reference Sheet” shall be laminated and provided in a separate binder or section of the O&M manual. Submit draft copies of the “Quick Reference Sheets” for approval by the Engineer before providing the laminated copies with the final O&M manuals.

N. Two (2) weeks after the date the unit was placed into service and the Owner has gained beneficial use, submit five (5) copies of the final updated Operations and Maintenance Manual. Refer to Section 017500 - Starting and Adjusting for requirements related to updating the manual(s).

O. 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**

## 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 to be provided by Contract P and Contract S.

### 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 PDF format on CD. The Contractor will be required to print out hard copy sets for field and internal use.

B. Hard copy sets of Contract Documents (plans, specifications and addenda) can be furnished to the Contractor at $300 per set, if requested.

### 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/Architect, 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.

B. Keep the record documents current as the work progresses. Record information concurrent with construction progress.

C. The Contractor shall include a lump sum amount in the bid amount for preparation of record drawings as follows: Contract G = $20,000; Contract E = $15,000; Contract P = $10,000; Contract S = $10,000;

1. Stipulated amount will be released when the record drawings have been accepted by the Engineer.

2. Satisfactory evidence shall be provided by the Contractor demonstrating compliance with these specifications and said drawings have been delivered and deemed in compliance with the specifications by the Engineer/Architect.

3. Progress payments will be allowed against the line item in the Schedule of Values only if record documents are considered accurate and up-to-date by the Engineer.

D. Do not permanently conceal any work until required information has been recorded.

1. Legibly mark the Contract Plans to record actual construction, including, but not limited to the following:

2. All as-built work.

3. All approved field changes and conditions.

4. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.

5. Location of underground conduits, boxes, devices. Wire sizes (AWG) and types installed. Number of active and spare wires in each conduit and conduit size (applicable where work involves electrical construction).

6. Tied-down location of all underground process lines and buried valves.

E. Shop Drawings: 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 General 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 as work of Contract G.

C. The primary electric service installed by LIPA shall also be located on the record drawings prepared by the Contractor's surveyor.

**1.06 - SUBMITTAL OF RECORD DOCUMENTS**

A. At Substantial Completion, the Contractor shall deliver one (1) preliminary record set of as-built documents to the Engineer/Architect with all changes conspicuously ballooned or otherwise emphasized.

B. **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".**

C. Prior to Final Completion, the Contractor shall conform the preliminary record drawings to the comments made by the Engineer and then provide the Owner a complete set of as-built drawings prints and one electronic copy on CD/DVD of all drawings in PDF format.

D. 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.

E. 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.

F. As a convenience, Engineer will make available to the Contractor mylar sepias or electronic media of the Contract Drawings for the sole purpose of the Contractor preparing as-built drawings.

G. 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 and pay the Engineer/Architect $20.00 per Contract Drawing sheet to cover the cost of providing mylar sepias.

2. Electronic media will be provided free of charge on disc in a zipped format.

3. Payment shall be by check, payable to Holzmacher, McLendon & Murrell, P.C., in advance of picking up the requested materials.

4. 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.

**1.08 – UNDERGROUND PIPELINE DOCUMENTATION – ALL CONTRACTS**

A. The Contractor shall document the location of all underground pipelines by taking digital photographs of the installed pipelines prior to backfilling. At least 3 digital photographs shall be taken of each pipe section before it has been backfilled.

B. The Contractor shall provide each pipe installation crew with a digital camera capable of a 3 mega-pixel quality picture using Smart Media, Compact Flash Media, or Memory Stick cards as the media within the camera.

C. At the end of each day that pipe has been installed, the crew foreman shall hand deliver to the Resident Engineer the removable media.

1. The Engineer/Architect will then download the photographs onto the Owner's computer and delete the photographs from the media.

2. The media will be returned to the crew foreman within two working days from the date it was delivered.

3. The Contractor shall have at least three (3) 2 GB media cards available for this purpose to be used on a rotating basis.

D. Installed work will not be eligible for payment until documentation is provided.

E. In addition, the underground piping shall be marked with construction grade spray paint before the photos have been taken to indicate the pipelines in the pictures.

1. The Contractor shall assign a separate paint color to each line to be shown in the picture.

2. The paint color, once selected by the Contractor, shall be used for the entire run of piping.

3. The marks shall be large and long enough to be visible in the picture. Where practical, spray paint the name of the contents that will be conveyed in the pipe, e.g. "PRE-EQ AIR", "MBR EFF.".

4. This requirement is necessary so that the pipe lines shown in the pictures can be easily named and referenced at a later date.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. The Section includes the requirements for delivering spare parts specified to be furnished under the provisions of the Contract Documents.

### 1.02 - QUALITY ASSURANCE

A. Spare parts shall be delivered as complete assemblies direct from the manufacturer such that the part is fully functional and ready to be installed.

### 1.03 - DELIVERY, STORAGE AND HANDLING OF SPARE PARTS

A. Comply with the requirements of Section 016500 for packing, delivery, storage and handling requirements for all parts delivered to the site of the work.

B. All spare parts required to be furnished under a Section of the Specifications shall be packaged in one separate box, crate or container with the words “SPARE PARTS” lettered on all sides of the container.

C. The equipment name or system name for which the spare parts are being provided shall also be lettered on the container.

D. A separate packing list for the spare parts shall be included in the container.

E. The Contractor shall store all spare parts indoors immediately upon delivery of the spare parts to the site. Spare parts will not be accepted by the Owner/Engineer/Architect if the spare parts have been stored outdoors for more than 8 hours upon delivery to the site.

F. The storage location shall be secure.

### 1.04 - TURN OVER OF SPARE PARTS

A. Spare parts shall be turned over to the Owner/Engineer approximately two (2) weeks prior to the Engineer/Architect’s preparation of the Final Punch List.

1. Spare parts will not be accepted until this time.

2. The Certificate of Substantial Completion will not be issued until all spare parts are delivered.

B. The following procedure shall be followed:

1. The Contractor shall provide a formal letter of transmittal listing the name or description of the part, part number, model number, manufacturer (or supplier), and system component name and the Section where it was specified to be provided.

2. Two (2) counterparts of the letter shall be provided.

3. The Contractor shall turn each part individually over to the Owner/Engineer/Architect.

4. The Owner/Engineer/Architect will initial next to the part description on each counterpart of the transmittal letter.

5. The initials represent that the part was received.

6. One transmittal counterpart will be returned to the Contractor.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

## 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 time specified to be provided under the specification sections shall be exclusive of travel time to and from the facility or site. For the purposes of this Contract, one (1) day shall be defined as eight (8) hours exclusive of breaks or mealtime.

F. 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.

G. 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.

H. If for any reason, the specified service days are not used, then the Owner shall receive a credit equal to **$500.00 (FIVE HUNDRED DOLLARS AND ZERO CENTS)** for each unused field service day specified.

I. A change order to the Contract reducing the Contract Price, by the dollar amount equivalent to the unused field service days, will be issued.

J. Submit manufacturers' startup reports (MSR's) in accordance with the requirements contained in Section 013300 - Submittals.

**1.03 - SUBMITTALS**

A. The Contractor shall prepare a list of all manufacturer specified field time required by the technical specifications. Compile this summary listing and submit it to the Engineer for review in accordance with the requirements contained in Section 013300.

B. Provide manufacturer's field training outline to Engineer for approval.

C. Manufacturer's Startup Reports shall be provided prior to receiving full payment for installation.

**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.

I. For control panels, explain the control sequence, timing structure, and safety precautions when working inside the panel, terminal wiring system, PLC program, if applicable, operator interface(s) and control logic.

J. Explain PLC LED input and output numbering system, if applicable. If control relays are used, explain technique for their replacement.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION**

Not Used

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Asbestos and lead-based paint certification.

B. Moisture control.

### 1.02 - RELATED SECTIONS

A. Section 014100 – Regulatory Requirements

B. Section 015719 – Environmental Protection

### 1.03 – ASBESTOS AND LEAD-BASED PAINT CERTIFICATION

A. Contractor shall submit the enclosed “Asbestos and Lead-Based Paint Certification” upon completion of all work.

### 1.04 – MOISTURE CONTROL

A. The Contractor shall maintain a strict policy and protocol for the control of water infiltration and moisture build-up during the course of the project. The plans and specifications are not intended to depict each and every condition or detail of construction. As the knowledgeable party in the field, the Contractor is in the best position to verify that all construction is completed in a manner which will provide a watertight structure. The Contractor has the sole responsibility for ensuring the watertight integrity of the structure. The Contractor’s contractual obligations include, but are not limited, to the following:

B. Water Infiltration: If the Contractor observes water infiltration (unintended) into a completed building or an ongoing construction site, he must immediately report the condition to the Owner and Engineer/Architect, and shall immediately take steps to investigate the source of the water infiltration, identify the responsible party (person who performed work that resulted in water infiltration) and devise a procedure to promptly eliminate water infiltration into the building.

C. Handling of Water-Damaged Building Materials and Construction:

1. Contractor shall inspect all building materials delivered to the site for pre-existing water damage, as well as existing mold growth.

2. If in-place construction becomes wet, notify the Owner and Engineer/Architect immediately. The Owner and Engineer/Architect will determine whether or not the work shall be removed and replaced, or if the type of material can be permitted to dry.

3. Under no circumstances may new or additional construction be placed over, or otherwise enclose, wet building materials.

D. Visible Mold/Mildew:

1. If the Contractor observes any substance that appears to be mold or other fungal growth and/or an unidentified substance within a completed building or the ongoing construction site, he shall immediately suspend construction operations in the area, and report the condition to the Owner and Engineer/Architect.

2. No person shall be allowed back into the affected area without permission of the Owner.

**1.05 – SUBMITTALS**

A. Contractor shall submit completed and notarized “Certification of Asbestos and Lead-Based Paint” form.

**PART 2 - PRODUCTS**

NOT USED

**PART 3 - EXECUTION**

NOT USED

## CERTIFICATE OF ASBESTOS AND LEAD-BASED PAINT

(New Work)

Client's Name: _____

Project Location: _____

Project Address: _____

Project Name: _____

Project Number: _____

Contract: _____ GC _____ Mechanical _____ Electrical

_____ Plumbing _____ Other (specify) _____

### Certification:

This Contractor hereby certifies that no asbestos-containing material and lead-based paint, as defined by applicable federal and state regulations, has been furnished or installed at the referenced project:

Contractor Name: _____

Signature: _____

Address: _____

_____

Telephone: _____ Date Executed: _____

**THIS FORM SHALL BE NOTARIZED**

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - DESCRIPTION

A. This Section covers the requirements for supplying all labor, materials, and equipment necessary to demolish, and/or remove existing facilities at the Calverton Sewage Treatment Plant as specified herein in Part 3 and as shown on the Contract Drawings.

B. Sequence and schedule demolitions and removals as specified in Section 011400 – Work Restrictions.

C. Refer to Section 025129 – High-Pressure Water Cleaning for tank cleaning requirements.

D. All materials and equipment shall remain the property of the Contractor except as listed herein in Part 3 or noted on the Contract Drawings.

E. Scope Notes:

1. All demolition work shall be performed by Contact G and/or Contract E unless otherwise noted.

2. The Electrical Contractor shall perform all electrical disconnections at the circuit breaker(s) or branch protection device(s) and the de-powering of electrical circuits. The actual device shall be removed by the General Contractor.

3. Electrical conduits that require removal to install new work or are designated for removal shall be work of the Electrical Contractor.

4. The removal of exposed conduit and wire shall be work of the Electrical Contractor as specified in Section 260010.

F. The Contractor shall also comply with the requirements contained in the following Sections as it relates to work of this Section:

1. Section 013100 - Project Management and Coordination

2. Section 013300 - Submittals

3. Section 014500 - Quality Control

### 1.02 - QUALITY ASSURANCE

A. The Contractor shall be responsible to restore existing surfaces as specified in Section 320000.

B. Demolition work shall proceed in an orderly and planned sequence, taking care not to disrupt the operation of the existing facility. Selected equipment removals and restrictions as noted on the plans or as specified in Section 011400 will require careful coordination with all other Contracts and must be conducted in phases with new equipment installations. The Contractor shall make no claim for extra compensation for failure to successfully coordinate all work with the other Contracts.

C. The Contractor shall employ labor on a continuous basis and complete each phase of the demolition work until it has been readied to receive the new work or until it has been demolished. Once work has been started on any one phase, it shall be completed.

D. Demolition shall be performed by persons experienced in this type of work and be directed by a foreman who shall be present during all phases of this operation.

E. Dismantling of equipment shall be performed by mechanics qualified to install equipment of the type being removed. All equipment shall be removed in accordance with the best practice of the trade.

F. All equipment shall be removed with care whether it shall be retained by the Owner or become the property of the Contractor.

G. The Contractor shall obtain the services of cranes and professional riggers as may be required to remove portions of the work, deliver equipment to the Owner, or otherwise comply with the requirements of these specifications.

H. The Contractor shall not stockpile debris. The Contractor shall immediately load debris into a roll off container or dump truck and dispose of it in accordance with all applicable rules and regulations. It shall be immediately hauled off site for disposal upon reaching full capacity. All containers shall be properly tarped or covered to prevent spill.

I. Performance Criteria:

1. Requirements of Structural Work: Do not cut structural work in a manner resulting in a reduction of load-carrying capacity of load/deflection ratio until interior removals and salvage has been completed and the area made safe.

2. Operational and Safety Limitations: Do not cut operational elements and safety-related components in a manner resulting in a reduction of capacities to perform in a manner intended or resulting in decreased safety until ready for demolition.

3. Loading: Do not superimpose loads at any point upon existing structure beyond design capacity including loads attributable to materials, construction equipment, demolition operations and shoring and bracing.

4. Vibration: Do not use means, methods, techniques or procedures which would induce vibration into any element of the structure to remain.

5. Fire: Do not use means, methods, techniques or procedures which would produce any fire hazard unless otherwise approved by the Engineer.

6. Water: Do not use means, methods, techniques or procedures which would produce excessive water run-off, and water pollution.

7. Air Pollution: Do not use means, methods, techniques or procedures which would produce uncontrolled dust, fumes or other damaging air pollution.

**1.03 – SUBMITTALS**

A. Comply with the requirements contained in Section 013300 - Submittals. The following documents shall be submitted:

1. Demolition plan including demolition schedule, removal sequence, and a detailed outline of dismantling, demolition, and disposal procedures.

2. Project record documents in accordance with Section 017839. Project record documents shall include accurately recorded locations of capped utilities, plugged pipes, and subsurface conditions left in place.

**1.04 – PROTECTION OF EXISTING CONSTRUCTION TO REMAIN**

A. Provide all labor and materials necessary for the temporary protection of existing construction (floors, roof, and walls) to remain when adjoining new work.

B. Provide temporary construction, constructed of framing and plywood and/or heavy weight poly to protect existing construction and surrounding surfaces from dust, damage by movement of materials and personnel.

C. The contractor is responsible for all damage to existing structures and shall replace or repair all areas of damage.

D. Repair, replace, or rebuild existing construction as required or as directed which has been removed, altered or disrupted to allow for new construction. Existing construction shall be corrected to match adjacent construction, new or existing.

E. Perform cutting of existing concrete and masonry construction with saws and core drills. Do not use jack-hammers or explosives.

F. Provide temporary shoring and bracing of existing construction to allow removal of existing structural elements. Maintain shoring until new structural elements are in place and accepted.

**PART 2 – PRODUCTS**

Not Used

**PART 3 – EXECUTION**

**3.01 – GENERAL**

A. The Contractor shall ready the site and adjacent structures and surfaces before beginning any one phase of the demolition work. Inspect the surrounding buildings, tanks, pipes and confirm, with the Engineer, the extent of the work at least five (5) working days prior to starting each phase of the work. Do not remove, dismantle, or take off line any existing pipe, structure or process component without first giving five (5) working days of written notice. Notice may be given verbally at progress meetings if it is within five (5) working days before the scheduled work.

B. Protect existing surfaces not to be demolished as directed by the Engineer or as may be reasonable in consideration of the type of work that will be undertaken. All surfaces damaged as a result of the Contractor's operation shall be immediately repaired or shall be scheduled for repair at the completion of the work as the Engineer may elect.

C. The Contractor shall uncover all buried piping and electrical facilities prior to beginning the actual removal phase for underground pipe. The Contractor shall verify the precise location, function, size, direction of run, and depth of such underground piping. The Contractor shall employ a backhoe with experienced operator and a foreman to direct a crew of at least two laborers to uncover existing buried pipelines on an as needed basis. The entire pipeline or conduit run shall be uncovered before dismantling and removing pipes. The Contractor shall hand dig within two feet of an existing pipeline. The requirements herein are in addition to that specified in Section 312316.

D. The pipe contents shall be completely drained and not be allowed to flow into open excavations.

E. Burning of material is prohibited.

F. The use of explosives is prohibited.

G. The Contractor shall notify all affected utilities before starting demolition. The Contractor shall comply with their requirements and the requirements of 16 NYCRR Part 753. The Contractor shall have the location and termination of all utilities clearly marked.

H. The Contractor shall coordinate the disconnection of all electrical branch circuits, wiring, and equipment prior to any demolition. Electric facilities shall be discontinued in compliance with applicable provisions of the National Electric Code and utility requirements. The Contractor shall verify that the circuit has been de-energized and is safe to be removed.

I. Hardware, such as bolts and nuts for fittings, shall become the property of the Contractor but shall not be reused on this project.

J. Piping and fittings set in concrete piers shall be removed without damaging the pipe or fitting.

K. Pumps attached to concrete piers and foundations using anchor bolts shall be burned off without damaging the pump or motor.

L. All concrete used as fill shall meet the requirements of Section 033000 and be a minimum of 3500 psi.

M. Material used for soil fill shall be obtained from on-site excess material and shall meet the specifications for Type D subsoil as specified in Section 312323.13.

N. Comply with the requirements contained in Section 015719 – Temporary Environmental Controls for use of jackhammers, generators, air compressors, and all other equipment that produces sound exceeding that specified therein.

O. The Contractor shall cease operations immediately if an unsafe condition develops. Do not resume operation until the condition has been corrected. On-site safety shall be the responsibility of the Contractor and all operations shall be performed in accordance with applicable OSHA regulations and guidelines. Scaffolding, safety rails, and trench sheeting shall be employed as required to satisfy OSHA regulations.

P. The Contractor shall remove sewage/sludge/process waste materials from existing structures as follows:

1. Contractor shall be responsible to provide all labor, equipment and materials to perform wastewater bypass pumping, sludge/waste/debris removal and cleaning/disinfection of all

process structures, pipelines and recharge beds for the contracted demolition and process conversion work. This work shall be included in the lump sum bid amount(s).

2. The Owner shall be responsible to empty or pump out existing process systems to the extent shown or noted on the Contract Plans to allow access for the Contractor to perform the contract work.

3. The Contractor shall transfer acceptable sewage and sludge to on-site treatment processes in lieu of hauling off site if the owner approves the sewage for transfer to existing facilities. All unacceptable sewage/sludge/process waste materials shall be removed from the site by the Contractor.

4. The Contractor shall limit the volume of sludge and process waste materials to be hauled off site for disposal by dewatering and pumping out acceptable wastes to on site systems to the greatest extent possible before removal of unacceptable wastes for offsite disposal.

**3.02 – PREPARATION**

A. Temporary Support: Provide adequate temporary support for work to be cut to prevent failure. Do not endanger other work.

B. Provide adequate protection of other work during selective demolition to prevent damage and provide protection of the work from adverse weather exposure.

**3.03 – PIPE REMOVAL**

A. Unless otherwise shown, noted or specified elsewhere, only underground pipe that conflicts with work being installed under this contract, shall be removed. Refer to the Demolition Contract Drawings for additional buried pipe removal requirements.

B. Protect plant life, lawns, rock outcropping, and other features remaining as a portion of final landscaping.

C. Comply with the requirements contained in Sections 312316, 312323.13, and 314116.13.

D. Sawcut each pipe a minimum of five (5) feet from either end where it enters or exits an existing structure to be removed or as necessary as shown on the Drawings.

E. Plug all remaining pipe stub penetrations in existing structures that are to remain with Emaco S66 CI by Master Builders or equal to provide a permanent seal.

F. Buried piping that is to be abandoned in place shall be capped at the cut ends with a mechanical joint ductile iron cap. Provide restrained MJ cap if line serves as a pressure line or forcemain.

G. Backfill trenches to match existing grade or new grades as shown on the Drawings.

H. Field measure location of end pipe cap and add location to record drawings

**3.04 – INFLUENT PUMP STATION**

A. The Contractor shall remove all equipment within the influent pump station as specified below or as shown on the Drawings. Equipment to be removed shall include, but not be limited to, the following: comminutor, static bar screen, control panel, level controls, valves and fittings, dry pit pumps and piping, HVAC equipment and accessories, access stairs and electrical equipment.

B. Drain and clean inside of wet well and install ductile iron caps on suction piping as shown on contract drawings.

**3.05 – SETTLING TANK DEMOLITIONS (FOR CONVERSION TO PRE-EQUALIZATION TANKS, PRE-EQUALIZATION PUMP STATION AND EFFLUENT PUMP STATION)**

A. The Contractor shall demolish all the equipment and structures within the two (2) settling tanks at the Calverton treatment facilities as shown on the Drawings. The demolition shall include, but not be limited to, the following: slide gates, handrailing, sludge splitter boxes, sludge piping, discharge chutes, sludge collection system and accessories including motor and drive, baffles and airlift piping.

B. Drain and clean inside of tank to accommodate the new work shown on contract drawings.

**3.06 – AERATION TANK DEMOLITIONS (FOR CONVERSION TO MBR PROCESS TANKS AND SLUDGE HOLDING TANKS)**

A. The Contractor shall remove the equipment within both aeration tanks as specified herein and as shown on the Drawings. The removals shall include, but not be limited to, the following: air piping and airlift systems, froth spray piping and supports, slide gates, weir plates, and diffusers.

**3.07 – SLUDGE HOLDING TANK DEMOLITIONS (FOR ABANDONMENT)**

A. Drain and clean inside of tank to accommodate the abandonment of this tank.

B. The Contractor shall remove selected equipment within both sludge holding tanks as specified herein and as shown on the Drawings. The removals shall include, but not be limited to, the following: sludge inlet and return piping and sludge splitter box.

**3.08 – CONTROL BUILDING REMOVALS**

A. The Contractor shall remove the equipment within the control buildings as specified herein and shown on the contract drawings. The Contractor shall remove the existing MCC after it has been de-energized, blower air intake and piping, aeration blowers, generator exhaust, chlorine room equipment and air intake louvers.

B. The Contractor shall remove all other miscellaneous mechanical piping and equipment, along with miscellaneous electrical equipment within the operations building as shown on the Drawings.

C. The Contractor shall remove masonry, windows, louvers and doors within the operations building as shown on the Drawings.

D. The Contractor shall remove the roof of the operations building as shown on the Drawings. Roof to be replaced as shown elsewhere within the Contract Documents.

E. All wall penetrations shall be sealed with non-shrink grout and pipes and fittings shall be capped where indicated on the Drawings.

**3.09– CHLORINE CONTACT DISINFECTION AND OUTFALL PIPING**

A. The Contractor shall demolish and remove all chlorine contact equipment and decommission outfall piping as specified herein and as shown on the Drawings. This includes, but is not limited to selected piping, and selective demolitions.

**3.10 – OTHER REMOVALS**

A. Refer to the demolition plan sheets for additional demolition and removal information.

B. Employ only skilled tradesmen to perform selective demolition.

C. Cut work by methods least likely to damage work to the retained and work adjoining.

D. In general, where physical cutting action is required, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings through concrete and masonry work.

E. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.

F. Where selective demolition terminates at a surface or finish to remain, completely remove all traces of material selectively demolished, including mortar beds. Provide smooth, even, substrate transition.

**3.11 – BACKFILLING AND GRADING**

A. All backfilling, filling, compaction, and grading shall be performed in accordance with Division 31 specifications.

B. Place fill in excavation and other voids.

C. Broken concrete and masonry materials shall not be used for backfill. Place fill in layers not exceeding 18 inches and compact each layer.

D. Compact in accordance with the requirements contained in Section 312323.13.

E. Final 18 inches of backfill below topsoil elevations shall be Type D - Subsoil backfill.

F. Rough grade surface to adjacent contours.

G. Rough grade areas to an elevation 4 inches below adjoining existing grades. Fill with topsoil as work of Section 329219.

**3.12 – DISPOSITION OF EQUIPMENT TO REMAIN THE PROPERTY OF THE OWNER**

A. The Contractor shall deliver the equipment shown on the contract drawings to the Owner:

B. Place items to be retained by the Owner in the designated storage area as directed by the Engineer.

C. The equipment and materials retained by the Owner shall be neatly stored and placed upright and blocked off the ground.

**END OF SECTION**

## PART 1 – GENERAL

### 1.01 - SECTION INCLUDES

A. Site preparation for pressure washing of tanks to be converted/abandoned.

B. Pressure washing requirements.

### 1.02 – RELATED SECTIONS

A. Section 011400 – Work Restrictions

B. Section 017423 – Cleaning

### 1.03 – REFERENCES

A. NACE No. 5/SSPC-SP12 (HP-WC) – Surface Preparation and Cleaning by Water Jetting Prior to Recoating

## PART 2 - PRODUCTS

Not Used.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Verify site conditions and tank details.

### 3.02 - PREPARATION

A. Provide rigging/access to allow working of all areas of the tank.

B. All tank openings (vents) shall be adequately protected during power washing to prevent any spray, dirt or debris from entering tank 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 interior/exterior surfaces of the tank are to be pressure washed.

B. All sediment and debris shall be removed from tank interior after high pressure water cleaning is performed.

C. Water pressure shall be a 4,000 – 5,000 psi as measured at the tip of the nozzle at the area of surface being cleaned. Contractor shall use the means necessary to accomplish the level of cleanliness less than 70µs/cm or as directed by engineer.

D. Water shall be of a minimum temperature of 120-150°F and shall be capable of removing loosely adhered coatings, mill scale, corrosion, accumulated dirt, mildew, algae, loose/flaking /poorly adhered concrete, efflorescence and calcium deposits. Water temperature shall be maintained with hot water or steam generator.

E. Stubborn staining shall be removed by soft bristle scrub brush. All exterior tank surfaces shall be cleaned with a mildewcide cleaning solution to remove all mildew, algae, biological growth, etc.

F. Work shall progress such that completed sections are not soiled by subsequent activities

G. Any damage to the site due to cleaning activities shall be restored by the contractor at his own expense.

**3.04 - TOLERANCES**

A. Minimum water temperature: 120°F.

**3.05 - FIELD QUALITY CONTROL**

A. Perform cleaning under provisions of Section 017423.

B. 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**

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. The purpose of this section is to outline the scope of work and work procedures required for the removal of asbestos containing materials noted for demolition on the contract plans.

B. Federal (EPA and OSHA) and New York State Department of Labor (NYS DOL) regulations (ICR 56.11), Project Drawings and Project Documents.

C. The Contractor shall be aware of all conditions of the Project and is responsible for field verifying quantities and locations of all ACM to be removed prior to submission of any bid. Failure to do so shall not relieve the Contractor of its obligation to furnish all labor and materials necessary to perform the Work. In the event that suspect materials not included in this Specification are encountered while the work is in progress, such material shall be tested for asbestos content or assumed positive for asbestos content, and removed in accordance with the procedures herein. Any discovery of new ACM shall not delay the progress of the Work. Payment for any additional work shall be considered on a case-by-case basis by the Engineer.

D. Any special job conditions, including any site specific variances are to be obtained by the Contractor, and any fees associated with procuring these variances shall be included in the Contractor’s bid.

E. The Contractor's industrial hygiene practices during asbestos abatement will be monitored by the Owner’s representative; however the Contractor shall be responsible for monitoring his own construction safety work practices for compliance with the OSHA regulations.

1.2 SPECIAL JOB CONDITIONS

A. Any special job conditions, including any site specific variances, are to be obtained by the Contractor, and any fees associated with procuring these variances shall be included in the Contractor’s bid.

1.3 CODES, PERMITS AND COMPLIANCE

A. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local laws, rules, and regulations pertaining to Work practices, protection of workers, authorized visitors to the site, persons, and property adjacent to the Work.

B. Perform asbestos related Work in accordance with Federal and New York State regulations. Where more stringent requirements are specified, adhere to the more stringent requirements.

C. State Licenses: The Contractor must maintain current licenses pursuant to the New York State Department of Labor (NYSDOL) and New York State Department of Environmental Conservation (NYSDEC) for all Work related to this Project.

1.4 APPLICABLE STANDARDS AND REGULATIONS

A. The Contractor shall comply with the following codes and standards, except where more stringent requirements are shown or specified:

B. Federal Regulations:
1. 29 CFR 1910.1001, "Asbestos" (OSHA)
2. 29 CFR 1910.1200, "Hazard Communication" (OSHA)
3. 29 CFR 1910.134, "Respiratory Protection" (OSHA)
4. 29 CFR 1910.145, "Specification for Accident Prevention Signs and Tags" (OSHA)
5. 29 CFR 1926, "Construction Industry" (OSHA)
6. 29 CFR 1926.1101, "Asbestos, Tremolite, Anthophyllite, and Actinolite" (OSHA)
7. 29 CFR 1926.500 "Guardrails, Handrails and Covers" (OSHA)
8. 40 CFR 61, Subpart A, "General Provisions" (EPA)
9. 40 CFR 61, Subpart M, "National Emission Standard for Asbestos" (EPA)
10. 49 CFR 171-172, Transportation Standards (DOT)

C. New York State Regulations:
1. 12 NYCRR, Part 56, "Asbestos", Industrial Code Rule 56 (DOL)
2. 6 NYCRR, Parts 360, 364, Disposal and Transportation (DEC)
3. 10 NYCRR, Part 73, "Asbestos Safety Program Requirements" (DOH)
4. New York State Department of Health (NYSDOH) Training Requirements

D. Standards and Guidance Documents:
1. American National Standard Institute (ANSI) Z88.2-80, Practices for Respiratory Protection
2. ANSI Z9.2-79, Fundamentals Governing the Design and Operation of Local Exhaust Systems
3. EPA 560/585-024, Guidance for Controlling Asbestos Containing Materials in Buildings (Purple Book)
4. EPA 530-SW-85-007, Asbestos Waste Management Guidance

1.5 DELIVERY AND STORAGE

A. Deliver non-contaminated materials to the job site in original packages with containers bearing manufacturer's name and label.

B. Store all materials at the job site in a suitable and designated area.
1. Store materials subject to deterioration/damage away from wet/damp surfaces and under cover.
2. Protect materials from unintended contamination.

C. Remove damaged or deteriorated materials from the job site. Materials contaminated with asbestos shall be disposed of as asbestos debris as herein specified.

PART 2 - PRODUCTS

2.1 PROTECTIVE CLOTHING

A. Provide personnel utilized during the Project with disposable protective whole body clothing, head coverings, gloves and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber for comfort, but shall not be used alone. Make sleeves secure at the wrists and make foot coverings secure at the ankles by the use of tape, or provide disposable coverings with elastic wrists or tops.

2.2 DISPOSAL BAGS, DRUMS, AND CONTAINERS

A. Provide 6 mil polyethylene disposal bags printed with asbestos caution labels. Bags shall also be imprinted with U.S. Department of Transportation required markings.

B. If the asbestos waste has the potential to damage or puncture the disposal bags, burlap sacks shall be utilized as a liner inside the polyethylene disposal bags to prevent puncture or damage to the disposal bags. In addition, 30 or 55 gallon capacity fiber or metal drums capable of being sealed air and water tight may also be used. Affix asbestos caution labels on lids and at one-third points around drum circumference to assure ready identification.

C. Containers and bags must be labeled with the names of the waste generator and the location at which the waste was generated in accordance with 40 CFR Part 61 NESHAPS.

D. Labeled ACM waste containers or bags shall not be used for non-ACM waste. Any material placed in labeled containers or bags, whether turned inside out or not shall be disposed of as ACM waste.

2.3 HEPA VACUUM EQUIPMENT

A. All dry vacuuming performed under this contract shall be performed with High Efficiency Particulate Absolute (HEPA) filter equipped industrial vacuums conforming to ANSI Z9.2.

B. Provide tools and specialized equipment including scraping nozzles with integral vacuum hoods connected to a HEPA vacuum with flexible hose.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Perform all asbestos removal Work using wet removal procedures. Dry removal procedures are not permitted.

3.2 WORK AREA PREPARATION

A. Work Area preparation shall be performed in accordance with NYSDOL regulations.

B. Remove all items attached to or in contact with ACM. HEPA vacuum and wet wipe with amended water all removed items prior to their removal from the Work Area and before the start of asbestos removal operations.

3.3 REMOVAL OF ASBESTOS CONTAINING MATERIALS

A. Asbestos-containing materials shall be removed in accordance with NYSDOL and the Contract Documents.

B. Sufficiently wet asbestos materials with a low pressure, airless fine spray of surfactant to ensure full penetration prior to material removal. Re-wet material that does not display evidence of saturation.

C. One Worker shall continuously apply amended water while ACM is being removed.

D. Perform cutting, drilling, abrading, or any penetration or disturbance of asbestos containing material in a manner to minimize the dispersal of asbestos fibers into the air. Use equipment

and methods specifically designed to limit generation of airborne asbestos particles. All power operated tools used shall be provided with HEPA equipped filtered local exhaust ventilation.

E. Power or pressure washers will not be allowed to be used for asbestos removal or clean-up procedures.

3.4 ACM WASTE CONTAINERIZING, DECONTAMINATION AND LOAD OUT PROCEDURES

A. Packaging of ACM shall conform to OSHA Standard 29 CFR 1926.1101, DOT 49 CFR 171, 172, and 173, and EPA Standard 40 CFR Part 61 and the requirements as herein specified.

B. The cleaned containers of asbestos material and equipment shall be placed in water tight carts with doors or tops that shall be closed and secured. These carts shall be held in the holding area pending removal. The carts shall be wet cleaned and/or HEPA vacuumed at least once each day.

3.5 WORK AREA CLEANING PROCEDURES

A. Following completion of gross abatement and after all accumulations of asbestos waste materials have been containerized, decontamination procedures shall be followed as specified in Title 15 or ICR 56, unless otherwise stated in the variance(s) utilized by the Contractor.

B. Following each decontamination procedure the PM shall inspect the Work Area for effectiveness of the cleanings. If necessary, additional cleaning shall be performed by the Contractor as directed by the PM.

3.6 ASBESTOS WASTE

A. Applicable Regulations: All asbestos waste shall be stored, transported and disposed of in accordance with the following regulations as applicable:
   1. NYS DEC 6 NYRCC part 360 and 364
   2. US EPA NESHAPS 40 CFR 61
   3. US EPA Asbestos Waste Management Guidance EPA/530 SW85

**END OF SECTION**

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. This lead-based paint and material removal project will consist of the localized removal of loose and/or damaged lead based paint in the areas indicated in the report attached herewith.

B. The work shall include, but not be limited to removal and disposal of the following:
   1. All positive lead containing materials greater than regulatory level of 1.0 described in the lead paint inspection report attached.

C. The Contractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all Work to be performed. Failure to do so shall not relieve the Contractor of its obligation to furnish all labor and materials necessary to perform the Work.

D. All Work shall be performed in strict accordance with the Project Documents and all governing codes, rules, and regulations. Where conflicts occur between the Project Documents and applicable codes, rules, and regulations, the more stringent shall apply.

1.2 PERMITS AND COMPLIANCE

A. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local laws, rules, and regulations pertaining to Work practices, protection of Workers, authorized visitors to the site, persons, and property adjacent to the Work.

B. The Contractor must maintain current licenses pursuant to New York State Department of Labor, Department of Environmental Conservation and Environmental Protection Agency for all Work related to this Project, including the removal, handling, transport, and disposal of lead containing materials.

C. The Contractor must have and submit proof upon request that any persons employed by the Contractor to engage in or supervise Work on any lead Project have prior experience on similar projects. If in the course of the project there should be materials or surfaces that contain asbestos, the contractor and all workers must be certified by the NYS Department of Labor as handlers and contractor/supervisors. It is then the responsibility of the contractor to also follow the asbestos specification for this project.

D. It is the sole responsibility of the Contractor to determine what, if any, patents are applicable to the Project. The Contractor shall pay all royalties and/or license fees. He shall defend all suits or claims for infringement of any patent rights and save the Owner, Architect, Engineer, Environmental Consultant, and Construction Manager harmless from loss, including attorney's fees, on account thereof.

E. Failure to adhere to the Project Documents shall constitute a breach of the Contract and the Owner shall have the right to and may terminate the Contract provided, however, the failure of the Owner to so terminate shall not relieve the Contractor from future compliance.

1.3 SUBMITTALS

A. Pre-contract Submittals: Within 3 days after bids are opened, the three apparent low bidders shall submit the following documentation. Failure to submit all required documentation truthfully or in a timely manner may be cause for rejection of the bid.
   1. Contractor certifications issued by the Environmental Protection Agency.
   2. The number of years engaged in lead-based paint renovation and remolding projections.
   3. A list of Projects performed within the past two (2) years and include the dollar value of all

Projects. Provide Project references to include Owner, consultant, contact persons, address, and phone number.

4. A list of owned equipment available to be used in the performance of the Project.
5. An outline of the Worker training course and medical surveillance program conducted by the Contractor.
6. A standard operating procedures manual describing Work practices and procedures, equipment, type of decontamination facilities, respiratory program, special removal techniques, etc.
7. Citations/Violations/Legal Proceedings: Submit a notarized statement describing:
   a. Any citations, violations, criminal charges, or legal proceedings undertaken or issued by any law enforcement, regulatory agency, or consultant concerning performance on previous lead contracts. Briefly describe the circumstances citing the Project and involved persons and agencies as well as the outcome of any actions.
   b. Any Stop Work Orders issued on Projects within the past 2 years.
   c. Any litigation or arbitration proceedings arising out of performance on past Projects.
   d. Any liquidated damages assessed within the last 2 years.
8. Preliminary Schedule: Provide an estimate of manpower to be utilized and the time required for completion of each major Work Area. Include estimated size and number of crews and work shifts.

B. Pre-Work Submittals: Within 7 days prior to the pre-construction conference, the Contractor shall submit 3 copies of the documents listed below:
   1. Progress Schedule:
      a. Show the complete sequence of lead related activities and the sequencing of Work within each building section.
      b. Show the dates for the beginning and completion of each major element of Work including substantial completion dates for each Work Area or phase.
      c. Show projected percentage of completion for each item, as of the first day of each month.
      d. Show final inspection dates.
   2. Permits: As required by State and local regulations, including arrangements for storage, transportation, and disposal of contaminated material.
   3. Lead Activities Work Plan: Provide plans which clearly indicate the following:
      a. All Work Areas/containment's numbered sequentially.
      b. Locations and types of all decontamination enclosures.
      c. Entrances and exits to the Work Areas/containment's.
      d. Type of lead related activity/technique for each Work Area/containment.
      e. Proposed location and construction of storage facilities and field office.
      f. Location of water and electrical connections to building services.
   4. Equipment: Submit manufacturer's data sheets/product descriptions of all equipment and products including HEPA vacuums, respirators, protective clothing, chemicals, etc. identified in this specification.
   5. Samples: Submit samples of warning notices to be posted, replacement materials, etc.
   6. Worker Training, Medical Surveillance, and Certification:
      a. The Contractor shall submit a list of persons to be employed for the Project.
      b. Present evidence that Workers have received proper training required by the regulations and the medical examinations required by OSHA 29 CFR 1926. 62.
      c. Submit documentation that Workers have been fit tested specifically for respirators used on the Project.
      d. Submit copies of Proof of Lead Renovation Remolding certification for each person employed in the disturbance of lead.
   7. Logs: Specimen copies of daily progress log, visitor's log, and disposal log.

8. Material List: A complete materials list of all items proposed to be furnished and used under this Contract.
9. Subcontractor List: List of all subcontractors to be used on the Project (i.e. Waste Hauler).
10. Material Safety Data Sheets (MSDS): Copies of MSDS for each chemical or material used for the Project (paint stripper, surfactant, etc.)
11. Project Supervisor: Resume of the proposed Project Supervisor.
12. Rental Notifications: Notices sent to rental suppliers informing them of the nature of the Work that the Contractor intends to use the equipment for.
13. Worker's Acknowledgments: Statements signed by each employee that the employee has received training in the proper handling of lead containing paint; understands the health implications and risks involved; and understands the use and limitations of the respiratory equipment to be used.
14. Laboratory: Submit the documentation that the laboratory performing the OSHA personnel air samples is recognized as an Environmental Protection Agency National Lead Laboratory Accredited Program (NLLAP) accredited laboratory.
15. HUD Title X: "Guidelines for the Evaluation and Control of Lead Based Paint."

C. Project Close-out Submittals: Submit the following at the closeout of the Project:
1. Copies of all waste disposal manifests, seals, and disposal logs.
2. OSHA compliance air monitoring records conducted during the Work.
3. Daily progress log.
4. Entry and exit log.
5. A list of all EPA Certified Workers used in the performance of the Project, including name, social security number.
6. Required Employee Statements including Medical Examination Statement, Worker's Acknowledgment Statement, and Employee Training Statement.

1.4 PRE-CONSTRUCTION CONFERENCE

A. Prior to start of preparatory Work under this Contract, the Contractor shall attend a pre-construction conference attended by Owner, Facility Personnel, and Environmental Consultant.

B. Agenda for this conference shall include but not necessarily be limited to:
1. Contractor's scope of Work, Work plan, and schedule to include number of Workers and shifts.
2. Contractor's safety and health precautions including protective clothing and equipment and decontamination procedures.
3. Environmental Consultant's duties, functions, and authority.
4. Contractor's Work procedures including:
   a. Methods of job site preparation and removal methods.
   b. Respiratory protection.
   c. Disposal procedures.
   d. Cleanup procedures.
   e. Fire exits and emergency procedures.
5. Contractor's plan for twenty-four (24) hour project security both for prevention of theft and for barring entry of unauthorized personnel into Work Areas.
6. Temporary utilities.
7. Handling of furniture and other moveable objects.
8. Storage of removed lead containing paint.
9. Waste disposal requirements and procedures.

C. In conjunction with the conference the Contractor shall accompany the Owner and Environmental Consultant on a pre-construction walk-through documenting existing condition of

finishes and furnishings, reviewing overall Work plan, location of fire exits, fire protection equipment, water supply and temporary electric tie-in.

1.5 APPLICABLE STANDARDS AND REGULATIONS

A. The Contractor shall comply with the following codes and standards, except where more stringent requirements are shown or specified:

B. Federal Regulations:
1. 29 CFR 1910, Occupational Safety and Health Standards
2. 29 CFR 1926, Safety and Health Regulations for Construction
3. 40 CFR 148, Hazardous Waste Injection Restrictions
4. 40 CFR 260, Hazardous Waste Management System: General
5. 40 CFR 261, Identification and Listing of Hazardous Waste
6. 40 CFR 262, Standards Applicable to Generators of Hazardous Waste
7. 40 CFR 263, Standards Applicable to Transporters of Hazardous Waste
8. 40 CFR 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
9. 40 CFR 265, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
10. 40 CFR 268, Land Disposal Restrictions
11. 40 CFR 745, Lead; Identification of Dangerous Levels of Lead; Proposed Rule
12. 49 CFR 172, Hazardous Material Table, Special Provisions, Hazardous Material Communications, Emergency Response Information, and Training Requirements
13. 49 CFR 178, Specifications for Packaging
14. HUD 0005646, (1990; Rev May 1991) Lead-Based Paint: Interim Guidelines for Hazard Identification and Abatement in Public and Indian Housing

C. Standards and Guidance Documents:
1. American National Standard Institute (ANSI) Z88.2-80, Practices for Respiratory Protection
2. ANSI Z9.2-79, Fundamentals Governing the Design and Operation of Local Exhaust Systems
3. UL 586, (1990) High-Efficiency, Particulate, Air Filter Units
4. NIOSH OSHA Booklet 3142, Lead in Construction
5. NFPA 701, (1989) Methods of Fire Test for Flame-Resistant Textiles and Films
6. EM 385-1-1, (1992) U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.6 NOTICES

A. The Contractor shall post and/or provide notification to building occupants 10 days prior to beginning lead activities. The posting shall include the following information:
1. The locations of the lead Renovation Remolding Project.
2. The amounts and types of materials being removed and/or disturbed.
3. The commencement and completion dates of the Project.
4. The name, address, and certification of the Lead Contractor.
5. The name and address of the Environmental Consultant and laboratory.

1.7 PROJECT MONITORING AND WIPE SAMPLING

A. The Owner shall engage the services of an Environmental Consultant (the Consultant) who shall serve as the Owner’s Representative in regard to the performance of the lead-based paint Project and provide direction as required throughout the entire lead period.

B. The Contractor is required to ensure cooperation of its personnel with the Consultant for the wipe sampling and project monitoring functions described below. The Contractor shall comply with all direction given by the Consultant during the course of the Project.

C. The Consultant shall provide the following administrative services:
   1. Review and approve or disapprove all submittals, shop drawings, schedules, and samples.
   2. Assure that all notifications to governmental agencies by the Contractor are submitted in a timely manner and are correct in content.
   3. Review and approve the Contractor's OSHA compliance testing laboratory.

D. The Consultant shall staff the Project with a trained person(s) to act on the Owner's behalf at the job site. At a minimum the trained person(s) shall be certified as a lead inspector or risk assessor. This individual shall be designated as the Lead Project Monitor (LPM).
   1. The LPM shall be on-site at all times the Contractor is on-site. The Contractor shall not be permitted to conduct any Work unless the LPM is on-site.
   2. The LPM shall have the authority to direct the actions of the Contractor verbally and in writing to ensure compliance with the Project documents and all regulations. The LPM shall have the authority to Stop Work when gross work practice deficiencies or unsafe practices are observed.
      a. Such Stop Work order shall be effective immediately and remain in effect until corrective measures have been taken and the situation has been corrected.
      b. Standby time required to resolve the situation shall be at the Contractor's expense.
   3. The LPM shall provide the following services:
      a. Inspection of the Contractor's Work, practices, and procedures, including temporary protection requirements, for compliance with all regulations and Project specifications.
      b. Verify daily that all Workers used in the performance of the Project are certified by the appropriate regulatory agency.
      c. Monitor the progress of the Contractor's Work, and report any deviations from the schedule to the Owner.
      d. Monitor, verify, and document all waste load-out operations.
      e. Verify that the Contractor is performing personal air monitoring daily, and that results are being returned and posted at the site as required.
   4. The following minimum inspections shall be conducted by the LPM. Additional inspections shall be conducted as required by Project conditions. Progression from one phase of work to the next by the Contractor is only permitted with the approval of the LPM.
      a. Pre-Construction Inspection: The purpose of this inspection is to verify the existing conditions of the Work Areas and to document these conditions.
      b. Pre-Commencement Inspection: The purpose of this inspection is to verify the integrity of each containment system prior to disturbance of any lead containing material. This inspection shall take place only after the Work Area is fully prepped for removal.
      c. Work Inspections: The purpose of this inspection is to monitor the Work practices and procedures employed on the Project and to monitor the continued integrity of the containment system. Inspections within the removal areas shall be conducted by the LPM during all preparation, removal, and cleaning activities at least twice every Work shift. Additional inspections shall be conducted as warranted.
      d. Visual Clearance Inspection: The purpose of this inspection is to verify the Contractor's certification that all materials have been removed from the Work Area and the absence of all visible accumulations of debris in the Work Area.
      e. Punch List Inspection: The purpose of this inspection is to verify the Contractor's certification that work has been completed as contracted and the existing condition of the area prior to its release to the Owner.

5. The LPM shall perform lead wipe (lead-dust clearance) sampling as follows:
   a. Wipe samples shall be collected from one sill surface and floor area surface where doors have been removed following the lead contractor's final cleaning of the work area. Lead wipe samples shall be analyzed by a NLLAP laboratory. Results shall be available within 24 hours of completing sampling.
6. The LPM shall perform a pilot air monitoring project as follows:
   a. Air samples shall be collected during the first phase of the lead project to determine if lead removal methods are generating airborne lead dust at concentrations exceeding regulatory guideline for locations exterior the Work Area. At least one air sample will be collected at the entrance to the Work Area and at critical barriers.
   b. Should it be established that airborne lead-dust concentrations, exterior to the work area, are within the applicable guidelines, no further air monitoring will be performed. Should airborne lead-dust concentrations, exterior the work area, be determined to exceed the applicable guideline concentration, additional engineering controls will be implemented and the pilot project repeated. Once affective engineering controls have been established and implemented, no further air monitoring will be performed.
   c. Lead air samples shall be analyzed by a NLLAP laboratory. Results shall be available within 24 hours of completing sampling.

1.8 CONTRACTOR AIR SAMPLING

A. In addition to the requirements of OSHA 1926.62, the Contractor shall be required to perform personal air monitoring to determine that appropriate respiratory protection is being utilized.

B. The Contractor's laboratory analysis of air samples shall be conducted by NLLAP approved laboratory, subject to approval of the Environmental Consultant.

C. Results of personnel air sample analyses shall be available, verbally, within twenty-four (24) hours of sampling and shall be posted upon receipt. Written laboratory reports shall be delivered and posted at the Work site within five (5) days.

1.9 PROJECT SUPERVISOR

A. The Contractor shall designate a full-time Project Supervisor who shall meet the following qualifications:
   1. The Project Supervisor shall hold Lead certification for the renovation & remolding of lead-based paint.
   2. The Project Supervisor shall have a minimum of one-year experience as a supervisor.
   3. The Project Supervisor must be able to read and write English fluently, as well as communicate in the primary language of the Workers.

B. Prior to the commencement of Work, the Contractor shall submit the proposed Project Supervisor's resume to the Owner and Environmental Consultant for approval.

C. If the Project Supervisor is not on-site at any time whatsoever, all Work shall be stopped. The Project Supervisor shall remain on-site until the Project is complete. The Project Supervisor cannot be removed from the Project without the written consent of the Owner and the Environmental Consultant.

D. The Project Supervisor shall maintain the Project Log Book required by section 2.03 of the specifications and a Waste Disposal Log.

E. The Project Supervisor shall be responsible for the performance of the Work and shall represent the Contractor in all respects at the Project site. The Supervisor shall be the primary point of contact for the Lead Project Monitor.

1.10 MEDICAL REQUIREMENTS

A. Employers must make available medical examinations to all employees covered under the medical surveillance program. Medical exams must be performed:
   1. Medical Surveillance should have undergone an initial medical surveillance examination
   2. At least annually when tests within the preceding 12 months indicated a blood lead level at or above 40 µg/dl;
   3. Prior assignment for each employee for the first time to an area in which lead concentrations are above the action level;
   4. As soon as possible when employee has developed signs or symptoms of lead exposure;
   5. For employees medically removed from work area; and
   6. For employees as final medical determination.

B. The medical exam consists of the following:
   1. A detailed work and medical history with particular attention to past lead exposure (occupational and non-occupational), personal habits (smoking, hygiene), and past gastrointestinal, hematological, renal, cardiovascular, reproductive and neuralgic problems.
   2. Through physical examination with particular attention to tooth, gums, hematological, gastrointestinal, renal cardiovascular, and neurological systems. Pulmonary status must be evaluated if respiratory protection will be used.
   3. Blood sample and analysis which determines:
      a. Blood lead level;
      b. Hemoglobin and Hematocrit determinations, red cells indices and examination of peripheral smear Morphology;
      c. Zinc protoporphyrin;
      d. Blood Urea Nitrogen (BUN);
      e. Respirator Health Check;
      f. Pulmonary function testing;
      g. Chest X-ray;
      h. Electrocardiogram.

C. Employees may seek a secondary physician for a second opinion to review initial results, and conduct examination consultations and laboratory tests deemed necessary. If two physicians disagree and are unable to resolve differences a third physician may be contacted (see OSHA Lead Standard [29 CFR 1910.1025(j)] for more details).

1.11 TRAINING

A. As required by applicable regulations, prior to assignment to lead Work instruct each employee with regard to the hazards of lead, safety and health precautions, and the use and requirements of protective clothing and equipment.

B. Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134, and 29 CFR 1926.62. Provide respirator training and fit-testing.

1.12 RESPIRATORY PROTECTION

A. Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

B. Respirators shall be individually fit-tested to personnel under the direction of an Industrial Hygienist. Fit-tested respirators shall be permanently marked to identify the individual fitted,

and use shall be limited to that individual. Fit-test records shall be maintained on site for each employee.

C. Respiratory protection will be based upon whether Class 1, 2, and 3 tasks are being performed, in accordance with 29 CFR 1926.62.

D. No respirators shall be issued to personnel without such personnel participating in a respiratory training program.

E. High Efficiency Particulate Air (HEPA) respirator filters shall be approved by NIOSH and shall conform to the OSHA requirements in 29 CFR 1910.134 and 29 CFR 1926.62.

F. A storage area for respirators shall be provided by the Contractor in the clean room side of the personnel decontamination enclosure where they will be kept in a clean environment.

G. The Contractor shall provide and make available a sufficient quantity of respirator filters so that filter changes can be made as necessary during the Workday. Filters will be removed and discarded during the decontamination process. Filters cannot be reused. Filters must be changed if breathing becomes difficult.

H. Filters used with negative pressure air purifying respirators shall not be used any longer than one eight (8) hour Workday.

I. Any authorized visitor, Worker, or supervisor found in the Work Area not wearing the required respiratory protection shall be removed from the Project site and not be permitted to return.

J. The Contractor shall have at least two (2) Powered Air Purifying Respirators stored on site designated for authorized visitors use. Appropriate respirator filters for authorized visitors shall be made available by the Contractor.

1.13 DELIVERY AND STORAGE

A. Deliver all materials to the job site in original packages with containers bearing manufacturer's name and label.

B. Store all materials at the job site in a suitable and designated area.

C. Store materials subject to deterioration or damage away from wet or damp surfaces and under cover.

D. Protect materials from unintended contamination.

E. Remove damaged or deteriorated materials from the job site. Materials contaminated with lead shall be disposed of as lead debris as herein specified.

1.14 TEMPORARY UTILITIES

A. Shut down and lock out all electrical power to the lead Work Areas.

B. Provide temporary 120-280 volt, single phase, three wire, 100 amp electric service with Ground Fault Circuit Interrupters (GFCI) for all electric requirements within the lead Work Area.
   1. Where available, obtain from Owner's existing system. Otherwise provide power from other sources (i.e. generator).
   2. Provide temporary wiring and "weatherproofreceptacles in sufficient quantity and location to serve all HEPA equipment and tools.

3. Provide wiring and receptacles as required by the Environmental Consultant for air sampling equipment.
4. All power to the Work Area shall be brought in from outside the area through GFCI's at the source.

C. Provide temporary lighting with "weatherprooffixtures for all Work Areas including decontamination chambers.
   1. The entire Work Area shall be kept illuminated at all times.
   2. Provide lighting as required by the Environmental Consultant for the purposes of performing required inspections.

D. All temporary devices and wiring used in the Work Area shall be capable of decontamination procedures including HEPA vacuuming and wet wiping.

E. Utilize domestic water service, if available, from Owner's existing system. Provide hot water heaters with sufficient capacity to meet Project demands.

PART 2 - PRODUCTS

2.1 PROTECTIVE CLOTHING

A. Provide personnel utilized during the Project with disposable protective whole body clothing, headcoverings, gloves and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber for comfort, but shall not be used alone. Make sleeves secure at the wrists and make foot coverings secure at the ankles by the use of tape, or provide disposable coverings with elastic wrists or tops.

B. Provide sufficient quantities of protective clothing to assure a minimum of four (4) complete disposable outfits per day for each individual performing lead Work.

C. Eye protection and hard hats shall be provided and made available for all personnel entering any Work Area.

D. Authorized visitors shall be provided with suitable protective clothing, headgear, eye protection, and footwear whenever they enter the Work Area.

2.2 SIGNS AND LABELS

A. Provide warning signs and barrier tapes at all approaches to lead Work Areas. Locate signs at such distance that personnel may read the sign and take the necessary protective steps required before entering the area.
   1. Provide danger signs in vertical format conforming to 29 CFR 1926. Minimum 20" x 14" displaying the following legend.

**DANGER**
**LEAD WORK AREA**
**POISON**
**NO SMOKING OR DRINKING**
**AUTHORIZED PERSONNEL ONLY**
**RESPIRATORS AND PROTECTIVE**
**CLOTHING ARE REQUIRED IN THIS AREA**

1. Provide 3” wide yellow barrier tape printed with black lettered, “DANGER LEAD REMOVAL”. Locate barrier tape across all corridors, entrances and access routes to lead Work Area. Install tape 3’ to 4’ AFF.

B. Provide lead danger labels affixed to all lead materials, scrap, waste, debris and other products contaminated with lead.
   1. Provide lead danger labels of sufficient size to be clearly legible, displaying the following legend, or equivalent:

**DANGER**
**CONTAINS LEAD**
**AVOID CREATING DUST**
**POISON HAZARD**

   1. Provide the following lead labels, of sufficient size to be clearly legible, for display on waste containers (bags or drums) which will be used to transport lead contaminated material in accordance with United States Department of Transportation 49 CFR, Part 745.
   2. Generator identification information shall be affixed to each waste container indicating the following printed in indelible ink:
      a. Generator Name:
      b. Facility Name:
      c. Facility Address:

2.3 PROJECT LOG BOOK

A. Provide a permanently bound Project log book of minimum 8-1/2” x 11” size. Log book shall contain on title page the Project name, name, address and phone number of Owner; name, address and phone number of Environmental Consultant; name, address and phone number of Lead Contractor; emergency numbers including, but not limited to local Fire/Rescue department.

B. All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted.

C. All persons entering and exiting the Work Area shall sign the log and include name, social security number, and time.

D. The Project Supervisor shall document all Work performed daily and note all inspections.

2.4 SCAFFOLDING AND LADDERS

A. Provide all scaffolding and/or staging as necessary to accomplish the Work of this Contract. Scaffolding may be of suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding and ladders shall comply with all applicable OSHA construction industry standards.

B. Provide scaffolding and ladders as required by the Environmental Consultant for the purposes of performing required inspections.

2.5 SURFACTANT (AMENDED WATER)

A. Wet all lead-containing materials prior to removal with surfactant mixed and applied in accordance with manufacturer's printed instructions.

2.6 ENCAPSULANT

A. Following lead scrapping, an encapsulant material shall be applied to the scrapped surfaces and remaining surfaces containing lead-based paint.

B. Approved Manufacturer:
   1. KapsulKote Inc.: KapsulKote II System – PrimerKote and FinishKote
   2. Premier Coatings, Inc.: Lead Block
   3. GLOBAL Encasement, Inc.: LeadLock GE-40
   4. Fiberlock Technologies, Inc.: L-B-C Lead Barrier Compound
   5. Fiberlock Technologies, Inc.: LeadMaster

2.7 DISPOSAL BAGS, DRUMS, AND CONTAINERS

A. Provide 6 mil polyethylene disposal bags. Bags shall also be imprinted with U.S. Department of Transportation required markings.

B. Provide 30 or 55 gallon capacity fiber or metal drums capable of being sealed air and water tight if lead waste has the potential to damage or puncture disposal bags. Affix lead caution labels on lids and at one-third points around drum circumference to assure ready identification.

C. Containers and bags must be labeled with the names of the waste generator and the location at which the waste was generated.

D. Labeled lead waste containers or bags shall not be used for non-lead waste or trash. Any material placed in labeled containers or bags, whether turned inside out or not shall be handled and disposed of as lead waste.

2.8 HEPA VACUUM EQUIPMENT

A. All dry vacuuming performed under this contract shall be performed with High Efficiency Particulate Absolute (HEPA) filter equipped industrial vacuums conforming to ANSI Z9.2.

B. Provide tools and specialized equipment including scraping nozzles with integral vacuum hoods connected to a HEPA vacuum with flexible hose.

C. Approved Manufacturers:
   1. Hako Minuteman
   2. Micro-Trap Inc.
   3. Control Resource Systems, Inc.

2.9 POWER TOOLS

A. Any power tools used to drill, cut into, or otherwise disturb lead material shall be equipped with HEPA filtered local exhaust ventilation.

2.10 POLYETHYLENE SHEETING

A. All polyethylene (plastic) sheeting used on the Project (including but not limited to sheeting used for critical and isolation barriers, fixed objects, walls, floors, ceilings, waste container) shall be at least 6 mil fire retardant sheeting.

B. Decontamination enclosure systems shall utilize at least 6 mil opaque fire retardant plastic sheeting. At least 2 layers of 6 mil reinforced fire retardant plastic sheeting shall be used for the flooring.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Should the area beyond the Work Area(s) become contaminated with lead containing materials, immediately stop Work and institute emergency procedures. Contaminated non-Work Areas shall be isolated and decontaminated in accordance with procedures established for lead removal. All costs incurred in decontaminating such non-Work Areas and the contents thereof shall be borne by the Contractor, at no additional cost to the Owner.

B. Medical approval, fit test reports, Worker Acknowledgments, and EPA certificates shall be on site prior to admittance of any Contractor's employees to the Work Area.

C. Perform all lead removal Work using wet removal procedures. Mix and apply surfactant in accordance with manufacturers written instructions. Dry removal procedures are not permitted.

D. The following documents shall be posted at the site at an approved location:
   1. Company license.
   2. Daily personal air monitoring results.
   3. Worker's EPA certificates (copies are acceptable provided Workers have original certificates in their possession).
   4. Medical records.
   5. Fit test reports.
   6. Project specifications.
   7. Project drawings.
   8. Notifications.
   9. Applicable regulations.
   10. Material Safety Data Sheets.
   11. Lead Work plan.
   12. List of emergency telephone numbers.
   13. Waste Disposal Log

E. The Work Area must be vacated by building occupants prior to decontamination enclosure construction and Work Area preparation.

3.2 PERSONNEL DECONTAMINATION ENCLOSURE

A. Provide a personnel decontamination enclosure contiguous to the Work Area, unless otherwise specified. The decontamination enclosure shall be attached to the Work Area and not located within it. If the decontamination chamber is accessible to the public it shall be fully framed and sheathed to prevent unauthorized entry. Alternately, a remote decontamination enclosure can be situated within 150 feet of the Work Area. Contamination enclosure requirements set forth in this part shall apply with the exception to Section 3.02B. Access to the Work Area will not be directly through the decontamination enclosure.

B. Access to the Work Area will be from the clean room through an air-lock to the shower, through an air lock to the equipment room then into the Work Area. Each airlock shall be a minimum of three feet from door to door.

C. The decontamination enclosure ceiling and walls shall be covered with two layers of opaque 6 mil fire retardant polyethylene sheeting. Two layers of 6 mil fire retardant reinforced polyethylene sheeting shall be used to cover the floor.

D. Establish a triple layer of six mil fire retardant polyethylene at the decontamination chamber doorways, weighted to insure a tight seal of the enclosure. Prior to establishing doorway seals move all required tools, scaffolding, and equipment into the Work Area.

E. The entrance to the clean room shall have a lockable door. Provide suitable lockers for storage of Worker's street clothes. Storage for respirators along with replacement filters and disposable towels shall also be provided.

F. Provide a temporary shower with individual hot and cold water supplies and faucets. Provide a sufficient supply of soap and shampoo. There shall be one shower for every six workers. The shower room shall be constructed in such a way so that travel through the shower chamber shall be through the shower. The shower shall not be able to be bypassed.

G. Shower water shall be drained, collected and filtered through a system with at least a 5.0 micron particle size collection capability containing a series of several filters with progressively smaller pore sizes to avoid rapid clogging of the system. The filtered waste water shall then be collected in a non-corrosive container and disposed of as lead waste according to all applicable laws.

H. The equipment room shall be used for the storage of tools and equipment. A labeled 6 mil plastic waste bag for collection of contaminated clothing shall be located in this room.

I. The personal decontamination enclosure shall be cleaned and disinfected minimally at the end of each Work shift and as otherwise directed by the Lead Project Monitor.

3.3 WORK AREA ENTRY AND EXIT PROCEDURES

A. Access to and from the Work Area is permitted only through the personnel decontamination enclosure.

B. Workers shall sign the entry/exit log upon every entry and exit.

C. The following procedures shall be followed when entering the Work Area:
   1. Before entering the Work Area, workers shall proceed to the clean room, remove all street clothes, and don protective clothing, equipment, and respirators. Two layer of protective clothing shall be required when a remote decontamination enclosure is being utilized.
   2. Workers shall proceed from the clean room through the shower room and the equipment room and into the Work Area.

D. The following procedures shall be followed when exiting the Work Area:
   1. Before leaving the Work Area, gross lead contamination will be removed by wet cleaning and HEPA vacuuming. At least two wet cleanings shall be performed with separate cleaning solutions and rinse waters.
   2. In the equipment room, workers shall remove disposable clothing, but not respirators, and shall place clothing in plastic disposal bags for disposal as contaminated debris prior to entering the shower room. For remote decontamination enclosures, one layer of protective clothing shall be removed prior to exiting the Work Are air lock.

3. Workers shall shower thoroughly while wearing respirators, then wash respirator with soap and water prior to removal. Disposal towels shall be provided as well as a 6 mil plastic disposal bag for the collection of the contaminated towels.
4. Upon exiting the shower, workers shall don new disposable clothing if work shift is to continue or street clothes to exit area. Under no circumstances shall workers enter public non-Work Areas in disposable protective clothing.

3.4 WORK AREA PREPARATION

A. Danger signs shall be posted at all approaches to the Work Area. Post all emergency exits as emergency exits only on the Work Area side, post with caution signs on the non-Work Area side. Provide all non-Work Area stairs and corridors accessible to the Work Area with warning tapes at the base of stairs and beginning of corridors. Warning tapes shall be in addition to caution signs. The Work Area shall be considered to include the entire room in which the window or door being addressed is located and any exterior locations constructed to enable the activities.

B. Shut down and lock out the building heating, ventilating, and air conditioning and electrical systems. Provide temporary electric power and lighting as specified herein.

C. All surfaces and objects within the Work Area shall be pre-cleaned using HEPA vacuuming and/or wet-wiping methods. Dry sweeping and any other methods that raise dust shall be prohibited.

D. Movable objects within the Work Area shall be HEPA vacuumed and/or wet-wiped and removed from the Work Area.

E. Should a construction barrier be constructed at the window or door opening being addressed, Section 3.05K will not be required.

F. All non-movable equipment in the Work Area shall be completely covered with 2 layers of fire retardant polyethylene sheeting, at least 6 mil in thickness, and secured in place with duct tape and/or spray adhesive.

G. Provide enclosure of the Work Area necessary to isolate it from unsealed areas of the building in accordance with the approved Work plan and as specified herein.

H. Seal off all openings including but not limited to windows, diffusers, grills, electrical outlets and boxes, doors, floor drains, and any other penetrations of the Work Area enclosure, using 2 layers of at least 6 mil fire retardant polyethylene sheeting to form a critical barrier.

I. Provide temporary framing and sheathing at openings larger than 32 square feet, which form the limits of the Work Area. Sheathing thickness must be a minimum of 3/8 inch and all sheathing shall be caulked and the Work Area side sealed with two layers of 6 mil fire retardant polyethylene sheeting to form an isolation barrier.

J. Isolation barriers shall be installed at all elevator openings in the Work Area. Elevator controls shall be modified so that elevators bypass the Work Area.

K. Provide two layers of 6 mil fire retardant polyethylene sheeting over all floor, wall, and ceiling surfaces. Isolation barriers shall also be covered with two layers (for a total of four layers). Sheeting shall be secured with spray adhesive and then sealed with duct tape. All joints in polyethylene sheeting shall overlap 12” minimum. Note that floor sheeting does not eliminate dust clearance sampling of the floor area below the sheeting and/or sampling of the sheeting floor area. Failure of either type of dust clearance sampling requires additional cleaning of the Work Area by the Contractor at no additional expense to the Owner.

L. Frame out emergency exits. Provide double layer 6 mil fire retardant polyethylene sheeting and tape seal opening. Post as emergency exits only. Within the Work Area, mark the locations and directions of emergency exits throughout the Work Area using exit signs and/or duct tape.

3.5 RENOVATION AND REMOLDING OF LEAD-BASED PAINT

A. Renovation and Remolding shall be conducted in accordance with the Contract Documents and the approved Lead Work Plan.

B. If Lead-based Paint surfaces need to be addressed then it should be accomplished with a low pressure, airless fine spray of surfactant to ensure full penetration prior to material removal. Re-wet material if it does not display evidence of saturation.

C. One Worker shall continuously apply amended water while lead based paint is being removed.

D. Removal of lead-based paint shall be accomplished through manual scrapping.

E. Perform cutting, drilling, abrading, or any penetration or disturbance of lead containing material in a manner to minimize the dispersal of lead into the air. Use equipment and methods specifically designed to limit generation of airborne particles. All power operated tools used shall be provided with HEPA equipped filtered local exhaust ventilation.

F. Upon removal of lead from the substrate, the newly exposed surfaces shall be HEPA vacuumed and/or wet cleaned. Surfaces must be thoroughly cleaned using necessary methods and any required solvents to completely remove any adhesive, mastic, etc. Wet and bag the debris as it is removed, using a 6 mil plastic disposable bag.

G. All removed material shall be placed into 6 mil plastic disposal bags or other suitable container upon detachment from the substrate or whenever there is enough accumulation to fill a single bag or container. Maintain the surfaces of the Work Area free of accumulation of lead debris.

H. Dust-tight enclosed inclined chutes shall be used for materials dropped from distances greater than 10 ft.

I. Large components shall be wrapped in two layers of 6 mil polyethylene sheeting. Sharp components likely to tear disposal bags shall be placed in fiber drums or boxes and then wrapped with sheeting.

J. Power or pressure washers will not be allowed to be used for lead-based paint removal or clean-up procedures.

K. All construction and demolition debris determined by the Environmental Consultant to be contaminated with lead shall be handled and disposed of as lead waste.

3.6 EQUIPMENT AND WASTE CONTAINER DECONTAMINATION AND REMOVAL PROCEDURES

A. External surfaces of contaminated containers and equipment shall be cleaned by wet cleaning and/or HEPA vacuuming in the Work Area before moving such items into the waste decontamination enclosure system airlock by persons assigned to this duty. The Work Area persons shall not enter the airlock. Large components may be moved directly to a waste container when a remote decontamination enclosure is being utilized. The component must be decontaminated within the work area and posse no health concerns when removed from the Work Area.

B. The cleaned containers of lead material and equipment are to be dried of any excessive pooled or beaded liquid, placed in uncontaminated plastic bags or sheeting, as the item's physical characteristics demand, and sealed airtight.

C. Containers and equipment shall be moved from the work area and into a holding area by persons dressed in clean personal protective equipment, who have entered from uncontaminated areas.

D. The cleaned containers of lead material and equipment shall be placed in water tight carts with doors or tops that shall be closed and secured. These carts shall be held in the holding area pending removal. The carts shall be wet cleaned and/or HEPA vacuumed at least once each day.

E. The exit from the decontamination enclosure system shall be secured to prevent unauthorized entry.

F. Where the waste removal enclosure is part of the personnel decontamination enclosure, waste removal shall not occur during shift changes or when otherwise occupied. Precautions shall be taken to prevent short circuiting and cycling of air outward through the shower and clean room.

3.7 WORK AREA DECONTAMINATION

A. Following completion of gross removal activities and after all accumulations of lead waste materials have been containerized, the following decontamination procedures shall be followed, unless otherwise specified.

B. Daily Cleaning:
   1. According to the HUD Guidelines, "A thorough cleanup of the entire area under active abatement should occur daily during the entire abatement process. This daily cleanup should consist of the following:
      a. Large Debris:
         1) Large demolition-type debris (e.g., doors, windows, trim) should be wrapped in 6-mil plastic, sealed with tape, and moved to the area designated for trash storage on the property. Since lead-contaminated debris is a potentially hazardous waste, it should never be stored outside while awaiting removal/disposal. Consequently, an area inside the property must be designated as a temporary trash storage area, unless an approved container is to be located exterior to the building.
      b. Small Debris:
         1) Small debris should be collected by wet mopping or wet sweeping and disposed of properly. However, before any sweeping occurs, the affected surfaces should be sprayed with a fine mist of water, to keep surface dust from becoming airborne and potentially containing other areas of the property and lead workers. Dry sweeping is prohibited. The swept debris should be placed in double 4-mil or single 6-mil plastic bags, properly sealed, and moved to the designated trash storage area. Care should be taken not to overload trash bags, which otherwise may rupture or puncture during handling and transport.
      c. Exterior Cleanup:
         1) Using a containment system should protect unabated areas potentially affected by exterior lead activities. Because weather can adversely affect the exterior of the containment, the surface plastic of the containment system should be removed at the end of each workday. On a daily basis, as well as during final cleanup, the immediate area should be examined visually to ensure that no lead debris has escaped containment. Any such debris should be raked or wept

swept and placed in single 6-mil or double 4-mil plastic bags, which should then be sealed and stored along with other contaminated debris.

2) At the conclusion of the lead activities, a final cleanup must occur. This is a much more thorough process than the daily cleanup. Failure to perform an adequate final cleanup will result in failure to pass post-lead-dust clearance.

C. Preliminary Final Cleanup:

1. Before final cleanup can begin and before abated surfaces can be painted or sealed, the plastic sheeting used for containment must be removed. This contaminated plastic sheeting must be removed and disposed of very carefully. Removal should start with upper-level plastic, as applicable. The plastic should be sprayed or misted with water to hold down dust, and then folded in upon itself to trap any dust residues inside. Before removal of floor plastic, it should be sprayed and swept as detailed earlier in this chapter. It should be folded carefully from the corners/ends to the middle to trap any remaining lead dust and placed into double 4-mil or single 6-mil plastic bags that are then sealed and removed from the premises. As with daily cleanups, this plastic removal process requires the use of protective equipment, especially appropriate respirators. Plastic sheets used to isolate contaminated rooms from non-contaminated rooms should not be removed at this time. These sheets should remain until after the preliminary final cleanup/final cleanup is complete and satisfactory lead dust clearance results are obtained. Then the plastic sheets used to isolate contaminated rooms from non-contaminated rooms should be carefully removed as described above.
2. After the plastic has been removed from the contaminated area, the entire area should be HEPA-vacuumed as detailed in [HUD Guidelines] Section 10.2.1, starting with the rooms farthest from the entrance to avoid retracking dust through the already-cleaned area. In each room, vacuuming should begin with the ceilings and proceed down the walls, making sure every surface is treated, including doors and door trim, windows, window sills, wells, and trim, baseboards, etc
3. The entire affected area should next be washed down with a TSP solution as detailed above and then it should be HEPA-vacuumed again using the steps already outlined. The contractor must not deviate from or skip any step. To do so could mean that hazardous levels of lead dust and residue could be embedded in the new paint and mobilized later when that paint deteriorates or is abraded.
4. Prior to and after isolation and critical barriers are removed, the Lead Project Monitor shall inspect the Work Area for cleanliness. If necessary, additional cleaning shall be performed by the Contractor as directed by the Lead Project Monitor.
5. As a result of any visual inspection by the Lead Project Monitor, the Contractor will clean or reclean the affected areas at no additional expense to the Owner.

D. Final Cleanup Procedures

1. The final clean-up procedures is as follows:
    a. Remove the top layer of 6-mil poly and seal in bags or clean 6-mil poly.
    b. Remove bags of poly and store in a secure area.
    c. Vacuum all surfaces with a HEPA-equipped vacuum beginning with the ceiling and working down.
    d. Wash all surfaces with TSP (trisodium phosphate) detergent.
    e. Vacuum all surfaces a second time.
    f. Wash all surfaces a second time.
    g. Remove all contaminated equipment and material to secure storage area.
    h. Removal final layer of poly, except isolation and critical barriers are to remain. Isolation and critical barriers are to be removed following satisfactory lead wipe clearance results.
    i. Vacuum floors with HEPA-equipped vacuums.
    j. Wash surfaces again with TSP.
    k. Vacuum again.

l. Seal surfaces with paint, polyurethane, or wax.

E. Cleanup Confirmation (Lead Dust Clearance)
1. The LPM will be collection lead wipe samples to confirm the effectiveness of the cleanup activities. Lead-dust results shall be available within 24 hours of completing sampling. Following satisfactory reporting of the results, all isolation and critical barriers shall be removed. Should results indicate lead-dust present at concentrations exceeding the acceptable guideline level, the Contractor will clean or reclean the affected areas at no additional expense to the Owner.
2. The established clearance level for dust-lead for floors is 40 micrograms per square foot (ug/ft2) and for window sills the clearance level is 250 micrograms per square foot (ug/ft2). This level has been established as part of Title 40 of the Code of Federal Regulations Part 745 (40 CFR Part 745). If the contractor should fail the wipe tests for lead dust clearance, the contractor shall pay for additional testing until clearance is obtained.

3.8 RESTORATION OF UTILITIES, FIRESTOPPING, AND FINISHES

A. After final clearance, remove locks and restore electrical and HVAC systems. All temporary power shall be disconnected, power lockouts removed and power restored. All temporary plumbing shall be removed.

B. Finishes damaged by lead activities including, but not limited to, plaster/paint damage due to duct tape and spray adhesives, and floor tile lifted due to wet or humid conditions, shall be restored prior to final payment, unless the damaged surfaces are to be replaced during renovation activities.
1. Finishes unable to be restored shall be replaced under this Contract.
2. All foam and expandable foam products and materials used to seal Work Area openings shall be completely removed upon completion of lead activities.

PART 4 - DISPOSAL OF LEAD WASTE

4.1 APPLICABLE REGULATIONS

A. All lead waste shall be stored, transported and disposed of in accordance with the following regulation(s) as a minimum:
1. NYS DEC 6 NYCRR

4.2 TRANSPORTATION AND DISPOSAL SITE

A. The Contractor’s Hauler and Disposal Site shall be approved by the Owner.

B. he Contractor shall give twenty-four (24) hour notification prior to removing any waste from the site. Waste shall be removed from the site only during normal Working hours unless otherwise specified. No waste may be taken from the site unless the Environmental Consultant is present and authorizes the release of the waste as described herein.

C. The Contractor shall have the Hauler provide the estimated date and time of arrival at the Disposal Site.

D. Upon arrival at the Project Site, the Hauler must possess and present to the Environmental Consultant a valid New York State Department of Environmental Conservation Hauler’s Permit. The Environmental Consultant may verify the authenticity of the hauler’s permit with the proper authority.

E. The Hauler, with the Contractor and the Environmental Consultant, shall inspect all material in the transport container prior to taking possession and signing the Waste Manifests.

F. Unless specifically approved by the Owner, the Contractor shall not permit any off-site transfers of the waste or allow the waste to be transported or combined with any other off-site lead material. The Hauler must travel directly to the disposal site without unauthorized stops.

4.3 WASTE STORAGE CONTAINERS

A. All waste containers shall be fully enclosed and lockable (i.e. enclosed dumpster, trailer, etc.), open containers will not be permitted on-site (i.e. open dumpster with canvas cover, etc.).

B. The Environmental Consultant shall verify that the waste storage container tags (license plates) match that listed on the New York State Department of Environmental Conservation permit. Any container not listed on the permit shall be removed from the site immediately.

C. The container shall be plasticized and sealed with a minimum of one (1) layer of 6 mil polyethylene on the sides and two (2) layers of 6 mil polyethylene on the floor.

D. While on-site, the container shall be labeled with EPA Danger signage:

**DANGER**
**CONTAINS LED**
**AVOID CREATING DUST**
**POISON HAZARD**

E. The New York State Department of Environmental Conservation Hauler's Permit number shall be stenciled on both sides and back of the container.

F. Once the container is loaded at the site, the door(s) will be locked at all times.

G. The container is not permitted to be loaded unless it is properly plasticized, has the appropriate danger signage affixed, and has the permit number appropriately stenciled on the container.

H. Before the container is removed from the Project Site for transportation to the Disposal Site the locks shall be removed at the Disposal Site by the operator of the Disposal Facility and returned by the Disposal Facility to the Contractor.
   1. The Owner may initiate random checks at the Disposal Site to insure that the procedures outlined herein are complied with.

**END OF SECTION**

## PART 1 – GENERAL

### 1.01 – SECTION INCLUDES

A. Repair of cracked, spalled, calcinated and hollow areas on concrete tank interior floors and walls.

### 1.02 - SUBMITTALS

A. Submit under provisions of Section 013300.

B. Submit manufacturers' product data and application requirements for proposed materials used to repair spalls and cracks.

C. Submit documentation on characteristics of proposed media for abrasive blasting.

D. Submit documentation indicating product applicators are trained and approved by product manufacturer.

### 1.03 - REGULATORY REQUIREMENTS

A. Coatings shall comply with NYCRR, Part 205, of the New York State Department of Environmental Conservation (NYSDEC).

B. Transport debris and rubbish in accordance with New York State Department of Environmental Conservation Law, Article 27, Treatment and Disposal of Refuse and Other Solid Waste.

### 1.04 - EXISTING CONDITIONS

A. Allow Owner/Engineer to conduct an inspection after tank cleaning to identify areas for repair.

## PART 2 - PRODUCTS

### 2.01 – MATERIALS

A. Two Component Polymer Modified Cement: Cement shall comply with ANSI/NSF Standard 61 for Two Component Polymer Modified Cement: Cement shall comply with ANSI/NSF Standard 61 for potable water. All repair mortar shall fully bond to existing surfaces and be free of chlorides. Repair mortar shall be SIKATOP 123 PLUS Repair Mortar for locations where concrete repair depths exceed more than 2-inches.

B. Bonding Agent and Reinforcement Protection: The bonding agent and reinforcement protection shall be a 3-component, solvent free, moisture tolerant, epoxy-modified, cemetitious product

specifically formulated as a bonding agent and anti-corrosion coating. This product shall be Armatec 110 EpoCem as manufactured by SIKA CORP.Water: Potable, clean and free from oils, acids, alkali organic matter and other deleterious material.

C. Water: Potable, clean and free from oils, acids, alkali organic matter and other deleterious material.

D. Filler: TNEMEC 63-1500 for locations where concrete repair depths are less than 2-inches.

**PART 3 - EXECUTION**

**3.01 –PROTECTION**

A. Protect pipe openings so that no materials enter into the lines during preparation and repair.

**3.02 – SURFACE PREPARATION**

A. Exterior Abrasive blasting: Utilize abrasive blasting to remove all existing coatings and deposits at area to be repaired. Remove loose material to sound substrate. Equipment shall have ample capacity to furnish the required volume of compressed air to operate the blast effectively. The air shall be free of oil or moisture. Media shall be composed principally of silica grains. Do not utilize previously used media for abrasive blasting. Conduct abrasive blasting to prevent spread of media to adjoining property.

B. Surfaces to be repaired and coated shall be clean.

C. Mechanical chipping: Where necessary, and as directed by the Engineer, use chipping hammers to remove unsound concrete.

**3.03 – REPAIR/RESTORATION**

A. Wall and Floor Crack Repair (Crack Repair)

1. Rout with dovetail profile to a depth of ½-inch.

2. Remove mortar at the ends of exposed wire and steel until corrosion free steel is exposed. Remove rust deposits and loose material from steel by blasting to a near white finish (SSPC-10). Coat bare steel with 20 mils (2 coats of 10 mils each) of SIKA ARMATEC 110 EPOCEM.

3. Saturate surface with clean water.

4. When repair area is saturated surface dry, coat entire concrete surface of repair area with 20 mils of Sika ARMATEC 110 EPOCEM.

5. Prepare two-component, polymer-modified, cementitious, non-sag mortar in accordance with manufacturer's standards.

6. Apply in accordance with manufacturer's recommendations.

7. Cure in accordance with ACI recommendations for Portland Cement Concrete.

B. Exterior Wall and Floor Repairs (Spall Repair)

1. Remove all loose material to sound substrate.

2. Abrasive blast to SSPC-SP13/NACE 6 Surface Preparation of Concrete.

3. When surface preparation of area to be repaired is completed, coat entire concrete surface of repair area with 1/16-inch of TNEMEC 63-1500.

**3.04 - CLEANUP**

A. Maintain work area in a neat, orderly fashion. Debris such as used sand, muck, rust, scale, shall be frequently cleaned up and removed from the site. Thinners used to clean spray guns and other tools and equipment shall be held in containers and removed from the site to an approved disposal area by the Contractor. Do not clean equipment in tank.

B. After completion of repair, thoroughly clean tank interior. Sweep broom clean.

C. Upon completion of the work, remove all excess material, rigging, empty containers, and supplies, from the site. Buildings and grounds shall be left in as good condition as when work was started.

D. Transport debris and rubbish in accordance with New York State Department of Environmental Conservation Law, Article 27, Treatment and Disposal of Refuse and Other Solid Waste.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 – WORK INCLUDED

A. Formwork, shoring, bracing, and anchorage.

B. Concrete reinforcement and accessories.

C. Cast-in-place concrete.

D. Grout

E. Concrete curing

F. Waterproofing

G. Final concrete finishes

H. Temporary wooden handrailing shall be provided as work of this section as specified in Section 015000.

### 1.02 - REFERENCES

I. ACI 301 – Specification for Structural Concrete.

J. ACI 304 – Guide For Measuring, Mixing, Transporting, and Placing Concrete.

K. ACI 305 – Hot Weather Concreting.

L. ACI 306 – Cold Weather Concreting.

M. ACI 308 – Guide To Curing Concrete.

N. ACI 318 – Building Code Requirements for Structural Concrete.

O. ACI 350 - Concrete Sanitary Engineering Structures.

P. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

Q. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.

R. ASTM C33 - Concrete Aggregates.

S. ASTM C94 - Ready-Mixed Concrete.

T. ASTM C150 - Portland Cement.

U. ASTM C260 - Air Entraining Admixtures for concrete.

V. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

W. ASTM C494 - Chemical Admixtures for Concrete.

X. ASTM C618 - Fly Ash and Raw or Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.

Y. ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.

Z. ASTM D2103 - Polyethylene Film and Sheeting.

AA. CRSI 63 – Recommended Practice for Placing Reinforcing Bars.

**1.03 - SUBMITTALS**

A. The Contractor shall comply with the requirements contained in Section 013300 - Submittals.

B. Product data shall be submitted for all products specified herein.

C. Shop drawings shall be prepared and submitted in accordance with the requirements specified in paragraph 1.07 below.

D. Provide proposed concrete mix design for each type of concrete, as specified in paragraph 1.11, below to be used on the project at least 30 calendar days prior to the first scheduled concrete pour. The Contractor's testing laboratory shall develop concrete mix designs and test all materials and mixes for conformance with these specifications. The costs associated with development of the design mix and testing of samples shall not be paid for out of the stipulated cash allowance and shall be included in the bid price.

E. Furnish the Engineer's field representative with the transit-mix delivery slips.

**1.04 - QUALITY CONTROL**

A. Comply with the referenced standards specified in paragraph 1.03 above.

B. Perform testing under the provisions of Section 014500 - Quality Control.

C. Laboratory testing costs associated with the work of this Section will be paid for under the contract allowance item. The Contractor shall arrange to have a qualified technician present at the prescribed time.

D. Perform all work in accordance with ACI 301.

E. Fabricate concrete reinforcing in accordance with CRSI 63.

F. Provide field quality control as specified herein this Section.

G. Procure concrete from a single approved central commercial batching plant. To further insure consistency, coloring, finish and quality, all aggregates, cement, water and other ingredients shall each be secured from the same source for the duration of the project.

H. The batching plant and raw materials may be subject to inspections and tests performed by the Engineer.

I. Contractor shall provide an adequately sized, insulated curing box to house concrete test cylinders, at the discretion of the Engineer, for the 24-hour period between concrete pour and sample pick-up by the testing lab. As directed by the Engineer, the Contractor shall cure additional cylinders in the same fashion as the in-place concrete.

J. Curing box shall be located away from the main construction area and shall be blocked up off the ground.

    1. Curing box shall be located away from the main construction area and shall be blocked up off of the ground.

    2. A log sheet shall be provided in a waterproof sheet protector to log in the placement and removal of the concrete test samples by the testing lab.

    3. Minimum information to be logged for each pour date shall include: date of pour, date of pick-up, weather conditions at time of pour, number of cylinders added, number of cylinders removed, location of pour, testing lab field technician name.

K. A log sheet shall be provided in a waterproof sheet protector to log in the placement and removal of the concrete test samples by the testing lab.

L. Minimum information to be logged for each pour date shall include: date of pour, date of pick-up, weather conditions at time of pour, number of cylinders added, number of cylinders removed, location of pour, testing lab field technician name.

**1.05 - REGULATORY REQUIREMENTS**

A. Conform to ACI 304 and all applicable codes for placement of concrete and related work.

**1.06 - TESTS**

A. Testing and analysis of concrete shall be performed under the requirements contained in Section 014500 – Quality Control.

B. The testing laboratory shall take cylinders, perform slump, and air entrainment tests in accordance with ACI 301.

**1.07 - SHOP DRAWINGS**

A. Submit shop drawings of reinforcing steel and formwork under the provisions of Section 013300 - Submittals.

B. Indicate reinforcement sizes, spacing, locations and quantities of reinforcing steel and wire fabric, bending and cutting schedules, splicing and supporting and spacing devices.

C. Indicate formwork dimensioning, materials, arrangement of joints and ties.

D. Submit details of temporary handrailing.

E. Submit formwork shop drawings prepared under the supervision of a professional engineer registered in the State of New York who shall be qualified as a structural engineer. Shop drawings shall bear the seal and signature of said licensed Professional Engineer.

**1.08 - COORDINATION**

A. Coordinate work under provisions of Section 013100 - Project Management and Coordination.

B. Coordinate work of other Sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

C. Notify Engineer a minimum of three (3) working days prior to commencement of concrete pours.

D. Arrange to have waterproofing product manufacturer present during the addition of the waterproofing agent to the mix. Provide manfucturer with at least (3) working days advance notice. In case of postponements due to acceptable weather conditions, then reschedule accordingly at no additional costs to the Owner.

**1.09 - DELIVERY, STORAGE AND HANDLING**

A. Store cement off the ground in a dry, weatherproof, adequately ventilated structure with provisions to prevent absorption of water.

B. Transport dry concrete batches from the central plant to the site in approved truck mixers conforming to the requirements of the Truck Mixer Manufacturer's Agitating Standards. Each truck shall contain a plate stating the capacity, drum speeds and be provided with a revolution counter.

**1.10 - ENVIRONMENTAL REQUIREMENTS**

A. Do not place concrete when the ambient temperature is below 40 deg. F. or when the concrete temperature exceeds 85 deg. F. Under certain circumstances, the Engineer may approve the placement of concrete under the above conditions, provided that the procedures of ACI 305 and ACI 306 are strictly adhered to.

B. Do not place concrete when the conditions may adversely affect the placing, curing or finishing of concrete, or its strength.

C. Comply with the requirements contained in Section 016500 - Product Delivery, Storage and Handling.

**1.11 - DESIGN MIXES**

A. Submit the following related to design mixes:

1. Name, address, and telephone number of Contractor's laboratory.

2. Mix proportions.

3. Source of cement, type, brand, and certified copies of mill reports, including physical and chemical analysis.

4. Source of fine aggregates and results of tests made in accordance with ASTM C33 and ASTM C40.

5. Source of coarse aggregates and results of tests made in accordance with ASTM C33.

6. Source of Fly Ash in accordance with ASTM C618 (To be used in Pre-Equalization Basin and MBR Tank Concrete).

7. Catalogue cuts of all admixtures.

8. Furnish test results of slump, air entrainment and water-cement ratio for each mix design.

9. For each mix proposed, make and cure four (4) standard 6 in. concrete test specimens in the lab in accordance with ASTM C192. Furnish compression test results made in accordance with ASTM C39. Break two (2) cylinders at seven (7) days and two (2) at 28 days.

10. If the concrete is intended to be pumped, design mix accordingly and submit certification that it has been tested for pumping.

B. If the adopted mix fails to produce concrete meeting the requirements for strength and placeability, the Engineer may order additional cement or adjustments to mix proportions at no extra cost to the Owner.

## PART 2 - PRODUCTS

### 2.01 - MATERIALS

A. Plywood forms: Douglas Fir species, solid one side grade and sound undamaged sheets. Thickness of wood shall be as required to support weight of concrete with minimal deflection.

B. Steel forms: Minimum 16 gage (1.5 mm) thick, stiffened to support weight of concrete with minimum deflection.

C. Tubular column type forms: Round, spirally wound laminated fiber material; inside surface treated with release agent.

D. Form ties: Snap-off metal, of fixed length, cone type.

E. Reinforcing: ASTM A615, 60 ksi (414 Mpa) yield grade billet steel deformed bars; uncoated finish, size and dimensions as indicated on plans.

F. Welded steel wire fabric: Plain type, ANSI/ASTM A185; in flat sheets; uncoated finish; size and dimensions as indicated on plans.

G. Cement: ASTM C150, Type II, Portland type, gray color.

H. Fine and coarse aggregates: ASTM C33. (No. 57 or No. 67).

I. Water: Clean and not detrimental to concrete.

**2.02 - ACCESSORIES**

A. Air entraining admixture: ASTM C260.

B. Chemical admixture: ASTM C494, Type as required.

C. Fly Ash Class C: ASTM C618. **(Influent Wet Well, Pre-Equalization Pump Station, Effluent Pump Station and MBR/Anoxic Tank Concrete only)**

D. Bonding agent: Three (3) component, solvent free, moisture tolerant, epoxy-modified cementitious product. Product Armatec 110 EpoCem as manufactured by Sika Corp. or specifically approved equal.

E. Vapor barrier: ASTM D2103, 15 mil (0.38 mm) thick clear polyethylene film.

F. Non shrink grout: Premixed compound with non-metallic aggregate, cement, water reducing and plasticizing agents; capable of minimum compressive strength of 2400 psi (16.5 Mpa) at 48 hours and 7000 psi (48.3 Mpa) at 28 days. Grout shall be suitable for contact with potable water. For equipment bases and pipe supports use non-shrink grout by Master Builders, Embeco 636, Unisorb V-1, or equal.

G. Flashing reglets: Galvanized steel; 26 gage (0.45 mm) longest possible lengths; alignment splines for joints; securable to formwork; Type CO, manufactured by FRY REGLET or equal.

H. Expansion joints: ASTM D1751; $^1/_2$-inch (13 mm) or ¾-inch (19 mm) thick, as indicated on drawings, asphalt impregnated fiberboard or felt.

I. Form release agent: Bio-Release EF or equal; colorless, water based, non-toxic, V.O.C. compliant, environmentally safe material which will not stain concrete, absorb moisture or impair natural bonding or color characteristics of coating intended for use on concrete; manufactured by Dayton Superior or equal. Agent shall not be detrimental to the environment.

J. Sealant: ASTM D1190; hot applied rubber compound manufactured by BURKE COMPANY or equal.

K. Absorptive mat: Burlap-polyethylene, 8-oz/sq. yd (270-g/sq. m.), bonded to prevent separation during use.

L. Membrane curing compound: Moisture Retention complying with ASTM C309. Products: Eucocure VOX as manufactured by Euclid or equal.

M. PVC Waterstops:

1. 6” high Polyvinylchloride with centerbulb, heat sealed joints at splices and intersections, Type 705 by Greenstreak Group, Inc. or equal.

2. 6” wide x 3” high (nom.) Polyvinylchloride retrofit style with centerbulb, heat sealed joints at splices and intersections, Type 609 by Greenstreak Group, Inc. or equal.

N. Injectable waterstop: One part polyurethane, extrudable swelling waterstop to create a compression seal; SikaSwell S-2 as manufactured by Sika Corp. or specifically approved equal.

O. Waterproofing Admixture **(Influent Wet Well, Pre-Equalization Pump Station, Effluent Pump Station and MBR/Anoxic Tank Concrete only)** :

1. Krystol Internal Membrane (KIM-HS) by Kryton or equal.

**2.03 - MIXES**

Cast in place concrete:

A. Mix concrete in accordance with ASTM C94, Alternative No. 2, to achieve the following:

1. Compressive strength (28 day): 4000 psi
2. Maximum water (cement ratio by weight): 0.50
3. Slump: Beams, Slabs, Footings, and Walls –
   a. Conventional Mix (Initial Slump): 3 ± 1 inch.
   b. Pump Mix (Final Slump): 6½± 1 Inch.
4. Air entrainment: 5½ ± 1 percent
5. Large aggregate: ¾” crushed stone, ASTM C33, No. 67

B. Concrete Fill:

1. Compressive strength (28 days): 2000 psi
2. Maximum water (cement ratio by weight): 0.50
3. Slump: 6 +/- 1 inch
4. Large Aggregate: 1 ½” gravel, ASTM C33, No.57

C. Use admixtures only when approved by the Engineer.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Verify lines, levels, and measurement before proceeding with formwork. Ensure that dimensions agree with the plans.

B. Inspect the formwork and reinforcing that it has been properly set and secured and that all items to be embedded, built-in or pass through concrete are at their proper locations and elevations.

C. The General Contractor shall verify that all other prime contractors have installed concrete inserts, sleeves and embedded elements of the project, such as conduit, and that their work has been totally completed and inspected by the Engineer.

### 3.02 - FORMWORK ERECTION

A. Hand trim sides and bottom of earth forms and remove loose soil to the satisfaction of the Engineer.

B. Remove water from forms and excavations and divert flows of water to avoid washing over, under or through freshly placed concrete.

C. Align form joints.

D. Do not apply form release agent where concrete surfaces are to receive special finishes or applied coatings that may be affected by the agent.

E. Where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack with non-metallic/non-shrink grout.

F. Prepare previously placed concrete by cleaning with steel brush and apply bonding agent in accordance with manufacturer's instructions.

G. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

### 3.03 - INSTALLATION

A. Place, support, and secure reinforcement against displacement at the locations and to the dimensions as indicated on the plans.

B. Use reinforcing splices at a minimum of locations and only at locations of minimum stress. Review locations of splices with Engineer.

C. Rebar splice overlap shall be the minimum length as per ACI 318 and 350.

D. Ensure reinforcement, inserts, embedded parts, formed joint fillers, and joint devices are not disturbed during concrete placement.

E. Install joint fillers in accordance with manufacturer's instructions.

F. Install joint devices in accordance with manufacturer's instructions.

G. Install joint device anchors. Maintain correct position to allow joint cover flush with floor and wall finish.

H. Install joint covers in one-piece length when adjacent construction activity is complete.

I. Apply sealants in joint devices in accordance with manufacturer's instructions.

J. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

K. Place concrete continuously between predetermined expansion, control and construction joints as rapidly as possible by methods that shall prevent the separation of ingredients.

L. Place concrete with the aid of mechanical vibrators and shall be capable of transmitting to the concrete not less than 3,000 impulses per minute. Maintain at least three (3) vibrators, in good working condition, ready for use when concrete placement starts in any one area.

M. Do not interrupt successive placement. Do not permit cold joints to occur.

N. Provide two inch thick poured concrete rat slab below footprint of Pre-Equilization Basin Tank to provide finished working surface.

O. Remove forms in accordance with ACI 301. Remove formwork after the concrete has sufficiently hardened, except in inaccessible spaces where approved by the Engineer. Forms shall be removed from placed concrete after a minimum of three full days following placement, or as otherwise approved by the Engineer.

**3.04 - CURING AND PROTECTION**

A. Hot Weather Concreting: Comply with ACI 305R whenever the atmospheric temperature or the form surface temperature is at or above 90 degrees F., or climatic conditions of wind and/or low humidity will cause premature drying of the concrete.

B. Curing Temperature: Maintain the temperature of the concrete at 50 degrees F. or above during the curing period. Keep the concrete temperature as uniform as possible and protect from rapid atmospheric temperature changes. Avoid concrete temperature changes that exceed 5 degrees F in any one hour and 50 degrees F in any 24 hour period.

**3.05 - INSTALLATION – FOUNDATION SLAB**

A. Saw cut control joints at an optimum time after finishing. Cut slabs with $^{3}/_{16}$-inch (4.8 mm) thick blade, $^{1}/_{4}$ depth of slab thickness.

B. Separate slabs on grade from vertical surfaces with joint filler. Extend joint filler from bottom of slab to within $^{1}/_{4}$ inch (6 mm) of finished slab surface.

C. Steel trowel all other surfaces except as noted.

D. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains maintaining a minimum 1 percent slope.

E. Cure floor surfaces in accordance with ACI 308.

F. Apply curing compound in accordance with manufacturer's instructions in two (2) coats with second coat at right angles to the first.

**3.06 - TOLERANCES**

A. Provide Class A tolerance to floor slabs according to ACI 301.

B. Tolerance shall be true planes within 1/8 inch in 10 feet, as determined by a 10 foot straightedge placed anywhere on the slab in any direction.

**3.07 - FIELD QUALITY CONTROL**

A. Inspection and testing of concrete performed by the independent testing laboratory shall be performed under provisions of Section 014500 - Quality Control.

**3.08 - FINISHES**

A. The Contractor shall finish all concrete by:

1. Filling all localized surface voids (“bugholes”), honeycombing, and pockets exceeding $^{1}/_{8}$ inch diameter and $^{1}/_{8}$ inch depth, in the concrete with an application of cement mortar as follows: White cement shall be added to the mortar in an amount sufficient to tint the

mortar a shade lighter than the concrete to be repaired. Mortar shall be mixed approximately 45 minutes in advance of use. Care shall be exercised to obtain a good bond with the concrete. After the mortar has thoroughly hardened, the surface shall be rubbed with a carborundum stone in order to obtain the same color in the mortar as in the surrounding concrete. The final appearance shall be acceptable to the Engineer.

2. All fins caused by form joints, and other projections shall be completely removed to the satisfaction of the Engineer.

3. Filling all snap tie voids with mortar as specified above.

B. First floor interior walking surfaces of all buildings shall be left with a flat rubbed, float or steel trowel finish and be readied for painting as work of another Section.

C. Interior basement areas not receiving coatings shall be left with a hard steel trowel finish.

D. Housekeeping pads shall be left with a broom finish with a steel trowel rounded edge.

E. All exterior-walking surfaces shall be left with a fine broom finish with a steel trowel border and rounded edges.

F. All exposed horizontal and vertical wall and slab corners shall have a ¾" wide chamfered edge.

**3.09 - PROTECTION AND REPAIR**

A. Protect concrete from damage and rust staining to the date that the Final Completion Certificate has been issued by the Engineer. Immediately remove all rust spots that have developed during the construction period as soon as directed by the Engineer.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Cleaning of all new exterior and interior masonry wall surfaces.

B. Cleaning of existing masonry wall surfaces in area where indicated on drawings.

B. Repointing defective mortar joints in area where indicated on drawings.

C. Masonry patches.

### 1.02 - RELATED SECTIONS

A. Section 04 20 00 – Concrete Unit Masonry.

B. Section 07 90 00 – Caulking and Sealants.

### 1.03 - REFERENCES

A. ANSI A41.2 - Building Code Requirements for Reinforced Masonry.

B. International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

### 1.04 - QUALITY ASSURANCE

A. Restorer: Company with 5 years documented experience in masonry restoration.

### 1.05 - SUBMITTALS

A. Provide product data on detergent for cleaning masonry surfaces.

B. Provide manufacturers literature on application.

C. Provide masonry unit manufacturer's letter approving detergent and application.

### 1.06 - DELIVERY, STORAGE AND HANDLING

A. Deliver, store and protect products per manufacturer's instruction.

B. Furnish materials in manufacturer's packaging, including instructions for use.

### 1.07 - ENVIRONMENTAL REQUIREMENTS

A. Do not lay masonry, stonework, repoint, calk, wash down or wet surfaces when temperature may drop below 40 degrees F within twenty-four hours.

B. Follow cold weather procedures in accordance with ANSI A41.2 when temperatures may drop below 40 degrees F.

C. Do not sandblast or use process creating dust or dirt when wind is over 10 miles/hr.

**1.08 - SEQUENCING/SCHEDULING**

A. Schedule and notify Owner 72 hours in advance of proposed work.

B. Perform repointing after cleaning.

C. Perform clear waterproofing after all masonry surfaces have thoroughly cured and dried, and accepted by Architect/Engineer.

**PART 2 - PRODUCTS**

**2.01 - MANUFACTURERS**

A. PROSOCO

B. DIEDRICH TECHNOLOGY

C. Or approved equal.

**2.02 - MASONRY MATERIALS**

A. Refer to:

a. Section 04 22 00: Concrete Unit Masonry.

B Detergent: Biodegradable, type recommended by masonry unit manufacturer to clear and prepare surfaces to receive scheduled finish.

C. Water: Clear, potable.

**2.03 - MORTAR MATERIALS**

A. Conform to requirements of Sections 04 22 00.

**PART 3 - EXECUTION**

**3.01 - EXAMINATION**

A. Verify that surfaces to be cleaned are ready for work of this Section.

B. Beginning of installation means acceptance of existing surfaces and conditions.

**3.02 - PREPARATION**

A. Protect elements surrounding the work of this Section from damage or disfiguration.

B. Carefully remove and store fixtures, fittings, finishing hardware, accessories as per Owner's direction.

C. Close off and seal areas, materials, and surfaces not receiving work of this Section to protect from damage.

D. Protect roof construction, trim and landscaping from damage.

**3.03 - CLEANING NEW MASONRY**

A. Verify mortar is fully set and cured.

B. Clean surfaces with detergent and remove large particles with wood scrapers, brass or nylon wire brushes approved by masonry unit manufacturer.

C. Saturate masonry with clean water and flush loose mortar and dirt.

D. Before solution dries, rinse and remove solution and dissolved mortar, using clean, pressurized water.

E. Test procedure and materials on sample wall panel and obtain Architect/Engineers approval before starting on building.

**3.04 - REPOINTING**

A. Cut out loose or disintegrated mortar in joints to a 1/2 inch depth.

B. Utilize hand tools.

C. Do not damage masonry units.

D. When cutting is complete, remove dust and loose material by brushing or with water jet.

E. Premoisten joint and apply mortar specified in Section 042113. Pack tightly in maximum 1/4 inch layers. Leave a smooth, compact concave joint.

F. Moist cure for 72 hours or as per manufacturer's recommendations.

G. As work proceeds and on completion of restoration, remove excess mortar, droppings, smears, stains, efflorescence, or other unsightly excess resulting from the work of this Section.

H. Clean surrounding surfaces.

**3.05 – MASONRY PATCHING**

A. Remove and replace any loose broken or cracked masonry units.

B. Tooth in masonry with whole masonry units to match existing.

C. Install units in line with existing masonry and prepare surface to receive finish coating to match existing wall.

D. Provide surface finish to masonry to match existing wall surface.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 RELATED DOCUMENTS

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

### 1.02 SUMMARY

A. Section Includes

1. Face brick.
2. Mortar and grout.
3. Ties and anchors.
4. Miscellaneous masonry accessories.
5. Chimney Cap
6. Metal Mesh Flue Cover Cap

### 1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For the following:

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.

C. Samples for Selection: For each type and color of the following:

1. Face brick, in the form of straps of five or more bricks.
2. Pigmented and colored-aggregate mortar. Make Samples using same sand and mortar ingredients to be used on Project.

### 1.04 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type and size of the following:

1. Masonry units.

2. Pre-blended, dry mortar mixes. Include description of type and proportions of ingredients.
3. Anchors, ties, and metal accessories.

B. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

## 1.05 QUALITY ASSURANCE

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

C. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

## 1.06 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver pre-blended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store pre-blended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

## 1.07 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides of walls and hold cover securely in place.

B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

## PART 2 - PRODUCTS

### 2.01 MASONRY UNITS, GENERAL

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

### 2.02 BRICK

A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units.

1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
3. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

B. Face Brick: Facing brick complying with ASTM C 216.

1. Products: Subject to compliance with requirements, provide the following:

    a. Standard Modular size brick to match existing. Texture, color and finish shall be selected by Architect from a manufacturer's standard brick selection. For assistance contact Rocco Maggio of CONSOLIDATED BRICK : 127 W. 24th Street, 3rd Floor, New York, NY 10011 (212-645-6700).

2. Grade: SW.
3. Type: FBS
4. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.
5. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."

## 2.03 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of Portland cement and hydrated lime containing no other ingredients.

D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in masonry mortar.

E. Colored Cement Product: Packaged blend made from Portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.

1. Products: Subject to compliance with requirements, provide the following:

a. Colored Portland Cement-Lime Mix:

1) Capital Materials Corporation; Riverton Portland Cement Lime Custom Color.
2) Holcim (US) Inc.; Rainbow Mortamix Custom Color Cement/Lime.
3) Lafarge North America Inc.; Eaglebond Portland & Lime.
4) Or Approved Equal.

2. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
3. Pigments shall not exceed 10 percent of Portland cement by weight.
4. Pigments shall not exceed 5 percent of masonry cement by weight.

F. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

## 2.04 CHIMNEY CAP

A. Pre-cast concrete cap, color to be approved by architect.

B. Reinforcement: minimum ½" mesh galvanized hardware cloth placed about midway in the concrete. Provide minimum of 2 inch drip edge with a drip slot on the underside of the chimney cap at least 1 ½" away from the chimney wall.

C. Minimum Slope: 10° away from flue liner

D. Provide Min. of 5/8" bond break between flue liner and chimney cap. Gap shall be sealed with noncombustible resilient sealant for waterproofing.

## 2.05 CHIMNEY METAL FLUE CAP

A. Materials: 24-gauge, 304 stainless steel with ¾" mesh. 16-gauge stainless steel base, attached with stainless steel bolts to chimney flue

B. Sloped stainless steel hood with roll formed edges, with a minimum 2" overhang.

## 2.06 REINFORCEMENT

A. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.

B. Masonry Joint Reinforcement for Veneers Anchored with Seismic Masonry-Veneer Anchors: Single 0.187-inch- diameter, hot-dip galvanized, carbon -steel continuous wire.

## 2.07 TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.
2. Stainless-Steel Wire: ASTM A 580/A 580M, Type 304.
3. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
4. Stainless-Steel Sheet: ASTM A 666, Type 304.

B. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches parallel to face of veneer.

C. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.187-inch diameter, hot-dip galvanized steel wire. Mill-galvanized wire may be used at interior walls unless otherwise indicated.

D. Adjustable Masonry-Veneer Anchors:

1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to metal studs, and as follows:

a. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch .

2. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie and a metal anchor section.

a. Products: Subject to compliance with requirements, provide one of the following:

1) Heckmann Building Products Inc.; 315-D.

2) Hohmann & Barnard, Inc.; DW-10HS.

3. Polymer-Coated, Steel Drill Screws for Steel Studs: ASTM C 954 except manufactured with hex washer head and neoprene or EPDM washer, No. 10 diameter by length required to penetrate steel stud flange with not less than three exposed threads, and with organic polymer coating with salt-spray resistance to red rust of more than 800 hours per ASTM B 117.

## 2.08 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

1. Fabricate through-wall metal flashing embedded in masonry from [stainless steel] [copper], with ribs at 3-inch intervals along length of flashing to provide an integral mortar bond.

B. Flexible Flashing: Use the following unless otherwise indicated:

1. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy.

a. Products: Subject to compliance with requirements, provide the following:

1) Mortar Net USA, Ltd.; Total Flash.
2) Or approved equal.

b. Monolithic Sheet: TPO Elastomeric thermoplastic flashing, 0.040 inch thick with integral stainless steel drip edge, drainage matrix, stainless steel termination bar with #14 x 2" fasteners at 6" o.c., integral weeps.

c. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.

C. Application: Unless otherwise indicated, use the following:

1. Where flashing is indicated to receive counterflashing, use metal flashing.
2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge.
4. Where flashing is fully concealed, use flexible flashing.

## 2.09 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.

B. Weep/Vent Products: Use [one of] the following unless otherwise indicated:

1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.

a. Products: Subject to compliance with requirements, provide one of the following:

1) Heckmann Building Products Inc.; No. 85 Cell Vent.
2) Hohmann & Barnard, Inc.; Quadro-Vent.
3) Wire-Bond; Cell Vent.

2. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch less than depth of outer wythe; in color selected from manufacturer's standard.

a. Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) Mortar Net USA, Ltd.; Mortar Net Weep Vents.
2) Or approved equal.

C. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dayton Superior Corporation, Dur-O-Wal Division; Polytite MortarStop.
b. Mortar Net USA, Ltd.; Mortar Net.

2. Provide one of the following:

a. Cavity Wall Drainage System: Total Flash System as manufactured by Mortar Net USA, Ltd. System is an all-inclusive flashing/drainage system with adhered cavity drainage/mortar collection material, drip edge, termination bar, weep tabs with included fasteners and adhesives. This system replaces the separate requirements for flashing, weeps, mortar collection products, drip edge and termination bar.

b. Or an approved equal system.

## 2.10 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. EaCo Chem, Inc.
   b. ProSoCo, Inc.

## 2.11 MORTAR MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar.
2. Use Portland cement-lime mortar unless otherwise indicated.
3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.

1. Pigments shall not exceed 10 percent of Portland cement by weight.
2. Pigments shall not exceed 5 percent of masonry cement by weight.
3. Mix to match Architect's sample.
4. Application: Use pigmented mortar for exposed mortar joints with the following units:

a. Face brick.

D. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.

1. Application: Use colored aggregate mortar for exposed mortar joints with the following units:

a. Face brick.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION, GENERAL

A. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.

B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

C. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

1. Mix units from several pallets or cubes as they are placed.

D. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

## 3.03 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch or minus 1/4 inch.
2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet , or 1/2 inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet , 1/4 inch in 20 feet, or 1/2 inch maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet , or 1/2 inch maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet or 1/2 inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch , with a maximum thickness limited to 1/2 inch ; do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
2. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.

3. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

## 3.04 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in bond pattern indicated on Drawings; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

## 3.05 MORTAR BEDDING AND JOINTING

A. Lay hollow brick as follows:

1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
2. With entire units, including areas under cells, fully bedded in mortar at starting course on footings.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

## 3.06 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

A. Anchor masonry to structural steel and concrete where masonry abuts or faces structural steel or concrete to comply with the following:

1. Provide an open space not less than 1/2 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally.

## 3.07 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to wall framing with masonry-veneer anchors to comply with the following requirements:

1. Fasten anchors with metal fasteners of type indicate as specified by manufacturers. Use two fasteners unless anchor design only uses one fastener.
2. Embed tie sections in masonry joints. Provide not less than 2 inches of air space between back of masonry veneer and face of sheathing.
3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally, with not less than 1 anchor for each 1.77 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches , around perimeter.

## 3.08 EXPANSION JOINTS

A. General: Install expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span expansion joints without provision to allow for in-plane wall or partition movement.

B. Form expansion joints in brick as follows:

1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
2. Build flanges of factory-fabricated, expansion-joint units into masonry.
3. Build in compressible joint fillers where indicated.
4. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Section 079200 "Joint Sealants."

C. Provide horizontal, pressure-relieving joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 079200 "Joint Sealants," but not less than 3/8 inch .

1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

## 3.09 LINTELS

A. Install galvanized steel lintels where indicated on drawings.

B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

## 3.10 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.

B. Install flashing as follows unless otherwise indicated:

1. For Total Flash System at base of wall: Install as directed by manufacturer.
2. At lintels, extend flashing a minimum of 8 inches into masonry at each end. At heads and sills, extend flashing 8 inches at ends and turn up not less than 2 inches to form end dams.

C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

D. Install vents in head joints in exterior wythes at spacing indicated. Use specified weep/vent products to form vents.

## 3.11 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.

B. Inspections: Level 1 special inspections according to the "International Building Code."

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.

## 3.12 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.

5. Clean brick by bucket-and-brush hand-cleaning method described in "BIA Technical Notes 20."
6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

## 3.13 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property.

B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.

1. Crush masonry waste to less than 4 inches in each dimension.
2. Do not dispose of masonry waste as fill within 18 inches of finished grade.

C. Excess Masonry waste as described above, and other masonry waste, and legally dispose of off Owner's property.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Provide Concrete Unit Masonry and all associated Concrete Unit Masonry accessories and components in accordance with the Contract Documents and as required to provide a complete and first class installation. The work of this section shall include, but not be limited to the following:

1. Concrete Block.
2. Mortar.
3. Anchors and Reinforcement.
4. Control Joints.

B. Installation of all items to be set into masonry walls including but not limited to: Steel Lintels, Metal Door Frames in Masonry and items furnished by other sections.

C. Cleaning of Masonry.

### 1.02 - RELATED SECTIONS

A. Section 033000 – Cast-In-Place Concrete.

B. Section 055000 – Metal Fabrications.

C. Section 061000 – Rough Carpentry.

D. Section 079200 – Caulking and Sealants.

E. Section 081113 - Hollow Metal Doors and Door Frames.

F. Section 099100 – Painting.

### 1.03 - SUBMITTALS

A. Submit under provisions of the Division 1.

B. Submit samples in duplicate of masonry ties, and reinforcing for Architect/Engineer’s approval.

C. Submit concrete block certifications from block manufacturer indicating that concrete masonry units meet or exceed project specifications.

D. Shop drawing: Layout of control joint placement.

**1.04 - DELIVERY AND STORAGE**

A. Materials shall be delivered and stored so as to avoid damage from breakage, moisture, staining or damage of any kind.

B. Protect materials and work from damage. Keep masonry units dry.

C. Cover work at end of each day's work with non-staining waterproof material so as to prevent entrance of excess water at top of wall.

**1.05 - APPLICABLE STANDARDS**

A. Conform to ACI/ASCE 5301-89.

**1.06 - PROJECT CONDITIONS**

A. No masonry work shall be installed in an atmosphere with temperature less than 40°F, unless work is protected in a manner previously approved by the Architect/Engineer.

B. For cold weather masonry construction, submit to Architect/Engineer for review and approval, a cold weather masonry construction plan, identifying all measures contractor shall take for cold weather masonry construction.

C. Hot Weather Construction - Protect masonry construction from direct exposure to wind and sun when erected in an ambient air temperature of 99°F or more in shade with relative humidity less than 50%.

**PART 2 - PRODUCTS**

**2.01 – MANUFACTURER**

A. Smithtown Concrete Products Corp., Smithtown, NY

B. Northeast Architectural Products, Ashley, PA.

C. Or approved equal.

**2.02 - CONCRETE MASONRY UNITS**

A. Provide Concrete Masonry Units of type as indicated on contract drawings. Unit color shall be as

selected by Engineer, from manufacturer's entire product line.

B. Units used for load bearing and non load bearing walls, shall be hollow load bearing masonry units meeting requirements of ASTM C90, Type I, Grade, N. Provide units meeting fire resistance rating in rated walls assemblies.

C. Special shaped units, U-blocks, pilaster blocks, etc., shall meet same specifications as adjacent units.

1. Interior Concrete Jamb Blocks: Blocks shall be formed with 5/8" radius on all exposed corners.

2. Provide supplier-finished corner blocks at all exterior building corners. Field-split corners will not be accepted.

**2.03 - MORTAR**

A. Mortar and grout materials and mix proportions shall meet applicable requirements of ASTM C270-866, Type S made with lime. Color shall be close to that of masonry units involved and shall be approved by the Architect.

**2.04 - REINFORCING**

A. Wall Reinforcing

1. Horizontal reinforcing for concrete masonry units shall be mill galvanized, ladder type with 9 gauge parallel wires in each face and 9 gauge cross members a maximum of 16" o.c., butt welded to side rods. Provide prefabricated corners and tees. Reinforcement shall be completely embedded in mortar or grout.

2. Vertical reinforcing bars shall meet ASTM A615 Grade 60.

B. Reinforcing bars for lintels and bond beams shall meet ASTM A615, Grade 60.

C. Control Joints – Provide as hereafter called for:

1. Joint filler shall be preformed neoprene or polyvinyl chloride.

2. Vertical control joint placement in non-reinforced masonry:

a. At major changes in wall height.

b. At changes in wall thickness.

c. At control joints in foundations, in roof, and in floors.

d. At chases and recesses for piping, columns, fixtures, etc.

e. At one or both sides of wall openings.

f. Near wall intersections.

g. Near return angles in L, T, and U-shaped structures.

3. Maximum spacing of control joints should in no case exceed 30'-0".

**PART 3 - EXECUTION**

**3.01 - PREPARATION**

A. Lay out work to avoid use of less than 8"x8" faced units at jambs in exposed work.

**3.02 GENERAL**

A. Mortar shall be thoroughly mixed and kept moist but shall not be retempered for use after initial set.

B. Lay only dry masonry units.

C. Install units with radius edge at all exposed jamb corners and at end of exposed walls.

D. Use masonry saw for cutting exposed surfaces. Cut units to provide a uniform 1/8" clearance around electrical boxes and similar items.

E. Do not use chipped, cracked or broken units.

F. Set units plumb, true to line, and level.

G. Adjust units to final position while mortar is soft and plastic. If unit is displaced after mortar has stiffened, remove unit, clean joints and unit of mortar and reset with fresh mortar.

H. When joining fresh work to set or partially set masonry clean exposed surface and remove loose mortar before laying fresh masonry.

I. When necessary to stop a horizontal, run back one-half block length in each course, do not tooth.

J. Unless indicated otherwise partitions shall extend from floor to bottom of floor or roof construction

above.

K. Where partitions run perpendicular to deck, fill voids at deck with grout, or approved fire safing insulation.

L. Construct concrete unit masonry exterior walls prior to masonry veneer construction. Do not construct concrete unit masonry and veneer masonry in the same construction sequence.

M. Cover work at end of each day's work with non-staining waterproof material so as to prevent entrance of excess water at top of wall.

**3.03 - BOND**

A. Lay units in running bond with vertical joints centered on unit in course below unless indicated otherwise on drawings.

**3.04 - MORTAR BEDS**

A. Lay hollow units with full mortar coverage on horizontal and vertical face shells. Provide full mortar coverage on horizontal and vertical face shells and webs where adjacent to cells or cavities to be filled with grout and on starting courses.

B. Lay block with full horizontal and vertical joints.

**3.05 - REINFORCEMENT**

A. Wire Reinforcement

1. Place wire reinforcements as follows:

   a. 8" and 12" concrete block walls - continuous horizontal reinforcement 16" o.c. vertically, unless noted otherwise.

   b. Concrete block walls on exterior - continuous horizontal reinforcement 16" o.c. vertically.

2. Wire reinforcement shall be completely embedded in mortar or grout. Joints with wire reinforcement shall be at least twice the thickness of the wire.

3. Wire reinforcement shall be lapped at least 8" at splices and shall contain at least one cross wire of each piece of reinforcement in the lapped distance.

B. Steel Reinforcement Bar

1. Steel reinforcement bars, unless otherwise detailed on plans, shall be placed as follows:

   a. 8” CMU: Install #5 bar, vertically at all corners and at door and window jambs and 48” o.c. typical.

   b. 12” CMU: Install #5 bar, vertically at all corners and at door and window jambs and 32” o.c. typical.

   c. Fill all concrete masonry unit cells containing reinforcement bars solid with mortar.

   d. Reinforcement bars shall be lapped at splices as follows:

| Bar Size | Min. Lap Distance |
|---|---|
| #4 | 24 inches |
| #5 | 30 inches |
| #6 | 36 inches |
| #7 | 42 inches |

   e. Reinforcement bars shall be field welded to steel beams where masonry walls are supported by structural frame.

**3.06 - JOINTS**

A. Nominal thickness shall be 3/8" and uniform.

B. Shove or rod all vertical joints tight.

C. Tool joints slightly concave in surfaces to be exposed or painted.

**3.07 - BUILT-UP WORK**

A. Cooperate with other trades in building in items in masonry work.

B. Grout solid around built-in items.

**3.08 - LINTELS AND BOND BEAMS**

A. Steel lintels shall extend into side walls at jambs, minimum 8" bearing on each side.

B. Install rebars and grout solid lintel blocks and bond beams as indicated. Provide temporary

shoring for openings wider than 36”.

C. Lintel blocks shall extend into side walls at jambs, minimum of 8" bearing on each side.

**3.09 - POINTING AND CLEANING**

A. Dry brush masonry surfaces after mortar has set, at end of each day's work and after final points.

B. Cut out and repoint defective joints.

C. At final completion of masonry work fill holes in joints and tool to match adjacent work.

D. Leave work and surrounding surfaces clean and free of mortar spots and droppings.

E. Clean masonry with approved masonry cleaner.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Structural steel framing members, support members.

B. Base plates.

C. Grouting under base plates.

### 1.02 - RELATED SECTIONS

A. Section 055000 - Metal Fabrications

B. Section 066000 – Plastic Fabrications

C. Section 099100 – Painting

### 1.03 - REFERENCES

A. AISC - Code of Standard Practice for Steel Buildings and Bridges.

B. AISC - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

C. AISC - Specification for Structural Joints Using ASTM A325 or A490 Bolts.

D. AISC - Specification for Architectural Exposed Structural Steel.

E. ASTM A36 - Structural Steel.

F. ASTM A53 - Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.

G. ASTM A108 - Steel Bars, Carbon, Cold-Finished, Standard Quality.

H. ASTM A123 - Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products.

I. ASTM A153 - Zinc Coating (Hot Dip) on Iron and Steel Hardware.

J. ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners.

K. ASTM A325 - High Strength Bolts for Structural Steel Joints.

L. ASTM A490 - Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints.

M. ASTM A500 - Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.

N. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

O. ASTM A992 – Standard Specifications for Structural Steel Shapes.

P. ASTM F1554 – Standard Specifications for Anchor Bolts.

Q. AWS A2.0 - Standard Welding Symbols.

R. AWS D1.1 - Structural Welding Code.

S. New York State Building Code

T. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.

U. SSPC PA-1 - Shop, Field and Maintenance Painting.

V. SSPC SP-2 - Hand Tool Cleaning.

W. SSPC SP-3 - Power Tool Cleaning.

**1.04 - SUBMITTALS**

A. Submit under provisions of Section 013300.

B. Product Data: Provide data on structural steel, structural steel paint and high strength bolts, including washers and nuts.

C. Shop Drawings: Indicate profiles, sizes, spacing and locations of structural members, openings, attachments, fasteners, connections, cambers and loads. Provide erection and fabrication drawings. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld lengths. Shop drawings shall bear the seal and signature of a registered professional engineer licensed in the State of New York. Structural Steel Shop Drawings will not be reviewed without said seal and signature. A full set of Engineering Calculations for all beam-to-column moment connections shall be submitted to the engineer of record for approval. The steel fabricator's shop drawings shall not be reviewed without said Engineering Calculations affixed with a seal and signature of licensed New York State Professional Engineer.

D. Mill Test Reports: Indicate structural strength, destructive and non-destructive test analysis.

E. Welders' Certificates: Submit certificates certifying that welders employed on the work have met AWS qualifications within the previous 12 months.

F. Manufacturer's Certificates: Certify that products meet or exceed specified requirements.

**1.05 - QUALITY ASSURANCE**

A. Fabricate structural steel members in accordance with AISC - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

B. Perform work in accordance with AISC - Specification for Architectural Exposed Structural Steel; AISC - Specification for Structural Joints Using ASTM A325 or A490 Bolts; and AISC - Code of Standard Practice for Steel Buildings and Bridges.

C. Maintain one copy of each document on site.

**1.06 - QUALIFICATIONS**

A. Fabricator: Company specializing in performing the work of this section with minimum 5 years documented experience.

B. Erector: Company specializing in performing the work of this section with minimum 3 years documented experience.

C. Design connections not detailed on the 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. The shop drawings shall bear the seal and signature of said professional structural engineer.

**1.07 - DELIVERY, STORAGE AND HANDLING**

A. Deliver, store and handle products to the site under provisions of Section 016500.

B. Schedule deliveries of materials to the site at intervals which will ensure uninterrupted progress of the work.

C. Do not store or handle materials in a manner which will damage or distort materials or supporting structures.

D. Do not store materials directly on the ground.

E. Store materials in a manner which will permit easy access for inspection and identification.

### 1.08 - FIELD MEASUREMENTS

A. Verify that field measurements are as shown on the plans and approved shop drawings.

B. The Contractor is responsible for the proper location and elevations of all work.

### 1.09 - COORDINATION

A. Coordinate the work under provisions of Section 013100 – Project Management and Coordination.

B. Coordinate the work of this section with utilities installation and all other adjacent work.

C. Coordinate the placement of anchor bolts with the placement of concrete.

D. Coordinate the work such that the general progress of the work is not interrupted.

## PART 2 - PRODUCTS

### 2.01 - MATERIALS

A. Structural Steel Members: ASTM A992.

B. Misc. Steel (angles, channels) and Plates: ASTM A36.

C. Structural Tubing: ASTM A500, Grade B seamless.

D. Shear Stud Connectors: ASTM A108, Grade 1015, forged steel, headed, uncoated.

E. Pipe: ASTM A53, Grade B.

F. Bolts, Nuts, and Washers: ASTM A325 galvanized to ASTM A153 for galvanized members; threads excluded from the shear plane; beveled washers for connection to member with flange slope greater than 1:20. Provide hexagonal heads and nuts and hardened washers for all connections.

G. Anchor Bolts:

1. ASTM F1554, 36 ksi Yield Strength, where indicated on drawings.

2. Stainless Steel Type 304, where exposed to elements, as indicated on drawings.

3. Stainless Steel Expansion Anchor, Hilti Kwik Bolt TZ or approved equal. Applicable only where indicated on contract drawings.

H. Welding Materials: AWS D1.1; type required for materials being welded.

I. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi (48 MPa) at 28 days.

**2.02 - FABRICATION**

A. Fabricate items of structural steel in accordance with AISC specifications and approved shop drawings.

B. All wide flange structural steel members shall be fabricated in accordance with ASTM A992. All miscellaneous steel members including channels, angles, S, HP, and M shapes shall be fabricated in accordance with ASTM A36.

C. Continuously seal joined members by intermittent welds and plastic filler. Grind exposed welds smooth.

D. All shop connections shall be welded or high strength bolted.

E. Bearing surfaces shall be planed true to give full bearing over entire surface.

F. All beams and girders shall be fabricated with a natural camber upward.

G. All holes required for connections and attachments of other work to the structural steel shall be shop fabricated.

H. Splicing is not permitted unless indicated on the plans or accepted on the final shop drawings.

**2.03 - SOURCE QUALITY CONTROL**

A. Testing and analysis of components will be performed under provisions of Section 014500.

B. Inspection and tests will not relieve the Contractor of responsibility for providing materials and fabrication and erection procedures in compliance with specified requirements. The Contractor is to verify that all materials meet or exceed the requirements specified in these specifications.

C. Materials not in compliance with specified requirements will be rejected.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Verify existing conditions under provisions of Section 013100.

B. Verify that field conditions are acceptable and are ready to receive work of this section.

C. Beginning of installation means erector accepts existing conditions.

### 3.02 - PREPARATION

A. Clean bearing surfaces and other surfaces which will be in permanent contact.

### 3.03 - ERECTION

A. Allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb and in true alignment until completion of erection and installation of permanent bracing.

B. Coordinate placement of anchors in concrete or masonry construction for securing bearing plates.

C. Erect all components in accordance with approved shop drawings.

D. Field weld components and shear studs as indicated on approved shop drawings and in accordance with AWS D1.1.

E. Do not field cut or alter structural members without written approval of Engineer.

F. After erection, prime welds, abrasions and surfaces not shop primed or galvanized, as required, except surfaces to be in contact with concrete.

G. Grout under base plates to produce a full and even bearing.

### 3.04 - TOLERANCES

A. All members shall be installed within AISC tolerances and the following:

1. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

2. Maximum Offset From True Alignment: 1/4 inch (6 mm).

### 3.05 - FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of Section 014500.

**3.06 - ADJUSTING**

A. All misfits due to errors in locations or fabrication or inaccuracies in the setting of anchor bolts or other items of attachment or support shall be immediately reported to the Engineer and corrected in a manner subject to approval by the Engineer.

B. Submit method of correction to the Engineer under provisions of Section 014500.

C. Proceed with corrective work only after receiving written approval from the Engineer.

D. All corrections shall be made at no additional cost to the Owner.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Steel roof deck and accessories.

B. Formed steel cant strips.

C. Framing for openings up to and including 18 inches (460 mm).

D. Bearing plates and angles.

### 1.02 - RELATED SECTIONS

A. Section 051200 – Structural Steel: Structural framed openings larger than 18 inches (460 mm).

### 1.03 - METHOD OF PAYMENT

A. Basis of Payment: Includes steel deck, steel bearing plates and angles, accessories and installation.

### 1.04 - REFERENCES

A. AISI - Specification for the Design of Cold-Formed Steel Structural Members.

B. ASTM A36 - Structural Steel.

C. ASTM A653/A653M-03 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated by the Hot-Dip Process.

D. ASTM A924/A924M-99 - Steel Sheet, Metallic-Coated by the Hot-Dip Process.

E. ASTM A568/A568M-03 - Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.

F. AWS A2.0 - Standard Welding Symbols.

G. AWS D1.1 - Structural Welding Code.

H. SDI - Design Manual for Composite Decks, Form Decks, Roof Decks.

**1.05 - PERFORMANCE REQUIREMENTS**

A. Design metal decking in accordance with SDI Design Manual for Composite Decks, Form Decks, Roof Decks.

B. The section properties of the steel roof deck shall be computed in accordance with the American Iron and Steel Institute Specification for the Design of Cold Formed Steel Structural Members.

C. Lateral deflection of diaphragm shall not exceed 1/500 of the story height.

**1.06 - SUBMITTALS**

A. Submit under provisions of Section 013300.

B. Product Data: Provide deck profile characteristics and dimensions, structural properties and finishes.

C. Shop Drawings: Indicate decking plan, support locations, projections, openings and reinforcement, pertinent details, and accessories. Indicate temporary shoring of decking where required. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

D. Manufacturer's Instructions: Indicate specific installation sequence and special instructions required for proper installation.

**1.07 - QUALIFICATIONS**

A. Installer: Company specializing in performing the work of this section with minimum 3 years documented experience.

B. Design deck layout, spans, fastening and joints 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.

**1.08 - DELIVERY, STORAGE AND HANDLING**

A. Deliver, store, protect and handle products to the site under provisions of Section 016500.

B. Schedule deliveries of materials to the site at intervals which will ensure uninterrupted progress of the work.

C. Cut plastic wrap to encourage ventilation.

D. Separate sheets and store decking on dry wood sleepers; slope for positive drainage.

E. Do not handle products in a manner which will distort or damage materials.

F. Do not store deck directly on the ground.

G. Store materials in a manner which will permit easy access for inspection and identification.

**1.09 - FIELD MEASUREMENTS**

A. Verify that field measurements are as shown on the plans and approved shop drawings and as required by the manufacturer.

B. The Contractor is responsible for the proper location and elevation of all work.

**1.10 - COORDINATION**

A. Coordinate the work under provisions of Section 013100.

B. Coordinate the work of this section with utilities installation and all other adjacent work.

C. Coordinate the work such that the general progress of the work is not interrupted.

**PART 2 - PRODUCTS**

**2.01 - MANUFACTURERS**

A. Vulcraft Nucor, TYPE 1.5B.

B. Substitutions shall be permitted only after receiving written approval from the Engineer.

**2.02 - MATERIALS**

A. Sheet Steel: ASTM A446, Grade A Structural Quality; with G60 galvanized coating conforming to ASTM A525.

**2.03 - ACCESSORIES**

A. Bearing Plates and Angles: ASTM A36 steel, unfinished.

B. Welding Materials: AWS D1.1.

C. Primer: Flexible, rust inhibitive.

D. Touch-Up Primer: Red oxide type.

E. Flute Closures: Closed cell foam rubber, one inch (25 mm) thick; profiled to fit tight to the decking.

**2.04 - FABRICATION**

A. Metal Decking: Sheet steel, configured as follows:

1. Span Design: Single

2. Minimum Metal Thickness (Excluding Finish): 20 gage

3. Nominal Height: 1-1/2 (38 mm), fluted profile.

4. Side Joints: Flat Side Lapped

5. Flute Sides: Plain vertical face

B. Metal Closure Strips, Wet Concrete Stops, Cover Plates, Cant Strips and Related Accessories: Same gage sheet steel as deck; of profile and size required.

C. Fabricate roof sump pan of 14 gage (1.9 mm) thick sheet steel, flat bottom, sloped sides, recessed 1-1/2 inches (38 mm) below roof deck surface, bearing flange 3 inches (75 mm) wide, sealed watertight.

D. Weld Washers: Mild steel, uncoated, 3/4 inch (19 mm) outside diameter, 1/8 inch (3 mm) thick.

**2.05 - SOURCE QUALITY CONTROL**

A. Testing and analysis of components will be performed under provisions of Section 014500.

B. Inspection and tests will not relieve the Contractor of responsibility for providing materials and fabrication and erection procedures in compliance with specified requirements. The Contractor is to verify that all materials meet or exceed the requirements specified in these specifications.

C. Materials not in compliance with the specified requirements will be rejected.

**PART 3 - EXECUTION**

**3.01 - EXAMINATION**

A. Verify existing conditions and substrate under provisions of Division 1 specifications.

B. Verify that field conditions are acceptable and are ready to receive work.

C. Beginning of installation means installer accepts existing conditions.

**3.02 - PREPARATION**

A. Clean all bearing surfaces of debris and foreign matter.

B. Verify bearing surface is smooth and flat.

C. Provide decking free of amounts of lubricants or oils which would impair the adhesion of spray on fireproofing or painting.

**3.03 - INSTALLATION**

A. Erect metal decking in accordance with SDI Design Manual for Composite Decks, Form Decks, Roof Decks, manufacturer's instructions and approved shop drawings.

B. Bear decking steel supports with 1-1/2 inch (38 mm) minimum bearing. Align and level.

C. Fasten deck to steel support members at ends and intermediate supports with fusion welds at 12 inches (300 mm) on center maximum, parallel with the deck flute and at each transverse flute. Weld washers are to be used only with decks 24 gage (0.7 mm) or thinner.

D. Field weld components as indicated on approved shop drawings in accordance with AWS D1.1.

E. Mechanically fasten male/female side laps at 24 inches (610 mm) on center maximum for decking thinner than 20 gage (0.9 mm). Weld male/female side laps at 18 inches (460 mm) on center maximum for decks 20 gage (0.9 mm) and heavier.

F. Reinforce steel deck openings from 6 to 18 inches (150 to 460 mm) in size with 2 inch x 2 inch x 1/4 inch (50 mm x 50 mm x 6 mm) steel angles. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.

G. Install 6 inch (150 mm) minimum wide sheet steel cover plates, of same thickness as decking, where deck changes direction. Fusion weld 12 inches (300 mm) on center maximum.

H. Install sheet steel closures and angle flashings to close openings between deck and walls, columns and openings.

I. Install single row of foam flute closures above walls and partitions perpendicular to deck flutes.

J. Position roof sump pans with flange bearing on top surface of deck. Fusion weld at each deck flute.

K. Place metal cant strips in position and fusion weld.

L. Immediately after welding deck and other metal components in position, coat welds, burned areas and damaged surface coating with touch-up prime paint.

**3.04 - FIELD QUALITY CONTROL**

A. Field inspection will be performed under provisions of Section 014500.

**3.05 - PROTECTION**

A. Protect finished work under provisions of Section 016500.

B. Protect decking from damage until project is accepted by the Owner.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Loose lintels, shelf angles, anchor bolts, sleeves, bearing plates, inserts and other incidental items of structural and/or miscellaneous steel as and where shown on the drawings and/or as required to be built into concrete, masonry or other construction shall be provided as indicated or specified. Where applicable, include instructions or templates for installation within masonry and/or concrete construction.

B. All miscellaneous steel members supporting penetrations of roof, floor or wall openings larger than 18" square, whether or not the same, are shown on the drawings.

C. All connections, erection fittings and devices required to complete this work.

D. All miscellaneous steel angles, beams, rods and/or braces to be furnished and/or installed for support or bracing of door frames and/or any other built in items and members as and where shown on the drawings.

E. All steel closure members including sleeves, brackets, braces and anchorage devices as specified herein and required for support.

F. Shop painting and field touch-up painting.

G. Steel Pipe Bollards.

### 1.02 - RELATED WORK

A. Section 033000 – Cast-in-Place Concrete

B. Section 042200 – Concrete Unit Masonry

C. Section 099000 – Painting

### 1.03 - DESIGN REQUIREMENTS

A. ANSI - American National Standards Institute.

B. OSHA - Occupational Safety & Health Act.

C. ASTM – American Society for Testing of Materials.

D. ADAAG – Americans with Disabilities Act Guidelines.

E. New York State Building Code.

**1.04 - SUBMITTALS**

A. Submit complete shop and erection drawings for specially fabricated items.

B. Submit complete descriptive data for all stock items.

C. Submit test reports confirming that materials furnished meet those specified.

D. Submit samples of welds, bends and finishes for all exposed and finished items.

**PART 2 - PRODUCTS**

**2.01 - MATERIALS**

A. Steel plates, angles, and other structural shapes shall conform to ASTM A36.

B. Bolts and nuts shall conform to ASTM A325 (Carbon Steel Components).

C. Steel pipe shall conform to ASTM A501.

D. Steel tubing shall conform to ASTM A500.

E. Structure Sections and Plates: Aluminum 6061-T6 Alloy, tempered.

F. Bolts, Nuts and Washers: Stainless steel, Type 304 (Aluminum Components).

G. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; consistent with design of stair structure.

H. Welding Materials: AWS D1.2; type required for materials being welded.

I. Welds, Welding Metal: To Match Component Being Welded.

J. Electrodes shall be suitable for the material, positions and other conditions of use as recommended by AWS or the manufacturer.

K. Welds, Welding Metal:

1. Welding electrodes for manual shielded metal-arc welding shall conform to ASTM A233, E 60 or E 70 Series. Bare electrodes and granular flux used in the submerged-arc process shall conform to Section 1.17.3 or AISC Specifications for Structural Steel for Buildings, June 1, 1989.

2. Electrodes shall be suitable for the positions and other conditions of use as recommended by AWS or the manufacturer.

**2.02 - FABRICATION**

A. Fabricate steel items according to approved shop drawings and to applicable portions of AISC Specifications. Conceal welds where possible; grind exposed welds smooth and flush.

**2.03 - SHOP PAINTING AND PROTECTIVE COATING**

A. Conform to Steel Structures Painting Council Specification 15-68T, Type 1, including preparation for painting.

B. Hot-Dip galvanizing and zinc coatings applied on products fabricated from rolled, pressed, and forged steel shapes, plates, bars and strips shall comply with ASTM Specification A386-61T. The weight of coatings shall be as designed in Table I for the class and thickness of material to be coated. Galvanized surfaces for which a shop coat of paint is specified shall be chemically treated to provide a bond for the paint. Except for bolts and nuts, all galvanizing shall be done after fabrication. **All exterior steel lintels to receive hot-dip galvanizing process. Field touch-up galvanizing as required.**

**PART 3 - EXECUTION**

**3.01 - ERECTION**

A. Conform to AISC Specifications, Contract Documents and approved shop drawings.

B. Set items straight, level, plumb and aligned with adjacent construction.

**3.02 - INSTALLATION**

A. Install all items per manufacturers' instructions, ADA, OSHA and ANSI regulations, or per approved shop drawings.

B. Prior to finishing, grind all welds smooth. Prime all welds.

C. Furnish all flanges, brackets and fittings shown or required, including anchorage embedded devices.

D. Apply primer and paint finish to all non-finished steel items included in this section.

**3.03 – ACCESSORIES**

A. Install wheel guards per manufacturer's instructions.

B. Set in concrete and plumb walls. Secure with tamper resistant fasteners.

C. Fill bell with grout; seal grout hole watertight.

**3.04 - ERECTION TOLERANCES**

A. Maximum Variation from Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset from True Alignment and Elevation: 1/4 inch.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. All labor, materials, equipment and services necessary to furnish and install interior aluminum handrails and guardrails, posts, toe plates, balusters, anchors, and fittings as detailed on the Construction Drawings.

B. Individual removable exterior railing sections shall be provided where shown of the drawings.

C. Furnish and install all adhesive anchors.

### 1.02 - RELATED WORK

A. Section 033000 – Concrete

B. Section 055000 – Metal Fabrications

### 1.03 - REFERENCES

A. ASTM B221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.

B. ASTM B241 - Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.

C. ASTM B483 - Aluminum and Aluminum-Alloy Drawn Tubes for General Purpose Applications.

D. ASTM E935 - Test Methods for Performance of Permanent Metal Handrailing Systems and Rails for Buildings.

E. ASTM E985 - Permanent Metal Handrailing Systems and Rails for Buildings.

F. ASTM F593 – Specification for Stainless Steel Bolts, Hex Cap Screws and Studs.

G. ASTM F594 – Specification for Stainless Steel Nuts.

### 1.04 - SUBMITTALS

A. Field measure for the railings after stairs, platforms and all abutting work are in place, including those items installed under other prime construction contracts. The shop drawings submitted by the manufacturer shall demonstrate field verification of the stairs, platforms, and other components as installed.

B. Shop Drawings shall include the following items:

1. Profiles, sizes, connection attachments, and accessories for railings.
2. Catalog cuts of all railings components.
3. Detail of toe plate anchorage.
4. Catalog cuts for anchorage hardware. Indicate size and type of anchorage hardware.
5. Samples of all components, bases, toe plate, mounting brackets and pipe.
6. Storage, handling and installation instructions.
7. Shop drawings shall bear the seal and signature of a registered professional engineer licensed in the State of New York.

C. Shop Drawings shall clearly indicate removable sections and interchangeable sections of the railings.

D. Warranty Certificate prepared in accordance with the requirements contained herein.

E. Certifications:

1. Manufacturer shall provide written documentation certifying that they have ten years experience in the design, manufacture, and installation of the railing system being installed under this contract.
2. Installation Contractor shall provide written documentation certifying that each has five (5) years experience in the installation of the railing systems being installed under this Contract.

**1.05 - QUALITY ASSURANCE**

A. A single manufacturer shall furnish all railing system components. This requires the supplier to be responsible for the development, design, delivery and assembly of the railing system.

B. The railing system shall not be fabricated by the contractor.

C. All railings, posts, balusters, mounting brackets, and fittings shall resist a singular concentrated lateral force of two hundred fifty (250) lbs. in any direction at any point along the top without loosening, damage or misalignment.

D. All railings, posts, balusters, mounting brackets, and fittings shall resist lateral force of fifty (50) lbs per linear foot at any point along the top rail, in any direction without damage or misalignment.

E. Intermediate rails, posts, balusters, filler panels, etc. shall resist a horizontal force of fifty (50) lbs. on an area not to exceed one (1) square foot including openings and space between rails.

F. All railings, posts, balusters, mounting brackets, and fittings shall conform to the requirements in ASTM E985.

G. Toe plates shall conform to OSHA standards.

**1.06 - DELIVERY, STORAGE AND HANDLING**

A. Comply with the requirements of Section 016500 - Product Delivery, Storage and Handling.

B. The manufacturer shall coordinate the loading of the railing with the Contractor such that the railing to be installed first is located at the bottom of the shipment.

C. All railing shall be shipped with plastic sleeves that shall be removed by the Contractor after the installation is completed.

D. All hand railing components shall be blocked off above grade or walking surface, and shall remain covered until such time as the installation begins.

**1.07 – WARRANTY**

A. The supplier shall provide a Warranty Certificate typed on company letterhead and signed by an authorize officer of the supplier. A notary public in the state which the company headquarters is located shall witness the signature. The Warranty Certificate shall be for all components of the railing system. The Certificate must warrant that the railing system installation shall be free from defects in design, materials, and workmanship for a period of one (1) year commencing on the date of issuance of the Certificate of Substantial Completion for the project.

**PART 2 - PRODUCTS**

**2.01 - MANUFACTURERS**

A. The railing system components shall be manufactured by Julius Blum & Company, Inc., or approved equal.

**2.02 - MATERIALS**

A. Post spacing for railings shall be a maximum of six (6) feet on center, or as detailed on the Construction Drawings.

B. Dimensions and sizes for the railing system shall be as shown on the drawings.

C. Posts and railings for the guard rail shall be 1.9 inch outside diameter. Railings for the handrail shall be 1.9 inch outside diameter. Schedule 40 aluminum pipe alloy 6063-832, ASTM B241, ASTM B221 or ASTM B429.

D. Toe plates shall be installed at all interior locations and they shall be shipped loose in stock lengths with pre-manufactured corners for field installation.

E. Toe plates shall be a minimum four (4) inches high and shall be an extrusion that attaches to the posts with clamps that allow for expansion and contraction between the posts.

F. Posts shall not interrupt the continuation of the top rail at any point along the railing, including corners and end terminations. The top surface of the top railing shall be smooth and shall not be interrupted by projected fittings.

G. Railings shall be installed using stainless steel bolts, size as required by the manufacturer. All bolts shall be stainless steel type in conformance with ASTM F593 and F594 and shall be furnished by the Contractor.

H. Openings in the railing shall be guarded by ¼ inch minimum type 304 stainless steel safety chain with stainless steel hardware for easy removal.

I. Finish shall be Aluminum Association M10-C22-A41 (215-R1).

J. Aluminum surfaces in contact with concrete, grout, or dissimilar metals shall be protected with a coat of bituminous paint, Mylar isolators, or other approved materials. The coating shall be factory applied.

K. Toeboards:

a. Manufacturers:

i. R&B Wagner, Inc.
ii. Thompson Fabricating, LLC.
iii. Or approved equal

a. Toeboards shall project 4-inches above the walking surface and shall not infringe on the minimum required walkway width.

b. Aluminum toeboards shall be extruded from aluminum alloy 6063-T6 unless otherwise noted.

c. Toeboards shall have a minimum thickness of 1/8" at any point. Geometry of toeboard shall closely resemble geometry shown on Drawings.

L. Expansion joint splices shall be provided at 30 feet maximum spacing and at all expansion joints in the structure supporting the railing.

M. The railing system shall be designed to resist the design loads specified by both OSHA and the New York State Building Code.

N. Provide handrail extensions at top and bottom of stairs and ramps in accordance with the New York State Building Code.

O. Railing shall be Two Rail handrail systems as shown on the Drawings.

a. Two-rail system. The centerline of the intermediate rail shall be 21 inches above the walking surface.

P. Safety Chains:

a. Manufacturers:

i. Nystrom
ii. Or approved equal

b. Provide standard duty/pedestrian stainless steel, 3/16” loop chain, attached with, but not limited to, aluminum spring clips to lifting eye nut attached to aluminum railing at the locations shown on the contract drawings.

c. OSHA 29 CFR1910.23 compliance

**2.03 - FABRICATION**

A. Fit and shop assemble components in largest practical sizes for delivery to the site.

B. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation

C. Provide anchors and mounting brackets required for connecting railings to the surrounding construction.

D. Install aluminum shims to compensate for unevenness in surfaces. Railing shall be straight and true.

E. Exposed mechanical fasteners shall be flush countersunk; unobtrusively located; consistent with design of railings, except where specifically noted otherwise.

F. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.

G. Grind exposed joints flush and smooth with adjacent finish surface. Exposed joints shall be butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

H. Accurately form components to each other and to surrounding construction.

I. Accommodate for expansion and contraction of members and structures without damage to connections or members.

J. Provide components capable of permitting removable railing sections, where indicated on the contract drawings.

## PART 3 - EXECUTION

### 3.01 - GENERAL

A. Verify that field conditions are acceptable and are ready to receive work.

### 3.02 - INSTALLATION

A. Posts shall be installed plumb and rails shall be installed level. All components shall be accurately fitted, free from distortion and defects.

B. Clean and strip aluminum where site welding is required. Welds shall be ground smooth and be the same diameter as the rail.

C. Supply items required to be embedded in concrete or placed in partitions with setting templates, for each appropriate section.

D. Anchor railings with mounting brackets supplied by the manufacturer.

E. Assemble with spigots and sleeves to accommodate tight joints where shown on the drawings.

F. Remove plastic wrap from pipe after installation.

G. Polish railing system in accordance with the requirements contained in Section 017423.

**3.03 - SITE TOLERANCES**

A. The maximum variation from plumb shall be one quarter (1/4) inch, non-cumulative.

B. The maximum offset from true alignment shall be one quarter (1/4) inch.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Aluminum floor gratings. All grating on the project shall be aluminum except as specified in Section 066000, or as noted on the Contract Drawings.

### 1.02 - RELATED SECTIONS

A. Section 033000 – Cast-in-Place Concrete.

B. Section 055200 – Metal Railings.

C. Section 066000 – Plastic Fabrications.

### 1.03 - REFERENCES

A. ANSI/ASTM B221 – Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.

B. ANSI/NAAMM MBG 531 - Metal Bar Grating Manual.

C. AWS A2.0 - Standard Welding Symbols.

### 1.04 - SUBMITTALS

A. Submit under provisions of Section 013300 - Submittals.

B. Product Data: Provide span and deflection tables.

C. Layout Drawing: Prepare a floor grating plan to a minimum scale of 1/4 inch = 1 foot showing the layout and sizes of all grating sections, holes in grating, overall dimensions and locations of openings, structural support members, and embedments.

D. Shop Drawings: Indicate details of component supports, openings, perimeter construction details and tolerances.

E. Samples: Submit one sample, 12 inches x 12 inches (300 mm x 300 mm) in size illustrating surface finish, color, and texture.

F. Manufacturer's Instructions: Indicate special procedures and conditions required for proper installation.

**1.05 - PERFORMANCE REQUIREMENTS**

A. Design Live Load: Uniform load of 100 lbs. / sq. ft. minimum; concentrated load of 900 lbs.

B. Maximum Allowable Deflection under Uniform Live Load: 3/8 inch or span/180 whichever is less.

C. No removable grating section shall exceed 100 pounds in weight, or be larger than eighteen (18) square feet in plan area. Grating sections shall be easily removable by a maximum of two (2) plant operators.

**1.06 - COORDINATION**

A. Field Verify depth of existing grating. Depth of new grating to match existing.

B. Do not submit layout plan specified above until all process piping has been installed.

C. Coordinate the work with placement of frames in concrete work and tolerances for openings.

D. Shop drawings shall demonstrate field verification of the physical sizes and actual locations of equipment and other components as installed.

**PART 2 - PRODUCTS**

**2.01 - MANUFACTURERS**

A. Aluminum floor gratings shall be manufactured by McNICHOLS CO., or approved equal.

**2.02 - MATERIALS**

A. Aluminum grating:

1. Plank sections, bearing bars and grating frames: ANSI/ASTM B221 extruded alloy 6063-T6.

2. Cross bars and connecting bars: ANSI/ASTM B221 aluminum. Gratings shall be Type GAL-200 with 2” x 3/16” bearing bars, typical, except at Headworks Channel, which shall receive new grating whose depth shall match existing.

3. Grating frames: ANSI/ASTM B221 aluminum angle shape, 1/4 inch (6 mm) thick min.

4. Embedment angle per Section 066000 – Plastic Fabrications.

**2.03 - ACCESSORIES**

A. Fasteners and saddle clips: Stainless steel.

**2.04 - FABRICATION**

A. Aluminum floor grating: 2” high, model No.GAL-200 by McNichols, typical unless otherwise indicated.

1. Swage Locked Rectangular Design:

a. Pattern: Main and cross bars shall be arranged in a rectangular pattern, with positive mechanical interlocking joints.

b. All grating shall be banded.

**2.05 - FINISHES**

A. Aluminum: Mill Finish.

B. Where aluminum surfaces come into contact with dissimilar materials or concrete the aluminum shall be neatly painted with two (2) coats of bituminous paint as specified in Section 099000.

**PART 3 - EXECUTION**

**3.01 - EXAMINATION**

A. Verify that opening sizes and dimensional tolerances are acceptable.

B. Verify that support anchors are correctly positioned.

**3.02 - INSTALLATION**

A. Install components in accordance with manufacturer's instructions.

B. Place frames in correct position, plumb, and level. Attach to substrate in accordance with manufacturer's instructions.

C. Anchor by bolting through saddle clips.

D. Set perimeter closure flush with top of grating and surrounding construction. Secure to prevent movement. Installed gratings which rock will be rejected.

**3.03 – TOLERANCES**

A. Conform to ANSI/NAAMM MBG 531 - Metal Bar Grating Manual

B. Maximum space between adjacent grating sections: 1/4 inch.

C. Maximum variation from top surface plane of adjacent sections and floors: 0 inches.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 RELATED DOCUMENTS

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

### 1.02 SUMMARY

A. Section Includes:

1. Influent Screen Platform Framing

2. Covered Overhang at Influent Screen Platform

3. Process Tank Floor Deck Framing Above Tanks

### 1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated, including finishing materials.

B. Shop Drawings: Show fabrication and installation details for decorative metal.

1. Include plans, elevations, component details, and attachments to other work.

2. Indicate materials and profiles of each decorative metal member, fittings, joinery, finishes, fasteners, anchorages, and accessory items.

### 1.04 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing decorative metal similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Anodic Finisher Qualifications: A firm experienced in successfully applying anodic finishes of type indicated and employing competent control personnel to conduct continuing, effective quality-control program to ensure compliance with requirements.

C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Store decorative metal in a well-ventilated area, away from uncured concrete and masonry, and protected from weather, moisture, soiling, abrasion, extreme temperatures, and humidity.

B. Deliver and store cast-metal products in wooden crates surrounded by sufficient packing material to ensure that products will not be cracked or otherwise damaged.

### 1.06 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with decorative metal by field measurements before fabrication and indicate measurements on Shop Drawings.

### 1.07 COORDINATION

A. Coordinate installation of anchorages for decorative metal items. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

## PART 2 - PRODUCTS

### 2.01 ALUMINUM FABRICATORS

A. Fabricators: Subject to compliance with requirements, fabricators offering decorative metal work that may be incorporated into the Work include, but are not limited to, the following:

1. Pleasant Mount Welding, Inc.
2. DAMS Incorporated
3. 3D Metal Fabricators
4. National Metal Fabricators.

### 2.02 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. Provide materials without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

### 2.03 ALUMINUM

A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties for each aluminum form required not less than that of alloy and temper designated below.

B. I and H Beams: ASTM B 308 (), Alloy 6061-T6.

C. Extruded Structural Pipe: ASTM B 429/B 429M, Alloy 6063-T6.

D. Plate and Sheet: ASTM B 209 (), Alloy 6061-T6.

## 2.04 FASTENERS

A. Fastener Materials: Unless otherwise indicated, provide the following:

1. Aluminum Items: Type 316 stainless-steel fasteners.

B. Fasteners for Anchoring to Other Construction: Unless otherwise indicated, select fasteners of type, grade, and class required to produce connections suitable for anchoring indicated items to other types of construction indicated.

C. Provide concealed fasteners for interconnecting components and for attaching decorative metal items to other work unless otherwise indicated.

1. Provide square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

E. Post-Installed Anchors: Torque-controlled expansion type.

1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

## 2.05 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

1. For aluminum, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

B. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.

C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

**2.06 FABRICATION, GENERAL**

A. Assemble items in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

B. Make up wire-rope assemblies in the shop to field-measured dimensions with fittings machine swaged. Minimize amount of turnbuckle take-up used for dimensional adjustment so maximum amount is available for tensioning wire ropes. Tag wire-rope assemblies and fittings to identify installation locations and orientations for coordinated installation.

C. Form aluminum to required shapes and sizes, true to line and level with true curves and accurate angles and surfaces. Finish exposed surfaces to smooth, sharp, well-defined lines and arris.

D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.

E. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch () unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

F. Mill joints to a tight, hairline fit. Cope or miter corner joints. Fabricate connections that will be exposed to weather in a manner to exclude water.

G. Provide weep holes where water may accumulate. Locate weep holes in inconspicuous locations.

H. Provide necessary rebates, lugs, and brackets to assemble units and to attach to other work. Cut, reinforce, drill, and tap as needed to receive finish hardware, screws, and similar items unless otherwise indicated.

I. Comply with AWS for recommended practices in shop welding. Weld behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded joints of flux, and dress exposed and contact surfaces.

1. Where welding cannot be concealed behind finished surfaces, finish joints to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 2 Welds: completely sanded joint, some undercutting and pinholes okay.

### 2.07 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

### 2.08 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of decorative metal.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION, GENERAL

A. Provide anchorage devices and fasteners where needed to secure decorative metal to in-place construction.

B. Perform cutting, drilling, and fitting required to install decorative metal. Set products accurately in location, alignment, and elevation, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items to be built into concrete, masonry, or similar construction.

C. Fit exposed connections accurately together to form tight, hairline joints or, where indicated, uniform reveals and spaces for sealants and joint fillers. Where cutting, welding, and grinding are required for proper shop fitting and jointing of decorative metal, restore finishes to eliminate evidence of such corrective work.

D. Do not cut or abrade finishes that cannot be completely restored in the field. Return items with such finishes to the shop for required alterations, followed by complete refinishing, or provide new units as required.

E. Restore protective coverings that have been damaged during shipment or installation. Remove protective coverings only when there is no possibility of damage from other work yet to be performed at same location.

1. Retain protective coverings intact; remove coverings simultaneously from similarly finished items to preclude non-uniform oxidation and discoloration.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

**3.03 CLEANING AND PROTECTION**

A. Unless otherwise indicated, clean metals by washing thoroughly with clean water and soap, rinsing with clean water, and drying with soft cloths.

B. Protect finishes of aluminum from damage during construction period with temporary protective coverings approved by decorative metal fabricator. Remove protective covering at time of Substantial Completion.

C. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

**END OF SECTION**

## PART 1 – GENERAL

### 1.01 – SECTION INCLUDES

A. Treated Wood Members.

B. Miscellaneous Framing, Blocking and Furring.

C. Fasteners.

D. Framing accessories.

### 1.02 – QUALITY ASSURANCE

A. Lumber Grading Rules and Wood Species to be in conformance with the Voluntary Product Standards PS 20-70. Grading rule of the following associations apply to materials furnished under this section:

1. Southern Pine Inspection Bureau (SPB).

2. Western Wood Products Associations (WWPA).

3. American Wood Preserves Bureau (AWPB).

4. American Plywood Association (APA).

5. NFPA.

6. Lumber Grading Agency by ALSC.

7. Building Officials and Code Administration (BOCA).

B. Requirements of regulatory agencies. Comply with the following:

1. Fire retardant treated wood: Testing agency, UL label rating, acceptable to governing Building Officials.

2. All lumber and plywood shall be grade-marked.

3. In lieu of grade stamping exposed to view lumber and plywood, submit manufacturer's certificate under provisions of Section 014500 that products meet or exceed specified requirements.

**1.03 – REFERENCES**

A. ALSC - American Lumber Standards Committee: Softwood Lumber Standards.

B. APA - American Plywood Association.

C. APA/EWS - American Plywood Association - Engineered Wood Systems

D. AWPA - (American Wood Preservers Association) C1 - All Timber Products Preservative Treatment by Pressure Process.

E. WWPA - Western Wood Products Association.

F. Lumber Grading:

1. Standard Grading and Dressing Rules No. 16, current edition, for Douglas Fir, Western Hemlock, West Red Cedar, White Fir, and Sitka Spruce, published by West Coast Lumber Inspection Bureau, or

2. “Current Grading Rules”, issued by the Western Wood Products Association.

G. ASTM D2559 - Adhesives for structural laminated wood products for use under exterior (wet use) exposure conditions.

H. AITC - American Institute of Timber Construction

I. Extended ASTM E84 Fire Test Method, Factory Mutual Research Report J.I. 1R9Q9. AC.

J. BOCA: 2310.2: Fire Retardant Treated Wood (1993).

K. ASTM C1177: L.

L. ASTM E136.

M. ASTM E119.

**1.04 – SUBMITTALS**

A. Certification:

1. Pressure Treated Wood: Submit certification by treating plant stating chemicals and process used, net amount of salts retained and in conformance with applicable standards.

2. Preservation Treated Wood: Submit certification for waterborne preservative that moisture content was reduced to 19% maximum, after treatment.

3. Fire-Retardant Treatment: Submit certification by treating plant stating that fire-retardant treatment materials comply with governing ordinances and that treatment will not bleed through finished surfaces.

**1.05 – PRODUCT DELIVERY, STORAGE AND PROTECTION**

A. All materials shall be inspected upon receipt at job site. No faulty or damaged materials shall be accepted. It shall be contractor's responsibility to produce finished items of work in first-class condition, free from all defects.

B. Do not handle products in a manner which will damage, warp or distort products.

C. Do not store products directly on the ground; protect from elements.

**1.06 – WARRANTY**

A. Provide 30 year manufacturer's written warranty for pressure treated and fire resistant treated wood items.

B. Provide five-year manufacturer's warranty for exterior grade sheathing.

**PART 2 – PRODUCTS**

**2.01 – MATERIALS – LUMBER AND FRAMING**

A. Materials shall meet the Federal specifications, commercial standards, product standards and these specifications, unless more restrictive requirements are indicated on drawings.

B. All lumber for blocking, plates and nailers located on the exterior of the building, within a maximum distance of 18 inches from grade or in contact with masonry or concrete shall be treated in accordance with AWPB Standards LP-2-80. All lumber shall be dried after treatment and have moisture content in each piece of 19% or less, or shall conform to the applicable grading standards for the species involved. All cuts, planed surfaces, bored holes, etc., shall be treated at the jobsite by dipping or liberally brushing with same materials as specified in AWPB Standard LPA2A80. All lumber shall be grade marked. Lumber treated by any method other than AWPB Standards LP-2-80 will not be accepted.

C. Miscellaneous Framing: No. 2 species, 19 percent maximum moisture content or equivalent stress grade.

D. Rough hardware, nails, screws, bolts, etc., for securing lumber in place shall be commercial quality, any suitable type and finish for interior dry location, galvanized or nonferrous hardware for all exterior work and for interior work in toilets.

**2.02 – MATERIALS – SHEATHING**

A. Backing panels: APA C-D plugged, 3/4 inch thick, exterior type.

B. All plywood shall comply with APA Standards and be of thickness indicated on drawings.

C. Moisture content of the plywood at the time of installation and at the time roofing is installed shall be less than 19 percent.

**2.03 - FASTENERS**

A. Nails and Fasteners: Hot-dipped galvanized steel for exterior, high humidity and treated wood locations, unfinished steel elsewhere.

B. Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel.

C. Lumber to lumber: Cement coated or annular threaded nails of sufficient length to penetrate 1.25 inches into adjoining members, except as otherwise indicated.

**2.04 - ACCESSORIES**

A. Construction Adhesive: Waterproof; air cured, rubber based, cartridge dispensed, Liquid Nail 601, manufactured by MACCO ADHESIVES, THE GLIDDEN COMPANY, or approved equal.

B. Provide accessories to conform to manufacturer's installation recommendations.

**PART 3 – EXECUTION**

**3.01 – VERIFICATION**

A. Verify existing conditions under provisions of Section 01 31 00.

B. Verify that walls and other substrates are at the proper elevations and ready to receive work of this section.

**3.02 - PREPARATION OF SURFACES**

A. Surfaces to receive new wood members shall be free of all dirt, debris, and loose materials. Exposed surfaces shall be mechanically scraped if necessary, to remove projections.

B. Surfaces shall have no free water present in any form (rain, dew, frost, snow or ice).

C. Contractor is responsible to inspect all exposed surfaces to see that conditions are satisfactory for installation of new work

**3.03 –WORKMANSHIP**

A. Work shall be performed in conformance with good trade practice, recommendations of manufacturers, building codes and these specifications unless specifically indicated otherwise on the drawings and shall be well fitted and securely fastened in its proper location with nails, screws, bolts or other approved fastening devices.

**3.04 – FIRE RETARDANT**

A. Required for wood blocking and nailers.

B. Treat to flame spread rating of 25 or less and fuel contribution of 30 or less when tested in accordance with ASTM E84. Re-dry to maximum 19 percent moisture content.

C. Each piece of treated wood shall bear UL label of compliance.

**3.05 – CLEAN-UP**

A. Clean or replace any adjacent surfaces of materials damaged by treated lumber.

**3.06 – INSTALLATION - SHEATHING**

A. Nailing pattern and spacing shall be in accordance with APA recommendations or as listed below.

B. Install telephone and electrical panel back boards with plywood sheathing material where required. Size the back board by 12 inches (25 cm) beyond size of electrical panel.

C. Fasteners:

1. Fastener heads shall be flush with wood surface and shall penetrate adjoining piece minimum 1.25 inches.

2. The installed withdrawal resistance shall be a minimum of 100 pounds per nail.

**3.07 - SCHEDULE**

A. Provide nailers, blocking, furring, and reinforcement as called for in all other specified sections in accordance with the requirements of this section.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Glass fiber reinforced polyester (FRP) resin fabrications.

B. FRP handrails, guardrails, posts, toe-plates, anchors and fittings.

C. FRP ladder, ladder extension, and attachment accessories.

D. FRP platforms and landings.

E. FRP gratings.

F. FRP embedment angles.

G. FRP roof panel for canopy structures.

H. All other appurtenances and accessories necessary to provide a complete installation

### 1.02 - RELATED SECTIONS

A. Section 033000 – Cast-In-Place Concrete

B. Section 057050 – Aluminum Fabrications

C. Section 051200 – Structural Steel

### 1.03 - REFERENCES

A. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.

B. ASTM D635: Rate of burning and/or Extent of Time Burning of Self-Supporting Plastics in a Horizontal Position.

C. HFPA 101 – Life Safety Code.

### 1.04 - SYSTEM DESCRIPTION

A. Fabricate railing, platform, ladder, deck, and cover assemblies to meet all applicable codes including:

1. New York State Building Code

2. Occupational Safety & Health Act of 1970 (OSHA) regulations.

3. Fire Code and Property Maintenance Code of New York State.

B. Deck and platform assemblies shall support 300lb. concentrated load at any point and uniform live load of 100 lb./sq. ft., non-simultaneously with a deflection not to exceed L/240.

C. All railings, posts, balusters, filler panels, etc. shall resist lateral force of fifty (50) lbs. per linear foot at any point along the top rail, in any direction without damage or misalignment.

D. Design for dead loads plus the following live loads: Ladders: 500 lbs. at the midspan of rungs.

E. Cover shall meet the requirements of paragraph 2.02, this section.

F. Toe-plates shall conform to OSHA standards.

G. Design items with sufficient strength for handling stresses.

H. Ladder extension shall conform to OSHA standards.

**1.05 - SUBMITTALS**

A. Submit under provisions of Section 013300 - Submittals.

B. Product Data: Submit product data on specified component products.

C. Samples: Submit one sample, 6 inches in length, illustrating color, texture and finish for each of the following: grating, railing, deck, and platform framing.

D. Shop Drawings: Indicate design load parameters, dimensions, adjacent construction, materials, thicknesses, fabrication details, required clearances, field jointing, tolerances, colors, finishes, methods of support and anchorages.

E. Fabricator's Installation Instructions: Provide information indicating special procedures required and perimeter conditions requiring special attention.

F. Independent laboratory test reports indicating that material being supplied is in compliance with ASTM E84. Certification must be composite material being supplied on this project. Data indicating resin performance only will not be accepted.

G. Stair assembly shop drawings shall bear the seal and signature of a registered professional engineer licensed in the state of New York.

H. Cover and platform assembly shop drawings and calculations shall bear the seal and signature of a registered professional engineer licensed in the state of New York.

I. Roof Panel shop drawings shall include decking plan, support locations, projections, and pertinent details of attachment to structure and laps.

J. Field verify measurements for stair and railing assembly that require consideration to existing and new previously installed construction, including items installed under other prime contracts.

**1.06 - QUALITY ASSURANCE**

A. Unless otherwise indicated, a single manufacturer shall furnish all system components for each item. This requires the Supplier to be responsible for the development, design, fabrication, delivery and assembly of the complete system.

B. Consideration will only be given to Manufacturers who can demonstrate that their grating, stair, railing, and ladder systems comply with these Specifications. The Manufacturer must successfully demonstrate to the Architect/Engineer that they have had a minimum of ten (10) years of successful and documented experience in the design, manufacture, and installation of grating systems of the size, quality, performance and reliability specified.

C. Design materials and bracing under direct supervision of a Professional Structural Engineer experienced in design of this work registered in the State in which the project is located. Shop Drawings shall bear seal and signature of said Engineer. A full set of calculations affixed a New York State Professional Engineer's seal and signature shall accompany the shop drawings for the Cover.

D. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work.

E. When located with chemical storage rooms, FRP fabrications shall be compatible with chemical being stored.

**1.07 – FIELD MEASUREMENT**

A. Verify that field measurements are as indicated on approved shop drawings.

**1.08 - REGULATORY REQUIREMENTS**

A. Conform to applicable code for a flame spread rating of 25 as measured in accordance with ASTM E84.

### 1.09 - OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 017820.

B. Maintenance Data: Include instructions for stain removal and surface and gloss restoration.

### 1.10 - DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products to site under provisions of Section 016500.

B. All materials shall be delivered on site in original, unbroken packaging bearing the label of the manufacturer.

C. Adhesives, resins, catalysts, and hardeners shall be packaged independently, and they shall be labeled and stored in a dry indoor storage area separate from the FRP materials. Storage area temperature shall remain between 70 and 85 degrees Fahrenheit for the entire storage period.

D. All materials shall be carefully handled to prevent abrasion, cracking, chipping, twisting, and other deformations or damage.

E. Store materials in an enclosed area free from contact with soil or water.

## PART 2 - PRODUCTS

### 2.01 – FABRICATORS

A. FIBERGRATE

B. FIBERGLASS WORLD

C. ENDURO

D. STONEWELL

E. SEASAFE, INC.

F. IKG INDUSTRIES.

G. Approved equal.

### 2.02 - MATERIALS

A. Mat: Chopped fine glass fiber strand, sized into mat form, for polyester resin laminate reinforcement.

B. Resin: Vinylester type, fire resistant, corrosion resistant, high workability characteristics, integral coloring additives.

C. Polishing Cream: Compatible gel coat polishing cream to restore gloss surface finish.

D. Core Framing: Softwood lumber, clear and free of knots.

E. All fasteners and clips shall be Type 316 Stainless Steel.

F. Provide a grit surface on upper surfaces for skid resistance.

G. Structural members for platform shall be fabricated from the structural fiberglass shapes using polyester resins. Structural members for platforms shall meet the following minimum standards:

| | | |
|---|---|---|
| 1. | Ultimate Tensile Strength: | 30,000 psi |
| 2. | Ultimate Compressive Strength: | 30,000 psi |
| 3. | Modulus of Elasticity: | 2,500,000 psi |
| 4. | Barcol Hardness: | 50 |

H. All FRP products shall have a maximum ASTM E84 flame spread rating of 25.

I. Ladders shall be constructed of pultruded structural fiberglass reinforced plastic shapes, utilizing a synthetic surfacing veil for maximum chemical and ultraviolet resistance. Minimum glass content shall be 60% for ladder rungs and rails, comprising of both longitudinal strands and continuous strand mat so aligned as to provide both longitudinal and transverse strength and prevent splitting due to laminar shear. Ladder systems shall have a flame spread rating of 25, or less per ASTM E84. Color shall be “Safety Yellow”.

J. Ladder rung to side rail connection shall be bonded and pinned with a dowel rod to prevent any possibility of rung rotation and pullout. Rungs shall have a factory-applied epoxy base non-skid grit surface. The ladder shall be entirely nonmetallic with the exception of splice and mounting fasteners. Intermediate wall stand-off clips shall be installed on each rail at a maximum spacing of 6 feet on center for the full run of the ladder height, and each rail shall be anchored to the floor slab/platform at its base.

**2.03 – PERFORMANCE AND DESIGN CRITERIA**

A. Size and locations shall be as indicated on contract drawings.

B. Handrails & Guardrails:

1. Two rail system
2. Height – minimum 42 inches measured above tread
3. Maximum spacing – 30”
4. Provide toe plates at all railing systems
5. Perimeter Dimension of not less than 4 inches or outside diameter of not less than 1-1/4 inches.
6. Install minimum return of 12” at all landings

C. Canopy Roof Panel:

1. 7.2 x 1.5 Tuff Span Series 450 panel by Enduro or Equal.
    a. Height of panel; 1 ½” (fluted)
    b. Span Design: Single Span

D. Influent Pump Station Grating:

1. Type T5020 Pultruded Grating by Fibergrate or Equal.
    a. Height of grating; 2”
    b. Span Design: Single Span
    c. Maximum deflection: ¼”
    d. Live Load: 220 PSF

**2.04 – FABRICATION - FRP**

A. Fabricate components with the open mold spray-up method to provide a minimum 1/4 inch (6 mm) thick product.

B. Brace shape with stiffeners to maintain shape as required.

C. Ladders shall be shop assembled, and as an option may be pre-drilled and prepared for field attachments of standoff clips.

D. Grating shall be pultruded type, size as indicated on the contract drawings.

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.

F. Accurately form components required for anchorage of stairs, landings and railings to each other and to building structure

G. Finish other surfaces not in contact with the mold to match the molded surfaces in appearance.

H. Finish trim corners and edges.

I. Band all edges of the grating around openings.

J. Coat surface with 0.017 inch (0.43 mm) to 0.025 inch (0.64 mm) thick gel coat of resin.

K. Cure components prior to shipment and remove material which may be toxic to plant or animal life or incompatible with adjacent building materials.

**2.05 – SHOP FINISHING**

A. Color: As selected by owner.

B. Surface Texture:

1. Skid resistant - grit surface texture for stair treads, ladder rungs and grating. Provide anti-slip nosing at all stair treads.

2. Smooth texture for all other components.

**PART 3 - EXECUTION**

**3.01 - EXAMINATION**

A. Verify that field conditions are acceptable and are ready to receive work. Beginning of installation means installer accepts existing substrate conditions.

B. Provide items required to be embedded in masonry and concrete with setting templates, to appropriate sections.

**3.02 - INSTALLATION**

A. Set angle embedments in concrete with tops flush with finish surface elevations as required by individual installation location/type; protect sleeves from infiltration of water and debris.

B. Install fabrications in accordance with approved shop drawings and fabricator's instructions.

C. Install items plumb and level, accurately fitted, free from distortion or defects to meet design requirements.

D. Provide anchors, plates, angles, hangers and struts as required for connecting stairs and ladder to structure.

E. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

F. Obtain Engineer's approval prior to site cutting or making adjustments not scheduled.

G. Seal cut edges and holes with a compatible resin system.

H. Miter edges at all corners.

I. Install items specified as indicated and in accordance with manufacturer's instructions.

J. Roof Panel:

1. Fastened to Structure at every low rib.

2. Side Laps at 12" on center.

3. Minimum End Lap Length: 6".

4. Fasteners for attachment to structure:

a. Set with pilot holes for stainless steel screws.

b. Type 'B' Point screws with 3/8" hex head.

c. Provide .729" diameter neoprene seal washer at every screw.

K. All anchors for cover and deck attachment to existing tank shall be adhesive set, with a minimum diameter of 3/8". Quantity and spacing as required by cover/deck manufacturer(s). Minimum embedment depth shall be 4".

**3.03 - TOLERANCES**

A. Maximum Variation from True Position: 1/8 inch (3 mm).

B. Maximum Offset from True Alignment: 1/8 inch (3 mm).

### 3.04 - CLEANING

A. Clean components of foreign material.

B. Clean fabrications in accordance with fabricator's instructions.

### 3.05 - PROTECTION

A. Protect finished work from damage until project is accepted by the Owner.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Membrane roofing.

B. Vapor Barrier.

C. Base flashings.

D. Fascia System.

E. Drip Edge.

F. Temporary protection against weather.

### 1.02 - RELATED SECTIONS

A. Section 06 10 00: Rough Carpentry.

B. Section 07 62 00: Flashing and Trim.

### 1.03 - REFERENCES

A. ASTM C272 - Test Method for Water Absorption of Core Materials for Structural Sandwich Construction.

B. ASTM C578 - Preformed, Cellular Polystyrene Thermal Insulation.

C. ASTM D312 - Asphalt Used in Roofing.

D. ASTM D412 - Rubber Properties in Tension.

E. ASTM D624 - Rubber Property - Tear Resistance.

F. D746 - Brittleness Temperature of Plastics and Elastomeric by Impact.

G. ASTM E96 - Water Vapor Transmission of Materials.

H. Factory Mutual Engineering & Research Corporation (FM)-Roof Assembly Classification

I. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.

J. Underwriters Laboratories, Inc. (UL) - Fire Hazard Classifications.

### 1.04 - SYSTEM DESCRIPTION

A. Fleecebacked SPF Adhered Roofing System incorporates 90-mil thick white non-reinforced EPDM membrane laminated to 55-mil thick non-wovenpolyester fleece-backing. The membrane is fully adhered to sprayed polyurethane foam insulation with adhesive.

B. Contractor shall provide roof system design letter issued by manufacturer outlining the entire roofing system including all components and warranty information.

**1.05 – SUBSTITUTIONS / OR EQUALS**

A. Substitutions/or Equals for the roofing material manufacturer and items listed in this specification are to be submitted in conformance with Division 1 and as otherwise modified by the following:

1. A proposed Substitution/or Equal submission package must be submitted to the Architect no later than (10) ten business days prior to the bid date. Otherwise, any Substitution/or Equal other than the manufacturer specified will not be considered.

2. Submittal to Architect must include:
   a. Identification of Project – Project Name;
   b. Name of Submitting Bidder;
   c. Telephone and Email address of Submitting Bidder;
   d. Manufacturer's Name of Proposed or Equal/Substitution;
   e. Model, line or material type;
   f. Equivalent line by line item comparison for each item listed in the materials section of this specification, including each of the optional accessories. Note: Each proposed item must have proposed manufacturer and model/product numbers.
   g. Addresses of two locations within 30 miles of the proposed site, where the proposed Substitution/or Equal manufacturer has installed their similar roofing product and name and telephone number of a contact person to be able to arrange a site visit.

3. Failure to follow any of the procedures outlined in division 1 or above may subject the entire submission for rejection.

4. Partial and/or incomplete submissions may not be reviewed.

5. Substitution/ or Equals if found acceptable will be approved via addenda, which will be issued to all bidder's.

6. In order to include an approved Substitution/or Equal in the bid, the bidder must acknowledge on the bidders bid form that the bidder intends to provide the approved Substitution/or Equal and the bidder shall also list the name of the

approved Substitution/or Equal manufacturer as well on the bidders bid form. Failure of the bidder to express their intent to use the approved Substitution/or Equal as part of the bid will exclude the bidder from being able to utilize another Manufacturer from the one specified.

7. If a bidder uses a Substitution/or Equal, the bidder will take responsibility to pay for the re-engineering and coordination of all other items that are to be provided that have been defined in the Contract Documents as additional items to the roofing system, including but not limited to all deck preparation/modifications, additional flashings or modification to existing roof drains.

**1.06 - SUBMITTALS**

A. Submit under provisions of Section 01 31 00.

B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, fasteners, adhesive and miscellaneous system materials.

C. Shop Drawings: Indicate setting plan for tapered insulation, mechanical fastener layout, joint or termination detail conditions, conditions of interface with other materials, roof seam layout, direction of laps and flashing details. Shop drawings must be preapproved by system manufacturers.

D. Samples: Submit one sample 12 inches x 12 inches in size illustrating insulation and roofing materials.

E. Manufacturer's Instructions: Indicate special precautions required for seaming the membrane and anchoring the insulation and membrane.

F. Manufacturer's Certificate: Certify that components and products meet or exceed specified standards and comply with referenced standards.

G. Manufacturers Certification indicating that installer is a certified installer of the manufacturers system with 5 years minimum documented experience.

**H.** Material Safety Data Sheets (MSDS) for all products.

**1.07 - QUALITY ASSURANCE**

A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.

B. Single Source Responsibility: Roofing system materials and components shall be supplied and warranted by membrane manufacturer for specified roofing system and specified membrane manufacturer's warranty and shall be in compliance with specified regulatory requirements.

A. Regulatory Requirements for Roof Assembly:

1. Comply with Factory Mutual System Approval Guide to provide FMRC-Approved roof assembly meeting Class IA-90 (FM Standard 4470) requirements for fire resistance and wind uplift in accordance with FM Loss Prevention Data Sheets 1-28 and 1-29.

2. Underwriters Laboratories, Inc. (UL): Class A Fire Hazard Classification.

B. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified in this section with 10 years documented experience.

2. Applicator: Company specializing in performing the work of this section with 5 years documented experience. Installer shall be an authorized roofing applicator for the system being installed.

C. Pre-installation Meeting:

1. Convene a Pre-installation Meeting at Project Site one week prior to commencing work of this Section.

2. Require attendance of parties directly affecting work of this Section.

3. Review preparation and installation procedures and coordinating and scheduling required with related work.

    a. Require Manufacturer's Roofing Quality Control Inspector to conduct Pre-installation Meeting along with Contractor Quality Control Representative and Architect/Engineer.

4. Agenda:

    a. Tour, inspect and discuss condition of substrate, roof drains, roof drain final locations, curbs, penetrations and other preparatory work performed by other trades.

b. Review structural loading limitations of deck and inspect deck for loss of flatness and for required mechanical fastening.

c. Review roofing system requirements (Drawings, Specifications and other Contract Documents).

d. Review required submittals, both completed and yet to be completed.

e. Review and finalize construction schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.

f. Review requirements for Manufacturer's Roofing Quality Control Inspector inspections, other inspections, testing, certifying, and material usage accounting procedures.

g. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions, including possibility of temporary roofing.

h. Review safety precautions relating to roofing installation.

**1.08 - REGULATORY REQUIREMENTS**

A. Conform to applicable code(s) for roof assembly fire hazard requirements.

B. Conform to loading requirements indicated in ASCE 7 for applicable building location, exposure and use.

C. Underwriters Laboratories, Inc. (UL): Class A Fire Hazard Classification.

D. Factory Mutual (FM) 1-90 Compliance/Roof Assembly.

**1.09 – DELIVERY, STORAGE AND HANDLING**

A. Deliver, store, protect and handle products to site under provisions of Section 01 65 00.

B. Deliver products in manufacturer's original containers, dry, undamaged, seals and labels intact.

C. Store products in weather protected environment, clear of ground and moisture.

D. Protect foam insulation from direct exposure to sunlight.

E. All curable materials must be stored between 60° F and 80°F.

F. Protect adjacent materials and surfaces against damage from roofing work. Do not store materials on previously completed roofing.

G. All components including underlayment and metal edgings must be supplied and warranted by the roof system manufacturer.

**1.10 - PROJECT CONDITIONS**

A. Environmental Requirements:

1. Do not apply roofing membrane during inclement weather or when ambient temperature is expected to fall below 40 degrees F. Follow cold weather application procedures recommended by manufacturer.
2. Do not apply roofing membrane to wet, damp or frozen deck surface or when precipitation is occurring.
3. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed in the same day.

B. Coordination

1. Coordinate the work with the installation of associated metal flashings, roof drains and other penetrations.

C. Provide covers and other means of protection as necessary to protect building surfaces against damage during roofing work.

D. Where work shall continue over finished roof membrane, protect surfaces.

**1.11 - WARRANTY**

A. Section 01 78 00 - Closeout Submittals: Procedures for closeout submittals.

B. Warranty:

2. Submit 30 year total roof system written warranty, without monetary limitation, signed by roofing system manufacturer agreeing to promptly repair leaks in roof membrane and base flashings resulting from defects in materials and workmanship.
3. Include materials and workmanship for the following items within Warranty:
    a. Membranes
    b. Flashings, including metal flashings and accessories supplied by roofing membrane manufacturer
    c. Insulation

d. Fasteners and adhesives

e. Accessories

4. Include the following items within Warranty:

    a. Roofing inspection by Manufacturer's Roofing Quality Control Inspector at date of Final Acceptance.

    b. Roofing manufacturer will provide unlimited repairs during warranty period with no cost limitation.

    c. Temporary emergency repairs may be made by the Owner without voiding any warranty provisions.

    d. Attach copy of Record Document Roof Plan Drawings, Roof Detail Drawings, and Record Modified Bituminous Membrane Roofing Specification Section to Warranty.

5. Warranty shall also cover leaks caused by accidental punctures:

    a. 32 man-hours per year for 145-mil Fleeceback EPDM

    b. When Flexible FAST is installed an additional 4 man-hours per year can be included.

6. Warranty shall also cover leaks caused by hail:

    a. 3” diameter hail when 145-mil Fleeceback EPDM installed

    b. When Flexible FAST is installed an additional 1” diameter hail can be included.

7. Pro-rated System Warranties shall not be accepted.

8. Evidence of the manufacturer's warranty reserve shall be included as part of the project submittals for the Architect's approval.

9. Four copies of Manufacturer’s warranty shall be provided to the Owner at the time it accepts completion of the project. The form and content of such warranty shall be in accordance with the foregoing and shall be subject to the approval of the Owner.

**PART 2 - PRODUCTS**

**2.01 – MANUFACTURERS**

A. Carlisle.

B. Or approved equal.

C. For submissions of substitutions / or equals see section 1.05 substitutions / or equals.

**2.02 – MATERIALS**

A. Membrane: 0.145 mil, fleece backed, non-reinforced EPDM; 10 foot wide sheets.

1. Low Temperature
2. Brittleness (ASTM D746): -67° F
3. Color: White

B. Vapor Barrier: VapAir Seal 725TR, polyethylene film laminated to layer of rubberized asphalt adhesive, minimum 40-mil- (1.0-mm-) total thickness; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor-retarder manufacturer.

C. Seaming Materials: As provided by membrane manufacturer.

D. Polyisocyanurate bonded foam surfaced insulation or approved equal as recommended and supplied by roof manufacturer. Provide minimum 5.2” thickness (R-30) for Tapered Insulation.

E. HP Recovery board: 5/8” Securock, or as required as underlayment per manufacturers requirements. Fasten per manufacturer recommendations to obtain necessary uplift criteria.

F. Roof Curb Insulation: Polyisocyanurate foam; thickness to match wood nailer.

G. Tapered Insulation: Provide crickets, saddles, and tapered insulation of same material as second layer of insulation; taper to the following slopes:

1. Crickets and Saddles: ¼ inch per foot.
2. Insulation Installed to Counter slope Roof Structure: ½ inch per foot, or twice slope of roof.
3. Insulation over level roof structure: 1/4 inch per foot.

**2.03 - ACCESSORIES**

A. Base Flashings: Flexible sheet flashing, type to suit membrane sheeting and as recommended by the roofing manufacturer.

B. Prefabricated Control or Expansion Joint Flashing: Type approved by roofing manufacturer.

C. Bonding adhesive, splice cleaner, and splice cement, and splice tape: as recommended by membrane manufacturer.

D. Insulation Joint Tape: 6" wide; self-adhering as recommended by membrane manufacturer.

E. Membrane fastening plates: "Russ" strips and corresponding anchors as recommended by membrane manufacturer.

F. Pitch Pockets: Pourable sealer pockets: Membrane manufacturer's standard.

G. Sealants and Primer: As recommended by membrane manufacturer.

H. Membrane Adhesive and anchors: As recommended by membrane manufacturer.

I. Termination Bar: A 1" wide and .098" thick extruded aluminum bar pre-punched 6" on center which incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.

J. Molded Pipe Flashings inside and outside corner flashing: as recommended by membrane manufacturer.

K. Fascia System: SecureEdge 2000 as manufactured by Carlisle or approved equal. Incorporates an anchor bar with pre-slotted holes, consisting of .040” thick aluminum fascia cover, Kynar 500 finish and profile to cover existing stone coping and wood blocking.

L. Drip Edge System: SecureSeal Drip Edge Fascia as manufactured by Carlisle or approved equal. Incorporates a continuous cleat with a .040” thick aluminum fascia drip edge, Kynar 500 finish.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Verify that field measurements, substrates, surfaces and site conditions are ready to receive work.

B. Verify deck is clean and smooth, free of depressions, waves or projections, properly sloped to drains, valleys or eaves, and is suitable for installation of roof system.

C. Verify deck surfaces are dry and free of snow or ice. Confirm dry deck by moisture meter with 12 percent moisture maximum.

D. Verify roof openings, curbs, pipes, sleeves, ducts, vents and other penetrations through roof are solidly set, and nailing strips and reglets are in place.

E. Verify that all roof penetrations have been completed.

F. Report in writing to Architect/Engineer prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.

G. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the Owner.

**3.02 - INSTALLATION – VAPOR BARRIER**

A. Vapor Barrier: Prime substrate as required by manufacturer. Install self-adhering-sheet vapor barrier over entire roof area, side and end lapping each sheet a minimum of 3-1/2 inches90 mm and 6 inches150 mm, respectively. Seal laps by rolling.

B. Completely seal vapor barrier at terminations, obstructions, and penetrations to prevent air movement into roofing system.

**3.03 - INSTALLATION - INSULATION**

A. Provide smooth base for new insulation.

B. Insulation shall be fully adhered to the roof deck with approved adhesive as recommended by membrane manufacturer.

C. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

D. Lay tapered boards for a minimum distance of 24 inches back from roof drains for positive drainage.

E. Apply no more insulation than can be covered with membrane in same day.

F. Tape joints of insulation in accordance with insulation manufacturer's instructions.

G. Install Dens-Deck Prime underlayment with adhesive as required per manufacturers recommendations.

**3.04 - APPLICATION - MEMBRANE**

A. Install membrane in accordance with manufacturer's instructions.

B. Roll out membrane, free from air pockets, wrinkles or tears. Firmly press sheet into place without stretching.

C. Bond sheet to substrate except those areas directly over or within 3 inches of a control or expansion joint.

D. Overlap edges and ends and seal by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

E. Shingle joints on sloped substrate in direction of drainage.

F. Extend membrane up a minimum of 8 inches onto vertical surfaces.

G. Seal membrane around roof penetrations.

H. Apply base flashings to seal membrane to vertical elements.

I. Secure to reglets and nailing strips at 4 inches on center.

J. Install prefabricated roofing control and expansion joints in accordance with manufacturer's instructions.

K. Coordinate installation of roof drains, penetrations and related flashings.

L. Seal flashings and flanges of items penetrating membrane.

M. Secure membrane on perimeter of each roof level, section, expansion joint, curb, skylight, penthouse and all other penetrations in accordance with membrane manufacturer’s recommendations

**3.05 - FIELD QUALITY CONTROL**

A. Section 01 45 00 - Quality Control: Field inspection.

B. Manufacturer's Field Services: Manufacturer's Roofing Quality Control Inspector.

1. Attend and conduct Pre-installation Meeting.

2. Perform preparatory, initial, follow-up and final inspections for roof insulation and roofing system.

3. Prepare and submit inspection reports for each inspection made.

C. Upon completion of the installation a manufacture's technical representative must conduct an onsite inspection in the presence of the Architect/Engineer to insure that the installation has been installed in accordance with the manufacturer’s specifications.

**3.06 - CLEANING**

A. Section 01 74 23 - Cleaning: Requirements for cleaning.

B. In areas where finished surfaces are soiled by work of this section, consult manufacturers of surfaces for cleaning advice and conform to their instructions.

C. Repair or replace defaced or disfigured finishes caused by work of this section.

**3.07 - PROTECTION**

A. Protect finished work under provisions of Section 01 65 00.

B. Protect building surfaces against damage from roofing work.

C. Where construction traffic must continue over finished roof installation, protect surfaces in manner recommended by roofing system manufacturer to protect Manufacturer's Warranty.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Sheet metal roof flashing, flashing accessories, flashing sleeves and collars at mechanical and plumbing items, which extend through the roof or wall surfaces.

B. Fastening hardware such as nails, screws, reglet wedge blocks, etc.

C. Sheet metal capping over wood trim.

### 1.02 - RELATED WORK

A. Section 042200 – Concrete Unit Masonry.

B. Section 061000 – Rough Carpentry.

C. Section 077123 – Gutters and Downspouts.

D. Section 079000 – Caulking and Sealants.

### 1.03 - REFERENCES

A. ASTM A-446 - Specification for Steel Sheet

B. ASTM B-209 - Specification for Aluminum Sheet

C. ASTM B-221 - Specification for Aluminum Extruded Shapes

D. FS QQ-L-201 - Specification for Lead Sheet

E. ASTM A792 - Steel Sheet, Aluminum-Zinc Alloy-Coated, by the Hot-Dip Process

F. ASTM B32 - Solder Metal

G. ASTM B209 - Aluminum and Alloy Sheet and Plate

H. ASTM B486 - Paste Solder

I. ASTM D226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing

J. ASTM D486 - Asphalt Roof Cement, Asbestos-free

K. FS O-F-506 - Flux, Soldering, Paste and Liquid

L. WH - Warnock Hersey International, Inc., Middleton, WI.

M. FM - Loss Prevention Data Sheet

N. NRCA - National Roofing Contractors Association – Roofing Manual

O. SMACNA - Architectural Sheet Metal Manual

**1.04 - SUBMITTALS**

A. Section 013300 Submittal Procedures

B. Shop Drawings: Submit shop drawings for all metal flashing and trim. Submitted shop drawings shall include, but shall not be limited to the following:

1. Dimensioned drawings of all metal flashing at roof penetrations and at changes and terminations of roofing. Indicate proposed material, gauge and accessories.

2. Indicate material profile, jointing pattern, jointing details, method of lapping joints, providing for expansion and turning corners, fastening methods, flashing terminations, and other installation details.

C. Product Data: Submit manufacturer's literature of all materials specified herein to Architect/Engineer for approval in accordance with requirements described in General Requirements. Obtain approval from Architect/Engineer in writing prior to delivery and installation.

D. Samples: Submit two samples 12″ long illustrating typical gauge, external corner, internal corner, junction to vertical dissimilar surface, flashing and capping material and finish.

**1.05 - QUALITY CONTROL**

A. Fabricator and Installer: Company specializing in sheet metal flashing work with 6 years experience.

B. Reference standards

1. Comply with details and recommendations of SMACNA Manual for workmanship, methods of joining, anchorage, provisions for expansion, etc.

C. Manufacturer’s Warranty

1. Pre-finished metal material shall require a written 20-year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D-2244 or chalking excess of 8 units per ASTM D-659. If either occurs material shall be replaced per warranty, at no cost to the Owner.

D. Contractor's Warranty

1. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period of two years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof.

**1.06 - DELIVERY, STORAGE AND PROTECTION**

A. Deliver and store materials in manufacturer's original, unopened containers or packages with labels intact and legible under the provisions of Section 016500.

B. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

C. Prevent contact with materials, which may cause discoloration or staining. Materials shall be stored in a safe, dry place.

**1.07 - GENERAL REQUIREMENTS**

A. Proper Surfaces: Surfaces to which roofing and flashings are to be applied shall be even, smooth, sound, thoroughly clean and dry, and free from all defects that might affect the application. Report any unsatisfactory surfaces to Architect/Engineer in writing, prior to commencing work.

B. Accessories: All accessories or other items essential to the completeness of the metal flashing installation, though not specified, shall be provided. All such items, unless otherwise indicated on drawings or specified, shall be of same material as the item to which applied. Nails, screws and bolts shall be of the types best suited for the purpose intended and shall be of a composition that is compatible with the metal that it will contact.

C. Dissimilar Materials: Where materials come in contact with dissimilar metals, an insulating paint or tape shall be applied between the dissimilar metals to prevent electrolysis between the two materials.

D. Workmanship: Except as otherwise indicated on drawings or specified, the workmanship of metal flashing work, method of forming joints, anchoring, cleating, provisions for expansion, etc. shall conform to the standard details and recommendations of the following:

1. The Aluminum Association.

2. Federal Specifications.

3. ASTM.

4. Architectural Sheet Metal Manual, latest edition as published by the Sheet Metal and Air Conditioning Contractors National Association, Inc.

**PART 2 - PRODUCTS**

**2.01 - MATERIALS**

A. Flashing, counter flashing, flashing associated with mechanical and plumbing items and material for trim capping.

1. Material: Continuous sheet, ASTM B209, .040 inch thickness. Coil stock will not be permitted. Provide proper size material to cap scheduled items, 20 inch width minimum for roof flashing.

2. Mill finish for all roof penetration flashing.

3. Finish – shop precoated with Kynar 500 or Hylar 5000 baked enamel finish.

4. Flashing Nails: Standard round wire roofing type, hot dipped zinc coated steel; minimum 19/64 inch head diameter and 0.104 inch shank diameter; of sufficient length to penetrate through roof sheathing into wood substrate. Screws, bolts and nuts for fastening aluminum sheet metal work shall be made of aluminum alloys 6061-T6. Washers of similar material shall be used to prevent tearing of sheet metal.

B. Aluminum Sill: .040 aluminum continuous sheet sill, where indicated on drawings.

C. Aluminum Capping: .032 Aluminum sheet material, color as selected by Owner.

D. Nails for fastening aluminum sheet metal work shall be made of aluminum alloys 6062 or 5056 meeting Federal Specification FF-N-105, Type 2, Style 20. Screws, bolts and nuts for fastening aluminum sheet metal work shall be made of aluminum alloys 6061-T6. Washers of similar material shall be used to prevent tearing of sheet metal.

**2.02 - ACCESSORIES**

A. Sealant: Specified in Section 079000 – Joint Sealants.

B. Slip Sheet: Resin paper.

**2.03 – FABRICATION**

A. Form sections true to shape, accurate in size, square and free from distortion or defects.

B. Fabricate cleats, interlockable with sheet.

C. Form pieces in longest possible lengths, in single-length sheets. Short lengths or splices will be unacceptable.

D. Hem exposed edges on underside ¼ inch, miter and seam corners.

E. Fabricate vertical faces with bottom edge formed outward ¼ inch and hemmed to form drip.

F. Form corners from one piece with 18 inch minimum legs. Solder joints.

G. Prime and paint all wood trim scheduled to receive capping.

H. Form flashings to protect roofing materials from physical damage and to shed water. Seal metal joints.

I. Apply bituminous paint on concealed surfaces of flashings.

**PART 3 - EXECUTION**

**3.01 - FABRICATION**

A. All metal flashing and trim work shall be fabricated in strict accordance with the detailed drawings and with best trade practices. Ends of fabricated sheets shall be fastened to make joints watertight and still provide for expansion and contraction. Lines and angles shall be sharp and true. Plane surfaces shall be free from waves and buckles. No oil canning shall be accepted in finished work. Seams shall be watertight.

**3.02 - EXAMINATION**

A. Section 013100 – Project Management and Coordination: Verification of existing conditions before starting work. Inspect all surfaces to which metal or metal accessories are to be installed. Do not install metal work unless such surfaces are sound, dry, clean and free of defects that might be detrimental to the metal work. Report any unacceptable conditions to the Architect/Engineer in writing before commencing work.

B. Protect contact areas of dissimilar metals with heavy asphalt or other approved coating, specifically made to stop electrolytic action.

C. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets are in place, and nailing strips located.

D. Verify membrane termination and base flashings are in place, sealed, and secure.

E. Beginning of installation means acceptance of existing conditions.

F. Field measure site conditions prior to fabricating work.

**3.03 - INSTALLATION**

A. Flashing shall be installed in strict accordance with trade practices. Completed installation shall be true to line with shapes undistorted, not damaged, and with properly shaped angles. Provide expansion joints and other means for relieving stresses from expansion and contraction of the material.

B. Install work watertight, without waves, warps, buckles, fastening stress, or distortion, allowing for expansion and contraction.

C. All accessories or other items essential to the completeness of sheet metal installation, whether specifically indicated or not, shall be provided and of the same material as item to which applied.

D. Flashing set into masonry shall be sealed with mortar. Tool joints tight and smooth.

E. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

F. Seal joints watertight.

G. Prime paint all wood trim scheduled to receive capping.

**3.04 - MANUFACTURED SHEET METAL SYSTEMS**

A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer’s recommendations.

B. Furnish and install manufactured sheet metal systems in strict accordance with manufacturer’s printed instructions.

**3.05 - SHOP FABRICATED SHEET METAL**

A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.

B. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.

C. Hem exposed edges. Angle bottom edges of exposed vertical surfaces to form drip.

D. All corners for sheet metal shall be lapped with adjoining pieces fastened and set in sealant.

E. Install sheet metal to comply with Architectural Sheet Metal manual, Sheet Metal and Air Conditioning Contractor's National Associations, Inc.

**3.06 - ERECTION TOLERANCES**

A. Maximum Variation from Alignment: 1/8 inch.

**3.07- GUARANTEE**

A. The Contractor shall guarantee that all materials and workmanship provided by this section shall be guaranteed free of defects for a period of two (2) years from date of acceptance. Any defects arising within this period shall be promptly corrected without additional cost. This is in addition to the manufacturer's warranty.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Provide Gutters and Downspouts and all associated Gutter and Downspouts accessories and components in accordance with the Contract Documents and as required to provide a complete and first-class installation. The work of this section shall include, but not be limited to the following:

1. Gutters and Downspouts.
2. Accessories.

### 1.02 - RELATED SECTIONS

A. Section 06 20 00 - Finish Carpentry.

B. Section 07 53 00 - Asphalt Shingles.

C. Section 07 62 00 - Flashing and Trim.

### 1.03 - REFERENCES

A. ASTM B32 - Solder Metal.

B. ASTM B209 - Aluminum and Aluminum Alloy Sheet and Plate.

C. SMACNA - Architectural Sheet Metal Manual.

### 1.04 - SUBMITTALS

A. Submit under provisions of the Division 1.

B. Product Data: Provide data on prefabricated components and color options.

C. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods and installation details.

D. Submit one full sized sample 12" long of each leader and gutter illustrating component design, finish color and configuration.

### 1.05 - REGULATORY REQUIREMENTS

A. Conform to applicable code(s) for size and method of rain water discharge.

### 1.06 - DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of the Division 1.

B. Stack preformed and prefinished material to prevent twisting, bending or abrasion, and to provide ventilation. Slope to drain.

C. Prevent contact with materials during storage which may cause discoloration, staining or damage.

**1.07 - COORDINATION**

A. Coordinate work under provisions of the Division 1.

B. Coordinate the work with downspout discharge pipe inlets, where applicable.

**PART 2 - PRODUCTS**

**2.01 - MANUFACTURERES**

A. Design is based on products manufactured by ATAS International, Inc. 6612 Snowdrift Road, Allentown, PA 18106. Telephone: 610-395-8445.

B. Or approved equal.

**2.01 - MATERIALS**

A. Aluminum Gutter: ASTM B209, 3003 alloy, H14 temper, 0.040 inch shop finished kynar 500 fluoropolymer paint coating, color to be selected by Architect from manufacturer's full product line.

B. Aluminum Downspout: ASTM B209, 3003 alloy, H14 temper, 0.032 inch shop finished kynar 500 fluoropolymer paint coating, color to be selected by Architect from manufacturer's full product line.

**2.02 - COMPONENTS**

A. Gutters: 4" Box Gutter (or min. size as otherwise indicated on Contract drawings).

B. Downspouts: SMACNA Rectangular profile and sized to match gutters.

C. Accessories: Profiled to suit gutters and downspouts.

**2.03 - ACCESSORIES**

A. Anchorage Devices: Type recommended by fabricator.

B. Gutter Supports: Concealed straps, sized and fastened as appropriate for condition encountered.

C. Downspout Supports: Concealed straps.

D. End Caps, Elbows: Fabricate to gutter profile.

E. Fasteners: Aluminum finish exposed fasteners same as flashing metal.

F. Leaf Screen: Dome wire guard, 10 gauge welded screen, galvanized after fabrication, sized to fit downspout openings.

G. Primer: Zinc chromate type.

H. Protective Backing Paint: Bituminous.

I. Splash Block: Provide a precast concrete splash block at each downspout location.

**2.04 - FABRICATION**

A. Form gutters and leaders to profiles and sizes indicated in accordance with approved shop drawings.

B. Fabricate with required connection pieces.

C. Form sections square, true and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Design for expansion at joints.

D. Hem exposed edges of metal.

E. Solder shop formed metal joints. After soldering, remove flux. Wipe and wash solder joints clean. Weather seal joints.

**2.05 - FINISHES**

A. Apply bituminous protective backing on surfaces in contact with dissimilar materials.

**PART 3 - EXECUTION**

**3.01 - EXAMINATION**

A. Verify existing conditions under provisions of the Division 1.

B. Verify that surfaces are ready to receive work.

**3.02 - INSTALLATION**

A. Install gutters and leaders, and accessories in accordance with manufacturer's instructions and approved shop drawings.

B. Slope gutters 1/8" per foot minimum.

B. Seal metal joints watertight.

C. Gutters to be fastened minimum 16" O.C.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Sealants and joint backing.

B. Perimeter of wall openings, joints and ends.

C. Joints of all material requiring caulking or sealants and to prevent water, moisture, and air infiltration.

### 1.02 – REFERENCES

A. ASTM C790 - Use of Latex Sealing Compounds.

B. ASTM C804 - Use of Solvent-Release Type Sealants.

C. ASTM C834 - Latex Sealing Compounds.

D. ASTM D1056 - Flexible Cellular Material - Sponge or Expanded Rubber.

E. SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specifications.

### 1.03 – SUBMITTALS

A. Submit under provision of Section 013300.

B. Manufacturer's complete descriptive data and color availability.

C. Manufacturer’s installation instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.

D. Submit schedule of all conditions and joints requiring caulking and sealant proposed for each condition.

### 1.04 - QUALITY ASSURANCE

A. Perform work in accordance with sealant manufacturer’s requirements for preparation of surfaces and material installation instructions.

B. All work shall be performed by a qualified caulking and sealant contractor, who has specialized in this type of work for a minimum of five (5) years. Provide a minimum of five (5) references to the engineer for review and approval.

**1.05 - PERFORMANCE REQUIREMENTS**

A. Install sealants to prevent air and moisture from infiltrating or migrating from the building exterior to the interior.

**1.06 – PROTECTION**

A. Mask surrounding surfaces.

B. Protect sealants until cured.

**1.07 - ENVIRONMENTAL REQUIREMENTS**

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

**1.08 – COORDINATION**

A. Coordinate the work with all sections referencing this section.

**1.09 – WARRANTY**

A. The products covered under this Section shall be covered by the manufacturer's standard 5 year warranty and include coverage for installed sealants and accessories which fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

**PART 2 - PRODUCTS**

**2.01 - SEALANT MANUFACTURERS**

A. Sealants shall be manufactured by Bostik, TPI, 3M, DOW CORNING or equal.

**2.02 – SEALANTS**

A. Acrylic latex sealant (Interior): ASTM C920, paintable grade; single component, solvent curing, non-staining, non-bleeding, non-sagging.

B. Polyurethane sealant (Exterior): ASTM C92C, multi-component, chemical curing, non-staining, non-bleeding, non-sagging.

C. Caulking compounds shall be non-staining. Selection based upon manufacturer's recommendations for type of surface material and submitted to the Architect/Engineer for approval.

D. Butyl: One part butyl non-sagging, FSTT-5-1657.

E. One Part Silicone: ASTM C920, Type 5, Grade HS, Class 75, vertical surfaces.

F. Backing material shall be inserted into joint to the proper depth to allow for the proper balance of joint and sealant dimensions. Avoid excessive longitudinal stretching of rods during installation.

**2.03 – ACCESSORIES**

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint cleaner: Non-corrosive and non-staining type, as recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint backing: Round, closed cell polyethylene foam rod, oversized 50% larger than joint width; as recommended by sealant manufacturer; and compatible with sealant.

D. Bond breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

**PART 3 - EXECUTION**

**3.01 – EXAMINATION**

A. Verify that substrate surface and joint openings are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

**3.02 – PREPARATION**

A. Remove loose materials and foreign matter which might impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer’s instructions.

C. Perform preparation in accordance with manufacturer’s instructions and ASTM C1193.

D. Protect elements surrounding the work of this section from damage or disfiguration.

E. Apply masking tape. Do not allow tape to touch surface to which caulking or sealant is to be applied.

**3.03 – INSTALLATION**

A. Perform installation in accordance with sealant manufacturer’s requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Install sealant to achieve performance requirements, in accordance with manufacturer's instructions.

D. Measure joint dimensions and size material to achieve required 2:1 width/depth ratios.

E. Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.

F. Remove masking tape immediately after tooling of sealant is accomplished and before surface skin has started to form.

G. Install bond breaker where joint backing is not used.

H. Install sealant free of air pockets, foreign embedded matter, ridges and sags.

I. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

J. Apply sealant in continuous uniform bed.

K. Tool joints concave, flush with surface of adjoining material.

L. Match color of sealant to adjoining material.

**3.04 – CLEANING**

A. Comply with the requirements of Section 017423.

B. Clean adjacent soiled surfaces.

**3.05 - PROTECTION OF FINISHED WORK**

A. Protect sealants until cured and until project completion.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Interior and exterior fire rated and non fire rated metal door frames.

B. Interior and exterior fire rated and non fire rated metal doors.

C. Accessories and fittings to be included with the doors and frames are anchors, spreaders, floor clips, cutouts for hardware, and reinforcing for hardware.

D. Grouting of hollow metal door frames with gypsum materials prior to setting frames.

E. Coordinate with Owner's security system installer for required factory preparations and site installations for doors and frames scheduled to receive security items.

### 1.02 - RELATED SECTIONS

A. Section 042200 - Concrete Unit Masonry.

B. Section 079000 - Caulking and Sealants.

C. Section 087100 - Finish Hardware.

D. Section 088000 – Glass and Glazing.

E. Section 099000 – Painting.

### 1.03 - SUBMITTALS

A. Section 013300: Submittals: Procedure for submittals.

B. Shop drawings: fully describe and locate all items being furnished and include large scale details of principal construction features and internal reinforcement. Indicate frame elevations, hardware, reinforcement, anchor types and spacings, location of cut-outs for hardware, and finishes.

C. Product Data: Indicate frame configuration and finishes.

### 1.04 - SITE STORAGE AND PROTECTION OF MATERIALS

A. Section 016500: Product Delivery, Storage and Handling: Transport, handle, store and protect product.

B. Any scratches or disfigurement caused in shipping or handling are to be promptly cleaned and touched up with a rust-inhibitive primer, and materials are to be properly stored on planks or dunnage, out of water, and covered to be protected from damage due to any cause.

C. Doors shall have their wrappings or coverings removed upon arrival at the building site and shall be stored in a vertical position, spaced by blocking to permit air circulation between them.

D. Provide packaging, separators, banding, spreaders and paper wrappings as required to completely protect all frames during transport and storage.

**1.05 - PROJECT CONDITIONS**

A. Section 013100: Project Management and Coordination.

B. Coordinate the work with frame opening construction, door and hardware installation.

**1.06 - PERFORMANCE REQUIREMENTS**

A. Fire Rated: UL listed, Classes of frames and doors A, B, C, also as indicated on Drawing Schedules. All doors and frames in fire rated walls are to match wall ratings as required by applicable codes, whether or not they are indicated in the door schedule.

B. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.

**PART 2 - PRODUCTS**

**2.01 - MANUFACTURERS**

A. CURRIES

B. Or approved equal

**2.02 - HOLLOW METAL DOORS**

A. Model: 707-N exterior insulated doors, 747-N interior doors.

1. Materials: Doors shall be made of commercial quality, level, cold-rolled steel conforming to ASTM Specification A366-66T and free of scale, pitting or other surface defects. Face sheets for all doors shall not be less than 16 gauge and shall be zinc-coated.

2. Exterior Door Insulation: Polystyrene core, formed in place.

3. Interior Door Insulation: Fiberglass, between stiffeners.

4. Provide label doors as required.

B. Design and Construction:

1. All doors shall be custom made, of the types and sizes shown on approved shop drawings, and shall be fully welded seamless construction with no visible seams

or joints on their faces or vertical edges. Minimum door thickness shall be 1-3/4 inches.

2. All doors shall be strong, rigid and neat in appearance, free from warpage and buckle. Corner bends shall be true and straight and of minimum radius for the gauge of metal used.

3. Face sheets shall be stiffened by continuous vertical formed steel sections occupying the full thickness of the interior space between door faces. These stiffeners shall not be less than 22 gauge, spaced not more than 6 inches apart and securely attached to both face sheets by spot welds not more than 4 inches on center. Spaces between stiffeners shall be sound-deadened and insulated the full height of the door with an inorganic noncombustible material.

4. Door faces shall be joined at their vertical edges by a continuous weld extending the full height of the door. All such welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.

5. Top and bottom edges of all doors shall be closed with a continuous recessed steel channel not less than 16 gauge, extending the full width of the door and spot welded to both faces. Exterior doors shall have an additional flush closing channel at their top edges, and where required for attachment of weatherstripping, a flush closure also at their bottom edges.

6. Openings shall be provided in the bottom closure of exterior doors to permit the escape of entrapped moisture.

7. Edge profiles shall be provided on both vertical edges of doors as follows:
   a. Single-Acting Swing Doors - Beveled 1/8 inch in 2 inches.

8. Hardware Reinforcements.
   a. Doors shall be mortised, reinforced, drilled and tapped at the factory for fully templated hardware only, in accordance with the approved hardware schedule and templates provided by the hardware contractor. Where surface-mounted hardware is to be applied, doors shall have reinforcing plates only; all drilling and tapping shall be done by others.
   b. Minimum gauges for hardware reinforcing plates shall be as follows:
      1. Hinge and Pivot Reinforcements - 7 gauge.
      2. Reinforcements for lock face, flush bolts, holders, concealed or surface mounted closers - 12 gauge.
      3. Reinforcements for all other surface-mounted hardware - 16 gauge.

9. Astragals (where double-doors are indicated) shall be full height, full welded to face of active leaf.

C. Finish: After fabrication, all tool marks and surface imperfections shall be dressed, filled and sanded as required to make all faces and vertical edges smooth, level and free of all irregularities. Doors shall then be chemically treated to insure maximum paint adhesion and shall be coated on all exposed surfaces, with a rust-inhibitive primer which is fully cured before shipment.

**2.03 - HOLLOW METAL FRAMES**

A. Frame Material

1. Frames for exterior openings shall be made of commercial grade cold-rolled steel conforming to ASTM Designation A366-66T, not less than 16 gauge, and shall be zinc-coated.

2. Frames for interior openings shall be either commercial grade cold-rolled steel conforming to ASTM Designation A366-66T or commercial grade hot-rolled and picked steel conforming to ASTM Designation A569-66T and shall be zinc coated. Metal thickness for frames shall be not less than 16 gauge.

3. Provide labeled frames to match label of all labeled doors.

B. Design and Construction:

1. All frames shall be custom made welded units with integral trim, of the sizes and shapes shown on approved shop drawings, knocked-down frames will not be accepted.

2. All finished work shall be strong and rigid, neat in appearance, square, true and free of defects, warp or buckle. Molded members shall be clean cut, straight and of uniform profile throughout their lengths.

3. Jamb depths, trim, profile and backbends shall be as scheduled by the Architect/Engineer and detailed on approved shop drawings. The two bottom legs of the door frame shall touch (be in contact with) the concrete slab in all openings. In the case where one leg is longer than the other due to the unevenness of the concrete floor, it is required of the Contractor to cut this leg so as both legs are in contact with the floor surface.

4. Corner joints shall have all contact edges closed tight, and stop mitered. The use of gussets will not be permitted.

5. Minimum depth of stop shall be 5/8 inch.

6. Hardware Reinforcements:
   a. Frames shall be mortised, reinforced, drilled and tapped at the factory for fully templated hardware only, in accordance with the approved hardware schedule and templates provided by the hardware contractor. Where surface-mounted hardware is to be applied, doors shall have reinforcing plates only; all drilling and tapping shall be done by others.
   b. Minimum thickness of hardware reinforcing plates shall be as follows:
      1. Hinge and Pivot Reinforcements - 3/16 inch, 1-1/4 inches x 10 inches minimum.
      2. Strike Reinforcements - 1/8 inch.
      3. Closer Reinforcements - 1/8 inch.
      4. Flush Bolt Reinforcements - 1/8 inch.
      5. Reinforcements for Surface-Mounted Hardware - 1/8 inch.

7. Hardware Cutouts
   a. Provide cutouts for frames and doors as required.
   b. Provide security cutouts in frames scheduled to receive security hardware.

8. Floor Anchors:
   a. Full width of frame floor anchor clips shall be securely welded inside each jamb, with two holes provided at each jamb for floor anchorage.
   b. Minimum thickness of floor anchors shall be 16 gauge.

9. Jamb Anchors:
   a. Frames for installation in masonry walls shall be provided with adjustable jamb T-Strap anchors. Anchors shall be not less than 16 gauge steel. Straps shall be not less than 2 inches x 10 inches in size, corrugated and/or perforated.
   b. Frames for installation in stud partitions shall be provided with steel anchors of suitable design, not less than 18 gauge thickness, securely welded inside each jamb as follows:
      1. Frames up to 7'-6" height - 3 anchors.
   c. The number of anchors provided on each jamb shall be as follows (typical for all wall construction types):
      1. Frames up to 7'-6" height - 3 anchors.
      2. Frames 7'-6" to 8'-0" height - 4 anchors.

3. Frames over 8'-0" height - 1 anchor for each 2 feet or fraction thereof in height.

10. Frames over 4’-0" wide for installation in masonry walls shall have an angle or channel stiffener, not less than 12 gauge and not longer than the opening width, welded into the head at the factory. Such stiffeners shall not be used as lintels or load-carrying members.

11. Dust cover boxes, or mortar guards, of not thinner than 26 gauge steel shall be provided at all hardware mortises on frames to be set in masonry or gypsum board partitions.

12. All frames shall be provided with a steel spreader temporarily attached to the feet of both jambs to serve as a brace during shipping and handling.

13. Prepare frames for silencers. Provide three single silencers for single doors and mullions of double doors on strike side. Provide two single silencers on frame head at double doors without mullions.

C. After fabrication, clean frames and treat against corrosion with one coat of rust inhibitive primer baked on. Final field coats of paint are to be applied under Section 09900.

D. Primer: Zinc chromate type.

**2.04 - CLEARANCES**

A. Edge clearances unless otherwise indicated on drawings shall be provided as follows:

1. Between Doors and frames, at head and jambs - 1/8 inch.

2. At Door Sills: Where no threshold is used - 3/8 inch. Maximum to finish floor, where threshold is used - 1/4 inch maximum between door and threshold.

3. Between meeting edges of pairs of doors - 1/8 inch.

**PART 3 - EXECUTION**

**3.01 - EXAMINATION**

A. Division 01: verification of existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Coordinate installation of door, door hardware and frames.

**3.02 - INSTALLATION**

A. Install doors and frames in accordance with ANSI/SDI 100 and manufacturer's instructions.

B. Install all door louvers, and vision panel openings plumb and level.

C. Coordinate installation of doors with installation of frames and hardware specified.

D. Coordinate installation of frames with installation of Owner's security system features.

E. Coordinate with masonry and steel stud wall construction for anchor placement.

F. Protect materials to prevent scratching, twisting, denting or otherwise damaging.

**3.03 - ERECTION TOLERANCES**

A. Maximum Diagonal Distortion: 1/16-inch measured with straight edge, corner to corner.

**3.04 - ADJUSTING**

A. Adjust door for smooth and balanced door movement.

**3.05 - SCHEDULE**

A. Refer to door and frame schedule on Contract Drawings or hardware schedule as referenced in specifications.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Access doors.

B. Ladder up post safety post

### 1.02 - SUBMITTALS

C. Submit under provisions of Section 013300.

D. Indicate on shop drawings plan layout, construction details and required clearances.

## PART 2 - PRODUCTS

### 2.01 – MANUFACTURERS

A. USF Fabrication, Hialeah, FL. , or approved equal.

B. BILCO Company, New Haven, CT., or approved equal.

### 2.02 – ACCESS DOORS

A. Fabricate frames of 1/4-inch thick aluminum channel with anchor flange round the perimeter.

B. Fabricate door leaf of 1/4-inch aluminum diamond plate reinforced with aluminum stiffeners as required to withstand live load indicated in schedule

C. Hinges: Heavy duty, bolted to underside of door.

D. Doors shall open to 90° and lock automatically in that position. Provide stainless steel pins compression spring operators for easy operation. Provide a vinyl grip handle to release the cover for closing. Doors shall not protrude into the channel frame when open.

E. Doors shall close flush with frame and rest on built in neoprene cushion/gasket.

F. Equip doors with a stainless steel slam lock. Provide two (2) removable square key wrenches.

G. Hardware and safety chain: 316 stainless steel.

H. Factory Finish: Mill finish with bituminous coating applied to exterior of frame.

I. Protective grating panel as manufactured by USF Fabrication, of Hialeah, Florida

1. Secondary protective grating panel shall be 1-1/2-in. “I” bar aluminum grating.

2. Grating panel color and finish shall be Safety Orange powder- coating.

3. Grating panel shall be two part, hinged and shall be supplied with positive latch to maintain unit in an upright position. Panel shall be hinged to open in the same direction of the access door(s) to limit obstruction of the opening.

4. A 4-in. by 6-in. viewing area shall be provided on each lateral unhinged side of grating panel, for visual observation and limited maintenance procedures.

5. On 300 lbs. psf load rating access covers, only, grating support ledges shall incorporate nut rail feature supplied with minimum of four (4) stainless steel spring nuts for mounting pump brackets and/or cable holders.

6. A padlock hasp for owner-supplied padlock shall be provided.

J. Guarantee access doors against defects in material and workmanship for a period of ten (10) years.

**2.03 - LADDER UP SAFETY POST**

A. Post shall be high strength, type 304 stainless steel tubing, mil finish, with a pull-up loop at its upper end.

B. All hardware shall be type 316 stainless steel, unless noted otherwise.

C. Up and down movement shall be controlled by a stainless steel balancing spring mechanism.

D. Post shall lock automatically when extended, and a release lever must be activated to disengage the post to permit the return to the lowered position.

**2.04 – RETRO FIT SAFETY GRATING**

A. Grating shall be “I” bar construction

B. T-316 stainless steel hardware

C. Spring loaded lifting handle

D. 300 lbs./ft2 load rating

E. Hinged with positive latch to maintain upright position

F. Safety orange powder coating finish

G. Shall allow for installation, regardless of existing hatch manufacturer

H. Retrofit grating shall be Halliday Products Series X Retro-Grating, or equal

**PART 3 - EXECUTION**

**3.01 - INSTALLATION**

A. Install access doors in accordance with manufacturer's instructions.

B. Pipe channel frame drain away from inside of structure.

**END OF SECTION**

## PART I - GENERAL

### 1.01 - SECTION INCLUDES

A. Hardware for all new hinged hollow metal doors.

B. Door silencers for metal door frames.

C. Door stops, floor or wall type as required.

D. Door closers for all exterior and fire rated doors, and where indicated on schedule and in specification.

E. Aluminum Threshold saddles for hollow metal doors.

F. Weather-stripping for hollow metal doors as indicated in specification.

G. Accessories and miscellaneous trim for hollow metal doors as indicated in specification.

H. Includes Owner's standard keying for security control.

I. Coordinate with Owner's security system installer and items to be furnished by Owner's security system installer.

### 1.02 - RELATED SECTIONS

A. Section 042200 - Concrete Unit Masonry.

B. Section 081113 - Hollow Metal Doors and Frames.

### 1.03 - GENERAL REQUIREMENTS

A. Keying:

1. General - Locks must incorporate a security system to ensure that keys are used during construction will not open doors after Owner occupancy. Coordinate locks with Owner's standard keying.

2. Construction keys and inserts - Permanent cylinders with construction inserts are to be assembled into and shipped with all exterior-door locksets. Construction keys are to be shipped with the door locks. Construction insert-extractor keys are to be shipped to the Owner via Registered Mail. Prior to substantial completion, the Contractor shall collect all construction keys and, in the presence of the Owner or Architect, remove the construction

inserts from the lock cylinders and give all construction keys and inserts to the Owner or Architect.

**1.04 - SUBMITTALS**

A. Comply with the requirements contained in Section 013300.

B. Submit detailed door hardware schedule.

C. Submit catalog cut sheets of all items for approval before ordering. Hardware sets will not be considered for approval without cut sheets.

D. Submit necessary templates to door manufacturers, and to any other manufacturer as needed.

**1.05 - DELIVERY, STORAGE, AND PROTECTION**

A. Comply with the requirements contained in Section 016500.

B. Packing and marking: Package each item of hardware and each lock set separately in individual containers, complete with necessary screws, keys, instructions, and installation template for spotting mortising tools. Mark each container, identifying installation location of each item. Keep knobs suitably covered during construction period.

**1.06 - PROJECT CONDITIONS**

A. Coordinate the work with Owner’s security system installer and other directly affected Sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.

B. Coordinate Owner’s keying requirements during the course of the Work. Furnish the Owner with five (5) keys per door. Key door cylinders to match Owner's master cylinder.

**1.07 - WARRANTY**

A. Provide manufacturer’s standard warranty for all hardware.

**1.08 - MAINTENANCE PRODUCTS**

A. Provide special wrenches and tools applicable to each different or special hardware component.

B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

**PART 2 - PRODUCTS**

**2.01 - MATERIALS (GENERAL)**

A. Bolts, screws and other fastenings required for the application of the finish hardware shall be of size and type to fit requirements and shall be of same material and finish as the exposed parts of the hardware which they fasten.

B. Door hardware: Hand of lock shall be as required. If door hand is changed by proper bulletin or change order before hardware is delivered, furnish such hardware items at no additional expense to Owner.

C. Strikes: Furnish curved lip strikes with dust box of sufficient length to protect trim on all locks or latches.

D. Silencers: Use GJ 64, GJ 65 for doors, three at single doors, four at pairs of doors on metal frames. Install in pre-drilled jamb holes.

E. All locks, locksets, latchsets, and bolts shall conform to Federal Specification FF-H-106a/ANSI. All locks shall accept interchangeable, removable cores.

1. All locks shall be keyed to the District's key system.

2. Locksets for security doors are not permitted to have an offset latch.

**2.02 - DOOR HARDWARE**

A. Cylindrical Locksets: Lever handle, ND Series as manufactured by Schlage or approved equal – Rhodes Lever- function as noted – 626 Satin Chromium Plated Finish (typical). Coordinate door strike and door strike package for doors scheduled to receive Owner's security system with Owner's security system installer.

1. Passage Function

B. Exit Device (exterior): Single leaf – Von Duprin 35A-NL-F, 626 finish.

C. Hinges: (All hinged doors) Stainless steel 4-1/2" x 4-1/2" heavy weight ball bearing, non-rising stainless steel pin, Model FBB199-32D, manufactured by STANLEY or approved equal, steel machine screws furnished by hinge manufacturer.

D. Closer: Parallel arm application, extra duty hold open (HEDA), cush-n-stop and spring cush features, adjustable opening to 180 degrees, Series 4041, 689 finish with SRI pretreatment coating, manufactured by LCN or approved equal.

E. Door Bottom: Full mortise, Model DB591A-U, polyurethane insert, manufactured by REESE or approved equal.

F. Weather-Stripping: (All exterior doors) Self-adhesive polypropylene, Model 161NA as manufactured by NGP or approved equal.

G. Exterior Threshold: Aluminum Model 896N as manufactured by NGP or approved equal.

H. Interior Threshold: Aluminum Model 425 as manufactured by NGP or approved equal.

I. Kick Plate: .050" thick, stainless steel, satin finish, both sides of door, 8" high, full width of door, bevel edges, Model 8400, manufactured by H.B. IVES or approved equal. Stainless steel screws furnished by plate manufacturer.

J. Stops: Provide hinge, wall or floor stop for each door as required to suit field condition. Stops to be by IVES.

K. Provide matching strikes, screws and brackets for all hardware.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Verify that doors and frames are ready to receive work and dimensions are as indicated.

### 3.02 - INSTALLATION

A. Install hardware in accordance with manufacturer's instructions.

B. Use templates provided by hardware item manufacturer.

C. For installation, removal for purpose of painting, and re-installing, refer to Section 062000 - Finish Carpentry.

### 3.03 - ADJUSTING

A. Adjust hardware for smooth operation.

### 3.04 - PROTECTION OF FINISHED WORK

A. Do not permit adjacent work to damage hardware or finish.

### 3.05 - HARDWARE SCHEDULE

**Type 1- Entry/Exit**
**(Door 02)**
3 Hinges

Exit Device (exterior) – rim exit device with pull trim (Entry/Exit Function)
Exterior Threshold
Kick Plate (only interior side)
Closer
Weather-stripping
Door bottom

**Type 2- Passage (FR Wall)**
**(Door 01)**
3 Hinges
Lockset – Passage Function
Closer
Interior Threshold
Kick Plate (both sides)
Silencers

**Type 3- Passage**
**(Door 03)**
3 Hinges
Lockset – Passage Function
Closer
Wall Stop
Interior Threshold
Kick Plate (both sides)
Silencers

(Refer to general hardware specification information for all other requirements)

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

Provide Glass & Glazing and all associated Glass & Glazing accessories and components in accordance with the Contract Documents and as required to provide a complete and first class installation. The work of this section shall include, but not be limited to the following:

1. Glass and glazing for all hollow metal door vision panels.

2. All related items to complete the glazing installation.

### 1.02 - RELATED SECTIONS

A. Section 079200 – Caulking and Sealants.

B. Section 081113 – Hollow Metal Doors and Frames.

### 1.03- SAMPLES

A. Submit for approval single samples of 12” x 12” size of each kind of glass required. Samples shall have included all proposed reflective coating’s and tinting and be assembled with appropriate spacers. Each sample shall bear a label indicating the kind and quality of the glass, type and manufacturer of coatings, if any, and the name of the glass manufacturer.

B. Submit product data: identify glazing system, glazing accessories and material, glass composition and emissivity rating.

C. Provide certificates of compliance from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements. Separate certification will not be required for glazing materials bearing manufacturer’s permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.

D. Provide Product Test Listings: From a qualified testing agency indicating fire-rated glass complies with requirements, based on comprehensive testing of current product.

E. Design Data: Provide glass size calculations, prepared in accordance with specified method.

### 1.04 – DESIGN REQUIREMENTS

A. Verify glass sizes specified can withstand dead loads and positive and negative live loads acting normal to plane of glass in accordance with ASTM E1300.

B. Verify glass deflection limit is within ¾ inch or within flexure limit of glass with full recovery of glazing materials, whichever is less.

**1.05 - WARRANTY**

A. It is the obligation of the supplier and/or subcontractor to replace all glass that cracks, breaks and that develops any other undesirable characteristics that cannot be contributed to the Owner's activities or vandalism, within one year following the letter of Substantial Completion.

B. Provide ten-year warranty to include replacement of sealed insulating glass units exhibiting seal failure.

**1.06 – REFERENCES**

A. ANSI Z97.1 – Safety Performance Specifications and Methods of Test.

B. ASTM C162 – Standard Terminology of Glass and Glass Products.

C. ASTM C1036 – Standard Specification for Flat Glass.

D. ASTM C1048 – Standard Specification for Heat Treated Flat Glass.

E. ASTM C1172 – Standard Specification for Laminated Architectural Flat Glass.

F. ASTM C1193 - Standard Guide for Use of Joint Seals.

G. ASTM E330 – Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

H. ASTM E773 – Standard Test Method for Seal Durability of Sealed Insulated Glass Units.

I. ASTM E774 – Standard Specification for Sealed Insulated Glass Units.

J. ASTM E1300 – Standard Practice for Determining the Minimum Thickness and Type of Glass Required to Resist a Specified Load.

K. ASTM E 152 – Methods for Fire Tests of Door Assemblies.

L. CSFM 43-7 – Fire Tests for Doors and Window Assemblies.

M. FGMA GM – Glazing Manual.

N. FGMA SM – Sealant Manual.

O. NFPA 80 – Fire Doors and Windows.

P. NFPA 252 – Fire Tests of Door Assemblies.

Q. UL 10B – Fire Tests of Door Assemblies.

R. UL 10C – Positive Pressure Fire Tests of Door Assemblies.

**1.07 - QUALITY ASSURANCE**

A. Manufacturer, Flat Glass Materials: Minimum five years documented experience producing glass products specified in this section.

B. Fabricator, Sealed Insulating Glass Units: Minimum ten years experience producing sealed insulating glass units qualifying to IGCC CBA level.

C. Installer: Minimum five years documented experience installing products specified by this section, and approved by fabricator.

D. Glazing Standards: FGMA Glazing Manual and Sealant Manual.

E. Glass shall be as defined in, and in accordance with, Federal Specifications DD-G-451-a and Flat Glass Jobbers Association.

F. All glazing specified in this section shall conform to the local, state and federal codes and requirements. Glass type and thickness as indicated shall be adjusted as required to meet structural performance.

G. Fire Protective Rated Glass: Each lite shall bear permanent, non-removable label of UL certifying it for use in tested and rated fire protective assemblies.

H. Fire Protective Glazing Products for Door Assemblies: Products identical to those tested per ASTM E 152, labeled and listed by UL or other certification agency acceptable to authorities having jurisdiction.

**1.08 - TEMPERATURE**

A. Glaze only when temperature is 40° or higher.

## PART 2 - PRODUCTS

### 2.01 MATERIALS: GLASS

A. Glass products shall be as manufactured by Pilkington, Pittsburgh Plate Glass or Libby Owens-Ford, except as noted otherwise.

1. All glazing in doors, transoms, sidelights, all glazing within 18” of finished floor, all glazing within 8’ of grade, and glazing greater than 50 S.F. shall be tempered glass.

2. All exterior glazing to be 1” insulating, low emissivity type glass, tinted where indicated and as specified.

3. All insulated glass units to have warm edge Thermo Plastic Spacers.

4. Vision Glass for Hollow Metal Doors: Tempered 1/4" inch thick, commercial grade

### 2.02 FIRE PROTECTION-RATED GLAZING

A. Fire-Protection-Rated Glazing, General: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252 for door assemblies.

B. Monolithic Ceramic Glazing: Clear, ceramic flat glass; 3/16-inch (5-mm) nominal thickness.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. TGP; Firelite NT

b. Safti First; SuperLite C/P.

c. Schott North America, Inc.; Pyran

d. Vetrotech Saint-Gobain; SGG Keralite FR-R

### 2.03 GLAZING ACCESSORIES

A. Tapes shall be Tremco's 440 Tape or Polybutene 3MN-EC1201.

B. Sealants and tapes shall conform to N.A.A.M.M. Specification for classes of work involved.

C. Glazing sealant on exterior shall be TREMCO "Mono" or GENERAL ELECTRIC "Silicone Construction Sealant", color as selected by the Architect/Engineer.

D. All insulating glass units shall be guaranteed not to develop material obstruction to vision as a result of dust or film formation on the inner glass surfaces caused by failure of the hermetic seal, other than through glass breakage, within a 10-year period following acceptance of the project by the Owner.

E. Neoprene setting blocks and spacer shims as approved by manufacturer.

**2.03 - FABRICATION**

A. Shop fabricate all components.

B. Warm Edge Unit Construction Requirements:

1. Provide extrusion of CHEMETALL “Naphtotherm 82” (Thermo Plastic) with “Molecular Sieve Matrix as primary seal.

2. Provide Dow Corning 3-7509 or Dow Corning 3-0117 (for structural applications) as secondary seal.

3. The primary and secondary seal shall be continuous. No corner keys, welds, soldering or segmentation shall be allowed.

4. Insulating glass units must be certified through the Insulating Glass Certification Council (IGCC) to class CBA in accordance with ASTM E773 and ASTM E774.

5. Argon units are to be argon retentive according to construction method and test method above.

**PART 3 - EXECUTION**

**3.01 - PREPARATION**

A. Before starting installation examine work to receive glazing and report any unsatisfactory work.

B. Immediately prior to glazing, all surfaces shall be wiped clean and free of protective coatings, moisture, and dust.

**3.02 - SETTING AND INSTALLATION**

A. Install glazing as per manufacturer's written instructions.

B. Conform to the more stringent requirements as set forth in the following publications:

1. Latest Edition - "Glazing Manual" issued by Flat Glass Jobbers' Association and manufacturer's instructions.

2. Latest Edition - "Glass for Construction" as published by Libbey-Owens-Ford Company, January, 1978.

C. Install tempered glass with tong marks at the bottom of openings.

D. Glass shall be set without springing, and with an equal bearing on the entire width and length of each piece.

E. The actual sizes required shall be determined by measuring the frames to receive the glass. All glass shall be factory labeled.

F Glass shall be properly cut and set in accordance with the best practice of the trade.

G. Center glass in glazing rabbet to maintain recommended clearances at perimeter for expansion and contraction of each face of glass.

H. Whenever flat glass is over 50 united inches, maintain the centered position and the sealer thickness from glass to frame through the use of setting blocks at the sill and centering shims.

**3.03 - PROTECTION AND CLEANING**

A. After installation, protect exposed portions of aluminum surfaces from damage by grinding and polishing compounds, plaster, lime, acid, cement, or other contaminants.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Provide Louvers and all associated louver accessories and components in accordance with the Contract Documents and as required to provide a complete and first class installation. The work of this section shall include, but not be limited to fixed metal louvers, dampers, and frames.

### 1.02 - RELATED SECTIONS

A. Mechanical: Division 23.

### 1.03 - REFERENCES

A. AMCA 500 (Air Movement Control Association) - Test Method for Louvers.

B. ASTM B221 – Aluminum Alloy Extruded Bars, Rods, Wire, Shapes and Tubes.

C. SMACNA – Sheet Metal Manual

### 1.04 - PERFORMANCE REQUIREMENTS

A. Design and fabricate units to withstand wind lateral loads and snow loads.

### 1.05 - SUBMITTALS

A. Submit under provisions of Section 013300.

B. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens and frames.

C. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.

D. Samples: Submit two (2) samples, 2" x 2" in size illustrating finish and color of exterior and interior surfaces.

E. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

F. Equals will only be accepted if they meet or exceed the performance of specified louvers.

### 1.06 - QUALITY ASSURANCE

A. Perform work in accordance with AMCA Certification for louvers and dampers.

### 1.07 - FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings and instructed by the manufacturer.

### 1.08 – WARRANTY

A. Provide manufacturer's standard warranty.

B. Provide 20 year manufacturer's warranty against failure of Kynar finish.

### 1.09 - COORDINATION

A. Coordinate the Work with installation of flashings.

B. Coordinate the Work with installation of mechanical ductwork.

## PART 2 - PRODUCTS

### 2.01 - ACCESSORIES

A. Fasteners and Anchors: Stainless steel type.

B. Head and Sill Flashings: Roll formed to required shape, single length in one piece per location. Flashings: Of same material as louver frame.

C. Screens: Install screen mesh in shaped frame, reinforce corner construction, shop install to louver with fasteners. Screen shall be easily removed from the building interior.

D. Sealants: Type specified in Section 079000.

### 2.02 – COMBINATION LOUVERS

A. Louvers shall be 45° standard blade-combination exhaust louvers with integral gravity backdraft dampers. Dampers shall be approximately 4" deep.

B. Louvers shall be provided with insect screen.

C. Material: Extruded Aluminum 6063-T52 frame, stationary blade, and operable blade.

D. Face of Louver: Full width head and sill with blades contained within jambs.

E. Louver finish shall be Kynar 5000® PDVF or Hylar 5000®, color as selected by Owner.

F. Louvers shall be Type 377 as manufactured by Arrow United Industries or approved equal.

**2.03 - OPERABLE LOUVERS**

A. Louvers shall be adjustable type with blades on 4” centers. Louvers shall be provided with a motorized actuator for blade operation. Linkage to be concealed in channel out of air stream.

B. Louvers shall be fabricated to provide a minimum of (44%), of free area and bear the AMCA certified ratings program seal for air performance and water penetration. The rating shall show a beginning point of water penetration at .01 ounces per square foot of free area at a free area velocity of 974 feet per minute, (6886) cubic feet per minute, with .14 inches of water gauge pressure drop for air intake. Louvers shall have a full width sill with head and blades contained within jambs. Louver shall be approximately 4" deep.

C. Louvers shall be provided with insect screen.

D. Material: Extruded Aluminum 6063 – T6.

E. Louver finish shall be Kynar 5000® PDVF or Hylar 5000®, color as selected by Owner.

F. Louvers shall be Type EA-450-D as manufactured by Arrow United Industries or approved equal.

**2.04 – MOTORIZED DAMPER ACTUATORS**

A. Fast-acting, two-position actuators shall be of the power open, spring return direct coupled type for on/off damper control.

B. Damper actuator shall fail normally closed.

C. Die-cast aluminum housing shall allow for flush mounting to damper.

D. Timing at rated torque and voltage:

1. Drive Open: 15 seconds

2. Spring Close: 15 seconds

E. Motorized actuators shall be Model MS4120F1006 as Manufactured by Honeywell or approved equal.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Verify that prepared openings and flashings are ready to receive work and opening dimensions are as indicated on shop drawings and instructed by the manufacturer.

### 3.02 - INSTALLATION

A. Install louver assembly in accordance with manufacturer's instructions.

B. Install louvers level and plumb.

C. Install flashings and align assembly to ensure moisture shed from flashings and diversion of moisture to exterior.

D. Secure louvers in opening framing with concealed fasteners.

E. Install screens and frame to interior of louver where indicated.

F. Install perimeter sealant and backing rod in accordance with Section 079000.

G. Provide and locate louvers per contract drawings.

H. Provide automatic control dampers with motors at louver locations as called for on contract drawings.

I. Blank off and seal any sections of louvers not covered by the ductwork.

### 3.03 - ADJUSTING

A. Adjust work under provisions of Section 017500.

### 3.04 - CLEANING

A. Clean work under provisions of 017400.

B. Clean surfaces and components.

**END OF SECTION**

## PART 1 – GENERAL

### 1.01 - SECTION INCLUDES

A. Painting.

B. Paint before the installation of equipment and piping.

1. Only touch-up painting will be allowed after the installation of: equipment, pipes, grating, handrails, furnishings, panels, conduit, electrical boxes, electrical equipment, conduits, and the like.

2. All painting shall be performed before the work of others begins in a designated area. Sequence and schedule the work of the Contract so that all painting is performed at least 7 calendar days before the scheduled date of the work for other prime contractors.

3. Remove all paint materials and application equipment before the scheduled work by others commences.

C. The work of this Section includes painting all of the applicable work items that were installed or constructed as work of Contract G and Contract P. Structures and items that pre-existed before construction of this project will be painted by the Owner at a later date, unless damaged by the Contractor during the work, or unless noted otherwise.

D. Paint the following items:

1. Ferrous metals.

2. Concrete tank walls, new block walls and floor surfaces only if shown to be painted on the Contract Drawings and/or specified in the Schedule at the end of this Section.

3. Small diameter pipes, fittings and valves regardless of pipe material, except for stainless steel.

4. Exposed process pipes, valves, and fittings (large diameter piping) except stainless steel.

5. Miscellaneous mechanical and electrical equipment as specified herein.

6. Other surfaces specified in the Painting Schedule 099100-1 as modified below in paragraph 1.01 (F).

7. Paint the ceilings, walls and floors of the existing control building after all demolition is completed and before new equipment is installed: Control Building Pump and MCC

Rooms.

E. In addition, products specified to be painted in other Technical Specification Sections.

F. Items not scheduled for painting includes:

1. Buried concrete walls and other surfaces.

2. Anodized aluminum surfaces and grating.

3. Motors and equipment, such as pumps, motors, motorized valve actuators, etc. furnished in final coats by the factory.

4. Stainless steel.

5. Pre-finished surfaces.

G. Schedule and coordinate painting with other prime contractors, through the Engineer. Do not begin painting until other work and/or job conditions are completed to the satisfaction of the Engineer.

H. Comply with the requirements in the following Sections:

1. Section 013300 - Submittals

2. Section 016500 - Product Delivery, Storage and Handling

3. Section 033000 - Concrete

4. Section 055000 - Metal Fabrications

5. Section 096716 – Floor Coating System

**1.02 - REFERENCES**

A. New York State Department of Environmental Conservation for VOC Compliance.

B. The Society for Protective Coatings (SSPC) Volume 2

1. Chapter 2 - Surface Preparation

2. Chapter 5 - Paint Application Specifications

**1.03 - SUBMITTALS**

A. Comply with the requirements in Section 013300 - Submittals.

B. Submit the following:

1. Technical data sheets for each paint specified.

2. Color charts showing availability of each paint specified in the attached schedule.

3. Two (2) paper chip samples, illustrating range of colors available for each paint specified in the schedule.

**1.04 - EXTRA STOCK MATERIALS**

A. Furnish the following in accordance with the requirements in Section 016500:

1. One (1) gallon of each color, type, and surface texture used on the project regardless of the quantity actually applied. Store this spare paint where directed by the Engineer. Label each container with color, type, texture, and room location, in addition to the manufacturer's label.

2. Turn over this material to the Engineer/Owner prior to substantial completion.

**1.05 - QUALITY ASSURANCE**

A. The paint shall be furnished by one single supplier (paint manufacturer).

B. Consideration will only be given to suppliers who can demonstrate that their paint system 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.

**1.06 - DELIVERY, STORAGE AND HANDLING**

A. Comply with the requirements in Section 016500 - Product Delivery, Storage and Handling.

B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability. Deliver application instructions to the Engineer.

C. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

D. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

E. Cover all building openings to achieve specified temperatures. Furnish and install temporary heaters and electric feed to maintain room temperatures. The use of propane heaters will be allowed when approved by the Engineer.

**1.07 - WARRANTY**

A. Provide a warranty certificate from the paint applicator typed on company letterhead and signed by an officer of the paint applicator. The certificate shall be witnessed by a notary public in the state in which the company headquarters is located.

B. The applicator shall guarantee the paint system to be free from any defect for a period of one (2) years commencing on the date of substantial completion or, in the case of mechanical equipment and piping only, from the date the painted object was accepted by the Owner and placed into permanent operation.

C. During the guarantee period, if the paint system fails to perform or shows signs of a defective application, the applicator shall repaint such defective surfaces free of any and all charges. The cost of labor and all other expenses resulting from the repainting shall be borne solely by the paint applicator. The application of the paint system shall be covered under the Contractor's maintenance bond.

**PART 2 - PRODUCTS**

**2.01 - MANUFACTURERS**

A. Tnemec East, Inc. of Wilmington, MA.

B. Sherwin Williams

C. Approved equal

**2.02 - MATERIALS**

A. Refer to the schedule for a listing of the appropriate surfaces for each paint material. The following are the types of materials that shall be used based on Tnemec products:

1. Series 66HS Epoxoline Hi-Build Polyamidoamine cured epoxy

| | | |
|---|---|---|
| 2. | Series 1095 EnduraShield | Hi-Build Aliphatic Polyurethane |
| 3. | 280 Tneme-Glaze | 100% Solids, Hi-Build amine epoxy |
| 4. | 114 H.B. Tneme-Tufcoat | High Build Water Base Acrylic Epoxy |
| 5. | 46H-413 Hi-Build Tneme Tar | Hi-Build Coal Tar Epoxy |
| 6. | Series 1528 EnduraHeat | Hi Temperature coating |
| 7. | 156/157 Envirocrete | Waterbase elastomeric coating |
| 8. | 46-465 H.B. Tnemecol | Bitumastic below grade coating |
| 9. | 151-1051 Elasto-Grip FC | Flexible waterbase epoxy primer |
| 10. | Series 1254 EpoxoBlock | Cementitious block filler |
| 11. | 201 Epoxoprime | 100% Solids clear epoxy primer |
| 12. | Series 1 Omnithane | Aromatic Urethane with Miox |
| 13. | Series 1029 EnduraTone | Waterbase acrylic Polymer |
| 14. | 135 Chembuild | High Solids Polyamidoamine epoxy |
| 15. | Series FC20HS PotaPox | Polamidoamine Epoxy for potable water |
| 16. | 218 Mortar Clad | Waterbase epoxy, cementitious filler |
| 17. | 290 CRU | Chemical resistant polyester urethane |
| 18. | 1028 Enduratone | Waterbase acrylic coating |

B. Colors shall be as selected by the Engineer.

C. Provide all required ladders, scaffolding, drop cloths, maskings, scrapers, tools, sandpaper, dusters, cleaning solvents, and miscellaneous equipment as required to perform the work and achieve the results specified herein.

**2.03 – COLOR MIXING**

A. Mixing or tinting shall be done at the factory.

B. Site mixing shall be prohibited.

**PART 3 - EXECUTION**

**3.01 - EXAMINATION**

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

C. Apply exterior paint only when temperature exceeds 50 degrees F or as otherwise required by manufacturer and drying conditions are good and predicted to remain so for at least 24 hours.

D. Apply interior paint only when inside space and surface temperatures exceed 60 degrees F, or as required by manufacturer, and will be maintained above that point until paint has dried.

E. Provide and maintain application temperatures for all finishes.

F. Before painting is started in any area, the area shall be cleaned and excessive dust shall be removed from all areas to be painted. After painting operations begin in a given area, clean only with commercial heavy-duty vacuum cleaning equipment.

G. Finish concrete as specified prior to paint application.

H. Provide adequate illumination and ventilation in all areas where painting operations are in progress.

I. Verify the surfaces are ready to receive the work as required by the product manufacturer.

J. Before starting any work, carefully examine surfaces to receive paint finish for defects which cannot be corrected by the procedures specified herein and which might prevent satisfactory painting results. Work shall not proceed until such defects are corrected.

K. The commencing of work in a specific area only shall be construed as acceptance of the surfaces, and thereafter the Contractor's applicator shall be fully responsible for satisfactory work as required herein.

L. Test shop applied primer for compatibility with subsequent cover materials.

M. Do not begin work until surfaces to receive paint are dry, firm, sound, clean and free of defects or blemishes, which would adversely affect the quality or appearance of the finished work.

N. Beginning of work means the applicator accepts existing surface conditions.

O. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Masonry and concrete unit masonry: 12 percent.

2. Concrete floors and walls: 8 percent.

**3.02 - PREPARATION**

A. Prepare surfaces as specified in the schedule. Surface preparation of steel shall be in accordance with SSPC - Chapter 2 - Surface Preparation Specifications.

B. Galvanized surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

C. Uncoated ferrous surfaces: Remove scale by wire brushing and wash clean with solvent. Apply treatment of phosphoric acid solution. Prime paint after repairs.

D. Shop primed and existing previously painted steel surfaces: Sand and scrape to remove loose paint and rust, power tool clean, feather edges; clean surfaces with solvent. Prime bare steel surfaces.

E. Masonry: All joints shall be tooled slightly concave. After erection, remove mortar splatter. Voids and holes shall be patched and leveled flush with the surrounding surfaces, and be bagged to simulate surrounding texture. All masonry shall be installed with the intent that it will be painted.

F. Concrete: All exposed concrete shall be installed with the intent that it will be painted. Patch bug holes and honeycombed areas as specified in Section 033000.

G. Surface appurtenances: If allowed by the Engineer, remove or mask electrical plates, hardware, light fixture trim, escutcheons, fittings, and all other surfaces to be protected from paint prior to preparing surfaces or finishing.

H. Surfaces: Correct defects and clean surfaces, which affect work of this Section. Remove or repair existing coatings that exhibit surface defects.

I. Follow manufacturer’s recommendations for preparing surfaces to be primed and painted.

J. Clean and sand surfaces to be painted.

K. Mask, cover, or remove surfaces to be protected from paint. Protect electrical and mechanical equipment and systems not to be painted.

L. Do not paint over UL Labels, manufacturer installed equipment nameplates, factory installed nameplates and equipment identification plates.

M. Clean and remove scale, oil or grease from ferrous metal surfaces.

**3.03 - APPLICATION**

A. Apply paint in accordance with SSPC - Chapter 5 - Paint Application Specifications.

B. It is the intent that the above brand names and types of material will give complete coverage with uniform appearance. If any additional coat is necessary for complete coverage and appearance, it shall be done at no additional cost.

C. All paints shall be new stock, delivered to the site unopened. Prepare surfaces properly for receiving paint; protect adjacent surfaces not to be painted.

D. Use of sprays may be permissible, upon prior approval by Engineer.

E. All work shall be carefully done by skilled painters. Finished surfaces to be uniform in coverage, gloss, finish, and color, and free from brush marks. All coats shall be thoroughly dry before applying succeeding coats.

F. Apply products in accordance with manufacturer’s instructions.

G. Do not apply finish coats until paintable sealant is applied.

H. Do not apply sealant or primer until surfaces are properly prepared.

I. Spray, roller and/or brush may be used as appropriate for the various conditions, but the specified dry film thicknesses shall be provided.

J. Thicknesses listed in the Schedule for High Build Coatings can be obtained in one coat by spray, but not necessarily by brush or roller.

K. The specified DFT shall hold precedence over whatever recommendations are made for other supplier’s products.

L. Minimum air and surface temperature for application of epoxy coatings shall be maintained at 55 degrees F. unless otherwise noted on the manufacturer's product data sheet.

M. Minimum air and surface temperature for 100% solids by volume epoxy coatings, such as 280 Tneme-Glaze, etc. shall be 70 degrees F. Optimum temperature of unopened 100% solids epoxy shall be 75 degrees F. Minimum temperature of unopened 100 solids epoxy shall be 60 degrees F.

N. Supply heat with equipment that delivers clean, warm air into the space to be coated. Heat shall not be supplied by devices that give off exhaust fumes such as carbon dioxide or carbon monoxide into the area to be coated. The purpose of this requirement is to prevent the coatings from yellowing during application and cure.

O. Sand surfaces lightly between coats to achieve required finish.

P. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

Q. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

R. Prime concealed surfaces of interior and exterior woodwork with primer paint.

S. Apply materials to obtain:

1. Owner’s satisfaction and approval.

2. Smooth uniform appearance.

3. Complete coverage.

4. Match with approved color sample.

5. Work free of runs, sags and skips.

6. Sharp, clean edges where finishes or colors change.

7. Surfaces free of defects and damage at time of acceptance.

T. Fill nail holes and cracks after prime coat. Fill minor imperfections in gypsum board prior to final coats.

U. Sand metal, wood and drywall between coats.

V. Paint PVC pipe in accordance with recommendations of the paint manufacturer and apply primer.

W. Coatings application equipment are not required to be new, but they shall be adequate and commensurate for the work and workmanship required herein.

**3.04 - FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT**

A. Paint shop primed equipment.

B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

C. Prime and paint insulated and exposed process pipes, fittings, valves, hangers, brackets, collars and supports, except where items are shop finished.

D. Paint both sides and edges of plywood backboards of electrical and telephone equipment before installing equipment.

E. Color code equipment, piping, conduit, and exposed ductwork in accordance with other Sections, as shown or noted on the Drawings, or as directed by the Engineer.

**3.05 - FIELD QUALITY CONTROL**

A. The appearance of all coatings shall be subject to comparison to the paper chip samples. Acceptance of finish shall be made by the Engineer based on these comparisons.

**3.06 - CLEANING**

A. Comply with the requirements in Section 017423 - Cleaning.

B. Collect waste material, which may constitute a fire hazard, place in closed metal containers, and remove daily from site.

C. Install finished items removed by this Section. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

D. Remove masking and protective covering.

E. Leave factory finish surfaces clean and free of paint.

**3.07 - PAINTS - SCHEDULE 099100-1**

A. FERROUS METALS, INTERIOR, NON-SUBMERGED (INCLUDING, BUT NOT LIMITED TO, STRUCTURAL STEEL, MISCELLANEOUS STEEL AND PROCESS DUCTILE IRON PIPING, VALVES AND FITTINGS)

1. Surface Preparation - SSPC-SP6, Commercial Blast Cleaning, 2-mil anchor pattern.

2. Shop Primer – Series 1 Omnithane, 2.5-3.5 mils DFT

3. Field Touch Up – Series 66H Epoxoline, 3-5 mils in finish color.

4. Finish – Series 66H Epoxoline, Hi-Build (to color), 4-6 mils DFT, or 2 coats @ 2-3 mils by brush and/or roller.

5. Notes:

   a. Color code process pipes then apply mechanical identification.

   b. Coordinate the work such that the prime coat specified is for process piping - See Section 402336.

   c. Paint piping before insulation is installed.

B. FERROUS METALS, INTERIOR AND EXTERIOR, SUBMERGED OR INTERMITTENTLY SUBMERGED IN LIQUIDS (RAW SEWAGE OR POTABLE WATER APPLICATIONS)

1. Surface Preparation - SSPC-SP10, Near While Metal blast cleaning, 1-2 mil anchor pattern.

2. Shop Primer – Series 1 Omnithane at 2.5 to 3.5 mils DFT

3. Touch Up – Series 1 Omnithane at 2.5 to 3.5 mils DFT. All primer shall be abraded if finsih is not applied within 14 days.

4. Finish – Series 66H Epoxoline (to color) 2 coats 4-6 mils DFT per coat or Series FC20HS Pota-Pox 2 coats 4-6 mils DFT per coat.

5. Notes:

   a. Color code process pipes then apply mechanical identification.

   b. Coordinate the work such that the prime coat specified is for process piping - See Section 402336.

   c. Paint piping before insulation is installed.

C. FERROUS METALS, EXTERIOR, NON-SUBMERGED

1. Surface Preparation - SSPC-SP6 Commercial Blast cleaning, 1-2 mil anchor pattern

2. Shop Primer – Series 1 Omnithane, 2.5 to 3.5 mils DFT

3. Field Intermediate – Series 66H Epoxoline (to color) 3.0 to 5 mils DFT

4. Field Finish – Series 1095 Endura-Shield, 2.0 to 3.0 mils DFT

5. Notes:

   a. Color code process pipes then apply mechanical identification.

   b. Coordinate the work such that the prime coat specified is for process piping - See Section 402336.

   c. Paint piping before insulation is installed.

D. FERROUS METAL SURFACES, HOT, TEMPERATURES FROM 250 DEGREES F TO 1200 DEGREES F (INCLUDES DUCTILE IRON PIPING CONVEYING PROCESS COMPRESSED AIR)

1. Surface Preparation - SSPC-SP10 Near White Metal Blasting, 1-2 mil anchor pattern

2. Primer – Series 1528 EnduraHeat, 1-2 mils DFT

3. Finish – Series 1528 EnduraHeat 1-2 mils DFT

E. CONCRETE WALLS AND CEILINGS, INTERIOR, POURED AND PRECAST, NON-SUBMERGED

1. Surface Preparation - Allow to cure 28 days, if new. Remove all oil, grease, loose mortar, mortar splatter, and all loose foreign matter. Moisture level to be below manufacturer's requirements. Lightly brush blast to provide surface profile.

2. Primer - 201 Epoxoprime, clear at 5-6 mils DFT. 201 with 211 filler can be used to fill air holes simultaneous with priming.

3. Finish - 280 Tneme-Glaze (to color) one coat at 8.0 - 10.0 mils DFT

4. Paint ceiling of the existing control building.

F. CONCRETE FLOORS, INTERIOR & EXTERIOR (WALKING SURFACES WHERE SPECIFIED OR SHOWN)

1. Surface Preparation - Brush Blast to remove laitence. Follow paint manufacturer's written and verbal instructions. Allow curing for 28 days.

2. Primer - 201 Epoxoprime at 5-6 mils DFT

3. Finish (regular) - 280 or 281 Tneme-Glaze at 8-10 mils DFT. For exterior, use 290 CRU (urethane) as an additional finish.

4. Finish (non-skid) - Broadcast 3-5 lbs. aluminum oxide/100 S.F. into primer.

5. Note: Paint floors/surfaces of the Control Building including equipment and MCC pads. Color to be selected by Owner/Engineer.

G. CONCRETE BLOCK WALLS, INTERIOR

1. Surface Preparation - Remove all loose mortar, mortar splatter. Level protrusions. Allow curing for 28 days.

2. Primer – Series 1254 EpoxoBlock at 60-80 sf/gal

3. Finish - 280 Tneme-Glaze (to color) at 7-10 mils DFT per coat, 2 coats. Finish surface shall be uniformly smooth to the touch, free of voids and cleanable.

4. Note: Paint new and existing block walls of: Control Building. Color to be selected by Owner/Engineer.

H. SMALL DIAMETER PVC PIPING, INTERIOR & EXTERIOR

1. Surface Preparation - Sand lightly and wipe clean

2. Primer – Series 66H Epoxoline (to color), 2-3 mils DFT

3. Finish – Series 66H Epoxoline (to color), 2-3 mils DFT

I. PIPE AND DUCT INSULATION - CLOTH MATERIALS ONLY

1. Surface Preparation - Remove all foreign matter.

2. Primer – 1028 Enduratone, 2 coats (to color), 2-3 mils per coat

**END OF SECTION**

## PART 1 – GENERAL

### 1.01 - SECTION INCLUDES

A. Signs for chemical storage totes and day tanks.

B. Tank signs

C. Room signs

D. Fasteners and mounting brackets

### 1.02 - REFERENCES

A. NFPA 704

### 1.03 - QUALITY ASSURANCE

A. Acceptable Manufacturers: Regularly engaged in production of signs that meet project requirements.

B. Provide manufacturer five (5) year warranty for tank & room signage.

### 1.04 - SUBMITTALS

A. Comply with the requirements in Section 013300 – Submittals.

B. Submit product data for review and approval.

C. Manufacturer's Instructions: Manufacturer’s recommended installation instructions and procedures for care of finished surfaces for each product specified.

D. Shop Drawings/Manufacturer's Data:

1. Details of printing and installation showing each product's materials, finishes and mounting style.

2. Indicating sizes, color, type, text, and style of letters, background and frame.

3. Color print or computer plot of the signs, at 1 to 1 scale.

E. Sample:

1. Sample of finished signage to be used for this project.

### 1.05 - PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in manufacturer's original unopened protective packaging under the provisions of Section 016500.

B. Identify contents, manufacturer and applicable standards.

C. Store in original packaging, off the ground and under protective covers.

D. Handle the product so as to prevent damage.

### 1.06 - COORDINATION

A. Furnish full-size spacing templates for coordination with work of other trades.

## PART 2 - PRODUCTS

### 2.01 - MATERIALS – SIGNS

A. Signs: Aluminum, UV stable for indoor or outdoor use.

B. Minimum size: 10-inch x 7-inch.

C. Font: Laser engraved “Americana BT” for main sign body.

D. Border required.

E. Background Color: White.

F. Foreground Color: Black.

G. Mounting: concealed stainless steel theft-resistant fasteners.

### 2.02 - MANUFACTURERS

A. SETON NAME PLATE CO., New Haven, CT or approved equal.

## PART 3 - EXECUTION

### 3.01 - INSPECTION

A. Examine walls or other areas scheduled to receive signs for conditions that would affect quality and execution of work. Do not proceed with installation until defects are corrected.

B. Do not proceed with installation until defects are corrected.

**3.01 - INSTALLATION**

A. Use stainless steel hardware to mount signs.

B. Install signs on walls next to chemical storage totes and day tanks in location as directed by Engineer.

C. Install signs on exterior doors in location as directed by Engineer.

D. Install sign and components at the locations to be determined by Owner, securely mount with concealed theft-resistant fasteners. Attach signs to substrates in accordance with the manufacturer's instructions.

E. Install level, plumb, and at a height selected by the Engineer. Cooperate with other trades for installation of sign units to finish surfaces.

**3.03 - SIGN SCHEDULE**

A. Tank signs

| LOCATION | QTY | TEXT |
|---|---|---|
| North MBR | 2 | MBR Tank #1 |
| South MBR | 2 | MBR Tank #2 |
| North Anoxic | 2 | Anoxic Tank #1 |
| South Anoxic | 2 | Anoxic Tank #2 |
| South Holding Tank | 1 | Sludge Holding Tank #1 |
| North Holding Tank | 1 | Sludge Holding Tank #2 |
| Pre-Equalization Pump Station | 1 | Pre-Equalization Pump Station |
| East Pre-Equalization Tank | 1 | Pre-Equalization Tank #1 |
| West Pre-Equalization Tank | 1 | Pre-Equalization Tank #2 |
| Influent Pump Station | 1 | Influent Pump Station |
| Influent Screening Channel | 1 | Influent Screens |
| Effluent Pump Station | 1 | Effluent Pump Station |
| Recharge Beds | 4 | Calverton Sewer District Recharge Beds |

B. Room Signs

| LOCATION | QTY | TEXT |
|---|---|---|
| Control Bldg. | 4 | Pump and Blower Room |
| Control Bldg. | 2 | Lab/Office/Bathroom/Boiler Room |
| Control Bldg. | 2 | MCC/Electrical Room |

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Provide Fire Extinguishers & Mounting Clips and all associated accessories and components in accordance with the Contract Documents and as required to provide a complete and first class installation. The work of this section shall include, but not be limited to the following:

1. Fire extinguishers.

2. Mounting clips.

### 1.02 - RELATED SECTIONS

A. Section 042200 - Concrete Unit Masonry.

### 1.03 - REFERENCES

B. ANSI/NFPA 10 - Portable Fire Extinguishers.

C. UL 299 - Dry Chemical Fire Extinguishers.

### 1.04 - SUBMITTALS

A. Submit under provisions of the Division 1.

B. Submit equipment cuts showing dimensions and installation requirements.

### 1.05 - OPERATION AND MAINTENANCE DATA

A. Submit under provisions of the Division 1.

B. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

### 1.06 - REGULATORY REQUIREMENTS

A. Conform to applicable code.

### 1.07 - ENVIRONMENTAL REQUIREMENTS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

## PART 2 - PRODUCTS

### 2.01 – MANUFACTURERS

A. Larsen's Manufacturing Co., Minneapolis, MN

B. J.L. Industries, Bloomington, MN

C. Or approved equal.

**2.02 - EXTINGUISHERS**

A. Contract G shall provide a minimum of (4) (or as otherwise indicated in the contract documents) #10 Class A, B, C fire extinguishers, brackets and stainless steel hardware for surface mounted wall mounting in locations as directed by the Engineer.

**PART 3 - EXECUTION**

**3.01 - EXAMINATION**

A. Verify wall openings under provisions of the Division 1.

B. Verify rough openings for cabinet are correctly sized and located.

**3.02 - INSTALLATION**

A. Install in accordance with manufacturer's instructions.

B. Install 14-inches from finished floor to inside bottom of extinguisher, where instructed in field.

C. Secure rigidly in place.

D. Place extinguishers on clips.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Common work results for plumbing.

### 1.02 - REFERENCE STANDARDS

A. Comply with the following codes and standards:

| | | |
|---|---|---|
| 1. | Codes, Rules and Regulations of the State of New York | |
| 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. | SA | Board of Standards and Appeals |
| 15. | MEA | Materials and Equipment Acceptance |
| 16. | ASHRAE | American Society of Heating, Refrigeration and Air Conditioning Engineers. |
| 17. | MSS | Manufacturer's Standardization Society of the Valve |

| | | |
|---|---|---|
| | | and Fitting Industry |
| 18. | ARI | American Refrigeration Institute |
| 19. | SMACNA | Sheet Metal and Air Conditioning Contractor's National Association |
| 20. | TEMA | Tubular Exchanger Manufacturers Association |
| 21. | ASA | Acoustical Society of America |
| 22. | NACE | National Association or Corrosion Engineers |
| 23. | ASSE | American Society of Sanitary Engineers |
| 24. | NYS | Uniform Fire Prevention and Building Code |
| 25. | NYS | Energy Conservation Construction Code |
| 26. | NYS | Industrial Code Rules |
| 27. | IRI | Industrial Risk Insurers |
| 28. | AGA | American Gas Association |
| 29. | AABC | American Air Balance Council |
| 30. | NEBB | National Environmental Balancing Bureau |
| 31. | AWS | American Welding Society |

**1.03 - DEFINITIONS**

A. "Provide" means furnish and install, complete, the specified material, equipment or other item and perform all required labor to make a finished installation.

B. "Furnish and install" has the same meaning as given above for "Provide."

**1.04 - ABBREVIATIONS**

A. Reference by abbreviation may be made in the Contract 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 or # | Pound |
| 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 |

B. See Contract Drawings and other sections of the specifications for additional abbreviations.

**1.05 - REVIEW OF CONTRACT DOCUMENTS AND SITE**

A. Comply with the requirements in the General Conditions and Division 1 sections related to visiting the site prior to submission of a bid. Refer to the requirements in Division 1 sections regarding coordination of the work with other Contractors.

**1.06 - COVERING OF WORK**

A. Do not cover duct, piping, fitting, or other work of any kind or hide from view before it has been examined or approved by the Engineer, Architect, and/or other authority having jurisdiction.

**1.07 - PROTECTION**

A. Protect the work and material of all trades from damage, and replace all damaged material with new.

B. Contractor shall be responsible for work and equipment until his work is finally inspected, tested, and accepted; protect 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 obstructing material.

C. Preserve 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. Carefully protect from disturbance or damage all property marks until an authorized agent has witnessed or otherwise referenced their location. Do not remove property marks until directed.

**1.08 - CUTTING AND PATCHING**

A. Provide all cutting and rough patching required for work included in these specifications as shown on the Contract Plans.

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. All holes cut through concrete slabs or arches shall be punched or drilled from the underside. Do not cut structural members without the approval of the Engineer and all such cutting shall be done in an approved manner.

D. Do not make cuts that may impair strength of building construction. No holes, except for small screws, may be drilled 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.

**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: adjust and align equipment interconnected with couplings or belts.

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.

4. Packing in equipment operated during construction shall be repacked just prior to system acceptance, using materials and methods specified by the supplying manufacturer.

E. Touch-up paint or repaint equipment furnished with factory finish as required to provide same appearance as new.

F. Tools: 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 products. Welding will be permitted only when approved by the Engineer.

C. Submit shop drawings of supports for approval to the Engineer 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 information and dimensions for the location of these leveling channels, anchor bolts, inserts, concrete bases and pads.

E. Where supports are on concrete construction, do not weaken concrete or penetrate waterproofing.

**3.03 - ACCESSIBILITY**

A. Valves, dampers and other items shall be 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, for purposes other than testing even with the Owner's consent, shall not be construed to be an 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 - EQUIPMENT INSTALLATION**

A. Locate and set equipment anchor bolts, dowels and aligning devices for equipment requiring them. Level and shim the equipment; coordinate and oversee the grouting work.

B. Field assembly, installation and alignment of equipment shall be done under field supervision provided by the manufacturer or with inspections, adjustments and approval by the manufacturer, as a part of the Work.

C. 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, a qualified representative of the manufacturer shall inspect the installation and shall report in writing on the manufacturer's letterhead as follows:

a. The shafts, bearings, seals, couplings, and belt drives are aligned and doweled so the equipment will remain aligned in the normal service intended by the 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.

D. Belt Drives: V-belt drives shall include a driving and driven sheave grooved for belts of trapezoidal cross-section. Belts shall be constructed of fabric and rubber so designed as not to touch the bottom of the grooves, the power being transmitted by the contact between the belts and V-shaped groove sides. Drives shall be designed for a minimum of 150 percent of motor horse-power. Driven sheaves shall be of the companion type.

E. Drives shall provide for 12-1/2 percent variation in speed, plus or minus. All motors shall be provided with adjustable sheaves except where indicated otherwise in the Contract.

F. Install fans with fixed pitch sheaves on their drive motors. Sheaves shall be selected to provide air quantities under specified conditions. Air systems shall be put into operation, and Contractor shall determine actual size of sheaves required to produce specified air quantities on installed systems. The fixed pitch motor shall then be replaced with the proper size adjustable sheave. Fixed pitch sheaves shall be property of Contractor and removed from premises. Adjustable

motor sheaves shall be Wood's Type FHP on fractional horsepower motors and Type SVS on motors one horsepower and larger.

G. Machinery Guards: Motor drives shall be protected 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. In all cases, guards of all types must be as approved as acceptable user OSHA Standards.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Pipe penetration seals.

## PART 2 - PRODUCTS

### 2.01 - MANUFACTURERS

A. Thunderline Corp. LINK-SEAL or equal.

### 2.02 - MATERIALS

A. Seals shall be modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall opening. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. Bolts and nuts shall be Type 18-8 stainless steel.

B. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the rubber sealing elements to expand and provide a watertight seal between the pipe and wall opening under 40 feet of head. Seal shall be suitable for a temperature range of -40°F to 250°F and submergence in groundwater.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Determine the required inside diameter of each individual wall opening or sleeve. The inside diameter of each wall opening shall be sized as recommended by the manufacturer to fit the pipe and pipe penetration seal to assure a watertight joint. Sizing for correct pipe penetration seal model and number of links per seal may be obtained through manufacturer's catalog.

B. If pipe outer diameter is nonstandard due to coating or insulation, consult manufacturer for engineering assistance and recommendation before proceeding with wall opening detail.

C. Coordinate all piping penetrations.

### 3.02 - INSTALLATION

A. Install and tighten seal to provide a watertight pipe penetration in accordance with manufacturer's instructions.

B. Install non-shrink grout on both sides of the wall as detailed on the Drawings.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Work of this Section includes specifications for the adequate support of exposed piping. Pipe hangers shall be meant to include pipe support systems.

B. Where product specifications are provided they are intended to provide a standard of quality.

C. The Drawings show the layout, sizes, elevations, and general arrangement of piping, valves, primary instrumentation elements, and process equipment. Pipe support systems shall be selected, configured, and installed by the Contractor in order to comply with the requirements contained herein. The Contractor shall install pipe support systems consisting of hangers, supports, clamps, U-bolts, brackets, bracings, attachments, and structural shapes to adequately support piping from building components, tank walls, decking, walkways, slabs, or fabricated structural assemblies specifically designed for this purpose. All piping supports and hardware shall be fabricated and erected of stainless steel as specified herein.

### 1.02 - REFERENCES / QUALITY ASSURANCE

A. Comply with the following in designing and installing pipe support systems:

1. MSS SP58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
2. MSS SP69 - Pipe Hangers and Supports - Selection and Application
3. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practice

B. Terminology used in this Section is defined in MSS SP-90.

C. All interior and exterior pipe support systems that are located within tanks, reactors, basins, wet wells, channels, pits, chambers, pipe galleries, rooms, buildings, either exposed, submerged, partially submerged, intermittently submerged or never submerged shall be 304L stainless steel as a minimum.

D. Below grade pipe support systems shall be as specified for underground pipe.

### 1.03 - SUBMITTALS

A. Comply with the requirements contained in Section 13300 - Submittals.

B. Submit the following:

1. Product data and installation instructions.

2. Pipe hanger and support catalog cuts showing manufacturer's figure number, size, materials of construction, and features for each type of support.

3. Provide catalog cuts for all types of stainless steel pipe support.

4. Provide details of each size knee brace and indicate materials of construction and the proposed locations.

## PART 2 - PRODUCTS

### 2.01 - MANUFACTURERS

A. Anvil International

B. Approved equal.

### 2.02 - MATERIALS

A. Stainless steel supports and hangers shall be used at locations specified in paragraph 1.02 (C) above.

B. Anvil International figure 260 MSS Type 1, with adjustable clevis hangers for non-insulated pipe 2 through 24-inch diameter.

C. Anvil International figure 260 adjustable wrought clevis hangers, with Figure 167, MSS Type 40 galvanized insulation protection shields sized for supporting insulation having a strength of 4 psi, at 8-foot intervals. Support piping on outside of insulation. Size hangers so that pipe insulation passes through them without interruption. Use these for:

1. Insulated steel pipe 1/2 through 24-inch diameter.

2. Insulated galvanized steel pipe 1/2 through 24-inch diameter.

3. Insulated copper pipe 1/2 through 8-inch o.d.

4. Insulated PVC pipe with no longitudinal movement.

D. Anvil International Figure 104, MSS Type 6, with adjustable swivel ring, split ring type for:

1. Non-insulated steel pipe, galvanized steel pipe, and copper pipe 1/2 through 1-1/2-inch diameter.

2. Non-insulated cast iron soil pipe up through 8-inch diameter.

E. Anvil International Figure CT-138R, MSS Type 9, with adjustable wrought tubing ring hanger, either plastic covered for:

1. Non-insulated copper tubing with no longitudinal movement.
2. Non-insulated PVC pipe, 1/2 through 4-inch diameter, with no longitudinal movement.

F. Anvil International Figure 171, MSS Type 41 with pipe roller, and Anvil International Figure 167, MSS Type 40 galvanized insulation protection shields (sized for supporting insulation having a compressive strength of 4 psi, at 8-foot intervals). Support piping on outside of insulation. Size hangers so that pipe insulation passes through them without interruption. Use these for:

1. Insulated copper pipe, 1/2 through 2-1/8-inch diameter, having longitudinal movement.
2. Insulated steel pipe, 1 through 30-inch diameter, having longitudinal movement.

G. Anvil International Figure CT-121C, MSS Type 8, riser clamps (at floor slab penetrations) to support:

1. Copper pipe risers.
2. PVC pipe risers.

H. Anvil International Figure 261, MSS Type 8, riser clamps (at floor slab penetrations) to support steel pipe risers.

I. Anvil International or Anvil-Strut Trapeze Hangers: Where three or more lines of pipe run parallel, support them with stainless steel trapeze hangers and stainless steel hardware.

J. Anvil International Figure 199, hot-dip galvanized, heavy welded steel bracket for support of pipe along concrete tank walls

K. Concrete Inserts: Anvil International Figure 282, MSS Type 18, universal concrete inserts, adequately sized and correctly positioned to support full load, operating systems.

L. C-Clamps: Anvil International Figure 66, MSS Type 23. Use these for attaching hangers to steel beams. Welding hanger rods to steel members is not permitted. Provide retaining clip for C-Clamps.

M. Malleable Beam Clamps: Anvil International Figure 229, MSS Type 30. Use these for attaching hangers to bar joists. Provide retaining clip for all beam clamps.

N. Floor supports: Steel, adjustable pipe support, adjustable height, locknut, nipple, floor flange and baseplate; Figure 265 and station Figure 62 or equal.

O. Hanger Rods: Stainless steel threaded both ends or continuous thread. Only stainless steel threaded rod shall be used on the project. Diameter shall be as required to adequately support the load except where otherwise shown on the Drawings.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Examine substrate and conditions under which supports and anchors are to be installed. Do not proceed with the installation until satisfactory conditions have been corrected by reinforcing the substrate.

### 3.02 - INSTALLATION OF HANGERS AND SUPPORTS

A. General: Install hangers, supports, clamps, and attachments to support piping properly from building structure; comply with MSS SP-69 and SP-89. Arrange for grouping of parallel runs of horizontal piping supported together on field-fabricated, heavy-duty trapeze hangers where possible. Install supports with maximum spacing complying with MSS SP-69. Where piping of various sizes is supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe as specified above for individual pipe hangers.

B. Install building attachments to wood joists or to structural steel. Space attachment within maximum piping span length indicated in MSS SP-69. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping.

C. Install hangers and supports complete with necessary bolts, rods, nuts, washers, and other accessories.

D. Field-Fabricated, Heavy-Duty Steel Trapezes: Fabricate from steel shapes selected for loads required; weld steel in accordance with AWS D-1.1.

E. Install hangers and supports to allow controlled movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.

F. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

G. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ASME B31.9 Building Services Piping Code is not exceeded.

H. Insulated Piping: Comply with the following installation requirements.

1. Clamps: Attach clamps, including spacers, to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ASME B31.9.

2. Saddles: Install protection saddles MSS Type 39 where insulation without vapor barrier is indicated. Fill interior voids with segments of insulation that match adjoining pipe insulation.

3. Shields: Install protective shields MSS Type 40 on cold water piping that has vapor barrier.

4. Shields shall span an arc of 180 degrees and shall have dimensions in inches not less than the following:

| NPS | LENGTH | THICKNESS |
|---|---|---|
| 1/4 through 3-1/2 | 12 | 0.048 |
| 4 | 12 | 0.060 |
| 5&6 | 18 | 0.060 |
| 8 through 14 | 24 | 0.075 |
| 16 through 24 | 24 | 0.105 |

5. Pipes 8 inches and larger shall have wood inserts.

6. Insert material shall be at least as long as the protective shield.

7. Thermal Hanger Shields: Install where indicated, with insulation of same thickness as piping.

**3.03 - INSTALLATION OF ANCHORS**

A. Install anchors at proper locations to prevent stresses from exceeding those permitted by ASME B31.9 and to prevent transfer of loading and stresses to connected equipment.

B. Fabricate and install anchors by welding steel shapes, plates, and bars to piping and to structure. Comply with ASME B31.9 and with AWS Standards D1.1.

C. Anchor Spacing: Install anchors at ends of principal pipe runs, at intermediate points in pipe runs between expansion loops and bends. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.

**3.04 - INSTALLATION OF PIPE ALIGNMENT GUIDES**

A. Install pipe alignment guides on piping that adjoins expansion joints and elsewhere as required.

B. Anchor to building substrate.

**3.05 - EQUIPMENT SUPPORTS**

A. Fabricate structural steel stands to suspend equipment from structure above or support equipment above floor. Structural steel members shall be used where lateral support is required.

B. Grouting: Form and place non-shrink grout for piping pier supports, thrust blocking, submersible pump discharge elbows, and equipment base plates. Shim to obtain level and plumb before placing grout.

**3.06 - METAL FABRICATION**

A. Cut, drill, and fit miscellaneous metal fabrications for pipe anchors and equipment supports. Install and align fabricated anchors in indicated locations.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1 for procedures of manual shielded metal-arc welding, appearance and quality of welds made, methods used in correcting welding work, and the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish welds at exposed connections so that no roughness shows after finishing, and so that contours welded surfaces to match adjacent contours.

**3.07 - ADJUSTING**

A. Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

**3.08 - SCHEDULE**

| PIPE SIZE<br>Inches | MAX. HANGER SPACING<br>Feet | DIAMETER<br>Inches |
|---|---|---|
| 1/2 to 1-1/4 | 6 | 3/8 |
| 1-1/2 to 2 | 10 | 3/8 |
| 2-1/2 to 3 | 10 | 1/2 |

| | | |
|---|---|---|
| 4 to 6 | 10 | 5/8 |
| 8 to 10 | 10 | 5/8 |

A. Hanger spacing based on copper and steel pipe without valves or other equipment.

B. Increased load due to valve and equipment shall require closer spacing of hangers.

C. Maximum hanger spacing shall be 4 feet for PVC pipe.

D. Maximum hanger spacing shall be 2 feet, 8 inches for PE and PB pipe.

E. Maximum hanger spacing for cast iron pipe less than 10 feet in length shall be 5 feet.

**END OF SECTION**

## PART 1 – GENERAL

### 1.01 - SECTION INCLUDES

A. Mechanical identification of equipment and piping. Provide labels for each type pipe and duct supplied and installed.

### 1.02 - DELIVERY AND STORAGE

A. Deliver products to the site in unopened original containers, bearing manufacturer's printed labels.

B. Store products the site where directed by the Engineer. Maintain storage space clean, well ventilated, heated to the proper temperature for storage, and accessible at all times. Remove oily rags and other debris resultant from painting Work from the premises, at the close of each day's work, and take all other necessary precautions to prevent fire.

### 1.03 - REFERENCES

A. 2007 ANSI A13.1

## PART 2 - PRODUCTS

### 2.01 - MATERIALS

A. Self-Adhesive Markers: Adhesive-backed vinyl markers. Marker size shall be 4-$^{1}/_{2}$ inches high by 24 inches long. Markers shall be ANSI color-coded for the service with flow direction arrow.

B. Self-Adhesive Labels with directional flow arrows: Supplied by USA Blue Book or approved equal.

1. Large size (2-1/4” x 14”) for pipes 3” or over size

2. Medium size (1 1/8” x 7”) for pipes 3” and below size

## PART 3 - EXECUTION

### 3.01 - PREPARATION

A. Do not execute the work of this Section until all testing, insulation, and finish painting work have been completed.

**3.02 - INSTALLATION**

A. Identify all piping, bare or insulated, by means of self-adhesive markers. Install four markers per 50 feet or less of duct or piping.

B. Locate markers to be readily visible from any point of observation.

C. Place identification along centerline of duct or pipe, close to equipment. Where view is unobstructed from two directions, apply two markers in each direction.

D. Samples of piping identification:

1. "AIR"

2. "SEWAGE"

3. "PERMEATE"

4. "WASTE ACTIVATED SLUDGE"

5. "RETURN ACTIVATED SLUDGE"

6. "POTABLE WATER"

7. "NON POTABLE WATER"

8. "PLANT EFFLUENT"

E. Identify all mechanical equipment, bare or insulated, installed in the rooms or on the roof, by means of labels. Place labels where directed by the Engineer.

F. Samples of Equipment Identification:

| | | |
|---|---|---|
| 1. | Exhaust Fan | "EF-1" |
| 2. | Discharge Piping | "DP-1" |

**3.03 - CLEANING**

A. Clean surfaces before label or marker is placed.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. This Section includes all labor, materials, and equipment necessary to install pipe insulation where indicated on the Drawings.

B. In addition, all exposed ductile iron air piping used for process aeration, regardless of location, shall be insulated.

C. Pipe insulation.

### 1.02 - REFERENCES

A. ASTM C335 - Steady-State Heat Transfer Properties of Horizontal Pipe Insulation.

B. ASTM C533 - Specification for Calcium Silicate Block and Pipe Thermal Insulation.

C. ASTM C534 - Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.

D. ASTM C547 - Mineral Fiber Preformed Pipe Insulation.

E. ASTM C921 - Properties of Jacketing Materials for Thermal Insulation.

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

G. ASTM E96 - Test Method for Water Vapor Transmission of Materials.

### 1.03 - SUBMITTALS

A. Submit the following in accordance with the requirements contained in Section 013300:

1. Product Data: Provide product description, list of materials and thickness for each service, color charts, and locations of work as specified or noted on the Contract Drawings for review.

2. Manufacturer's Installation Instructions: Indicate procedures that ensure acceptable workmanship and installation standards will be achieved.

### 1.04 - DELIVERY, STORAGE AND HANDLING

A. Comply with the requirements contained in Section 016500.

B. Deliver, store and protect products in accordance with manufacturer’s instructions.

C. Deliver materials to site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

D. Store insulation in original wrapping and protect from weather and construction activities.

E. Protect insulation against dirt, water, chemical, and mechanical damage.

**1.05 - ENVIRONMENTAL REQUIREMENTS**

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.

B. Maintain temperature during and after installation for minimum period of 24 hours.

**1.06 - QUALITY ASSURANCE**

A. Work of this Section shall be performed by persons experienced in the installation of the specified system.

B. If requested by the Engineer, submit documentation relative to the installer’s qualifications. The Owner and Engineer may elect to visit the installer’s previous work.

C. Submit at least three references who may be contacted regarding the installer’s qualifications.

**PART 2 - PRODUCTS**

**2.01 - GLASS FIBER**

A. Manufacturers: Owens Corning or equal.

B. Insulation:

1. High density all service jacket with double adhesive lap seal, two-component, butt strip, closure system.

2. ASTM C547; rigid noncombustible molded type

3. K-Value: ASTM C335, 0.24 at 75° F.

4. Minimum Service Temperature: 0° F.

5. Maximum Service Temperature: 850° F.

6. Maximum Moisture Absorption: 0.2% by volume.

C. Vapor Barrier Jacket (Interior and Exterior Service):

1. Fiberglass SSL II by Owens Corning or equal.

2. ASTM C 1136

3. Secure with self-sealing longitudinal laps and butt strips.

4. Secure with outward clinch expanding staples and vapor barrier mastic.

D. Tie Wire: 18 gage stainless steel with twisted ends on maximum 12 inch (300 mm) centers.

E. Fire and Smoke Hazard Ratings: Class 1 and 2 jacketing materials, mastics, sealants and adhesives shall have a maximum flamespread rating of 25 and a maximum fuel contributed and smoke developed rating of 50 or less, when tested in accordance with ASTM E84 and UL723.

F. For Exterior Use Only:

1. PVC Cover for Pipe and Fittings:

a. High impact, self-extinguishing PVC and suitable for outdoor service.

b. Fed. Spec. L-P-535E

c. Physical Property Data:

| Property | Test Method | Specification |
|---|---|---|
| **Specific Gravity** | **ASTM D792** | **1.46** |
| **Water Sorption** | | **.05** |
| **Moisture Vapor Transmission** | | **<0.05** |
| **Tensile Strength, psi** | **ASTM D638** | **7000** |

## PART 3 - EXECUTION

### 3.01 - PLACEMENT

A. Install insulation on all copper water lines including fresh water rinse piping and incoming water service piping both protected and unprotected.

B. Install insulation on all piping installed overhead.

C. Coordinate work with other Contracts before insulation is installed.

D. Install insulation on piping as shown on contract drawings.

**3.02 - EXAMINATION**

A. Verify that piping has been tested and heat traced before applying insulation materials.

B. Verify that surfaces are clean, foreign material removed and dry.

C. Paint piping before insulation is installed. Painting shall be work of Section 099100.

**3.03 - INSTALLATION**

A. Install insulation on all exposed piping located aboveground or water or where floor drainage is not available.

B. Install materials in accordance with manufacturer's instructions.

C. Minimum pipe insulation thickness shall be in accordance with New York State Energy Code requirements

D. Inserts and Shields:

1. Application: All piping regardless of size.

2. Shields: 304L Stainless steel between pipe hangers or pipe hanger rolls and inserts.

3. Insert Location: Between support shield and piping, and under the finish jacket.

4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.

5. Insert Material: Cork or other heavy density insulating material suitable for the planned temperature range.

6. Neatly finish insulation at supports, protrusions, and interruptions.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Copper piping and accessories

B. HDPE water piping and accessories

C. PVC piping and accessories

D. Black iron piping and accessories

E. Cross linked polyethylene tubing (PEX) & accessories

F. Injection quills

G. Air relief/vacuum valves

H. Corporation stops

I. Exposed ball valves

J. Solenoid valves

K. Pressure gauges

L. Pressure regulating valves

M. Vacuum breakers

N. Vent caps

O. Pressure relief valves

P. Natural Gas Piping

### 1.02 - RELATED SECTIONS

A. Section 220529 – Hangers & Support for Plumbing Piping and Equipment

B. Section 220553 – Identification for Plumbing Piping & Equipment

C. Section 331213.13 – Water Supply Backflow Preventer Assemblies

D. Section 331300 – Disinfection of Water Distribution Piping

E. Section 220719 – Plumbing Insulation

F. Section 220533 – Heat Tracing for Plumbing Piping

**1.03 - REFERENCES**

A. ASME B16.3 - Malleable Iron Threaded Fittings.

B. ASME B16.22 - Wrought Copper and Bronze Solder-Joint Pressure Fittings.

C. ASME B16.23 - Cast Copper Alloy Solder - Joint Drainage Fittings -DWV.

D. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV.

E. ASME B31.3 – Process Piping.

F. ASTM A120 - Pipe, steel, black and Hot-Dipped Zinc Coated (Galvanized), Welded and Seamless, for Ordinary Uses.

G. ASTM A269 – Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

H. ASTM B42 - Seamless Copper Pipe.

I. ASTM B88 – Seamless Copper Tube

J. ASTM B306 - Copper Drainage Tube (DWV).

K. ASTM A403 – Wrought Austenitic Stainless Steel Fittings.

L. ASTM D1784 – Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Ploy (Vinyl Chloride) (CPVC) Compounds

M. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.

N. ASTM D2241 - Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).

O. ASTM D2467 – Standard Specification for Poly (Vinyl Chloride) PVC) Plastic Pipe Fittings, Schedule 80

P. ASTM D2564 - Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.

Q. ASTM D2737 – Standard Specification for Polyethylene (PE) Plastic Tubing

R. ASTM D2855 - Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

S. ASTM F876 – Standard Specification for Crosslinked Polyethylene (PEX) Tubing

T. ASTM F877 – Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot and Cold-Water Distribution Systems

U. ASTM F190 – Standard Specification for Cold Expansion Fittings with PEX reinforcing Rings for Use with Crosslinked Polyethylene Tubing

V. ANSI/AWWA C901 – Polyethylene Pressure Pipe and Tubing 1/3” to 3” for Water Service

**1.04 - SUBMITTALS**

A. Submit product data under provisions of Section 013300.

B. Product Data: Provide data on pipe materials, pipe fittings, valves, hydrants and accessories.

C. Dimensional data.

D. Manufacturer’s Certificate: Certify that products meet or exceed specified requirements.

**1.05 - PROJECT RECORD DOCUMENTS**

A. Submit under provisions of Section 017839.

B. Accurately record actual locations of piping mains, valves, connections and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

**1.06 - QUALITY ASSURANCE**

A. Perform work in accordance with the New York State Plumbing Code, Suffolk County Department of Health Services (SCDHS) and local water utility company requirements.

B. Valves: Manufacturer’s name and pressure rating marked on valve body.

### 1.07 - DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 016500.

B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation. Protect piping systems form entry of foreign materials by temporary covers, completing sections of the work and isolating parts of completed system.

C. Deliver and store valves in shipping containers with labeling in place.

## PART 2 - PRODUCTS

### 2.01 - COPPER PIPING AND ACCESSORIES

A. All small copper piping, for potable water, gauges, and meters, shall be Type "K" hard drawn copper tubing, conforming to ASTM Specification B42-81, with fittings per ASME B-16.22. All underground piping shall be soft annealed Type “K” ANSI H-23.1 with fittings per ANSI A-40.2.

B. ½” to 2” check valves shall be swing check renewable BUNA-N disc, all bronze, STOCKHAM Figure B-319 (threaded end) or Figure B-309 (solder end) - 250 to 300 psi non-shock water.

C. Brass ball valves shall be renewable reinforced Teflon seats, adjustable packing gland, non-blowout stem with run port opening with a working operating pressure between 0 – 150 psi. Ball valves shall be STOCKHAM Figure S-216 (threaded or soldered ends).

D. Brass pressure relief/backpressure valves shall be molded in-line valves with PVC body construction, size as noted on drawings. Valves shall have a setting range from 0 to 250 psi.

E. Pressure connections to flow and pressure transmitters, switches, recorders and indicating gauges shall be equipped with snubbers.

F. Dielectric connections: EPCO sales, inc or “V-Line” Lochinvar Co. or equal dielectric couplers. Use couplers at junction of dissimilar metal piping systems. Do not use steel or cast iron fitting in copper piping systems. Brass fittings may be used for dielectric locations.

G. Joints shall be flared or compression type conforming to ANSI/AWS A5.8, BCUP silver braze. No lead solder will be permitted.

### 2.02 – HDPE WATER PIPING AND ACCESSORIES

A. HDPE pipe shall be manufactured from extra high molecular weight polyethylene pipe materials meeting the requirements of ASTM D2239, NSF listed, and meet AWWA C901/C906. The pipe shall meet the requirements of cell classification PE345444C standard PE code designation

PE3408 as defined by ASTM D3350096 and D3350. The manufacturer shall certify that the material meeting this specification has exceeded 5,000 hours without failure when tested under ASTM F 1248 and has a hydrostatic design basis of 1,600 psi at 73F and 800 psi at 140F when tested under ASTM D2837.

B. HDPE fitting shall be manufactured using the same pressure rating as the pipe and compatible with standard fittings, valves, tees, service saddles, curb stops and meter stops. Connections to the existing water systems other than HDPE pipe shall have restrained mechanical joint fittings, with stiffeners, or inserts if recommended by the manufacturer.

C. The manufacturer shall apply production data markings as specified herein to the outside surface of the pipe, running longitudinally, repeated contunously using a permanent non-toxic lettering. Required production data shall include pipe diameter and designation, material code identification PE3408, dimension ration DR 9 or 11 pressure class (at least 150 psi) AWWA designation AWWA C901 or 906 and potable water designation NSF. ***HDPE pipe for potable water shall have a blue stripe. HDPE for reclaimed (reuse) piping shall have a purple stripe. The striping will be continuous along the entire length of the pipe. HDPE for natural gas shall be solid yellow.***

D. Pipe shall be manufactured by JM Eagle.

**2.03 - PVC PIPING AND ACCESSORIES**

A. PVC piping shall be polyvinyl chloride, Class 1245-B, Schedule 80, and shall conform to ASTM Specifications D2241, D1784 and D1785. Pipe shall be as manufactured by A.M. BEYERS COMPANY or approved equal. Fittings for PVC piping shall be slip type and shall be of the same schedule approved for use by the pipe manufacturer. Pipe shall bear the trademark of the manufacturer.

B. Ball valves shall be schedule 80 double union/double block with PVC body, ball, insert and stainless steel rod and stem with Teflon seats, Tru-Bloc by NIBCO CHEMTROL, SPEARS or approved equal.

C. Check valves shall be of the true union ball check type with a PVC body construction. Free oscillation of ball in guide rips shall facilitate full port flow with minimum turbulence and chatter. Valves shall operate in the horizontal or vertical position. The valves shall be rated at 150 psi. The valves shall be manufactured by HAYWARD CO., SPEARS or approved equal.

D. Strainers shall be Y type, of size indicated, PVC body with 40 mesh cylindrical stainless steel screen and shall be as manufactured by HAYWARD CO. or approved equal.

E. Pressure relief/backpressure valves shall be molded in-line valves with PVC body construction. Valves shall have a setting range from 0 to 150 psi.

F. Globe valves shall be of thermoplastic construction rated to 150 psi with EPDM seals and flanged connections. Valves shall be as manufactured by ASAHI-AMERICA, NIBCO or approved equal.

G. Unions shall be UL listed, O ring unions with Teflon gaskets by HAYWARD CO. or approved equal.

H. Transitions from PVC to poly-tubing shall be made with barbed fittings and stainless steel clamps.

I. All wetted parts of PVC piping, valves and accessories shall be compatible with treatment chemicals.

J. Threads and dimensions: ANSI B1.1 and B18.2

K. Thread lubricant: Crane "Formula 425", or equal. (NOTE: Approved Teflon tape may be used).

L. Gaskets: Full face, 1/8-inch thick neoprene rubber.

M. Solvent welded joints for chemical piping shall be made using solvent cement that meets or exceeds ASTM F493, compatible with PVC pipe and fittings. Solvent cement shall be Low V.O.C., Heavy Duty Industrial solvent cement by Oatey; Model EP42 or specifically approved equal.

**2.04 - BLACK IRON PIPE AND ACCESSORIES**

A. Standard weight, Schedule 40, threaded ends, conforming to ASTM A53/A53M. Fittings shall be malleable iron, screwed type conforming to ASME B16.3.

B. Gate Valves: Bronze body, bronze trim, non-rising stem, hand-wheel, inside screw, single wedge or disc threaded connection.

C. Ball Valves: two piece cast bronze body, silicon bronze stem, blow-out proof design, TFE conventional port seats, rated at 200 psi, threaded connections.

D. Check Valves: Shall be swing check renewable BUNA-N disc all bronze STOCKHAM Figure B-319 (threaded ends), 250-300 psi.

E. Flanges, fittings, unions and similar items: Commercially available products marked in accordance with MSS-SP-25 marking on small size of odd shaped prodcts mabe be omitted

provided they are listed in the sequence so allowed by MSS-SP-25, but such products shall bear the manufacturer's name and trademark.

F. Fittings 2 inches and smaller: Threaded, standard cast iron.

G. Union: Cast Iron with bronze to iron ground joint rated at 150 lbs.

H. Threads and dimensions: ANSI B1.1 and B18.2.

I. Thread lubricant: Crane "Formula 425", or equal. Teflon tape may be used.

J. Gaskets: Full face, 1/8-inch thick neoprene rubber.

**2.05 –CROSSLINKED POLYETHYLENE TUBING AND ACCESSORIES**

A. Manufacturer: IPEX, Vanguard or approved equal.

B. Cross linked polyethylene (PEX-Aluminum-PEX) manufactured to CTS-OD sizes, with a standard thickness of SDR-9. Manufactured in accordance with ASTM F876 and ASTM F877 and tested for compliance by an independent third-party agency.

C. Fittings for PEX piping shall be brass. Connections shall be fastened via stainless steel ring clamp.

**2.06- INJECTION QUILLS**

A. Injection quill assembly to be manufactured by SAF-T-FLO, complete with retractable solution tube, corporation stop, adapters, safety chain, restrain hook, and bushings. Must be rated to 150 psi. Solution tube sizing to match line sizing.

1. 3/8" - 3/4" solution tube: Brass corporation stop and compression nuts, PVC solution tube with 45 degree bevel injection end. Solution tube length to be ½ diameter of pipe.

2. 1" and above solution tube: Brass corporation stop and compression nuts, stainless steel solution tube with 45 degree bevel injection end. Solution tube length to be ½ diameter of pipe.

B. A service saddle shall be utilized on all taps greater than 1-inch. Service saddle shall be Type F3202 as manufactured by FORD METER BOX CONMPANY or MUELLER COMPANY,

**2.07 - CORPORATION STOPS**

A. Manufacturers: MUELLER COMPANY, Model No. H-15000 or approved equal.

B. Water service bronze body with AWWA standard thread inlet and copper AWWA outlet, complete with straight coupling nuts.

C. Ball valve type corporation stops, Ford Meter Box Company FB600, or approved equal, may be utilized.

**2.08 – EXPOSED BALL VALVES**

A. Manufacturer: Hammond Model 8211, WATTS Series WBV or approved equal.

B. Construction, 4 inches (100 mm) and smaller: MSS SP-110, Class 150, 400 psi CWP, bronze, two piece body, chrome plated brass ball, regular port, teflon seats and stuffing ring box ring, blow-out proof stem, lever handle, solder ends.

**2.09 – SPRING LOADED CHECK VALVES**

A. Manufacturer: Stockham, watts or approved equal.

B. Bronze body, bronze trim, bronze disc, solder ends.

**2.10 – STRAINERS**

A. Size 2 inch and under.

B. Manufacturer: Watts.

C. Threaded brass body for 175 psi CWP Y pattern with 1/32 stainless steel perforated screen.

**2.11 – ESCUTCHEONS**

A. Chrome slip on type.

**2.12 – ESCUTCHEONS**

A. Stainless steel hose and braid. Metraflex Co. metraloop, min 125 psig pressure.

**2.13 - SOLENOID VALVES**

A. Solenoid valves shall be Series 8210-D-12, Red Hat II, normally closed, 120 volt AC, stainless steel body.

**2.14 – PRESSURE GAUGES**

A. Pressure gauges shall be manufactured by ASHCROFT, all stainless steel construction, with pressure range from 0 to 250 psi, stem mounted 4" diameter, liquid filled, provided with snubber and shut-off petcock valve.

**2.15 – PRESSURE REGULATING VALVES**

A. Manufacturer:

1. WATTS, Series 263A (3-way), or approved equal.

B. Valves shall be of brass construction with Buna-N disc/diaphragm, inlets/outlet size to match piping, maximum working pressure 300 psi, adjustable range 3 psi to 50 psi.

C. Provide with pressure gauge and slotted adjusting screw.

**2.16 – VACUUM BREAKERS**

A. Vacuum breaker check valves shall be constructed of PVDF (Kynar), normally-closed, with self-sealing diaphragm. Connectors to match pipe and fittings. As manufactured by PLAST-O-MATIC VALVES, INC., Series VBM, or approved equal.

**2.17 – RELIEF VALVES**

A. Air Release/Vacuum Valves

1. Manufacturer:

a. CRISPIN of Berwick, PA. "AL" series

b. Approved equal

2. Valve shall comply with ANSI/AWWA C512 Standards.

3. The body and valve shall be constructed of cast iron conforming to ASTM A126, Class B.

4. Spherical stainless steel float shall seal against a renewable Buna-N resilient seat.

B. Pressure relief / Backpressure / Anti-siphon valves

1. Manufacturer:

a. PLAST-O-MATIC VALVES, INC.

b. WALLACE & TIERNAN

c. WALCHEM

d. Approved equal

C. Pressure relief / Backpressure / anti-siphon valves / combination valves for chemical systems shall be molded in-line valves with PVC body construction. Valves shall have a setting range from 5 to 120 psi and be compatible with chemicals in application. Size in accordance with the Plans.

**2.18 - NATURAL GAS PIPING, ABOVE GRADE**

A. Steel Pipe: ASTM A53 Schedule 40 black.

1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, forged steel welding type.

2. Joints: NFPA 54, threaded for pressures less than seven inches W.C. or welded to ANSI B31.2 for pressure greater than seven inches W.C. or four inches and larger pipe diameter.

B. Above grade outdoor threaded piping and fittings shall be galvanized.

C. Above grade outdoor welded piping and fittings shall be painted or provided with a coating and taping system in accordance with utility company requirements.

**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.

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 offsets and expansion joints as shown on drawings.

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. Support pipe in accordance with provisions of Section 220529.

G. Install non-conducting dielectric connections wherever joining dissimilar metals.

H. Install valves with stems upright or horizontal.

I. Install water service lines in accordance with water utility standards.

**3.02 - PIPING INSTALLATION**

A. Joints between PVC and Iron Pipe (wherever necessary), shall be made with screwed fittings or screwed companion flanges.

B. Small PVC Piping Installation: Pipe and fittings connections to treatment equipment and at ends of runs shall have screw type joints. In all other locations, solvent welded slip type joints shall be used.

C. PEX Tubing Installation: Pipe and fittings connections shall be joined via stainless steel ring clamp.

D. Black Iron: All piping shall be cut square and threaded using standard pipe threading tools. Threads shall be full cut and perfect.

E. Joint shall be made up using Teflon base compounds placed on the pipe threads. Do not place compound on threads of fittings. NO WICKING WILL BE PERMITTED.

F. Reinforced Tubing: Connect tubing to transition couplings with stainless steel clamps in accordance with tubing manufacturers installation instructions.

G. Threaded joints where specified shall be made using standard hand or machine pipe threading tools. Dies must be sharp and in good condition to assure a clean and smooth threading operation from start to finish. Threads shall be full cut and perfect. Protective pads of leather, rubber or felt shall be employed to prevent damage to pipe walls by chuck and/or vise jaws. A slightly tapered wood plug shall be tapped snugly into the pipe for the length of thread to prevent distortion of the pipe wall by the die.

H. Solvent welded joints shall be made using solvent cement that meets or exceeds ASTM F493, compatible with PVC pipe and fittings. Solvent cement shall be Heavy Duty Industrial orange solvent cement by Oatey, or specifically approved equal.

I. Install PVC pipe in such a manner that it is not forced out of line by pipe supports, hangers or other supporting members. Pipe hangers shall be clevis or strap type.

J. For anchoring pipe, use metal compression type hangers padded with a compressible insert band.

K. All fittings, except couplings, shall be supported and valves shall be braced to resist torque during valve manipulation.

L. All piping shall be free of traps and graded to permit complete drainage.

M. Copper Piping: All piping shall be cut square, burrs removed and reamed after cutting. Fitting sockets and tube ends shall be thoroughly cleaned to a bright finish. All solder joints shall be fluxed and soldered using 95-5 tin and antimony solder and water soluble flux.

D. Cuts made in copper service tubing for installation of valves or connection to the building shall be square, reamed, and all burrs removed. Protective pads or leather, rubber or felt shall be employed to prevent damage to pipe walls by chuck and/or vise jaws. A slightly tapered wood plug shall be tapped snugly into the pipe for the length of thread to prevent distortion of the pipe wall by the die.

N. Solder used for service line fittings shall be lead-free, with a maximum lead content of 0.2 percent.

**3.03 - DISINFECTION OF WATER PIPING SYSTEM**

A. Flush and disinfect system in accordance with Section 331300.

**3.04 - FIELD QUALITY CONTROL**

A. Field inspection and testing will be performed under provisions of Section 014500.

B. Flush piping prior to conducting pressure testing.

C. Rework or replace defective and leaking joints, and joints which are otherwise unsatisfactory. Peening, caulking and doping are not permitted.

D. The Contractor shall furnish all labor, materials and equipment necessary to accomplish all testing and repairs.

**3.05 - TESTING**

A. Leakage testing shall be in accordance with ANSI/AWWA C600. Check joints for leakage while under air pressure by swabbing, utilizing soap and water solution, and leaks found shall be repaired and rechecked. Furnish all labor, materials, and equipment necessary to accomplish all testing and repairs.

B. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to Owner.

C. Rework or replace defective and leaking joints, and joints that are otherwise unsatisfactory. Peening, caulking and doping are not permitted.

**END OF SECTION**

## 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 York
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. | DEC | New York State Department of Environmental Conservation - 6 NYCRR Part 613 Handling and Storage of Petroleum |
| 17. | ASHRAE | American Society of Heating, Refrigeration and Air Conditioning Engineers. |
| 18. | AWWA | American Water Works Association |
| 19. | MSS | Manufacturer's Standardization Society of the Valve and Fitting Industry |
| 20. | ARI | American Refrigeration Institute |
| 21. | SMACNA | Sheet Metal and Air Conditioning Contractor's National Association |
| 22. | TEMA | Tubular Exchanger Manufacturers Association |
| 23. | F.S. or FED | Spec. Federal Specification |

| | | |
|---|---|---|
| 24. | ASA | Acoustical Society of America |
| 25. | NACE | National Association or Corrosion Engineers |
| 26. | ASSE | American Society of Sanitary Engineers |
| 27. | International Building Code | |
| 28. | International Fire Code | |
| 29. | International Existing Building Code | |
| 30. | International Fuel Gas Code | |
| 31. | International Plumbing Code | |
| 32. | International Energy Conservation Code | |
| 33. | International Mechanical Code | |
| 34. | New York State Sanitary Code | |
| 35. | New York State Industrial Code Rules | |
| 36. | IRI | Industrial Risk Insurers |
| 37. | AGA | American Gas Association |
| 38. | AABC | American Air Balance Council |
| 39. | NEBB | National Environmental Balancing Bureau |
| 40. | 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:

| | |
|---|---|
| HVAC | Heating, Ventilating and Air Conditioning |
| CM | Construction Manager |
| AC | Air Conditioning |
| H & V | Heating and Ventilating |
| AWG | American Wire Gauge |
| BWG | Birmingham Wire Gauge |
| USS | United States Standard |
| B & S | Brown & Sharpe |
| OS & Y | Outside Screw and Yoke |
| IBBM | Iron Body Brass Mounted |
| WSP | Working Steam Pressure |
| PSIG | Pounds per Square Inch Gauge |
| PRV | Pressure Reducing Valve |
| GPM | Gallons per Minute |
| MBH | Thousand BTU per hour |
| BTU | British Thermal Units |
| WG | Water Gage |
| LB | Pound (Also shown as: #) |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society for Testing Materials |

| | |
|---|---|
| ABMA | American Boiler Manufacturers Association |
| ASA | American Standards Associates |
| 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 Architect/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 Architect/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 Architect/Engineer. Perform all cutting in a manner directed by the Architect/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. Breeching layout drawings

3. Piping and equipment layout drawings.

4. Piping materials, valves, hangers, supports and accessories

5. Automatic temperature control equipment, diagrams and control sequences

6. Equipment, fixtures, and appurtenances

7. Insulation

8. 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 and water 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 NYSECC 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 he deems 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 Architect/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 Architect/Engineer furnish the Owner a CD copy of the record drawings along with one hard copy for his 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.

3. Clean all strainers after system cleaning and flushing and again before system startup.

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 Architect/Engineer.

C. Submit shop drawings of supports to the Architect/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.

1. Level and shim the equipment; coordinate and oversee the grouting work.

B. Perform field assembly, installation and alignment of equipment under direct supervision provided by the manufacturer or with inspections, adjustments and approval by the manufacturer.

C. 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.

2. Make any corrections to items that are required or recommended based on the manufacturer’s inspection and have the equipment re-inspected.

D. 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.

E. 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.

F. 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 – POSTED OPERATIONS INSTRUCTIONS**

A. Prepare instructions using professionally prepared graphics, printed on full size sheets and in color.

B. Prepare instructions for posting for all mechanical systems. Include all components. Include the following information as a minimum:

1. Comprehensive schematics for air distributing and handling systems

2. Facility floor plans showing location of all equipment with coordinated identification.

3. Piping diagrams for all systems.

4. System diagrams, including isometrics of equipment and systems (boiler, pumps, chiller, AHU's, VAV's, exhaust systems, etc)

5. Valve charts

6. Equipment Schedules

C. Include full control diagrams, include the following:

1. Control sequence of operations diagrams

2. Point's lists. Include all defined points along with a specific sequence of operations

3. Schematic HVAC systems and operations diagrams showing piping and ducting systems relative to each major item of equipment.

4. All control termination points permanently labeled and with labeling documented at the panel and in the posted instructions.

D. Frame all instructions in extruded metal frames, mounted under glass. Permanently mount instructions in the locations designated by the Owner.

**3.08 - 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. Provide minimum equipment instruction periods as follows:

| Systems or Equipment | Training Time (Hours) |
|---|---|
| All equipment | 4 hrs. (each) |

Note: Consult individual equipment specification sections for additional training requirements.

**END OF SECTION**

## 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. Inspection Report of Underground Piping Systems

D. 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 Architect/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 Architect/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**

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 Architect/Engineer and Owner. Include all interruptions of existing services in schedules submitted for approval by the Architect/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 Architect/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 Architect/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 Architect/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 Architect/Engineer.

**3.03 – PIPING REMOVAL**

A. Cut off all welded piping square at the locations indicated on the Drawings. No cutting is required where the demolition ends at a flanged valve or equipment. Close off all openings of any remaining valves, piping or fittings with weld caps or blind flanges to prevent debris from entering the existing system.

B. Disconnect all threaded piping at the location indicated on the Drawings. Close off all openings of remaining valves, piping, fittings and equipment with pipe plugs or pipe caps as required to prevent debris from entering the existing systems.

C. Remove all pipe hangers, supports, miscellaneous steel and anchors with the piping.

**3.04 – 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 Architect/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.

C. It is the Contractor's responsibility to ensure that piping systems that are being worked on are completely drained from water prior to the start of demolition. If water is not drained and the water freezes it is the Contractor's responsibility to replace piping and repair all damages caused by water leakage at his own expense.

**3.05 – 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.

**3.06 – 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.

**3.07 – REFRIGERANT REMOVAL**

A. Recover and dispose of all existing refrigerant charges in accordance with EPA regulations. Comply with all regulations applicable to the release of chlorofluorocarbon refrigerants to the atmosphere.

**3.08 – 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.

**3.09 – INSULATION REMOVAL**

A. Remove insulation, together with all piping, fittings, valves and equipment designated for demolition.

**3.10 – 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**

## PART 1 — GENERAL

### 1.01 - DESCRIPTION OF WORK

A. This section describes the insulation, jackets and accessories for piping 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. International Energy Conservation Code

D. International Mechanical Code

E. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

F. SMACNA - HVAC Duct Construction Standards - Metal and Flexible

G. Underwriters Laboratories, Inc. (UL):

1. UL 723 - Surface Burning Characteristics of Building Materials.

H. 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 C335 - Steady-State Heat Transfer Properties of Horizontal Pipe Insulation.

4. ASTM C518 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

5. ASTM C533 – Calcium Silicate Block and Pipe Thermal Insulation

6. ASTM C534 - Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.

7. ASTM C547 - Mineral Fiber Preformed Pipe Insulation.

8. ASTM C 552 – Specification for Cellular Glass Thermal Insulation

9. ASTM C553 - Mineral Fiber Blanket and Felt Insulation.

10. ASTM C585 - Standard Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System)

11. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel

12. ASTM C921 - Properties of Jacketing Materials for Thermal Insulation.

13. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation

14. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.

15. ASTM E84 - Surface Burning Characteristics of Building Materials.

16. 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/ Surfaces: Pipes or surfaces where the normal operating temperature is 60 degrees F or lower.

**1.04 - SUBMITTALS**

A. Product data: 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.

**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. Insulation for duct, pipe and equipment for above grade exposed to weather outside building shall be certified as being self-extinguishing for 1" thickness in less than 53 seconds when tested in accordance with ASTM D1692.

## PART 2 – PRODUCTS

### 2.01 – ELASTOMERIC INSULATION

A. Flexible, closed-cell elastomeric insulation in tubular or sheet form. Manufacture insulation material without the use of CFC's, HFC's or HCFC's and to be formaldehyde free, low VOC's, fiber free, dust free and to resist mold and mildew. Maximum thermal conductivity; 0.27 Btu-in./h-ft2-deg F at a 75 deg F mean temperature when tested in accordance with ASTM C 177 or ASTM C 518, latest revisions. Maximum water vapor transmission; 0.08 per-inches when tested in accordance with ASTM E96, Procedure A, latest revision.

B. Approved Products:

1. AP Armaflex by Armstrong

### 2.02 – ELASTOMERIC INSULATION ACCESSORIES

A. Adhesives and Finishes:

1. Insulation manufacturer's recommended contact adhesive: Armaflex 520, Armaflex BLV or Armaflex HT 625 Adhesive.

2. Insulation manufacturer's recommended finish: WB Armaflex Finish.

### 2.03 - HIGH DENSITY JACKETED INSULATION INSERTS FOR HANGERS AND SUPPORTS

A. For Use with Flexible Elastomeric Foam Insulation: Hardwood dowels and blocks, length or thickness equal to insulation thickness, other dimensions as specified or required.

## PART 3 — EXECUTION

### 3.01 - EXAMINATION

A. Verify that all piping 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 – 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. Maintain continuous pipe insulation through walls, ceiling or floor openings, or sleeves except where firestop or firesafing materials are required.

E. Install insulation neatly, accurately and without voids, in accordance with manufacturer's instructions and NIAC National Commercial and Industrial Insulation Standards.

F. Insulate fittings, valves and flanges using premolded covers with precut insulation inserts.

G. Insulate piping using insulation of type and thickness scheduled in this Section. Where piping is to be heat traced, provide insulation thickness scheduled for traced lines and not the thickness scheduled for the outdoor location of the specified piping system. Coordinate insulation installation with heat-tracing installation and testing. Insulate piping after tracing or heat distribution tape has been installed and tested for continuity.

H. Install metal shields between hangers or supports and the piping insulation. Install rigid insulation inserts as required between the pipe and the insulation shields. Fabricate inserts to be of equal thickness to the adjacent insulation and vapor seal as required. Insulation inserts shall be no less than the following lengths:

| | |
|---|---|
| 1½" to 2½" IPS | 10" long |
| 3" to 6" IPS | 12" long |
| 8" to 10" IPS | 16" long |
| 12" and over IPS | 22" long |

I. Protect piping insulation exposed in mechanical rooms or high traffic areas from abuse by the use of appropriate thickness of PVC jacketing or metal jacketing.

**3.03 – INSTALLATION (ELASTOMERIC)**

A. Piping:

1. Install pipe insulation by slitting tubular sections and applying onto piping or tubing. Alternately, slide unslit sections over the open ends of piping or tubing. Adhere and seal all seams and butt joints using Armaflex 520 or 520 BLV Adhesive. Only adhere the butt joints using Armaflex 520 or 520 BLV Adhesive when using AP Armaflex SS.

2. Push insulation onto the pipe, never pull. Stretching of insulation may result in open seams and joints.

3. Tape the ends of the tubing before slipping the Armaflex insulation over the new pipes to prevent dust from entering the pipe.

4. Clean cut all edges. Do not leave rough or jagged edges of the insulation. Use proper tools such as sharp non-serrated knives.

5. On cold piping, adhere insulation directly to the piping at the high end of the run using a two-inch strip of Armaflex 520 or 520 BLV Adhesive on the ID of the insulation and on the pipe. Coat all exposed end cuts of the insulation with Armaflex 520 or 520 BLV Adhesive. Adhere all penetrations through the insulation and termination to the substrate to prevent condensation migration.

6. Use sheet insulation on all pipes larger than 6" IPS. Do not stretch insulation around the pipe. On pipes larger than 12" IPS, adhere insulation directly to the pipe on the lower 1/3 of the pipe. On pipes greater than 24" IPS, completely adhere insulation.

7. Stagger seams when applying multiple layers of insulation.

B. Valves, Flanges and Fittings:

1. Insulate all fittings with the same insulation thickness as the adjacent piping. Adhere all seams and mitered joints with Armaflex 520 or 520 BLV Adhesive. Sleeve screwed fittings and adhere with a minimum 1" overlap onto the adjacent insulation. Use Armaflex HT 625 Adhesive with HT Armaflex.

2. Insulate valves, flanges, strainers, and Victaulic couplings using Armaflex donuts covered with sheet or oversized tubular insulation.

C. Hangers:

1. Support piping system using high density inserts with sufficient compressive strength. Apply elastomeric foam insulation with the same or greater thickness than the pipe insulation to pipe supports. Seal all joints with Armaflex 520 or 520 BLV adhesive.

2. Standard and split hangers – Insulate piping supported by ring hangers with the same insulation thickness as the adjacent pipe. Seal all seams and butt joints with Armaflex 520 or 520 BLV Adhesive. Use Armaflex HT 625 Adhesive with HT Armaflex. Sleeve ring hangers using oversized tubular insulation. On cold piping, extend insulation up the hanger rod a distance equal to four times the insulation thickness. Insulation tape may be used to a thickness equal to the adjacent insulation thickness.

3. Clevis hangers or other pipe support systems – Install saddles under all insulated lines at unistrut clamps, clevis hangers, or locations where insulation may be compressed due to the weight of the pipe. Insert and adhere wooden dowels or blocks of a thickness equal to the insulation to the insulation between the pipe and the saddle.

4. Armafix IPH or Armafix NPH can be used to prevent compression of insulation at standard split, clevis hangers or other pipe support systems. Adhere a pair of non-skid pads s to the clamps to minimize the movement of Armafix,. In addition, to prevent loosening of the clamps, use an antivibratory fastener, such as a nylon-locking nut.

D. Outdoors Exposed Piping:

1. Paint all outdoor exposed piping with two coats of WB Armaflex Finish. Prior to applying the Finish, wipe the insulation with denatured alcohol. Do not tint the Finish.

2. Locate seams for all outdoor exposed piping on the lower half of the pipe.

**3.04 - PIPING INSULATION SCHEDULE**

| SYSTEM OR SERVICE | LOCATION | PIPE SIZE | INSULATION TYPE | THICKNESS (INCHES) | JACKET |
|---|---|---|---|---|---|
| Condensate Drains | Inside | Up to 2” | Elastomeric | 1/2 | |
| HVAC Refrigerant Lines | Inside | Up to 2” | Elastomeric | 1-1/2 | |
| HVAC Refrigerant Lines | Outside | Up to 2” | Elastomeric | 1-1/2 | Exterior Coating |

**END OF SECTION**

## 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

## 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.

### 3.02 – SEQUENCE OF OPERATION – ELECTRIC WALL HEATER, EUH-1 & EUH-2

A. General:

1. The heater shall be provided with an integral thermostat.

B. Heating:

1. The heating set point temperature shall be 55°F (adj.). When the space temperature falls below the set point temperature, the heater shall turn on to maintain the set point temperature.

**3.03 – SEQUENCE OF OPERATION – SUPPLY FAN, SF-1**

A. General:

1. The supply fan shall be provided with an H-A switch and door contacts by Contract 'E'.

a. Hand Mode: Supply fan shall operate.

b. Auto Mode: Supply fan shall operate upon Influent Pump Station hatch doors opening and shall continue to operate until doors are closed.

**3.04 – SEQUENCE OF OPERATION – EXHAUST FAN AND MOTORIZED LOUVERS, EF-1, L-1 & L-2**

A. General:

1. The exhaust fan shall be provided with an HOA switch and remote mounted thermostat by Contract 'E'.

a. Hand Mode: Exhaust fan shall operate and motorized louvers shall open.

b. Off Mode: Exhaust fan shall be off and motorized louvers shall be closed.

c. Auto Mode: Exhaust fan shall operate and motorized louvers shall open upon a rise in space temperature above 85°F (adj.).

**3.05 – SEQUENCE OF OPERATION – EXHAUST FAN, EF-2**

A. General:

1. The exhaust fan operation shall be interlocked with the Toilet Room lights operation.

**3.06 – SEQUENCE OF OPERATION – VARIABLE REFRIGERANT FLOW HEAT PUMP SYSTEM, AC-1, AC-2, CU-1**

A. General:

1. The heat pump system shall be provided with a wall mounted digital thermostat with both heating and cooling modes.

B. Heating:

1. The heating set point temperature shall be 60°F (adj.). When the space temperature falls below the set point temperature, the unit shall turn on to maintain the set point temperature.

C. Cooling:

1. The cooling set point temperature shall be 80°F (adj.). When the space temperature rises above the set point temperature, the unit shall turn on to maintain the set point temperature.

**3.07 – SEQUENCE OF OPERATION – VARIABLE REFRIGERANT FLOW HEAT PUMP SYSTEM, AC-3, CU-2**

A. General:

1. The heat pump system shall be provided with a wall mounted digital thermostat with both heating and cooling modes.

B. Heating:

1. The heating set point temperature shall be 65°F (adj.). When the space temperature falls below the set point temperature, the unit shall turn on to maintain the set point temperature.

C. Cooling:

1. The cooling set point temperature shall be 76°F (adj.). When the space temperature rises above the set point temperature, the unit shall turn on to maintain the set point temperature.

**3.08 – SEQUENCE OF OPERATION – VARIABLE REFRIGERANT FLOW HEAT PUMP SYSTEM, AC-4, CU-2**

A. General:

1. The heat pump system shall be provided with a wall mounted digital thermostat with both heating and cooling modes.

B. Heating:

1. The heating set point temperature shall be 65°F (adj.). When the space temperature falls below the set point temperature, the unit shall turn on to maintain the set point temperature.

C. Cooling:

1. The cooling set point temperature shall be 76°F (adj.). When the space temperature rises above the set point temperature, the unit shall turn on to maintain the set point temperature.

**3.09 – SEQUENCE OF OPERATION – VARIABLE REFRIGERANT FLOW HEAT PUMP SYSTEM, AC-5, CU-2**

A. General:

1. The heat pump system shall be provided with a wall mounted digital thermostat with both heating and cooling modes.

B. Heating:

1. The heating set point temperature shall be 65°F (adj.). When the space temperature falls below the set point temperature, the unit shall turn on to maintain the set point temperature.

C. Cooling:

1. The cooling set point temperature shall be 76°F (adj.). When the space temperature rises above the set point temperature, the unit shall turn on to maintain the set point temperature.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - RELATED DOCUMENTS

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

B. Requirements of the following Division 23 Sections apply to this section:

1. Section 230010-General Mechanical Requirements.

2. Section 230700-Pipe Insulation

### 1.02 - SUMMARY

A. This Section includes refrigerant piping used for air conditioning applications. This Section includes:

1. Piping, tubing, fittings, and specialties.

2. Special duty valves.

3. Refrigerants.

B. Products installed but not furnished under this Section include pre-charged tubing, refrigerant specialties, and refrigerant accessories furnished as an integral part of or separately with packaged air conditioning equipment.

### 1.03 - SUBMITTALS

A. Product data for the following products:

1. Each type of valve specified.

2. Each type of refrigerant piping specialty specified.

B. Shop Drawings showing layout of refrigerant piping, specialties, and fittings including, but not necessarily limited to, pipe and tube sizes, valve arrangements and locations, slopes of horizontal runs, wall and floor penetrations, and equipment connection details. Show interface and spatial relationship between piping and proximity to equipment.

C. Brazer's Certificates signed by Contractor certifying that brazers comply with requirements specified under "Quality Assurance" below.

E. Maintenance data for refrigerant valves and piping specialties, for inclusion in Operating and Maintenance Manual specified in Division 01 and Division 23.

**1.04 - QUALITY ASSURANCE**

A. Qualify brazing processes and brazing operators in accordance with ASME "Boiler and Pressure Vessel Code," Section IX, "Welding and Brazing Qualifications".

B. Regulatory Requirements: Comply with provisions of the following codes:

1. ANSI B31.5: ASME Code for Pressure Piping - Refrigerant Piping.

2. ANSI/ASHRAE Standard 15: Safety Code for Mechanical Refrigeration.

C. Mechanical Code of New York State

**1.05 - SEQUENCING AND SCHEDULING**

A. Coordinate the installation of roof piping supports, and roof penetrations.

**PART 2 - PRODUCTS**

**2.01 - MANUFACTURERS**

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

B. Refrigerant Valves and Specialties:

1. Alco Controls Div, Emerson Electric.

2. Danfoss Electronics, Inc.

3. EATON Corporation, Control Div.

4. Henry Valve Company.

5. Parker-Hannifin Corporation, Refrigeration and Air Conditioning Division.

6. Sporlan Valve Company.

**2.02 - PIPE AND TUBING MATERIALS**

A. General: Refer to Part 3, Article "PIPE APPLICATIONS" for identification of systems where the below specified pipe and fitting materials are used.

B. Copper Tubing: ASTM B 280, Type ACR, hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing. Tubing shall be factory cleaned, ready for installation, and have ends capped to protect cleanliness of pipe interiors prior to shipping.

C. Copper Tubing: ASTM B 88, Type L, hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing.

**2.03 - FITTINGS**

A. Wrought-Copper Fittings: ANSI B16.22, streamlined pattern.

**2.04 - JOINING MATERIALS**

A. Brazing Filler Metals: AWS A5.8, Classification BAg-1 (Silver).

**2.05 - VALVES**

A. General: Complete valve assembly shall be UL-listed and designed to conform to ARI 760.

B. Globe: 450 psig maximum operating pressure, 275 deg. F maximum operating temperature; cast bronze body, with cast bronze or forged brass wing cap and bolted bonnet; replaceable resilient seat disc; plated steel stem. Valve shall be capable of being repacked under pressure. Valve shall be straight through or angle pattern, with solder-end connections.

C. Check Valves - Smaller Than 7/8 inch: 500 psig maximum operating pressure, 300 deg. F maximum operating temperature; cast brass body, with removable piston, Teflon seat, and stainless steel spring; straight through globe design. Valve shall be straight through pattern, with solder-end connections.

D. Check Valves - 7/8 inch and Larger: 450 psig maximum operating pressure, 300 deg. F maximum operating temperature; cast bronze body, with cast bronze or forged brass bolted bonnet; floating piston with mechanically retained Teflon seat disc. Valve shall be straight through or angle pattern, with solder-end connections.

E. Solenoid Valves: 250 deg. F temperature rating, 400 psig working pressure; forged brass, with Teflon valve seat, two-way straight through pattern, and solder end connections. Provide manual

operator to open valve. Furnish complete with NEMA 1 solenoid enclosure with 1/2 inch conduit adapter, and 24 volt, 60 Hz. normally closed holding coil.

F. Hot Gas Bypass Valve: adjustable type, sized to provide capacity reduction beyond the last step of compressor unloading; and wrought copper fittings for solder end connections.

**2.06 - REFRIGERANT PIPING SPECIALTIES**

A. General: Complete refrigerant piping specialty assembly shall be UL-listed and designed to conform to ARI 760.

B. Strainers: 500 psig maximum working pressure; forged brass body with monel 80-mesh screen, and screwed cleanout plug; Y-pattern, with solder end connections.

C. Moisture/liquid Indicators: 500 psig maximum operation pressure, 200 deg. F maximum operating temperature; forged brass body, with replaceable polished optical viewing window, and solder end connections.

D. Filter-driers: 500 psig maximum operation pressure; steel shell, flange ring, and spring, ductile iron cover plate with steel capscrews, and wrought copper fittings for solder end connections. Furnish complete with replaceable filter-drier core kit, including gaskets. Standard capacity desiccant sieves to provide micronic filtration.

E. Flanged Unions: 400 psig maximum working pressure, 330 deg. F maximum operating temperature; two brass tailpiece adapters for solder end connections to copper tubing; flanges for 7/8 inch through 1-5/8 inch unions shall be forged steel, and for 2-1/8 inch through 3-1/8 inch shall be ductile iron; four plated steel bolts, with silicon bronze nuts and fiber gasket. Flanges and bolts shall have factory-applied rust-resistant coating.

F. Flexible Connectors: 500 psig maximum operating pressure; seamless tin bronze or stainless steel core, high tensile bronze braid covering, solder connections, and synthetic covering; dehydrated, pressure tested, minimum 7 inch in length.

**2.07 - REFRIGERANT**

A. Refrigerant No. 410A, in accordance with ASHRAE Standard 34.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Examine rough-in for refrigerant piping systems to verify actual locations of piping connections prior to installation.

### 3.02 - PIPE APPLICATIONS

A. Use Type L, or Type ACR drawn copper tubing with wrought copper fittings and brazed joints above ground, within building. Use Type K, annealed temper copper tubing for 2 inch and smaller without joints, below ground and within slabs. Mechanical fittings (crimp or flair) are not permitted.

B. Install annealed temper tubing in pipe duct. Vent pipe duct to the outside.

C. If other than Type ACR tubing is used, clean and protect inside of tubing as specified in Article "CLEANING" below.

### 3.03 - PIPING INSTALLATIONS

A. General: Install refrigerant piping in accordance with ASHRAE Standard 15 - "The Safety Code for Mechanical Refrigeration."

B. Install piping in as short and direct arrangement as possible to minimize pressure drop.

C. Install piping for minimum number of joints using as few elbows and other fitting as possible.

D. Arrange piping to allow normal inspection and servicing of compressor and other equipment. Install valves and specialties in accessible locations to allow for servicing and inspection.

E. Provide adequate clearance between pipe and adjacent walls and hanger, or between pipes for insulation installation. Use sleeves through floors, walls, or ceilings, sized to permit installation of full thickness insulation.

F. Insulate suction lines. Liquid line are not required to be insulated, except where they are installed adjacent and clamped to suction lines, where both liquid and suction lines shall be insulated as a unit.

G. Do not install insulation until system testing has been completed and all leaks have been eliminated.

H. Install branch tie-in lines to parallel compressors equal length, and pipe identically and symmetrically.

I. Install copper tubing in rigid or flexible conduit in locations where copper tubing will be exposed to mechanical injury.

J. Slope refrigerant piping as follows:

1. Install horizontal hot gas discharge piping with 1/2" per 10 feet downward slope away from the compressor.

2. Install horizontal suction lines with 1/2 inch per 10 feet downward slope to the compressor, with no long traps or dead ends which may cause oil to separate from the suction gas and return to the compressor in damaging slugs.

3. Liquid lines may be installed level.

K. Install traps and double risers where indicated, and where required to entrain oil in vertical runs.

L. Use fittings for all changes in direction and all branch connections.

M. Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted, unless expressly indicated.

N. Install piping free of sags or bends and with ample space between piping to permit proper insulation applications.

O. Conceal all pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade or floors, unless indicated to be exposed to view.

P. Install piping tight to slabs, beams, joists, columns, walls, and other permanent elements of the building. Provide space to permit insulation applications, with 1 inch clearance outside the insulation. Allow sufficient space above removable ceiling panels to allow for panel removal.

Q. Locate groups of pipe parallel to each other, spaced to permit applying insulation and servicing of valves.

R. Exterior Wall Penetrations: Seal pipe penetrations through exterior walls using sleeves and mechanical sleeve seals. Pipe sleeves smaller than 6 inch shall be steel; pipe sleeves 6 inch and larger shall be sheet metal.

S. Fire Barrier Penetrations: Where pipes pass through fire rated walls, partitions, ceilings, and floors, maintain the fire rated integrity. Refer to Division 7 for special sealers and materials.

T. Make reductions in pipe sizes using eccentric reducer fittings installed with the level side down.

U. Install strainers immediately ahead of each expansion valve, solenoid valve, hot gas bypass valve, compressor suction valve, and as required to protect refrigerant piping system components.

V. Install moisture/liquid indicators in liquid lines between filter/driers and thermostatic expansion valves and in liquid line to receiver.

W. Install moisture/liquid indicators in lines larger than 2-1/8 inch OD, using a bypass line.

X. Install unions to allow removal of solenoid valves, pressure regulating valves, expansion valves, and at connections to compressors and evaporators.

Y. Install flexible connectors at the inlet and discharge connection of compressors.

**3.04 - HANGERS AND SUPPORTS**

A. General: Hanger, supports, and anchors are specified in Division 23 Section "PIPE HANGERS AND SUPPORTS." Conform to the table below for maximum spacing of supports:

B. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal runs less than 20 feet in length.

C. Install hangers with the following minimum rod sizes and maximum spacing:

| NOM. PIPE SIZE INCHES | MAX. SPAN FT | MIN. ROD SIZE INCHES |
|---|---|---|
| 1 | 7 | 3/8 |
| 1-1/2 | 9 | 3/8 |
| 2 | 10 | 3/8 |

D. Support vertical runs at each floor.

**3.05 - PIPE JOINT CONSTRUCTION**

A. Brazed Joints: Comply with the procedures contained in the AWS "Brazing Manual."

B. WARNING: Some filler metals contain compounds which produce highly toxic fumes when heated. Avoid breathing fumes. Provide adequate ventilation.

C. CAUTION: When solenoid valves are being installed, remove the coil to prevent damage. When sight glasses are being installed, remove the glass. Remove stems, seats, and packing of valves, and accessible internal parts of refrigerant specialties before brazing. Do no apply heat near the bulb of the expansion valve.

D. Fill the pipe and fittings during brazing, with an inert gas (i.e., nitrogen or carbon dioxide) to prevent formation of scale.

E. Heat joints using oxy-acetylene torch. Heat to proper and uniform brazing temperature.

**3.06 - VALVE INSTALLATIONS**

A. General: Install refrigerant valves where indicated, and in accordance with manufacturer's instructions.

B. Install globe valves on each side of strainers and driers, in liquid and suction lines at evaporators, and elsewhere as indicated.

C. Install a full sized, 3-valve bypass around each drier.

D. Install solenoid valves ahead of each expansion valve and hot-gas bypass valve. Install solenoid valves in horizontal lines with coil at the top.

E. Electrical wiring for solenoid valves is specified in Division 26. Coordinate electrical requirements and connections.

F. Thermostatic expansion valves may be mounted in any position, as close as possible to the evaporator.

G. Where refrigerant distributors are used, mount the distributor directly on the expansion valve outlet.

H. Install the valve in such a location so that the diaphragm case is warmer than the bulb.

I. Secure the bulb to a clean, straight, horizontal section of the suction line using two bulb straps. Do not mount bulb in a trap or at the bottom of the line.

J. Where external equalizer lines are required make the connection where it will clearly reflect the pressure existing in the suction line at the bulb location.

K. Install pressure regulating and relieving valves as required by ASHRAE Standard 15.

**3.07 - EQUIPMENT CONNECTIONS**

A. The Drawings indicate the general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow servicing and maintenance.

### 3.08 - FIELD QUALITY CONTROL

A. Inspect, test, and perform corrective action of refrigerant piping in accordance with ASME Code B31.5, Chapter VI.

B. Repair leaking joints using new materials, and retest for leaks.

### 3.09 - CLEANING

A. Before installation of copper tubing other than Type ACR tubing, clean the tubing and fitting using following cleaning procedure:

1. Remove coarse particles of dirt and dust by drawing a clean, lintless cloth through the tubing by means of a wire or an electrician's tape.

2. Draw a clean, lintless cloth saturated with trichloroethylene through the tube or pipe. Continue this procedure until cloth is not discolored by dirt.

3. Draw a clean, lintless cloth, saturated with compressor oil, squeezed dry, through the tube or pipe to remove remaining lint. Inspect tube or pipe visually for remaining dirt and lint.

4. Finally, draw a clean, dry, lintless cloth through the tube or pipe.

### 3.10 - ADJUSTING AND CLEANING

A. Verify actual evaporator applications and operating conditions, and adjust thermostatic expansion valve to obtain proper evaporator superheat requirements.

B. Clean and inspect refrigerant piping systems in accordance with requirements of Division-23 General Mechanical Requirements

C. Adjust controls and safeties. Replace damaged or malfunctioning controls and equipment with new materials and products.

### 3.11 - COMMISSIONING

A. Charge system using the following procedure:

1. Install core in filter dryer after leak test but before evacuation.

2. Evacuate refrigerant system with vacuum pump; until temperature of 35 deg F is indicated on vacuum dehydration indicator.

3. During evacuation, apply heat to pockets, elbows, and low spots in piping.

4. Maintain vacuum on system for minimum of 5 hours after closing valve between vacuum pump and system.

5. Break vacuum with refrigerant gas, allow pressure to build up to 2 psi.

6. Complete charging of system, using new filter dryer core in charging line. Provide full operating charge.

7. Train Owner's maintenance personnel on procedures and schedules related to start-up and shut-down, troubleshooting, servicing, and preventative maintenance of refrigerant piping valves and refrigerant piping specialties.

B. Review data in Operating and Maintenance Manuals. Refer to Division 01 section "Project Closeout."

C. Schedule training with Owner with at least 7 days advance notice.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - DESCRIPTION OF WORK

A. This Section describes the 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 - 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. International Mechanical Code.

### 1.03 - REGULATORY REQUIREMENTS

A. Construct ductwork to NFPA 90A and International Mechanical Code standards.

### 1.04 - 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.

**1.05 – 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 – STAINLESS STEEL DUCTWORK**

A. Fabricate ducts of minimum 20 gage AISI Type 316 stainless steel sheet metal.

B. Use stainless steel fasteners.

C. Use stainless steel reinforcing members.

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 – HEAVY DUTY FLEXIBLE CONNECTIONS**

A. Heavy Duty Flexible Connections shall be used in high pressure (greater than 2 in. w.c.), high temperature (greater than 150 degree F) air applications or where the gas is highly corrosive and the duct connector must be leak proof.

B. Flexible Connectors shall be flanged. If installed outdoors, all metallic components shall be stainless steel construction. Provide flexible connector materials of construction as recommended by the manufacturer for the pressure, temperature, and gas that is being used in air handler system.

C. Approved Manufacturers:

1. Mercer Rubber Company

**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 – 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 |
| 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.

**3.08 – 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. Ductwork to be painted shall be as shown on the Drawings. Painting shall be in accordance with the requirements of the “Painting” Specification Section.

**3.09 – DUCTWORK MATERIAL SCHEDULE**

| AIR SYSTEM | DUCTWORK MATERIAL |
|---|---|
| Influent Pump Station Ductwork | Type 316 Stainless Steel |

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 – DESCRIPTION OF WORK

A. Provide 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 – INLINE CENTRIFUGAL SUPPLY FAN (SF-1)**

A. General Description:

1. Fan shall be Model TCBRS as manufactured by Greenheck or approved equal**.**

2. Fan shall be for roof mounted applications.

3. Fan shall be belt driven in AMCA arrangement 9 only with wheel secured to the fan shaft.

4. Fan shall be equipped with lifting lugs.

5. Each fan shall bear a permanently affixed manufacture's engraved metal nameplate containing the model number and individual serial number.

B. Fan Housing and Outlet:

1. Fan housing to be aerodynamically designed with punched inlet and outlet flanges for ductwork connection on inline fans.

2. Fan housing shall be constructed of aluminum.

3. Housing and bearing support shall be constructed of welded structural steel members to prevent vibration and rigidly support the shaft and bearings.

4. Either an OSHA compliant weatherhood, or an OSHA compliant belt guard shall be included to completely cover the motor pulley and belt(s).

5. Curb cap shall be constructed of painted steel and welded to the fan housing.

6. Hoods shall be inter-locking panel style for superior strength. Hood construction shall be painted steel.

C. Fan Wheel:

1. The fan wheel shall be of the non-overloading backward inclined centrifugal type. Wheels shall be statically and dynamically balanced to balance grade G6.3 per ANSI S2.19.

2. Wheel shall be constructed with half-welded and half-riveted aluminum. The maximum pressure capabilities shall be 2 inches W.G.

3. Aluminum parts shall not require protective coating.

4. The wheel and fan inlet shall be carefully matched and shall have precise running tolerances for maximum performance and operating efficiency.

D. Fan Motors and Drive:

1. Motors shall meet or exceed EPACT (Energy Policy ACT) efficiencies. Motors to be NEMA T-frame, 1800 or 3600 RPM, Open Drip Proof (ODP) or Totally Enclosed Fan Cooled (TEFC) with a 1.15 service factor.

2. Drive belts and sheaves shall be sized for 150% of the fan operating brake horsepower, and shall be readily and easily accessible for service, if required.

3. Fan shaft to be turned and polished steel that is sized so the first critical speed is at least 25% over the maximum operating speed for each pressure class.

4. Fan shaft bearings shall be Air Handling Quality, bearings shall be heavy-duty grease lubricated, self-aligning or roller pillow block type.

5. Air Handling Quality bearings to be designed with low swivel torque to allow the outer race of the bearing to pivot or swivel within the cast pillow block. Bearings shall be 100% tested for noise and vibration by the manufacturer. Bearings shall be 100% tested to insure the inner race diameter is within tolerance to prevent vibration.

6. Bearings shall be selected for a basic rating fatigue life (L-10) of 80,000 hours at maximum operating speed for each pressure class [Average Life or (L-50) of 400,000 hours].

7. Bearings shall be fixed to the fan shaft using concentric mounting locking collars, which reduce vibration, increase service life, and improve serviceability. Bearings that use set screws shall not be allowed.

8. Bearings shall have extended lube lines with Zerk fittings to allow for lubrication.

E. Options/Accessories:

1. All options and accessories shall be as called for on the equipment schedules.

**2.02 – DIRECT DRIVE SIDEWALL MOUNTED PROPELLER FANS (EF-1)**

A. General Description:

1. Fans shall be model SE as manufactured by Greenheck or approved equal.

2. Fan arrangement shall be either supply or exhaust, see Fan Schedule.

3. Sidewall mounted applications.

4. Each fan shall bear a permanently affixed manufacturer's engraved metal nameplate containing the model number and individual serial number.

B. Wheel:

1. Propeller shall be aluminum blade riveted to steel hub.

2. A standard square key and set screw or tapered bushing shall lock the propeller to the motor shaft.

3. Statically and dynamically balanced in accordance with AMCA Standard 204-05.

4. The propeller and fan inlet will be matched and shall have precise running tolerances for maximum performance and operating efficiency.

C. Motors:

1. Motor enclosure: Totally enclosed air over

2. Motors are permanently lubricated, sleeve bearing type or ball bearing type to match with the fan load and furnished at the specific voltage and phase.

3. Accessible for maintenance

D. Drive Frame:

1. Drive frame assemblies and fan panels shall be galvanized steel.

2. Drive frame shall have welded wire or formed channels and fan panels shall have pre-punched mounting holes, formed flanges and a deep formed one piece inlet venture.

E. Options/Accessories:

1. All options and accessories shall be as called for on the equipment schedules.

**2.03 – THRU-WALL VENTILATOR (EF-2)**

A. General Description:

1. Fans shall be model 509 as manufactured by Broan or approved equal.

2. Fan arrangement shall be either supply or exhaust, see Fan Schedule.

3. Sidewall mounted applications.

B. Housing:

1. Housing shall adjust to fit walls from 4-1/2 to 9-1/2 inches thick.

2. Housing shall be steel finished with electrically-bonded epoxy paint. Interior grille shall be white polymeric.

3. Fan shall include built-in backdraft damper.

C. Motors:

1. Motor assembly shall be removable, permanently lubricated, thermally protected, plug-in motor with twist-lock installation.

2. Fan blade shall be polymeric.

**PART 3 - EXECUTION**

**3.01 – GENERAL**

A. Install fans, including all necessary structural supports and bracings 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 ensure proper alignment and phased electrical connections.

B. Test fans individually and as part of system.

C. Ensure fans are properly interlocked with control system.

D. Demonstrate operation to Owner and instruct maintenance personnel in operation of equipment.

**END OF SECTION**

## PART 1 –GENERAL

### 1.01 - SUMMARY

A. Section Includes: HVAC Gravity Intake and Relief Ventilators

B. Related Sections:

1. Division 1: General Requirements
2. Division 7: Thermal and Moisture Protection
3. Division 9: Finishes
4. Division 23: Heating, Ventilating, and Air-Conditioning (HVAC)

### 1.02 - SUBMITTALS

A. General: Submit in accordance with Section 013300 Submittals.

B. Provide dimensional drawings and product data on each gravity intake.

C. Provide performance data for each gravity intake at the specified airflow with the static pressure and throat velocity clearly noted.

D. Strictly adhere to QUALITY ASSURANCE requirements as stated in section 1.04 of this specification.

E. Provide manufacturer's certification that exhaust fans are licensed to bear Air Movement and Control Association (AMCA), Certified Rating Seal for sound and air performance.

F. Installation, Operation, and Maintenance Manual (IOM): Provide manufacturer's installation, operations, and maintenance manual, including instructions on installation, operations, maintenance, pulley adjustment, receiving, handling, storage, safety information and cleaning. A troubleshooting guide, parts list, warranty and electrical wiring diagrams.

### 1.03 - DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer’s original, unopened containers and packaging, with labels clearly indicating manufacturer, material, products included, and location of installation.

B. Storage: Store materials in a dry area indoor, protected from damage, and in accordance with manufacturer’s instructions. For long term storage follow manufacturer's Installation, Operations, and Maintenance Manual.

C. Handling: Handle and lift fans in accordance with the manufacturer’s instructions. Protect materials and finishes during handling and installation to prevent damage. Follow all safety warnings posted by the manufacturer.

**1.04 - WARRANTY**

A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

1. The warranty of this equipment is to be free from defects in material and workmanship for a period of one year from the purchase date. Any units or parts which prove defective during the warranty period will be replaced at the Manufacturers option when returned to Manufacturer, transportation prepaid.

2. Motor Warranty is warranted by the motor manufacturer for a period of one year. Should motors furnished by us prove defective during this period, they should be returned to the nearest authorized motor service station.

**1.05 - MAINTENANCE**

A. Refer to Manufacturer's Installation, Operation and Maintenance Manual (IOM), to find maintenance procedures.

**PART 2 – PRODUCTS**

**2.01 - SPUN ALUMINUM INTAKE AND RELIEF GRAVITY VENTILATOR**

A. Spun aluminum gravity intake ventilator shall be model GRSI by Greenheck or approved equal.

B. General Description:

1. Ventilator is low silhouette for relief applications with natural gravity or negative pressure system.

2. Selection based on ducted applications.

3. Intake unit size as indicated on drawings.

4. Performance as indicated on drawings.

5. Each unit shall bear a permanently affixed manufacture's nameplate containing the model number and individual serial number.

C. Hood:

1. Constructed of aluminum.

2. Internal structure constructed of galvanized steel.

D. Housing:

1. Constructed of aluminum, includes windband and curb cap. Galvanized material is not acceptable.

E. Options/Accessories:

1. All options and accessories shall be as called for on the equipment schedules.

## PART 3 - EXECUTION

### 3.01 - MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including technical bulletins, product catalog installation instructions.

### 3.02 - EXAMINATION

A. Examine areas to receive fans. Notify the Engineer of conditions that would adversely affect installation or subsequent utilization and maintenance of fans. Do not proceed with installation until unsatisfactory conditions are corrected.

### 3.03 - PREPARATION

A. Ensure roof openings are square, accurately aligned, correctly located, and in tolerance.

B. Ensure duct is plumb, sized correctly, and to proper elevation above roof deck. Install duct as specified in Air Distribution (Division 23).

### 3.04 - INSTALLATION

A. Install ventilators as indicated on the Installation, Operation and Maintenance Manual (IOM) and contract drawings.

B. Install ventilators in accordance with manufacturer's instructions.

**3.05 - SYSTEM STARTUP**

A. Refer to Installation, Operation, and Maintenance Manual (IOM).

**3.06 - ADJUSTING**

A. Ventilators shall be adjusted according to manufacturer's instructions.

**3.07 - CLEANING**

A. Clean as recommended by manufacturer. Do not use material or methods which may damage finish surface or surrounding construction.

**3.08 - PROTECTION**

A. Protect installed product and finished surfaces from damage during construction

B. Protect installed ventilators to ensure that, except for normal weathering, ventilators will be without damage or deterioration at time of substantial completion.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SYSTEM DESCRIPTION

A. The heat pump system shall be a variable refrigerant flow system with Variable Speed Inverter Compressor technology. The system shall consist of an air-cooled outdoor unit, one or more indoor ceiling cassette units, and a wired wall mounted controller.

### 1.02 - QUALITY ASSURANCE

A. The units shall be tested by a Nationally Recognized Testing Laboratory (NRTL) and shall bear the ETL label.

B. All wiring shall be in accordance with the National Electrical Code (N.E.C.).

C. The units shall have published performance ratings certified by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) and listed in the AHRI Standard 1230 certified product directory.

D. The units shall be manufactured in a facility registered to ISO 9001 and ISO 14001.

### 1.03 - DELIVERY, STORAGE, AND HANDLING

A. Unit shall be stored and handled according to the manufacturer’s recommendations.

### 1.04 - WARRANTY

A. The manufacturer shall provide a 2-year parts only warranty and an extended 4-year parts only warranty on the hermetic compressor assembly. Warranty period shall commence on the date of original installation or 60 days from the date of shipment, whichever is sooner.

### 1.05 - SUBMITTALS

A. Submit manufacturer’s product data including capacity of unit, electrical requirements, airflow, sound pressure data, indoor and outdoor unit measurements, weight, control schematics, and wiring diagrams.

## PART 2 - PRODUCTS

### 2.01 - CEILING CASSETTE INDOOR UNITS

A. General

1. System shall be manufactured by LG or approved equal.

2. Indoor units shall be made by the same manufacturer as the outdoor unit. The indoor unit shall be factory assembled, wired, piped, and provided with an internal electronic expansion device, control circuit board, fan and motor. The unit shall be capable of satisfactory operation within voltage limits of +/-10%. Refer to schedules for electrical power requirements.

3. Indoor unit refrigeration circuit shall be pressure tested at the factory and shipped with a holding charge of dry nitrogen gas.

4. All internal refrigerant lines shall be factory insulated. All refrigerant lines external to the indoor unit case shall be field insulated. The entire unit shall be run tested at the factory.

5. The unit shall be provided with a factory installed non-metallic condensate drain pan. An insulated flexible condensate drain hose shall be provided to connect the unit drain pan to the field provided condensate drain system.

B. Coil

1. Indoor unit coils shall be a minimum of two rows and manufactured using non-ferrous materials. Tubes shall be copper with inner grooves. Fin material shall be aluminum with a stamped louvered configuration. Coils shall be factory pressure tested to 600 psig air pressure.

2. The unit shall be provided with 45º flare refrigerant pipe connections.

C. Casing

1. The case shall be designed to mount recessed in the ceiling with the bottom of the cassette assembly exposed and flush with the ceiling surface. The unit shall be manufactured using light-gauge galvanized steel and sound attenuating coated polystyrene insulating foam insert. The case shall be provided with metal hangers designed to support the unit weight on four corners. Hangers shall have pre-punched holes designed to accept field supplied all thread rod hangers.

2. The casing shall have provisions for connecting a field provided fresh air duct.

D. Bottom Cover

1. The ceiling cassette assembly shall be provided with an off-white architectural bottom cover made with ABS polymer resin. Cover shall have a tapered trim edge and a hinged, snap close (screw-less) return air grille.

2. The unit case shall be designed to allow bottom access to hanger rods and adjustment nuts to allow unit leveling without accessing the ceiling cavity.

E. Fan

1. The indoor unit shall have a single, direct-drive, cross-flow fan. The fan wheel shall be a turbo design made of high strength ABS HT-700 polymer resin. The fan wheel shall be statically and dynamically balanced across the entire operating speed range. The fan shall be driven by a digitally controlled inverter that varies fan speed from zero to full speed.

2. The motor shall be high efficiency, brushless, digitally controlled (DC), having permanently lubricated ball bearings tested for a minimum life cycle of 30,000 hours designed and made by the unit manufacturer.

3. The fan speed shall be controlled using a microprocessor based direct digital control algorithm that provides a minimum of four pre-programmed fan speeds in the heating and fan only modes, and five speeds in the cooling mode. The fifth speed in the cooling mode shall be a jet-cool power cooling cycle.

4. A chaos wind algorithm shall provide random changes in fan speed simulating natural breeze conditions.

5. The fan speed algorithm shall also provide a field selectable auto-speed setting that adjusts fan speed based on the difference between controller set-point and space temperature.

F. Filter

1. Return air shall be filtered with a removable and washable pre-filter designed to capture airborne dust particles. Pre-filter media shall be treated with an anti-fungal agent to restrict the growth of bacteria on the media. The filter system shall have a factory installed secondary, multistage, washable, bio-fusion filter designed to breakdown the cell walls of certain bacteria and allergen cells.

2. The unit shall be supplied with a plasma type washable final filter designed to reduce microscopic particulate matter from the air including common dust, house mites, and pollen.

G. Guide Vanes

1. The bottom cover shall have four directional slot diffusers each equipped with independent oscillating motorized guide vanes designed to change the direction of airflow up and down with a 40º range of motion.

2. The control algorithm shall provide the capability of locking each guide vane independently in a field adjusted fixed position.

H. Controls

1. Unit shall be provided with a microprocessor based controller made by the unit manufacturer designed to perform all functions necessary to operate the system and shall interface with the outdoor unit and other indoor connected devices via a RS485 daisy chain communications link.

2. The microprocessor control algorithms shall provide self-diagnostics, auto restart following power restoration, and test run functions.

3. The microprocessor control algorithm shall provide five operation modes: Auto Operation, Heating, Cooling, Dehumidification, and Fan Only. Auto Operation mode shall automatically switch between cooling, dehumidification, and heating based on room temperature conditions.

4. In the heating mode, the microprocessor control shall not begin fan operation until the coil has reached 78ºF.

5. The microprocessor control shall provide a method for the service technician to adjust the delivered air volume at each preset fan speed to compensate for restrictions to airflow (ESP).

6. The microprocessor control shall provide a minimum of four settings; super high, high, standard, and low designed to adjust unit operation for installation at various ceiling heights ranging from 8.6 to 15 feet.

7. The unit shall be equipped with a room temperature thermistor mounted in the return air stream. Wall mounted and hand-held local controllers shall be equipped with a

temperature thermistor. In addition, the unit shall be designed to work with an optional auxiliary wall mounted remote temperature sensor. The unit shall be capable of controlling operations using any of the three sensors individually or any two of the three concurrently.

8. A single indoor unit shall have the capability of being controlled by up to two local wired controllers.

9. The microprocessor control shall have an override button that will start or stop the unit without the presence of either a wired or hand-held controller using the factory default unit operation settings.

10. The microprocessor control shall provide malfunction diagnostic codes at the local controller upon unit malfunction. Displayed diagnostic codes shall be specific and provide the service technician with the source of the malfunction.

I. Condensate Lift/Pump

1. The indoor unit shall be provided with a factory installed and wired condensate lift pump capable of providing a minimum 27-1/2” lift from the bottom exterior surface of the return air grille.

**2.02 - OUTDOOR UNIT (CU-1)**

A. General

1. The air-conditioning system shall use R410A refrigerant.

2. Refrigerant circuit configuration for Heat Pump System:

a. The refrigerant circuit shall be constructed using field provided copper piped together with manufacturer supplied Y- branches or Headers connected to multiple indoor units to effectively and efficiently control heating or cooling operation of the VRF system.

b. All refrigerant pipe, y-branch, header kit, elbows and valves shall be individually insulated with no air gaps. All joints shall be glued and sealed.

3. Factory installed microprocessor controls in the outdoor unit(s), and indoor unit(s) shall perform functions to efficiently operate the VRF system and communicate in a daisy chain configuration between outdoor unit and indoor unit(s) via RS485.

4. The system shall be designed to accept connection up to 13 indoor units.

5. The system shall be capable of performing continuous operation when an individual indoor unit is being serviced or power to indoor unit is disconnected.

6. The maximum allowable system combination ratio shall be 130%. Systems designed with combination ratio above 130% are not acceptable.

7. The total nominal capacity of all indoor units shall be no less than 50% and no more than 130% of outdoor unit's nominal capacity to ensure the VRF system will have sufficient capacity to meet the building's cooling and heating load at design day weather conditions.

8. The outdoor unit shall have a fusible plug.

9. The fusible plug shall have a threaded connector.

10. The unit shall be shipped from the factory fully assembled including internal refrigerant piping, compressor, contacts, relay(s), power and communications wiring necessary.

11. Each outdoor unit refrigeration circuit shall have the following components:

    a. Refrigerant strainer(s)

    b. Check valve(s)

    c. Oil separator

    d. Accumulator

    e. 4-way reversing valve

    f. Vapor injection valve

    g. Variable path valve

    h. Oil Level sensor

    i. Electronic expansion valve(s)

    j. Sub-cooler

    k. High and low side Schrader valve service ports with caps.

l. Service valves

B. Refrigerant Pipe

1. The outdoor unit shall be capable of operating at an elevation difference of up to 360 feet above or below the lowest or highest indoor unit respectively.

2. The outdoor unit shall be capable of operating with up to 3280 equivalent length feet of interconnecting liquid line refrigerant pipe in the network.

3. The outdoor unit shall be capable of operating with up to 656 actual feet or 738 equivalent length feet of liquid line refrigerant pipe spanning between outdoor unit and farthest indoor unit.

C. Defrost Operations

1. The outdoor unit(s) shall be capable of auto defrost operation to melt accumulated frost off the outdoor unit heat exchanger. The defrost cycle control shall be based on outdoor ambient temperatures and outdoor unit heat exchanger temperatures.

a. Continuous heating defrost

1) During first two defrost cycles the unit shall allow heating mode indoor unit fans to stay “on” in low speed continuing to heat.

b. Complete defrost

2) The third defrost cycle shall switch all outdoor units to defrost mode to fully melt and clear frost, snow or ice accumulations off the outdoor coil while turning “off” heating mode indoor unit fans to maintain efficient performance.

D. Oil Management

1. The system shall have Hi-POR (High Pressure Oil Return) to ensure a consistent film of oil on all moving compressor parts at low speed. Oil is returned to compressor through a separate oil injection pipe.

2. The system shall be provided with a centrifugal oil separator designed to extract oil from the oil/refrigerant gas stream leaving the compressor and return the extracted oil to the compressor oil sump.

3. The system shall have an oil level sensor in the compressor to provide direct oil level sensing.

4. The system shall only initiate an oil return cycle if the oil level is too low.

E. Cabinet

1. Outdoor unit cabinet shall be made of 20 gauge galvanized steel with an enamel finish.

2. Outdoor unit cabinet finish shall be tested in accordance with ASTM B-117 salt spray test procedure for a minimum of 1000 hours.

3. The front panels of the outdoor units shall be removable type for access to internal components.

4. A smaller service access panel, not larger than 6.25”x 6.67” and secured by a maximum of (2) screws shall be provided to access the following:

   a. Service tool connection

   b. DIP switches

   c. Auto addressing

   d. Error codes

5. The cabinet shall have piping knockouts to allow refrigerant piping to be connected at the front or through the bottom of the unit.

F. Fan

1. Each cabinet shall be equipped with direct drive variable speed propeller fan(s) with brushless digitally controlled (BLDC) motor(s) with a vertical air discharge.

2. The fan(s) blades shall be made of Acrylonitrile Butadiene Styrene (ABS) material.

3. The fan(s) motor shall be equipped with permanently lubricated bearings.

4. The fan(s) motor shall be variable speed with a maximum operating speed of 1050 RPM.

5. The fan(s) shall have a raised guard to help prevent contact with moving parts.

6. The cabinet shall have option to change the discharge air direction from vertical to horizontal using optional factory provided air guides.

7. The cabinet shall have DIP switch setting to raise external static pressure up to 0.32 in-wg.

G. Coil

1. The outdoor unit shall have a factory built coil comprised of aluminum fins mechanically bonded on copper tubing.

2. The copper tubes shall have inner groves.

3. The aluminum fins shall have factory applied corrosion resistant material.

4. Coil coating shall be tested in accordance with ASTM B-117 salt spray test procedure for a minimum of 1000 hours

5. The outdoor unit coil shall be tested to a pressure of 551 psig.

6. The coil for each cabinet shall have 14 Fins per Inch (FPI).

7. All the outdoor units shall have a 3 rows heat exchanger.

8. The cabinet shall have a coil guard.

H. Compressor

1. Each cabinet shall be equipped with hermetically sealed, inverter driven, High Side Shell (HSS) scroll compressor(s).

2. Each inverter driven, HSS scroll compressor shall be capable of operating in a frequency range from 15 Hz to 150 Hz with control in 0.5 Hz increments.

3. The compressor(s) shall be equipped with a 60 Watt crankcase heater.

4. The compressor shall use a factory charge of Polyvinyl Ether (PVE) oil.

5. The compressor bearing(s) shall have Teflon™ coating.

6. The compressor(s) shall be protected with:

a. High Pressure switch

b. Over-current /under current protection

c. Phase failure

d. Phase reversal

I. Sound Levels

1. Each cabinet shall be rated with a sound level not to exceed 59.5 dB(A) when tested in an anechoic chamber under ISO3745 standard.

J. Sensors

1. Each single cabinet shall have:

a. Suction temperature sensor

b. Discharge temperature sensor

c. High Pressure sensor

d. Low Pressure sensor

e. Outdoor temperature sensor

f. Outdoor unit heat exchanger temperature sensor

**2.03 - WALL MOUNTED INDOOR UNITS**

A. General

1. System shall be manufactured by LG or approved equal.

2. Indoor units shall be made by the same manufacturer as the outdoor unit. The indoor unit shall be factory assembled, wired, piped, and provided with an internal electronic expansion device, control circuit board, fan and motor. The unit shall be capable of satisfactory operation within voltage limits of +/-10%. Refer to schedules for electrical power requirements.

3. Indoor unit refrigeration circuit shall be pressure tested at the factory and shipped with a holding charge of dry nitrogen gas.

4. All internal refrigerant lines shall be factory insulated. All refrigerant lines external to the indoor unit case shall be field insulated. The entire unit shall be run tested at the factory.

5. The unit shall be provided with a factory installed non-metallic condensate drain pan. An insulated flexible condensate drain hose shall be provided to connect the unit drain pan to the field provided condensate drain system.

B. Coil

1. Indoor unit coils shall be a minimum of two rows and manufactured using non-ferrous materials. Tubes shall be copper with inner grooves. Fin material shall be aluminum with a stamped louvered configuration. Coils shall be factory pressure tested to 600 psig air pressure.

2. The unit shall be provided with 45º flare refrigerant pipe connections.

C. Casing

1. Units shall be designed for mounting on a vertical surface and come complete with installation mounting template guide and separate hanging bracket. The wall mounted unit shall not protrude from the wall more than eight inches. The front panel of the unit shall be removable without the use of tools.

D. Fan

1. The indoor unit shall have a single, direct-drive, cross-flow tangential fan wheel. The wheel shall be a sirocco design made of high strength ABS BSN-7530 polymer resin.

2. The fan assembly shall be statically and dynamically balanced across the entire operating speed range. The assembly shall be independently driven by a digitally controlled inverter that varies fan speed from zero to full speed.

3. The fan motor shall be a designed and built by the unit manufacturer. The motor shall be a brushless digitally controlled (DC) design and have permanently lubricated ball bearings tested for a minimum life cycle of 30,000 hours, inherent overload and over temperature protection.

4. The fan speed shall be varied from zero to maximum design speed by a digitally controlled (DC) inverter. The fan speed control algorithm shall provide a minimum of three pre-programmed, field adjustable, fan speeds in the heating and fan only modes,

and four speeds in the cooling mode. The fourth speed in the cooling mode shall be a jet-cool power cooling cycle.

5. A chaos algorithm shall provide a simultaneous and random change in fan speed and flow direction simulating changes in natural outdoor wind conditions.

6. The fan speed algorithm shall also provide a field selectable auto-speed setting that adjusts fan speed based on the difference between controller set-point and space temperature.

E. Filter

1. Return air shall be filtered with a removable, washable pre-filter designed to capture airborne dust particles. Pre-filter media shall be treated with an anti-fungal agent to restrict the growth of bacteria on the media. The filter system shall have a factory installed secondary, multistage, washable, nano-carbon filter designed to reduce the volume of odorous particulates in the air. The unit shall be supplied with a plasma type washable final filter designed to reduce microscopic particulate matter from the air including common dust, house mites, and pollen.

F. Guide Vanes

1. The indoor unit shall be provided with a motorized sweeping guide vane to automatically change the direction of airflow from side to side and up and down.

G. Controls

1. Unit shall be provided with a microprocessor based controller made by the unit manufacturer designed to perform all functions necessary to operate the system and shall interface with the outdoor unit and other indoor connected devices via a RS485 daisy chain communications link.

2. The microprocessor control algorithms shall provide self-diagnostics, auto restart following power restoration, and test run functions.

3. The microprocessor control algorithm shall provide five operation modes: Auto Operation, Heating, Cooling, Dehumidification, and Fan Only. Auto Operation mode shall automatically switch between cooling, dehumidification, and heating based on room temperature conditions.

4. In the heating mode, the microprocessor control shall not begin fan operation until the coil has reached 78ºF.

5. A control algorithm shall be provided that continues to run the indoor unit fan following a cooling cycle until condensation on the surface of the coil has been eliminated.

6. The unit shall be equipped with a room temperature thermistor mounted in the return air stream. Wall mounted and hand-held local controllers shall be equipped with a temperature thermistor. In addition, the unit shall be designed to work with an optional auxiliary wall mounted remote temperature sensor. The unit shall be capable of controlling operations using any of the three sensors individually or any two of the three concurrently.

7. A single indoor unit shall have the capability of being controlled by up to two local wired controllers.

8. The microprocessor control shall have an override button that will start or stop the unit without the presence of either a wired or hand-held controller using the factory default unit operation settings.

9. The microprocessor control shall provide a cooling mode test cycle that operates the unit in full cooling mode for a minimum of 18 minutes without regard to the return air temperature.

10. The microprocessor control shall provide malfunction diagnostic codes at the local controller upon unit malfunction. Diagnostic code shall be specific and provide the service technician with the source of the malfunction.

H. Condensate

1. The unit shall be designed for gravity draining of condensate.

**2.04 - OUTDOOR UNIT (CU-2)**

A. Casing

1. Outdoor unit casing shall be constructed of 22-gauge heavy duty steel. An easily removable front panel shall be provided to allow access to major components and control devices. Casing shall be supplied with lifting handles in four locations and a unit base rail with built in lifting channels designed to accommodate a standard forklift.

2. Exterior surfaces shall be cleaned, and finished with weather resistant baked enamel finish applied using a powder-coat process. Outdoor unit casings shall be tested a minimum of 500 hours a salt spray test using ASTM B-117.

3. Condenser fan guards shall be provided and made of heavy gauge, heavy duty polymer resin. The outdoor unit coil shall be protected with a heavy gauge steel wire guard finished with a powder coat finish.

B. Refrigeration System

1. The system shall have a single refrigeration circuit and use refrigerant R-410a.

2. The outdoor unit shall be with factory installed components including a refrigeration filter dryer, check valves, oil separator(s), accumulator, hot gas bypass valve, 4-way reversing valve, electronic controlled thermal expansion valve (EEV), high and low side charging ports, and interconnecting piping.

3. The outdoor unit shall be equipped with an integral subcooling circuit consisting of a plate-type heat exchanger and an electronically controlled thermal expansion valve (EEV) capable of providing a minimum of 20º F subcooling.

C. Refrigeration Oil Control

1. Refrigeration oil levels in the compressor crankcase shall be maintained using a three stage oil control system. The compressor discharge port shall be equipped with an oil filtering device designed to restrict oil loss from the compressor. The high pressure discharge vapor shall leave the compressor an immediately enter an oil separator designed to use centrifugal force to extract oil vapor from the refrigerant gas stream. The outdoor unit microprocessor shall be equipped with a control algorithm designed to control the position of the electronic expansion valves located in the indoor units. The algorithm shall monitor the amount of time each indoor unit expansion valve has remained in the closed position. For every expansion valve that has been closed for a period of four hours, the algorithm shall open the valve and allow refrigerant flow for a minimum of three minutes.

D. Single Inverter/ Compressor

1. Unit shall be equipped with one hermetic digitally controlled (DC) inverter driven scroll compressor. The compressor scroll shall be specifically designed for the refrigerant provided and shall be made by the unit manufacturer and shall be engineered for a minimum run-time of 21, 500 hours.

2. The compressor frequency inverter shall be designed and manufactured by the outdoor unit manufacturer and be capable of providing a minimum modulation range from 25 to 105Hz.

3. The compressor motor shall be suction gas-cooled and shall have a voltage utilization range of plus or minus 10 percent of nameplate voltage. The compressor shall be equipped with a crankcase heater, internal temperature, and current sensing motor overloads. External suction and discharge temperature and pressure sensors shall be provided to protect the compressor from damage caused by over temperature or over pressure conditions.

4. The compressor shall be provided with a positive displacement oil pump and oil injection device capable of providing a sufficient bearing oil film on all bearing surfaces across the entire inverter modulation range.

5. Compressor bearing shall be provided with a Teflon® coating on all wear surfaces.

6. The scroll type compressor shall provide inherently low vibration and noise by having no suction and discharge valves. The compressor compartment shall be lined with sound attenuating insulation and mounted on isolation pads to avoid transmission of mechanical vibration.

E. Coil

1. Outdoor unit coils shall be a minimum of two rows and manufactured using non-ferrous materials. Tubes shall be copper. Fin material shall be aluminum with a stamped louvered configuration. Fin material shall be finished with a factory applied Gold-Fin™ corrosion resistant hydrophilic silica gel coating prior to coil assembly. Coil coating shall be tested using ASTM B-117 salt spray test procedure for a minimum 1000 hours. Coils shall be burst tested at a minimum of 500 psig.

F. Fans and Motors

1. Outdoor units shall be furnished with a minimum of two direct-drive propeller type fans designed to provide horizontal airflow from the rear to the front of the unit. Fan blades shall be 20-1/2” statically and dynamically balanced propeller fans made of durable Lupos (ABS) polymer resin.

2. Motors shall be designed to operate at a maximum speed of 950 rpm to assure quiet operation. Each fan shall be driven by a digitally controlled inverter that varies the fan speed from zero to maximum design speed.

3. The fan motor shall be a designed and built by the unit manufacturer. The motor shall be a brushless digitally controlled (DC) design and have permanently lubricated ball bearings and inherent overload and over temperature protection.

4. The fan speed shall be controlled using a microprocessor based direct digital control algorithm that provides a minimum of three pre-programmed field adjustable fan speeds.

5. Fans control algorithm shall provide a night-time (off peak) fan speed limiting control that reduces unattenuated, fan generated noise by a total of 10 DBA in three steps. Algorithm shall provide three field selectable off-peak operation schedules.

G. Controls

1. Outdoor units shall be completely factory wired with necessary electrical control components, printed circuit boards, thermistors, sensors, terminal blocks and contactor lugs for power wiring. Control wiring circuit shall be 24-volt which includes control power transformer and fuses. Solid state microprocessor based algorithms shall provide outdoor unit component protection, soft-start capability, refrigeration system pressure and temperature control, defrost and low ambient controls. Unit shall be designed for continuous operation from -4º F to 110ºF.

2. While operating in the heating mode, the outdoor unit shall have an automatic defrost control cycle designed to cycle the compressor operation based on indoor unit low pressure vapor pipe temperature.

3. When the system is started, the connected indoor units shall be assigned an electronic unit address automatically by the outdoor unit microprocessor or manually by the installer.

4. The microprocessor shall have a refrigeration system pump-down cycle that will isolate up to 17.6 lbs of the system refrigerant charge into the outdoor unit coil. The unit shall be equipped with back-seat valves that isolate the units' initial charge in the outdoor unit refrigeration circuit.

5. The microprocessor shall have a refrigeration system pump-out cycle designed to evacuate the majority of the system refrigerant charge from the outdoor unit. The unit shall be equipped with factory installed back-seat valves used to isolate the outdoor unit from the balance of the refrigeration system.

6. The microprocessor shall have a cooperative control algorithm that automatically adjusts distribution of refrigerant in the system to prevent any one indoor unit from being starved for refrigerant.

7. Upon unit malfunction, power outage, or system shutdown, the microprocessor shall store up to the last 3000 system events or system events that occurred over the last 30 days into non-volatile EEPROM memory.

8. The active system malfunction codes shall be communicated using a three-digit, seven-segment display on the microprocessor board. The microprocessor shall have an algorithm that actively verifies the operational condition of system sensors and thermistors.

9. The microprocessor shall have the ability to verify the system is undercharged, overcharged, or correct.

**PART 3 - EXECUTION**

**3.01 - INSTALLATION**

1. Install all equipment, piping, and controls in accordance with manufacturer's installation instructions.

2. Install refrigerant piping as per manufacturer's instructions and specification.

3. Mount the outdoor condensing unit on a concrete equipment pad.

4. Support the indoor unit as per the manufacturer's instructions.

5. Mount the controller. Coordinate exact location with the owner.

6. Install the drain line. Pitch drain line in the direction of flow.

7. Install new filter on indoor unit.

8. Clean all equipment after installation.

**END OF SECTION**

## PART 1 – GENERAL

### 1.01 – DESCRIPTION OF WORK

A. Electric Wall Heaters

### 1.02 - REFERENCES

A. Electric heaters shall meet the requirements of the National Electric Code (NEC) and shall be UL listed.

### 1.03 - SUBMITTALS

A. Submit under provisions of Division 1.

B. Submit manufacturer's product data and installation instructions to Engineer.

C. Submittal data shall include capacity and size of each heater and wiring instructions.

## PART 2 - PRODUCTS

### 2.01 – ELECTRIC WALL HEATERS

A. Wall mounted electric automatic fan forced heaters shall be Model AWH as manufactured by QMark or approved equal. The heaters shall be UL listed and be designed for wall, recess, or surface mounting. Refer to equipment schedule for mounting type.

B. Heater Assembly: The heater assembly shall consist of a fan panel upon which is mounted all of the operational parts of the heater.

C. Heating Element: The heating element shall be of non-glowing design consisting of an 50/20 nickel chromium resistance wire enclosed in a steel sheath to which plate fins are copper brazed. It shall be warranted for 5 years.

D. Fan and Fan Motor: The fan shall be five-bladed aluminum. The fan motor shall be totally enclosed.

E. Fan Delay Switch: Fan control shall be of bi-metallic, snap action type, and shall activate fan after heating element reaches operating temperature. The fan shall continue to operate after the thermostat is satisfied and until the heating element is cool.

F. Thermostat: The tamper-proof thermostat shall be of the bi-metallic, snap-action type with enclosed contracts. It shall be completely concealed behind the front cover to become tamper proof.

G. Thermal Cutout: A thermal cutout shall be built into the system to shut off the heater in the event of over-heating.

H. Disconnect Switch: A double-pole single throw disconnect switch shall be mounted on the back box for positive disconnect of power supply. It will be completely concealed behind the front grid panel.

I. Back Box: The back box shall be designed for duty as a recessed rough-in box in either masonry or frame installations and for use with a surface mounting frame in surface mounting installations. The back box shall be 20-gauge galvanized steel and shall contain knockouts through which power leads are brought.

J. Front Panel: The front panel shall be of the bar grille type and shall be constructed of 16 gauge cold rolled steel, welded into a uniform grille and finished in baked enamel to direct the warmed air toward the floor. The front grille shall be surrounded by a decorative satin-finish aluminum frame.

K. Provide other accessories as described on the contract drawings.

**PART 3 - EXECUTION**

**3.01 - INSTALLATION**

A. Install unit in accordance with manufacturer's published installation instructions.

B. Do not install horizontal unit heaters closer than 12 inches to combustible materials in any direction.

C. Do not install vertical unit heaters closer than 18 inches from ceiling and 24 inches horizontally from combustible materials in any direction. The bottom of the unit must be a minimum of 8 feet above the floor.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Remove and dispose of surface debris as required.

B. Remove and dispose of paving, sidewalk, curbs, etc.

C. Clear site or designated areas of the site of plant life and grass as required, and dispose of as required.

D. Remove and dispose of trees and shrubs as required.

E. Remove and dispose of stumps and root system of trees and shrubs as required.

F. Removal and storage of topsoil.

G. Removing above and below grade site improvements.

H. Temporary erosion and sedimentation control measures.

### 1.02 - RELATED SECTIONS

A. Section 015000 – Temporary Facilities and Controls

B. Section 024100 - Demolition

C. Section 312213 - Rough Grading.

D. Section 329119.13 - Landscape Grading and Topsoil: Placement of stored topsoil.

### 1.03 - REGULATORY REQUIREMENTS

A. Conform to applicable local code(s) for disposal of debris.

B. Burning of materials on site is prohibited.

C. Coordinate clearing work with utility companies.

### 1.04 - DEFINITIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.

D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

**1.05 - PROJECT CONDITIONS**

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

C. Do not proceed with work on adjoining property until directed by Engineer.

D. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

E. Utility Locator Service: Notify “Call Before You Dig” for area where Project is located before site clearing. Additional third party utility locator is required to identify underground onsite process piping and utility locations for areas not located by “Call Before You Dig” utility locator service.

F. Do not commence site clearing operations until locations of existing below grade utilities are located, temporary erosion and sedimentation control and plant protection measures are in place.

G. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

H. Disposal:

1. Burning of materials is prohibited.

2. Burial of materials is prohibited.

## PART 2 - PRODUCTS

A. Requirements for satisfactory soil material are specified in Section – 312323.13 "Backfilling."

## PART 3 - EXECUTION

### 3.01 - PREPARATION

A. Locate and clearly identify trees, shrubs, and other vegetation to remain. Flag each tree trunk at 54 inches above the ground.

B. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

C. Verify limits of clearing.

D. Coordinate identification of a temporary topsoil stockpile location with Owner.

E. Verify that pipeline routings and other items of work have been accurately located and clearly marked.

### 3.02 - PROTECTION

A. Locate, identify and protect utilities that are to remain from damage.

B. Protect trees, plant growth and features designated to remain as final landscaping.

C. Protect benchmarks and existing structures from damage or displacement. Any damage to existing structures is to be promptly repaired at no additional cost to the Owner.

### 3.03 – TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion and sedimentation control Drawings and requirements of authorities having jurisdiction.

B. Inspect, maintain, and repair erosion- and sedimentation control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

**3.04 - TREE AND PLANT PROTECTION**

A. In grassed, planted and open areas, do not remove or trim trees or planting without the prior permission of Owner. Take-up and preserve small trees, plantings, flowers, and similar vegetation for reuse. Comply with all requirements of this section.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Engineer.

**3.05 - WALLS, FENCES AND OTHER OBSTRUCTIONS**

A. All walls, fences, signs, sheds and other obstructions encountered shall be carefully taken-up and stored for subsequent replacement. If damaged, full new replacement will be required at no additional expense to the Owner.

B. Do not disturb property markers unless necessary. If it becomes necessary to disturb or remove a property marker, have a licensed land surveyor provide four (4) ties to the marker. The licensed land surveyor shall replace the marker as soon as possible.

C. Remove and dispose of all other obstructions which will affect the Work or which are specifically designated to be removed.

**3.06 - PAVEMENTS AND WALKS**

A. Remove existing pavements and walks to the limits shown on the Drawings, or if not shown, to the minimum extent possible.

B. Saw cut asphalt and concrete paved surfaces before removal. Use a saw blade that will cut a neat, straight joint line.

C. Carefully remove slate and flag stone walks, granite, and stone curbs to the minimum extent possible. Terminate removals at a joint. Store and protect for reuse.

**3.07 - EXISTING UTILITIES**

A. Locate, identify, and disconnect utilities indicated to be abandoned in place.

B. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Engineer not less than two days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Engineer's written permission.

**3.08 - CLEARING AND GRUBBING**

A. Clearing consists of cutting and disposing of all down timber, stubs, brushes, snags, vegetation, rubbish, debris and other objectionable matter and materials and the removal and storage of fences, signs, walks and other items to be restored.

B. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.

2. Chip removed tree branches and dispose of off-site.

C. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

D. Pavements which are required to be removed, including roadways and driveways may be saw cut in advance but removals shall not be done until the work is ready to be installed.

E. All signs, guide rails and all other control, safety and warning devices shall not be removed until just prior to the installation of the work. All fences which are required to be removed shall not be removed until the property owners affected are notified at least four days in advance of such removal. Unless received, no fence shall be removed more than 48 hours in advance of the installation of the work affecting the fence.

F. It is the intent of this Section that all items affecting traffic, safety, lives and all items essential to the protection of property be left in place as long as possible and replaced as soon as possible when such items must be removed.

G. Schedule and conduct operations to minimize erosion of soils and to prevent silting and muddying of streams, rivers, wetlands, impoundments and land adjacent to or affected by the work. Erosion control measures include: water diversion structures or ditches, sedimentation basins or traps, berms, staked hay bales seeding, mulching, covering with netting, or sodding disturbed areas. The area of soil exposed by construction at any one time should be kept to a minimum and final restoration should be carried out as soon as possible following completion of construction.

H. Grubbing consists of the removal and disposal of all stumps, roots, duff, grass, turf, sod, debris, vegetation, foundations and other objectionable matter and materials.

I. All operations shall be done in a manner so that present growth will blend with the limits of construction and a natural appearance will be attained.

**3.09 - SITE IMPROVEMENTS**

J. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

K. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

**3.10 - DISPOSAL OF SURPLUS AND WASTE MATERIALS**

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and promptly and legally dispose of them off Owner's property.

B. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

C. Site and route of work shall be left in a neat and orderly condition at the end of every day.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Removal and storage of subsoil.

B. Cutting, grading, filling and rough contouring the site prior to placement of topsoil or pavement base for final grading.

### 1.02 - RELATED SECTIONS

A. Section 311100 – Site Clearing.

B. Section 312316 – Excavation – Removal of Unsuitable Soils.

C. Section 312323.13 – Backfilling – Replacement of Unsuitable Soils.

### 1.03 - REFERENCES

A. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. Rammer and 18 inch Drop.

### 1.04 - SUBMITTALS

A. Submit under provisions of Section 013300.

B. Sieve Analysis: Submit a sieve analysis of all types of fill material to be used.

### 1.05 - PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of utilities remaining, by horizontal dimensions, elevations or inverts, and slope gradients.

## PART 2 - PRODUCTS

### 2.01 - MATERIALS

A. Subsoil: Reused excavated material, graded, free of lumps, rocks and gravel larger than 3 inches in size, debris and contaminants.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Verify site conditions.

B. Verify that survey benchmark and intended elevations for the work are as indicated.

**3.02 - PREPARATION**

A. Identify required lines, levels, contours and datum.

B. Identify known underground, aboveground and aerial utilities. Stake and flag locations.

C. Coordinate the removal or relocation of utilities with the necessary utility companies.

D. Protect above and below-grade utilities that are to remain.

E. Protect plant life, lawns, rock outcropping and other features remaining as a portion of final landscaping.

F. Protect benchmarks, existing structures, fences, sidewalks, paving and curbs from excavation equipment and vehicular traffic.

**3.03 - APPLICATION**

A. Excavate subsoil from areas to be further excavated, re-landscaped or re-graded. Do not excavate wet subsoil.

B. Stockpile in area designated on site. Remove excess subsoil not being reused from site.

C. Stockpile subsoil to a height not exceeding 8 feet. Cover to protect from erosion.

D. When excavation through roots is necessary, perform work by hand and cut roots with sharp axe.

E. Fill areas to contours and elevations with unfrozen subsoil material, aggregate base course or paving.

F. Place and compact subsoil fill material in continuous layers not exceeding 6 inches compacted depth, compacted to 95 percent maximum dry density in accordance with ANSI/ASTM D1557.

G. Maintain optimum moisture content of fill materials to attain required compaction density.

H. Make grade changes gradual. Blend slope into level areas.

I. Remove surplus fill materials from site.

**3.04 - TOLERANCES**

A. Maximum Variation From Top Surface of Subgrade: 1 inch.

**3.05 - FIELD QUALITY CONTROL**

A. Perform field inspection and testing under provisions of Section 014500.

B. Perform tests and analysis of fill material in accordance with ANSI/ASTM D1557.

C. Perform compaction tests at a rate of one for every 10 cubic yards of material placed.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Excavation for slabs-on-grade, paving and landscaping.

B. Excavation for site structures.

C. Excavation for recharge basins.

D. Site excavation.

E. Refer to Section 312333 for pipe trenching requirements including underground utility mapping.

### 1.02 - RELATED SECTIONS

A. Section 312213 – Rough Grading.

B. Section 312323.13 - Backfilling: Backfilling excavated material.

C. Section 314116.13 – Excavation Support and Protection

D. Section 312333 - Trenching

### 1.03 - QUALITY ASSURANCE

A. Do not excavate wet or frozen materials without written approval from the Engineer.

B. Provide safety barricades around open excavations.

C. If excavation exceeds a depth of four feet (1.2 m), place temporary sheeting. Refer to Section 314116.13.

### 1.04 - FIELD MEASUREMENTS

A. Verify that survey benchmark and intended elevations for the work are as indicated.

### 1.05 - COORDINATION

A. Coordinate work under provisions of Section 013100.

B. Coordinate excavation with installation of sheeting and pile work (if required).

## PART 2 - PRODUCTS

Not Used.

## PART 3 - EXECUTION

### 3.01 - PREPARATION

A. Comply with the requirements contained in Section 312333 – Trenching regarding the location, verification, and mapping of underground utilities (pipelines, water, gas, electrical conduit, electricity, etc.) prior to starting any excavation required under this project.

B. Identify required lines, levels, contours and datum.

C. Identify known underground, above ground and aerial utilities. Stake and flag locations.

D. Notify utility company to remove or relocate utilities, if required.

E. Protect above and below grade utilities which are to remain.

F. Protect plant life, lawns and other features remaining as a portion of final landscaping.

G. Protect bench marks, existing structures, fences, sidewalks, paving and curbs from excavation equipment and vehicular traffic.

H. Notify the Engineer prior to commencement of excavation.

### 3.02 - EXCAVATION

A. Underpin adjacent structures that may be damaged by excavation work, including utilities and pipe chases.

B. Excavate for structures, building foundations, slabs-on-grade, paving, drainage or sanitary structures, sidewalks, landscaping to the limits as indicated on the plans and extend a sufficient distance from walls, piers, footings and curbs to provide adequate clearances for construction operations, including sheeting and bracing, if required, and for inspection purposes.

C. Trim approximately the last four (4) inches of excavation subgrade in earth with a smooth edged bucket or by hand just prior to placement of concrete or concrete reinforcement.

D. Machine slope banks to angle of repose or less, until shored.

E. Excavation cut not to interfere with normal 45 degree bearing splay of foundations.

F. Grade top perimeter of excavation to prevent surface water from draining into excavation.

G. Hand trim excavation. Remove loose matter.

H. Remove lumped subsoil, boulders, and rock.

I. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

J. Correct unauthorized excavation at no extra cost to Owner in accordance with Section 312323.13.

K. Stockpile excavated material in area designated on site and remove excess material not being reused from site.

L. While in the course of excavating for new work, and existing underground electrical feeders are encountered that were not shown on the Drawings, then immediately notify the Engineer. The Engineer will promptly investigate. If the Engineer determines that the condition justifies an adjustment in compensation then a change order will be prepared.

**3.03 - FIELD QUALITY CONTROL**

A. Perform field inspection and testing under provisions of Section 014500.

B. Provide for visual inspection of bearing surfaces.

**3.04 - PROTECTION**

A. Protect work under provisions of Section 015000.

B. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.

C. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

**3.05 - DISPOSAL OF MATERIALS**

A. All suitable excavated material shall be utilized for backfill and embankment or for Owner selected stockpiling. Stockpile on-site or transport suitable material off site and bring back when conditions allow the stockpiling or filling operations to begin.

B. All excess suitable excavated material shall become the property of the Contractor and be disposed of by the Contractor in accordance with governing regulations and laws. The cost for hauling and disposal of excess suitable excavated material shall be included in the price as bid.

C. All unsuitable excavated material that cannot be used for backfill shall become the property of the Contractor and be hauled and disposed of off-site in accordance with governing regulations and laws. The cost for hauling and disposal of unsuitable material shall be included in the price as bid.

**3.06 - MATERIALS**

A. The Contractor shall remove unsuitable materials in excavations, which are incapable of supporting structures, as determined by an independent soil-testing laboratory, to the extent and depth directed by the Engineer. Refill and compact the excavation with Type C - Sand fill as defined in Section 312323.13. If required and directed by the Engineer, import Type C – Sand. The trucking and material costs associated with the import of Type C material will be paid for as “Extra Work” in accordance with the provisions contained in the Contract. The equipment cost used to offload and place imported material shall be included in the price as bid. The cost for filling and compacting the imported material shall also be included in the price as bid.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Work of this Section includes dewatering for tank construction and all other underground pipelines and utilities. All costs associated with work of this Section, including all costs associated with satisfying the requirements of the NYSDEC, shall be solely borne by the Contractor.

B. No time extensions will be granted for the Contractor's failure to obtain the permit in accordance with the Contractor's own schedule and sequence of construction as may have been anticipated prior to the submission of the bid.

### 1.02 - RELATED SECTIONS

A. Section 312316 – Excavation

B. Section 312323.13 – Backfilling

C. Section 033000 – Concrete

### 1.03 - PROJECT CONDITIONS

A. Groundwater Levels: The Bidder shall be solely responsible to ascertain the exact level of groundwater prior to bid. Water levels, as shown on the Plans, solely represent the levels obtained at the times and specific locations of soil borings, monitoring wells, or test holes. They are not intended to be indicative of levels to be found at locations other than those shown. Separate payments will not be made to the Bidder / Contractor for the cost of ascertaining groundwater or surface water levels. Separate payments will not be made to the Contractor for dewatering operations. The Bidder shall contact the Engineer to request arrangements for access to the site to conduct explorations and investigations.

B. Subsoil Conditions: The Contractor shall be solely responsible to ascertain the exact nature of soils near the excavation(s), as it affects the design of the dewatering conditions. The results of test borings previously conducted have been included in the Drawings for information only. The cost for any additional test borings shall be borne by the Contractor.

C. Noise Control: When dewatering systems utilizing well points or central pumping systems are used, acoustically shield pumping equipment from neighboring buildings. Use Styrofoam or other sound absorbing material on the inside of the enclosure surrounding the pump. Provide an exhaust stack extension when required by the Engineer. The Engineer will not permit the use of

loud pumps generating excessive emissions and/or noise. Comply with the requirements of Section 015680 – Environmental Protection.

D. The Contractor shall supply power to all dewatering equipment by use of a suitably sized portable generator. Temporary electric shall be furnished and installed as work of this contract.

E. Dewatering operations shall be conducted by companies regularly engaged in this type of work, are experienced, and are knowledgeable with governing health, labor, and environmental regulations associated with dewatering operations.

**1.04 - REGULATORY REQUIREMENTS**

A. Apply, obtain, and pay for permits required by regulatory agencies. All associated costs including reports, plans, applications, and engineering fees shall be borne by the Contractor.

B. The Contractor shall discharge water removed from trenches and excavations in compliance with the requirements of regulatory agencies and the Owner.

C. The Owner makes no representation that water removed from excavations can be disposed of readily or without expense associated with conveyance and/or treatment prior to discharge. The Contractor, by submitting a bid, has satisfied himself/herself that disposal of water can be discharged (returned to groundwater or surface water) in accordance with all regulatory requirements.

D. Well pointing shall be carried out by registered well drillers in accordance with Section 15-1525 of New York State Environmental Conservation Law.

E. The type of dewatering system shall be selected by the Contractor, as necessary to install the work. The method of dewatering to be used will depend upon subsoil conditions and the depth of water encountered. The method of dewatering and treatment system, if necessary, is at the sole discretion of the Contractor.

F. Conduct dewatering operations and groundwater recharge so as not to cause a harmful effect on adjoining wetlands in compliance with the requirements contained in Section 015680.

**1.05 - SUBMITTALS**

A. Prior to submitting information to the NYSDEC, the Contractor shall submit to the Engineer, for review and comment purposes only, the proposed layout of the dewatering system together with proposed sampling protocols that are to be followed by the Contractor in order to secure the required permits and approvals.

B. Submit to the Engineer, for record purposes only, the proposed layout of the dewatering system together with any subsurface explorations, sampling and testing results, or studies that may have been conducted by the Contractor in order to secure the required permits and approvals.

C. The Contractor shall provide a copy of the dewatering permit as issued by the New York State Department of Environmental Conservation to the Engineer for record purposes. Any permit costs shall be the responsibility of the Contractor.

**PART 2 - MATERIALS**

Not Used

**PART 3- EXECUTION**

**3.01 - INSTALLATION**

A. Dewater trenches and excavations when ground or surface water is encountered in the installation of pipe, foundations, structures, or appurtenances.

B. Furnish all piping, pumps, electrical systems and equipment, well pointing equipment, materials and labor required to properly well point or sump excavations in order to eliminate ground and surface water or precipitation from entering the excavation area during construction.

**3.02 – PERFORMANCE**

A. All water removed from the trenches or excavations by pumping, bailing, siphoning, well-points, or other means shall be disposed of in such a manner so as to avoid interference with wetlands, environment, plant operations, pedestrian and vehicular traffic and so to prevent damage to persons or property.

B. Unless otherwise permitted, groundwater encountered within the limits of excavation shall be depressed to an elevation not less than twelve inches below the bottom thereof before pipe laying or concreting is started, and shall be so maintained until concrete and joint material have attained adequate and specified strength. Dewatering operations shall be continuous (24 hours per day, 7 days per week) unless otherwise noted on the Contract Drawings. Dewatering operations shall be continued until the entire structure is backfilled to the grades required by the Contract Documents.

C. The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water or storm sewer without the approval of the NYSDEC.

D. Water from dewatering operations shall be treated by chemical treatment, physical treatment, filtration, settling basins, or other NYSDEC approved methods to reduce the amount of contaminates, sediment, and/or pollution contained in the water to allowable levels, as determined by the State.

E. Upon completion of the portion of the work wherein the operations have been performed, the Contractor shall remove from the catch basins, sumps, ditches or water courses, all mud, silt, debris and other accumulations discharged to these various locations. The Contractor is responsible for leaving them in a condition similar to that which existed prior to his operations to the satisfaction of the regulatory agency. Proper control measures shall be employed, to minimize siltation and erosion in and adjacent to the area of the Work at all times.

F. Locate dewatering pumps as far as possible from residential structures. The pumps shall be housed in noise suppression enclosures. If the operation noise levels, as determined by the Engineer, are still excessive, the Contractor shall, at the discretion and direction of the Engineer, apply damping compound to the external portion of the enclosure.

G. The Contractor is hereby advised that during the dewatering process, in some instances, as directed by the Engineer, the quantity of water to be discharged will have to be limited so that flooding will not occur.

H. Dewatering shall continue as required to avoid floatation to structures until completed, unless other positive measures, such as flooding sleeves, can be used.

**3.03 – PROTECTION**

A. Provide adequate protection from the affect of possible uplift due to storm or groundwater where buoyancy might lift installed work or cause joint or structure failure during construction. Provide back-up equipment where pump failure could result in damage to installed work.

B. Protect the interior of installed work from the entering and accumulation of liquids, ice, and snow. Immediately remove and dispose any accumulation that may occur.

**3.04 - CLEANING**

A. Upon completion of all work, remove from the gutters, catch basins, drains, and manholes all debris and other accumulations, leaving them in a condition equal to or better than that, which existed prior to the work. Restore any pavement, shoulder or other areas disturbed or damaged by the installation of the dewatering system.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Building perimeter and site structure backfilling to sub-grade elevations.

B. Site filling and backfilling.

C. Fill under slabs-on-grade and paving.

D. Consolidation and compaction.

E. Fill for over-excavation.

F. Flowable Fill material for abandoned in place pipelines and structural backfill alternative.

### 1.02 - RELATED SECTIONS

A. Section 314116.13 - Excavation Support and Protection

B. Section 312213 - Rough Grading

C. Section 312316 - Excavation

D. Section 312333 - Trenching

E. Section 329119.13 - Landscape Grading and Topsoil

F. Section 033000 - Concrete

### 1.03 - REFERENCES

A. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. Rammer and 18-inch Drop.

C. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

### 1.04 - SUBMITTALS

A. Submit under provisions of Section 013300.

B. Test Reports: Submit sieve analysis for each type fill to be used, compaction reports and flowable fill mix design.

**1.05 - QUALITY ASSURANCE**

A. Do not backfill over or with wet or frozen materials.

B. Field quality control laboratory tests will be paid for out of the cash allowance for testing services. All Coordination with the testing lab shall be the Contractor's responsibility and be included in the price as bid.

**1.06 - COORDINATION**

A. Coordinate work under provisions of Section 013100.

B. Coordinate and make all arrangements to have the testing laboratory present so that tests can be made. The Engineer may stop backfilling operations until such time as the testing laboratory is on-site to make tests or take required samples.

**PART 2 - PRODUCTS**

**2.01 - FILL MATERIALS**

A. Type A – Coarse Stone: Angular, washed natural stone; free of shale, clay, friable material, sand, debris; graded in accordance with ANSI/ASTM C136, within the following limits:

| Sieve Size | Percent Passing |
|---|---|
| 2-inch (50 mm) | 100 |
| 1-inch (25 mm) | 95 |
| 3/4-inch (19 mm) | 75 - 90 |
| 5/8-inch (16 mm) | 35 - 60 |
| 3/8-inch (9.5 mm) | 15-35 |
| No. 4 (4.75 mm) | <5 |

B. Type B - Pea Gravel: Natural stone; washed, free of clay, shale, organic matter; graded in accordance with ANSI/ASTM C136, to the following:

1. Minimum Size: 1/4-inch (6.4 mm).

2. Maximum Size: 5/8-inch (16 mm).

C. Type C - Sand: Natural river or bank sand; washed, free of silt, clay, loam, friable or soluble materials, or organic matter; graded in accordance with ANSI/ASTM C136, within the following limits:

| Sieve Size | Percent Passing |
|---|---|
| No. 4 | 100 |
| No. 14 | 10 - 100 |

| | |
|---|---|
| No. 50 | 5 - 90 |
| No. 100 | 4 - 30 |
| No. 200 | 0 - 1 |

D. Type D - Subsoil: Reused, excavated material, graded, free of lumps, rocks and gravel larger than 3 inches in size, debris and contaminants; no more than 15% passing the No. 200 sieve.

E. Type E - ¾ inch Crushed Blue Stone Surfacing: Angular, washed blue stone; free of shale, clay, friable material, sand, and debris.

F. Flowable Fill:

1. Ready-mix Controlled Low Strength Material used as an alternative to compacted soil, and is also known as controlled density fill, and several other names, some of which are trademark names of material suppliers. Flowable fill (Controlled Low Strength Material) differs from portland cement concrete as it contains a low cementitious content to reduce strength development for possible future removal.

2. Unless specifically approved otherwise, by the Engineer, flowable fill used as structural fill shall be designed as a permanent material, not designed for future removal. Design strength for this permanent type flowable fill shall be a compressive strength of 2.1 MPa (300 psi) minimum at 28 days. Chemical admixtures may also be used in flowable fill to modify performance properties of strength, flow, set and permeability.

3. Excavatable Flowable fill – flowable fill used as pipe filing and alternative trench backfill shall be designed with a compressive strength that will allow excavation as either machine tool excavatable at compressive strength of 1.5 MPa (200 psi) maximum at 1 year, or hand tool excavatable at compressive strength of 0.7 MPa (100 psi) maximum at 1 year.

4. Mix design shall produce a consistency that will result in a flowable product at the time of placement which does not require manual means to move it into place.

5. Flowable fill Mix Design: Provide flowable fill mix design containing cement and water. At the contractor's option, it may also contain fly ash, aggregate, or chemical admixtures in any proportions such that the final product meets the strength and flow consistency, and shrinkage requirements included in this specification.

6. Test and Performance - Submit the following data:

a. Flowable fill shall have a minimum strength as noted above.

b. Flowable fill shall have minimal subsidence and bleed water shrinkage. Evaporation of bleed water shall not result in shrinkage of more than 10.4 mm per m (1/8 inch per ft.) of flowable fill depth (for mixes containing high fly ash content). Measurement of a Final Bleeding shall be as measured in Section 10 of ASTM C 940 “Standard Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Verify existing conditions and substrate.

B. Verify fill materials to be reused are acceptable.

C. Verify items to be buried during backfilling process have been inspected prior to backfilling.

### 3.02 - PREPARATION

A. Compact subgrade to 95 percent maximum dry density in accordance with ANSI/ASTM D1557 or ASTM D2922.

B. Cut out soft areas of subgrade not capable of in situ compaction. Backfill with Type C fill and compact to density equal to or greater than requirements for subsequent backfill material.

### 3.03 - BACKFILLING

A. Backfill areas to contours and elevations with unfrozen materials.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy materials.

C. Place and compact materials in continuous layers not exceeding 6 inches compacted density.

D. All backfilled materials shall be compacted to 95 percent maximum dry density in accordance with ANSI/ASTM D1557 or ASTM D2922. Maintain optimum moisture content to attain required density.

E. Employ a placement method that does not disturb or damage structures or other items against which material is backfilled.

F. Backfill against supported structures. Do not backfill against unsupported structures.

G. Backfill simultaneously on each side of structure.

H. Make grade changes gradual. Blend slope into level areas.

I. Remove surplus backfill materials from site.

J. Immediately remove suitable backfill material from the site if stockpiling the material is not possible due to site restraints such as: insufficient area to store the material in a safe and secure manner, stockpiling the material would present interference with the operations of the facility, stockpiling the material hinders the operations of other contractors, stockpiling the material does not comply with the adopted Site Utilization Plan specified to be provided in Section 011400 – Work Restrictions. Truck suitable backfill material back to the site as soon as conditions are amenable to continuing the backfilling operations.

K. Leave fill material stockpile areas completely free of excess fill materials.

L. Remove temporary sheeting, as backfilling progresses, under provisions of Section 314116.13.

**3.04 - TOLERANCES**

A. Maximum Variation From Top Surface of Backfilling Under Paved Areas: 1/4 inch.

B. Maximum Variation From Top Surface of General Backfilling: 1 inch.

**3.05 - FIELD QUALITY CONTROL**

A. Perform field inspection and testing under provisions of Section 014500.

B. Perform field tests and analysis of fill material in accordance with ANSI/ASTM D1557 or ASTM D2922.

C. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to Owner.

D. Unless additional testing is required by the Engineer, compaction tests shall be taken at the following rates:

1. Concrete Structures: One test per 5 vertical feet (1.5 m) of structure. Compaction tests required for compacted fill below and adjacent to the concrete structures (i.e., tankage and building foundations).

2. Pavement Subgrade: One test per 500 square feet (50-sq. m) of subgrade immediately prior to placing subbase.

3. Concrete Flatwork: One test per 400 square feet (40-sq. m) of flatwork.

4. Curbing: one test per 100 linear feet (30 m).

5. Piping Installations: Compaction testing at horizontal intervals of 100 feet at the spring-line of the pipe and after each two (2) vertical feet of backfilling thereafter.

6. Precast Concrete Structures: One (1) compaction test per 500 square feet of structure.

E. It is the Contractor's responsibility to coordinate the efforts of the testing laboratory and to have a technician present from the laboratory so those tests can be made.

**3.06 - PROTECTION**

A. Protect finished work under provisions of Section 015000.

B. Re-compact fills subjected to vehicular traffic.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Excavate trenches for piping and utilities.

B. Compacted bedding and backfill around and over piping and utilities to subgrade elevations.

C. Backfilling and compaction.

### 1.02 - RELATED SECTIONS

A. Section 312213 – Rough Grading: Topsoil removal from site surface.

### 1.03 - REFERENCES

B. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

C. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb Rammer and 18-inch Drop.

### 1.04 - SUBMITTALS

A. Submit under provisions of Section 013300.

B. Test Reports: Submit a sieve analysis for backfill to be used.

### 1.05 - QUALITY ASSURANCE

A. Do not excavate wet or frozen materials without written approval from the Engineer.

B. Do not backfill over or with wet or frozen materials.

C. When an excavation exceeds a depth of 4 feet (1.2 m), the Contractor shall place temporary sheeting. Comply with the requirements contained in Section 314116.13 and all OSHA standards.

D. The Contractor shall include in the as-bid price the costs for providing a backhoe, equivalent to a Ford 755, with operator and laborer to dig test holes at locations selected by the Engineer. Test holes may be dug to a depth of eight (8) feet or less. Hand digging shall be provided when in the opinion of the Engineer the use of machinery may cause damage to existing lines. The Contractor shall provide seven (7) non-consecutive days (eight hours per day) in the bid. Test holes shall remain open until tie distances are obtained. Tie distances to exposed piping, located via test holes, shall be obtained by the Contractor and recorded on record drawings prepared by the Contractor as work of Section 017839 – Project Record Documents. Do not backfill test holes until directed by the Engineer. Photographs of exposed piping shall be taken by the Contractor and kept on file for the duration of the project. Duplicate prints shall be provided to the Engineer.

Annotate on the back of each print the location of the photograph, the name of the exposed line, and the date it was taken. All photographs shall be taken using a digital camera. The digital file shall be provided to the Engineer. All prints shall be 4 inches by 6 inches. Trenching for new buried pipelines shall not be started until the locations of existing pipes and utilities are verified.

E. The Contractor shall also employ the services of a company regularly engaged in locating underground utilities and also include the costs for it in the bid price. The services shall be provided by a company specializing in locating underground facilities such as pipelines, electrical conduit, water lines, and utilities such as gas and electricity and have at least three years of experience. The Contractor shall include six (6) non-consecutive days (at 8 hours each day) in the bid price. The work shall be conducted during early morning hours if deemed so by the company, which would result in more accurate findings. The company shall be equipped with the latest state-of-the-art equipment. The company shall place ground markers where utilities are mapped, and develop a sketch showing tie distances to all mapped utilities. Use different colored markers for each separate utility run. Immediately take digital photographs to document the mapped utilities and provide same to the Engineer.

F. Each unused day for exploration digging shall be credited to the Owner at $1,500 per day (machine, operator, and laborer). Each unused hour for the utility mapping company shall be credited to the Owner at the amount usually billed by the utility mapping company. The Contractor shall perform as much underground exploration and underground mapping as is necessary to accurately satisfy these specifications. The Owner will not pay for additional days of exploration and / or mapping services. The Owner/Engineer makes no claim that the labor, equipment, material and services specified above is sufficient to properly satisfy the requirements contained herein these specifications. Include separate line items in the Schedule of Values for all items subject to Owner's credit.

G. Field quality control laboratory tests will be paid for out of the cash allowance for testing services. Coordination with the testing lab shall be the Contractor's responsibility and be included in the price as bid.

H. Provide safety barricades around open excavations.

**1.06 - FIELD MEASUREMENTS**

A. Verify that survey benchmark and intended elevations for the work are as shown on plans.

**1.07 - COORDINATION**

A. Coordinate work under provisions of Section 013100.

B. Coordinate trenching with installation of pipe or conduit.

C. Coordinate and make all arrangements to have the testing laboratory present so that tests can be made. The Engineer may stop trenching operations until such time as the testing laboratory is on-site to make tests or take required samples.

## PART 2 - PRODUCTS

### 2.01 - MATERIALS

A. Refer to Section 312323.13 for gradation requirements.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Verify that existing site conditions are suitable for trenching operations to take place in that existing structures, piping, and utilities have been located as not being in conflict with the new work. Refer to paragraph 1.05 herein.

B. Verify fill materials to be reused are acceptable.

C. Verify, with the Engineer, that excavated material is acceptable for fill. If directed by the Engineer, send soil samples to the testing laboratory to determine its ability to support intended loads.

D. Test piping prior to backfilling in accordance with the requirements contained in specification sections 221116 – Plumbing Piping, 017550 – Process Pipe and Tank Testing and 402336 – Air and Water Process Piping.

E. Do not backfill any item until the Engineer has fully inspected the work. Expose the work that was not inspected by the Engineer, when so directed by the Engineer.

### 3.02 - PREPARATION

A. Identify and confirm the location of all underground piping shown on the Contract Drawings prior to excavating for pipe or structures. Dig test holes and employ the underground utility mapping company to determine the existence and location of underground utilities prior to starting any underground work.

B. Identify required lines, levels, contours, and datum.

C. Maintain and protect existing utilities remaining which pass through the work area.

D. Protect plant life, lawns, rock outcropping, and other features remaining as a portion of final landscaping.

E. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic. Any item damaged by the Contractor shall be promptly repaired at the Contractor's expense.

F. Protect above and below grade utilities that are to remain.

G. Excavate unsuitable material in accordance with the requirements contained in Section 312316, paragraph 3.05. Import suitable material in accordance with the requirements contained in Section 312323.13, paragraph 3.05.

**3.03 - EXCAVATION**

A. Excavate subsoil required for piping.

B. Cut trenches to the dimensions shown on the plans.

C. Excavation shall not interfere with normal 45 degree bearing splay of foundations.

D. Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

E. Remove lumped subsoil, boulders, and rock.

F. For trenches made in solid rock, excavate to a depth of 1 foot below the proposed pipe invert.

G. Correct unauthorized excavation at no cost to Owner in accordance with Section 312323.13.

H. Stockpile excavated material in area designated on site and remove excess material not being used from site. Remove excavated material from site.

**3.04 - BACKFILLING**

A. In accordance with Specification Section 312323.13 – Backfilling.

**3.05 - CLEANING**

A. Remove surplus backfill materials from site.

B. Leave fill material stockpile areas completely free of excess fill materials.

**3.06 - PROTECTION**

A. Protect finished work under provisions of Section 015000.

**END OF SECTION**

## PART 1 – GENERAL

### 1.01 – SECTION INCLUDES

A. Wood and steel sheeting.

B. Sheeting box.

C. Steel H-section soldier piles.

D. Lagging.

### 1.02 – RELATED SECTIONS

A. Section 312316 – Excavation.

B. Section 312323.13 - Backfilling.

C. Section 312333 - Trenching.

### 1.03 – REFERENCES

A. Occupational Safety and Health Standards – Excavations; Final Rule (29 CFR Part 1926) – OSHA Standards.

### 1.04 - SUBMITTALS

A. Submit under provisions of Section 013300.

B. Shop Drawings: Submit drawings and details of sheeting for information purposes only. These drawings will not be reviewed. Include design and supporting calculations prepared by a professional engineer licensed in the state of New York.

### 1.05 - QUALITY ASSURANCE

A. Perform all work of this section in accordance with OSHA Standards and approved shop drawings.

B. Sheeting shall be installed by persons regularly engaged in sheeting installation and who have a minimum of five years of experience with the type of system being installed.

C. Sheeting shall be installed under the direct supervision of the professional engineer who designed the sheeting system. This does not require the professional engineer to be present during all phases of its installation, but it does require him to inspect the work as it progresses on a part-time basis, sufficient to adequately certify the system. The engineer shall certify, in writing, that the

sheeting was installed in accordance with the supporting calculations and that the installer complied with recognized procedures, methods and techniques.

D. An amount equal to 15% of the scheduled value of the excavation support and protection will be withheld until the certification has been provided for record purposes only.

**1.06 - COORDINATION**

A. Coordinate work under provisions of Section 013100.

B. Coordinate work with all other sections requiring temporary sheeting and bracing.

**PART 2 - PRODUCTS**

**2.01 – MATERIALS**

A. Wood Sheeting: Hardwood species of size and dimensions capable of being driven to the required depths and capable of supporting excavation sides and soil pressures when braced; free from wormholes, wind shakes, loose knots, decayed or unsound portions or defects which would impair its strength or tightness; 3 inches thick minimum.

B. Steel Sheeting: ASTM A328, corrugated "Z" shape cross-section; of size and dimensions capable of being driven to the required depths and capable of supporting excavation sides and soil pressures when braced; structurally sound; special shapes for corner construction and transition points.

C. Sheeting Boxes: Steel, of size and dimensions capable of supporting excavation sides and soil pressures; structurally sound.

D. Structural Steel: ASTM A36.

E. Tiebacks: ASTM A722, ASTM A416

**PART 3 - EXECUTION**

**3.01 - EXAMINATION**

A. Verify existing soil substrate site conditions and elevations are as indicated on the plans.

B. Verify proposed locations of excavations are as indicated on the plans.

C. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage or other evidence of movement to ensure that systems are stable.

D. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

**3.02 - PREPARATION**

A. Excavate to a depth no greater than 4 feet from existing grade.

B. Assemble and drive the sheeting in accordance with shop drawings prepared by the contractor's engineer.

**3.03 - INSTALLATION - SHEETING**

A. Drive sheeting in place to thoroughly support both sides of the excavation using a sheeting hammer. Use a steam or pneumatic hammer for steel sheeting.

B. Water jetting of sheeting will not be permitted. Do not loosen adjacent ground which might result in collapse.

C. Install walls and braces or shores tight and in accordance with shop drawings prepared by the contractor's engineer.

**3.04 - INSTALLATION - SHEETING BOX**

A. Place box in trench utilizing a means which will not damage structural integrity of the box.

B. Excavate ahead of the sheeting box only enough to advance the sheeting box and only immediately prior to moving the sheeting box.

C. Backfill on both sides of the sheeting box as it is moved.

**3.05 - REMOVAL OF SHEETING**

A. Remove sheeting only as backfilling progresses.

B. Carefully remove sheeting such that compacted backfill is not displaced. Add additional backfill to the areas vacated by the sheeting.

C. All sheeting is to be removed from the site once its use is no longer required.

D. Removing sheeting in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities and utilities.

E. The contractor may request permission to leave sheeting or bracing in place. The Engineer may grant permission on the condition that the cost of sheeting and bracing be borne by the contractor.

F. Sheeting to be left in place shall be at cut and removed to a minimum depth of 5 feet below finished grade elevation or 1 foot below lowest crossing utility/pipeline, whichever is deeper.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - DESCRIPTION

A. Work covered by this Section includes the restoration of surfaces damaged or disturbed because of the Contractor's operations and installation of the work.

B. Contract G - The Contractor's cost associated with work of this Section shall be included in the lump sum price (Base Bid) as bid.

C. Contract S – Costs associated with work of this section shall be covered by the Unit Prices as bid.

### 1.02 - RELATED SECTIONS

A. Related Sections shall include all applicable technical specification sections.

### 1.03 - QUALITY ASSURANCE

A. Provide at least one person who shall be present at all times during this portion of Work and who is thoroughly familiar with the types of materials being installed, the best methods for their installation and who shall direct all work performed under this Section.

B. Grades and surfaces shall be restored so as to be equal to or better than the original conditions which existed at the time they were damaged or disturbed, except as otherwise specified or shown on the Drawings.

C. Restoration of surfaces under the jurisdiction of public authorities or public utilities shall be in accordance with the requirements of such authorities. Ascertain these requirements, procure necessary permits, arrange for required inspections, and pay all fees, deposits, and other charges that may be required by the authorities.

D. Existing pavements, curbs, and walks to be restored shall be replaced with new pavement equivalent to or superior to the existing in quality, thickness, bearing capacity and surface finish, except where otherwise specified.

E. Replaced pavement shall be free from all noticeable sags, settlements, bumps, humps, cracks or other defects. Other than possibly color, the replaced pavement shall be unnoticeable from the existing pavement.

### 1.04 - SUBMITTALS

A. See Section 013300.

B. Submittals required are identical to those required under other Sections. If submittals have been made and approved under the other Sections, and is applicable to this Section, then a notification to this effect will be sufficient.

C. At the completion of the Work under this Section, submit copies of letters of approval from all authorities having jurisdiction over the areas that were restored.

**1.05 - SCHEDULING**

A. It is the intent of this Section to restore all surfaces as soon as possible to cause the least amount of inconvenience to the existing plant operation.

B. Replace all pavements as specified elsewhere in these specifications.

C. Replace all items as soon as possible after the installation of the work, with special attention directed at those that control traffic, protect property and lives, create hazards when not in place or are otherwise deemed essential.

D. The phrase “after installation of the work” means after the installation of the work that necessitated the removal of an item or items.

**1.06 - MAINTENANCE AND GUARANTEE**

A. The maintenance and guarantee requirements of other applicable Sections are required under this Section.

B. Maintain and care for all restoration work.

C. Continually maintain all areas where pavement has been removed to provide a smooth, dust-free surface by adding fill and dust control materials and grading daily, or more frequently when required.

**PART 2 - PRODUCTS**

**2.01 - REUSE OF EXISTING MATERIALS**

A. Curbs, walks, roads, fences, walls, signs and other items which have been removed, knocked down, or displaced shall be replaced with existing materials when, in the opinion of Engineer, such materials are in acceptable condition. Where such materials have been damaged, marred, broken, or are otherwise in an unacceptable condition, provide replacements of equal or better quality, appearance, size and type, at the Contractor’s expense.

## PART 3 - EXECUTION

### 3.01 - INSPECTION

A. Carefully inspect the work installed under other Sections and verify that all such work is complete to the point where restoration of surfaces may properly commence and to insure the unnecessary disturbance of restored surfaces at a later date.

B. Verify schedule of work for conformance to allowable planting times.

C. Do not begin restoration work until conditions are satisfactory.

### 3.02 - GRASS AND LAWNS

A. Comply with the requirements contained in Section 329219 - SEEDING

### 3.03 - PLANTS AND REPLANTING

A. As soon as possible after construction operations have moved to another portion of the site, replant plants, shrubs, trees and other vegetation that was taken up in their original locations, provided that they survived and show indications of continued life.

B. Replace with the same kind and size, any plantings, trees, shrubs or other vegetation that fail to survive the moving operation.

### 3.04 – ASPHALTIC CONCRETE PAVEMENT

A. All work and materials shall conform to Section 321216.

B. Cut back undisturbed pavement surfaces and binder course at least 12 inches beyond the walls of the backfilled excavations and trenches, with straight and vertical edges to form an undisturbed ledge of base course under the new pavement.

C. Thoroughly roll finished surfaces and match existing adjacent surfaces as nearly as practicable.

D. Replace all pavement markings, as they originally existed.

### 3.05 - SIDEWALKS

A. Portland Cement Concrete - Replace walks after backfill has been brought up to proper subgrade elevation and compacted.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Recycled concrete aggregate base course.

### 1.02 - RELATED SECTIONS

A. Section 312213 – Rough Grading: Preparation of site for base course.

B. Section 312323.13 – Backfilling.

C. Section 312333 – Trenching.

### 1.03 - REFERENCES

A. ANSI/ASTM C88 - Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.

B. ANSI/ASTM C136 - Sieve Analysis of Fine and Coarse Aggregates.

C. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb Rammer and 18-inch Drop.

D. ASTM D4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

### 1.04 - SUBMITTALS

A. Submit under provisions of Section 013300.

B. Test Reports: Submit a sieve analysis for the aggregate base course used.

### 1.05 - DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products to the site under provisions of Section 016500.

B. Do not handle aggregate in any manner which will cause segregation of large or fine particles.

## PART 2 - PRODUCTS

### 2.01 - MATERIALS

A. Aggregate Base Course: Angular, crushed, recycled concrete; free of shale, clay, friable materials and debris; graded in accordance with ANSI/ASTM C136 within the following limits:

| Sieve Size | Percent Passing |
|---|---|
| 2 inches | 100 |
| 1 inch | 80-100 |
| 1/4 inch | 50-85 |
| 3/8 inch | 55-75 |
| No. 10 | 30-70 |
| No. 40 | 15-40 |
| No. 200 | 6-12 |

B. Material retained on the 1/2 inch sieve is coarse aggregate.

C. Coarse aggregate shall not have more than 10 percent by weight of flat or elongated pieces. A flat or elongated piece is defined as being three times greater in the largest dimension as compared to its least dimension.

D. The portion of the aggregate base course which passes the No. 40 screen shall have a plasticity index of one as tested in accordance with ASTM D4318.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Verify existing conditions and substrate.

B. Verify elevations of subgrade are as indicated on the plans.

C. Verify that subgrade is properly compacted and ready to receive work of this section.

D. Beginning work of this section means acceptance of existing conditions.

### 3.02 - PREPARATION

A. Fine grade and compact subgrade to 95 percent maximum dry density in accordance with ANSI/ASTM D1557.

### 3.03 - AGGREGATE PLACEMENT

A. Spread course aggregate over prepared subgrade to a total compacted thickness as indicated on the plans.

B. Place aggregate in 3 inch layers and compact by roller.

C. Level and contour surfaces to elevations and gradients indicated.

D. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.

E. Compact placed aggregate materials to achieve 92% maximum dry density in accordance with ANSI/ASTM D1557. Maintain optimum moisture content to attain required density.

F. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

G. Use mechanical vibrating tamping in areas inaccessible to compaction equipment.

H. New pavement must be placed on the properly compacted aggregate base course within 24 hours of final compaction. If aggregate base course is left open for more than 24 hours, re-compact and retest in accordance with ANSI/ASTM D1557.

**3.04 - TOLERANCES**

A. Maximum Variation From Flatness: 1/4 inch measured with 10 foot straight edge.

B. Maximum Variation From Scheduled Compacted Thickness: 1/4 inch.

C. Maximum Variation from True Elevation: 1/4 inch.

**3.05 - FIELD QUALITY CONTROL**

A. Perform field inspection and testing under provisions of Section 014500.

B. Perform compaction testing in accordance with ANSI/ASTM D1557.

C. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to Owner.

D. Frequency of Tests: One test per 500 sq ft. immediately prior to paving.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Asphaltic concrete paving.

### 1.02 - RELATED SECTIONS

A. Section 321123 – Recycled Concrete Aggregate Base Course.

### 1.03 - REFERENCES

A. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot Mix Types.

B. AI MS-8 - Asphalt Paving Manual.

C. ASTM D242 - Mineral Filler for Bituminous Paving Mixtures.

D. ASTM D546 - Test Method for Sieve Analysis of Mineral Filler for Road and Paving Materials.

### 1.04 - SUBMITTALS

A. Submit under provisions of Section 013300.

B. Supplier: Submit name of asphalt supplier to be used on the project prior to placement of any asphalt on the project.

C. Design Data: Submit asphalt mix design for each asphalt type to be used.

D. Testing Firm: Submit name of testing firm to be performing tests on asphalt pavement.

### 1.05 - QUALITY ASSURANCE

A. Obtain materials from the same supplier throughout the duration of the project.

B. Do not alter from mix design requirements.

### 1.06 - DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products to the site under provisions of Section 016500.

B. Deliver asphalt in sealed, metal containers covered with suitable material to protect the asphalt from the elements.

C. Lightly lubricate the inside surface of the container with a thin oil or soap solution before loading asphalt.

D. All containers must be cleaned of all foreign materials prior to loading.

**1.07 - ENVIRONMENTAL REQUIREMENTS**

A. Do not place asphalt when base surface temperature is less than 40 degrees F, or if surface is wet or frozen.

B. Do not place asphalt when precipitation is occurring.

**PART 2 - PRODUCTS**

**2.01 - MATERIALS**

A. Asphalt Cement: AC-20; homogeneous, and shall not foam when heated to 347 degrees F.

B. Fine Aggregate: Material passing the 1/8 inch sieve; natural sand of hard, strong, durable particles which are free from coatings or injurious amounts of clay, loam or other deleterious substances.

C. Coarse Aggregate: Material retained on the 1/8 inch sieve; crushed stone or gravel; clean, durable, sharp angled fragments of rock of uniform quality.

D. Mineral Filler: ASTM D242, finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter; 100 percent shall pass the No. 30 sieve; a minimum of 85 percent shall pass the No. 80 sieve; and a minimum of 65 percent shall pass the No. 200 sieve as measured in accordance with ASTM D546.

**2.02 - EQUIPMENT**

A. Rollers: Minimum weight of 10 tons; equipped with lubricating devices for the roller wheels.

B. Pavers: Equipped with a vibratory device.

**2.03 - ACCESSORIES**

A. Tack Coat: Homogeneous, medium curing, liquid asphalt.

B. Wheel Lubricant: Oil-water mixture containing maximum 10 percent lubricating oil.

**2.04 - MIXES**

A. Use dry material to avoid foaming. Mix uniformly.

B. Binder Course: NYSDOT Type 3; 4.5 to 6.5 percent of asphalt cement by weight in mixture in accordance with the following gradation:

| Sieve Size | Percent Passing |
|---|---|
| 1-1/2 inches | 100 |
| 1 inch | 95-100 |
| 1/2 inch | 70-90 |
| 1/4 inch | 48-74 |
| 1/8 inch | 32-62 |
| No. 20 | 15-39 |
| No. 40 | 8-27 |
| No. 80 | 4-16 |
| No. 200 | 2-8 |

C. Wearing Course: NYSDOT Type 6; 5.8 to 7.0 percent of asphalt cement by weight in mixture in accordance with the following gradation:

| Sieve Size | Percent Passing |
|---|---|
| 1 inch | 100 |
| 1/2 inch | 95-100 |
| 1/4 inch | 65-85 |
| 1/8 inch | 36-65 |
| No. 20 | 15-39 |
| No. 40 | 8-27 |
| No. 80 | 4-16 |
| No. 200 | 3-6 |

**2.05 - SOURCE QUALITY CONTROL**

A. Obtain asphalt materials from same source throughout the project.

B. Provide asphalt in accordance with the approved mix design for each type of asphalt.

C. Test samples in accordance with AI MS-2.

**PART 3 - EXECUTION**

**3.01 - EXAMINATION**

A. Verify existing conditions and substrate.

B. Verify that compacted subbase is dry and ready to receive work of this section.

C. Verify gradients and elevations of base are correct.

D. Verify that all castings are properly installed and are at the correct elevations.

E. Beginning of installation means installer accepts existing conditions.

**3.02 - PREPARATION**

A. Apply tack coat at uniform rate of 0.03 to 0.07 gal/sq. yd. to contact surfaces of castings, curbs, gutters and any asphalt or concrete material.

B. Do not apply tack coat to wet or frozen surfaces.

C. Coat top surfaces of castings with oil to prevent bond with asphalt pavement.

**3.03 - INSTALLATION**

A. Install work in accordance with AI MS-8.

B. Maintain asphalt temperature between 250 and 325 degrees F during placement.

C. Place asphalt within 24 hours of applying tack coat.

D. Place asphalt to compacted thicknesses as identified on plans. If a multiple course pavement is to be used, place top course within 24 hours of placing bottom course. If more than 24 hours elapse, a tack coat will be required to be placed over the entire surface of the bottom course prior to any additional paving.

E. Utilize the vibratory device on the paver at all times.

F. Compact pavement by rolling. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

G. Compact pavement to a minimum of 94% maximum density.

H. Develop rolling with consecutive passes to achieve even and smooth finish, without roller marks.

I. Seal all joints between new pavement and existing pavement with asphalt cement.

**3.04 - TOLERANCES**

A. Maximum Variation From Flatness: 1/8 inch measured with 10 foot straight edge.

B. Maximum Variation From Scheduled Compacted Thickness: 1/8 inch.

C. Maximum Variation from True Elevation: 1/4 inch.

**3.05 - FIELD QUALITY CONTROL**

A. Perform field inspection and testing under provisions of Section 014500.

B. Take samples and perform tests in accordance with AI MS-2.

C. Test are to include percent compaction, gradation and asphalt content.

D. Provide an asphalt thermometer for determining the asphalt temperature during paving operations.

E. Frequency of Tests: One test for every 1,000 square feet of each pavement course.

**3.06 - PROTECTION**

A. Protect finished work under provisions of Section 015000.

B. Immediately after placement, protect pavement from mechanical injury until project is accepted by the Owner.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Concrete sidewalks.

B. Formwork.

### 1.02 - RELATED SECTIONS

A. Section 312213 - Rough Grading: Preparation of subgrade for sidewalk placement.

### 1.03 - REFERENCES

A. ACI 301 - Structural Concrete for Buildings.

B. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

C. ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.

D. ASTM C33 - Concrete Aggregates.

E. ASTM C94 - Ready Mix Concrete.

F. ASTM C150 - Portland Cement

G. ASTM C260 - Air-Entraining Admixtures for Concrete.

H. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

I. ASTM C494 - Chemical Admixtures for Concrete.

### 1.04 - SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Provide data on joint filler, admixtures and curing compounds.

C. Supplier: Submit name of concrete supplier prior to the placement of any concrete on the project.

D. Design Data: Provide a design mix for each type of concrete to be used on the project.

E. Certificates: Submit receipts of all concrete deliveries, indicating source, date, contractor, amount of concrete, concrete strength, truck number and time load was batched.

F. Testing Firm: Submit name of testing firm to be performing tests on concrete.

**1.05 - PROJECT RECORD DOCUMENTS**

A. Submit under provisions of Section 017839.

B. Accurately record locations of each day's concrete pour.

**1.06 - QUALITY ASSURANCE**

A. Perform work in accordance with ACI 301.

B. Obtain concrete only from approved suppliers and maintain the same source throughout the project.

**1.07 - DELIVERY, STORAGE AND HANDLING**

A. Deliver, store and handle products to the site under provisions of Section 016500.

B. Deliver concrete in accordance with ASTM C94, Alternative No. 2.

C. Place all concrete within 90 minutes of time load was batched.

**1.08 - ENVIRONMENTAL REQUIREMENTS**

A. Do not place concrete when base surface temperature is less than 40 degrees F, or if surface is wet or frozen.

**PART 2 - PRODUCTS**

**2.01 - MATERIALS**

A. Cement: ASTM C150, air entraining, Type 1A Portland, gray color.

B. Aggregates: ASTM C33.

C. Water: Potable and not detrimental to concrete.

D. Reinforcement: ANSI/ASTM A185 plain welded steel wire fabric; in flat sheets; uncoated finish.

**2.02 - ACCESSORIES**

A. Forms: Douglas Fir plywood type; solid, sound, undamaged sheets.

B. Joint Filler: ANSI/ASTM D1751; 1/2 inch thick.

C. Air Entraining Admixture: ASTM C260.

D. Chemical Admixture: ASTM C494, type as required.

E. Curing Compound: ASTM C309, Type 1, Class A.

F. Form Release Agent: Colorless material which will not stain concrete or absorb moisture.

G. Joint Sealant: ASTM C920,,Type M, Grade P; SL-2 by Sonneborn or equal.

**2.03 - MIXES**

A. Concrete shall be mixed and prepared in accordance with the approved mix design and ASTM C94, Alternative No. 2.

B. The mix shall be such that the concrete shall attain the following characteristics:

| | | |
|---|---|---|
| 1. | Compressive Strength (28 days): | 4,000 psi. |
| 2. | Slump: | 2½ to 3½ inches. |
| 3. | Air Entrainment: | 6% ±1%. |

C. Use chemical admixtures only when approved by the Engineer. Use of admixtures will not relax placement requirements.

**PART 3 - EXECUTION**

**3.01 - EXAMINATION**

A. Verify existing conditions and substrate.

B. Verify datum and all elevations are as indicated on the plans.

C. Verify compacted granular subbase has been properly prepared and is ready to receive work of this section.

D. Beginning of installation means installer accepts existing conditions.

**3.02 - PREPARATION**

A. Compact base to minimum 92 percent maximum dry density in accordance with ANSI/ASTM D1557.

B. Moisten base to a minimum depth of 1/2 inch to minimize absorption of water from fresh concrete.

C. Coat surfaces of manhole and catch basin frames with oil to prevent bond with concrete pavement.

D. Place and secure forms to correct location, dimension and profile.

E. Assemble formwork to permit easy stripping and dismantling without damaging concrete. Coat forms with form release agent.

**3.03 - INSTALLATION**

A. Place joint filler vertical in position in straight lines. Secure to formwork during concrete placement.

B. Place reinforcement as indicated on the plans. Interrupt reinforcement at expansion joints.

C. Place concrete in accordance with ACI 301.

D. Ensure reinforcement and formed joints are not disturbed during concrete placement.

E. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that joints occur.

F. Vibrate concrete adjacent to forms.

G. Place concrete to pattern indicated.

H. Place expansion joints with joint filler at 20 foot intervals.

I. Place scored contraction joints at 4 foot intervals.

J. Place joint filler between paving components and building or other appurtenances and in expansion joints.

K. Apply a light broom finish perpendicular to traffic.

L. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

**3.04 - FIELD QUALITY CONTROL**

A. Field inspection and testing shall be performed under provisions of Section 014500.

B. Take six concrete test cylinders for every 50 cu. yds. or fraction thereof of each class of concrete placed each day.

C. Cure test cylinders on site under same conditions as concrete sidewalk.

D. Take one slump test for each set of test cylinders taken.

E. Concrete not meeting slump requirements will be rejected.

F. Concrete represented by cylinders which do not meet required strength will be removed and replaced at no additional cost to the Owner.

**3.05 - PROTECTION**

A. Protect finished work under provisions of Section 015000.

B. Immediately after placement, protect sidewalk from premature drying, excessive temperatures and mechanical injury.

C. Protect sidewalk from damage until project is accepted by the Owner.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Work of this Section includes the disinfection of all potable water piping installed as work of Contract G & P.

B. Testing and reporting results.

### 1.02 - REFERENCES

A. ANSI/AWWA B300 - Standard for Hypochlorites.

B. ANSI/AWWA B301 - Standard for Liquid Chlorine.

C. ANSI/AWWA C651 - Standards for Disinfecting Water Mains.

### 1.03 - SUBMITTALS

A. Test reports shall indicate results comparative to specified requirements.

### 1.04 - PROJECT RECORD DOCUMENTS

A. Disinfection report shall contain the following information:

1. Type and form of disinfectant used.

2. Date and time of disinfectant injection start and time of completion.

3. Test 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. Bacteriological report contain 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 for each outlet tested.

6. Coliform bacteria test results for each outlet tested.

7. Certification that water conforms, or fails to conform, to bacterial standards of health department.

8. Bacteriologist's signature and authority.

**1.05 - QUALITY ASSURANCE**

A. Perform work in accordance with ANSI/AWWA C 651.

B. Testing will be paid for out of the cash allowance for testing services. Coordination with the testing lab shall be the Contractor’s responsibility and be included in the price as bid.

**1.06 - QUALIFICATIONS**

A. The testing laboratory shall specialize in testing potable water systems and be certified by the State of New York.

**1.07 - REGULATORY REQUIREMENTS**

A. Conform to NY State Sanitary code, NYSDOH and health department requirements for performing the work of this section.

B. Comply with applicable Suffolk County Department of Health Services requirements.

**PART 2 - PRODUCTS**

**2.01 - MATERIALS**

A. Apply chlorine gas-water mixture by means of solution feed chlorination device. Dry gas may be fed directly through proper devices for regulating the rate of flow and providing effective diffusion of the gas into the water within the pipe being treated. Chlorinating devices for feeding solutions of the chlorine gas or the gas itself must provide means for preventing the backflow of water into the chlorine cylinder or feed device.

B. Chlorine shall meet ANSI/AWWA B301.

C. CHLORINE-BEARING COMPOUNDS IN WATER:

1. A mixture of water and a chlorine-bearing compound of known chlorine content may be utilized. The chlorine-bearing compounds which may be used are:

a. Calcium hypochlorite

b. Chlorinated lime

c. Sodium hypochlorite

2. Hypochlorite shall meet ANSI/AWWA B300.

3. A 5% solution of the powder shall be prepared, consisting of 5% available chlorine to 95% of water by weight, due attention being given to the chlorine content of the product used. This calcium hypochlorite or chlorinated lime and water mixture, first made into a paste and then thinned to slurry with clean water, shall be injected or pumped into the newly laid pipe after preliminary flushing. If sodium hypochlorite is used, mix the solution (as purchased) with water to obtain the desired concentration of chlorine, and feed into the pipe under treatment in the same manner as is used for feeding other hypochlorites.

## PART 3 - EXECUTION

### 3.01 - EXAMINATION

A. Verify that piping system has been cleaned, inspected and pressure tested.

B. Perform scheduling and disinfection activity with startup, testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

### 3.02 - PROCEDURE

A. Water mains and all process lines shall be thoroughly flushed to remove loose dirt, stones and other foreign material. Water for flushing and sterilization will be furnished to the Contractor by the Owner without charge.

B. Any of the following methods of procedure, arranged in order of preference, shall be followed, subject to the approval of the Engineer:

1. Direct chlorine feed.

2. Calcium or sodium hypochlorite and water mixture.

3. Chlorinated lime and water mixture.

**3.03 - APPLICATION**

A. The point of application of the chlorinating agent shall be at the beginning of the pipeline extension or any valved section of it, and through a corporation stop inserted by the Contractor to the top of the newly laid pipe. If required, a tap on the pressure side of the valve controlling the flow into the pipeline extension shall be made by the Contractor for supplying a water injector used to deliver the chlorine-bearing water into the main.

B. Water from the existing distribution system or other source of supply shall be controlled so as to flow slowly into the newly installed pipeline during the application of chlorine. The rate of chlorine mixture flow shall be in such proportion to the rate of water entering the pipe that the chlorine dose applied to the water entering the newly installed pipe shall be approximately 100 ppm (mg/L) or more, as required to obtain the immediately required residual of 50 ppm (mg/L).

C. The rate of flow of water into the line to be treated shall be determined by the Contractor and shall be by means of a pitot gauge or rate setter. Retain the services of a professional engineer to direct the Contractor in this procedure.

D. Valves shall be manipulated so that the strong chlorine solution in the line being treated shall not flow back into the line supplying the water.

E. Treated water shall be retained in the pipe long enough to destroy all nonspore-forming bacteria. This period should be at least 24 hours or longer, as may be directed by the Engineer. After the chlorine-treated water has been retained for the required time, the chlorine residual at the pipe extremities and at other representative points shall be at least 25 ppm (mg/L) after 24 hours.

F. In the process of chlorinating newly installed pipe, all valves and other appurtenances shall be operated while the pipeline is filled with chlorinating agent.

**3.04 - FINAL FLUSHING AND TEST**

A. Following chlorination, all treated water shall be thoroughly flushed from the newly installed pipeline at its extremities until the replacement water throughout its length shall, upon test, be proven comparable to the quality of water served the public from the existing water supply system. Water flushed from the water main shall be dechlorinated to less than 1 mg/l and conveyed to either open fields or existing storm water disposal system so as to prevent street flooding.

B. The environment to which the chlorinated water is to be discharged shall be inspected. If there is any question that the chlorinated discharge will cause damage to the environment, then a

reducing agent shall be applied to the water to be wasted, to neutralize thoroughly the chlorine residual remaining in the water.

C. The Contractor shall have a comparator with a range of 0 to 250 ppm (mg/L) on the site.

**3.05 - FIELD QUALITY CONTROL**

A. Bacteriological Testing: Upon completion of chlorination and final flushing, the Contractor shall provide approved sampling points (including taps and copper tubing) for the collection of water samples from locations as directed on the new main installation.

B. A minimum of two (2) bacteriological samples, 24 hours apart, for this project; and two (2) samples, 24 hours apart, on each dead end will be required.

C. After each section of water main or process pipe has been blown off and allowed to stand for 24 hours, samples of water shall be taken from the approved sampling points for bacteria by the laboratory personnel of a New York State approved laboratory. The costs for the bacteriological tests shall be paid for out of the cash allowance for testing. The costs for having the laboratory technician grab the samples and transport them back to the lab for analysis shall also be included in the cash allowance.

D. Positive Samples: If positive samples are obtained after chlorination, the Contractor shall rechlorinate and samples shall be recollected until successive negative coliform bacteria tests are obtained.

E. Approval by Engineer: No sections of new main or process pipe shall be opened to the distribution system until satisfactory bacteriological tests are obtained by a New York State approved laboratory, with a certificate that the samples were taken by laboratory personnel, and approval is granted by the Engineer.

F. Cleanup: After approval, all holes, washouts, damages and the like in connection with sampling operations shall be filled and repaired.

**3.06 - NEUTRALIZATION OF RESIDUAL CHLORINE**

A. Neutralize residual chlorine with a suitable quantity of sodium bisulfide, sodium sulfide or sodium thiosulfate prior to disposal.

**END OF SECTION**

## PART 1 – GENERAL

### 1.01 - SECTION INCLUDES

A. Pipe and fittings for gravity sanitary sewers and gravity drain lines

### 1.02 - RELATED SECTIONS

A. Section 314116.13 – Excavation Support and Protection

B. Section 312316 – Excavation

C. Section 312323.13 – Backfilling

D. Section 312333 – Trenching

### 1.03 - REFERENCES

A. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.

B. ACI 308 - Standard Practice for Curing Concrete.

C. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

D. ANSI/AWWA C104 - Cement-Mortar Lining for Ductile Iron Pipe and Fittings for Water.

E. ANSI/AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids.

F. ANSI/AWWA C150/A21.50 - American National Standard for Thickness Design of Ductile Iron Pipe.

G. ANSI/AWWA C600- Installation of Ductile Iron Water Mains and Appurtenances.

H. ANSI B18.2.1 - Square and Hex Bolts and Screws Inch Series Including Hex Cap Screws and Lag Screws.

I. ANSI B18.2.2 - Square and Hex Nuts (Inch Series).

J. ASTM A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

K. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

L. ASTM C923 - Resilient Connectors between Reinforced Concrete Manhole Structures and Pipe.

M. ANSI/ASTM D698 - Test Methods for Moisture - Density Relations of Soils and Soil Aggregate Mixtures. Using 5.5 lb. rammer and 12-inch drop.

N. ASTM D2321 - Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.

O. Great Lakes-Upper Mississippi River Board of State Sanitary Engineers - Recommended Standards for Sewage Works (Ten State Standards).

P. ASTM F-714, ASTM D-3261, ASTM D3350 for High Molecular Weight, High Density PE 3408 Polyethylene Pipe

Q. CRSI 63 - Recommended Practice for Placing Reinforcing Bars.

R. UNI-B-5-89 - Recommended Practice for the Installation of Polyvinyl Chloride Sewer Pipe.

S. ASTM D3034 - Type PDM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings.

**1.04 - SUBMITTALS**

A. Submit under provisions of Section 013300.

B. Submit underground pipeline documentation as required in Section 01785.

C. Product Data: Provide data on pipe materials, pipe fittings, drop bowl assembly, accessories and marking tape.

D. Manufacturer's Installation Instructions: Indicate procedures required to install products specified.

E. Manufacturers' Certificate: Certify that products meet or exceed specified requirements.

F. Foundry Records and Tests: Written transcripts of the test results shall be delivered directly to the Engineer within one week of the shipment of pipe with the date of the tests as close to the date of manufacture as practical. For ductile iron pipe, written transcripts shall be furnished directly to the Engineer in accordance with applicable sections of AWWA C151 and ANSI A21.51:

| | |
|---|---|
| **Transcripts & Certification:** | 51-5.2 |
| **Group Tests Required:** | Hydrostatic Test (51-9) |
| | Tensile Test (51-12.1) |
| | Impact Test (51-12.2) |
| | Low Temperature Impact Test (51-13) |
| | Number of Specific Group Tests |
| | Required in Addition to Genera |
| **Certification:** | One (1) per pipe size per 2,000 linear feet of pipe. |

### 1.05 - QUALITY ASSURANCE

A. High Density, High Molecular Weight Polyethylene Pipe: Manufacturer's name, size, manufacturer's code, cell classification and ASTM designation stamped on the pipe.

B. All pipe joints shall be made by installers factory trained for butt fusion welding.

C. Ductile iron pipe manufacturer shall be a member of the Ductile Iron Pipe Research Association.

D. Pipe shall be marked with the manufacturer's name, classification, or nominal thickness and "DI" or "Ductile Iron".

### 1.06 - DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect, and handle products in accordance with manufacturer's instructions to prevent soiling, disfigurement, or damage.

B. Protect piping systems from entry of foreign materials by temporary covers, completing sections of work and isolating parts of completed systems.

### 1.07 - ENVIRONMENTAL REQUIREMENTS

A. Do not install underground piping when bedding is wet or frozen.

B. Do not mix or place mortar and non-shrink grout if ambient temperature is below 40 degrees F.

C. Do not backfill over or with frozen materials.

## PART 2 - PRODUCTS

### 2.01 - MANUFACTURERS

A. Ductile iron pipe: U.S. Pipe & Foundry Co., American Ductile Iron Pipe.

### 2.02 - MATERIALS

A. Sewer Pipe:

1. Ductile Iron - Pipe shall be centrifugally cast with primary graphite in modular form or spherulitic and conform to AWWA C151, Class 52, mechanical joint. All buried and exposed pipe and fittings shall be cement lined per AWWA C104, double thickness, minimum 3/16 inch for pipe and standard thickness for fittings. All buried pipe and fittings shall be provided with bituminous seal coat per AWWA C106, inside and out. Ductile iron

fittings shall comply with AWWA C110. Nuts and bolts shall be alloy steel conforming to the physical properties of ASTM A563 and ANSI B18.2.1 for bolts and ANSI B18.2.2 for nuts.

B. Concrete:

1. Cement: ASTM C150 Type II.

2. Fine and Coarse Aggregates: ASTM C33.

3. Water: Clean and not detrimental to concrete.

4. Mix concrete with a minimum 28-day compressive strength of 4000 psi.

C. Reinforcing Steel:

1. ANSI/ASTM A185 or ASTM A615, 60 ksi yield grade, plain finish.

2. Tie Wire: Minimum 16 gauge, annealed type.

D. Non-Shrink Grout:

1. Cement-Based Grout: Premeasured and prepackaged materials supplied by the manufacturer, requiring only the addition of water. The manufacturer's instructions must be printed on the outside of each bag.

2. Water: Potable, not detrimental to concrete.

3. Use the minimum water necessary for proper installation.

4. Grout Characteristics:

a. Non-Shrink: No shrinkage (0.0%) and a maximum 4.0% expansion when tested in accordance with ASTM C-827. No shrinkage (0.0%) and a maximum of 0.2% expansion in the hardened state when tested in accordance with CRD-C-621.

b. Compressive Strength: A minimum 28-day compressive strength of 5,000 psi when tested in accordance with ASTM C-109.

c. Setting Time: A minimum initial set time of 60 minutes when tested in accordance with ASTM C-191.

d. Composition: Shall not contain metallic particles such as aluminum powders, iron filings, or expansive cement.

E. Lock Joint Flexible Sleeves: ASTM C923 - Resilient Connector between manhole and piping suitably sized for the outside diameter of polyethylene pipe.

**2.03 - ACCESSORIES**

A. Marking Tape: Solid plastic tape with a minimum total thickness of 4.5 mil. Tape resistant to alkalis, acids, and other destructive elements. Green in color, minimum 3 inches wide with the words "Caution - Sanitary Sewer" repeated every 16-36 inches, conforming to APWA uniform color code. Tape shall be installed as specified in Part 3.

B. Pipe Connectors: Elastomeric PVC with Series 300 stainless steel bands by FERNCO, Davison, MI.

**2.04 - SOURCE QUALITY CONTROL**

A. Notify Engineer at least 48 hours before pouring precast concrete sections.

B. Mark precast concrete structures in accordance with ASTM C478.

C. Provide compressive strength test results of concrete used in making precast concrete structures. Provide data for cylinders tested in accordance with ASTM C39 at seven days and twenty-eight days.

**PART 3 - EXECUTION**

**3.01 - EXAMINATION**

A. Verify that excavations are to required grade, dry and not over excavated. Comply with the requirements contained in Section 312333 – Trenching.

**3.02 - PREPARATION**

A. Remove scale and dirt, on inside and outside, before assembly.

B. Remove large stones or other hard matter that could damage pipe or impede consistent backfilling or compaction.

C. All encountered obstructions in the line of the work shall be carefully taken-up and stored for subsequent replacement. If damaged, full and new replacement will be required at no additional expense to the Owner.

D. Remove and dispose of all other obstructions which will affect the work or which are specifically designated to be removed.

E. Hand trim excavations to required elevations. Correct over excavation with Type C fill as defined in Section 312316 - Excavation.

**3.03 - INSTALLATION**

A. Maintain separation of sanitary sewer from water piping in accordance with regulations of New York State Department of Environmental Conservation and the Recommended Standards for Wastewater Facilities.

B. Parallel Water and Sewer Lines - Pipelines carrying sewage, sludge or other wastewater, whether treated or not, shall not be located any closer than 10 ft. horizontally from a potable water pipeline. If it is not possible to maintain horizontal separation, the lines may be located at least 3 ft. horizontally from each other, provided that there is at least 18 inches of clear vertical separation, with the sewer line being below the water line.

C. Water and Sewer Line Crossings - Whenever water and sewer lines must cross, the sewer must be situated below the water line with at least an 18 inches of clear vertical separation. In no case shall a water line pass under a sewer.

D. Special Conditions - Parallel Lines - When it is impossible to achieve the requirements of paragraph 3.03 (B), immediately notify Engineer. If Engineer concurs, he will order the construction of the sewer with ductile mechanical joint pipe and may order the reconstruction of the existing water line. Regardless, sewer shall be installed at a lower elevation than the water line and sewer line and the reconstructed water line shall be pressure tested for leakage in accordance with Section 017550.

E. Special Conditions - Crossing Lines - When it is impossible to achieve the requirements of paragraph 3.03 (C), immediately notify Engineer. If Engineer concurs; he will order 1) the water pipe raised, 2) the construction of the sewer line with ductile mechanical joint pipe. Regardless, sewer shall be installed at a lower elevation than the water line. The full length of sewer pipe shall be centered under the crossing line. The joint shall not be closer than 9.5 ft. to the crossing.

F. Unusual Conditions - Immediately notify Engineer when it is impossible to achieve any of the above conditions. The Engineer will prescribe the procedures to be followed.

G. Install plastic pipe, fittings, and accessories in accordance with ASTM D2321 and manufacturer's instructions. Install ductile iron pipe in accordance with AWWA and ANSI standards and manufacturer's instructions. Seal joints watertight. Select pipe and fittings so that there will be as small a deviation as possible at the joints and so those inverts present a smooth surface. Pipe and fittings that do not fit together to form a tight fitting joint are not permitted.

H. Install pipe to allow for expansion and contraction without stressing pipe or joints.

I. Lay pipe to slope gradients noted on drawings with maximum variation from the slope of $^{1}/_{8}$ inch in 10 feet.

J. Backfill and compact trench in accordance with Division 2 requirements.

K. Plug or close every open pipe end before leaving work at night, and when pipe installation is not in progress.

L. After partially backfilling, install marking tape 18" to 24" above crown of pipe. Place as straight as possible. Hold tape in position by adding backfill with hand shovels before using mechanical equipment to finish the backfill.

M. Install precast concrete base, shaft, and slab top of precast plumb and level. Establish elevations and pipe inverts for inlets and outlets as indicated. Locate manhole rungs as directed by the Engineer relative to the top slab opening.

N. Adjust lock joint flexible sleeve or install non-shrink grout to provide water-tight pipe penetration. Mount lid and frame level in grout, secured to top section to elevation indicated.

O. Perform all mixing, surface preparation and grouting in accordance with manufacturer's recommendations.

P. Provide concrete bench in base of all manholes.

Q. In each stretch of underground pipe, light shall be visible from one end to the other and the pipe shall be true to line and grade. All deposits found in the pipes, protruding cement or packing shall be removed and the sewer bore left clean and free through its entire length. There shall be no visible leakage into any stretch of sewer. All manholes and other appurtenance shall be of the specified size and form and of neat appearance, and their tops shall be set to the proper grade. If the Work is found to be in any condition other than in accordance with these specifications, it shall be brought to proper condition by cleaning, pointing, or if necessary, excavating and rebuilding.

R. Install pipes to the lines and grades as given on the drawings. Engineer reserves the right to disapprove a method of control, including those previously accepted, if, in Engineer's opinion, the method of control is not providing the accuracy required under the Contract.

S. Drainage of construction excavations through sanitary sewers is not permitted.

T. Maintain the excavation free of water during the progress of the Work. No pipe shall be laid in water nor shall there by any joints made up in water. No separate allowance for pumping or otherwise removing water will be made. All slides or cave-ins of the trenches or cuts shall be remedied at the expense of the Contractor, and to the satisfaction of the Engineer.

U. Make connections between pipes of different materials with approved adapters. The encasement of adapter made connections with concrete is not permitted. Commence pipe laying at the lowest point, with the spigot ends pointing in the direction of flow.

V. All adjustments to the line and grade of pipe laid on earth foundation shall be done by scraping away or filling in the earth under the barrel of the pipe, and not be blocking or wedging. Where excavation has been carried too deep but not in excess of six (6) inches, the Contractor may replace with suitable earth and hand tamp same to provide a firm foundation. Wherever the contractor has excavated to a depth in excess of six (6) inches, the Engineer may order broken stone or gravel fill without additional compensation to the Contractor. In all cases the trench under the joint shall be excavated to permit an even bearing for the barrel of the pipe.

W. When unsuitable materials and/or conditions are encountered, the Engineer may direct the excavation to continue below grade and the trench filled with gravel or crushed stone foundation, or the Engineer may order other corrective measures.

X. Where required, holes and spaces to be used for joints shall be sufficiently large to leave the joint of each pipe free and not resting on the ground at any point. Every joint shall be made up in the trench.

**3.04 - PIPE INSTALLATION**

A. Excavate and shape the trench to conform to the details shown on the Drawings. If accidental or intentional over excavation of the trench occurs, in depth or width, such corrective measures shall be taken by the Contractor. No additional compensation will be made therefore. This requirement applies equally in the case of cave-in of the trench walls, by failure to apply necessary sheeting measures.

B. Join sections of polyethylene pipe by butt fusion welding as follows:

1. Clean each pipe with clean cotton cloth.

2. Square (face) end of each pipe to be fused.

3. Check line-up of pipe ends. Adjust high-low. Check heater plate for proper temperature and wipe header surface clean. Thermometer reading shall conform to manufacturer's printed requirements for coated or uncoated plates.

4. Insert heater plate between aligned ends and bring ends firmly in contact with plate, but DO NOT apply pressure while achieving melt pattern. Watch for proper melt.

5. Remove heater plate after achieving proper melt bead.

6. Bring melted ends together rapidly. Do not slam. Apply sufficient pressure to form a double roll-back bead.

7. Allow the butt fusion joint to cool properly prior to placement.

C. Place and compact embedment materials in accordance with Paragraph 5.10.2, "Methods of Placing Embedment Materials", of Recommended Standard UNI-B-5 of the Uni-Bell Plastic Pipe Association, subject to the conditions of the Plans and these Specifications. Pipe haunching and initial backfill shall be brought up and compacted equally on either side of the pipe, to preclude disturbance of the pipe, in layers not to exceed four inches in height, by use of hand tamping supplemented by mechanical compacting using hand-operated compactors, similar to "Whacker" or equal. Flooding, puddling and jetting of initial backfill are prohibited for PVC pipe installations.

D. Place and final backfill in accordance with Section 312323.13, as modified herein. "Hydrohammers" and similar compacting equipment, which, in the opinion of the Engineer, may cause disturbance to the pipe and/or the materials in the pipe zone (bedding, haunching, and initial backfill) shall not be utilized within four feet (4') of the pipe. This shall not be construed to preclude the use of mechanical compactors, "hoe-packers", and the like, which may be demonstrated, by the Contractor, to produce no deleterious effects on the embedment materials. Such demonstration shall be the responsibility of the Contractor. The use of mechanical compaction equipment shall be in accordance with the pipe manufacturer's recommendations, and as approved by the Engineer.

E. The Contractor's specific attention is directed towards the critical nature of effecting and maintaining the specified compaction of the embedment materials in the pipe zone. Lower limit for sheeting driven and pulled shall be one foot (1') above the top of the pipe. All sheeting placed below this level shall be cut off at said point and left in place. Compensation therefore will be made only if ordered to drive below this level, by the Engineer.

F. Use of a moveable “trench box” when moved, may cause disturbance to the materials in the pipe zone. Usage of a trench box, for protection of personnel in accordance with OSHA requirements, will be permitted only under one of the following conditions, which shall be the Contractor’s responsibility to propose and employ:

1. Position the moveable trench box on a shelf above the pipe springline, with the pipe installed in a narrow, vertical walled subditch. The width of the subditch shall not exceed the O.D. of the pipe plus 9 inches on each side; or

2. Increase the overall trench width to produce a minimum clearance of 2-1/2 pipe diameters between the pipe barrel and the trench box on each side of the pipe after embedment has been placed and compacted. In utilizing this option, all voids left in the embedment material as the result of trench box removal shall be filled and compacted. Disturbance to the loss of compaction density in the pipe zones is not permitted.

3. The Contractor shall submit his proposed method of meeting the above-specified conditions to the Engineer. No additional compensation will be made for meeting these conditions, nor for additional excavation, backfill, repaving, or similar items.

G. Compaction of embedment materials, including bedding, haunching, and initial backfill shall be as shown on the Drawings, and initial backfill shall be as shown on the Drawings, but in no case shall the density attained be less than that required for the final backfill above. The Contractor’s attention is directed toward compaction requirements for pavement sub-base material, specified elsewhere in the specifications.

**3.05 - MECHANICAL JOINT PIPE/FITTING INSTALLATION**

A. Clean the socket and plain end. All surfaces with which the gasket comes in contact shall be thoroughly wired brushed just prior to assembly. All loose rust, mud, frozen material, sand, gravel, and other foreign material shall be removed.

B. Wipe the gasket clean and install the gasket. Take care that no gasket loops or bulges protrude into the path of the entering pipe spigot. In temperatures below 32 deg. F, the gaskets shall be warmed before installation.

C. Using a clean brush, apply a liberal amount of lubricant supplied by the pipe manufacturer completely over the end of the pipe, the spigot radius, and the outer surface of the pipe up to the assembly stripe. Lubricant shall have no deteriorating effects on gasket and pipe material. Also, apply lubricant completely over the exposed surface of the gasket.

D. Install the bevel end of the pipe into the socket. Take care that the plain end is centrally located in the socket and push the pipe home. The joint deflection may then be set.

E. When tightening bolts on mechanical joint fittings, the gland shall be brought up to the fitting flange evenly, maintaining approximately the same distance between the gland and the face of the flange at all points around. This shall be done by partially tightening the bottom bolt first, then the top bolt, next the bolts at either side, and last the remaining bolts. Repeat this process until the proper joint tightness is achieved. Overstressing the bolts to compensate for the poor installation will not be permitted.

**3.06 - CONNECTIONS TO EXISTING MANHOLES AND STRUCTURES**

A. The use of excessive force or blunt instruments is prohibited in installing the pipe into the walls of existing manholes and structures. Neatly core drill a hole through the exiting wall, to achieve the minimum diameter hole required to install the pipe true to line and grade. The structure shall be maintained in good repair. Provide flexible and watertight connection at the wall.

B. In making the connection to an existing manhole or structure, pump out each structure in order to make this connection.

C. Where drop inlets are required for connections to existing manholes, install in accordance with the details and configurations indicated in the Contract Documents.

**3.07 - DEFLECTION TESTING**

A. The total vertical wall deflection shall not exceed four percent (4%) of the inside pipe diameter. The deflection shall be checked no earlier than 30 days after placement and compaction of the final backfill by manually pulling a go, no go deflection testing mandrel through the pipe. If the percent of deflection exceeds the maximum specified, undertake such remedial action as required to reduce the deflection to the limits specified. Vertical deflection tests shall be performed on all lines. Furnish all test equipment and labor for conducting the tests.

B. Arrange for the testing to be observed by the Engineer.

**3.08 - EXFILTRATION TESTING**

A. Test each section of pipe between manholes individually. Continuous sections shall not be tested simultaneously.

B. The minimum positive head of water for exfiltration testing shall be two feet above the exterior crown of the pipe at the highest point of the line under test, or two feet above the groundwater

level when groundwater levels are above the exterior crown of the pipe. Immediately upon completion of the test, remove the downstream plug in the presence of the Engineer, to verify that all test water flows freely from the pipe and upstream manhole under test.

C. The maximum allowable quantity of exfiltration shall be as specified in Section 017550. There will be no separate exfiltration allowance for manholes, except that their width will not be deducted from the length of pipe used in computing the total allowable leakage for the section under test. Allow testing to be observed by the Engineer.

**3.09 - SITE TOLERANCES**

A. Maximum variation from proposed rim elevation shall be 1/4 inch.

**3.10 - FIELD QUALITY CONTROL**

A. Request inspection prior to and immediately after placing backfill.

B. Compaction testing shall be performed in accordance with ASTM D2922.

C. If tests indicate work does not meet specified requirements, remove work, replace, and retest at no cost to Owner.

**3.11 - PROTECTION**

A. Protect pipes, structures, and appurtenances from damage or displacement during backfilling.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SCOPE OF WORK

A. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to install, ready for operation and field test stainless steel gates and appurtenances as shown on the Contract Drawings and as specified herein.

B. The gates and appurtenances shall be supplied in accordance with the latest edition of AWWA C561 Standard for Fabricated Stainless Steel Slide Gates as modified herein. The allowable leakage rate for the stainless steel gates in this specification shall be 1/2 the allowable leakage listed in the latest revision of AWWA C561.

### 1.02 - SUBMITTALS

A. Provide the following information to confirm compliance with the specification in addition to the submittal requirements specified in Section 013300.

1. Complete description of all materials including the material thickness of all structural components of the frame and slide.

2. Installation drawings showing all details of construction, details required for installation, dimensions and anchor bolt locations.

3. Maximum bending stress and deflection of the slide under the maximum design head.

4. The location of the company headquarters and the location of the principle manufacturing facility. Provide the name of the company that manufactures the equipment if the supplier utilizes an outside source.

### 1.03 - QUALITY ASSURANCE

A. Qualifications

1. All of the equipment specified under this Section shall be furnished by a single manufacturer with a minimum of 20 years experience designing and manufacturing water control gates. The manufacturer shall have manufactured water control gates for a minimum of 100 projects.

2. The specification is based on the AQUANOX Series W Weir Gates as manufactured by ISE Metal Inc. or approved equal.

**1.04 – WARRANTY**

A. The manufacturer shall provide a standard factory notarized warranty that guarantees all components of each stop gate to be free from defects in design, materials and workmanship for a period of one (1) year commencing on the date the stop gate is placed into and accepted for permanent operation.

B. During the guarantee period, if any part or component is defective or falls to perform then the manufacturer shall repair or exchange such defective part(s).

**PART 2 - EQUIPMENT**

**2.01 - GENERAL**

A. Gates shall be as specified herein and have the characteristics and dimensions shown on the Contract Drawings.

B. Leakage shall not exceed 0.05 gpm/ft of wetted seal perimeter in seating head and unseating head conditions.

C. The gate shall utilize self-adjusting seals. Due to the difficulty of accessing gates when they are in service, gates that utilize adjustable wedges, wedging devices or pressure pads are not acceptable.

D. All structural components of the frame and slide shall be fabricated of stainless steel having a minimum thickness of 1/4-inch and shall have adequate strength to prevent distortion during normal handling, during installation and while in service.

E. Slide gate frames shall be shipped fully assembled with the invert member welded to the side frames and the slide installed in the frame unless the overall width of the slide gate exceeds 96 inches or the overall height of the slide gate exceed 25 feet.

F. All welds shall be performed by welders with AWS D1.6 certification.

G. Finish: Mill finish on stainless steel. Welds shall be sandblasted to remove weld burn and scale. All iron and steel components shall be properly prepared and shop coated with a primer.

H. Materials:

| COMPONENTS | MATERIALS |
|---|---|
| Frame Assembly and Retainers | Stainless Steel, Type 304L, ASTM A240 |
| Slide and Stiffeners | Stainless Steel, Type 304L, ASTM A240 |
| Stem | Stainless Steel, Type 304, ASTM A276 |
| Anchor Studs, Fasteners and Nuts | Stainless Steel, Type 316, ASTM A276 |
| Invert Seal (Upward Opening Gates Only) | Neoprene ASTM D-2000 or EPDM |
| Seat/Seals and Facing | Ultra-High Molecular Weight Polyethylene ASTM D4020 |
| Lift Nuts | Bronze ASTM B584 |
| Pedestals and Wall Brackets | Stainless Steel, Type 304L, ASTM A240 |
| Operator Housing | Cast aluminum or ductile iron |

**2.02 - FRAME**

A. The frame assembly, including the guide members, invert member and yoke members, shall be constructed of formed stainless steel plate with a minimum thickness of 1/4-inch.

1. Frame design shall allow for embedded mounting, mounting directly to a wall with stainless steel anchor bolts and grout or mounting to a wall thimble with stainless steel mounting studs and a mastic gasket material. Mounting style shall be as shown on the Contract Drawings.

2. All wall mounted or wall thimble mounted gates shall have a flange frame. Flat frame gates are not acceptable.

3. The structural portion of the frame that incorporates the seat/seals shall be formed into a one-piece shape for rigidity. Guide members that consist of two or more bolted structural members are not acceptable. Guide member designs where water loads are transferred through the assembly bolts are specifically not acceptable.

4. Gussets shall be provided as necessary to support the guide members in an unseating head condition. The gussets shall extend to support the outer portion of the guide assembly and shall be positioned to ensure that the load is transferred to the anchor bolts or the wall thimble studs.

5. The frame shall extend to accommodate the entire height of the slide when the slide is in the fully opened position on upward opening gates or downward opening weir gates.

6. On self-contained gates, a yoke shall be provided across the top of the frame. The yoke shall be formed by two structural members affixed to the top of the side frame members to provide a one-piece rigid assembly. The yoke shall be designed to allow removal of the slide.

7. A rigid stainless steel invert member shall be provided across the bottom of the opening. The invert member shall be of the flush bottom type on upward opening gates.

8. A rigid stainless steel top seal member shall be provided across the top of the opening on gates designed to cover submerged openings.

9. A rigid stainless steel member shall be provided across the invert of the opening on downward opening weir gates.

**2.03 - SLIDE**

A. The slide and reinforcing stiffeners shall be constructed of stainless steel plate. All structural components shall have a minimum thickness of 1/4-inch.

1. The slide shall not deflect more than 1/360 of the span or 1/16 inch, whichever is smaller, under the maximum design head.

2. When the width of the gate opening multiplied by the maximum design head is greater than 80 square feet, the portion of the slide that engages the guide members shall be of a “thick edge” design. The thick edge portion of the slide shall have a minimum thickness of 3 inches.

3. Reinforcing stiffeners shall be welded to the slide and mounted horizontally. Vertical stiffeners shall be welded on the outside of the horizontal stiffeners for additional reinforcement.

4. The stem connector shall be constructed of two angles or plates. The stem connector shall be welded to the slide. A minimum of two bolts shall connect the stem to the stem connector.

**2.04 - SEALS**

A. All gates shall be provided with a self-adjusting seal system to restrict leakage in accordance with the requirements listed in this specification.

1. All gates shall be equipped with UHMW polyethylene seat/seals to restrict leakage and to prevent metal to metal contact between the frame and slide.

2. The seat/seals shall extend to accommodate the 1-1/2 x the height of the slide when the slide is in the fully closed or fully opened position.

3. All upward opening gates shall be provided with a resilient seal to seal the bottom portion of the gate. The seal shall be attached to the invert member or the bottom of the slide and it shall be held in place with stainless steel attachment hardware.

4. All downward opening weir gates shall be provided with UHMW polyethylene seat/seals across the invert member.

5. The seal system shall be durable and shall be designed to accommodate high velocities and frequent cycling without loosening or suffering damage.

6. All seals must be bolted or otherwise mechanically fastened to the frame or slide. Arrangement with seals that are force fit or held in place with adhesives are unacceptable.

7. The seals shall be mounted so as not to obstruct the water way opening.

8. Gates that utilize rubber “J” seals or “P” seals are not acceptable.

9. The seal system shall have been factory tested to confirm negligible wear (less than 0.01”) and proper sealing. The factory testing shall consist of an accelerated wear test comprised of a minimum of 25,000 open-close cycles using a well-agitated sand/water mixture to simulate fluidized grit.

**2.05 - STEM**

A. A threaded operating stem shall be utilized to connect the operating mechanism to the slide. On rising stem gates, the threaded portion shall engage the operating nut in the manual operator or motor actuator. On non-rising stem gates, the threaded portion shall engage the nut on the slide.

1. The threaded portion of the stem shall have a minimum outside diameter of 1-1/2 inches. Stem extension pipes are not acceptable.

2. The stem shall be constructed of solid stainless steel bar for the entire length, the metal having a tensile strength of not less than 75,000 psi.

3. The stem shall be threaded to allow full travel of the slide unless the travel distance is otherwise shown on the Contract Drawings.

4. Maximum L/R ratio for the unsupported part of the stem shall not exceed 200.

5. In compression, the stem shall be designed for a critical buckling load caused by a 40 lb effort on the crank or handwheel with a safety factor of 2, using the Euler column formula.

6. The stem shall be designed to withstand the tension load caused by the application of a 40 lb effort on the crank or handwheel without exceeding 1/5 of the ultimate tensile strength of the stem material.

7. The threaded portion of the stem shall have machine rolled threads of the full Acme type with a 16 microinch finish or better. Stub threads are not acceptable.

8. Stems of more than one section shall be joined by stainless steel or bronze couplings. The coupling shall be bolted to the stems.

9. Stems, on manually operated gates, shall be provided with adjustable stop collars to prevent over closing of the slide.

**2.06 - STEM GUIDES**

A. Stem guide shall be provided when necessary to ensure that the maximum L/R ratio for the unsupported part of the stem is 200 or less.

1. Stem guide brackets shall be fabricated of stainless steel and shall be outfitted with UHMW or bronze bushings.

2. Adjustable in two directions.

**2.07 - WALL THIMBLES**

A. Wall thimbles shall be provided when shown on the Contract Drawings.

1. The wall thimble depth shall be equal to the thickness of the concrete wall in which the thimble is to be mounted.

2. Wall thimbles shall be fabricated stainless steel construction of adequate section to withstand all operational and reasonable installation stresses.

3. Wall thimbles shall be constructed of 1/4-inch minimum thickness stainless steel and the front face shall have a minimum thickness of 1/4–inch.

4. The fabrication process shall ensure that the wall thimble is square and plumb and the front face is sufficiently flat to provide a proper mounting surface for the gate frame.

5. The face of the wall thimble shall only be machined if recommended by the gate manufacturer. If the wall thimble is to be machined, the front face shall have a minimum thickness of 1/4-inch after machining.

6. A water stop shall be welded around the periphery of the thimble. Wall thimbles shall be designed to allow thorough and uniform concrete placement during installation.

7. Studs and nuts shall be stainless steel. Water stop may be stitch welded.

8. A suitable gasket or mastic shall be provided to seal between the gate frame and the wall thimble.

**2.08 - MANUAL OPERATORS**

A. Unless otherwise shown on the Drawings, gates shall be operated by a manual handwheel or a manual crank-operated gearbox. The operator shall be mounted on the yoke of self contained gates or on the pedestal of non-self contained gates.

1. The gate manufacturer shall select the proper gear ratio to ensure that the gate can be operated with no more than a 40 lb effort when the gate is in the closed position and experiencing the maximum operating head.

2. An arrow with the word "OPEN" shall be permanently attached or cast onto the operator to indicate the direction or rotation to open the gate.

3. Handwheel operators shall be fully enclosed and shall have a cast aluminum housing.

   a. Handwheel operators shall be provided with a threaded cast bronze lift nut to engage the operating stem.

   b. Handwheel operators shall be equipped with roller bearings above and below the operating nut.

   c. Positive mechanical seals shall be provided above and below the operating nut to exclude moisture and dirt and prevent leakage of lubricant out of the hoist.

   d. The handwheel shall be removable and shall have a minimum diameter of 15 inches.

4. Crank-operated gearboxes shall be fully enclosed and shall have a cast aluminum or ductile iron housing.

   a. Gearboxes shall have either single or double gear reduction depending upon the lifting capacity required.

b. Gearboxes shall be provided with a threaded cast bronze lift nut to engage the operating stem.

c. Bearings shall be provided above and below the flange on the operating nut to support both opening and closing thrusts.

d. Gears shall be steel with machined cut teeth designed for smooth operation.

e. The pinion shaft shall be stainless steel and shall be supported on ball or tapered roller bearings.

f. Positive mechanical seals shall be provided on the operating nut and the pinion shafts to exclude moisture and dirt and prevent leakage of lubricant out of the hoist.

g. The crank shall be cast aluminum or cast iron with a revolving nylon grip.

h. The crank shall be removable.

5. All gates having widths in excess of 72 inches and widths greater than twice their height shall be provided with two gearboxes connected by an interconnecting shaft for simultaneous operation.

a. Interconnecting shafting shall be constructed of aluminum or stainless steel.

b. Flexible couplings shall be provided at each end of the interconnecting shaft. Couplings shall be stainless steel or non-metallic.

c. One crank shall be provided to mount on the pinion shaft of one of the gearboxes.

6. An extended operator system utilizing chain and sprockets shall be furnished by the manufacturer when the centerline of the crank or handwheel, on a non-geared operator, is located over 48-in above the operating floor. Chain wheels are not acceptable.

a. A removable stainless steel or aluminum cover shall be provided to enclose chain and sprockets.

b. The extended operator system shall lower the centerline of the pinion shaft to 36-in above the operating floor.

c. A handwheel may be utilized in conjunction with a gearbox in lieu of the extended operator system if the centerline of the pinion shaft is 60-in or less above the operating floor.

7. Pedestals shall be constructed of stainless steel. Aluminum pedestals are not acceptable.

a. The pedestal height shall be such that the handwheel or pinion shaft on the crank-operated gearbox is located approximately 36-in above the operating floor.

b. Wall brackets shall be used to support floor stands where shown on the Drawings and shall be constructed of stainless steel.

c. Wall brackets shall be reinforced to withstand in compression at least two times the rated output of the operator with a 40 lb effort on the crank or handwheel.

d. The design and detail of the brackets and anchor bolts shall be provided by the gate manufacturer and shall be approved by the ENGINEER. The gate manufacturer shall supply the bracket, anchor bolts and accessories as part of the gate assembly.

8. Operators shall be equipped with fracture-resistant clear butyrate or lexan plastic stem covers.

a. The top of the stem cover shall be closed.

b. The bottom end of the stem cover shall be mounted in a housing or adapter for easy field mounting.

c. Stem covers shall be complete with indicator markings to indicate gate position.

9. When shown on the Contract Drawings, provide 2 inch square nut, mounted in a floor box, with a non-rising stem.

a. The square nut shall be constructed of bronze.

b. The floor box shall be constructed of stainless steel or cast iron and shall be set in the concrete floor above the gate as shown.

c. Provide one aluminum or stainless steel T-handle wrench for operation.

### 2.09 - ANCHOR BOLTS

A. Anchor bolts shall be provided by the gate manufacturer for mounting the gates and appurtenances.

1. Quantity and location shall be determined by the gate manufacturer.

2. If epoxy type anchor bolts are provided, the gate manufacturer shall provide the studs and nuts.

3. Anchor bolts shall have a minimum diameter of 1/2-inch.

## PART 3 - EXECUTION

### 3.01 - INSTALLATION

A. Installation of the gates and appurtenances shall be done in a workmanlike manner. It shall be the responsibility of the CONTRACTOR to handle, store and install the equipment specified in this Section in strict accordance with the manufacturer's recommendations.

B. The CONTRACTOR shall review the installation drawings and installation instruction prior to installing the gates.

C. The gate assemblies shall be installed in a true vertical plane, square and plumb.

D. The CONTRACTOR shall fill the void in between the gate frame and the wall with non-shrink grout as shown on the installation drawing and in accordance with the manufacturer’s recommendations.

E. The CONTRACTOR shall add a mastic gasket between the gate frame and wall thimble (when applicable) in accordance with the manufacturer’s recommendations.

### 3.02 - FIELD TESTING

A. After installation, all gates shall be field tested in the presence of the ENGINEER and OWNER to ensure that all items of equipment are in full compliance with this Section. Each gate shall be cycled to confirm that they operate without binding, scraping, or distorting. The effort to open and close manual operators shall be measured, and shall not exceed the maximum operating effort specified above. Electric motor actuators shall function smoothly and without interruption. Each gate shall be water tested by the CONTRACTOR, at the discretion of the ENGINEER and OWNER, to confirm that leakage does not exceed the specified allowable leakage.

**END OF SECTION**

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## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Butterfly valves

B. Plug valves

C. Butterfly and plug valve worm gear actuators

D. Buried gate valves

E. Buried ball valves

F. Grooved end stainless steel butterfly valves

G. Floor Stands

H. Valve boxes

I. Combination sewage air / vacuum valves

J. Swing Check Valves

K. Ball Check Valves

### 1.02 – GENERAL INFORMATION

A. *All valves installed in pipelines where the pipe is specified or shown to be any grade or diameter of stainless steel, regardless of end connection style, shall also be stainless steel.*

B. *All valves installed in pipelines where the pipe is specified or shown to be any diameter of ductile iron, regardless of end connection style, shall be cast iron body style valve.*

C. For the purposes of this specification, large diameter piping shall be considered pipe with a diameter equal to or greater than 3 inches nominal diameter.

### 1.03 - RELATED SECTIONS

A. Section 432113 – Centrifugal Liquid pumps for check valves that are furnished and installed under that section, if any.

B. Section 016500 – Product Delivery, Storage and Handling

C. Section 220529 – Hangers and Supports for Plumbing Piping and Equipment

D. Section 331213 – Site Piping Buried Distribution Valves

E. Section 333400 – Sanitary Utility Sewerage Force Mains

F. Section 402336 – Air and Water Process Piping

**1.04 - REFERENCES**

A. ANSI/AWWA C111- Rubber Gasket Joints for Ductile Iron and Grey Iron Pressure Pipe and Fittings.

B. ANSI/AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.

C. ANSI/AWWA C500 - Gate Valves, 3 inch (75 mm) through 12 inch (305 mm) NPS, for Water and Sewage Systems.

D. ANSI/AWWA C504 - Rubber - Seated Butterfly Valves.

E. AWWA C507 – Ball Valves, 6 in. through 48 in.

F. AWWA C508 - Swing - Check Valves for Water Works Service, 2 in. through 24 in.

G. AWWA C509 – Resilient Seated Gate Valves for Water Supply

H. AWWA C540 – Power Actuating Devices for Valves and Service Gates

I. ANSI/AWWA C600 - Installation of Ductile Iron Water Mains and Appurtenances.

J. AWWA C606 – Grooved and Shouldered Joints

K. ANSI/AWWA C800 - Underground Service Line Valves and Fittings.

L. ASTM A351 – Austenitic Gray Iron Castings

M. ASTM A436 – Austenitic Gray Iron Castings

N. ASTM A744 – Specifications for Castings, Iron-Chromium-Nickel, Corrosion Resistant for Severe Service

O. ASTM A743 – Castings, Iron Chromium, Iron-Chromium-Nickel, Corrosion Resistant for General Application

P. ASTM A126 – Gray Iron Castings for Valves, Flanges and Pipe Fittings

**1.05 - SUBMITTALS**

A. The Contractor shall submit separate valve schedules for each valve type (or style) that shall form the index of the shop drawing submittal. Each valve schedule shall provide the following information in tabular form and the Engineer reserves the right not to review the submittal until such time as all of the specified information is provided without claims for delay:

1. Shop drawing reference number
2. Manufacturer's valve tag designation
3. Abbreviated process piping application as shown on Contract Drawing PD-1, if shown.
4. Quantity
5. Diameter
6. End connection
7. Packing
8. Actuator type
9. Accessories
10. List of AWWA, ANSI, and ASTM applicable standards
11. Body material
12. Stem material
13. Gasket material to be used with the valve (if applicable)

B. The remaining shop drawing submittal package shall include the following and be submitted in accordance with the requirements contained in Section 013300:

1. Dimensional prints valves and actuators.
2. Valve specifications including materials of construction and features of design.
3. Shop drawings for extension rods and guides indicating diameter, length, and material.
4. Drawings for installation and support of guides.
5. Catalog cuts and dimensional data for floor stands.
6. Catalog cuts for valve boxes with cover casting indicated.
7. Painting system catalog cuts.

C. Installation, operations and maintenance instructions for each type valve prepared in accordance with the requirements contained in Section 017823.

D. Product Data: Provide data on pipe materials, pipe fitting, valves and accessories.

E. A Warranty Certificate as specified herein shall be provided from each valve manufacturer.

**1.06 - PROJECT RECORD DOCUMENTS**

A. Submit product data under provisions of Section 017839.

B. Accurately record actual locations of piping mains, valves, connections, and invert elevations.

**1.07 - QUALITY ASSURANCE**

A. Perform work in accordance with the local utility company requirements.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

C. Affidavit of Compliance: The Contractor shall have the manufacturer provide an affidavit directly to the Engineer that all valves supplied on this project comply with all applicable provisions of AWWA Specification C509-94, and that each valve was subjected to and passed the 500 psi hydrostatic test without leakage. No final payment for valves will be made until this Affidavit of Compliance is received by the Engineer.

D. 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.

**1.08 – FIELD SERVICES**

A. The valve and valve accessory Supplier(s) shall supply and credit to the Owner the costs for 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. One (1) day totaling one (1) trip by each valve manufacturer for providing installation instruction to the Contractor. The Contractor shall be responsible for all costs associated with having the manufacturer present should the Contractor require more days of installation instruction.

2. One (1) day totaling one (1) trip by each valve manufacturer to field check the completed installation and verify proper operation during normal plant operating conditions.

**1.09 - 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.

C. Completely follow the manufacturer's recommended short and long term storage procedures. Partial payment requests for valves delivered to the site, but not yet installed, will not be processed if valve deliveries and storage requirements of the manufacturer are not followed.

D. Deliver and store valves in shipping containers with labeling in place until the time that the valve is to be installed.

**1.10 – WARRANTY**

A. The manufacturer shall guarantee all valve components to be free from defects in design, materials and workmanship for a period of one (1) year commencing on the date the valve was placed into permanent and consistent operation.

B. 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 manufacturer will be responsible for 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.

**PART 2 - PRODUCTS**

**2.01 –BUTTERFLY VALVES**

A. Exposed and Buried Flanged Valve Construction – Cast Iron Body:

1. Flanged end butterfly valves - 2-1/2 inch and larger shall be of the EPDM-seated, tight closing type, with cast body and disc, and 150 psi working pressure. Valves shall conform to the requirements specified in AWWA C504 Standard for Rubber-Seated Butterfly Valves.

2. Valve body shall be cast iron per ASTM A-126, Class B, with integrally cast hubs for shaft bearing housing, and 125 pound flanged ends faced and drilled in accordance with ANSI B16.1, Standard for Cast Iron Flanges.

3. Valve disc shall be symmetrical about the shaft axis with no external ribs, cast of alloy cast iron per Military Specification MIL 6-858a, Class I. Valve shaft shall be of a solid one-piece

design of center less ground 18-8 stainless steel or high strength steel (70,000 psi) completely isolated from line fluid. Disc movement shall be 90 degrees open to closed.

4. The valve shall be field repairable and may be disassembled in the field for seat replacement. Rubber seats mounted on the disc shall be clamped theron. Rubber seats mounted on valve bodies shall be cemented and clamped, bonded or vulcanized to the valve body. Rubber seats shall be made of EPDM material.

5. Taper pins, lock washers and nuts shall be 18-8 stainless steel. Valve seat shall be of molded natural rubber, recess mounted, bonded and mechanically secured to the valve body or disc. Seat shall provide leak free shutoff at 150-psi differential. Sleeve type bearings of self-lubricating material shall be installed in the hubs of the valve body, designed for maximum load of 2,500 psi or one-fifth the compressive strength of the material, whichever is highest.

6. A shaft seal shall be provided in the valve body hub where the shaft extends through it. The one-piece cast gland follower studs and nuts shall be bronze. Packing shall be self-adjusting split "V" type, or triple "O" ring.

B. Grooved Valve Construction – Cast Iron Body:

1. Grooved end valves shall be provided in conformance with pipe and coupling specified in specification section 402336 – Air and Water Process Piping.

2. Grooved end butterfly valves - 2-1/2 inch and larger shall be of the EPDM-seated, tight closing type, with cast body and disc, and 175 psi working pressure. Valves shall conform to the requirements specified in AWWA C504 Standard for Rubber-Seated Butterfly Valves.

3. Valve body shall be ductile iron per ASTM A-536.

4. Valve disc shall be narrow profile type and offset about the shaft. Disc shall ride on stainless steel upper and lower stems. Valve disc shall be of ductile iron construction, black PPS coated. Disc movement shall be 90 degrees open to closed.

C. Manual Valve Operators

1. Manual operators shall be of the worm and gear type and shall be self-locking. The gear operators shall be permanently lubricated, totally enclosed, with adjustable stops for the open and closed position, and valve disc position indicator. The operator shall be designed so that a pull of not more than 80 pounds will produce an output torque sufficient to operate the valve under actual line pressures and velocities.

2. Valves shall be equipped with hand wheels and position indicators.

D. All wetted parts shall be 304 stainless steel.

E. Manufacturers: Dezurik, Crane or Victaulic

**2.02 – PLUG VALVES**

A. Exposed and Buried Valves – Flanged / Mechanical Joint Ends:

1. Valves shall be of the non-lubricated eccentric type equipped with resilient faced, balanced plugs and shall be furnished with end connections as specified below.

2. Port area for valves less than 6-inch diameter shall be at least 80% of full pipe area. Port areas of 6 inch and larger valves shall be at least 100% of full pipe area.

3. Valve bodies shall be of ASTM A126, Class B, and cast iron. All exposed nuts, bolts, springs, washers, etc., shall be stainless steel. Resilient plug facings shall be of Nitrile Butadiene suitable for use with septic sewage (hydrogen sulfide).

4. Valves shall be furnished with corrosive resistant seats. Seats in 3-inch diameter and larger valves shall have a welded-in overlay of high nickel content on all surfaces containing the plug face.

5. Valves shall be furnished with replaceable, permanently lubricated, stainless steel sleeve-type bearings in the upper and lower journals.

6. Valve pressure ratings shall be as follows and shall be established by hydrostatic tests as specified by ANSI Standard B16.1. Pressure ratings shall be 175 psi for valves through 12-inch diameter, 150 psi for valves in sizes 14 inch through 36-inch diameter. Valves shall provide drip-tight shutoff up to the full pressure ratings. Valves shall be capable of providing drip-tight shutoff up to the full valve rating with pressure in either direction.

7. Valve shaft seals, bearings and seats shall comply with applicable portions of AWWA C504 and C507.

8. Valve actuator shall operate valve at a pressure differential up to 50 psi.

9. Buried: Mechanical Joint, gear actuator and enclosure for buried installation.

10. Exposed: Flanged joint, gear actuator with handwheel.

11. Manufacturer: Dezurik or Clow

B. Exposed Valves – Grooved Ends:

1. Circular port area shall allow for pigging of lines. Port areas of 6 inch and larger valves shall be at least 100% of full pipe area.

2. Valve bodies shall be of AWWA C-606 and C509 cast iron, coated with alkyd enamel. All

exposed nuts, bolts, springs, washers, etc., shall be stainless steel. Eccentric resilient plug facings shall be of Nitrile Butadiene suitable for use with septic sewage (hydrogen sulfide).

3. Valves shall be furnished with corrosive resistant seats. Seats in 3-inch diameter and larger valves shall have a welded-in overlay of high nickel content on all surfaces containing the plug face.

4. Valves shall be furnished with replaceable, permanently lubricated, stainless steel sleeve-type bearings in the upper and lower journals.

5. Valve pressure ratings shall be as follows and shall be established by hydrostatic tests as specified by ANSI Standard B16.1. Pressure ratings shall be 175 psi for valves through 12-inch diameter, 150 psi for valves in sizes 14 inch through 18-inch diameter. Valves shall provide drip-tight shutoff up to the full pressure ratings. Valves shall be capable of providing drip-tight shutoff up to the full valve rating with pressure in either direction.

6. Exposed valves by Victaulic with grooved ends: 6-inch diameter and larger, with gear operator with handwheel. Valve actuator shall operate valve at a pressure differential up to 50 psi. Smaller than 6” diameter shall be provided with handle operator and required stem extension unless stated otherwise.

C. Submerged Service:

1. All plug valves located below water level shall be furnished with a side mounted gear actuator, square nut extension rod, manufacturer’s stainless steel valve stem guide, and floor stand (if Shown on the Contract Drawings).

2. Extension rods: Type 304 stainless steel

3. Manufacturer: Dezurik, Trumbull or Clow

**2.03 – BURIED GATE VALVES (UNDER 12” DIAMETER)**

A. Manufacturer: MUELLER, Model A-2360-20, or specifically approved equal.

B. All vertical gate valves up to and including 12-inch diameter shall conform to AWWA Specification C509-94 or latest revision, and shall be specified as follows:

C. Quality Assurance

1. Material: Gray/Ductile Iron body, bronze mounted.

2. Pressure: 250 psi minimum working pressure.

3. Wedge: Cast iron wedge with urethane rubber coating (encapsulated). The rubber/metal bond shall be tested to meet ASTM D429-73.

4. Stem: Forged bronze, non-rising stem with two "O" ring seals.

5. Wrench Nut: Two-inch square (at base) wrench nut opening to the left or counterclockwise.

6. Mechanical Joint Ends: Mechanical joint ends complete with all joint accessories including rubber gaskets.

7. Painting: The body and bonnet shall be coated with a fusion coating both interior and exterior to meet AWWA Standard C550-90.

8. Markings: Markings shall be cast on the bonnet or body of each valve, and shall show the manufacturer's name or mark, the year the valve casting was made, the size of the valve, and the designation of working water pressure for 4 to 12-inch valves.

9. Affidavit of Compliance: The Contractor shall have the manufacturer provide an affidavit directly to the Engineer that all valves supplied on this project comply with all applicable provisions of AWWA Specification C509-94, and that each valve was subjected to and passed the 500 psi hydrostatic test without leakage. No final payment for valves will be made until this Affidavit of Compliance is received by the Engineer.

**2.04 – BURIED SERVICE BALL VALVES (UNDER 4” DIAMETER)**

A. Curb, straight meter and service ball valves shall have “low-lead” ASTM B62 Alloy C83600 bronze body, stem, cap and ball conforming to ANSI/AWWA C800 standard for underground service line valves.

B. All types and sizes of valves shall seal full rated pressure in either direction and have a 300 psig water pressure rating and 180 F temperature rating, Valves shall be two directional flow type valves.

C. Ball coating shall be PTFE. Stem O-ring shall be ASTM D2000 EPDM rubber. Molded rubbers seater ASTM D2000 Nitrile (Buna-N) rubber.

D. MUELLER COMPANY 300™ or approved equal.

**2.05– BUTTERFLY AND PLUG VALVE - WORM GEAR OPERATORS**

A. Worm gear operators shall be required on all exposed valves that are 6" nominal size and larger and shall be self-locking as noted on the contract plans. Valves less than 6" nominal diameter shall be provided with lever type manual operators unless otherwise indicated. All operators shall be provided with memory stops. The gear operators shall be permanently lubricated, totally enclosed, with adjustable stops for the open and closed position, and valve disc position indicator. The operator shall be designed so that a pull of not more than 80 pounds will produce an output torque sufficient to operate the valve under actual line pressures and velocities.

B. Valves shall be equipped with hand wheels and position indicators.

C. Valves installed six (6) feet above finished floor or higher shall be provided with chainwheel operators and stainless steel chain.

D. Actuators shall be manufactured by the valve manufacturer.

**2.06 – GROOVED END STAINLESS STEEL VALVES**

A. All valves installed in pipelines where the pipe is specified or shown to be any grade or diameter of stainless steel, regardless of end connection style, shall also be stainless steel.

B. Body and disc: Grade CF8M stainless steel conforming to ASTM A351, A743, and A744.

C. Stems and hardware: Type 316 stainless steel.

D. Bearings: PTFE impregnated glass fabric with 316 stainless steel backing and/or PEEK.

E. Handle: 316 stainless steel.

F. Gear Operator: 300 series stainless steel housing with aluminum bronze quadrant and steel worm gear. All valves with a diameter of 6-inches and greater shall be provided with a gear operator. All valves with a diameter less than 6-inches shall be provided with a lever lock handle.

G. Disc seal: Grade "L" silicone compound (red color coded) for all air service applications; EPDM (green color coded) for all other service applications.

H. Valves shall be manufactured by Victaulic.

**2.07 – FLOOR STANDS**

A. Manufacturer: Floor stands and accessories shall be furnished by the valve manufacturer.

B. Floor stands shall be heavy pattern type, with non-rising stem, handwheel, and valve position indicator. Ball thrust bearings shall be used. Floor stands shall be factory primed and factory painted using the paint system specified in Section 099100 for exterior ferrous metals or an equivalent paint system may be used if approved by the Engineer.

**2.08 - VALVE BOXES**

A. Acceptable Manufacturers are Mueller Company, Clow Valve Company, American Flow Control or A.Y. McDonald.

B. All buried plug and gate valves shall be provided with a 2-inch square nut.

C. Valve boxes shall be provided for all buried valves. Valve boxes shall be assembled unit composed of the valve box, extension stem, and a self-centering alignment ring. All moving parts of the extension stem shall be enclosed in a housing to prevent contact with the soil. Valve box assemblies shall be adjustable to accommodate variable trench depths.

D. The entire assembly shall be made of minimum ¼-inch heavy wall high-density polyethylene. All components shall be joined with a permanent locking design. The valve box section shall be adaptable to fit inside a standard valve box upper section.

E. The stem assembly shall be of a telescoping design that allows for variable adjustment length. The material shall be galvanized steel square tubing. The stem assembly shall have a built-in device that keeps the stem assembly from disengaging at its fully extended length. The extension stem shall be torque tested to 1,000 foot-pounds.

F. All valve boxes shall come complete with a 2-inch high top extension for final adjustment prior to paving/grading.

G. Cover: Cast in the cover the word, “REUSE WATER”, “POTABLE WATER” or “SEWAGE”, as applicable.

H. Handles: Furnish one operator handle for each buried valve at 42 inches above top of box.

I. Where existing valve boxes are being used, provide a retrofit valve box insert.

J. For valve boxes in existing concrete, core drill and provide Trumbull Item No. 367-5036 or equal set in non-shrink grout.

**2.09 - COMBINATION SEWAGE AIR/VACUUM VALVES**

A. A.R.I. Flow Control Accessories, Model D-020; Crispin Multiflex Manufacturing Co., Model SL20B; or equal.

B. The valve body shall be funnel-shaped and fabricated of stainless steel.

C. 3-inch inlet, maximum working pressure if 230 psi, stainless steel inner parts and float. Valve shall automatically exhaust large quantities of air, gas and vapor during the filling of pipeline. Valve shall allow air to re-enter system during draining or when a vacuum occurs.

D. Self-cleaning with drainage outlet ball valve.

**2.10 – SWING CHECK VALVE**

A. Manufacturers: GA Industries, Inc. Figure 250-DS, APCO Series 250, or approved equal.

B. Check valves shall be of the full body type with a domed access cover and only two moving parts, the flexible disc and the disc accelerator. The top access port shall be full size, allowing removal of the disc without removing the valve from the line.

C. The valves shall be provided with ANSI B16.1 Class 125 ductile iron flanges.

D. The valve body shall be constructed of ASTM A536 Grade 65-45-12 ductile iron. The valve body shall be full flow equal to nominal pipe diameter at all points through the valve.

E. The disc shall be one-piece construction, precision molded with an integral o-ring type sealing surface, and contain alloy steel and nylon reinforcement in the flexible hinge area. Non-Slam closing characteristics shall be provided through a short 35 degree disc stroke and a disc accelerator to prove a cracking pressure of 0.3 PSIG.

F. A mechanical indicator shall have continuous contact with the disc under all operating conditions to assure accurate disc indication.

G. Provide a bottom mounted oil dashpot (oil cushion) to provide hydraulic control of the final 10% of valve closure and reduce valve slam and watter hammer normally associated with rapid flow reversal conditions on pump shutdown where required on the Plans.

H. The valve shall be hydrostatically tested at 1.5 times its rated cold working pressure. The valve interior and exterior shall be coated with an ANSI/NSF 61 certified epoxy coating.

I. A SCADA compatible, Nema-4 heavy duty, UL listed limit switch with DPDT contacts shall be provided, where required on Plans. The switch shall be activated by the external position indicator.

### 2.11 – BALL CHECK VALVE

A. Check valves furnished under this Section shall be HDL type 5087 by Flygt or equal as follows:

1. Body: Nodular cast iron, type GGG40
2. Flanged Drilling: ANSI B16.1, Class 125, Flat Faced
3. Ball: Hollow metal core with vulcanized Nitrile rubber covering.

B. The nominal size of the valve shall match the piping as shown on the Contract Plans.

## PART 3 - EXECUTION

### 3.01 - GENERAL

A. 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.

### 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. Install check valves for proper direction of flow. Adjust cushion chamber check valve to prevent water hammer at service conditions.

D. 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.

### 3.03 - PREPARATION

A. Remove scale and dirt, on inside and outside, before assembly. Inspection, Handling and Storage:

1. Valves and boxes found to be either defective or damaged shall be rejected and immediately removed from the job site.
2. Handling - Valves and boxes shall be loaded and unloaded by lifting with hoists or skidding under control with ropes in order to avoid shock or damage. Valves and boxes

shall not be dropped.

3. Storage - Valves, floor stands, joint accessories and valve boxes, 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.

B. Ream pipe and tube ends and remove burrs.

C. Perform operating tests on valves as per the manufacturers recommendations as may to determine they are in satisfactory operating condition and do not leak. All valves upon completion of the work shall be checked to determine they are in an open position, unless otherwise indicated.

**3.04 - FIELD QUALITY CONTROL**

A. Leakage testing shall be in accordance with ANSI/AWWA C600.

B. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to Owner.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Work of this Section includes all labor, materials, and equipment necessary to furnish and install air and water process piping under pressure.

B. Work includes exposed and underground piping as shown on the Drawings.

C. BID NOTES (Grooved Piping Option):

1. Included in the as-bid price, and at the Contractor's option, groove ended pipe and fittings may be used in lieu of flanged pipe and fittings in locations where ductile iron pipe is indicated on the Drawings or in lieu of butt-welded fittings for areas where stainless steel pipe is indicated on the Drawings, with the following provisions or except as stated herein.

2. Equipment with flanged outlets and inlets, pumps, constant head boxes, valves, flow meters, and other in-line process equipment, shown on the Drawings as flanged, shall remain flanged.

3. Provide and install flanged by groove ended pipe adapters for all plug, check, and butterfly valves to mate groove ended joints to flanged fittings and equipment. Groove ended valves will be permitted on this project.

4. Provide a flanged by groove ended spool piece to make joints for equipment, pumps, constant head boxes, flow meters, and other in-line equipment. Spool pieces shall be at least equal to five (5) times the pipe diameter. Adapters will not be permitted in this instance.

5. Where the specifications call for flanged pipe as being packaged with system equipment, this pipe shall remain as flanged.

6. Groove ended stainless steel fittings will be permitted for use on compressed air lines unless otherwise noted on the Drawings. All buried and exposed stainless steel piping shall be butt-welded.

7. Joint restraint using rodding, specified on the Drawings, need not be provided for groove ended pipe and fittings.

8. Concrete thrust blocking, pipe restraining fittings and support piers, where shown for exposed pipe, shall be installed for either piping system.

9. All costs associated with installing piping shall be included in the bid price.

**1.02 - REFERENCES**

A. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.

B. ANSI B36.19M – Stainless Steel Pipe

C. ANSI/AWWA C104 - Cement-Mortar Lining for Ductile Iron Pipe and Fittings for Water.

D. ANSI/AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids.

E. ANSI/AWWA - C115/A21.15 - American National Standard for Flanged Ductile Iron Pipe with Threaded Flanges.

F. ANSI/AWWA C150/A21.50 - American National Standard for Thickness Design of Ductile Iron Pipe.

G. ANSI/AWWA C600-93 - Installation of Ductile Iron Water Mains and Appurtenances.

H. ANSI B18.2.1 - Square and Hex Bolts and Screws Inch Series Including Hex Cap Screws and Lag Screws.

I. ANSI B18.2.2 - Square and Hex Nuts (Inch Series).

J. ASTM A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

K. AWWA C606-87 – Grooved and Shouldered Joints.

L. AWS D10.4 – Recommended Practices for Welding Austenitic Chromium Nickel Stainless Steel Piping

M. ASTM A312/A312M – Seamless and Welded Austenitic Stainless Pipes

**1.03 - SUBMITTALS**

A. Submit information in accordance with Section 013300.

B. Prepare a schedule for each service classification specified herein listing the pipe, fitting, lining, coating and joint type proposed for the project.

C. Provide data on pipe material, coatings, linings, pipe fittings, dimensions and accessories. Provide manufacturer's catalog information.

D. Piping shop drawings shall be provided. Field measurement then fabrication of pipe will not be permitted. All exposed pipe shall be delivered to the site cut to exact layout dimensions.

E. Manufacturer's installation instructions for each pipe type.

F. Foundry Records and Tests for ductile iron pipe: Written transcripts of the test results shall be delivered directly to the Engineer within one week of the shipment of pipe with the date of the tests as close to the date of manufacture as practical. For ductile iron pipe, written transcripts shall be furnished directly to the Engineer in accordance with applicable sections of AWWA C151 and ANSI A21.51:

Transcripts & Certification: 51-5.2

Group Tests Required: Hydrostatic Test (51-9)
Tensile Test (51-12.1)
Impact Test (51-12.2)

Low Temperature Impact Test (51-13)

Number of Specific Group Tests

Required in Addition to General

Certification: One (1) per pipe size per 2,000 linear feet of pipe.

G. Certifications for stainless steel piping specified in the following documents:

1. ASTM A403, paragraph 14.1

2. ASTM A774, paragraph 14.1

3. ASTM A778, paragraph 14.1

4. ASTM A409, paragraph 17.1

H. Names and qualification records of proposed welders.

I. Other data necessary to show conformance of the stainless steel piping system to these specifications.

**1.04 - QUALITY ASSURANCE**

A. All piping manufacturers shall meet ISO 9001:2000.

B. Ductile iron pipe manufacturer shall be a member of the Ductile Iron Pipe Research Association.

C. Ductile iron pipe shall be marked with the manufacturer's name, classification, or nominal thickness and "DI" or "Ductile Iron".

D. Stainless steel pipe shall be marked with manufacturer's name, gauge, or nominal thickness and heat rating.

E. All shop fabricated stainless steel pipe and fittings shall be furnished by a single manufacturer who is experienced and qualified in the manufacture and fabrication of the items to be furnished.

F. The pipe and fittings shall be shop-fabricated and field-installed in accordance with common industry wide practices and methods and shall comply with these specifications.

G. Only weld procedures which have been qualified under ASME Section IX and only welders who have successfully completed performance qualification tests per ASME Section IX on these qualified procedures shall be utilized.

H. The stainless steel piping supplier and the Contractor shall use extreme care to avoid the contact of any ferrous materials with the stainless steel piping during manufacturing, fabricating, handling, and installation stages.

I. All saws, drills, files, and wire brushes shall be used for stainless steel piping only. Pipe storage and fabrication racks shall be nonferrous, stainless steel, or rubber-lined.

J. Nylon slings or straps shall be used for handling stainless steel piping. After installation, the Contractor shall wash and rinse all foreign matter from the piping surface.

K. All welded joints shall be treated with a pickling solution, brushed with stainless steel wire brushes, and rinsed clean. If rusting of embedded iron occurs, the Contractor shall pickle the affected surface with Oakite Deoxidizer SS, or equal, scrub with stainless steel brushes, and rinse clean.

L. Factory testing of stainless steel piping shall conform to the requirements of ASTM A312, ASTM A409 HT-0, or ASTM A778, depending on the size and type of stainless steel pipe provided.

**1.05 - DELIVERY, STORAGE AND HANDLING**

A. Deliver, store, protect, and handle products in accordance with manufacturer's instructions.

B. Fabricated piping shall have openings plugged and flanges secured for storage or transport after fabrication.

C. Fabricated piping shall be piece-marked with identifying numbers or codes which correspond to the Contractor's layout and installation drawings. The marks shall be located on the spools at opposite ends and 180° (degrees) apart.

D. Pipe spools shall be loaded, blocked, and lagged as necessary to ensure protection from damage during shipping.

E. Stainless steel pipe and fittings shall be stored per manufacturer's recommendation.

F. Dents, gouges, and scratches in stainless steel pipe and fittings are not acceptable and are reason for rejecting pipe and fittings.

G. Protect products from entry of foreign materials.

**1.06 - ENVIRONMENTAL REQUIREMENTS**

A. Do not install piping when bedding is wet or frozen.

**PART 2 - PRODUCTS**

**2.01 - DUCTILE IRON PIPE AND FITTINGS – BURIED AND EXPOSED**

A. Ductile iron pipe shall be centrifugally cast with primary graphite in nodular form or spherulitic and conform to AWWA C151.

1. All buried and exposed (dry and submerged service) shall be thickness Class 53.

2. Grooved end ductile iron pipe shall conform to AWWA C606-87 and be manufactured to rigid groove dimensions.

3. All buried and exposed ductile iron pipe and fittings shall be cement lined in accordance with AWWA C104 for liquid carrying service, double thickness, minimum $^{3}/_{16}$" for pipe and standard thickness for fittings. Air piping shall be unlined.

4. All buried ductile iron pipe and fittings shall be provided with bituminous seal coat in accordance with AWWA C106, inside and out.

5. All exposed (dry and immersion service) ductile iron pipe shall be provided with an interior seal coat in accordance with AWWA C106. The exterior of all exposed ductile

iron pipe shall be factory primed using a high solids epoxy system with a shop coat thickness of 3.0-8.0 mils DFT. The primer shall be manufactured by Tnemec Company or equal and be red oxide in color. Field paint exposed ductile iron pipe (dry and immersion service) as specified in Section 099100.

B. Fittings: Comply with AWWA C110 for center-to-center end dimensions.

1. Buried: All buried fittings and buried valve joints shall be mechanically restrained and be provided with thrust blocking as detailed on the Drawings. Mechanical joint restraint shall be incorporated into the design of the follower gland. The restraining mechanism shall consist of individually actuated wedges. The joint restraint ring shall be made of 60-42-10 ductile iron conforming to ASTM A536-84. The restraint shall be series 1100 Megalug by Ebba Iron or equal.

2. Exposed:

a. Ductile iron flanged fittings shall match those of Class 125 flanges in accordance with ANSI B16.1 with $^{1}/_{8}$-inch full-face plain rubber SBR (Styrene Butadiene Copolymer) gaskets for sewage and water service.

b. Ductile iron grooved fittings shall comply with AWWA C606 rigid radius grooving dimensions. Fittings shall be ductile conforming to ASTM A-536.

C. Joints:

1. Exposed Piping:

a. Flanged: shall be as specified above for fittings.

b. Grooved: shall be Victaulic Style 31 or equal, cast of ductile iron conforming to ASTM A-536 with alkyd-phenolic primer coating with a synthetic rubber gasket suitable for the intended service. Gasket shall be specially compounded to conform to ductile iron pipe surfaces with a short center leg that shall bridge the pipe ends offering an initial seal on the leading edge of the pipe ends.

2. Buried Piping: AWWA C111 push on joint with stainless steel locking segments vulcanized into rubber ring gasket, Flex-Ring ® by American Ductile Iron Pipe or FieldLok ® by U.S. Pipe or equal.

D. Exposed and Buried Service Bolts and Nuts: Nuts and bolts shall be alloy steel conforming to the physical properties of ASTM A563. Bolts shall conform to ANSI B18.2.1. Nuts shall conform to

ANSI B18.2.2. Bolts and nuts for grooved pipe shall be heat-treated plated carbon steel, track head, conforming to the physical properties of ASTM A183. Paint exposed and buried bolts and nuts in accordance with Section 099100.

E. Submerged Service Bolts and Nuts: Type 304 stainless steel conforming to ASTM A-193. All piping bolts and nuts located in any tank, vault, well, chamber, or any other structure that treats, stores or conveys water or sewage shall be considered a submerged (immersion) service even if it is not physically located below the water level. The Contractor shall not paint these nuts and bolts. Mask the exposed threads prior to pipe painting. All bolts and nuts in any process tank, regardless if it is located above water level shall meet the requirements of this paragraph.

F. Lubricant for Joints: Shall have no deteriorating effects on gasket or pipe material and shall be supplied by the pipe manufacturer or joint manufacturer in sufficient quantity.

G. Manufacturer: American Ductile Iron Pipe, U.S. Pipe & Foundry Co. or equal.

H. Flanged Adapters: Dismantling joint Smith Blair, Inc., Model 975 or equal for plain end steel or cast iron pipe with all bolts, rings, gaskets and accessories.

I. Couplings: Smith Blair, Inc., Model 411 or equal for plain end steel or cast iron pipe with all bolts, rings, gaskets and accessories.

J. Restrained Joint Fittings: Ford Meter Box Co., Inc., UNI-FLANGE “BlockBuster” series 13100, 1400 & 1500 for PVC, ductile iron and steel piping.

**2.02 – STAINLESS STEEL PIPE AND FITTINGS – BURIED AND EXPOSED**

A. Stainless steel pipe shall be Type 304L stainless steel, with 2D finish in compliance with AISI 304L and ASTM A240. Pipe shall be manufactured to nominal pipe sizes as listed in ANSI B36.19 and shall have nominal wall thicknesses corresponding to schedule 10 for above grade and schedule 40 for below grade. Only extra-low carbon (ELC) materials with 0.030% maximum carbon shall be used.

B. All connections shall be welded in compliance with AWS D10.4, except as otherwise shown on Drawings.

C. Fittings:

1. Unless otherwise specified, stainless steel fittings 3-inch and larger: butt weld type manufactured in accordance with ASTM A774 of the same material and in the same thicknesses as the pipe. Long radius elbows less than 24-inches in diameter shall be

smooth flow. All short radius, special radius, reducing, and long radius elbows 24-inches and greater in diameter shall be of mitered construction. Reducers shall be straight tapered cone type. Tees, crosses, laterals, and wyes shall be shop-fabricated from pipe.

2. Flanged fittings: match those of Class 125 flanges in accordance with ANSI B16.1.

3. Gaskets: EPDM (Ethylene Propylene Diene Monomer) with a temperature capability of 250 deg. F.

   a. For air piping, gaskets shall be Viton with temperature capability of 350 deg. F.

4. Bolts nuts and washers for stainless steel flange assemblies: Type 316 stainless steel with bolts and nuts conforming to ASTM A193 Grade B8M.

D. Pipe support systems: include all hangers, rods, structural attachments, and other components of support systems for stainless steel pipe shall be of the same materials as the pipe.

E. Finishing: After all shop operations have been completed, pipe and fittings shall be pickled and passivated in the manufacturer's plant, and scrubbed and washed until discoloration and possible iron picked up from manufacturing process are removed. The standard finish for 16-gauge through 8-gauge material shall be No. 1 or 2B per ASTM A480; 3/16-inch and heavier plate material shall be No. 1-mil finish or better per ASTM A480.

## PART 3 - EXECUTION

### 3.01 - BURIED PIPE INSTALLATION – GENERAL

A. Install pipe in accordance with the manufacturer’s written instructions and in accordance with applicable AWWA and ANSI standards.

B. Comply with the excavation, backfill, compaction, and dewatering requirements contained in Division 2 of these specifications for installation of buried pipe.

C. Keep buried piping clean as it is being installed by plugging the open end. Do not allow foreign material, such as soil and groundwater, from entering the pipe. If directed by the Engineer, the Contractor shall water flush installed pipe to remove foreign material. Water used to flush pipe shall be trucked to the site by the Contractor. Use of site water will not be allowed. The Owner will not pay for water usage in this regard.

D. Maintain the excavation free of water during the progress of the work. No pipes shall be installed in water nor shall any joints be made in water. All slides or cave-ins of trenches or cuts shall be remedied prior to the work continuing.

E. Commence pipe laying at the lowest point, with the bell or socket end pointing in the direction of flow.

F. Use the manufacturer's approved equipment for cutting pipe to length.

G. Thoroughly clean pipe and fitting interiors, joint surfaces, and gaskets prior to them being placed in the trench for installation. Maintain all materials clean during the prosecution of the work.

H. Carefully lower pipes and fittings into the trench using industry recognized rigging standards and techniques. Every joint shall be made in the trench.

I. All adjustments to the line and grade of pipe laid in earth foundation shall be done by scraping away or filling in the earth under the barrel of the pipe, and not by blocking or wedging. Where the excavation has been carried too deep, but not in excess of six (6) inches, the Contractor may replace with suitable material and mechanically compact to provide a firm foundation. Wherever, the excavations have been carried to a depth in excess of six (6) inches, the Engineer may order stone or gravel refill without additional compensation. In all cases, the trench under the joint shall be excavated to permit an even bearing for the barrel of the pipe.

J. When unsuitable materials are encountered, the Engineer may direct the Contractor to continue the excavation below the required elevation and the trench filled with suitable material. This work will be paid for as "Extra Work".

K. Stainless steel pipe cutting, threading and jointing shall conform to the requirements of ANSI B31.1. All pipe threads shall be lubricated with Teflon tape.

L. Form and place concrete for thrust blocks at each tee, plug or bend which is deflecting 22½° or more. Place blocking so pipe and joint fittings will be accessible for repair. The minimum square foot bearing area of the blocking on solid ground shall be as indicated in the following table:

| Pipe Size | Dead End or Tee | 90 Bend | 45 Bend | 22½ Bend |
|---|---|---|---|---|
| 4 inch | 1 | 1-1/2 | 3/4 | 1/2 |
| 6 inch | 2 | 3 | 2 | 1 |
| 8 inch | 4 | 5-1/2 | 3 | 1-1/2 |
| 10 inch | 6 | 9-1/2 | 4-1/2 | 2-1/2 |
| 12 inch | 9 | 12 | 6-1/2 | 3-1/2 |
| 14 inch | 15 | 22 | 12 | 6 |

**3.02 – STAINLESS STEEL PIPE INSTALLATION – GENERAL**

A. Piping with wall thickness up to 11-gauge (0.120-inch): welded with the TIG (GTAW) process. Unless otherwise specified, heavier walls shall be properly beveled and have a root pass with the TIG (GTAW) process followed by subsequent passes with the TIG (GTAW), MIG (GMAW), or Metallic Arc (SMAW) process. Filler wire of ELC grades only shall be added to all welds to provide a cross section at the weld equal to or greater than the parent metal. Weld deposit shall be smooth and evenly distributed and have a crown of no more than 1/16-inch on the I.D. and 3/32-inch on the O.D. of the piping. Concavity, undercut, cracks, or crevices shall not be allowed. Butt welds shall have full penetration to the interior surface, and inert gas shielding shall be provided to the interior and exterior of the joint. Excessive weld deposits, slag, spatter, and projections shall be removed by grinding. Welds on gasket surfaces shall be ground smooth.

B. Field welding; minimized to the greatest extent possible by prefabrication of pipe systems at the factory. Pipe butt welds may be performed at the job site providing the butt welds are performed only with an inert gas shielded process and that other applicable specified welding requirements are rigidly adhered to. All residue, oxide, and heat stain is to be removed from any type of field weld and the affected adjacent areas by the use of stainless steel wire brushes. The field weld shall then be cleaned with an agent such as Eutectic Company's "Eucleen" or equal followed by complete removal of the agent.

C. Preparation of Surfaces to Be Welded shall be free from mill scale, slag, grease, oil, paint, rust, and other foreign material.

D. Joints to be welded shall be wire-brushed with stainless steel wire brushes and precisely fitted before welding.

E. Welding shall be done only when the surfaces are completely free of any moisture. Welding of the pipe shall not be done during periods of high winds or rain unless the areas being welded are properly shielded.

F. Nicks, gouges, notches, and depressions in the base metal in the area of the joint shall be repaired before the joint weld is made. Tack welds, clips, and other attachments shall be removed and defects repaired, except where the tack welds occur within the weld area and these tack welds do not exceed the size of the completed weld. Cracked tack welds shall be removed. Areas to be repaired shall be ground to clean metal and then repaired by building up with weld metal. The repaired areas shall be ground smooth to form a plane surface with the base metal.

G. Welds with cracks, slag inclusions, porosity, undercutting, incomplete penetration, or which are otherwise deficient in quality or made contrary to any provisions of these specifications shall be removed by chipping or grinding throughout their depth to clean base metal. Calking or peening

of welds to correct defects shall not be done. Welds found deficient in dimension but not in quality shall be enlarged by additional welding after thoroughly cleaning the surface of previously deposited metal and the adjoining plate. Weld deposits, slag, weld spatter, and projections into the interior of the pipe shall be removed by grinding.

**3.03 - BURIED PIPE/FITTING INSTALLATION – MECHANICAL/RESTRAINED JOINT**

A. Comply with the manufacturer's written instructions for installing ductile iron pipe, fittings and retainer.

B. Clean the socket and plain end. All surfaces with which the gasket comes in contact shall be thoroughly wired brushed just prior to assembly. All loose rust, mud, frozen material, sand, gravel, and other foreign material shall be removed.

C. Wipe the gasket clean and install the gasket. Take care that no gasket loops or bulges protrude into the path of the entering pipe spigot. In temperatures below 32 degrees F, warm gaskets before installation.

D. Using a clean brush, apply a liberal amount of lubricant completely over the end of the pipe, the spigot radius, and the outer surface of the pipe up to the assembly stripe. Also, apply lubricant completely over the exposed surface of the gasket.

E. Install the bevel end of the pipe into the socket. Take care that the plain end is centrally located in the socket and push the pipe home. The joint deflection may then be set.

F. When tightening bolts on mechanical joint fittings, the gland shall be brought up to the fitting flange evenly, maintaining approximately the same distance between the gland and the face of the flange at all points around. This shall be done by partially tightening the bottom bolt first then the top bolt, next the bolts at either side, and last the remaining bolts. Repeat this process until the proper joint tightness is achieved and the nut is sheared off. Overstressing the bolts to compensate for the poor installation will not be permitted.

G. Complete the installation by applying a single coat of bitumastic to the entire surface of the retainer.

**3.04 - EXPOSED PIPING**

A. Flanged: 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.

B. Grooved:

1. Pipe ends shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove for proper gasket sealing.

2. A thin uniform coat of lubricant, provided by the joint manufacturer, shall be applied to the gasket, coupling or housing using a clean brush.

3. The gasket and coupling housing shall be installed as contained in the manufacturer's written instructions.

C. Install flanged adapters and couplings in accordance with manufacturer's installation instructions.

**3.05 - RECHECKING AND REPAIRING**

A. Pressure test all exposed and underground pipe in accordance with the requirements contained in Division 1. Before piping is concealed, recheck for leaks.

B. Rework or replace defective and leaking joints, and joints that are otherwise unsatisfactory. Peening, caulking and doping are not permitted.

**3.06 - FIELD QUALITY CONTROL**

A. Conduct pressure testing in accordance with AWWA C600 and Division 1 requirements.

B. Blow out all dirt, debris and foreign material in all aeration process piping before placing the aeration system diffusers on-line. Do not use water to flush out material. The use of the supplied air compressors may be used if approved by the Engineer.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Aeration blowers and ancillary equipment for:

1. Pre-Equalization Tanks

2. Sludge Holding Tanks

B. The control panels for aeration equipment shall be furnished as work of the Electrical Contract. The designated control panel is listed on the schedules at the end of this Section. Coordinate the work of this Section with the work of the Electrical Contract to provide fully integrated and automatic aeration systems.

C. Supply each blower as a package from the factory that shall include, but is not limited to, the following: blower, electric motor, matched belts and sheaves, inlet filter, discharge silencer, discharge check valve, rubber inlet sleeve and discharge connection, pressure relief valve, rubber expansion joint, pressure gauge, belt guard, discharge pressure switch, temperature gauge with switch, inlet filter maintenance indicator, metal base skid and sound attenuating enclosure.

D. Aeration blower packages need not be all from the same manufacturer, except blower groupings provided for a process/treatment system must be of the same manufacturer and model, i.e, the pre-equalization blowers must be of the same manufacturer as the blowers provided for the sludge holding tanks based on common spare.

E. Refer to the Schedule for aeration equipment quantities, performance characteristics and the electrical characteristics for each aeration application.

F. Nameplates stating the name of the manufacturer, the motor model number, the motor serial number, the rated horsepower, speed, voltage, amps, rated service factor and other pertinent data, shall be attached to the motor.

G. Coordinate work in accordance with the requirements in Section 013100 – Project Management and Coordination.

### 1.02 – RELATED SECTIONS

A. Section 013300 - Submittals

B. Section 014500 - Quality Control

C. Section 016100 - Basic Product Requirements

D. Section 016500 – Product Delivery Requirements

E. Section 017500 - Starting and Adjusting

F. Section 017823 – Operating and Maintenance Data

G. Section 099100 – Painting

H. Section 465121 – Coarse Bubble Diffusers

**1.03 - REFERENCES**

A. American Gear Manufacturers Association

B. American National Standards Institute

C. American Society of Heating, Refrigeration and Air Conditioning Engineers

D. American Society of Manufacturing Engineers

E. American Society of Testing and Materials

F. Anti-Friction Bearing Manufacturers' Association

G. National Electrical Manufacturers Association

H. National Electrical Manufacturers Association

**1.04 - QUALITY ASSURANCE AND TESTING**

A. The aeration equipment and accessories specified herein shall be furnished by one single Supplier (Manufacturer) for the blowers for each separate process tank type. This requires the Supplier to be responsible for the development, design, fabrication, assembly and delivery of the blower aeration system, but 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 equipment 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.

C. The system shall be designed, furnished, and installed to achieve the conditions of service specified herein.

D. The Supplier shall have at least ten (10) years of experience in the design and manufacturing of aeration blowers for the wastewater industry.

E. All critical dimensions of the blower components provided by the manufacturer shall be verified and documented prior to assembly.

F. Each blower shall be operated at its maximum rated speed and differential pressure for fifteen (15) minutes as a factory test in accordance with ISO 1217, Annex B. The test shall by performed by the Manufacturer and results of the test shall be submitted prior to shipment of the blowers.

G. The rotating parts of each blower shall be statically and dynamically balanced before final assembly. The blower alone shall operate without vibration with the rotor assemblies statically and dynamically balanced to ISO standard 1940/1 – Q2.5.

H. Each blower shall be slip tested (per ISO 1217). The slip rpm shall be documented and supplied for each blower.

I. Blowers to be provided per submittals and quote. Each blower package shall be guaranteed to provide performance to ISO 1217, Annex C.

J. On completion of final assembly of the packaged blower and prior to shipment, each packaged blower shall be mechanically run for a minimum of fifteen minutes.

**1.05 - SUBMITTALS**

A. Submit in accordance with the requirements contained in Section 013300.

B. Submit the following aeration related information for each blower listed in the schedule:

1. Technical specifications for the blower packages

2. Dimensional data for components of each aeration system to ensure a suitable fit in the area designated on the contract plans. Blowers must meet spatial and capacity requirements to be considered for this project.

3. Normal operating point curve for each of the blowers. These curves shall demonstrate the relationship between temperature rise ($^{o}$F), inlet volume (SCFM), and brake horsepower (BHP) against rotating speed (RPM).

4. Electrical data sheet and field wiring diagram for motors.

5. Outline drawings showing placement of blower, motor, and all accessory items.

6. Storage, handling and installation instructions.

7. Warranty Certificate.

8. Manufacturer Startup Reports (MSR's) as specified in Section 017500 for the aeration equipment.

C. Submit an operation and maintenance manual for each piece of equipment in accordance with the requirements contained in Section 017823.

**1.06 - DELIVERY, STORAGE AND HANDLING**

A. Comply with requirements contained in Section 016500 - Product Delivery Requirements.

**1.07 - WARRANTY**

A. The Manufacturer's Standard warranty shall apply.

**1.08 - COMMISSIONING**

A. Supply and credit to the Owner field services as specified in Section 014516 - Quality Control.

B. Provide the following field services of the blower manufacturer as a minimum in accordance with the requirements contained in Section 017500 - Starting and Adjusting:

1. Two (2) days totaling two (2) trips, one trip for each blower process designation, once each system has been installed to check the completed installation, make all necessary adjustments and otherwise place the system into permanent operation as specified in Section 017500 - Starting and Adjusting. During one of these trips, and before substantial completion, provide operation and maintenance instruction to the Owner. A complete review of the operations and maintenance manual shall be presented at this time. The Contractor shall coordinate startup activities with the prime electrical contractor. The Prime Electrical Contractor's work shall be verified as correct by the blower supplier representative.

**1.09 - EXTRA MATERIALS**

A. Supply the following spare parts in accordance with Section 017843:

1. Four (4) filter elements for each blower assembly listed in the schedules.

2. One (1) set of V-belts for each blower assembly listed in the schedule at the design capacity.

3. Two (2) year supply of manufacturer recommended viscosity grade oil for each blower listed in the schedule.

## PART 2 - PRODUCTS

### 2.01 - MANUFACTURERS

A. Blower Packages: Kaeser, approved equal.

### 2.02 –BLOWER PACKAGES

A. The Kaeser package blower system and model numbers utilized are for the purpose of establishing the standard of quality and general configuration desired and are specified in the schedule at the end. Other package blower systems that adhere to the base specification requirements may be submitted for consideration of substitution approval by the Engineer.

B. Blower Design Capacity Parameters:

1. Standard Pressure (psia): 14.700

2. Actual Pressure (psia): 14.696

3. Actual Relative Humidity: 0.80

4. Standard Temperature (ºF): 68

5. Actual Temperature(ºF): 100

C. Each blower shall be of the horizontal, rotary, positive displacement type. Each assembly shall be rugged in construction and of such design that it may be disassembled and inspected without disturbing the inlet or discharge piping. The blower supplied shall be constructed with inlet and discharge connections oriented as shown on the contract drawings.

D. Casing: Casing shall be of one piece with separate head plates and shall be made of closed grained gray cast iron suitably ribbed to resist deflection and facilitate cooling under the specified service conditions.

E. Head Plates: Fabricate drive end and gear end head plates of close grained cast iron which are

precision machined for exact bearing housing fit.

F. Impeller and Shaft: Impeller and shaft shall be made from EN GGG 50 material. Impeller shall be of the straight, tri-lobe type and shall operate without rubbing and shall be positively timed by a pair of accurately machined heat-treated alloy steel, spur tooth and timing gears. Impellars shall be greater than 8-inches.

G. Bearings: Each impeller/shaft shall be supported by double row ball or cylindrical roller bearings sized for a minimum of 40,000 hours at blower's maximum speed and pressure, 100,000 hours at design conditions.

H. Bearing Seals: Provide a labyrinth type oil seal on each end, designed to prevent lubricant from leaking into the air stream. Provisions shall be made to vent the lubrication system to prevent any possible carryover of lubricant into the air stream.

I. Lubrication: Both the gear end and the drive end of the blowers shall be oil splash lubricated for minimal maintenance and long service life. Grease lubricated bearings are not acceptable. The lubrication design shall ensure adequate lubrication of the timing gears and bearings.

**2.03 – BLOWER MOTOR**

A. Provide a single speed, constant torque, TEFC, Inverter Duty motor 1.15 S.F., premium efficiency suitable for mounting on a swing base and connecting to the blower shaft by a V-belt and sheave drive assembly. Motor shall have a cast iron frame and brackets. See schedule for size and electrical performance of each blower.

B. Drive motors shall be designed, manufactured, and tested in accordance with the latest revised editions of NEMA MG-1, IEC, IEEE, ANSI, and AFBMMA standards as applicable and shall be capable of continuous operation. Motors shall be as manufactured by WEG Electric or approved equal.

C. The motor nameplate horsepower rating shall not be exceeded at the design speed.

D. The temperature rise of the motor windings shall not exceed IEC and NEMA standards when the motor is operated continuously at the rated horsepower, rated voltage, and rated frequency in ambient conditions of 40 deg. C. Winding insulation shall be Class F. Temperature rise Class B.

E. All motors shall be variable speed ready and capable of the minimum turndown as listed in the schedule for each blower.

**2.04 – BLOWER PACKAGE ACCESSORIES**

A. The blower package shall be fabricated and assembled with accessories specified herein and shipped complete as a unit.

B. Equipment Base/Discharge Silencer: The base shall be built so that the blower and the motor are mounted to provide for horizontal tensioning of the v-belt drive. The base, angle legs and gussets shall be a minimum of 3/8” plate steel. The blower package base must weigh at least 80% of the blower weight. All welds are to be continuous and full penetration. All seams shall be welded. Each leg shall be gusseted in two planes. Base frame shall contain integrated discharge silencer and designed for horizontal mounting of blower with vertical air flow. The blower shall incorporate the pivoting motor swing base and tensioning assembly to ensure proper alignment of the drive assembly.

C. Drive: Provide V-belt drive assembly consisting of sheaves, quick detachable bushings, V-belts and swing motor base. Provide drive assembly with a 1.2 service factor based on motor nameplate horsepower.

D. Guard: Provide steel belt guard to enclose drive and belts which meets OSHA standards. Design guard for easy removal. The guard shall be constructed to allow visual inspection of the drive system without removing the guard.

E. Intake Filter: Provide each blower with a suitably sized air filter.

F. Expansion Joints: Provide web reinforced silicone rubber sleeve with corrosion resistant clamps for blower inlet and discharge connections. Furnish units which are capable of withstanding 25 psi and handle operating temperatures of 250°F.

G. Pressure Relief Valve: Provide spring type relief valve with proper sizing for set point pressure.

H. Check Valves: Provide threaded type, cast iron body, aluminum internals for mounting on blower discharge piping.

I. Discharge Pressure Gauge: Provide a panel mounted discharge pressure gauge on the blower package to be equivalent to U.S. Gauge, McDaniel Instruments or approved equal.

1. Range: 0-23 psig.

2. Accuracy: 1 percent of full scale.

3. Dial: 2.5", 270 degree scale.

J. Inlet Restriction Gauge: Provide each blower with an inlet gauge to measure loss through the inlet filter, or equal.

**2.05 – PAINTING**

A. Kaeser Blower Package - Cast parts are to be painted with a two-part gray epoxy primer and two part top coat. Fabricated parts are to be painted with a two-part gray epoxy primer and two part top coat. Sound enclosure parts are to be powder coated. Panels and base paint finish shall be pretreated by de-greasing and phosphate cleaning, then powder coated to a thickness of 70 um – 100 um on both sides.

B. Alternate Blower Package - Shop prime paint all components with gray Kem-Flash prime paint manufactured by Sherwin Williams Company. Prime paint by the individual component manufacturer is not acceptable.

C. Alternate Blower Package - Finish paint all component parts before assembly with machine tool gray Kem-Lustral Enamel as manufactured by Sherwin Williams Company. Field painting of blower equipment is not acceptable.

**2.06 – BLOWER SOUND ATTENUATING ENCLOSURE**

A. To prevent transmission of vibration and noise, as well as secure the package to the foundation, the base shall include vibration isolators made of rubber.

B. Each blower assembly shall be furnished with a weather tight, sound attenuating enclosure. The enclosure shall have a metal powder coated back with a lift off front panel made of rotomolded polymer polyethylene. The sound enclosure acoustic material shall comply to FMVSS 302 with a burning rate B or lower than 100 mm/min.

C. An air ventilation fan shall be mounted on the enclosure and sized as necessary to keep the assembly at a temperature needed to maintain proper operation as recommended by the assembly manufacturer. The ventilation fan motor will be 120v/1 ph/60 hz; and shall provide a minimum of 10 CFM/motor HP.

D. Any pipe penetration holes in the enclosure shall be sized to allow for passage of pipe flanges. All penetration holes shall have flash rings installed to seal around the pipe.

**PART 3 - EXECUTION**

**3.01 - INSTALLATION**

A. Install blower assembly and diffuser equipment in accordance with manufacturers' installation

instructions.

B. Coordinate checking of blower rotation with the prime electrical contractor in the presence of the manufacturer's representative.

C. Install valves on the blower assemblies downstream of the pressure relief valve. Pressure gauges shall be located for easy reading. The weight of connecting piping shall not be supported by the blower or silencers.

D. Paint all parts of the blower package that are not stainless steel except parts that are factory finished.

**3.02 - FIELD QUALITY CONTROL**

A. Submit separate MSR for each blower assembly startup. Record the model number, serial number, and nameplate data on each MSR.

**3.03 - AERATION EQUIPMENT - SCHEDULE 4311000**

A. Application: Pre-Equalization Tanks/Sludge Holding Tanks Air

1. General:
   a. Quantity: 3
   b. Model Number: BB52C
   c. Control Panel: CP-1 (Provided by others)
2. Performance Characteristics:
   a. Max Design Capacity
      1. (SCFM): 106
      2. (ICFM): 119
3. Discharge Pressure (PSIG): 4.5
4. Relief Valve Setting (PSIG): 7.4
5. Discharge Diameter: 2-inch
6. Electrical Characteristics:
   a. Minimum Motor Horsepower (HP): 5
   b. Brake Horsepower (BHP): 4.2
   c. Maximum Motor Speed (RPM): 3600
   d. Minimum Blower Speed Turndown (RPM): 1380
   e. Service Voltage (V): 460
   f. Frequency (HZ): 60

g. Phase: 3

h. Enclosure Fan Voltage: 120V/3Phase/60 HZ

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. Submersible sewage pumps

### 1.02 - REFERENCES

A. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified:

1. ASTM A48 - Gray Iron Castings.
2. NFPA 70 – National Electric Code
3. Hydraulic Institute Standards
4. National Electrical Manufacturers Association
5. Institute of Electrical and Electronic Engineers
6. American National Standards Institute
7. NEMA ICS 1 - General Standards for Industrial Control and Systems.
8. NEMA ICS 2 - Standards for Industrial Control Devices, Controllers and Assemblies.
9. NEMA ICS 3 - Industrial Systems.
10. NEMA ICS 6 - Enclosures for Industrial Controls and Systems.

### 1.03 - 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.

### 1.04 - SUBMITTALS

A. All information shall be submitted in accordance with the requirements in Section 013300.

B. Submit the following:

1. Technical specifications for the pump and motor, and accessories.

2. Dimensional data for pump/mixer and motor.

3. Certified pump performance curve with duty point shown.

4. Electrical data sheet for pump/mixer motor. Provide field-wiring diagram for pump/mixer motor.

5. Outline drawings showing placement of support rails.

6. Catalog cuts and/or engineering data for each accessory item specified to be provided herein.

7. Storage, handling and installation instructions.

8. Warranty Certificate in the form specified herein.

9. Manufacturer Startup Reports (MSR's) as specified in Sections 017500 and 017839 for the pump.

10. Submit an operation and maintenance manual in accordance with the requirements in Section 019213.

**1.05 - QUALITY ASSURANCE**

A. The pumps and accessories specified herein shall be furnished by one single supplier (Manufacturer). This requires the supplier to be responsible for the development, design, fabrication, assembly, delivery, and proper sustained automatic operation of the pumping system, but 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 equipment 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.

C. The system shall be designed, furnished, and installed to achieve the conditions of service specified herein.

D. The supplier shall have at least ten (10) years of experience in the design and manufacturing of raw sewage, non-clog, and submersible fibrous waste (cutter) pumps.

E. The supplier shall have at least ten (10) years of experience in the design and manufacturing of raw sewage.

**1.06 - FIELD SERVICES**

A. Supply and credit to the Owner field services as specified in Section 014546 - Quality Control.

B. Provide the following field services as a minimum in accordance with the requirements in Section 017500 - Starting and Adjusting:

1. One (1) day for providing installation assistance for the pumps to the Contractor.

2. Three (3) days totaling three (3) trips for each of the submersible sewage pump systems installed to check the completed installations, make all necessary adjustments and otherwise place the system into permanent operation as specified in Section 017500 - Starting and Adjusting. During one day of these trips, after all the systems have been installed and before substantial completion, provide operation and maintenance instruction to the Owner. A complete review of the Operations and Maintenance Manual shall be presented at this time.

**1.07 - WARRANTY**

A. Provide a warranty certificate typed on manufacturers letterhead and signed by an officer of the manufacturer. The certificate shall be witnessed by a notary public in the state in which the company headquarters is located.

B. The manufacturer's standard five (5) year warranty on the pump and motor shall apply.

C. In addition, the manufacturer shall guarantee all components of the equipment specified to be furnished under this Section to be free from defects in design, materials and workmanship for a period of one (1) year commencing on the date of the Manufacturer's Startup Report. That being the day that the pump was placed into permanent, automatic, and consistent, fault free operation.

D. 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(s), the supplier shall repair or exchange, at the discretion of the Owner, such defective part(s) free of any and all charges including freight. 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 supplier.

## PART 2 – PRODUCTS

### 2.01 - SUBMERSIBLE SEWAGE PUMPS

A. General Requirements:

1. Each pump shall be equipped with a submersible, electric motor connected for operation. Each motor shall be explosion-proof. Each pump shall be supplied with submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and have P-MSHA Approval. The schedules at the end of this Section note the electrical service requirements.

2. Each pump shall be supplied with a mating cast iron discharge connection. See the attached schedules for discharge pipe diameter. Each pump shall be capable of achieving the conditions of service specified in the attached schedules.

B. Stainless steel nameplates shall be attached to each pump and motor giving pertinent design data, horsepower, voltage, phase, running amps, model, serial numbers, and manufacturer's name.

C. Spare nameplates shall be provided for each pump and turned over to the Engineer/Owner.

D. Lifting System:

1. Each submersible pump shall be automatically and firmly connected to the discharge connection, guided by no less than two (2) guide rails extending from the top of the respective tank, well or basin to the discharge elbow. There shall be no need for personnel to enter the structure. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal-to-metal watertight contact. Sealing of the discharge interface with a diaphragm, o-ring or profile gasket will not be acceptable. No portion of the pump shall bear directly on the tank, well or basin floor.

2. Each pump shall be supplied with its own base elbow to the size as noted on the Schedules.

3. Guide rails for each pump shall be schedule 40 stainless steel pipe and be a minimum of 5 feet longer than the total depth of the tank the where pump is to be installed.

4. Each pump shall be fitted with 25 feet of stainless steel heavy duty lifting chain. The working load of the lifting system shall be 50% greater than the pump's unit weight. A heavy-duty, stainless steel, safety hook shall be furnished for each pump. Provide Grip-eye® removal device for each submersible pump.

5. The pumps shall be supplied with upper guide rail holders made specifically for the specified pump model. The holders shall be fabricated of 304 stainless steel.

E. Pump Construction:

1. Major pump components shall be of gray cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. All exposed nuts or bolts shall be AISI type 304 stainless steel construction. All metal surfaces coming into contact with the pump, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

2. Sealing design shall incorporate metal-to-metal contact between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or Viton rubber o-rings. Fittings shall be the result of controlled compression of rubber O-rings in two planes and o-ring contact of four sides without the requirement of a specific torque limit.

3. Rectangular cross-sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical o-rings, grease, or other devices shall be used.

F. Cooling System: Pump motors shall be sufficiently cooled by the surrounding media and be able to run dry.

G. Cable Entry Seal: The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable when necessary using the same entry seal. The cable entry junction chamber and motor shall be separated by a stator lead sealing gland or terminal board, which shall isolate the interior from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.

H. Motor:

1. The pump motor shall be explosion-proof.

2. The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be

insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of up to 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator lead coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The junction chamber shall be sealed off from the stator housing and shall contain a terminal board for connection of power and pilot sensor cables using threaded compression type terminals. The use of wire nuts or crimp-type connectors is not acceptable. The motor and the pump shall be produced by the same manufacturer.

3. The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided upon request showing curves for torque, current, power factor, input/output kW and efficiency throughout the minimum to maximum power rating. This chart shall also include data on starting and no-load characteristics.

4. The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chloroprene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet.

5. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

I. Bearings: The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep groove ball bearing. The lower bearing shall be a two row angular contact bearing to compensate for axial thrust and radial forces. Single row lower bearings are not acceptable.

J. Mechanical Seal:

1. Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydrodynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating tungsten-carbide ring. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary tungsten-carbide seal ring and one positively driven rotating carbon seal ring. Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor depend on direction of rotation for sealing. The position of both mechanical seals shall depend on the shaft. Mounting of the lower mechanical seal on the impeller hub will not be acceptable

2. The following seal types shall not be considered acceptable nor equal to the dual independent seal specified: shaft seals without positively driven rotating members, or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces. Cartridge type systems will not be acceptable. No system requiring a pressure differential to offset pressure and to effect sealing shall be used.

3. Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. The motor shall be able to operate dry without damage while pumping under load.

4. Seal lubricant shall be FDA Approved, non-toxic.

K. Pump Shaft: Pump and motor shaft shall be the same unit. The pump shaft shall be an extension of the motor shaft. Couplings shall not be acceptable. The pump shall be AISI type 420 stainless steel. A shaft material of lower quality than 420 stainless steel shall not be used.

L. Impeller (Type N):

1. Impellers shall be of Hard-IronTM (ASTM A-532 (Alloy III A) 25% chrome cast iron) dynamically balanced, semi-open, multi-vane, back-swept, screw shaped, non-clogging designs. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The leading edges of the impellar shall be hardened to Rc 60 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter found in wastewater.

2. The screw shape of the impeller inlet shall provide an inducing effect for rthe handling of up to 5% sludge and rag laden wastewater. The impellar to volute clearance shall be readily adjustable by the means of a single trim screw. The impeller shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

3. Mass moment of inertia calculations shall be provided by the pump manufacturer upon request.

M. Volute/Suction Cover:

1. Pump volute(s) shall be single-piece gray cast iron, ASTM 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a replaceable suction cover insert ring in which are cast spiral-edged grooves.

2. The spiral grooves shall provide trash release pathways and sharp edges across which each impeller vane leading edge shall cross during rotation so to remain unobstructed.

3. The insert ring shall be cast of Hard-IronTM (ASTM A-532(Alloy IIIA) 25% chrome cast iron) and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

N. Protection:

1. All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. At 125 deg. C (260 deg. F) the thermal switches shall open, stop the motor and activate an alarm.

2. A leakage sensor shall be provided to detect water in the stator chamber. The float leakage sensor (FLS) shall be a small float switch used to detect the presence of water in the stator chamber. When activated, the FLS shall stop the motor and send an alarm to the control panel. Use of voltage sensitive, solid state sensors and trip temperature above 125 deg. C (260 deg. F) shall not be allowed.

3. The thermal switches and FLS shall be connected to a Mini CAS (Control and Status) monitoring unit by Flygt. Each Mini CAS shall be interchangeable so it can be used for any submersible pump furnished under this specification. Contract “G” shall supply the Mini CAS thermal relay and coordinate turn over to the Electrical Contractor for installation by the control panel manufacturer, or for installation in the appropriate MCC as required.

### 2.02 - PORTABLE DAVIT CRANE

A. Furnish a 316 stainless steel portable crane assembly by THERN Series 5124 for the pumps as shown on the Contract drawings.

B. The pumps shall be furnished with a dedicated stainless steel davit crane and stainless steel platform socket as noted on the following Schedules. Each crane shall: be rated for a safe load of the specified pump/mixer, provide a lift of 10 feet greater than the applicable tank total depth, have 36" minimum reach and 84" maximum reach. Hoist cable shall consist of 316 stainless steel cable, stainless steel lifting hook, and 316 stainless steel snap hook.

C. Each crane to be provided with a crane winch. Winch shall be stainless steel spur gear hand winch type.

D. Provide each base socket with: base cover & wire rope keeper.

### 2.03 - SPARE PARTS

A. One (1) set of lower and upper seals for each model pump.

B. One (1) set of lower and upper bearings for each model pump.

C. One (1) set of gaskets for each pump

D. One (1) control and status monitoring units by Flygt.

## PART 3 - EXECUTION

### 3.01 - FACTORY TEST

A. Each component shall be factory tested to ensure optimal operation and performance prior to being shipped to the owner. Provide Engineer with TDH and flow performance curves for each pump from the minimum to maximum speed.

### 3.02 - PUMP INSTALLATION

A. Contractor shall protect all components of the pump and electrical connections prior to permanent electrical installation by Contract “E” and satisfactory start-up.

B. Install base elbows and pumps plumb and level. Shim base elbow to proper elevation and anchor to concrete with ½ inch s.s. adhesive anchors. Install four (4) anchors per base elbow.

C. Install upper guide bar bracket, lifting chain, and rails for proper removal of the pump. Set rails plumb and secure upper guide bar brackets level in accordance with manufacturer's clearance requirements. Install properly sized stainless steel threaded rod within schedule 40 stainless steel carrier conduit (shim assemblies) for each upper guide bar bracket in order to maintain proper offset distance for each rail. Length of shim assemblies shall be as required to properly set the rails relative to the base elbow and upper guide bar bracket. Install two (2) shim assemblies per upper guide bar bracket.

D. Install motor and pump in accordance with manufacturers installation instructions.

E. Coordinate each pump's rotation with the Prime Electrical Contractor in the presence of the manufacturer's representative.

F. Install platform sockets and jib cranes where directed by the Engineer using ½ inch s.s. adhesive anchors sized for the intended load. Install lifting cable and lifting hardware.

**3.03 - FIELD QUALITY CONTROL**

A. Test each electric motor and record operating voltage and amperage with the prime electrical contractor. Test the seal leak sensor and relay for each pump. The authorized manufacturer representative shall record this information on the manufacturer's startup report (MSR).

B. Submit the MSR for each pump startup for record purposes. Record the model number, serial number, and nameplate data on each MSR. Separate MSR's shall be provided for each pump.

C. The Contractor shall mount all pump hoist deck sockets where directed by the Engineer using s.s. hardware rated for the intended maximum load with a factor of safety of 2.

### 3.04 - SUBMERSIBLE SEWAGE PUMP - SCHEDULE 432113-1

A. General:

| | |
|---|---|
| Application: | Influent Pump Station |
| Quantity: | (2) Total: (2) Duty pumps |
| Flygt Model Number: | NP-3085.930 MT |
| Flygt Impeller Number: | 63-462 |
| Control Panel: | CP-1 |

B. Pumping Characteristics:

The system head curves for a “C” value equal to 140 at minimum and maximum static head conditions are as follows:

| Flow (gpm) | 140 | 250 | 280 | 310 | 340 |
|---|---|---|---|---|---|
| TDH-Maximum Static (ft.) | 22.06 | 22.23 | 22.29 | 22.36 | 22.44 |
| TDH-Minimum Static (ft.) | 17.58 | 17.75 | 17.81 | 17.88 | 17.96 |

One pump in operation, at maximum static head, shall deliver a minimum flow of 280 gpm at 22.46 ft. TDH at 60 HZ.

C. Physical Characteristics:

| | |
|---|---|
| Pump Discharge Size (inches): | 4 in. |
| Base Elbow Size: | 4 in. x 4 in. |

D. Electrical Characteristics:

| | |
|---|---|
| Minimum Motor Horsepower (hp): | 3.5 |
| Motor Speed (RPM): | 1800 RPM |
| Service Voltage (V): | 460 |
| Frequency (HZ): | 60 |
| Phase: | 3 |

Variable Frequency Ready Motor Required

### 3.05 - SUBMERSIBLE SEWAGE PUMP - SCHEDULE 432113-2

A. General:

| | |
|---|---|
| Application: | Pre-Equalization Pump Station |
| Quantity: | (2) Total: (2) Duty pumps |
| Flygt Model Number: | NP-3085.070MT |

Flygt Impeller Number: 63-453
Control Panel: CP-1

B. Pumping Characteristics:
The system head curves for a “C” value equal to 140 at minimum and maximum static head conditions are as follows:

| Flow (gpm) | 100 | 125 | 150 | 175 | 200 |
|---|---|---|---|---|---|
| TDH-Maximum Static (ft.) | 12.15 | 12.24 | 12.34 | 12.46 | 12.59 |
| TDH-Minimum Static (ft.) | 5.15 | 5.24 | 5.34 | 5.46 | 5.59 |

One pump in operation, at maximum static head, shall deliver a minimum flow of 150 gpm at 12.34 ft. TDH at 60 HZ.

C. Physical Characteristics:

Pump Discharge Size (inches): 3 in.
Base Elbow Size: 3 in. x 3 in.

D. Electrical Characteristics:

Minimum Motor Horsepower (hp): 1.6
Motor Speed (RPM): 1755 RPM
Service Voltage (V): 460
Frequency (HZ): 60
Phase: 3

Variable Frequency Ready Motor Required

**3.06 - SUBMERSIBLE SEWAGE PUMP - SCHEDULE 432113-3**

A. General:

Application: Effluent Pump Station
Quantity: (2) Total: (2) Duty pumps
Flygt Model Number: NP-3102.930 SH
Flygt Impeller Number: 63-256
Control Panel: CP-1

B. Pumping Characteristics:
The system head curves for a “C” value equal to 140 at minimum and maximum static head conditions are as follows:

| | | | | | |
|---|---|---|---|---|---|
| Flow (gpm) | 155 | 230 | 310 | 390 | 470 |
| TDH-Maximum Static (ft.) | 24.08 | 28.75 | 35.42 | 43.76 | 53.71 |
| TDH-Minimum Static (ft.) | 15.51 | 20.18 | 26.85 | 35.19 | 45.15 |

One pump in operation, at maximum static head, shall deliver a minimum flow of 350 gpm at 40 ft. TDH at 60 HZ.

C. Physical Characteristics:

Pump Discharge Size (inches): 3 in.
Base Elbow Size: 3 in. x 3 in.

D. Electrical Characteristics:

Minimum Motor Horsepower (hp): 7.2
Motor Speed (RPM): 3600 RPM
Service Voltage (V): 460
Frequency (HZ): 60
Phase: 3

Variable Frequency Ready Motor Required

**3.07 - SUBMERSIBLE SEWAGE PUMP - SCHEDULE 432113-4**

A. General :

Application: Sludge Holding Tank Decant Pump
Quantity: 2
Flygt Model Number: NP 3085.170
Flygt Impeller No. 63-456
Control Panel : Local Control Station

B. Physical Characteristics:

Pump Discharge Size (inches): 3 inch
Discharge Fitting: 3 inch hose coupling

C. Electrical Characteristics:

Minimum Motor Horsepower (hp): 1.5
Motor Speed (RPM): 3325 RPM
Service Voltage (V): 208
Frequency (HZ): 60

Phase: 3

Variable Frequency Ready Motor Not Required

NOTES: (1) Check valve not required.
(2) Seal leak and over temperature sensors are required.
(3) Pump cable to be connected to twist lock outlet at local control station.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. (1) Fine Screen washwater multistage centrifugal booster pump unit and accessories for potable water distribution, new motors for all pumping units, inspection and servicing of the combined pump and motor units and testing, adjusting, alignment and balancing.

B. (1) NEMA 12 VFD and (1) integrated NEMA 12 Operator's Control Panel.

C. (2) Pressure Transmitters for monitoring line pressure and communicating with Operator's Control Panel

### 1.02 - REFERENCES

A. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified:

1. ASTM A48 - Gray Iron Castings.
2. ASTM A53 – Pipe, Steel, Black and Hot-Dipped Zinc-Coated, Welded and Seamless.
3. ASTM A108 – Steel Bars, Carbon, Cold Finished, Standard Quality
4. ASTM B42 – Seamless Copper Pipe, Standard Sizes
5. ANSI B16.22 – Wrought Copper and Copper Allow Solder Joint Pressure Fittings.
6. NFPA 70 – National Electric Code
7. Hydraulic Institute Standards
8. National Electrical Manufacturers Association
9. Institute of Electrical and Electronic Engineers
10. American National Standards Institute
11. NEMA ICS 1 - General Standards for Industrial Control and Systems.
12. NEMA ICS 2 - Standards for Industrial Control Devices, Controllers and Assemblies.
13. NEMA ICS 3 - Industrial Systems.

14. NEMA ICS 6 - Enclosures for Industrial Controls and Systems.

**1.03 - 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.

**1.04 - SUBMITTALS**

A. All information shall be submitted in accordance with the requirements in Section 013300.

B. Submit the following:

1. Technical specifications for the pump and motor, and accessories.

2. Dimensional data for pump and motor.

3. Certified pump performance curve with duty point shown.

4. Electrical data sheet for pump motor. Provide field-wiring diagram for pump motor.

5. Outline drawings showing placement of floor mounting locations.

6. Catalog cuts and/or engineering data for each accessory item specified to be provided herein.

7. Storage, handling and installation instructions.

8. Warranty Certificate in the form specified herein.

9. Manufacturer Startup Reports (MSR's) as specified in Sections 017500 and 017839 for the pump.

C. Submit an operation and maintenance manual for each piece of equipment in accordance with the requirements contained in Section 017823.

**1.05 - QUALITY ASSURANCE**

A. The pumps and accessories specified herein shall be furnished by one single supplier (Manufacturer). This requires the supplier to be responsible for the development, design, fabrication, assembly, delivery, and proper sustained automatic operation of the pumping system,

but 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 equipment 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.

C. The system shall be designed, furnished, and installed to achieve the conditions of service specified herein.

D. The supplier shall have at least ten (10) years of experience in the design and manufacturing of multistage centrifugal pumps.

**1.06 - FIELD SERVICES**

A. Supply and credit to the Owner field services as specified in Section 014546 - Quality Control.

B. Provide the following field services as a minimum in accordance with the requirements in Section 017500 - Starting and Adjusting:

1. One (1) day for providing installation assistance for the pumps to the Contractor.

2. Two (2) days totaling two (2) trips once Fine Screen washwater booster pump has been installed to check the completed installations, make all necessary adjustments and otherwise place the system into permanent operation as specified in Section 017500 - Starting and Adjusting. During one day of these trips, after all the systems have been installed and before substantial completion, provide operation and maintenance instruction to the Owner. A complete review of the Operations and Maintenance Manual shall be presented at this time.

**1.07 - WARRANTY**

A. Provide a warranty certificate typed on manufacturer’s letterhead and signed by an officer of the manufacturer. The certificate shall be witnessed by a notary public in the state in which the company headquarters is located.

B. The manufacturer’s standard five (5) year warranty on the pump and motor shall apply.

C. In addition, the manufacturer shall guarantee all components of the equipment specified to be furnished under this Section to be free from defects in design, materials and workmanship for a

period of one (1) year commencing on the date of the Manufacturer's Startup Report, that being the day that the pump was placed into permanent, automatic, and consistent, fault free operation.

D. 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(s), the supplier shall repair or exchange, at the discretion of the Owner, such defective part(s) free of any and all charges including freight. The cost of labor, freight 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 supplier.

## PART 2 – PRODUCTS

### 2.01 - MANUFACTURERS

A. Goulds Water Technology

B. Approved Equal

### 2.02 – MULTISTAGE CENTRIFIGUAL BOOSTER PUMP

A. General Requirements:

1. The schedules at the end of this Section note the electrical service requirements.

2. Each pump shall be capable of achieving the conditions of service specified in the attached schedules.

B. Spare nameplates shall be provided for each pump and turned over to the Engineer/Owner.

C. Pump Construction:

1. The Plant Water Booster pump shall be a ***vertically mounted single stage***, double suction, cast iron, bronze fitted, axially split case design with ANSI 125 suction and discharge flanges and mounting feet cast integral with the lower half casing. Suction and discharge shall be on a common centerline in both the horizontal and vertical planes. The upper half casing shall be removable without disturbing suction or discharge piping.

2. Pump shall be direct to shall be direct coupled to electric motor with flexible coupling. Tapped and plugged holes shall be provided for priming, vent, drain and gauge connections.

D. Casing: The pump casing shall be of deep drawn, laser welded AISI 304L or 316L stainless steel and shall be capable of withstanding maximum working pressures of 360 psi or 580 psi. Number based on pump staging and flange selection. Piping connections shall be in-line and shall be compatible with ANSI raised face flanges (optional NPT or Victaulic).

E. Wear Ring: Wear rings composed of PPS shall be provided within each stage. Wear rings must be self-centering and easily replaceable.

F. Impeller: Impellers shall be of enclosed design and constructed of AISI 316L or AISI 304L stainless steel. Impellers shall provide internal thrust balance in each stage.

G. Diffuser Bowl: Each stage shall have a bowl with attached diffuser and be constructed of AISI 304L or 316L stainless steel.

H. Seal Housing: The seal housing shall be of concave design and shall hold the seal faces below the topmost part of the pump casing.

I. Impeller Shaft: Steel ASTM A322 Grade 4140, supported by bearings on both sides of the impeller and connected to the motor with a flexible pump coupling. Shaft shall be of ample size to operate under load with a minimum deflection. The coupling shall be rated for a minimum of 150% of maximum rated torque. The shaft sleeve shall be bronze ASTM B584 Alloy C80500 and locked in place by threaded, bronze shaft sleeve nuts. A Buna Rubber “O” ring shall prevent leakage on the shaft sleeve.

J. Mechanical Seal: The pump shaft seal shall be one of the following configurations as indicated:

| Rotary Face | Stationary Face | Elastomer |
|---|---|---|
| High Temperature Carbon | Silicon Carbide Graphite Filled | Viton or EPR |
| Silicon Carbide Graphite Filled | Silicon Carbide Graphite Filled | EPR |
| Carbon | Silicon Carbide | Aflas |

K. Shaft Sleeve and Bearing: The pump shall have shaft sleeves made of tungsten carbide and ceramic bearings. Shaft height shall be set with a standard spacer.

L. Impeller Rings: ASTM B505-932 Bronze, fastened with an anti-rotation device so that they cannot rotate or become loose when the pump is subjected to reversed rotation.

M. Bearings: Ball type bearings shall be provided in dust tight housings and selected to carry radial and axial thrust loads. Bearings shall have a minimum L10 bearing life of 80,000 hours at the design point. The inboard or coupling end bearing shall be a single row ball bearing. The outboard bearing shall be double roll roller, selected to carry radial and thrust loads. The outboard bearing shall be retained by bearing locknut and lockwasher. Bearings shall be grease lubricated.

N. Bearing Housing: Housing shall be cast iron ASTM A48 Class 25B bolted to the ends of the bearing bracket/stuffing box and shall be fitted for full 360 degrees to assure positive alignment. The housings shall provide for thermal expansion when the bearings are clamped into position and take all thrust loads and keep the rotating element in its proper axial location.

O. Baseplate: Baseplate shall be steel with drip pan, sufficiently rigid to support the pump and driver. Final alignment of the pump and driver shall be made after grouting and installation and after Engineer's inspection.

P. Coupling: Coupling hubs shall be secured to the driver and pump shafts by set screw located over the key.

Q. Coupling Guard: Coupling guard shall be an all metal guard rated per ANSI B15.1, Section 8 and OSHA 1910-219 compliant.

R. Electric Motor:

1. The pump drive motor shall be NEMA standard design TC frame suitable for vertical mounting and close coupled to the pump unit. Motors shall be of standard manufacturers catalog design and must not use special bearings as a thrust handling device.

2. The motors shall have the following minimum characteristics: high-efficiency, 480 volt, 3-phase, 60 cycle, Service Factor 1.15, ODP enclosure.

3. The motor shall conform to NEMA Standards MB, applicable IEEE Standards, and applicable ANSI C50 Standards. The motors shall have the following minimum characteristics: 480 Volt, 3-phase, 60 cycle NEMA B design. Normal starting torque. Service Factor 1.15. Class F insulation.

4. The motor frame shall be corrosion-resistant cast iron or cast steel. The mounting ring shall be built integral with the frame.

5. The ball bearings shall be double shielded, grease lubricated, single row width and made from vacuum degassed steel. The bearing shall be grease lubricated with readily

accessible inlet and outlet plugs or fittings to allow for changing of the grease. The bearing shall have an AFBMA rating of 5 year minimum - 10 year average life.

6. Nameplates shall be stainless steel with embossed of preprinted lettering and shall be fastened to the motor frame with corrosion resistant pins. All bolts and cap screws shall be stainless steel. Nameplate data shall include manufacturer's name, pump designation, phase, horsepower, rpm, ampere, and volt ratings, efficiency, power factor, enclosure insulation and frame size.

7. Pump motors shall be as manufactured by one of the following: General Electric, U.S. Electrical Motors or approved equal.

8. The motor shall be protected with a normally closed (NC), bi-metalic temperature actuated element mounted on the stator windings with leads marked P1 and P2.

9. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out. The motor shall be variable speed ready.

**2.04 – CONTROLS AND INSTRUMENTATION**

A. Control panel shall include, but not be limited to the following devices:

1. Hand-Off-Automatic (HOA) selector switches for each pump, plus pilot device for automatic control.

2. Emergency E-stop pushbutton.

3. System failure alarm indication light (for common VFD fault alarms)

4. Systems requiring a PLC or microprocessor for system operation, and or pump lead and lag alternation shall not be acceptable.

B. Variable Frequency Drives:

1. Variable frequency drives shall be ITT PumpSmart model PS200 or ITT PumpSmart PS220 or approved equal.

2. The drive shall be solid state, with a Pulse Width Modulated (PWM) output. The drive shall be a Direct Torque Control (DTC) or sensorless vector equivalent AC to AC converter utilizing the latest isolated gate bipolar transistor (IGBT) technology. The drive must also provide an optional operational mode for scalar or V/Hz operation.

3. The Drive shall be UL listed, Canadian UL listed, or CSA listed and comply with EMC Directive 89/336 EEC, Low Voltage Directive 73/23 EEC and Machinery Directive 98/37 EC in accordance with the European Union's CE directive.

4. The Drive shall utilize the same communications architecture, utilizing plug-in communications cards, for high-speed noise immune connectivity throughout the entire Drive manufacturer's Power range.

5. Ratings:

    a. The Drive shall be rated to operate from 3-phase power at 230VAC to 500VAC ±10%, 48Hz to 63Hz. The Drive shall employ a full wave rectifier to prevent input line notching and operate at a fundamental (displacement) input power factor of 0.97 at all speeds and loads.

    b. The Drive efficiency shall be 98% or better at full speed and load. An internally mounted AC line reactor or DC choke shall be provided to reduce input current harmonic content, provide protection from power line transients such as utility power factor correction capacitor switching transients and reduce RFI emissions.

    c. The overload current capacity shall be 110% of rated current for one (1) minute out of five (5) minutes. Output frequency shall be adjustable between 0Hz and 180Hz.

6. Operator Control Panel (Keypad)

    a. Each Drive shall be equipped with a front mounted operator control panel (keypad) consisting of a four- (4-) line by 20-character back-lit alphanumeric display and a keypad with keys for Run/Stop, Local/Remote, Increase/Decrease, reset, menu navigation and parameter select/save.

    b. The control panel shall include a feature for uploading parameter settings to control panel memory and downloading from the control panel to the same drive or to another drive.

    c. All Drives throughout the entire power range shall have the same customer interface, including digital display, and keypad, regardless of horsepower rating.

    d. The keypad shall be removable and insertable under drive power, capable of remote mounting, and shall have its own non-volatile memory.

e. During normal operation, one (1) line of the control panel shall display the setpoint reference, run/stop and local/remote status. The remaining three (3) lines of the display shall be programmable to display the values of any three (3) operating parameters. At least 24 VFD and 18 pump related parameter selections shall be available including the following:

(i) Pump process variable in units of psig, gpm, ft, etc.

(ii) Vibration level in units of IP/s or mm/s

(iii) Energy Savings verses a constant speed pump

(iv) RPM

(v) Output frequency, voltage, current and torque

(vi) Input voltage, power and kilowatt hours

(vii) Heatsink temperature and DC bus voltage

(viii) Status of discrete inputs and outputs

7. I/O Capabilities

a. Six (6) discrete inputs shall be designed for “dry contact” inputs used with either an internal or external 24 VDC source.

b. Three (3) form C relay contact outputs, all independently programmable. Relay contacts shall be rated for continuous 2 Amps at 24VDC or 115/230VAC.

c. Function selections shall include indications that the drive is ready, running, faulted. General and specific warning and pump fault indications shall be available

d. Three (3) analog inputs, expandable to five (5), one (1) +/- 0VAC - 10VAC and two (2) 4mA - 20mA, all independently programmable. A differential input isolation amplifier shall be provided for each input. Analog input signal processing functions shall include scaling adjustments and adjustable filtering. If the input reference (4-20mA or 2-10V) is lost, the AFD shall give the user the option of the following: (1) stopping and displaying a fault, (2) running at a programmable preset speed, (3) hold the AFD speed based on the last good reference received, or (4) cause a warning to be issued, as selected by the user.

The drive shall be programmable to signal this condition via a keypad warning and/or over the serial communications bus.

e. Two (2) analog, expandable to four (4), outputs providing 4mA to 20mA signals. Analog output signal processing functions shall include scaling adjustments, adjustable filtering and signal inversion. Outputs shall be independently programmable to provide signals proportional to at least 11 output function selections including output speed, frequency, current, process variable and vibration level.

8. Serial communications

a. Serial communication interface modules are available for a wide selection of communication protocols. Available adapters are as follows: Modbus, Modbus Plus, Profibus, DeviceNet and Ethernet.

b. Serial communication capabilities shall include, but not be limited to, run-stop control; setpoint adjustment, current limit, and accel/decel time adjustments. The drive shall have the capability of allowing the Distributed Drive Controller (DDC) to monitor feedback such as process variable feedback, output speed/frequency, current (in amps), % torque, power (kW), kilowatt hours (resettable), operating hours (resettable), relay outputs, and diagnostic warning and fault information. Additionally, remote Local Area Network (LAN) VFD fault reset shall be possible.

c. A fiber optic communication port shall also be provided for personal computer interface. Microsoft Windows®-based software shall be available for drive setup, diagnostic analysis, monitoring and control. The software shall provide real time graphical displays of drive performance.

9. Drive Protective Functions

a. For each programmed warning and fault protection function, the drive shall display a message in complete English words or Standard English abbreviations. The sixty-four (64) most recent fault messages and times shall be stored in the drive's fault history.

b. The drive shall include internal MOV's for phase to phase and phase to ground line voltage transient protection.

c. Output short circuit and ground fault protection rated for 65,000 amps shall be provided per UL508C without relying on line fuses. Motor phase loss protection shall be provided.

d. The drive shall provide electronic motor overload protection qualified per UL508C.

e. Protection shall be provided for AC line or DC bus overvoltage at 130% of maximum rated voltage or undervoltage at 65% of min. rated voltage and input phase loss.

f. A power loss ride through feature will allow the drive to remain fully operational after losing power as long as kinetic energy can be recovered from the rotating mass of the motor and load.

g. Stall protection shall be programmable to provide a warning or stop the drive after the motor has operated above a programmed torque level for a programmed time limit.

h. Underload protection shall be programmable to provide a warning or stop the drive after the motor has operated below a selected underload curve for a programmed time limit.

i. Over-temperature protection shall provide a warning if the power module temperature is less than 5°C below the over-temperature trip level.

10. All logic set forth in this specification must reside internal to the drives internal microprocessor. No systems using an external controller shall be acceptable.

11. Drive shall be preprogrammed with a centrifugal pump specific application macro.

12. The two drives shall be connected via fiber optic cables to allow communication between the drives.

    a. A master drive shall have the ability to stage and de-stage up to three (3) lag pumps based on demand of the system.

    b. If for any reason a pump fault or VFD fault is detected the drive shall stop the pump and single the lag pumps to compensate.

    c. The drive should have the ability to automatically switch lead lag based on a timed value.

13. The program must be designed for ease of use and come standard with a user friendly programming manual specific for centrifugal pumps.

14. The Control Panel (keypad) should have the ability to display pump nomenclature (PSIG, GPM, IP/s, mm/s, etc.) to allow the operator to have a better understanding of the current pump and system status.

15. Drive shall have an internal controller to control a process variable such as pressure, flow, level, etc.

16. Controls functions shall be as follows:

    a. A motor parameter ID function shall automatically define the motor equivalent circuit used by the sensorless vector torque controller.

    b. The VFD shall be capable of starting into a rotating load and accelerate or decelerate to reference without safety tripping or component damage (flying start).

    c. The VFD shall have the ability to automatically restart after an overcurrent, overvoltage, undervoltage or pump protect fault. The number of restart attempts, trial time, and time between reset attempts shall be programmable.

    d. Discrete Inputs

        (i) Start/Stop functions shall include two (2) or (3) wire start/stop discrete inputs.

        (ii) Drive shall have a discrete input for a remote manual override/jog function in two (2) wire start/stop control.

    e. Drive shall include a digital input that allows two preprogrammed setpoints to be toggled back and forth to allow the ease of changing the setpoint for different modes, time of day, etc.

    f. Drive shall include a drive permissive or emergency stop digital input.

    g. Drive shall have adjustable accel/decel ramp rates to limit the in-rush current and prevent water hammer in the piping system.

17. Pump Protection Features:

a. Drive shall have the ability to detect and protect against detrimental pump conditions including:

(i) Dry Run

(ii) Shut Off

(iii) Dead Head

(iv) Severe Cavitation

(v) Low Flow

b. Drive shall have a minimum of two digital inputs dedicated for a secondary pump protection binary input such as level, pressure, flow, temperature switches.

18. Condition Monitoring

a. Drive shall have the capability to monitor bearing vibration via a 4-20mA analog input. The keypad display should clearly indicate the units of the vibration condition such as IP/s or mm/s. The drive will have two programmable levels to signal a warning and alarm. If the alarm level is reached the drive shall either reduce the pump speed to pre-programmed speed or fault the pump.

19. Hydraulic Wear Monitor

a. Drive should have the capability to detect pump wear at programmable levels of 10%, 15%, 20%, 25% and indicate when these levels have been achieved.

b. The drive shall have the ability to distinguish between actual pump performance degradation and system changes.

20. Sequence of Operation

a. Setpoints shall be entered at the keypad of the lead drive. Alternately setpoint in auto mode may be provided via a 4-20mA input to the lead drive, or over Ethernet (Ethernet card required).

b. In Automatic mode, the system shall monitor discharge pressure via the discharge pressure transmitter. When discharge pressure drops below the specified set point the pump set shall be enabled.

c. Once enabled, the system shall automatically maintain the discharge pressure set-point until pressure rises above the pressure set point, disabling the booster pump station until pressure falls again.

d. When enabled in auto mode, the system shall automatically stage and destage pumps if a single pump cannot meet system demand.

e. The drives shall be programmed to automatically protect the pumps from flow below minimum flow and from run-out using the drives' sensorless flow feature. No external flow meter shall be required.

21. Pressure Transmitter

a. Provide a pressure transmitter with analog 4-20ma output with the minimum range of 0-150. Pressure transmitter shall be Rosemount Model 2088 or approved equal.

**2.05 - ACCESSORIES**

A. Lubrication Lines: Copper Tubing

B. Pump Plugs: Steel

C. Bolts and Hardware: Stainless Steel, ASTM A582, Type 416

D. Casing Relief Valve: ¾"

E. Suction and Discharge Gauges: 4 ½".

**2.06 - SPARE PARTS**

A. One (1) set of wear rings for each pump.

B. One (1) set of shaft sleeves for each pump.

C. One (1) set of inner and outer bearings for each pump.

D. One (1) set of mechanical seals for each pump.

E. One (1) set of complete gaskets for each pump.

## PART 3 - EXECUTION

### 3.01 - FACTORY TEST

A. Each component shall be factory tested to ensure optimal operation and performance prior to being shipped to the owner. Provide Engineer with TDH and flow performance curves for each pump from the minimum to maximum speed.

### 3.02 - PUMP INSTALLATION

A. Contractor shall protect all components of the pump and electrical connections prior to permanent electrical installation by Contract “E” and satisfactory start-up.

B. Install pumps plumb and level. Anchor pump to concrete with ½ inch S.S. adhesive anchors.

C. Install motor and pump in accordance with manufacturers installation instructions.

D. Coordinate each pump’s rotation with the prime Electrical Contractor in the presence of the manufacturer’s representative.

E. Turn over Operator’s Control Panel to Electrical Contractor for installation in location shown on the drawings. Electrical Contractor shall provide power to the Control Panel and connection of pressure transmitter to the Control Panel.

F. Turn over pressure transmitter to Plumbing Contractor for installation on discharge piping.

### 3.03 - FIELD QUALITY CONTROL

A. Test each electric motor and record operating voltage and amperage with the prime electrical contractor. Test the seal leak sensor and relay for each pump. The authorized manufacturer representative shall record this information on the manufacturer’s startup report (MSR).

B. Submit the MSR for each pump startup for record purposes. Record the model number, serial number, and nameplate data on each MSR. Separate MSR’s shall be provided for each pump.

C. The Contractor shall mount all pump hoist deck sockets where directed by the Engineer using s.s. hardware rated for the intended maximum load with a factor of safety of 2.

**3.04 - BOOSTER PUMP - SCHEDULE 432110-1**

A. General:

| | |
|---|---|
| Application: | Fine Screen Washwater Booster Pump (BP-1) |
| Quantity: | 1 |
| Stages: | 3 |
| Gould's Model Number: | 10eSV |
| Control Panel: | VFD Control Panel |
| Flow: | up to 40 gpm |
| Output pressure: | minimum 80 psi |

B. Physical Characteristics:

| | |
|---|---|
| Pump Suction Size: | 2 in. |
| Pump Discharge Size: | 2 in |

C. Electrical Characteristics:

| | |
|---|---|
| Minimum Motor Horsepower (hp): | 5 HP |
| Motor Speed (RPM): | 3500 RPM |
| Service Voltage (V): | 460 |
| Frequency (HZ): | 60 |
| Phase: | 3 |

Variable Frequency Ready Motor Required

NOTES: (1) Pump shall be capable of installation in the vertical configuration as shown on the Contract Drawings.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 DESCRIPTION

A. Scope:

This section of the specifications covers the labor, materials, equipment and installation necessary to install two (2) rotating drum screens with appurtenances for a complete operating system. Items of equipment include but are not limited to; rotating screen basket, cleaning comb, concentric screw conveyor, dewatering and compaction section, drive assembly, pivoting support structure, booster pump and spray wash systems, weather protection system, channel cover, spare parts, control panel and anchors and fasteners. All equipment items shall be supplied by a single supplier to insure a complete working system.

Each rotating drum screen shall be complete with dedicated electrical control panels, CP-2A and CP-2B, and level sensing system. Systems for this project, other than rotating drum screens with integral screening, screenings washing, transport, and compaction/dewatering using a single motor drive system, shall not be considered for this project. All equipment manufacturers not listed in the specifications shall submit documentation in accordance with Section 012500 – Product Substitution Procedures.

The rotating drum screens shall be designed for removing floating, particulate or fibrous material and to transport washed and dewatered screenings to a collection container as shown on the contract plans. All materials of construction for the rotating drum screen shall be corrosion resistant.

B. Design Summary

1. Number of Rotating Drum Screens - 2
2. Maximum Clean Water Capacity per Screen, mgd - 1.380
3. Maximum Upstream Liquid Level, inches - 21
4. Maximum Clean Water Headloss, inches - 16
5. Screen Basket Type - Perforated
6. Nominal Screening Basket Diameter, inches - 29.00
7. Screen Opening Diameter, inches - 0.080
8. Minimum Wetted Area of the Screen Basket, square inches - 1,384
9. Screening Channel Width, inches - 30

10. Nominal Screw Conveyor Diameter, inches - 10

11. Minimum Screen Invert to Discharge Height, inches - 168

12. Speed Reducer Minimum Service Factor - 1.63

13. Speed Reducer Minimum Torque Rating, in.-lb - 26,900

14. Speed Reducer Minimum Thrust Rating, lbf - 8,400

15. Speed Reducer Maximum Output Shaft Speed, rev/min - 7.2

16. Minimum Drive Motor Size, hp – 2

17. Electrical Power Characteristics, VAC – Hertz – Phase - 460 – 60 – 3

18. Motor and Solenoid Valve Electrical Classification - Class I - Division 1 - Group D

19. Maximum Spray Wash System Flow Rate, gal/min -15

20. Minimum Spray Wash System Pressure, psig - 80

21. Lower Wash Systems Number of Nozzles per Header - 26

22. Liquid Level Sensing System Type - Ultrasonic differential

23. Electrical Enclosure Type - NEMA 4X stainless steel

**1.02 REFERENCES**

A. American Gear Manufacturers Association (AGMA)

B. American Institute of Steel Construction (AISC)

C. American Society of Testing and Materials (ASTM)

D. American Welding Society (AWS)

E. National Electrical Manufacturers Association (NEMA)

F. National Fire Protection Association (NFPA)

## 1.03 QUALITY ASSURANCE

A. The fine screen enclosure shall be furnished by a single manufacturer fully experienced in the manufacturing of the equipment to be furnished. The fine screen manufacturer shall have a minimum of 10 years of experience in the design and manufacturer of the automatic rotary drum type fine screens.

B. The contract documents provide details of a complete equipment installation for the purpose specified. It shall be the responsibility of the Contractor to coordinate all the details required for a complete operating system, such as protective coatings, piping, pumps, precast concrete and wiring. The Contractor shall provide for all work required to properly install, adjust and place into operation a complete working system.

## 1.04 SUBMITTALS

A. Information required for approval by the Engineer prior to incorporation into the project shall include the following as a minimum requirement:

1. Certified dimension prints detailing all required anchor bolt locations and conduit stub-outs.

2. Specifications for all electrical and mechanical components and complete wiring diagrams for all the automatic functions.

3. Manufacturer’s recommended procedures for jobsite storage and handling of equipment.

B. Operation and Maintenance Manuals (2 required): Prior to delivery of equipment and updated as required during installation of the equipment, the manufacturer shall furnish complete and detailed installation, operation and maintenance manuals which shall include the following as a minimum requirement:

1. Assembly, installation and adjustment instructions.

2. Maintenance instructions.

3. Complete descriptive literature of all materials and components furnished.

4. Erection drawings with equipment mark numbers.

## 1.05 PERFORMANCE

A. The rotating drum screen shall be designed to handle the maximum clean water hydraulic capacity with the maximum upstream liquid level. This maximum upstream liquid depth includes the maximum allowable clean water headloss.

B. Screen designs that define the opening spacing as the distance between a fixed bar element and a moving adjacent rake element (step-type screen) shall not be acceptable for this project. Screens using a stationary perforated plate cleaned by a brush (semi-cylindrical screen) shall not be acceptable for this project.

C. The average screen flow through velocity shall not exceed 3.0 ft/sec under any flow condition up to the maximum clean water hydraulic capacity. The screen design shall minimize solids deposition in the channel.

D. The rotating drum screen shall include a rotating cylindrical drum with an integral screw conveyor and press. The rotating drum screen shall use a single drive for screening, conveying, dewatering and compressing screening material. Dual drive designs shall not be acceptable for this project.

E. The operation of the rotating drum screen shall be automatically initiated at a preset high liquid level. Screens that operate continuously or via timer only shall not be acceptable. The rotating drum screen shall remove solids from the wastewater flow and shall deposit them into the concentric screw conveyor trough. The screenings shall be transported up the screw conveyor and through a compression chamber.

F. The screening equipment shall produce dewatered screenings capable of passing the EPA Paint Filter Test as described in method 9095 of EPA Publication SW-486.

G. The control system shall be designed so that the cleaning characteristics of the screen and spray wash systems can be changed via the programmable controller. Systems that do not offer this feature shall not be considered for this project.

## 1.06 SCREENINGS WASHING

A. Each screen shall be furnished with a dual screenings spray wash system to flush organic material from the screenings prior to compaction and dewatering. The screenings washing systems shall be designed to minimize the amount of organic material in the screenings and to maximize solids dryness after compaction and dewatering. The dual screenings washing systems shall include:

1. Basket spray system shall be oriented basket with two (2) spray wash headers, complete

with nozzles to remove collected screenings from the inside of the basket into the screenings collection trough. The basket spray system shall pre-wash the screenings to remove fecal material and to minimize fecal material in the dewatered screenings.

2. Screenings wash system shall be located just prior to the beginning of the compaction zone after maximum maceration of the screenings by the screenings transport screw conveyor. At the maximum wash water flow rate, the screw conveyor shall be designed to prevent screenings from being washed down the screenings transport tube to the basket.

**1.07 ODOR CONTROL**

A. To minimize odors and nuisance insect populations, the rotating drum screen transport system and compaction/dewatering system shall be completely enclosed.

B. The spray wash systems shall be completely enclosed to prevent spray, aerosols, and leakage from coming in contact with the operating floor.

**1.08 MATERIALS QUALITY**

A. All fabricated components of the screen shall be AISI Type 316 stainless steel including the screen basket, screw conveyor, outer screw conveyor housing, support structure, and channel cover. Materials thicknesses identified in PART 2 - PRODUCTS are the minimum requirements for this project. Materials with increased thicknesses will be acceptable.

B. To ensure spare parts availability, all fabricated components shall be manufactured in the United States. To ensure prompt service and to ensure spare parts availability in a timely manner and at a reasonable cost, foreign fabricated materials of construction for the components identified in paragraph 1.08.A. shall not be acceptable for this project.

C. If metric materials are utilized for fabrication of the screen components, the manufacturer shall utilize materials that are equal to or larger for unit sizes noted and shall utilize material thicknesses that are equal to or greater than specified.

**1.09 WARRANTY**

A. Provide a Warranty Certificate from the manufacturer typed on company letterhead and signed by an authorized officer of the manufacturer. The certificate shall be witnessed by a notary public in the state in which the company headquarters is located. The Warranty Certificate shall be submitted, verbatim and without exception, as follows:

"***(Name of Manufacturer)*** guarantees all components of the system to be free from defects in design, materials and workmanship for a period of two (2) years commencing on the date

the system was permanently placed on-line, and the mechanical equipment functions without flaw.

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 we provided, then we shall repair or exchange such defective part(s).

The replacement or repair of parts normally consumed in service shall include lubrication. These parts only shall be considered as part of routine maintenance and upkeep and shall not be considered eligible for exchange free of charge under this Warranty.

Agreed upon this _____ day by
(DATE)

_____ of
(NAME OF AUTHORIZED AGENT)

_____, who,
(NAME OF MANUFACTURER)

by signing this document, affirms that he/she is legally authorized to submit this warranty on behalf of the Supplier.

_____ _____

AUTHORIZED SIGNATURE DATE

_____ _____

NOTARY DATE

**PART 2 – PRODUCTS**

**2.01 MANUFACTURER**

A. The rotating drum screen assembly shall include all necessary equipment and appurtenances as manufactured by Lakeside Equipment Corporation, of Bartlett, Illinois, or pre-approved equal.

**2.02 ROTATING DRUM SCREEN**

A. Screen

1. The rotating drum screen shall be designed and built to withstand maximum possible static and hydraulic forces exerted by the liquid to the screen. All structural and functional parts shall be sized for the loads encountered during the screening, conveying and pressing operations. All submerged components and all components of the rotating drum screen in contact with the screened solids shall be of stainless steel construction.

2. The screen basket shall be of a cylindrical shape and installed in the channel parallel to the direction of liquid flow.

3. The basket diameter shall be matched with a sufficient screen opening size and spacing to ensure the maximum clean water hydraulic capacity flow rate is achieved and to

provide less than the maximum headloss.

4. The basket screen shall be bolted to 1-inch thick minimum upper and lower stainless steel support rings with a sufficient number of bolted stainless steel strengthening spokes to allow for field replacement of the basket. Stainless steel lifting vanes shall be welded to the inside of the basket to lift the screenings out of the flow and to deposit them into the screenings collection hopper. Lifting vanes shall be fabricated from 10-gauge thick minimum stainless steel.

5. A deflector plate shall be provided to enclose the circular screen and the rectangular concrete channel. The deflector plate shall be fabricated of 10 gauge thick minimum stainless steel and shall be of sufficient height to prevent bypassing of flow around the screen at the maximum clean water hydraulic capacity flow rate. The deflector plate shall be structurally tied to the upper basket support plate in each of the four corners to ensure proper basket seal alignment at all times. Each of the four (4) deflector plate structural support members shall be fabricated of 2-inch minimum Schedule 40S pipe.

6. The rotating drum screen shall be provided with a field replaceable seal between the rotating basket and the deflector plate.

7. The screen shall be provided with a pivoting support stand allowing for easy removal of the screen basket from the channel for maintenance purposes. To ensure operator safety during servicing of the screen, the supports and support stand shall be fabricated from 1/4-inch minimum stainless steel shapes and plates for operator safety.

8. A stainless steel lower screen basket support fabricated of 1/4-inch sections shall be provided to support the basket in the channel. Support shall allow vertical adjustment of the screen basket so that it does not rest on the channel floor.

B. Screenings Conveyor and Screenings Dewatering Press

1. The screenings screw conveyor transport tube shall be fabricated of Schedule 10S pipe with a minimum wall thickness of 0.165 inches to minimize deflection.

2. A minimum of three (3) 3/4-inch wide minimum anti-rotation bars with 1/4-inch minimum thickness shall be welded to the inside of the transport tube along the longitudinal axis from the compaction zone to the beginning of the screenings collection trough. The screenings screw conveyor shall not depend on support from the anti-rotation bars during normal operation.

3. A basket support plate flange shall be a minimum of 3/4-inch and shall be welded to the

lower end of the screenings transport tube to attach the screen basket and to provide for attachment of the screenings collection hopper. A 1/2-inch minimum thick drive support flange shall be welded to the upper end of the screenings transport tube for attachment of the drive assembly. After all welding of components to the screenings transport tube have been completed the fabrication shall be placed in a lathe to machine the face of the upper drive flange, to machine the face of the lower basket support plate flange for mating the basket and to machine the lower bearing housing. A 1/2-inch thick minimum drive assembly adaptor stainless steel flange shall be provided to bolt to the upper drive support flange.

4. The dewatering screw shall be designed to transport and dewater the screened material. Screw flights shall be all stainless steel construction with a minimum thickness of 3/16-inch with increased 3/8-inch thick minimum thickness in the screenings collection trough and in the compaction and dewatering zone. Designs using alloy carbon steel or a shaftless screw design shall not be acceptable for this project. Flight pitch distance shall be a maximum in the screenings collection hopper and shall be reduced along the length of the screenings transport tube to a minimum pitch distance in the compaction zone. Constant pitch screenings screw conveyor designs shall not be acceptable for this project.

5. The upper and lower screenings conveyor torque tube shall be fitted with a solid stainless steel stub shaft. The stub shafts and screenings screw conveyor torque tube shall be accurately machined to allow a welded shrink-fit design.

6. The rotating basket shall be driven by a single lower basket support spoke fabricated of 4-inch by 4-inch by 3/8-inch thick minimum square stainless steel tubing that shall be connected to a basket web fabricated of 1/2-inch thick minimum stainless steel plate that is attached to the rotating screen basket. The lower basket support spoke hub outer diameter shall match the outer diameter of the stationary bearing housing to minimize material wrapping around the shaft. A seal plate shall be furnished to mate between the stationary lower bearing support and the rotating support spoke hub to prevent material intrusion into the bearing seals. A key with keyway shall be provided to position the basket hub on the screenings screw conveyor lower stub shaft.

7. The lower end of the screenings conveyor shall be supported by a sealed, self-lubricated lower polymeric composite sleeve bearing with stainless steel wear sleeve. Metallic-based or ceramic-coated metallic-based lower bearings shall not be acceptable for this project. The lower bearing shall not take any thrust load from the screw conveyor. A minimum of two (2) seals shall be provided each with a UHMW polyethylene seal retainer plate. The stainless steel bearing housing shall be field-replaceable and shall be

machined to mate with the screenings collection housing by a bolted connection. The lower bearing housing shall be mated to the screenings collection hopper via a bolted design utilizing a minimum of four (4) stainless steel bolts. Designs in which the bearing housing is welded directly to the screen body shall not be acceptable for this project.

8. The rotating drum screen attachment hub outer diameter shall match the outer diameter of the stationary bearing housing to minimize material wrapping around the shaft. A seal plate shall be furnished to mate between the stationary lower bearing support and the rotating drum to prevent material intrusion into the bearing seals.

9. The upper end of the rotating drum screen basket shall be supported by a minimum of four (4) polymeric roller assemblies. Each roller assembly shall be mounted on a stainless steel carriage that shall be bolted to the main upper basket support flange to provide smooth operation of the rotating drum screen basket. Each roller assembly shall be supported by two (2) grease-lubricated bearing assemblies.

10. A drainage section shall be provided along the entire length of the screenings collection trough invert to allow for gravity drainage of washwater without flushing screenings out of the trough. The width of the drainage section shall be based upon a minimum 64-degree arc with cutouts with 2-inch spacings between the cutouts in the lower screenings transport tube. The gravity drainage section shall be provided with a perforated drainage plate that shall be fabricated from 11 gauge minimum thick stainless steel and shall have 1/4-inch diameter perforations spaced on 5/16-inch centers to provide a minimum open area of 58 percent. The gravity drainage plate shall be welded to the inside diameter of the lower screenings transport tube.

11. A compaction zone shall be an integral part of the screenings screw conveyor and transport tube design. The compaction zone shall be designed to form a screenings plug of material and to return water released from the screened material back to the wastewater channel through circular holes that are machined into the screenings transport tube. Compaction zone shall be fabricated from 12 gauge minimum thick stainless steel welded to the screenings transport tube to provide a watertight screenings pressate collection chamber. Compaction zone housings that are non-metallic and which require seals to prevent leakage around the screenings transport tube shall not be acceptable for this project. Compaction zone housing shall be furnished with a hinged and gasketed access cover held in place with captive stainless steel fasteners as well as a bolted dewatering section panel inside the dewatering chamber to allow direct access to the screw conveyor should the compaction zone ever become plugged. Designs that require removal of the drive assembly, discharge head or screw conveyor to gain access to the compaction zone shall not be acceptable for this project.

12. Water that is released from the screenings shall be returned via a reinforced rubber hose attached to the dewatering section. Drain design shall allow for removal and cleaning of the drain hose should it ever become plugged without removing the drive, discharge head or screw conveyor.

C. Drive Assembly

1. The rotating drum screen and transport screw shall be driven by a direct-connected, cycloidal-bevel, hollow-shaft, high-thrust, right-angle speed reducer. The cyclo element of the speed reducer shall be designed to take a 500 percent shock load without damage. The speed reducer manufacturer shall be a member of AGMA. Combination gear motor designs shall not be acceptable for this project. The speed reducer shall be bolted to the drive adaptor flange at upper end of the screenings transport tube.

2. The speed reducer shall be driven by a field-replaceable NEMA C-flanged, 1,800 rev/min, ball bearing, inverter-duty, premium-efficiency, totally-enclosed, fan-cooled motor with leads to a large conduit box for outdoor operation. Explosion-proof motor shall be furnished with over-temperature thermostats in the motor rated for cutout at approximately 160$^{o}$C.

3. Chain-drives, belt drives, hydraulic drives or a separate upper bearing for the transport screw shall not be acceptable for this project.

D. Spray Wash Systems

1. Three (3) spray systems shall be provided for each screen. Each spray wash system shall be furnished with a control solenoid valve, Schedule 40S stainless steel piping and fittings, flexible reinforced PVC hose and nozzles. A plant water strainer shall be provided for the incoming plant water supply for each screen. The three (3) spray wash systems shall include:

i. Basket lower external spray system – two (2) basket lower external spray systems shall be located on the exterior of the screen basket and shall include a stainless steel header assembly that shall span the full length of the basket. The lower outer spray wash system header shall be 1-inch diameter Schedule 40S stainless steel pipe header assembly with the minimum of stainless steel spray nozzles. Plastic header assemblies shall not be acceptable for this project.

ii. Screenings wash system – the screenings wash system shall be located in the upper section of the transport tube no more than 17 inches from the beginning of the compaction zone to break up and return organic materials to the flow stream

and to ensure maximum screenings washing. A minimum of one (1) injection point shall be provided. The screenings wash system and screenings screw conveyor shall be designed to prevent washing screenings down the center of the screw conveyor.

iii. Dewatering chamber flush system – the dewatering chamber flush system shall periodically clean the compaction and dewatering zone via a stainless steel wash nozzle located in the compaction/dewatering chamber.

2. The three (3) flow control solenoid valves for each wash system shall be 3/4-inch minimum, brass body suitable for 120 VAC operation with an electrical rating. Solenoid valves shall be normally closed and rated for up to 100 psig. Solenoid valves shall be ASCO Series 8221, or equal, slow-close type to minimize water hammer and shall be capable of operating at water temperatures up to 125 degrees F.

3. Solenoid valves shall be factory installed to a piping manifold to ensure even pressure distribution to each spray wash system. The solenoid valve wiring shall be factory installed to a common junction box on the spray wash manifold for wire nut connection to external power. Conduit and fittings shall be factory installed between the solenoid valves and junction boxes. Junction box, conduit and fittings shall be rated NEMA 4/7/9 for explosion-proof locations. The entire wash system shall be factory-mounted to the outside of the screenings transport tube. Mounting the wash system to the compaction zone pressate collection chamber shall not be acceptable for this project.

4. One (1) water strainer shall be provided for each screen suitable for a 3/4-inch connection and a minimum flow rate of 25 gal/min with a maximum 2 psig pressure drop. The water strainer shall be suitable for a maximum pressure of 125 psig and a maximum water temperature of 125$^{o}$F. Water filter shall be a stacked filter element design with washable 80-mesh (200 micron) polyethylene or polypropylene disc elements, polypropylene head and bowl and Buna N gaskets. Wye-type shall not be acceptable for this project.

**2.03 SCREENINGS BAGGER**

A. The discharge chute shall be furnished with a bagging device to contain and encase dewatered screenings.

B. The bagging device shall be fabricated of 12 gauge minimum stainless steel.

C. The screenings bagger attachment shall be designed to be fitted with 262 ft of continuous hose that is factory-mounted to a field-replaceable cassette. Two (2) hose bagger cassettes with factory-mounted hose shall be provided for each screen.

**2.04 COLD WEATHER PROTECTION**

A. The screenings discharge transport tube shall be furnished with a heat tracing system for outdoor weather protection that shall completely enclose the screenings transport tube, compaction and dewatering zone, screenings discharge drop chute and all spray wash piping and solenoid valves.

B. The cold weather protection system shall include heat tracing, adjustable thermostat, insulation and a fiberglass protective jacket. Heat tracing shall be suitable for an electrical environment as noted.

C. The heat tracing system shall be suitable for operation down to a minimum temperature of -25$^{o}$C (-13$^{o}$F) and shall be powered from the main control panel.

D. Weather protection system protective cover shall be molded fiberglass reinforced polyester laminate, with the exterior surface gel coated for ultraviolet radiation protection. Fabricated metallic or plastic covers that are glued, bolted, or riveted together or covers made of fabric shall not be acceptable for this project. Fiberglass shall have a glass content of not less than 30%, a tensile strength of not less than 22,000 psi, a flexural strength of not less than 25,000 psi and Barcol hardness of not less than 40. Finished fiberglass must withstand a temperature of 200oF without blistering, pinholes, warping or other defects. Gel coat shall be provided with impregnated pigment for exterior light gray color. The weather protection package cover shall be designed to support a wind load of 30 lb per square foot.

E. The weather protection package fiberglass cover sections shall be split into two (2) sections when mounted axially along the transport tube. Weather protection system fiberglass cover sections shall extend from the discharge chute over the compaction and dewatering zone and down to the main basket support flange gussets. Each split fiberglass cover section shall be connected via fiberglass flanges and no more than six (6) stainless steel thumb screws for ease of operator access. Each fiberglass cover section shall be designed so that the insulation is completely encapsulated within the fiberglass to prevent water intrusion and damage. Designs utilizing loose fiberglass or foam insulation that are not encapsulated in FRP shall not be acceptable for this project. Each fiberglass half section shall be approximately 2 feet long with molded fiberglass flanges. Individual sections shall be connected via fiberglass flanges and a stainless steel V-ring captive clamping system for easy installation and removal.

F. Where the wash water supply and electrical wiring conduit penetrates the fiberglass cover bulkhead adapters shall be provided.

G. All fasteners to assemble the fiberglass cover components shall be stainless steel.

H. The plant water supply system piping to the screen and the water strainer described in paragraph 2.02.D.4. shall be provided with heat tracing and insulation by the CONTRACTOR. The MANUFACTURERS control panel shall be provided with sufficient low voltage power to handle up to an additional 250 Watts from the CONTRACTOR supplied plant water heat tracing system.

I. A stainless steel weather protection housing shall be provided to cover the top of the screen basket to minimize wind chill effects. The weather protection housing sides and top shall be fabricated of 14 gauge minimum stainless steel. The top of the weather protection cover shall be designed with two (2) sliding cover sections that have been reinforced. Each cover section shall be provided with four (4) 1-1/2 inch minimum diameter wheels that shall roll in a 14-gauge minimum thick stainless steel wheel track. Each cover shall be provided with a handle for opening and closing the weather protection enclosure. The weather protection cover shall be designed to work with the FRP screenings transport screw weather protection system. Where the screenings transport screw exits the housing a split stainless steel cover plate shall be provided to allow the entire weather protection cover to be removed without complete disassembly.

**2.05 CONTROL SYSTEM**

A. All controls necessary for the fully automatic operation of the screen shall be provided in accordance with the NEMA standards.

B. The electrical control system shall provide for automatic control of the screen via an upstream liquid level using an ultrasonic liquid level control system in connection with an adjustable time clock. The screen shall operate at an operator defined liquid level and or a pre-determined time sequence to provide a variable time between cleaning operations.

C. The plant water booster pump pressure transducer shall monitor the line pressure to maintain a minimum of 80psi and a maximum of 100 psi and shall automatically run the booster pump to maintain this range.

D. The ultrasonic level sensing system for each screen shall be a Siemens LUT400 and EchoMax XPS-15F level transducer, or equal, which are suitable for an electrical environment as noted in paragraph 1.03.C.19. Pressure-type level sensors or float switches shall not be acceptable for this project.

E. A local-mounted main control panel for each screen (CP-2A and CP-B) suitable for wall or uni-strut mounting shall contain the following items:

1. Door-interlocked fused disconnect

2. Allen-Bradley MicroLogix 1100 programmable logic controller (PLC) with LCD, integral 10/100-Base-T Ethernet port, and back-up memory module

3. Square D Altivar 31, or equal, variable frequency drive (VFD) with line reactor. Reversing motor starters with current overload protection shall not be acceptable for this project.

4. Control power transformer fused primary and secondary with 120 VAC transient voltage surge suppressor (TVSS)

5. Full-voltage LED push-to-test pilot lights for each of the following:

   i. Control power ON (White)

   ii. Screen RUN (Red)

   iii. Multifunctional overload shutdown/screen fault (Amber)

   iv. Screen upstream high level ALARM (Amber)

   v. Booster pump RUN (Red)

6. Hand-Off-Auto selector switches for each of the following:

   i. Screen drive

   ii. Screen common wash system solenoid valves

   iii. Booster pump drive

7. Forward-Off-Reverse selector switch (spring return to center) for screen drive

8. E-stop pushbutton (Red)

9. Cycle/Re-set pushbutton (Black)

10. Door-mounted non-resettable elapsed time meter for each of the following:

    i. Screen drive

    ii. Booster pump drive

11. Remote dry contact outputs for the following:

    i. Screen drive RUN

ii. Multifunctional overload shutdown/screen fault ALARM

iii. Screen upstream high level ALARM

iv. Booster pump drive RUN

12. Screen weather protection system heat tracing circuit breaker

13. Plant water heat tracing (250 WATTS MAX BY CONTRACTOR) circuit breaker

14. Alarm horn, 100 dBA at 1 m with SILENCE pushbutton

15. Internal fluorescent 15-inch light, 120 VAC

16. Internal simplex receptacle, 120 VAC, 2 Amp maximum

17. Delta, or equal, lightning arrestor, 3 Phase

18. 3-phase surge suppression device, 230/460 VAC

19. One (1) set of spare fuses of each size and type

20. White phenolic nameplates with black lettering

21. 600 VAC terminal block

22. U.L. label for the project application

23. Electrical enclosure shall be provided in accordance with paragraph 1.03.C.21. complete with white coating on entire exterior surface and a stainless steel sunshield to minimize heat build-up.

**2.06 ANCHOR BOLTS**

A. Equipment manufacturer shall furnish all anchor bolts of ample size and strength required to anchor securely each item of equipment. Anchor bolts, hex nuts, and washers shall be AISI Type 316 stainless steel unless noted otherwise. Anchor bolts shall be drilled-in epoxy type.

B. Anchor bolts shall be set by the CONTRACTOR. Equipment shall be placed on the foundations, leveled, shimmed, bolted down, and grouted with a non-shrinking grout.

**2.07 SPARE PARTS**

A. The following spare parts shall be provided for each screen and/or control panel:

1. One (1) lower basket seal
2. Four (4) basket support polymeric roller and bearing assemblies
3. One (1) complete solenoid valve assembly
4. One (1) solenoid valve re-build kit
5. One (1) lower bearing element, stainless steel wear sleeve, and seal set
6. Two (2) hose bagger cassettes complete with factory-mounted 262-ft of hose
7. One (1) fuse set of each size and type

B. Spare parts shall be individually boxed with the project name and part number clearly identified on each individual box. All spare parts shall be shipped in a separate crate and clearly labeled. Spare parts shall be stored indoors by the CONTRACTOR in a temperature-controlled environment.

**2.08 SHOP SURFACE PREPARATION AND PAINTING**

A. Electric motors, speed reducers, and other self-contained or enclosed components shall have manufacturer's standard enamel finish.

B. Glass bead blast and/or chemically passivate all external non-wetted stainless steel to a uniform finish with Citrisurf 2050 and/or 2210. Chemical passivated stainless steel products shall not produce any hazardous wastes during the passivation process. The screen manufacturer shall clearly identify the passivation procedure methodology and shall certify that no hazardous wastes were produced.

**2.09 SOURCE QUALITY CONTROL**

A. All structural stainless steel components shall be fabricated in the United States and shall conform to the requirements of "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" published by the American Institute of Steel Construction. Certification of U.S. fabrication of all stainless steel components shall be provided with shop drawing submittals.

B. All parts and assemblies shall be fabricated from sheets and plates of AISI Type 316 stainless steel conforming to AISI 316 and ASTM A666, unless noted otherwise. All rolled or extruded shapes shall be fabricated to conform to ASTM A276. All tubular products and fittings shall be fabricated to conform to ASTM A269, A351, and A403.

C. All welding in the factory shall use shielded arc, inert gas, MIG, or TIG method. Filler wire shall be added to all welds to provide for a cross section equal to or greater than the parent metal does. All butt welds shall be full penetration type to the interior surface. Provide gas shielding to interior and exterior of the joint.

D. Welding of the screen components shall be in accordance with the latest edition of the American Welding Society (AWS) standards. Field welding of stainless steel shall not be permitted.

E. Assembly bolts, nuts, and washers shall be AISI Type 316 stainless steel furnished in accordance with ASTM A193.

F. All surfaces that are specified to be machined shall be designed and fabricated to provide a runout of not more than 0.005 inches and a concentricity to within 0.005 inches.

G. Design and fabrication of structural steel members shall be in accordance with AISC and AWS Standards. The manufacturer shall comply with the American Welding Society (AWS) and the American Institute of Steel Construction (AISC) most current listed standards and qualifications in 2004 D1.1, the criteria per the requirements of Section 6 - Inspection - Structural Welding Code. Evidence of such AWS and AISC compliance shall be submitted with shop drawing submittals as follows:

1. The fabrication facility shall successfully meet the quality certification requirements of the AISC Quality Certification Program with a Category I or higher. The AISC Quality Certification Program will confirm that the AISC certified shop has the personnel, organization, experience, procedures, knowledge, equipment, capability and commitment to produce fabricated steel or stainless steel of the required quality for the wastewater treatment equipment.

2. AWS Certified Welding Inspectors (minimum 2 on staff) shall conform to all standards, current or previous as listed in section 6.1.4 AWS QC1, Standard and Guide for Qualification and Certification of Welding Inspectors.

3. AWS Non Destructive Testing Inspectors (Level I, II, III) for Magnetic Particle and Ultra-Sonic testing (minimum 2 on staff) shall conform to all standards, current or previous as listed in and in conformance with The American Society for Non-Destructive Testing (ASNT-TC-1A).

**PART 3 - EXECUTION**

**3.01 SHOP TESTING**

A. Prior to shipment of the equipment the screen shall be operated for a minimum of four (4) hours at the fabrication location with the specific drive motor that will be furnished for the project at the actual operating angle of the screen for the project.

B. During the shop test the following parameters shall be recorded:

1. Motor serial number

2. Amperage draw at start-up, after two hours and after four hours during forward operation

3. Amperage draw during reverse operation

C. A certified shop test report shall be submitted to the ENGINEER.

**3.02 FIELD PREPARATION AND PAINTING**

A. The CONTRACTOR shall touch-up all shipping damage to the paint and stainless steel as soon as the equipment arrives on the job site.

B. The CONTRACTOR shall finish paint electrical motors, speed reducers, and other self-contained or enclosed components with oil-resistance enamel.

C. Prior to assembly the CONTRACTOR shall coat all stainless steel bolts and nut threads with a non-seizing compound.

**3.03 INSTALLATION**

A. The manufacturer shall schedule two (2) trips to the project site for equipment start-up assistance for each screen for the CONTRACTOR and for operating training for OWNER personnel.

B. After the CONTRACTOR has installed the rotating drum screens and the equipment is capable of being operated, the equipment manufacturer shall furnish a qualified representative for a minimum of three (3) days (up to 24 hours) to inspect the equipment and to supervise field-testing and start-up for the CONTRACTOR.

C. After the equipment has been placed into operation, the manufacturer's representative shall make all final adjustments for proper operation.

**3.04 FIELD TESTING**

A. Prior to final acceptance of the screen, three (3) tests shall be conducted according to the EPA Paint Filter Test as described in method 9095 of EPA Publication SW-486.

B. Should the system fail to produce screenings capable of passing the "EPA Paint Filter Test", the manufacturer shall at its own expense make all necessary modifications to the equipment until such tests can be passed.

**3.05 OPERATOR TRAINING**

A. Provide operator training for OWNER'S personnel after system is operational. Training will take place while manufacturer's representative is at the job site for inspection.

B. Within twelve (12) months after start-up, the manufacturer shall provide one (1) trip and one (1) day (up to 8 hours) of follow-up service and operator training. This shall be exclusive of the start-up service work that is specified in paragraph 3.03. and 3.05.A.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - SECTION INCLUDES

A. The aeration header drop legs and diffuser assemblies for the new Pre-Equalization tanks and Sludge Holding tanks as shown on the Contract Plans shall be furnished and installed as work of this Section by the installing General contractor.

B. Provide adhesive anchors for diffuser systems in accordance with the spacing requirements specified herein.

### 1.02 – RELATED SECTIONS

A. Section 013300 - Submittals

B. Section 014500 - Quality Control

C. Section 016500 - Product Delivery, Storage and Handling

D. Section 017500 - Starting and Adjusting

E. Section 017823 - Operating and Maintenance Data

F. Section 099100 - Painting

G. Section 220529 – Hangers and Supports for Plumbing Piping and Equipment

H. Section 401200 – Compressed Air Process Piping

### 1.03 - REFERENCES

A. American Gear Manufacturers Association

B. American National Standards Institute

C. American Society of Heating, Refrigeration and Air Conditioning Engineers

D. American Society of Manufacturing Engineers

E. American Society of Testing and Materials

F. Anti-Friction Bearing Manufacturers' Association

G. AWS D10.4 - Recommended Practices for Welding Austenitic Chromium Nickel Stainless Steel

Piping and Tubing

H. National Electrical Manufacturers Association

I. National Electrical Manufacturers Association

**1.04 – SYSTEM DESCRIPTION**

A. Exposed pipe located within any tank, including headers, drops and diffusers laterals shall be stainless steel.

**1.05 - SUBMITTALS**

A. Submit in accordance with the requirements contained in Section 013300.

B. Submit the following aeration related information for each diffuser listed in the schedule:

1. Technical specifications for the diffusers and accessories, including the Certified Oxygen Transfer Curve and the Certified Diffuser Headloss Curve for the applied coarse bubble diffusers.

2. Dimensional data for components of each aeration system

3. Outline drawings showing placement of drop pipe, manifold, headers, valves, diffusers, and all other diffuser equipment in relation to interior tank or basin walls.

4. Data on pipe material, coatings, linings, pipe fittings, dimensions and accessories. Provide manufacturer's catalog information.

5. Piping shop drawings. Field measurement then fabrication of pipe will not be permitted.

6. Storage, handling and installation instructions.

7. Warranty Certificate.

8. Manufacturer Startup Reports (MSR's) as specified in Section 017500 for the aeration equipment.

C. Submit an operation and maintenance manual for each piece of equipment in accordance with the requirements contained in Section 017823.

**1.06 - QUALITY ASSURANCE**

A. The aeration equipment and accessories specified herein shall be furnished by one single Supplier (Manufacturer) for the aeration diffusers systems for each separate process tank type. This requires the Supplier to be responsible for the development, design, fabrication, assembly, delivery, and proper sustained operation of the aeration system, but 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 equipment 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.

C. The system shall be designed, furnished, and installed to achieve the conditions of service specified herein.

D. The Supplier shall have at least ten (10) years of experience in the design and manufacturing of aeration diffusers for the wastewater industry.

**1.07 - DELIVERY, STORAGE AND HANDLING**

A. Comply with requirements contained in Section 016500 - Product Delivery, Storage and Handling.

**1.08 - WARRANTY**

A. The Supplier shall provide a Warranty Certificate typed on company letterhead and signed by an authorized officer of the Supplier. The certificate shall be witnessed by a notary public in the state in which the company headquarters is located. The Warranty Certificate shall be submitted, verbatim and without exception, as follows:

> "(Name of Supplier) guarantees all components of the system to be free from defects in design, materials and workmanship for a period of one (1) year commencing on the date the system was permanently placed on-line or eighteen (18) months from date of delivery, and the mechanical equipment functions without flaw.
>
> 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 we provided, then we shall repair or exchange such defective part (s).
>
> Agreed upon this _____ day by
> (DATE)
> _____ of
> (NAME OF AUTHORIZED AGENT)
> _____, who,
> (NAME OF SUPPLIER)

by signing this document, affirms that he/she is legally authorized to submit this warranty on behalf of the Supplier.

| | |
|---|---|
| _____ | _____ |
| AUTHORIZED SIGNATURE | DATE |
| _____ | _____ |
| NOTARY | DATE |

**1.09 - COMMISSIONING**

A. Supply and credit to the Owner field services as specified in Section 014500 - Quality Control.

B. Provide the following field services of the blower manufacturer as a minimum in accordance with the requirements contained in Section 017500 - Starting and Adjusting:

1. Two (2) days totaling two (2) trips, one trip for each system, once each system has been installed to check the completed installation, make all necessary adjustments and otherwise place the system into permanent operation as specified in Section 017500 - Starting and Adjusting. During one of these trips, and before substantial completion, provide operation and maintenance instruction to the Owner.

**PART 2 - PRODUCTS**

**2.01 - MANUFACTURERS**

A. Aeration equipment (Pre-Equalization Tank): Sanitaire, or approved equal.

B. Aeration equipment (Sludge Holding Tanks): Tideflex, or approved equal.

**2.02 – MAIN AERATION HEADER**

A. Stainless Steel Pipe: All exposed pipe within the tank shall be Type 304L stainless steel, Schedule 10, with a 2D finish in compliance with AISI 304L and ASTM A240. All connections shall be welded in compliance with AWS D10.4, except as otherwise shown on the Drawings.

**2.03 – FIXED HEADER AERATION SYSTEM**

A. General:

1. Fabricate all welded parts and assemblies from sheets and plates of 304L stainless steel with a 2D finish conforming to ASTM A240.

2. Fabricate non-welded parts and pieces from sheets and plates of 304 stainless steel conforming to ASTM A240.

3. Provide droplegs and headers of the diameter shown on the Drawings with dimensional tolerances conforming to ASTM A554.

4. Fabricate all applicable products and fittings conforming to ASTM A774 and A778.

5. Welding:

   a. Perform all welding in the factory using MIG, TIG or plasma-arc welding inert gas processes.

   b. Add filler wire to all welds to provide for a cross section equal to or greater than the parent metal. Use ER 316L filler wire.

   c. Fully penetrate butt welds to the interior surface and provide gas shielding to interior and exterior of joint.

   d. Interior weld beads shall be smooth, evenly distributed with an interior projection not exceeding $^{1}/_{16}$" beyond the I.D. of the air header or fittings.

   e. Continuously weld both sides of face rings and flanges.

   f. Field welding will not be permitted.

6. Corrosion Protection And Finishing - Clean all stainless surfaces after fabrication and welding by using the following procedure:

   a. Pre-clean all outside weld areas to remove weld splatter with the use of stainless steel brushes and/or deburring and finishing grinding wheels.

   b. Finish clean to remove all carbon deposits, light oxide films and similar contaminants by full immersion pickling and rinsing, to aid the regeneration of a uniform corrosion resistant chromium oxide film as follows:

      i. Completely immerse all stainless steel assemblies and components in an acid solution as described in Section 6.2.11 of ASTM A380-88. The acid shall be a nitric-hydrofluoric solution as defined in Table A.2.1 of Annex A2 of ASTM A380.

      ii. Provide final thorough rinse using ordinary industrial or potable water and dry in conformance per Section 8.3 of ASTM A380.

   c. Corrosion protection techniques not using full immersion methods will not be

acceptable.

7. Furnish all nuts, bolts and washers including anchor bolts in 18-8 series stainless steel.

8. Furnish 304L stainless steel diffuser with a cast inlet end cap the equivalent of 304L stainless steel.

B. Furnish neoprene gaskets 45 to 55 durometer (Shore A).

C. Furnish PVC connector plugs (if required) for all unused diffuser connector ports.

D. Furnish appropriately sized molded acetal orifice inserts when required.

**2.04 – AERATION HEADERS**

A. Provide a dropleg from the main aeration header connection as shown on the Drawings.

1. Provide a loose stainless steel follower flange for the top connection.

2. Provide a stainless steel band coupling for the lower dropleg to header connection for ease of installation and alignment.

3. Support and restrain the dropleg against separation from its upper connection.

4. Provide a thrust anchor on the connected header or manifold near the dropleg.

B. The bottom elevation of the air distribution header shall be the same throughout the tank.

1. Accomplish changes in diameter by using eccentric reducers.

2. Provide all air distribution headers with welded end caps unless otherwise shown on the Drawings.

C. Join sections of air distribution headers with special flanged joints, expansion joints or compression-sleeve couplings so that individual header sections can be rotated independently of adjacent sections for alignment purposes during installation.

1. Compression-sleeve couplings must be stainless steel and restrained by through bolts and threaded limit rods or integral restraining rings attached to the header.

2. Expansion joints shall be stainless steel consisting of a plain end, "O" ring, follower flange, and expansion barrel to accommodate $\pm$ 2" of movement.

3. Design all joints to structurally transmit the longitudinal forces caused by expansion and contraction of the header and provide positive means to prevent joint blow-apart.

D. Design and furnish an expansion/contraction system for all headers. The expansion/contraction system shall consist of simple supports, fixed supports and expansion joints in an integrated design. Design the expansion/contraction system for all headers to allow for a total of 125$^{O}$F temperature range and limit thermally induced bending stresses to 24,000 psi or less.

1. Continuous lengths of header may extend up to 80 feet from a restraining point without an expansion joint.

2. Maximum distance between restraining points on a continuous length of header shall not exceed 120 feet.

3. Provide an expansion joint on all continuous lengths of header between two restraining points.

   a. Furnish expansion joints as specified previously.

   b. Locate expansion joints at quarter span points between supports to minimize bending moment loading.

4. Fabricate simple supports to allow for longitudinal header movement.

   a. Simple supports shall act as longitudinal guides for the header and restrain the header from buoyant uplift forces.

   b. Simple supports that restrain longitudinal header movement will be unacceptable.

   c. Furnish simple supports in compliance with paragraph 2.04 (E).

5. Fabricate fixed supports in compliance with paragraph 2.04 (E).

   a. Limit movement to prevent expansion joint separation.

   b. Fixed supports utilizing stainless steel "U" bolts that grip the header to transmit expansion forces to the support base will be unacceptable.

E. Supports:

1. Provide each section of air header with a minimum of two supports with the maximum spacing between supports not to exceed 15’-0”.

2. Header supports shall include a vertically adjustable header hold down locking mechanism mounted on a stainless steel supporting structure.

3. Provide supports with a mechanism to provide for ± 2" of vertical adjustment and ± 1/2" of lateral adjustment for alignment of the header in the field.

4. Provide a wall or floor mounted support locking mechanism near the drop pipe to header connection that will:

   a. Provide vertical support for all uplift induced loads.

   b. Provide restraint of movement due to thermal expansion and blow apart.

5. Position supports at the end of the header run to limit cantilevers to no greater than 40 inches.

6. Attach support mechanisms to the tank by means of a field installed stainless steel adhesive type anchor.

F. Diffuser Connectors:

1. Place diffuser connectors on a common horizontal plane.

2. Release air from the diffuser into the wastewater at or below this common horizontal plane.

3. Provide connectors of length appropriate to the header diameter and positioned so that air exiting the diffusers clears the header.

**2.05 – PRE-EQUALIZATION TANK COARSE BUBBLE DIFFUSERS**

A. Provide diffusers as shown on Drawings. The arrangement and spacing shall not exceed the dimensions shown.

B. Provide diffusers of proven non-clog design.

C. Pre-Equalization Tank Coarse Bubble Diffusers:

1. Diffusers shall consist of a balancing nozzle with orifice insert, if required, an inverted air reservoir, air exit ports, cast end cap at inlet end and a full-length deflector.

   a. Design diffusers to provide full wide band aeration. Release air uniformly along a minimum two-foot band beyond each side of the header.

b. The diffuser shall have a minimum air release perimeter of 48 inches.

c. Locate exit ports discharging air into liquid on horizontal planes at two levels.

2. Diffuser Deflector:

a. Provide deflector below each diffuser for its full length and width.

b. Design deflector to direct the liquid being aerated along the diffuser reservoir walls so that the air exits through the ports and is sheared into small bubbles and distributed into the liquid.

c. Design deflector to prevent stringy material from wrapping around or entering the bottom of the diffuser.

d. Deflectors may be integral with diffuser and supported by diffuser end caps.

e. Non-integral deflectors shall be securely bolted to the tank floor and have a mechanism to provide plus or minus two inches vertical adjustment for field leveling by the Contractor.

f. Open bottom diffusers allowing liquid and debris to enter the bottom of the diffuser will not be permitted.

3. Diffuser Capacity:

a. Air release shall be distributed along the 48 inch perimeter uniformly at air rates from 8 to 40 SCFM with no disproportionate air flow from any single point.

b. Furnish 25% additional diffusers and connectors over the number shown on the Drawings for diffusers not satisfying capacity requirements specified in paragraph 2.05(E)(1).

4. Supply Stainless Steel Diffusers that meet the specification in paragraph 2.03(A).

a. Cast the diffuser inlet end cap with an alloy equivalent to 304L stainless steel. Provide the inlet end cap with a Schedule 80; 3/4" NPT male pipe thread connection and integral hex head nut.

b. Fabricate the diffuser bodies and outboard end cap from 304L stainless steel.

**2.06 – SLUDGE HOLDING TANK COURSE BUBBLE DIFFUSERS**

A. Install diffusers on new fixed aeration system installed in the sludge holding tanks.

B. Approved manufacturers

1. Tideflex Technologies

a. Submitted alternate manufacturers must comply with these specifications for performance. Alternate diffusers cannot be duckbill type as Tideflex diffusers are patented as duckbill type.

b. The Tideflex diffuser model specified under this design shall be the following;

i. Tideflex Model TFA-3.00 with 45 elbow and internal closure plates

ii. Part Number: TFA-030-45B-6R6140 (EPDM Elastomer)

C. Diffuser Construction and Performance

1. The diffuser shall be capable of preventing backflow of the process liquid into the diffuser and distribution piping through the diffuser air emittance opening when the discharge airflow is shut-off, there will be no exceptions to this requirement for any submitted alternate style diffusers.

2. The diffuser shall be equipped with internal stainless steel closure plates that provide positive closure of the bill opening at zero external pressure or hydrostatic head. The plates shall be totally incased in the elastomer with no visible exposure.

3. The diffuser shall be capable of complete submersion in a sludge blanket of minimum 3% solids concentration with zero airflow through the diffuser without causing clogging of the diffuser discharge opening or misalignment of the diffuser original orientation. The diffuser shall be capable of operating in an on-off blower operation mode without clogging of the diffuser, there will be no exceptions to this requirement for any submitted alternate style diffusers.

4. The elastomer diffuser must be clamped to a bushing using a heavy duty clamp to ensure the diffuser will not separate from the connection during operation. The bushing shall have a ribbed or barbed end for connection to the elastomer cuff portion of the duckbill diffuser. Unrestrained elastomer components using compression fit, snap-on, and friction fit connections will not be accepted.

5. The assembly shall include a 304SS 45 degree elbow fitting and a ¾" NPT threaded male end. A polyester orifice plug shall be provided for insertion into the ¾" threaded end, the orifice port diameter shall be [ 0.4375 ] inches.

6. All elastomer components shall be constructed of EPDM synthetic elastomer with a leachable oils content of 10% or less.

D. Guidelines for Sizing

1. Submergence – The diffuser shall be capable of orienting the discharge point downward at a distance within 4" above the finish floor elevation of the tank. The emittence point of air from the diffuser shall not be greater than 4" above the tank floor for the diffusers closest to the top of slope of the floor elevation unless specified otherwise on the contract drawings.

2. Lateral Distribution Pipe Clearance – The diffuser shall be capable of connection to the distribution pipe which shall be located with a minimum of 4" of clearance from the bottom of the pipe to the finish floor elevation.

## PART 3 - EXECUTION

### 3.01 - FABRICATION

A. All welding on the diffusers shall be completed at the manufacturer's factory. Field welding will not be permitted. All stainless steel welding shall be by the shielded arc, inert gas, MIG, or TIG method. Filler wire shall be added to all welds to provide a cross section of weld metal equal to, or greater than, the parent metal. Butt welds shall have full penetration to the interior surface, and gas shielding shall be provided to the interior and exterior of the joint.

B. Interior weld beads shall be smooth, evenly distributed, with an interior projection not exceeding $^{1}/_{16}$ inch beyond the inner diameter of the air header or fitting.

### 3.02 - INSTALLATION

A. Install metal base weldment and aeration equipment plumb and level. Shim metal base weldment to proper elevation and anchor to concrete with ½ inch stainless steel adhesive anchors. Install four (4) anchors per metal base weldment.

B. Install pipe in accordance with the manufacturer's written instructions and in accordance with applicable AWWA, ASTM and ANSI standards. Install pipe plumb and level.

C. Thoroughly clean stainless steel pipe, fitting interiors and joint surfaces prior to welding. Maintain

all materials clean during the prosecution of the work.

D. Carefully lower stainless steel pipes and fittings into the tank or basin. Each joint shall be made in the tank or basin.

**3.03 - DIFFUSER SYSTEM LAYOUT AND INSTALLATION**

A. Layout and install support anchors in accordance with equipment manufacturer's recommendations and anchor setting plan.

B. Follow equipment manufacturer's recommendations for sequencing equipment installation.

C. Level aeration system such that all diffusers connected to a header are within plus or minus 3/8 inch of a common horizontal plane.

D. All supports for diffusers shall be anchored using adhesive type stainless steel anchors sized by the manufacturer for uplift at full tank submergence.

E. Discharge orientation of the sludge holding tank diffusers shall be shown on the installation drawings. The diffuser assembly is shipped as a complete unit with the elastomer diffuser sleeve clamped onto a PVC adapter bushing and the stainless steel fittings connected to the adapter. Prior to installation, the installer should confirm that the orifice plug has been inserted into the threaded end. The threaded end can then be connected to the existing threaded port on the manifold piping, the installer should tighten the assembly by clamping the non-threaded area on the pipe nipple section that is being thread into the manifold. The entire assembly should be rotated into the correct orientation where the 45 bend and diffuser is pointing towards the basin floor. The bill slit opening of the diffuser should be horizontal and parallel with the floor, if it is not in this position then the hose clamp can be loosened, the diffuser sleeve rotated and the clamp re-tightened. Installation of the sludge blending tank diffusers shall be free of any obstructions within the tank that would cause the flexible end to be bent from its standard molded form.

**3.04 - FIELD QUALITY CONTROL**

A. After installation of the coarse bubble diffusers is complete, the Engineer shall witness functional testing conducted by the Contractor to check for leaks, uniformity of air release, and verification of level installation on all pipe. Functional testing shall be performed with clean water at a depth over the diffusers as required by the Engineer. All leaks in the headers, diffusers, and stainless steel pipes, or any part of the aeration system shall be repaired immediately by the Contractor. The test shall be repeated until each header, diffuser, and stainless steel pipe assembly passes without any leaks.

### 3.05 - AERATION EQUIPMENT - SCHEDULE 465121-1

A. General:

1. Application: Pre-Equalization Tanks

B. Diffuser Requirements:

1. Pre-Equalization Tank: quantity of coarse bubble diffusers. Total of eight (8) of Model D-24 diffusers as per the Contract Drawing.

2. Provide equal spacing between diffusers.

3. Refer to contract drawings for air diffuser layout along tank floor.

### 3.06 - AERATION EQUIPMENT - SCHEDULE 465121-2

A. General:

1. Application: Sludge Holding Tanks

B. Diffuser Requirements:

1. Sludge Holding Tanks: Model TFA-3.00 as shown on the contract drawings.

**END OF SECTION**

## PART 1 - GENERAL

### 1.01 - DESCRIPTION

A. This Section covers the requirements for supplying all labor, materials, equipment and services necessary to furnish and install a fully automatic Membrane Bioreactor (MBR) wastewater treatment system as it is specified herein and shown on the Contract Drawings for upgrade of the Calverton Sewage Treatment Plant. The system shall come complete, and without restricting the generality of the following, shall consist of:

1. Various Intermediate Supports, Guide Rails, and Associated Hardware as detailed on the Contract Drawings.

2. Assembly Hardware as specified herein or as shown on the Contract Drawings.

3. Spare Parts and Miscellaneous Equipment specified herein this document.

B. The System Control Panel (designated as CP-3) shall be supplied as work of this Section for installation by the Electrical Contractor. Refer to Section 016500 - Product Delivery, Storage and Handling for work involved with the supply and turnover of CP-3.

C. All Contractors and the MBR manufacturer shall comply with the applicable requirements contained in the following Sections as it relates to work of this Section:

1. Section 013100 - Project Management and Coordination

2. Section 013300 - Submittals

3. Section 014500 - Quality Control

4. Section 016500 - Product Delivery, Storage and Handling

5. Section 017500 - Starting and Adjusting

6. Section 017823 - Operating and Maintenance Data

D. Scope Notes:

1. The Contractor shall furnish all labor, rigging, materials, and incidentals required for the installation of the MBR System in accordance with the installation instructions provided by the Supplier. Once installed, the MBR System shall be complete and operational with all control equipment and accessories as specified herein and described in the Contract Documents.

2. Equipment furnished as work of this Section shall be as specified herein or as shown on the Contract Drawings.

3. All adhesive anchors, stud anchors, and expansion bolts necessary to anchor equipment supplied by the MBR equipment manufacturer to concrete or another rigid surface shall be furnished by and installed by the Contractor and be as shown on the MBR detail sheets or as specified elsewhere.

4. All assembly hardware such as bolts, washers, nuts, and jam nuts shall be furnished and installed by the Contractor.

5. Intermediate supports for MBR units in the MBR basins, except valve and pump lift rail extensions, shall be fabricated by the MBR manufacturer for installation by the Contractor as shown on the Drawings.

6. Intermediate valve stem guides for MBR manufacturer supplied process valves shall be furnished by the MBR manufacturer and installed by the Contractor.

7. Threaded rod and other pipe restraining devices shall be furnished and installed by the Contractor.

8. Pipe hangers shall be work of Section 220529.

9. Electrical power conductors, control and float cables that are factory attached to MBR equipment and devices (included but not limited to; primary level transmitters, level floats and analytical probes) shall be brought to the top of the tank wall and temporarily secured to handrails. Electrical installation and connections, including junction boxes and local disconnect switches, shall be the responsibility of the Electrical Contractor.

10. Refer to the Mechanical Drawings for additional scope of work requirements.

**1.02 - QUALITY ASSURANCE**

A. The system shall be furnished by one single Supplier (MBR Manufacturer). This requires the Supplier to be responsible for the development, design, fabrication, assembly, delivery and proper sustained automatic operation of all system equipment in order to achieve the effluent water quality specified herein, but does not require that all system equipment and accessories be the products of one single manufacturer. The equipment shall be manufactured by OVIVO, Inc., or equal.

B. Consideration will only be given to Suppliers who can demonstrate that their system 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. The supplier must have minimum of 50 operating MBR installations in USA, where they were responsible for complete system supply. Limited supply related to membrane only projects or third party system supply will not be acceptable.

C. The system supplier shall conform to the basis of design performance specifications contained within this section, and must fit within the space allocated on the design drawings.

D. The system shall be designed, furnished, and installed to achieve the conditions of service specified in paragraph 1.05 herein.

E. The Supplier shall have at least ten (10) years of experience in the design, manufacturing and system supply representative of the specified system, in the United States of America that meet the following minimum criteria in order to be considered qualified:

1. Referenced projects shall:

a. Have been a complete system supply. Limited supply related to membrane only projects or third party system supply will not be acceptable.

b. Have a plant or process train design capacity between 10,000 gallons per day to 125,000 gallons per day.

c. Have been in operation in the U.S. for at least two years at time of bid.

d. One plant shall have been in operation for ten years.

e. Three plants shall be retrofit projects, with no new basins.

f. Have operated within 50% of nominal rated capacity for a minimum of 12 months at time of bid.

F. To show evidence of being able to provide the quality of equipment and services described in this specification, the Membrane System Supplier shall submit their quality system ISO 9001 certification applicable to design, manufacturing, supply, installation, and servicing of wastewater and water treatment plants, associated equipment and systems. The quality system shall be audited by a third party independent inspector. Certification shall remain in effect throughout the project startup. Proof of current certification shall be provided.

G. The MBR System Supplier shall have a multidiscipline staff of at least thirty (30) employees dedicated to the MBR product line, all based out of USA. Fifteen (15) of those employees shall have at least five (5) years experience in MBR System Supply. Contracted resources will not be

considered. MBR System Supplier shall provide documentation to support staff resources available.

H. The membrane and membrane unit must be manufactured in USA.

I. The brand name products specified were chosen on the basis of past performance, compatibility and testing and constitute a standard for quality and performance for the specific purpose for which they are intended. Products other than that specified will be considered for use under the provisions set forth as follows:

1. The named products constitute the “Base Bid” system. All bidders are advised to provide “Base Bid” pricing since the magnitude of the expenses involved with engineering redesign or modifications may be difficult to determine during the bidding period. Refer to Section 012500 - Product Substitution Procedures regarding product substitutions.

2. If alternate equipment is proposed, the Supplier shall prepare and submit to the Engineer three (3) copies of the “Evaluation Documentation” of systems in United States of America Engineered by the company proposed as an equal with documentation as listed below. The information shall be in a form that is neat, clear, precise, legible and computer drafted and prepared so as to allow the Engineer to evaluate the proposed equipment. The “Evaluation Documentation” shall be hand delivered directly to the Engineer at least twenty (20) calendar days prior to the date set for the bid opening. The pre-bid “Evaluation Documentation” shall consist of the following:

a. A Process Diagram showing reactor size, pipe names, flow directions, pipe and valve sizes, chemical injection points (if any), and location of every system component.

b. Instrumentation Diagram showing loop names and loop descriptions.

c. Process calculations showing unit sizing, mass balance, hydraulic flow rates, and chemical feed rates (if any).

d. Descriptive technical information for the proposed product(s) highlighted to show the differences between the proposed unit(s) and the specified unit(s). Descriptive technical information shall include model numbers, type, sizes, weights, performance data, and materials of construction. Include all major electrical devices mounted inside the System Control Panel.

e. List of facilities showing facility name, active contact name and telephone number, years in service, design conditions and parameters and design

engineer's name and current telephone number of the company. Reference facilities must meet the criteria detailed in 1.02E.

f. Equipment cuts showing dimensional data for all system components.

g. Cross sections of the system and media support method.

h. Warranty information, detailing membrane design fluxes for all seasonal flow conditions.

i. Control panel wiring schematics and drawings detailing the interior and exterior layouts, components, panel dimensions and panel materials of construction.

3. The System Supplier shall state if he/she is in compliance with each and all Sections of the Specifications. Any variance from the specified equipment shall be listed and a description of each variance must be in letter form. Facsimile transmissions will not be accepted.

4. Failure to submit the above listed information twenty (20) calendar days prior to the date set for the bid opening shall be cause for non-evaluation and the product will not be considered for the project.

J. The Engineer will issue an addendum of approved products prior to the date set for the bid opening. The Engineer's determination regarding the product's acceptance shall be final.

K. The acceptance of products prior to the bid date does not relieve the Contractor of his/her responsibility regarding the performance or ability to meet the requirements of the Contract Documents.

L. After Contract execution, the Contractor shall submit shop drawings of the system as specified herein and in compliance with the requirements contained in Section 013300 - Submittals. The Contractor shall remain fully responsible for all design revisions, including but not limited to, the following: structural, mechanical, electrical, and instrumentation because of utilization of substitute equipment. Refer to Section 012500 - Product Substitution Procedures for costs associated with redesigns and/or modifications caused by the use of a substitute product offered by the Contractor. Note that although Section 012500 allows for "Product Substitution" up to 30 days after bid, this does not refer to the MBR supplier "or equal" which must be qualified prior to the bid as described in 1.02.I.4 above. The "Product Substitution" section is meant to apply to individual components as referenced herein.

M. All costs, including engineering, and legal costs, associated with accommodating alternate

equipment shall be borne by the Contractor.

N. The System supplier responsibility for the MBR experience clause above (and for this project) shall be defined as a system scope that includes integrated controls, SCADA, screens, mixers, pumps, membranes, instrumentation, diffusers and biological design for the plants used as experience references.

O. For System Supply experience to qualify the Application Engineer, Project Manager, Startup Technician, Mechanical Piping Designer and Product Service Support (Field Service Technician) that delivered the Reference Project must be named, must have worked for the Supplier or currently work for the Supplier (directly employed).

P. For Warranty purposes, the primary person responsible for executing the warranty (within the parent company not a subsidiary) must sign the Warranty Statement. The document shall also be notarized by the President of the parent company prior to approval of alternate technologies.

**1.03 – PROCESS & EQUIPMENT WARRANTY**

A. *The MBR system supplier shall provide a Process and Equipment Warranty Certificate typed on company letterhead and signed by an authorized officer of the company. A notary public in the state in which the company headquarters is located shall witness the signing of the certificate. The certificate shall be submitted, verbatim and without exception, as follows:*

*"Assuming the system equipment and the process is being operated in accordance with the written operating instructions provided by the (Name of MBR System Supplier), (MBR System Supplier) shall warranty and replace the membranes under warranty for a period of 5 years from the date of successful completion of system commissioning and operation. The warranty shall not be prorated. Based on the influent wastewater design flow and monthly average concentrations below, the (MBR System Supplier) shall further guarantee that the MBR process will produce an MBR effluent water quality with the following concentrations:*

- *Total Nitrogen (daily maximum):* *10 mg/l or less*
- *BOD-5 (30 day arithmetic mean):* *10 mg/l or less*
- *Total Suspended Solids (30 day arithmetic mean):* *10 mg/l or less*

*The MBR influent wastewater design flow and monthly average parameters are as follows:*

- *Average Annual Flow (AAF)* *77,000 GPD*
- *Max Month Flow (MMF)* *100,000 GPD*

- *Peak Week Flow (PWF)* *100,000 GPD*
- *Peak Daily Flow (PDF)* *100,000 GPD*
- *Peak Hourly Flow (PHF)* *200,000 GPD*
- *BOD-5:* *250 mg/l*
- *TSS:* *300 mg/l*
- *Total Kjeldahl Nitrogen/TN:* *50 mg/l*
- *Alkalinity* *300 mg/l*
- *Temperature Range:* *10˚C to 25˚C*
- *Oxygen Requirements:* *1.25 lbs. O2/lb. $BOD_5$ applied*
  *4.60 lbs. O2/lb. TKN applied*

*The process warranty portion of this certificate shall remain in continuous full effect for 12 months from the date that design process parameters such as MLSS concentration, sludge age, and F/M ratio have been achieved. In the event that effluent quality was fully achieved for the 12-month period following, then the terms of the warranty shall be satisfied. However, if permit discharge conditions have been exceeded for Total Nitrogen, BOD-5, TSS or MLSS thickening, then the process warranty period shall be extended to a period of time equal to the period of non-compliance with the discharge permit.*

*In no event will the MBR System Supplier's liability exceed 100% of the purchase order amount, including any change orders, provided by (name of contractor who purchased the equipment for the project).*

*If the system fails to achieve the discharge limits contained herein, then (MBR System Supplier) will modify, supplement, and/or replace the system equipment by paying all costs associated with the removal of the old equipment and the installation and startup of the new system equipment at no charge to the Owner including all engineering and Town of Riverhead administrative and legal costs.*

*In addition, the MBR Manufacturer shall guarantee all mechanical and electrical components of the system to be free from defects in design, materials and workmanship for a period of two (2) years commencing on the date from which the MBR system was successfully commissioned and operational.*

*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, then the (MBR System Supplier) shall repair or exchange such defective part (s).*

*The replacement or repair of parts normally consumed in service shall include pilot light bulbs, chart paper, chemicals and lubricants. These parts only shall be considered as part of routine maintenance and upkeep and shall not be considered eligible for exchange free of charge under this Warranty.*

***MEMBRANE WARRANTY***

1. *Membrane Workmanship Warranty (5 Years)*
    - 1.1. *The Membrane Units shall be warranted for a period of 5 years after completion of the Performance Test or 5.5 years from delivery, whichever period is longer.*
    - 1.1.1. *Membrane Units shall be free from defects in material and workmanship.*
    - 1.1.2. *This warranty may be reduced or voided if MUs have been subjected to misuse, accident, fire, improper repair, tampering or abuse.*
    - 1.1.3. *Inappropriate operation that results in exposure of the membrane equipment to mixed liquor suspended solids concentrations in excess of 15 grams per liter, for more than 24 hours greater than three times per year or a cumulative total of 72 hours and never above 18 grams per liter.*
2. *Membrane Performance Guarantee (5 Years)*
    - 2.1. *The filtration capacity and effluent quality shall be per Section 1.03 of the Calverton STP Membrane Biological Reactor Spec Request for Detailed Proposals from Contractors and Ovivo's Final Bid Proposal.*
    - 2.2. *Ovivo will repair or replace equipment as necessary to meet specified capacity and quality parameters called out in the specifications. For individual pieces of equipment, for Membrane Units, cassettes shall be replaced as necessary in order to maintain permeability of > 11 gfd/psi temperature corrected to 20 deg. C in clean water.*
3. *MBR Process Guarantee (1 Year)*
    - 3.1. *The effluent quality shall be per Section 1.03 of the Calverton STP Membrane Biological Reactor Spec Request for Detailed Proposals from Contractors.*
    - 3.2. *Loading can vary +/- 10% on a daily basis during a 30 day period.*
    - 3.3. *During Peak Day conditions the loading can vary +/- 10% of Maximum Month loading during a 24 hour period.*

4. *Monitoring Requirements*

*4.1. Owner shall maintain a reliable, high-speed connection to the processor.*

*4.2. Owner shall submit raw (PLC) data for TMP, permeate flow, flux, permeability, water temperature and air scour on a monthly basis. In addition to instrument readings, Owner shall provide records for:*

*4.2.1. Membrane cleaning concentrations, volumes, soak times, and fill times.*

*4.2.2. Mixed liquor suspended solids (MLSS) concentration per MBR 2X/week or more.*

*4.2.3. Coarse suspended solids (CSS) concentration per MBR 2X/week or more.*

*4.3. Coverage may be reduced or voided if:*

*4.3.1. Equipment has been subjected to misuse, accident, fire, improper repair, tampering or abuse.*

*4.3.2. >10% of data is missing or if data does not conform with the following:*

| ***MBR MLSS*** | ***Permeability[1]*** | ***CSS*** | ***TMP*** | ***Membrane Air Scour*** |
|---|---|---|---|---|
| *≥90% @ <15,000 mg/l*<br><br>*100% @ <18,000 mg/l* | *≥95% @ >5.2 gfd/psi*<br><br>*≤5% @ <3.6 gfd/psi* | *≥90% @ <200 mg/l*<br><br>*100% @ <1,000 mg/l* | *100% @ <5.8 psig* | *≥90% @ < 72 SCFM*<br><br>*100% @ <94 SCFM* |

*[1]Temperature corrected permeability is calculated by multiplying the measured permeability by 1.024*(T-20) where T is the water temperature in degrees Celsius.*

*4.4. Equipment shall not be operated for more than 72hrs consecutively at a temperature corrected permeability (TCP) of < 3.6 gfd/psig without a comprehensive visual inspection.*

*4.5. Equipment shall not be operated at a TCP of < 3.6 gfd/psi for >24hrs more than 3 times in a calendar year.*

5. *If the MBR System should at any time be unable to meet Warranty requirements, System Supplier shall supply Technical Assistance at no cost to the Owner until performance criteria are achieved. The Owner agrees to implement reasonable operational modifications as requested by System Supplier, and in accordance with the Reference Documents. If the problem cannot be successfully remediated with remote assistance within 10 working days, the Supplier shall dispatch a trained Technician to site. The System Supplier shall be allowed a minimum of three (3) months to implement a remedy to operational issues and meet performance criteria.*

6. *Ovivo disclaims all other warranties, express or implied in respect to Products delivered hereunder, including but not limited to implied warranties of merchantability or fitness for a particular purpose. In no event shall System Supplier be liable for any lost profits, cost for procurement of substitute products and services, loss of use, or any other special, incidental, indirect, or consequential damages, arising out of or related to any and all contracts or agreements or the use or the performance of the Products, however caused and on any theory of liability, whether in an action for contract or tort (including negligence) or otherwise. System Supplier total aggregate liability rising out of or related to any and all contracts or agreements shall in no event exceed the amount paid for such products.*

*Agreed upon this* _____ *day*
*(date)*
*by* _____ *of*
*(name of authorized agent)*
_____*, who,*
*(name of supplier)*
*by signing this document, affirms that I am legally authorized to submit this warranty on behalf of* (MBR System Supplier)*.*

_____ _____
*AUTHORIZED SIGNATURE* *DATE*

_____ _____
*NOTARY* *DATE*

**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.

B. The MBR manufacturer shall provide a master parts list, packaged in a plastic protector page holder. Provide three (3) copies of the master parts list, each in a plastic holder.

C. The General Contractor shall then store all plastic pails on a common wooden pallet that can be moved about the site and lowered into the tank. The storage system shall be maintained in a neat, orderly fashion to allow the Engineer to properly observe the use of component hardware.

D. The installation drawings shall be folded and shipped in a plastic project case with the title box showing. The project case shall be commercially purchased and be suitably sized to store all installation drawings. Provide a duplicate set of installation drawings (in a project case also) with the equipment shipment for use by the Engineer.

E. The installation shall not be allowed to proceed until the General Contractor has demonstrated to the Engineer that the hardware will be properly inventoried. The General Contractor shall replace pail lids at the end of each day.

F. All Contractors shall immediately store all fragile, electronic devices indoors until ready for installation. Immediately store the spare parts crate indoors. Keep all spare parts in the crate until the manufacturer's representative is onsite to inventory the components with the General Contractor. The manufacturer's field report shall address the status of the spare parts delivered to the site.

**1.05 - PERFORMANCE AND DESIGN REQUIREMENTS**

A. The manufacturer of the MBR system shall be responsible for the proper design of their system, including but not limited to: new diffused aeration equipment and blowers, transfer pumps, mixers, sensors and controls. All equipment shall perform as specified and the completed installation shall operate in accordance with the requirements specified herein.

B. The aeration/mixing system shall be designed to provide oxygen distribution to the MBR treatment process throughout the entire basin (reactor). It shall also ensure mixing to promote suspension of all biological solids in the basins without the introduction of air. No change in the basin geometry shall be allowed. The velocity and mixing in the basin shall be sufficient to ensure complete biological solids suspension and dispersion.

C. The MBR aeration/mixer systems shall be capable of providing mixing such that when operated under any combination of the specified design conditions, it shall suspend all biological floc and mixed liquor suspended solids throughout the liquid mass in each basin.

D. The aeration system shall be designed to operate within a minimum of 11 feet side water depth and shall be capable of transferring a minimum of 453 lbs. O2 per day of process oxygen (A.O.R.- Actual Oxygen Requirement).

E. The project conditions shall be as follows:

| | |
|---|---|
| *Average Daily Flow:* | *0.10 MGD* |
| *Peak Daily Flow:* | *0.10 MGD (equalized flow)* |
| Design Loadings: | Influent Values: |

| | |
|---|---|
| BOD5 (mg/l) | 250 |
| TSS (mg/l) | 300 |
| TKN (mg/l) | 50 |
| pH (units) | 7.0 |
| Alkalinity (mg/l) | 300 |
| Wastewater Temperature Range: | 10 deg. C to 20 deg. C |
| Jobsite Elevation: | 100 feet MSL |
| Ambient Air Temperature Range: | 1 deg. F to 100 deg. F |
| Alpha (maximum value allowed): | 0.50 |
| Beta (maximum value allowed): | 0.95 |
| F/M Ratio: | 0.07 lbs. $BOD_5$ / lb. MLSS-day |
| Anoxic Tank MLSS at Low Water Level: | 10,000 mg/l |
| Membrane Tank Average MLSS | 12,000 mg/l |
| Oxygen Requirements: | 1.25 lbs. O2/lb. $BOD_5$ applied |
| | 4.60 lbs. O2/lb. TKN applied |

**1.06 - FIELD SERVICES**

A. The Supplier shall supply and credit to the Owner the costs for 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. Three (3) days totaling one (1) trip for providing installation instruction to the General, Plumbing and Electrical Contractors. The General Contractor shall be responsible for all costs associated with having the manufacturer present should any Contractor require more days of installation instruction. The manufacturer's field technician shall report to the site at 7:00 am, Tuesday and work a normal workday (coinciding with the Contractor's work force). The General Contractor, at least one week prior to the Monday, shall uncrate, sort, separate and arrange parts of the system and otherwise become familiar with the installation of all MBR components. At least two crews shall be assigned to this initial installation period. One crew shall install the membrane units and the other crew shall install the diffuser assemblies.

2. Fifteen (15) days totaling three (3) trips once the system has been mechanically installed to check the completed installation, make all necessary mechanical adjustments, debug the PLC program and make program changes required by the Engineer/Owner, startup the control panel, provide operations and maintenance instruction to the Owner, and otherwise place the system into permanent, fault free operation as specified in Section 017500 - Starting and Adjusting.

3. The General Contractor shall coordinate startup activities such that the work is fully completed and all associated electrical installations and the motor control centers containing associated motor starters and variable frequency controls are properly wired and functioning. The Supplier's representative shall verify the electrical work and control wiring terminations via the functioning of the control panel.

4. Six (6) days totaling two (2) trips (three days per trip) before substantial completion and once the biomass has developed, to provide process operations instruction to the Owner. The manufacturer shall present a complete review of the process chapter of the Operations and Maintenance Manual at this time. A classroom type instruction class shall be presented on the theory of activated sludge and process control parameters.

5. Six (6 days, three (3) trips, approximately three (3) and six (6) months after system startup to review the operation with the plant superintendent and the Engineer and to make system adjustments, as necessary. Dates shall be selected by the Owner and may be used by the Owner any time within a two (2) year period from the date of initial startup.

**1.07 - SUBMITTALS**

A. Comply with the requirements contained in Section 013300 - Submittals. The following documents shall be submitted:

1. Technical descriptive data for each equipment item in the system showing model number(s), sizes, capacities, weights, horsepower, motor and voltage information, and similar type information. Catalog cuts are acceptable if they contain the necessary information.

2. Scaled plan of the reactors with location dimensions for all reactor-mounted equipment. Establish point(s) of reference and dimension the location of all equipment from these point(s). Show the location of primary element transmitters.

3. Complete process calculations.

4. Diffuser assembly details and technical specifications for the diffuser.

5. Adhesive anchor plan for moored-in-place equipment.

6. Equipment details for each system component.

7. Field wiring diagram for each motor operated piece of equipment and valve and all primary element transmitters.

8. System control panel schematic wiring diagram.

9. Control panel layout diagrams for the panel's interior and exterior.

10. Blower arrangement plan and section view.

11. Catalog cuts for each component of the blower package.

12. Legend nameplate details for control panel switches, lights and panel mounted equipment.

13. Catalog cuts for every electrical device mounted inside and on the face of the control panel such as: breakers, terminal blocks, switches, level display unit, pressure display unit, pilot lights, programmable logic controller, operator interfaces, etc.

14. Programmable logic controller and operator interface information.

15. List of operator field adjustable set points/control points.

16. List of alarm conditions annunciated through the operator interface.

17. Color screen shots of each graphic display of the operator interface with remarks to describe the color changing sequence.

18. Storage, handling and installation instructions.

19. List of spare parts and miscellaneous equipment to be provided under this Section.

20. Process and Equipment Warranty Certificate prepared, signed and notarized in accordance with paragraph 1.03 herein.

21. Manufacturer Start-up Report (MSR) prepared in accordance with paragraph 3.01 herein.

C. Submit manufacturer's requirements for testing and certifying all components and equipment for a two (2) tank Anoxic and two (2) MBR tank system with the ability to only operate one (1) Anoxic tank and one (1) MBR tank at a time.

D. Operations and Maintenance Manual prepared in accordance with the requirements contained in Section 017823 - Operating and Maintenance Data. A complete process chapter shall be prepared specifically for this project. A draft O & M manual shall be submitted 90 days prior to the date set for start-up.

**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 – MBR CONTROL PANEL (CP-3)**

A. An electrical control panel shall be designed and furnished to optimize the MBR process while minimizing operator attention and to accommodate the continuous maximum daily flow without adjusting cycle structures. The panel shall be factory assembled and pre-wired and shall include all controls necessary for automatic and semi-automatic system operation with provisions for manual control of the MBR process. The control software program shall be factory tested prior to installation at the job site.

B. The control panel shall be timer based system with level overrides and shall provide control, sequence, monitoring and alarm annunciation capabilities. The operator shall be able to access the timer values and set points through the operator interface panel to allow for adjustment of cycle times and system flexibility. The control system shall be designed to automatically accommodate the plant's full range of loads and flows.

C. CP-3 shall consist of I/O for the following:

| QTY | ANOXIC EQUIPMENT DESCRIPTION |
|---|---|
| 4 | R.A.S. Pumps |
| 2 | Mixers |
| 2 | Dual Level Float Switch Assembly |
| 2 | 4-20 mA Level Probe and Transmitter |
| 2 | R.A.S. Flow Meters |
| 4 | F.L.S. (MiniCAS) |
| QTY | MBR EQUIPMENT DESCRIPTION |
| 2 | 4-20 mA D.O. Signals |
| 2 | 4-20 mA T.S.S. Signals |
| 2 | 4-20 mA pH Signals |
| 2 | 4-20 mA Level Probe and Transmitter |
| 2 | Dual Level Float Switch Assembly |
| 6 | High/Low Pressure Switch for Blowers |
| 6 | High Temperature Switch for Blowers |

| | |
|---|---|
| 4 | Blower Discharge Pressure Transducer |
| 2 | Permeate Flow Meters |
| 2 | Air Scour Flow Meters |
| 2 | 4-20 mA Turbidity Monitors |
| 2 | W.A.S. Pumps |
| 2 | FLS (MiniCAS) |
| 1 | W.A.S. Flow Meter |

D. The control panel shall be properly wired for connection to 120V power. (A separate Motor Control Center with Motor starters for electrically operated MBR equipment will be furnished and installed as work of the Electrical Contractor.)

E. The panel shall be for NEMA 12 service. The enclosure shall be fabricated of 12 gauge, steel and be free standing for floor mounting. It shall be designed to accept electrical conduits from the panel top. The height of the panel shall not exceed 7 feet – 6 inches with lifting lugs. The width of the panel shall be as required to satisfy the requirements of these specifications. The weight of the operator interface shall be considered so that the door does not sag thus preventing it from operating properly.

F. The PLC shall be located in the upper half of the panel with an internal duplex GFI convenience power receptacle located in the lower half of the panel.

G. Concealed stainless steel piano type hinges shall be used to hinge the front doors. The hinges shall be for the entire door height. Lifting lugs shall be provided. All seams shall be continuously welded and ground smooth, with no holes or knockouts. Door and enclosure stiffeners shall be welded into the enclosure as required to maintain flat smooth surfaces.

H. Heavy duty 3-point latching mechanism operated by Type 316 stainless steel POWERGLIDE® padlocking handles.

I. A two lamp 18-inch fluorescent light fixture shall be attached to the panel ceiling plate to provide direct task lighting while the door is open. It need not be interlocked with the panel door to automatically turn on. A switch shall be provided inside the panel.

J. A 115v, approximately 100cfm, compact cooling fan with finger guard, to keep air circulating within the enclosure shall be provided and located adjacent to the PLC CPU.

K. Wiring shall be accomplished in a neat workmanlike manner and run in PVC wiring duct where practical. All ducts shall be oversized by 25%. Where not practical it shall be supported and tied

into position with nylon cable ties. All wiring and terminals shall be identified with a number code matching the approved wiring schematic. The panel shall comply with NEMA Standard Section 2, Part 322 for Class II, Type B control centers. Each device inside the panel shall be properly identified as to function using laminated white on black nameplates or labeling tape, if nameplates are not practical.

L. All control panel wire shall be 16 AWG multi-strand machine tool wire minimum. Insulation shall be MTW. Wiring color shall be:

1. 120 VAC control power: RED

2. Neutral: WHITE

3. Ground: GREEN

4. Control from remote source: YELLOW

5. 24VDC(+) to be Blue and 24VDC(-) to be White w/ Blue stripe.

M. Wire terminations shall be tubular compression. All terminals shall be strip mounted and be a voltage rating of 600 volts, amperage rating 25 amps.

N. Each device of the panel that is powered from the panel shall be provided with a properly sized circuit breaker. Gang or group the circuit breakers in one area of the panel and provide a printed directory for the breakers. The directory shall be screw attached to the subpanel. The directory shall be engraved laminated phenolic with white background, black 3/16" high letters to identify each circuit breaker. The following remote equipment shall be provided as part of the MBR process equipment scope of supply and be powered from the MBR control panel and provided with individual properly sized and labeled circuit breakers:

1. Float Switches

2. Level Transducers

3. Analytical Controller (DO, pH, TSS)

4. Flow Meters

5. Solenoid Valves on air extraction system

6. Temperature Switches

7. Pressure Switches

8. Pressure Transmitters

O. UL listed control relays for general control purposes shall be supplied with a pilot light to indicate when the coil is in an energized state. The relay socket shall be panel or DIN rail mounted inside the enclosure. The relays shall provide the following ratings: 120VAC 60 hz coil, 10A contact rating (thermal), at 250 VAC (resistive), 80% PF. Expected life 10 million mechanical life cycles and an operating temperature range of -22°F to 131°F. Relays shall be Allen-Bradley 700-HK or approved equal.

P. Supply UL listed ground fault interrupter (GFCI) duplex receptacle within the panel. The receptacle shall be protected with a 5 Amp circuit breaker with a 20A/125 VAC rating. Receptacle will be Hubbel DRUGGF120 or approved equal.

Q. Supply an electric heater inside the control panel enclosure to protect sensitive mechanical and electrical components from the harmful effects of condensation, corrosion and low temperatures. The heater shall be thermostatically controlled, fan driven unit and manufactured by Hoffman.

R. Supply a UL listed uninterruptible power supply suitable for location in a UL 508 panel to protect the HMI and PLC from short power outages by switching to an emergency battery backup without data loss or downtime. Nominal input voltage shall be 120 VAC with an autosensing input frequency of 47-63 HZ. Output power capacity of 325W/500VA. The UPS shall be provided with an audible alarm and LED status indicator and operate from 0-50 degC. The UPS alarm shall be communicated to and recorded through the PLC alarm history. The UPS shall be an Allen Bradley 1609-B600N.

S. Programmable Logic Controller:

1. The PLC function shall be to control, sequence and monitor the MBR including:

   a. Component Monitoring: the monitoring of components for fault conditions and the orderly alarming and logging of the fault.

   b. Permeate Flow Summation. Sum of the flow from the two operating permeate pumps and maintained for recording purposes.

2. Programmable logic controllers shall be CompactLogix Model 1769-L30ER. Processor as manufactured by Allen Bradley or equal.

3. Diagnostic indicators shall be provided to show I/O status, DC power, PC run, Battery

low, and Forced I/O. All slots shall be labeled. All terminals shall be labeled.

4. The PLC shall come complete with system processors, disconnecting means, auxiliary power supply, rack mounted power supplies, and input output cards as required to satisfy the conditions for this project.

5. Provide one (1) spare installed input card and one (1) spare installed output card in addition to input and output cards required to satisfy specified programming conditions. Label these slots as “SPARE CARDS” on the panel wiring diagram and directly on the card itself. These installed spare cards are in addition to the on-the-shelf spare cards specified to be furnished as spare parts.

6. The I/O rack shall be provided with adapter module(s) allowing it to function with a remote processor through a single communications cable.

7. The program instruction of the PLC shall have capacitor backup to provide at least one (1) week’s backup of memory. In addition, it shall have battery backup to maintain memory for three years minimum.

8. The PLC shall have EEPROM for permanent memory retention.

9. Program timers in both on-delay and off-delay, counters in both count up and count down. Sequencers and shift registers shall be provided.

10. The PLC’s power supply shall accept AC power of 85-132 volts, 170-265 volts at 50/60 hertz. It shall be capable of withstanding a power loss for a minimum of 20 milliseconds while still remaining in operation.

11. The CPU shall be self-contained, provide ladder rung program execution, and support remote or local programming. The unit shall also supply I/O scanning and inter-processor and peripheral communication functions.

12. The program storage medium shall be solid-state RAM type, EEPROM type cartridge. Memory capacity shall be sized to allow for future programming expansion on 30% minimum.

13. During normal operation, a malfunction in any remote input/output channel shall affect the operation of only that channel and not the operation of the CPU or any other channel.

14. Replacement of input or output cards (module) shall be accomplished without disturbing panel wiring. Each input and output module shall contain a visual indicator to display

On/Off status of individual input or output points.

15. The PLC shall also be configured to allow the MBR manufacturer to download applications to the Panelview Plus via the PLC modem kit.

16. The PLC shall be provided with one (1) licensed copy of RS Logix 5000 Mini Edition software by Rockwell, latest version. One (1) communication cable from PLC to PC shall be furnished.

T. Human Machine Interface (HMI): A color operator terminal shall be provided and built into the panel for the purpose of allowing the operator to monitor system parameters, change variables, and acknowledge alarms. The unit shall be a model Panelview Plus 1500, with a Color touchscreen operator terminal by Allen Bradley, catalog number 2711P-T15C4D8.

1. Provide one (1) licensed copy of RSView Studio ME development software.

2. HMI shall utilize real time clock and 128 MB application memory.

3. Provide cable to allow download/upload of Panelview Plus operator terminal to PC computer. Provide access code security to be assigned to any screen.

4. Display shall be an Analog Resistive Touch screen with 1024 x 768 18bit Color Graphics with antiglare overlay accessory for all terminals and keypads.

5. HMI shall utilize Ethernet and RS-232 communication. Provide two USB port and USB slot for transferring files, logging data or system upgrades.

6. The operator interface and PLC program shall comply with the following:

   a. A main graphic listing the name of the manufacturer, facility name, and the consulting engineer's company name. The graphic shall also show the direct dial telephone numbers for the manufacturer's customer service department, process engineering department, and the PLC programming department.

   b. A display screen with a simple schematic of the MBR system shall be provided. The tanks, mixers, blowers, pumps, analytical sensors (level, pH, DO, TSS), flow meters, pressure and temperature gauges/switches, and process lines shall be represented on the graphic. Flow arrows and pipeline designations shall be shown. Include tags such as "From" and "To" for each pipeline. The color of the MBR equipment component shall be indicated based on its status as follows: Red for running or open, Green for off or closed, Yellow for alarm condition, Flashing Yellow for silenced

alarm, and Flashing Red for MBR blower being off during a blower sequence. Submit a screen shot for this display for approval. The MBR designations shall follow the layout of the control panel when looking at the monitor. South tanks are Anoxic Basin #1, MBR Basin #1 and North tanks are Anoxic Basin #2 and MBR Basin #2. A graphic display to indicate the reactor status shall be provided as a separate screen. This screen shall also display the following:

i. The operating pressure and air flow of each blower as required.

ii. The water level in each process tank shall be represented by a vertical bar graph. The calculated volume will also be displayed.

iii. The dissolved oxygen, pH and TSS concentration for each process tank monitored shall be continuously indicated on this display.

iv. A “Dissolved Oxygen, TSS, pH” profile for each anoxic reactor and membrane tank. D.O., TSS, pH profiles shall be plotted (D.O. vs. Time) based on a proportional 4-20 mA signal transmitted by the analytical controller for the D.O, TSS and pH probes. The profile curve shall be plotted and graphed regardless of the mode of operation. The blower timer periods shall be as input by the operator. Each plot shall contain the following features:

The vertical axis shall be D.O. from 0.0 to 5.0 mg/l. The vertical axis for TSS shall be from 0.0 to 20.0 mg/l. The vertical axis for pH shall be from 0.0 to 14.0 mg/l. All pens on a trend must share the same vertical axis. Therefore the necessary logic must be included in the PLC to represent the phase and blower on/off periods on the D.O and TSS trending.

The horizontal scale shall be in time increments.

Trends start on the right hand side of the screen and update on the right, pushing old data to the left

Each pen shall be configured with a specific color. The sample rate shall be every 60 seconds.

A red vertical line shall represent the blower “ON” period. The blower “OFF” period shall be represented by a green vertical line.

7. Manufacturer’s standard display screen showing the status of each equipment

component. The specified color designation for running, stopped, open, or closed equipment shall be used.

8. Alarm history screen with clear and scrolling feature buttons.

9. An analog setup screen with dissolved oxygen set points, total suspended solids, pH, level and pressure ranges.

10. Manual MBR blower speed adjustments, in percent of full speed with corresponding hertz indicated. Graphic up and down arrows shall be used to adjust the speed of each blower. A graphic “enter” shall be provided to set the speed at the indicated value.

11. Other screens as the MBR manufacturer may require.

U. Automatic transient protection for protection from the effects of lightning induced currents shall be provided. The suppressor shall have solid-state bi-directional componentry and failure indicator (neon). Advanced Protection Technologies, Inc. Model TE/110 or equal shall be provided.

V. Identification: (Quotation marks used herein this specification denotes wording of the nameplate or escutcheon legend plate.)

1. Nameplates shall be engraved laminated phenolic with white background, black 3/16” high letters to identify each door-mounted component, and shall be mounted to the panel face without screws.

2. Provide a master nameplate - “MEMBRANE BIOREACTOR CONTROL PANEL (CP-3).” This nameplate shall be 2 inches high with 1-inch high letters and be centered at the top of the panel above the operator interface. The background shall be red with black letters. Attach this nameplate to the door.

3. Provide a yellow warning label attached to the door that reads as follows: THIS PANEL IS PROTECTED BY A MAIN CIRCUIT BREAKER. SHUT POWER TO THE PANEL BEFORE MAKING REPAIRS.

4. The manufacturer’s company name, location and project number shall be shown on the front door on an aluminum nameplate.

W. Pilot Lights, Push buttons, and Switches: Pilot lights, push buttons, and selector switches shall be manufactured by Allen-Bradley and be oil tight NEMA 13, heavy duty type. The Owner’s color-coding system shall be used.

1. “TROUBLE”, “ALARM”, or “FAULT” pilot lights shall be push-to-test, incandescent type

with amber color cap.

2. “RUN”, “OPEN”, “ON”, “HAND”, or “START” pilot lights shall be push-to-test, incandescent type with red color cap.

3. “OFF”, “CLOSE” or “STOP” pilot lights shall be push-to-test, incandescent type with green color cap.

4. Selector switches shall be maintained position type with properly labeled legend plate.

X. The control panel face shall contain the following controls, indicators, switches, and devices and be arranged in groups, banks, rows or columns to provide a logical separation of function and shall be designed and fabricated to accomplish the functions specified. Status pilots lights shall be provided in addition to the Panelview Plus display in case the graphic display is out of service and the operator is forced to operate the system without the benefit of the graphic display. The following shall be provided:

1. White pilot light centered at the top of the panel showing that the panel is energized - “120 VOLT POWER”.

2. “RUN-OFF-AUTO” selector switch to control the operation of each Permeate, WAS and RAS Feed pump.

3. “RUN-OFF-AUTO” selector switch to control the operation of each MBR aeration and MBR air scour blower.

4. “RUN-OFF-AUTO” selector switch to control the operation of each Anoxic mixer.

Y. "ONLINE/OFFLINE” selector switch for each Anoxic Basin and MBR Basin. The MBR Online/Offline selector switches will be marked “Train No. 1” and “Train No. 2”. These switches shall allow the system to operate as a continuous flow single reactor system or dual reactor system. Each train can be taken off line by switching the respective switch to the “OFFLINE” position. If any train is taken off line at any time, the single remaining operating train shall operate the system as a single continuous flow reactor.

Z. Provide elapsed hour meters for the following: WAS pumps (2), RAS pumps (4), mixers (2), MBR blowers (6) and Permeate Pumps (3). This feature at the manufacturer’s option can be provided only on the operator interface.

AA. The PLC shall also monitor DO and control the air flow rate from the MBR aeration blowers through a proportional 4-20ma signal to the blower MCC sections. If the flow rate peaks at 175

CFM, or the operator selected DO in the MBR tank, he shall be able to control air flow to fluctuate between the minimum and maximum manufacturer required air scour rates in the event that the MBR tanks require more or less air.

BB. Provide common alarm pilot light for each tank for all alarm conditions.

CC. The following alarm conditions shall be annunciated using the operator interface:

1. “MBR DISSOLVED OXYGEN PROBE OUT OF RANGE”

2. “MBR PH PROBE OUT OF RANGE”

3. “MBR TOTAL SUSPENDED SOLIDS PROBE OUT OF RANGE”

4. Each mixer as follows: “MIXER FAILED TO START”, “MIXER FAILED TO STOP”, “MOTOR OVERTEMPERATURE”, “SEAL LEAK”.

5. Each aeration blower as follows: “BLOWER FAILED TO START”, “BLOWER FAILED TO STOP”, “MOTOR OVERTEMPERATURE”

6. Each blower discharge pressure transmitter as follows: “BLOWER LOW PRESSURE” and “BLOWER HIGH PRESSURE”. The pressure set point for each blower shall be adjustable via the operator interface.

7. Out of range alarms for blower pressure and temperature.

8. “HIGH LEVEL” & “LOW LEVEL” for ANOXIC TANKS.

9. “HIGH LEVEL” & “LOW LEVEL” for MBR TANKS.

10. Each permeate pump, RAS pump and WAS pump as follows” “HIGH MOTOR TEMPERATURE” AND “PUMP FAILED TO START”, “PUMP FAILED TO STOP”

11. Other alarms as required by the MBR manufacturer.

DD. Provide a program feature that provides a warning banner if more than the required number of MBR air scour blowers to operate the plant are turned “OFF”. This means that at least 2 blowers must be in the “RUN” or “AUTO” position for 2 basin operation, and at least 1 blower must be in the “RUN” or “AUTO” position for 1 tank operation. Provide similar programming for the MBR aeration blowers.

EE. Provide an alarm horn with a silence pushbutton and a reset pushbutton, which shall sound when

any alarm condition is activated. Provide a dry contact for activation of all alarm conditions at the facility annunciator. The horn and pushbuttons shall be mounted on the front of the panel. The horn shall be manufactured by Edwards. The volume shall be adjustable.

FF. SCADA Interconnection

1. Control panel supplier/manufacturer shall coordinate the programming of the PLC with the SCADA computer to provide access to the all system data residing therein as well as access to adjust any operator adjustable set points via the SCADA system, as the Owner desires.

2. All control panels shall be provided with an Ethernet switch suitable for both ethernet and fiber optic connection for use by SCADA computer. Ethernet connection shall be Cat6E type. Switch shall have a minimum of 8 ethernet and 4 SC type fiber optic pair inputs to provide space for integration of other project control panels.

**2.02 – PERSONAL COMPUTER (PC) MONITORING SCADA SYSTEM**

A. In addition to the PLC based MBR Control Panel specified under this section, one (1) dedicated Personal Computer (PC) for SCADA shall be provided by the MBR equipment manufacturer as described herein (and as shown on the contract drawings). The computer monitoring systems shall be provided loose for installation, interconnection, and field wiring by the installing contractor.

B. High speed internet connection with recommended minimum download and upload speeds of 1 MB/s shall be available (by others). A fixed IP address is required from the internet service provider.

C. UPS: A UL listed uninterruptible power supply suitable for location shall be provided to protect PCs from short power outages by switching to an emergency battery backup without data loss or downtime. Nominal input voltage and output voltage shall be 120VAC with an autosensing input frequency of 47-63 Hz. Output power capacity of 780W / 1300VA. The UPS shall be provided with an audible alarm and LED status indicators and operate from 0 – 50 degC.

D. Each computer monitoring system provided shall meet the following minimum component specifications. At time of manufacture of the monitoring system, components specified below shall be subject to "upgrade" or "or equal" status to provide for the most current model component available.

1. The MBR Control panel PLC to PC communication shall be provided by the MBR

equipment manufacturer and shall be via an Ethernet communication network from the PLC(s) to an interface card located in the SCADA PC.

2. The A-B CompactLogix processor shall communicate from channel 1 on the PLC processor(s) to a dedicated Ethernet PC network interface card (NIC) which shall provide the SCADA connectivity to the plant control network.

3. The Ethernet network shall be a local area network that provides communication between various devices at 10 Mbaud utilizing TCP/IP message protocol. The A-B CompactLogix processor channel 1 connector shall conform to ISO/IEC 8802-3 STD 8-2.3 and utilize 10 Base-T media. Connections shall be made directly from the PLC to an Ethernet switch. The SCADA PC and network card shall also be of the type 10 Base-T and shall connect directly a 10/100 Base-T Ethernet switch, which shall be connected to all hubs on the network. Twisted pair 10Base-T cables with RJ-45 connectors shall be used to make connections between switches and devices and shall be a maximum of 323 feet in length. If greater, MBR supplier must be contacted. Interconnecting network cable shall be provided by the installing Electrical contractor and shall be type Belden #9463 (shielded twin axial) or equal.

E. The hardware for the dedicated for SCADA Personal Computer monitoring shall meet the following:

1. Dell Precision T5810 Touch Screen Computer, with 5-Year ProSupport

2. Processor: Intel® Core™ i7-4770 Quad Core, 3.9GHz.

3. Memory: 8GB DDR3, 1600 MHz Dual Channel SDRAM

4. Keyboard: USB Quiet Keyboard

5. Monitor: Dell UltraSharp™ 21.5 inch Widescreen

6. Video Card: 1 GB DVI

7. Boot Hard Drive: 500GB SATA 16 MB DataBurst Cache™

8. Second Hard Drive: same as boot hard drive

9. Mouse: Optical mouse with scroll

10. Modem: Dell V.92 data/fax controller less modem

11. Removable Media: 16X DVD+/-RW with Roxio Creator & CyberlinkPowerDVD

12. NIC: 10/100 /1000 Ethernet

13. Color inkjet printer with printer cable HP Deskjet 2540 or equal. One only for entire project.

F. The following Standard Commercial Pre-loaded Software shall be provided for the SCADA PC:

1. Microsoft Windows 10 Professional, 64-bit.

2. Microsoft® Office 365 Business.

3. McAfee® Total Security

4. TechSmith SnagIt

5. Kepware OPC Server Database Engine

6. Admin server for remote access

7. Rockwell Software Factorytalk HMI Runtime

8. Win911 Alarm Notification software

9. All software packages shall be provided with use license and user manuals required for operation.

10. Remote accessibility programs for supplier, Owner and Engineer.

G. The SCADA system shall include the same features as the HMI with screens also for the following:

1. Operating status of: influent screens, influent pumps, pre-equalization pumps, effluent pumps, pre-equalization blower, sludge holding tank blower and common pre-equalization/sludge holding tank blower

2. Level status of: influent screening channels, influent pump station, pre-equalization pump station and effluent pump station

3. Common alarms from: CP-1 – Pump Stations Control Panel and CP-2A/CP-2B – Influent Screen Control Panels

**2.03 - ANOXIC MIXERS**

A. The manufacturer shall provide (2) duty and (1) shelf spare anoxic mixer. Each mixer shall be 2.3 HP, 3 phase, 460 V, 60 HZ and model 4620 manufactured by Flygt.

B. Manufacturer Specifications:

1. Cable Entry: Cable entry consists of a compressible rubber bushing to seal off motor area and relieve strain on the cable. Cable entry housing is constructed of vinyl ester for shock and chemical resistance.

2. Junction Box: Box is sealed off from surrounding liquid and stator casing via terminal board and an O-ring.

3. Motor: Squirrel cage, 3 phase induction shell type design NEMA B motors are specifically designed for each mixer frame size. Non-overloading for full performance range. Motor insulation is Class F with a maximum working temperature of 155°C (311°F). Combined service factor of 1.10. Motors can be run continuously or intermittently. The stator is cooled by the surrounding mixed media.
4. Oil Casing: An environmentally friendly white paraffin based, FDA approved, non-toxic oil lubricates and cools the seals and acts as an additional barrier to prevent liquid from penetrating the motor area. Pressure build-up within the casing is reduced by an inner and outer oil compartment design which transports any foreign liquids away from rotating components. Casing is constructed of vinyl ester for shock and chemical resistance.
5. Bearings: Bearings shall be rated in excess of 100,000 hours of operation (L-10aa rated life). Shaft is supported by a single row angular contact ball bearing and single row cylindrical roller bearing, plus a heavy duty single row angular contact ball bearing on the propeller side.
6. Shaft: Motor shaft and rotor are a single integral unit. Shaft is completely isolated and cannot come in contact with the mixed media.
7. Active Shaft Seals: Outer mechanical seal isolates the oil housing and surrounding liquids and is tungsten carbide lapped end faced running in oil. Inner mechanical seal operates between oil casing and stator casing. Only seal faces operate in the mixed media, all other components are within motor housing. One seal face of the inner seal pair has laser etched spiral grooves. As the seal rotates, these grooves act to pump any leakage back into the oil casing from out of the stator housing.
8. Propeller: Two bladed, 316 stainless steel propeller. Blades shall have large width, thin profile and smooth surface with a back swept design for optimum efficiency and non-

clogging operation. The blades shall be laser cut to exacting tolerances. Propeller is available in other materials.

9. Monitoring Equipment: The stator incorporates three thermal switches connected in series (one in each phase) which open at 260°F (125°C).

**ANOXIC MIXERS - SCHEDULE 465349-1**

**GENERAL:**

| | |
|---|---|
| Application: | ANOXIC TANK MIXER |
| Quantity: | 2 duty, 1 replacement |
| Manufacturer: | Flygt or approved equal |
| Model Number: | 4620 or approved equal |
| Control Panel: | CP-3 |

**PHYSICAL CHARACTERISTICS:**

| | |
|---|---|
| Propeller Size (inches): | 8 9/32 in. |
| Minimum Water Level (inches): | 21 (From top of Propeller) |
| Nominal Thrust (N): | 305 |

**ELECTRICAL CHARACTERISTICS:**

| | |
|---|---|
| Minimum Motor Horsepower (hp): | 2.3 |
| Motor Speed (RPM): | 1675 |
| Service Voltage (V): | 460 |
| Frequency (HZ): | 60 |
| Phase: | 3 |

Variable Frequency Ready Motor Not Required

**2.04 - AIR DIFFUSER ASSEMBLIES**

A. The aeration system shall be a fine bubble diffused air system and shall be as shown on the contract drawings. The aeration system shall be capable of delivering 175 SCFM per basin.

B. The strip diffuser membrane shall be a homogenous thermoplastic material from the polyurethane family. The membrane shall have a proven record of performance in more than 25 installations. The membrane must be manufactured as a seamless, calendered sheet without defects or repairs. Membrane materials containing plasticizers or softeners are not acceptable. The surface of the membrane must be smooth to prevent biological growth from attaching. Membrane shall be capable of producing fine bubbles of 1 mm in diameter across the entire surface. Air flow shall be uniform across the entire membrane surface. EPDM, Teflon coated EPDM, and silicone based membranes are not allowed on this project.

C. The frame shall provide structural support for the strip diffuser membrane and be structurally self-sufficient. In addition to securing the entire perimeter of the membrane with an airtight sealing mechanism, the frame shall provide the necessary mechanism for even distribution of air. No fasteners shall be allowed to penetrate the membrane. No discs or tube diffusers are allowed on this project. Only strip diffusers are allowed on this project.

D. The base profile shall be made from PVC. The membrane shall be fastened to the base profile using polyamide tubing. Air shall be supplied to the strip diffuser through a fitting in the end of the diffuser. The air feed fitting shall be made from PVC and is bonded to the base profile. The diffuser shall be anchored by preformed elements (304 SS or PP) and secured by standard bolts, nuts and anchors (304 SS).

E. Anchors shall be fabricated from minimum 3/8-inch diameter type 304 stainless steel threaded rod. Anchors shall be suitable for insertion into concrete slab with epoxy adhesive and shall be sized for a pull out strength 5 times the calculated buoyant forces. Support profiles, nuts, bolts, washers, and other fasteners shall be made from 304 stainless steel. Consumables such as thread lubricants, epoxy, teflon tape, etc. shall be supplied by the CONTRACTOR.

F. The drop pipe connecting to main air supply shall be polyethylene and meet the requirements of ASTM D 1248, Type III, Class C, Category 5 Grade P34, or ISO S8,3/SDR 17.6. The pipe shall be connected to the air main piping by a king nipple (304 SS), supplied by the CONTRACTOR, attached to a high temperature rated flexible hose supplied by the strip diffuser supplier.

G. Attach supports to the tank floor using epoxy type concrete anchors designed for embedment in 3,000 psi concrete. Space supports at 6 feet (maximum) center to center. Size anchors for pull-out strength 5 times the calculated buoyant forces.

H. Distribution piping shall be Polyethylene and shall be 1-inch in diameter and meet the requirements of ASTM D 1248, Type III, Class C, Category 5 Grade P34, or ISO S8,3/SDR 17.6. All polyethylene shall be provided in continuous lengths. No field welding shall be required. Provide compression fittings to connect PE piping to diffuser and air header piping. All feed assemblies shall be fabricated for field installation using standard components and couplings. Feed lines shall be easily connected and disconnected to allow purging of debris after installation but before operation. Each distribution pipe shall be supplied with a removable end cap or plug to allow purging of the air lines.

I. Attach pipe supports to the tank floor using epoxy type concrete anchors designed for embedment in 3,000 psi concrete. Space supports at 6 feet (maximum) center to center. Size anchors for pull-out strength 5 times the calculated buoyant forces.

**2.05 - MBR AIR SCOUR/MBR AERATION**

A. The MBR System Supplier shall be responsible for providing all materials, equipment and services necessary for furnishing three (3) MBR air scour blowers and (3) MBR aeration blowers for a total of six (6) aeration blower packages, complete with all accessories as listed in these specifications and as shown on the plans to include enclosures.

B. Each blower assembly shall be complete and mounted on a base weldment with four-corner anti-vibration mountings, designed for direct application on a concrete slab or other solid foundation. Each assembly shall be suitable for shipment as a complete unit, factory assembled (less discharge pipe fittings) as much as possible to facilitate shipping and handling. The blower package shall be as specified herein. Refer to the Schedule for aeration equipment quantities, performance characteristics and the electrical characteristics for each aeration application.

C. Supply each blower as a package from the factory that shall include, but is not limited to, the following: blower, electric motor, matched belts and sheaves, inlet filter, inlet silencer, discharge silencer, discharge check valve, rubber inlet sleeve and discharge connection, pressure relief valve, automatic unloading valve, rubber expansion joint, pressure gauge, belt guard, discharge pressure switch, temperature gauge with switch, inlet filter maintenance indicator, metal base skid, sound attenuating enclosure with properly sized enclosure cooling fan.

D. The rotating parts of each blower shall be statically and dynamically balanced before final assembly. The blower alone shall operate without vibration in excess of the limits stated in the latest revision of NEMA MG-1. Each blower shall be operated at its maximum rated speed and differential pressure for thirty (30) minutes as a factory test.

E. Each blower shall be slip tested (per ISO 1217). The slip rpm shall be documented and supplied for each blower. A document certifying that the supplied blowers conform to the design specifications and plans shall be provided.

F. The air blower(s) shall be of the positive displacement type, and shall be constructed with inlet and discharge connections oriented as shown on the contract drawings. Each blower shall be equipped with detachable rugged steel mounting feet for mounting in horizontal configuration.

G. Blower units are based on the Aerzen package system as specified in the schedule below. Other package blower systems that adhere to the base specification requirements may be submitted for consideration of substitution approval by the Engineer. Each blower shall be factory tested to meet ISO 9001 quality standards and shall meet the requirements contained in the schedule.

H. Casing: The blower casing shall be one piece, with separate head plates, and shall be made of ASTM A48 Class 30B close-grained cast iron. Each head plate shall incorporate a vent to atmosphere. In a pressure application this vent prevents pressurization of the oil chambers. In a vacuum application the vent prevents oil carry over to the air stream.

I. Impellers-Shaft Assembly: Each impeller-shaft assembly shall be made from high-strength ASTM A395-60-45-15 ductile iron. The shafts are cast integrally with the impellers. The impellers shall be of the straight, two-lobe involute type, and shall operate without rubbing, liquid seals or

lubrication. The assembly shall be dynamically balanced by removing metal from the impeller body, and shall be center-timed to permit rotation in either direction. Each shaft is fitted with a cast iron ASTM A48 Class 30B sleeve and ductile iron piston ring, SAEJ929. The piston ring is located on the shaft at the point where the shaft passes through the head plate. Each impeller and shaft assembly shall be supported by oversized anti-friction bearings engineered for long service life and fixed to control the axial location of the impeller/shaft in the unit.

J. Timing Gears: The impellers shall be timed by a pair of SAE 8620 carburized and hardened steel spur gears. The gears shall be hardened to 58-62 Rockwell hardness and mounted on the shafts with a tapered fit and secured by a locknut.

K. Both the gear end and the drive end of the blowers shall be oil splash lubricated for minimal maintenance and long service life. Grease lubricated bearings are not acceptable. The lubrication design shall ensure adequate lubrication of the timing gears and bearings.

1. The seals shall be designed for low maintenance as well as Retaining the air inside the rotor chamber and minimizing the air leaks, preventing oil from leaking into the rotor chamber, contaminating the process air, and preventing the oil from leaking out of the machine.

L. Drive motors shall be designed, manufactured, and tested in accordance with the latest revised editions of NEMA MG-1, IEC, IEEE, ANSI, and AFBMMA standards as applicable and shall be capable of continuous operation.

M. A filter maintenance indicator shall be installed and connected to the blower intake. The blower shall be enclosed in a sound enclosure, therefore the filter maintenance indicator shall be installed on the sound enclosure wall and visible without opening the sound enclosure. Filter silencer unit shall be provided by the blower manufacturer.

N. A Combination Base shall be acceptable such that the blower base is in combination with discharge silencer. The base/discharge silencer will have a connection for a pressure relief valve built into the silencer. The belt drive shall be covered by a belt guard. The belt guard shall be in compliance with OSHA regulations.

O. The packages shall be driven through V-belts and sheaves. Belt tension shall be automatic. Neither slide rails nor adjustable spring load shall be used. The belt drive system shall not require adjustment. Automatic tensioning of the V-belts by use of a pivoting, swing frame motor base, with adjustable spring assistance and visual indication of V-belt tension, shall be provided to ensure the V-belts remain properly tensioned with minimal maintenance and to extend V-belt, sheave, and bearing life. Adjustment of the tensioning device shall be accomplished

P. Oil drains from the blower drive end and gear end lubricating oil sumps shall be manifolded to the edge of the base for ease of maintenance.

Q. An elastomer material sleeve with industrial quality clamps shall be used to connect the discharge of the blower package to the discharge piping. The flexible connector shall be used downstream of the discharge silencer. It shall be designed to withstand continuous exposure to temperatures up to 300ºF (150ºC) and pressures up to 15 psig. (1 bar g.). The distance between the package discharge and the connecting piping shall be sufficient to allow for free thermal expansion without touching. The alignment of the piping to the package shall be accurate within ⅛ ". The piping shall be independently supported.

R. Each blower shall be protected by spring-loaded pressure relief valve preset to start opening at the value listed in the attached schedules. The pressure relief valve shall be fully open at not more than 10% above the pressure listed, and rated for the SCFM and PSIA listed in the schedule. If the valve malfunctions it shall remain in the open position to prevent blower damage. The relief valve shall be shipped attached to the blower package. Pressure relief valve shall not vent discharge air into the blower unit/motor enclosure.

S. Each blower shall have a discharge check valve. The check valve shall have threaded connections for 5" diameter and below and wafer style for 6" and above. Check valve shall be cast iron or carbon steel with silicone seat and stainless steel spring. The blower manufacture must insure the valve is of suitable for the application. Valve shall be installed by the blower manufacturer and shipped with the blower package.

T. The blower package shall include a NEMA 4 discharge temperature switch. Switch to be mounted on the outside of the noise enclosure. The switch shall include 10 feet of 316 SS capillary with 75W SS well. Manufacture shall be Dresser Instruments, Dresser Inc model T424T10-303 or approved equal The blower manufacturer shall provide the necessary thermisitor relay for installation in the MCC section.

U. The blower package shall include a NEMA 4 high discharge pressure switch. Switch to be mounted on the outside of the noise enclosure. The pressure switch shall sense high air pressure. The switch shall have an adjustable dial calibrated for the discharge pressure listed in the attached schedules plus and minus fifty percent, minimum. SS tubing to be used. Manufacture shall be Dresser Instruments, Dresser Inc. model B424V or approved equal.

V. MBR and Air Scour blowers discharge pressure transmitters shall be diaphragm type, range -15 to + 15 PSI model Cerabar T PMC 131-A22F1V6N/Q4H as manufactured by Endress Hauser. Pressure transmitter shall have a 304SS enclosure material, FPM Viton process seal, NEMA 4X rating, ½" MNPT process connection, 11 to 30 VDC power supply and 4-20 mA output. Provide

air pressure transmitter for each MBR and Air Scour blower.

W. An 80 dBA or less free field guaranteed noise enclosure shall be provided for each blower system. The enclosure must be suitable for outdoor installation. The enclosure shall include a vent system and removable panels for easy access and maintenance. The noise enclosure shall provide up to 22-dba attenuation, free field, and supplied by Blower manufacturer.

X. Each blower will have an enclosure cooling fan that will need to be on a time delay which can lock out if fan cools blower, blower turns back on three times. Each blower will also have a motor thermal overload relay provided that needs to go back to the control panel CP-3. Additionally there will be a temperature switch, HI/LO pressure switch and pressure transmitter installed in the discharge piping which will need to be brought back from each blower to CP-3.

Y. The MBR equipment manufacturer shall coordinate all blower, aeration supply, control and signal requirements with the approved blower packages supplier and be responsible for the products as delivered to the job site.

## MBR BLOWERS - SCHEDULE 465349-2

**GENERAL:**

Application: MBR AIR SCOUR & MBR AERATION BLOWER
Quantity: 6
Manufacturer: Aerzen or approved equal
Model Number: GM 10S – DN-80 or approved equal
Control Panel: CP-3

**PHYSICAL CHARACTERISTICS:**

Discharge Size (inches) 3 in.

**ELECTRICAL AND PERFORMANCE CHARACTERISTICS:**

**MBR AIR SCOUR/AERATION BLOWER**

| | |
|---|---|
| Quantity: | 6 |
| SCFM: | 175 @ 4.5 psig |
| ACFM | 123 @ 7.4 psig |
| Minimum Motor Horsepower (hp): | 10 |
| Motor Speed (RPM): | 4355 |
| Service Voltage (V): | 480 |
| Frequency (HZ): | 60 |
| Phase: | 3 |

Variable Frequency Ready Motor Required

**2.06 - MEMBRANE MODULES AND MOUNTING ACCESSORIES**

A. Membrane Units shall be type OV480 as manufactured by Ovivo. Membrane Units shall include a diffuser case and membrane module. Furnish two (2) fixed membrane units for each membrane

tank for direct filtration of MLSS, as shown on the drawings.

B. Each membrane sheet shall be comprised of two PES (polyethersulfone) filtration layers uniformly fused to and separated by an integral polyester (PE) drainage layer.

1. The sheet assembly shall be ultrasonically welded on all sides and backwashable at pressures up to 2.2 psig.

2. Each sheet shall be 2mm in thickness, 8mm apart and sufficiently flexible to minimize or prevent the effects of localized dewatering.

3. Membrane filtration shall have an average pore size of 0.04 microns or less.

4. Capable of being aerated during periods of no filtration.

5. Easy to recover localized dewatering or clogging in the event of mis-operation or operation outside of normal operating conditions.

a. Only a routine Maintenance Cleaning shall be required following a dewatering event to recover specified performance.

b. In situ physical or mechanical cleaning only; no manual cleaning shall be required to recover.

6. Be resistant to damaging debris and self-heal in terms of effluent quality per the following:

a. Turbidity shall recover to specified limits within 10 minutes of a damaging event or occurrence provided the resulting cut or abrasion is less than 4” in total length.

C. Membrane Units shall have integral permeate manifolds.

D. Membrane Units shall have integral diffuser assembly manifolds.

1. Diffuser cases shall:

a. Be fabricated from 304 SS.

b. Be attached to the Cassettes to accommodate removal without lowering water level.

2. Medium Bubble Diffuser Assembly

a. Consist of (7) separate diffusers, each fed by a common manifold and easily

replaceable.

b. Polyurethane membrane

c. Non-clogging type that do not require a cleaning procedure.

d. Provide a minimum of 1.3% OTE.

E. Each membrane unit shall be provided with flexible hoses and flange fittings for the connection of the permeate and air scour common manifolds to the piping connection(s) of each module. MBR System Supplier shall provide all other piping, hoses, fittings and valves as indicated on the drawings.

1. Permeate hose shall be 3-inch clear PVC multi-purpose Series W300 hose manufactured by Tiger Flex. Hose length as required by manufactured.

2. MBR Air scour hose shall be 3-inch EP Plicord Con-AG Black Rubber Suction Discharge Hose as manufactured by Goodyear Engineered Products, or approved equal. Hose length as required by manufacturer.

F. Membrane Units shall be constructed of type 304 stainless steel, SCH 80 PVC, and PE components and shall be designed to support the Membrane Unit inside the bioreactor. Membrane Units shall be furnished with anchors for securing Units within the basin.

G. Membrane Units shall be furnished with 316 stainless steel guide bars and lifting chains.

**2.07 - MEMBRANE PERMEATE DISCHARGE PUMPS**

A. Furnish three (3) Permeate discharge pumps located as shown on the contract drawings.

B. Permeate pumps shall be Gorman Rupp Model 11 1/2A20-B centrifugal pumps. Pumps shall be designed for variable speed operation, and shall serve forward flow (permeate) purposes. The pump shall be capable of delivering 77 GPM.

C. The motor shall deliver 3 HP and shall be wired for 460 volt, three phase, 60 hertz operation. The pump shall be designed for direct coupling with TEFC inverter-duty rated integral gear motors.

D. The pumps shall be provided complete with mounting base and 304 stainless steel anchors for field anchoring to concrete slab.

**MBR PERMEATE PUMP - SCHEDULE 465349-3**

**GENERAL:**

| | |
|---|---|
| Application: | MBT Permeate (P2) |
| Quantity: | 3 |

| | |
|---|---|
| Manufacturer: | Gorman-Rupp or approved equal |
| Model Number: | 11 1/2A20-B or approved equal |
| Control Panel: | CP-3 |
| **PHYSICAL CHARACTERISTICS:** | |
| Pump Discharge Size (inches): | 1.5 in. |
| **ELECTRICAL CHARACTERISTICS:** | |
| Minimum Motor Horsepower (hp): | 3 |
| Motor Speed (RPM): | 1800 |
| Service Voltage (V): | 480 |
| Frequency (HZ): | 60 |
| Phase: | 3 |
| Variable Frequency Ready Motor Required | |

**2.08 - PERMEATE LINE INSTRUMENTATION AND ACCESSORIES**

A. Furnish one (1) Rosemount Model 2088 pressure transmitter to be installed in each permeate line as shown on the contract drawings. Transmitter output shall be a 4-20 mA signal to CP-3. Supply of 1/2" NPT and two 1/2" ball valves and piping as shown on the drawings shall be the responsibility of the contractor. Installation of the pressure transmitter in the permeate piping shall be by the contractor. Contract E to wire all solenoid valves and transmitters.

B. Furnish two (2) solenoid valves (one (1) ¾” and one (1) 1”) for each permeate line to allow for air extraction system. Valve(s) shall be shipped loose for installation in permeate header by the installing Contractor, as shown on the drawings. Solenoid valve shall be Asco Series 221, normally closed.

C. All permeate line instruments and valves will be shipped loose for installation by the Installing General and Electrical Contractors.

**2.09 - MEMBRANE AIR SCOUR**

A. Membrane Air Scour Pressure Monitoring

1. Furnish one (1) Rosemont Model 2088 pressure transmitter assembly to be installed in the main air scour and aeration headers for monitoring of air scour blower pressure for each train (total of 4). The assembly is comprised of a ½” NPT ball valve and a 0-15 PSI pressure transmitter, and must be contractor installed and wired in a sensing location for each membrane train as shown on the drawings.

2. The pressure transmitter shall include the following: 304SS enclosure material, FPM Viton process seal, NEMA 4X rating, ½” MNPT process connection, 11 to 30 VDC power supply and 4-20 mA output.

3. The pressure transmitter shall be turned over to Contract P for installation in pipe and

shall be wired by Contract E.

B. Membrane Air Scour Flow Monitoring

1. Furnish one (1) flow transmitter for each air scour main: Proline t-mass, Model 651 or equal.

2. Plumbing Contractor to provide 1" FNPT in piping for installation.

**2.10 – LEVEL TRANSDUCERS**

A. Furnish one (1) Endress Hauser FMX167 Water pilot submersible pressure transducer unit constructed of stainless steel for each Anoxic and MBR Basin for a total of four (4) assemblies. Each level pressure transducer shall be submersible type units constructed of stainless steel for each tank.

B. Transducer shall utilize a diffused silicone semiconductor sensor protected by an integral stainless steel diaphragm with seal fluid. Transducer output shall be a 4-20 mA signal. Electrical connection shall be 2-wire, loop powered through a shielded integral cable comprised of 22 AWG conductors and separate drain wire.

C. Each transducer shall be suspended within a 6-inch diameter stilling well attached to the tank wall. The stilling well shall be furnished and installed by the General Contractor. Electrical connection shall be by the Electrical Contractor.

D. Electrical connection shall be to an attached two wire, 22 gauge polyethylene shielded cable. 35 feet of cable per shall be provided. Attachment and supply of the junction box/disconnect at the basin wall shall be the responsibility of the installing Electrical contractor.

E. Adhesive anchors of 304 stainless steel shall be provided for anchoring the pressure transducer suspension cables mounting bracket.

**2.11 – LEVEL FLOAT SENSOR ASSEMBLIES**

A. Furnish one (1) level dual high and low level float assembly for each Anoxic and MBR Basin. The assembly shall be furnished by the MBR manufacturer for installation by the Contractor. Electrical connection shall be by the Electrical Contractor.

B. Each assembly shall consist of a pipe support column wall bracket, and mounting hardware as detailed on the Contract Drawings.

C. Each assembly shall come complete with 304 stainless steel float weights with a smooth, chemical resistant polypropylene casing for each tank. The floats shall be model GSI 40NONC

manufactured by Anchor Scientific. Each mast shall include two S.P.D.T. level sensors with #19 three conductor electrical cable. Electrical cable shall terminate at a junction box/disconnect located at the tank wall. Field wiring and junction box/disconnect shall be provided by the installing Electrical Contractor.

**2.12 – SUBMERSIBLE PUMPS**

A. The submersible RAS and WAS pumps listed in the schedule and supplied by the MBR System Supplier shall conform completely with Specification Section 432113 – Centrifugal Liquid Pumps.

**RAS PUMP - SCHEDULE 465349-4**

**PUMPING CHARACTERISTICS**:

| | |
|---|---|
| Flow: (GPM) | 500 |

**GENERAL:**

| | |
|---|---|
| Application: | Return Activated Sludge |
| Quantity: | 4 ; 1 Duty and 1 Installed Spare per basin |
| Manufacturer: | Flygt or approved equal |
| Model Number: | NP 3102 MT 3~463 or approved equal |
| Control Panel: | CP-3 |

**PHYSICAL CHARACTERISTICS:**

| | |
|---|---|
| Discharge Size (inches): | 4 in. |

**ELECTRICAL CHARACTERISTICS:**

| | |
|---|---|
| Minimum Motor Horsepower (hp): | 5 |
| Motor Speed (RPM): | 1705 |
| Service Voltage (V): | 460 |
| Frequency (HZ): | 60 |
| Phase: | 3 |

Variable Frequency Ready Motor Required

**WAS TRANSFER PUMPS - SCHEDULE 465349-5**

**PUMPING CHARACTERISTICS**:

| | |
|---|---|
| Flow: (GPM) | 75 |

**GENERAL:**

| | |
|---|---|
| Application: | WAS Transfer Pumps |
| Quantity: | 3 ; 1 duty per basin and shelf spare |
| Manufacturer: | FLGYT or approved equal |
| Model Number: | NP 3085.190 SH or approved equal |
| Control Panel: | CP-3 |

**PHYSICAL CHARACTERISTICS:**

Discharge Size (inches): 3 in.

**ELECTRICAL CHARACTERISTICS:**

Minimum Motor Horsepower (hp): 1.5
Motor Speed (RPM): 1755
Service Voltage (V): 480
Frequency (HZ): 60
Phase: 3
Variable Frequency Ready Motor Required

**2.13 – FLOW METERS**

A. Flow meter shall be magnetic-inductive type that produces a magnetic field by positioning the coils inside the flow tube. The flow meter sizes and quantity are specified herein. Flow meter shall be ABB Instrumentation WaterMaster electromagnetic flow meter.

B. Flow meter shall be provided with ANSI 150 flanged ends, hard rubber lining, electrodes and 316 stainless steel grounding rings.

C. Flow meter shall include integral signal converter with NEMA 4/IP 65 electrical rating, backlit three line, internal keypad and LCD display indicating instantaneous flow and total flow in GPM, isolated 4-20 mA DC and scaled pulse outputs, and 120 VAC power requirements.

D. Furnish one (1) 4” flow meter for the WAS pump discharge piping as shown on the drawings.

E. Furnish two (2) 6” flow meters for the RAS pump discharge piping as shown on the drawings.

F. Furnish two (2) 3” flow meters for the MBR permeate discharge piping as shown on the drawings.

**2.14 – ANALYTICAL INSTRUMENTATION EQUIPMENT**

A. MBR manufacturer to provide a multi-parameter digital terminal/controller system, manufactured by YSI Incorporated. The multi-parameter system shall be integrated with the MBR Control Panel CP-3. The controller system shall consist of the following components:

1. One (1) System 2020 3G - 20 Channel Terminal/Controller with 6 Current outputs, power supply 100-240 VAC & USB interface. 5 available IQ Sensor Net Connections

2. Two (2) Passive Junction Box, IQ. 4 IQ Sensor Net Connections

3. One (1) Rail mounting kit for SSH/IQ sun shield

4. One (1) IQ Sun Shield Plastic, for 2020 & 182 module mounting

5. Two (2) Top Hat Rail Mounting for IQ Modules (Din Rail Mounting System)

6. One (1) Output Module, IQ, 3 Analog and 3 Relay. 2 IQ Sensor Net Connections

7. Two (2) Suspended Solids probe for IQ System with built-in ultrasonic cleaning

8. Two (2) Optical DO probe for IQ System, 0-20.00 mg/l

9. Two (2) pH/ORP Probe with amplifier

10. Two (2) pH Electrode with built in reference, 2 – 12 pH

11. Six (6) Quick Release Stainless Steel Handrail Mounting Bracket for Sensors with 1.5 inch PVC couplers and end cap

12. One (1) Interconnection Network Cable Between IQ Module and Controller; Length: 1,640.4 Feet

13. One (1) pH Buffer, 4 (6 pints)

14. One (1) pH Buffer, 6 (6 pints)

15. Six (6) Sensor Connection cable IQ, 7m, 22.9ft.

B. All equipment, sensor and analyzer installation instructions shall be packaged with the shipment and installed by General Contract and wired by Electrical Contractor.

C. Provide interconnection SACIQ-7.5 sensor connection cable for each probe supplied, Cables shall be without splices between wiring connection points. Controllers shall interface with CP-3 via Ethernet cables.

**2.16 – ASSET MANAGEMENT TOOL**

A. The application must have all the features and modules listed below and the accessibility of those modules shall be based on the licensing terms.

B. Asset Management: The asset management module within the application shall include all the following functionality and minimum requirements:

1. Status of the asset: Asset management tool shall be able to show the status of the assets at the plant (e.g. – operational, idle, decommissioned, etc.).

2. Asset Import: Manufacturer assets as noted herein shall be pre-loaded into the asset management tool.

3. Asset Location: Ability to map the asset via map or image-map.

4. Asset Life Expectancy: Tracking of asset useful life.

5. Critical Asset Identification: Asset tool shall provide ability to identify which assets are most critical to normal operation.

6. Asset Documentation: Asset manufacturer shall provide digital O&M documentation. All necessary instructional videos and documents shall be provided for equipment models specific to this facility.

7. All pre-loaded videos and other content must be copyrighted or licensed by the Manufacturer. All asset documentation shall be accessed from the application and available in the cloud from any internet-connected device.

8. Request for Quote and Parts Ordering: Asset management tool shall include the ability to request quotes from manufacturers of the assets listed.

9. Asset Knowledge Management: The asset management tool will allow the end-user to directly attach additional or revised material such as documents, videos, training and maintenance information in accordance with applicable storage limits. The end user should be able to attach any of these items to the specified asset from the mobile device camera or stored files.

10. Support Contacts Details: The user can add and update support contact details specific to each asset.

C. Maintenance Management: The application will provide maintenance management functionality such as work order requests via scheduled tasks and condition-based maintenance reminders,

1. Maintenance Scheduling: Manufacturer will provide maintenance schedule for applicable assets within the application. End user will be able to create their own maintenance schedules or work orders with any of the assets in the application.

2. Condition-Based Maintenance: User shall be notified by equipment data parameters where applicable to perform a maintenance task.

D. Data Monitoring and Trending:

1. The application shall include reliable access to real-time data monitoring as outlined in the end-user license agreement from the Manufacturer-supplied control system, including all instrument readings and equipment statuses as referenced in this specification

section.

2. The application shall have the ability to log data, build trendlines and create HMI visualizations separate from the controls system. End-user shall be able to easily construct and save custom graphs and HMI widgets.

3. With a reliable internet connection, the data shall trend in near real-time with a minimum update every 30 seconds as outlined in the end user license agreement. Trending and HMI widgets shall be accessible and of a responsive design for a mobile device.

E. Alert Management:

1. The application shall send customized text and/or email alerts specified by the end-user based on Boolean logic functions of instrumentation or equipment status supplied in this section.

2. User shall have the ability to acknowledge alerts within the application.

3. Users shall be able to identify to whom they would like the alerts to be sent including individuals outside of the plant if they choose.

F. Internet Connectivity:

1. A hard-wired internet connection with a unique IP address shall be supplied by the Owner.

**2.17 - SPARE PARTS AND MISCELLANEOUS EQUIPMENT**

A. The following shall be furnished in accordance with the requirements contained in Section 01650:

1. Two (2) dozen fuses of each size used in the control panel

2. Three (3) pilot light lens caps of each color

3. Three (3) dozen pilot light lamps for panel face lights

4. One (1) level transducer with cable

5. Two (2) non-mercury float switches

6. One (1) three position selector switch

7. One (1) dozen grease cartridges for mixer motor lubrication

8. Seventeen (17) gallons of oil for the blowers

9. Two (2) sets of replacement filter elements per blower

10. Two (2) sets of replacement v-belts per blower (3 belts per set)

11. One (1) Panelview Plus operator interface unit

12. One (1) PLC input card

13. One (1) PLC output card

14. One (1) PLC analog card

15. One (1) PLC Scanner module

16. One (1) PLC Remote I/O module

17. One (1) PLC power supply unit

18. One (1) PLC CPU with final MBR program installed

19. Three (3) control relays of each type used

**PART 3 - EXECUTION**

**3.01 - GENERAL**

A. All components of the system shall be installed in accordance with the written and /or verbal instructions provided by the MBR 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 0.50 % of the scheduled value for the work of this Section shall be retained until the report has been furnished.

C. Unless otherwise required in the Contract Documents, the MBR Supplier shall provide all submittal documentation as described in this Section no later than 8 weeks after receipt of purchase order and notice to proceed.

D. Unless otherwise required in the Contract Documents, the MBR Supplier shall deliver all components in their Scope of Supply, as described in this Section, no later than 18 weeks after receipt of written submittal approval.

**3.02 – CONTROL SYSTEM FACTORY ACCEPTANCE TEST**

A. The MBR System Supplier shall coordinate and conduct a factory acceptance test (FAT) of the MBR control system during which:

1. The PLC control logic and HMI operability shall be demonstrated by systematically forcing I/O to verify all controls functions and HMI screen representations defined in the system control narrative.

2. The MBR control panel shall be inspected for completeness, and workmanship.

3. The MBR Supplier shall provide a minimum of 2 weeks notice to the Owner and Engineer prior to the FAT. The Owner and Engineer may, at their option and the expense of others, choose to attend and witness the FAT.

4. Whether or not the Owner and/or Engineer attend the FAT, the MBR Supplier shall provide written documentation and certification of the completed FAT.

**3.03 – MATERIALS INSPECTION**

A. The Contractor shall inspect delivered equipment upon arrival on site for completeness of scope delivery and to verify that all components have arrived undamaged. The Contractor is responsible for notifying the Supplier of deficiencies in quantities or conditions within 28 days from the ship date.

B. The Contractor shall provide all labor, materials, and equipment for unloading, de-crating, organizing, and compiling take-off of received MBR equipment, components, and instrumentation.

C. The Supplier shall make available, upon the request of the Contractor, personnel to assist in the inspection of the Supplier's equipment upon unload at the site. Supplier's personnel shall provide services in accordance with their standard daily rates.

**3.04 – MECHANICAL INSPECTION**

A. The Contractor shall schedule with the MBR System Supplier to perform a Mechanical Inspection at least 2 weeks prior to the scheduled Commissioning of the System.

B. The MBR Suppler shall conduct a Mechanical Inspection of the MBR System to verify that the installation is complete and ready to begin Commissioning activities. The Supplier shall verify the following:

1. Installation of all equipment per the Engineer's and Supplier's drawings and Supplier's IOM information.

2. Installation of all instrumentation per the Engineer's drawings and IOM information.

3. Completeness of all piping installations.

4. Completeness of all electrical installations.

5. Proper installation of the MBR Membrane Unit diffuser assemblies per the Submittal and IOM information.

6. Completeness of all basins, including removal of all debris that may cause damage to the Membrane Sheets.

7. Review of all pipe integrity testing (leak checking) results.

C. Upon completion of the Mechanical Inspection, the Supplier shall provide written documentation of the inspection results.

1. If the MBR System is complete per the requirements of the Mechanical inspection, the MBR Supplier shall schedule the System Commissioning with the Contractor. The date for the System Commissioning is to be established within 2 weeks of the successful completion of the Mechanical Inspection.

2. If the MBR System is not complete at the time of the Mechanical Inspection, the Supplier shall document system deficiencies to the Contractor, Engineer, and Owner. The Contractor will then complete all necessary work and provide documentation (including digital photographs) of the completed work. After all noted deficiencies are resolved to the satisfaction of the Engineer, Owner, and Supplier, the date for the System Commissioning is to be established within 2 weeks.

3. If the Mechanical Inspection deficiencies are deemed as sufficiently important by the Supplier, Owner, or Engineer, the Contractor shall arrange for the Mechanical Inspection to be repeated at the Contractor's expense

**3.05 – SYSTEM COMMISSIONING**

A. The MBR System Supplier shall coordinate with the Contractor, Engineer, and Owner for execution of the System Commissioning. In advance of System Commissioning the MBR System Supplier shall perform an onsite Mechanical Inspection of the facility and generate a punchlist of inconsistencies. The Contractor is required to resolve the punchlist items to the satisfaction of the System Supplier, prior to scheduling System Commissioning. The System Commissioning will consist of the following:

1. General inspection of systems (lubrication, rotation, calibration).

2. Loop checking, instrumentation, and control system verification.

3. Pipe loss testing.

4. Sludge seeding.

B. The Contractor shall provide materials and personnel in support of the System Commissioning to fill basins with clean water, transfer fluids, repair/remedy any and all electrical and mechanical issues, provide temporary tie-ins, temporary piping, transfer pumps, etc.

C. The Contractor shall coordinate with the Engineer and Owner to seed the MBR system with sludge. The MBR Supplier is not responsible for supplying the seed sludge.

D. The System Commissioning shall begin at the Contractor's discretion, within the limits defined herein:

1. Successful completion of a pre-commissioning Mechanical Inspection is required.

2. Start of Commissioning shall be no later than 60 days after completion of Mechanical Inspection.

3. The Owner shall operate the plant during the Commissioning Period; however, Supplier and Contractor shall be allowed to provide onsite assistance.

E. Supplier is responsible for monitoring operating conditions and performance during the Commissioning Period.

F. Supplier shall provide the Owner with a Plant Operations Manual at the end of the Commissioning Period. The manual shall include at a minimum:

1. As-built drawings

2. Safety Manual

3. HMI Users Manual

4. As-built control schematics

5. Process variables and control narrative.

G. Supplier shall submit the Plant Operations Manual within 30 days following the end of the Commissioning Period.

H. Membrane permeate quality shall be evaluated to determine compliance of the MBR System with Performance Requirements. If the MBR system fails to comply with requirements of membrane

permeate quality, Supplier shall provide to the Owner and the Engineer a written plan of modifications to the system (such as repairing damaged fibers, replacing seals, complete replacement of system) to achieve compliance with the requirements. Upon implementation of modifications plan, the permeate quality tests shall re-commence in their entirety.

**3.06 - TRAINING**

A. The MBR System Supplier shall provide Training in the maintenance and operation of all systems included in the Supplier's control system.

B. Training shall be completed prior to the completion of the System Commissioning. All training shall be performed by the Supplier or a factory-certified representative of the supplier or component supplier. Training is to include:

1. Navigation of all HMI screens and menus.

2. Review of automatic operations and controls.

3. Changing process set points

4. Overriding controls from the HMI

5. Manual operation of the system in the event of a power failure

6. Maintenance cleaning

7. Trouble shooting.

**3.07 - INSTALLATION**

A. The General Contractor shall install and/or coordinate installations of all applicable equipment of this Section with the Plumbing and Electrical contractor unless noted on the Drawings or specified herein. All equipment shall be installed in accordance with the manufacturer's written instructions.

B. Provide and install tubing with isolation ball valve for each pressure connection. Install pressure gauge connection at a location recommended by the MBR representative.

C. Erect backup float supports and hang backup level floats at elevations shown.

D. No piece of equipment shall be attached to handrails.

**END OF SECTION**

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# J.R. Holzmacher P.E., LLC

**3555 Veterans Memorial Highway, Suite A, Ronkonkoma, New York 11779-7636**
**Tel: (631) 234-2220 Fax: (631) 234-2221 e-mail: info@holzmacher.com**

September 26, 2017

H2M architects + engineers
Attn: James Vierling
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747

Re: Geotechnical Evaluation
Calverton STP Upgrade
4062 Grumman Blvd.
Calverton, NY 11933
H2M Project No.: CASD 16-02

Dear Mr. Vierling:

J.R. Holzmacher P.E., LLC (JRH) Consulting Engineers has prepared this Geotechnical Evaluation Report (GER) for the above referenced site. The soil borings described in this report were completed by Land, Air, Water Environmental Services, Inc. (LAWES). Field data was used in rendering geotechnical evaluation and judgment regarding subsoil suitability in connection with construction at the above referenced site. No materials testing laboratory analysis was requested or performed on any of the soil samples.

## EXPLORATION PROGRAM

Soil borings were completed on August 30, 2017 and August 31, 2017 to determine the nature and condition of the soils below the existing ground surface at the site. The boring program consisted of drilling eight (8) soil borings and installing one 4-inch permanent monitoring well. All eight (8) soil borings were completed to a depth of 17-feet below grade and the monitoring well was installed to a depth of 15-feet below grade. The well was constructed with 4-inch PVC pipe with 5-feet of casing and 10-feet of slotted screening.

The soil borings were completed by LAWES, a NYSDEC licensed driller with JRH oversight. Samples were collected by a Geoprobe 7822DT and Mobile Drill Rig using a split-spoon core barrel sampler. The sampler was driven in six-inch increments by using the equivalent force of a 140-pound hammer from a height of thirty inches. Samples were collected using a standard 2" by 24" long split spoon sampler driven into the soil. The driller who recorded the Standard Penetration Test (SPT) values characterized the samples recorded during the performance of the test. Based on these descriptions and measurements, geologic soil-boring logs were prepared.

The general subsurface conditions encountered during the field exploration program are shown in the soil boring logs (Appendix A). Soil stratification is based on the examination of recovered soil samples and interpretation of the field boring logs. The stratification lines, dimensions, as

well as reported values of this report represent the approximate boundaries between the soil types, while the actual transitions and dimensions may be more gradual. While the borings are representative of the subsurface conditions at their respective location and within respective vertical reaches, variations over the site may be encountered.

## METHODOLGY

The scope of the work was to drill through unconsolidated soils to obtain geotechnical information. Samples were logged and collected at various depths. The borings were logged with respect to blow counts and classified according to the unified soils classification system (USCS). The borings and all sampling was performed in accordance to ASTM D1586-84. Restoration consisted of backfilling the boring hole with sand.

Representative samples were routinely obtained during the drilling process at selected intervals by applying a two-inch diameter split spoon-sampling tube. The sampler was driven by the 30-inch fall of a 140-pound hammer. The number of blows required to drive the sample spoon from 6 inches to 18 inches represents the standard penetration resistance (N), and is an indicator of the safe bearing capacity of the soil.

The drilling and testing procedures were performed applying the guidelines and procedures of ASTM designations:

ASTM D1586 Penetration Test and Split Barrel Sampling of Soils.
ASTM D2488 Recommended Practice for Description of Soils.
ASTM D2487 Standard Practice for Classification of Soils (USCS).

Sectional linear samples were also secured in conjunction with the performance of the standard penetration and density test. The soil profiles reported by the boring logs should be reviewed for specific information at the individual boring location and test depths.

## SUMMARY

This report was developed from conventional and standard soil testing procedures and engineering analysis. Brown topsoil and/or sand and medium to fine sand was recovered from grade to 2-feet below grade at boring locations B-1, B-2, B-3, and B-5. Grey RCA, coarse to fine sand and gravel was recovered from grade to 2-feet below grade at boring location B-4. Black/dark brown topsoil, medium to fine sand, and trace gravel was recovered from grade to 2-feet below grade at boring locations B-6 and B-7. Black/brown topsoil/silty sand, and medium to fine sand was recovered from grade to 2-feet below grade at boring location B-8. Light brown/grey sand, concrete, coarse to fine sand, and gravel was recovered from 6-feet to 8-feet below grade at boring location B-6. Brown sand and medium to fine sand was recovered at the remaining depths of all boring locations.
Low blow counts (N<15) were encountered from grade to 17-feet below grade at boring locations B-1 through B-3, B-7, and B-8; from 15-feet to 17-feet below grade at boring location

B-4; from grade to 8-feet below grade and 15-feet to 17-feet below grade at boring location B-5; from 2-feet to 6-feet below grade and from 8-feet to 17-feet below grade at boring location B-6.

## SUBSURFACE WATER CONDITIONS

Groundwater was encountered from 8'-6" to 14'-0" below grade at boring locations B-1 through B-4 and the location of the monitoring well during the field investigation. Groundwater was not encountered at boring locations B-5 through B-8 during the investigation. A permanent monitoring well (PZ-1) was installed to the east of boring location B-2 as indicated on Figures 2 and 4. The initial depth to water reading was collected on August 30, 2017 after the well was installed at 11:00 am and again on August 31, 2017 at 7:20 AM. The depth to water was 8.3-feet below grade for both readings.

## FLOOD ZONE

The Flood Insurance Rate Map (FIRM map) is not available for this location. This site is located in Zone "X" outside the statistical 500-year flood plain.

## OBSERVATIONS AND ANALYSIS

Soil bearing capacity is estimated from results of in-situ tests using empirical correlation factors. Soil bearing values (SBVs) in tons per square foot (TSF) to undisturbed, structurally rated soils are inferred from blow counts as tabulated in Appendix B.

| **Boring No.** | TSF @ 3.5-ft | TSF @ 5.5-ft | TSF @ 7.5-ft | TSF @ 9.5-ft |
|---|---|---|---|---|
| **B-1** | 0.30 | 0.60 | 0.50 | 0.20 |
| **B-2** | 0.55 | 0.60 | 0.40 | 0.40 |
| **B-3** | 0.40 | 0.35 | 0.50 | 0.50 |
| **B-4** | 1.59 | 1.19 | 1.04 | 0.94 |
| **B-5** | 0.30 | 0.70 | 0.65 | 1.04 |
| **B-6** | 0.60 | 0.25 | 0.75 | 0.10 |
| **B-7** | 0.45 | 0.30 | 0.30 | 0.30 |
| **B-8** | 0.40 | 0.55 | 0.70 | 0.50 |

The SBVs are predicted based on saturated sands. An additional contingency to address the variation in soil strength can be realized by increasing the reinforcing steel within footings or the pile cap to accommodate "soft spots" without cracking. Lower settlement of the granular materials encountered is expected to be small in magnitude and to occur rapidly as the load is applied. Longer-term settlement of silt and organic layers, if any exist, may be significant.

## SEISMIC COMPONENT

The 2015 IBC contains a requirement that every structure be designed to resist the effect of earthquake motion and be assigned a seismic Design Category. The 2015 IBC, Earthquake loads Section 1613.3.2, Site Class Definition further dictates, at a minimum, that Site Class E be imposed. The USGS seismic summary report is included in Appendix C.

**Subject Site**

| | |
|---|---|
| Site Designation | Class 'E' |
| Site Coefficient | $F_a = 2.5$ |
| One Second Site Coefficient | $F_v = 3.5$ |
| 5% Peak Dampened Acceleration Stress Design | $S_{DS} = 0.274g$ |
| One Second Peak 5% Dampened Acceleration Stress Design | $S_{D1} = 0.133g$ |

Moreover, the project location would result in a wind design component that would exceed the anticipated effect of seismic action and would therefore govern the structural integrity of the design. The analysis and recommendations are based on the data obtained from the limited test borings performed for this report. The nature and extent of variations may not become evident until open excavation is initiated. Variations should be noted and their impact evaluated with respect to the necessity to modify the recommendations of this report.

## LATERAL EARTH PRESSURES COEFFICIENTS

Lateral Earth Pressures as described by theories presented by both Coulomb and Rankine, requires that the foundation size be determined prior to determining the true failure planes and the resultant forces. Since the soils noted in the boring are granular, we recommend that the Active and Passive Lateral Earth Pressure coefficients be based upon cohesionless soils. The angle of internal friction is estimated at 34°, accounting for the variations within the soil column, and can be used in the computation of the loads on the foundation. An internal angle of friction for the soil yields an active earth pressure of Ka = 0.2827 and a passive earth pressure of Kp = 3.5371. Furthermore, the 2015 IBC Table 1806.2 permits an allowable lateral bearing of 150 psf/ft. below natural grade and a 0.25 coefficient of friction lateral sliding resistance for soil types SW, SP, SM, SC, GM, and GC. This would therefore be applicable to the soils found onsite.

## RECOMMENDATIONS

The boring exploration was completed to determine the structural design requirements for construction related to the upgrade of the Calverton Sewer District's sewage treatment plant (STP). The proposed STP upgrade includes the construction of one (1) new stand-alone equipment platform, a 2.0 mile long force main and four (4) new 50-ft by 50-ft recharge basins. Based upon the bearing capacities computed from the geotechnical boring data, the use of reinforced spread concrete footings are recommended. A mat foundation should be considered if significant point loads are expected. A helical pile design would allow for zero settlement and should also be considered due to the weak soils encountered throughout boring locations B-1 and B-2 which are located in the area of the proposed equipment platform. Please refer to Appendix B for the calculated bearing capacities and the associated depth of each. We further recommend the foundation extend below the frost line, which is approximately four (4) feet for this area. The soils encountered throughout all boring locations are suitable for the installation of recharge basins.

The footings should be designed to bear upon suitable soils. Should poor materials be encountered we recommend removal of those soils down to virgin structurally rated soil and importing engineered fill designed as per the structural engineer of record. Foundation design plans should indicate a procedure for removal of substandard materials based upon conditions encountered during excavation. This is necessary, as the borings are an examination of only a small area.

Structural backfill should be placed and compacted to grade. Compacted structural backfill should be well-graded granular soil, meeting the gradations shown in Table 1. Common backfill can be used in other areas around the site which are not directly beneath the proposed structures. A grain distribution curve and a Modified Proctor Density should be provided for any imported backfill brought to the site for approval by the Engineer of Record before placement.

**Table 1 – Gradations of Granular Backfill**

| **Sieve Size** | **Percent Passing by Weight** | |
|---|---|---|
| | **Structural Backfill** | **Common Backfill** |
| 3 inch | 100% | 100% |
| ¼ inch | 100% | 30-80% |
| No. 40 | 5-50% | 10-40% |
| No. 200 | 0-10% | 0-15% |

Backfill should not be placed frozen or onto frozen subgrade. In the event that the subgrade does freeze, the frozen backfill should be removed and the surface should be scarified prior to placing any new backfill. Placement of backfill should follow requirements specified in Table 2.

**Table 2 – Backfill Compaction Requirements**

| Type of Backfill | Maximum Thickness of Backfill placed in Loose Lifts | Minimum Required Modified Proctor Density (ASTM D1557) |
|---|---|---|
| Structural | 9 inches | 95% |
| Common | 12 inches | 90% |

The adequacy of compaction should be tested in the field by a knowledgeable and experienced inspector at the rate of at least two compaction tests per shift, per lift, or per 10 cubic yards of backfill, whichever is more frequent.

After improving the site soils by the methods described above, the foundations may be installed by excavating to their respective subgrade levels. Upon reaching footing subgrade, the final few inches of excavation should be made by hand or smooth tipped excavator. Soils disturbed or loosened by excavation, trenching for utilities or other construction activity should be removed, and replaced as compacted backfill. All foundation subgrade should be approved by an independent testing agency. Once approved for bearing, foundation soils should be protected from disturbance. In the event disturbance does occur, the disturbed area should be excavated, backfilled, and compacted as described above.

Backfill of excavations, following foundation construction, should be performed using clean, excavated soils or compatible imported select common fill where additional material is required. Soil consolidation is expected to be less than one half (0.5”) inch, based upon a properly designed foundation bearing upon properly compacted soil.

Any and all excavations should follow OSHA guidelines for excavation protection. Any excavations that are adjacent to existing buildings should be reviewed with specific interest in the depths of the existing foundations to determine if underpinning would be required.

## LIMITATIONS

The recommendations in this report are based on our experience and training, in conjunction with the limited soils exposed at the site. We believe that this information gives an acceptable degree of reliability for anticipating behavior of the proposed improvement to be constructed; however, our recommendations are professional opinions and cannot assure accuracy beyond the limits of the soil profiles from which data was obtained. This report is based on the evaluation at the described site and on the specific anticipated construction.

## MISCELLANEOUS

The attached boring log and calculations are components of this report. If you have any questions regarding this report, or if we can be of further service, please do not hesitate to contact our office. We trust this report provides you with the necessary information to continue with development of the project.

Very truly yours,
**J.R. Holzmacher P.E., LLC**



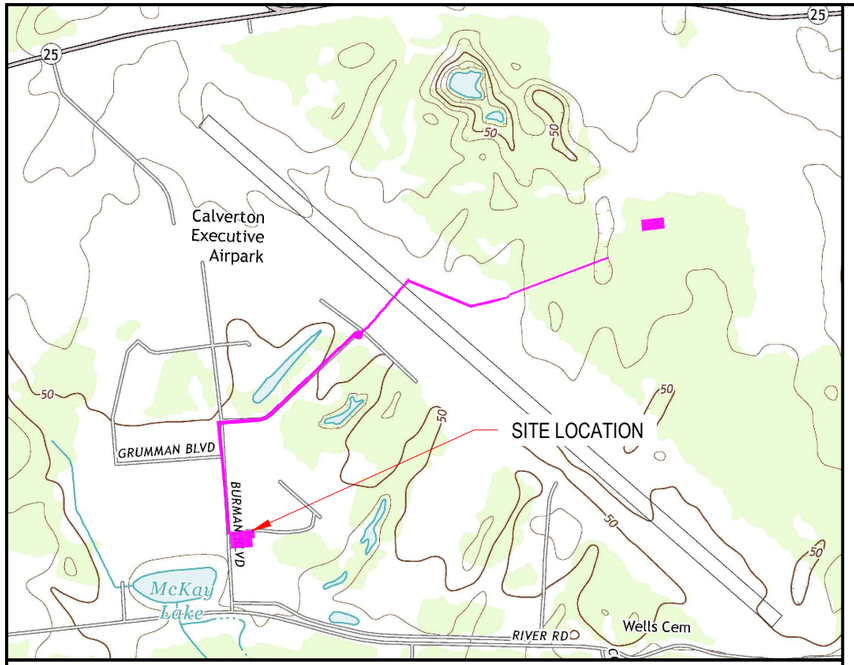
Michael C. Simon, P.E.
Principal

MCS:hvs
Encl.

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**FIGURES**

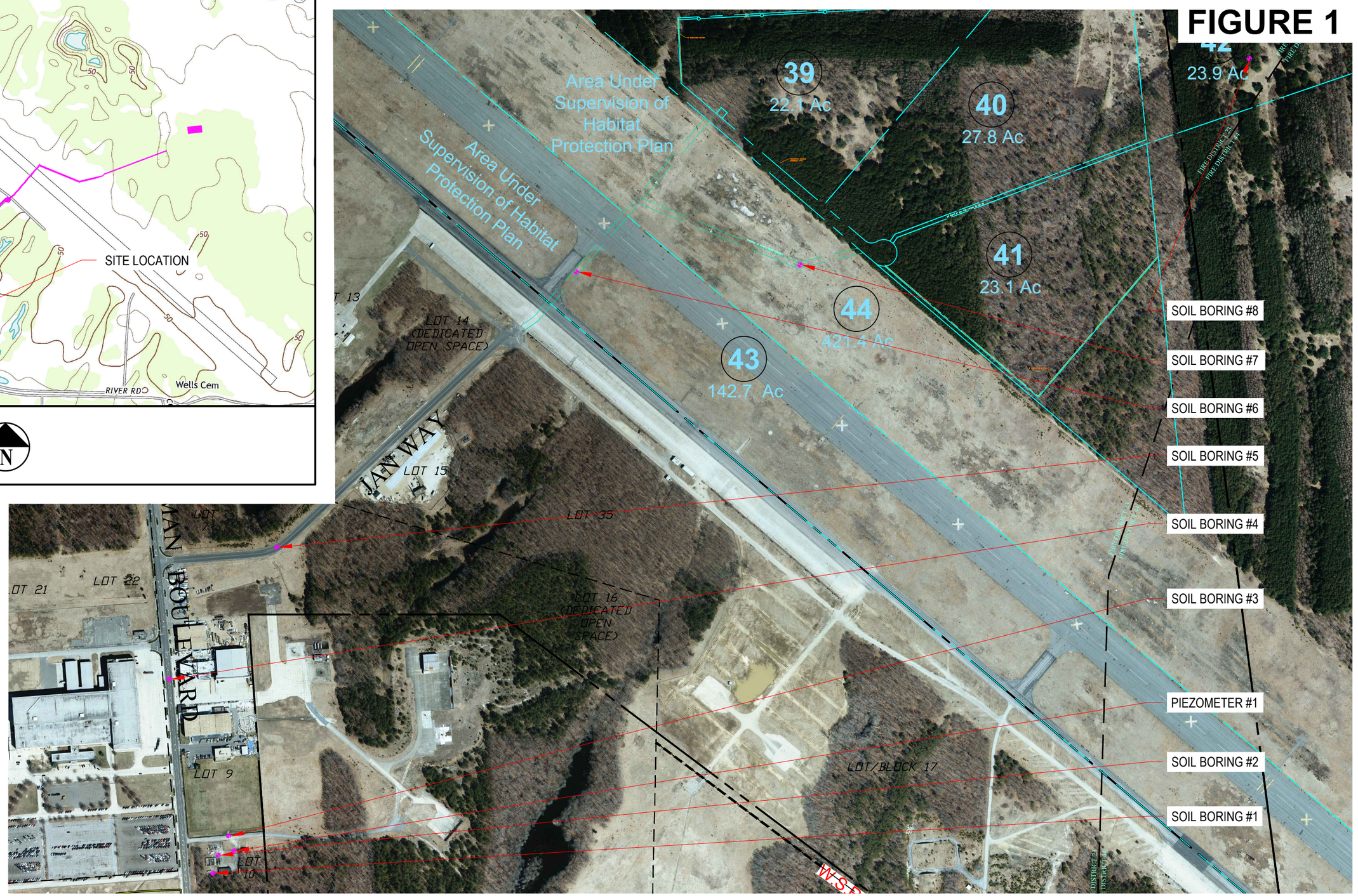
# FIGURE 1




## Location Map

SCALE: 1"= 2,000'-0"

N




## Soil Boring Overview

SCALE: 1"= 500'-0"

N

H2M architects + engineers

Melville, NY · New York, NY · White Plains, NY · Albany, NY · New City, NY · Parsippany, NJ · Howell, NJ

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# FIGURE 2




## STP Site Overview

SCALE: 1"= 40'-0"

N

NOTES:

1. BORING LOCATION DIMENSIONS SHOWN HEREON ARE APPROXIMATE AND INTENDED TO SHOW THE AREAS OF INTEREST WHERE WE ARE REQUESTING SURVEY WORK TO BE PERFORMED. THESE DIMENSIONS ARE MEASURED FROM EXISTING SITE FEATURES SHOWN IN AERIAL BACKGROUND.

H2M architects + engineers

Melville, NY New York, NY | White Plains, NY Albany, NY New City, NY | Parsippany, NJ Howell, NJ

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# FIGURE 3




NOTES:

1. SOIL BORING LOCATIONS SHOWN HEREON ARE APPROXIMATE AND INTENDED TO SHOW THE AREAS OF INTEREST WHERE WE ARE REQUESTING BORING WORK TO BE PERFORMED. THESE DIMENSIONS ARE MEASURED FROM THE SOUTHWEST CORNER OF PARCEL 42 AT THE INTERSECTION WITH THE ACCESS EASEMENT TO THE PARCEL.

## Recharge Bed Site Overview

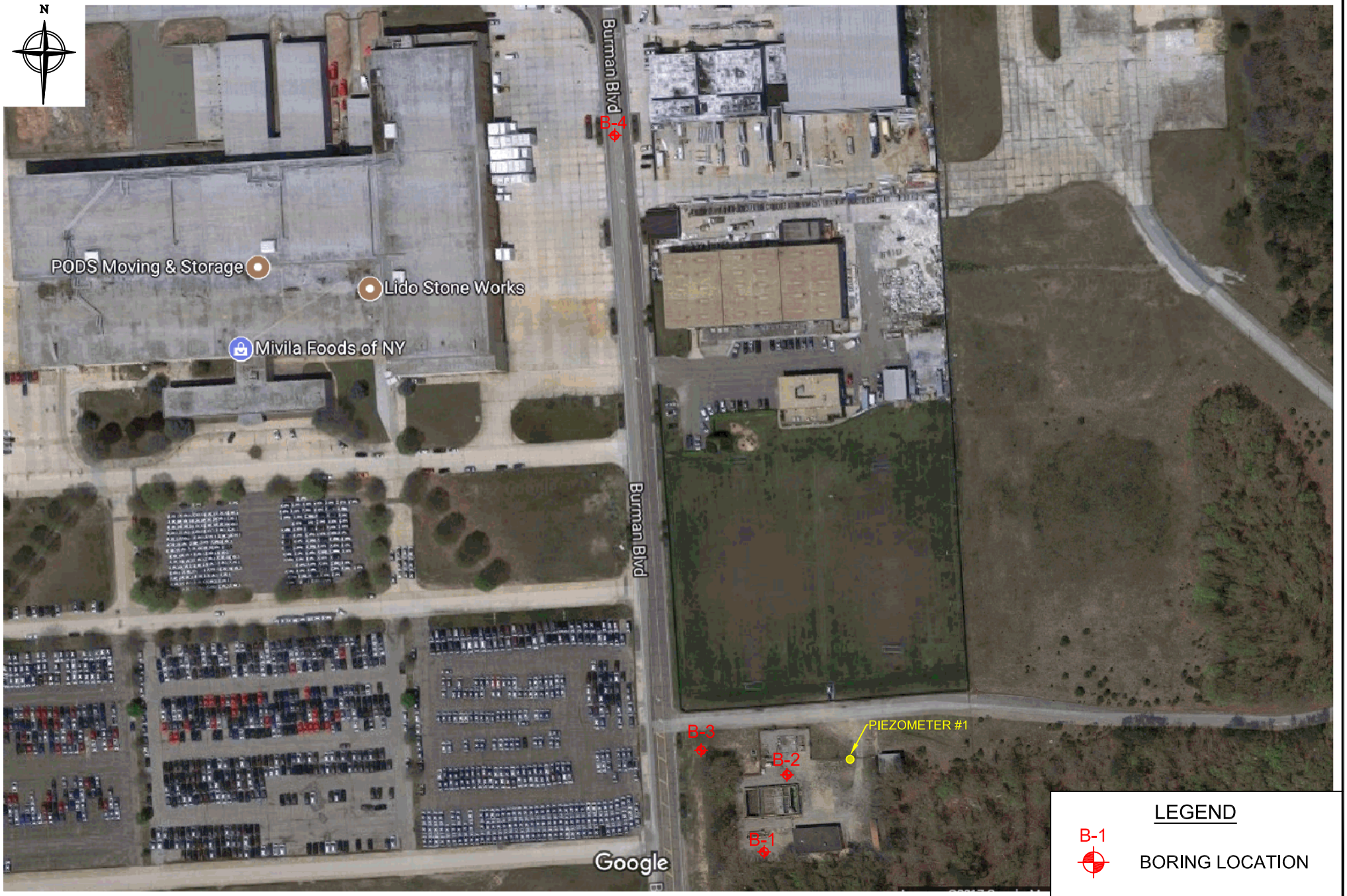
SCALE: 1"= 100'-0"

N

H2M architects + engineers

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LEGEND

B-1 BORING LOCATION

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PREPARED BY:

**J.R. HOLZMACHER P.E., LLC**

*The Third Generation of Excellence*
*In Water Supply, Water Resources,*
*Civil and Environmental Engineering*

*3555 VETERANS MEMORIAL HIGHWAY,*
*SUITE A, RONKONKOMA, NY 11779*
*PHONE # (631) 234-2220* *FAX # (631) 234-2221*
*E-MAIL: info@holzmacher.com*

TITLE:

# BORING LOCATION MAP

4062 GRUMMAN BLVD,
CALVERTON, NY 11933

| DWN: | SCALE: | DATE: | PROJECT NO.: |
|---|---|---|---|
| LJF | N.T.S. | 09/05/17 | LAWES 17-11 |
| CHKD: | APPD: | REV.: | NOTES: |
| AJS | HVS | - | - |

FIGURE NO.: 4




LEGEND

B-5 BORING LOCATION

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*E-MAIL: info@holzmacher.com*

TITLE:

# BORING LOCATION MAP

4062 GRUMMAN BLVD,
CALVERTON, NY 11933

| DWN: | SCALE: | DATE: | PROJECT NO.: |
|---|---|---|---|
| LJF | 1:30 | 09/05/17 | LAWES 17-11 |
| CHKD: | APPD: | REV.: | NOTES: |
| AJS | HVS | - | - |

FIGURE NO.: 5

# APPENDIX A

# SOIL BORING LOGS

# Land, Air, Water Environmental Services, Inc.

# DRILLER'S LOGS

**BORING#: B-1**



DATE: August 30, 2017
SITE: Town of Riverhead
Calverton Sewer District STP

CONSULTANT: H2M Group
Melville, NY

DEPTH DRILLED: 17 feet
CORING DEVICE: 2" x 24"
AUTOMATIC SPT DROP HAMMER
DRILL RIG / GEOPROBE TYPE: Geoprobe 78DT

DEPTH TO WATER: 10 feet
TIME WATER WAS TAKEN: 8:38 AM
BORING RESTORATION: Backfill
DRILLING METHOD: 3.5" Geoprobe rods

DRILLER: E. Santiago

HELPER: A. Gonzalez

| DEPTH FROM | DEPTH TO | RECOVERY | BLOWS / 6 INCHES | SAMPLE DESCRIPTION |
|---|---|---|---|---|
| 0 ft | 2 ft | 19 inches | 1-2-5-4 | Brown topsoil/sand, medium to fine, (SW) |
| 2 ft | 4 ft | 19 inches | 4-3-3-5 | Light brown sand, medium to fine, (SW) |
| 4 ft | 6 ft | 16 inches | 5-5-7-8 | Light brown sand, medium to fine, (SW) |
| 6 ft | 8 ft | 22 inches | 7-6-4-5 | Light brown sand, medium to fine, (SW) |
| 8 ft | 10 ft | 14 inches | 2-2-2-2 | Light brown sand, medium to fine, (SW) |
| 10 ft | 15 ft | Direct Push | | Rod Advancement |
| 15 ft | 17 ft | 7 inches | 4-6-6-8 | Light brown sand, medium to fine, (SW), wet |

The boring / well has been finished at grade as contracted. It is the responsibility of the client and / or property owner to maintain the boring / well and have it legally abandoned when decommissioning is required.

# Land, Air, Water Environmental Services, Inc.

# DRILLER'S LOGS

**BORING#: B-2**



DATE: August 30, 2017
SITE: Town of Riverhead
Calverton Sewer District STP

CONSULTANT: H2M Group
Melville, NY

DEPTH DRILLED: 17 feet
CORING DEVICE: 2" x 24"
AUTOMATIC SPT DROP HAMMER
DRILL RIG / GEOPROBE TYPE: Geoprobe 78DT

DEPTH TO WATER: 8.5 feet
TIME WATER WAS TAKEN: 9:15 AM
BORING RESTORATION: Backfill
DRILLING METHOD: 3.5" Geoprobe rods

DRILLER: E. Santiago

HELPER: A. Gonzalez

| DEPTH FROM | DEPTH TO | RECOVERY | BLOWS / 6 INCHES | SAMPLE DESCRIPTION |
|---|---|---|---|---|
| 0 ft | 2 ft | 13 inches | 1-2-3-6 | Brown sand/soil, medium to fine, (SW) |
| 2 ft | 4 ft | 16 inches | 5-5-6-6 | Brown sand/gravel, medium to fine, 5% gravel, (SW) |
| 4 ft | 6 ft | 19 inches | 6-6-6-7 | Light brown sand, medium to fine, (SW) |
| 6 ft | 8 ft | 21 inches | 5-3-5-6 | Light brown sand, medium to fine, (SW) |
| 8 ft | 10 ft | 15 inches | 5-4-4-5 | Light brown sand, medium to fine, (SW), wet |
| 10 ft | 15 ft | Direct Push | | Rod Advancement |
| 15 ft | 17 ft | 8 inches | 1-2-1-3 | Light brown sand, medium to fine, (SW), wet |

The boring / well has been finished at grade as contracted. It is the responsibility of the client and / or property owner to maintain the boring / well and have it legally abandoned when decommissioning is required.

# Land, Air, Water Environmental Services, Inc.

# DRILLER'S LOGS

**BORING#: B-3**



DATE: August 30, 2017
SITE: Town of Riverhead
Calverton Sewer District STP

CONSULTANT: H2M Group
Melville, NY

DEPTH DRILLED: 17 feet
CORING DEVICE: 2" x 24"
AUTOMATIC SPT DROP HAMMER
DRILL RIG / GEOPROBE TYPE: Geoprobe 78DT

DEPTH TO WATER: 8.5 feet
TIME WATER WAS TAKEN: 11:42 AM
BORING RESTORATION: Backfill
DRILLING METHOD: 3.5" Geoprobe rods

DRILLER: E. Santiago

HELPER: A. Gonzalez

| DEPTH FROM | DEPTH TO | RECOVERY | BLOWS / 6 INCHES | SAMPLE DESCRIPTION |
|---|---|---|---|---|
| 0 ft | 2 ft | 20 inches | 2-4-4-4 | Brown sand/topsoil, medium to fine, (SW) |
| 2 ft | 4 ft | 18 inches | 4-4-4-4 | Brown sand/gravel, medium to fine, 5% gravel, (SW) |
| 4 ft | 6 ft | 23 inches | 3-3-4-5 | Light brown sand, medium to fine, (SW) |
| 6 ft | 8 ft | 18 inches | 5-4-6-6 | Light brown sand, medium to fine, (SW) |
| 8 ft | 10 ft | 18 inches | 5-5-5-6 | Light brown sand, medium to fine, (SW), wet |
| 10 ft | 15 ft | Direct Push | | Rod Advancement |
| 15 ft | 17 ft | 17 inches | 4-4-5-6 | Light brown sand, medium to fine, (SW), wet |

The boring / well has been finished at grade as contracted. It is the responsibility of the client and / or property owner to maintain the boring / well and have it legally abandoned when decommissioning is required.

# Land, Air, Water Environmental Services, Inc.

# DRILLER'S LOGS

**BORING#: B-4**



DATE: August 30, 2017
SITE: Town of Riverhead
Calverton Sewer District STP

CONSULTANT: H2M Group
Melville, NY

DEPTH DRILLED: 17 feet
CORING DEVICE: 2" x 24"
AUTOMATIC SPT DROP HAMMER
DRILL RIG / GEOPROBE TYPE: Geoprobe 78DT

DEPTH TO WATER: 14 feet
TIME WATER WAS TAKEN: 2:13 PM
BORING RESTORATION: Backfill
DRILLING METHOD: 3.5" Geoprobe rods

DRILLER: E. Santiago

HELPER: A. Gonzalez

| DEPTH FROM | DEPTH TO | RECOVERY | BLOWS / 6 INCHES | SAMPLE DESCRIPTION |
|---|---|---|---|---|
| 0 ft | 2 ft | 4 inches | 50/5" | Grey RCA, coarse to fine, 80% gravel, (fill) |
| 2 ft | 4 ft | 23 inches | 18-15-17-19 | Brown sand, medium to fine, (SW) |
| 4 ft | 6 ft | 19 inches | 18-12-12-15 | Light brown sand, medium to fine, (SW) |
| 6 ft | 8 ft | 21 inches | 11-11-10-12 | Light brown sand, medium to fine, (SW) |
| 8 ft | 10 ft | 20 inches | 10-10-9-10 | Light brown sand, medium to fine, (SW) |
| 10 ft | 15 ft | Direct Push | | Rod Advancement |
| 15 ft | 17 ft | 23 inches | 2-2-4-6 | Light brown sand, medium to fine, (SW), wet |

The boring / well has been finished at grade as contracted. It is the responsibility of the client and / or property owner to maintain the boring / well and have it legally abandoned when decommissioning is required.

# Land, Air, Water Environmental Services, Inc.

# DRILLER'S LOGS

**BORING#: B-5**



DATE: August 31, 2017
SITE: Town of Riverhead
Calverton Sewer District STP

CONSULTANT: H2M Group
Melville, NY

DEPTH DRILLED: 17 feet
CORING DEVICE: 2" x 24"
AUTOMATIC SPT DROP HAMMER
DRILL RIG / GEOPROBE TYPE: Geoprobe 78DT

DEPTH TO WATER: Did Not Encounter
BORING RESTORATION: Backfill
DRILLING METHOD: 3.5" Geoprobe rods

DRILLER: E. Santiago

HELPER: A. Gonzalez

| DEPTH FROM | DEPTH TO | RECOVERY | BLOWS / 6 INCHES | SAMPLE DESCRIPTION |
|---|---|---|---|---|
| 0 ft | 2 ft | 2 inches | 2-5-7-7 | Brown topsoil/ sand, medium to fine, (SW) |
| 2 ft | 4 ft | 22 inches | 3-3-3-4 | Brown silty sand, medium to fine, (SW) |
| 4 ft | 6 ft | 16 inches | 4-7-7-8 | Light brown sand, medium to fine, (SW) |
| 6 ft | 8 ft | 20 inches | 6-6-7-11 | Light brown sand/gravel, medium to fine, 5% gravel, (SW) |
| 8 ft | 10 ft | 19 inches | 13-10-11-13 | Light brown sand, medium to fine, (SW) |
| 10 ft | 15 ft | Direct Push | | Rod Advancement |
| 15 ft | 17 ft | 18 inches | 9-6-8-8 | Light brown sand, medium to fine, (SW) |

The boring / well has been finished at grade as contracted. It is the responsibility of the client and / or property owner to maintain the boring / well and have it legally abandoned when decommissioning is required.

# Land, Air, Water Environmental Services, Inc.

# DRILLER'S LOGS

**BORING#: B-6**



DATE: August 31, 2017
SITE: Town of Riverhead
Calverton Sewer District STP

CONSULTANT: H2M Group
Melville, NY

DEPTH DRILLED: 17 feet
CORING DEVICE: 2" x 24"
AUTOMATIC SPT DROP HAMMER
DRILL RIG / GEOPROBE TYPE: Geoprobe 78DT

DEPTH TO WATER: Did Not Encounter
BORING RESTORATION: Backfill
DRILLING METHOD: 3.5" Geoprobe rods

DRILLER: E. Santiago

HELPER: A. Gonzalez

| DEPTH FROM | DEPTH TO | RECOVERY | BLOWS / 6 INCHES | SAMPLE DESCRIPTION |
|---|---|---|---|---|
| 0 ft | 2 ft | 6 inches | 4-7-8-10 | Black topsoil, medium to fine, trace of gravel, (topsoil) |
| 2 ft | 4 ft | 16 inches | 6-6-6-5 | Light brown sand, medium to fine, (SW) |
| 4 ft | 6 ft | 16 inches | 3-2-3-3 | Light brown/brown sand, medium to fine, trace of gravel, (SW) |
| 6 ft | 8 ft | 12 inches | 10-11-4-3 | Light brown/grey sand 6"/concrete 4"/sand 2", coarse to fine, 30% gravel, (SW)/(fill) |
| 8 ft | 10 ft | 18 inches | 2-1-1-3 | Light brown sand, medium to fine, trace of gravel, (SW) |
| 10 ft | 15 ft | Direct Push | | Rod Advancement |
| 15 ft | 17 ft | 20 inches | 3-3-3-3 | Light brown sand, medium to fine, trace of gravel, (SW) |

The boring / well has been finished at grade as contracted. It is the responsibility of the client and / or property owner to maintain the boring / well and have it legally abandoned when decommissioning is required.

# Land, Air, Water Environmental Services, Inc.

# DRILLER'S LOGS

**BORING#: B-7**



DATE: August 31, 2017
SITE: Town of Riverhead
Calverton Sewer District STP

CONSULTANT: H2M Group
Melville, NY

DEPTH DRILLED: 17 feet
CORING DEVICE: 2" x 24"
AUTOMATIC SPT DROP HAMMER
DRILL RIG / GEOPROBE TYPE: Geoprobe 78DT

DEPTH TO WATER: Did Not Encounter
BORING RESTORATION: Backfill
DRILLING METHOD: 3.5" Geoprobe rods

DRILLER: E. Santiago

HELPER: A. Gonzalez

| DEPTH FROM | DEPTH TO | RECOVERY | BLOWS / 6 INCHES | SAMPLE DESCRIPTION |
|---|---|---|---|---|
| 0 ft | 2 ft | 12 inches | W.O.H.3-2 | Dark brown/light brown topsoil 2"/sand 10", medium to fine, trace of gravel, (topsoil)/(SW) |
| 2 ft | 4 ft | 20 inches | 3-4-5-4 | Light brown sand, medium to fine, trace of gravel, (SW) |
| 4 ft | 6 ft | 18 inches | 1-3-3-4 | Light brown sand, medium to fine, (SW) |
| 6 ft | 8 ft | 14 inches | 2-3-3-4 | Light brown sand, medium to fine, (SW) |
| 8 ft | 10 ft | 20 inches | 5-3-3-4 | Light brown sand, medium to fine, (SW) |
| 10 ft | 15 ft | Direct Push | | Rod Advancement |
| 15 ft | 17 ft | 18 inches | 4-3-2-3 | Light brown sand, medium to fine, (SW) |

The boring / well has been finished at grade as contracted. It is the responsibility of the client and / or property owner to maintain the boring / well and have it legally abandoned when decommissioning is required.

# Land, Air, Water Environmental Services, Inc.

# DRILLER'S LOGS

**BORING#: B-8**



DATE: August 31, 2017
SITE: Town of Riverhead
Calverton Sewer District STP

CONSULTANT: H2M Group
Melville, NY

DEPTH DRILLED: 17 feet
CORING DEVICE: 2" x 24"
AUTOMATIC SPT DROP HAMMER
DRILL RIG / GEOPROBE TYPE: Geoprobe 78DT

DEPTH TO WATER: Did Not Encounter
BORING RESTORATION: Backfill
DRILLING METHOD: 3.5" Geoprobe rods

DRILLER: E. Santiago

HELPER: A. Gonzalez

| DEPTH FROM | DEPTH TO | RECOVERY | BLOWS / 6 INCHES | SAMPLE DESCRIPTION |
|---|---|---|---|---|
| 0 ft | 2 ft | 16 inches | 2-8-4-12 | Black/brown topsoil/silty sand, medium to fine, (SW) |
| 2 ft | 4 ft | 14 inches | 8-4-4-5 | Light brown sand/gravel, medium to fine, 5% gravel, (SW) |
| 4 ft | 6 ft | 20 inches | 3-6-5-7 | Light brown sand/gravel, medium to fine, 5% gravel, (SW) |
| 6 ft | 8 ft | 18 inches | 7-7-7-11 | Light brown sand/gravel, medium to fine, 5% gravel, (SW) |
| 8 ft | 10 ft | 15 inches | 5-5-5-4 | Light brown sand, medium to fine, (SW) |
| 10 ft | 15 ft | Direct Push | | Rod Advancement |
| 15 ft | 17 ft | 20 inches | 5-6-5-6 | Light brown sand, medium to fine, (SW) |

The boring / well has been finished at grade as contracted. It is the responsibility of the client and / or property owner to maintain the boring / well and have it legally abandoned when decommissioning is required.

# Land, Air, Water Environmental Services, Inc.

# DRILLER'S LOGS

## WELL #: PZ-1



DATE: August 30, 2017
SITE: Town of Riverhead
Calverton Sewer District STP

CONSULTANT: H2M Group
Melville, NY

DEPTH DRILLED: 16 feet
CASING INSTALLED: 5 feet
SCREEN INSTALLED: 10 feet
DRILLING METHOD: Hollow Stem Auger 6 5/8"
DEPTH TO BOTTOM TAPED: 15 feet
DRILL RIG / GEOPROBE TYPE: Geoprobe 78DT

DEPTH TO WATER: 8.3 feet
TIME WATER WAS TAKEN: 11:00 AM
CASING DIAMETER: 4 inches
SLOT SIZE: 0.020 inches
WELL RESTORATION: Backfill

DRILLER: E. Santiago
HELPER: A. Gonzalez

| DEPTH FROM | DEPTH TO | RECOVERY | SAMPLE DESCRIPTION |
|---|---|---|---|
| 0 ft | 16 ft | Auger Cuttings | Brown/light brown sand, medium to fine, trace of gravel |

The boring / well has been finished at grade as contracted. It is the responsibility of the client and / or property owner to maintain the boring / well and have it legally abandoned when decommissioning is required.

# APPENDIX B

# SOIL BEARING STRENGTH

# APPENDIX B
## Land, Air, Water, Environmental Services (LAWES)
**Calverton Sewer District STP**
**4062 Grumman Blvd.**
**Calverton, NY 11933**

Boring Performed August 30, 2017

**B-1**

| Sample Depth (ft bg) | | Blows | N | Bearing | |
|---|---|---|---|---|---|
| From | To | (per 6") | | Strength (TSF) | |
| 0 | 2 | 1 | | | |
| | | 2 | | | |
| | | 5 | 7 | 0.35 | |
| | | 4 | | | |
| 2 | 4 | 4 | | | |
| | | 3 | | | |
| | | 3 | 6 | 0.30 | |
| | | 5 | | | |
| 4 | 6 | 5 | | | |
| | | 5 | | | |
| | | 7 | 12 | 0.60 | |
| | | 8 | | | |
| 6 | 8 | 7 | | | |
| | | 6 | | | |
| | | 4 | 10 | 0.50 | |
| | | 5 | | | |
| 8 | 10 | 2 | | | |
| | | 2 | | | |
| | | 2 | 4 | 0.20 | DTW |
| | | 2 | | | 10'-0" |
| 15 | 17 | 4 | | | |
| | | 6 | | | |
| | | 6 | 12 | 0.60 | |
| | | 8 | | | |

**DTW - DEPTH TO WATER**

# APPENDIX B
## Land, Air, Water, Environmental Services (LAWES)
**Calverton Sewer District STP**
**4062 Grumman Blvd.**
**Calverton, NY 11933**

Boring Performed August 30, 2017

**B-2**

| Sample Depth (ft bg) | | Blows | N | Bearing | |
|---|---|---|---|---|---|
| From | To | (per 6") | | Strength (TSF) | |
| 0 | 2 | 1 | | | |
| | | 2 | | | |
| | | 3 | 5 | 0.25 | |
| | | 6 | | | |
| 2 | 4 | 5 | | | |
| | | 5 | | | |
| | | 6 | 11 | 0.55 | |
| | | 6 | | | |
| 4 | 6 | 6 | | | |
| | | 6 | | | |
| | | 6 | 12 | 0.60 | |
| | | 7 | | | |
| 6 | 8 | 5 | | | |
| | | 3 | | | |
| | | 5 | 8 | 0.40 | |
| | | 6 | | | DTW |
| 8 | 10 | 5 | | | 8'-6" |
| | | 4 | | | |
| | | 4 | 8 | 0.40 | |
| | | 5 | | | |
| 15 | 17 | 1 | | | |
| | | 2 | | | |
| | | 1 | 3 | 0.15 | |
| | | 3 | | | |

**DTW - DEPTH TO WATER**

# APPENDIX B

## Land, Air, Water, Environmental Services (LAWES)

**Calverton Sewer District STP**
**4062 Grumman Blvd.**
**Calverton, NY 11933**

Boring Performed August 30, 2017

**B-3**

| Sample Depth (ft bg) | | Blows | N | Bearing | |
|---|---|---|---|---|---|
| From | To | (per 6") | | Strength (TSF) | |
| 0 | 2 | 2 | | | |
| | | 4 | | | |
| | | 4 | 8 | 0.40 | |
| | | 4 | | | |
| 2 | 4 | 4 | | | |
| | | 4 | | | |
| | | 4 | 8 | 0.40 | |
| | | 4 | | | |
| 4 | 6 | 3 | | | |
| | | 3 | | | |
| | | 4 | 7 | 0.35 | |
| | | 5 | | | |
| 6 | 8 | 5 | | | |
| | | 4 | | | |
| | | 6 | 10 | 0.50 | |
| | | 6 | | | DTW |
| 8 | 10 | 5 | | | 8'-6" |
| | | 5 | | | |
| | | 5 | 10 | 0.50 | |
| | | 6 | | | |
| 15 | 17 | 4 | | | |
| | | 4 | | | |
| | | 5 | 9 | 0.45 | |
| | | 6 | | | |

**DTW - DEPTH TO WATER**

**APPENDIX B**
**Land, Air, Water, Environmental Services (LAWES)**
**Calverton Sewer District STP**
**4062 Grumman Blvd.**
**Calverton, NY 11933**

Boring Performed August 30, 2017

**B-4**

| Sample Depth (ft bg) | | Blows | N | Bearing | |
|---|---|---|---|---|---|
| From | To | (per 6") | | Strength (TSF) | |
| 0 | 2 | 50 | | | |
| | | Refusal | 50 | 2.49 | |
| | | | | | |
| | | | | | |
| 2 | 4 | 18 | | | |
| | | 15 | | | |
| | | 17 | 32 | 1.59 | |
| | | 19 | | | |
| 4 | 6 | 18 | | | |
| | | 12 | | | |
| | | 12 | 24 | 1.19 | |
| | | 15 | | | |
| 6 | 8 | 11 | | | |
| | | 11 | | | |
| | | 10 | 21 | 1.04 | |
| | | 12 | | | |
| 8 | 10 | 10 | | | |
| | | 10 | | | |
| | | 9 | 19 | 0.94 | |
| | | 10 | | | DTW |
| 15 | 17 | 2 | | | 14'-0" |
| | | 2 | | | |
| | | 4 | 6 | 0.30 | |
| | | 6 | | | |

**DTW - DEPTH TO WATER**

**APPENDIX B**

**Land, Air, Water, Environmental Services (LAWES)**

**Calverton Sewer District STP**
**4062 Grumman Blvd.**
**Calverton, NY 11933**

Boring Performed August 31, 2017

**B-5**

| Sample Depth (ft bg) | | Blows | N | Bearing |
|---|---|---|---|---|
| From | To | (per 6") | | Strength (TSF) |
| 0 | 2 | 2 | | |
| | | 5 | | |
| | | 7 | 12 | 0.60 |
| | | 7 | | |
| 2 | 4 | 3 | | |
| | | 3 | | |
| | | 3 | 6 | 0.30 |
| | | 4 | | |
| 4 | 6 | 4 | | |
| | | 7 | | |
| | | 7 | 14 | 0.70 |
| | | 8 | | |
| 6 | 8 | 6 | | |
| | | 6 | | |
| | | 7 | 13 | 0.65 |
| | | 11 | | |
| 8 | 10 | 13 | | |
| | | 10 | | |
| | | 11 | 21 | 1.04 |
| | | 13 | | |
| 15 | 17 | 9 | | |
| | | 6 | | |
| | | 8 | 14 | 0.70 |
| | | 8 | | |

**APPENDIX B**

**Land, Air, Water, Environmental Services (LAWES)**

**Calverton Sewer District STP**
**4062 Grumman Blvd.**
**Calverton, NY 11933**

Boring Performed August 31, 2017

**B-6**

| Sample Depth (ft bg) | | Blows | N | Bearing |
|---|---|---|---|---|
| From | To | (per 6") | | Strength (TSF) |
| 0 | 2 | 4 | | |
| | | 7 | | |
| | | 8 | 15 | 0.75 |
| | | 10 | | |
| 2 | 4 | 6 | | |
| | | 6 | | |
| | | 6 | 12 | 0.60 |
| | | 5 | | |
| 4 | 6 | 3 | | |
| | | 2 | | |
| | | 3 | 5 | 0.25 |
| | | 3 | | |
| 6 | 8 | 10 | | |
| | | 11 | | |
| | | 4 | 15 | 0.75 |
| | | 3 | | |
| 8 | 10 | 2 | | |
| | | 1 | | |
| | | 1 | 2 | 0.10 |
| | | 3 | | |
| 15 | 17 | 3 | | |
| | | 3 | | |
| | | 3 | 6 | 0.30 |
| | | 3 | | |

## APPENDIX B
## Land, Air, Water, Environmental Services (LAWES)
**Calverton Sewer District STP**
**4062 Grumman Blvd.**
**Calverton, NY 11933**

Boring Performed August 31, 2017

**B-7**

| Sample Depth (ft bg) | | Blows | N | Bearing |
|---|---|---|---|---|
| From | To | (per 6") | | Strength (TSF) |
| 0 | 2 | W.O.H. | | |
| | | 3 | | |
| | | 4 | 7 | 0.35 |
| | | | | |
| 2 | 4 | 3 | | |
| | | 4 | | |
| | | 5 | 9 | 0.45 |
| | | 4 | | |
| 4 | 6 | 1 | | |
| | | 3 | | |
| | | 3 | 6 | 0.30 |
| | | 4 | | |
| 6 | 8 | 2 | | |
| | | 3 | | |
| | | 3 | 6 | 0.30 |
| | | 4 | | |
| 8 | 10 | 5 | | |
| | | 3 | | |
| | | 3 | 6 | 0.30 |
| | | 4 | | |
| 15 | 17 | 4 | | |
| | | 3 | | |
| | | 2 | 5 | 0.25 |
| | | 3 | | |

**W.O.H. - WEIGHT OF HAMMER**

**APPENDIX B**

**Land, Air, Water, Environmental Services (LAWES)**

**Calverton Sewer District STP**
**4062 Grumman Blvd.**
**Calverton, NY 11933**

Boring Performed August 31, 2017

**B-8**

| Sample Depth (ft bg) | | Blows | N | Bearing |
|---|---|---|---|---|
| From | To | (per 6") | | Strength (TSF) |
| 0 | 2 | 2 | | |
| | | 8 | | |
| | | 4 | 12 | 0.60 |
| | | 12 | | |
| 2 | 4 | 8 | | |
| | | 4 | | |
| | | 4 | 8 | 0.40 |
| | | 5 | | |
| 4 | 6 | 3 | | |
| | | 6 | | |
| | | 5 | 11 | 0.55 |
| | | 7 | | |
| 6 | 8 | 7 | | |
| | | 7 | | |
| | | 7 | 14 | 0.70 |
| | | 11 | | |
| 8 | 10 | 5 | | |
| | | 5 | | |
| | | 5 | 10 | 0.50 |
| | | 4 | | |
| 15 | 17 | 5 | | |
| | | 6 | | |
| | | 5 | 11 | 0.55 |
| | | 6 | | |

**W.O.H. - WEIGHT OF HAMMER**

# APPENDIX C

# USGS SEISMIC SUMMARY REPORT

# USGS Design Maps Summary Report

## User–Specified Input

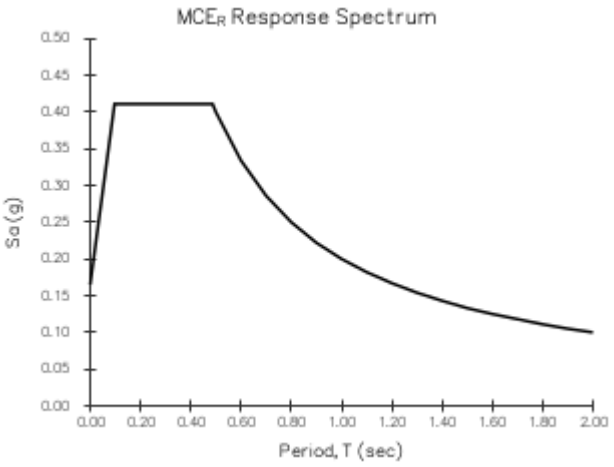
| | |
|---|---|
| **Building Code Reference Document** | 2012/2015 International Building Code<br>(which utilizes USGS hazard data available in 2008) |
| **Site Coordinates** | 40.90466°N, 72.81046°W |
| **Site Soil Classification** | Site Class E – "Soft Clay Soil" |
| **Risk Category** | IV (e.g. essential facilities) |

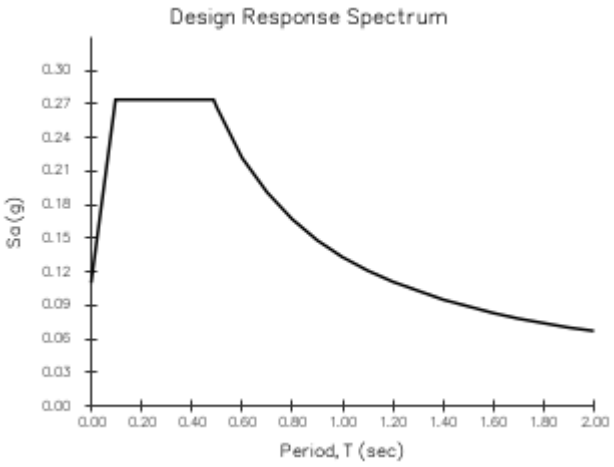



## USGS–Provided Output

| | | | | | |
|---|---|---|---|---|---|
| $S_S$ = | 0.165 g | $S_{MS}$ = | 0.411 g | $S_{DS}$ = | 0.274 g |
| $S_1$ = | 0.057 g | $S_{M1}$ = | 0.200 g | $S_{D1}$ = | 0.133 g |

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.




Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.

**Sound Environmental Associates, LLC 67 Heights Road, Stony Point, New York 10980**
**Tel. 631-414-7198, Fax 631-514-3697**

**Project:**
Lead Paint & Asbestos Survey

**Location:**
Control Building & Pump Station/Drywell Vault
Calverton Sewage Treatment Plant
4062 Grumman Boulevard
Calverton, NY

**Prepared For:**
H2M Architects and Engineers
2 Executive Blvd #401
Suffern NY

**Prepared by:**
Sound Environmental Associates
67 Heights Road
Stony Point, NY 10980

**Dates of Inspection**:
September 26 and 27, 2017

**Date of Report**:
October 23rd, 2017

## TABLE OF CONTENTS


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| III. | Asbestos and Lead Survey | 4 |
| IV. | Discussion/Summary | 5 |
| V | Conclusion | 6 |

Appendix A - Asbestos Sample Results
Appendix B – Lead Sample Results
Appendix C - Licensure and Certifications

## I. PURPOSE

An asbestos survey and XRF lead based paint inspection were conducted at the Control Building and the Pump Station/Drywell Vault for the Calverton Sewage Treatment Plant located at 4062 Grumman Boulevard, Calverton, NY on September 26 and 27, 2017. The purpose of the inspection was to identify locations where regulated and/or hazardous materials were present that require special handling, remediation, or other safeguards to minimize exposure hazards to workers during the renovation project. Specifically the survey was conducted in order to:

- Determine if lead paint was present on pumps, electrical equipment, walls and floors, and other surfaces likely to be disturbed during scheduled renovations and equipment upgrades.
- Determine if asbestos containing material were present in building materials and electrical equipment that will be impacted as part of the facility upgrade.

Representing Sound Environmental Associates was Edward F. von Briesen, a New York State Asbestos Investigator and EPA lead risk assessor.

## II. SITE CONDITIONS AND DESCRIPTION

**Control Building:**

The following renovations are scheduled to be performed at the Control Building:

1. The flat roof roofing material is to be removed and replaced.
2. The pumps and piping located in the pump room (Room #1 on the attached floor plan sketch of the Control Building) are scheduled to be updated. The interior partition wall between the pump room (Room #1) and the utility room (Room #2) is to be removed. The rear exterior entry door (located on wall C) to the Pump Room will be removed and replaced and the rear exterior entry door to the Utility Room (Toom #2) is to be removed. The tan linoleum tile flooring in the Hall, Office, and Sitting Room is to be removed and replaced. In addition, it was requested that the windows in the Pump Room be surveyed for possible asbestos containing materials.

The Control Building is constructed with painted concrete block and contains painted steel doors installed in one piece steel buck frames, unpainted aluminum windows with no painted wood trim installed, painted interior concrete block walls, and painted concrete ceilings. The pumps and piping are painted steel or cast iron. The floors in the Pump Room and Utility Room are painted concrete.

**Pump Station/Drywell Vault:**

The following renovations are scheduled to be performed in the Pump Station/Drywell Vault:

1. The pumps and piping are to be removed and replaced.
2. The interior walls are to be re-painted.

Please note that this vault contains two rooms. These rooms consist of the Pump Room (Room #1 as noted on the attached floor plan sketch) and the Drywell Room. No work is scheduled to be performed in the Drywell Room so this location was not included as part of this survey.

The Pump Station is constructed with painted concrete walls, ceiling, and floor. The entry hatches and stairwell consist of unpainted galvanized steel. The pumps and piping that are to be updated or replaced are painted steel and cast iron. The only accessible potential asbestos containing material noted in this room were gaskets on some pipe flanges. These materials were sampled. No potential asbestos containing materials were noted on the ground level roof slab.

## III. Asbestos and Lead Survey

### Asbestos

The asbestos survey consisted of a visual inspection and bulk sampling to identify ACM within the designated spaces. Samples were identified with a unique ID number, with sampling locations labeled and documented both by photographs and on the attached floor plan sketches. All asbestos samples taken are identified in Red on the attached floor plan drawings. Suspect materials were sampled and submitted for analysis to determine asbestos content.

Analysis was performed via EPA Method 600M4 (laboratory manual approval Items 198.1, 198.4 and 198.6, utilizing Polarized Light Microscopy (PLM) and using Transmission Electron Microscopy (TEM). All bulk samples collected were submitted to EMSL's Carl Place laboratory located at 528 Mineola Avenue, Carl Place New York, NY for analysis. EMSL is approved by the NYS Department of Health (NYS ELAP certification # 11469) for the analysis of bulk samples to determine asbestos content.

Procedures for locating and identifying ACM were based on guidelines published by the United States Environmental Protection Agency (EPA).[1] The EPA defines asbestos as any material that contains more than 1% asbestos.

### Lead

Mr. Edward F. von Briesen (Ct. Inspector Certificate No. IR001381, E.P.A. Certificate No. NY-R-5760-6) utilized an RMD Model LPA-1 X-ray Fluorescence (XRF) instrument (serial # 01379). One XRF reading was performed for each testing combination except for walls. The following components that were adjacent to each other were grouped together into one single testing combination:

- Window casings and aprons
- Window stops and jambs
- Interior window mullions and window sash
- Exterior window mullions and sash
- Door jambs, stops, transoms, casings, and other door frame parts
- Door styles, rails, panels, mullions, and other door parts
- Baseboards and associated trim
- Painted electrical sockets, switches, or plates were grouped with walls
- Pumps painted the same color
- Pipe and conduit painted the same color

[1] Environmental Protection Agency, Guidelines for Controlling Asbestos-Containing Materials in Buildings, Office of Pesticides and Toxic Substances, EPA Report Number 560/5-85-024.

In the Control Building Roof, and the Pump Station/Drywell building, Wall A faces Burman Boulevard. The remaining walls are labeled B, C and D in a clockwise fashion. Calibration XRF readings were conducted at the beginning and the end of the inspection using the manufacturer's calibration block.

Please note that in several instances, similar components such as walls, piping, steel conduit, pump bodies and motors of the same color and substrate were only tested in one location. If the component checked tested positive for lead, it should be assumed that all similar components are also positive for lead. Components that tested negative for lead and that are similar can also be considered negative (less than 1.0 mg/sq cm).

## IV. Discussion/Summary

### Asbestos

A total of thirty eight bulk samples from the Control Building and four bulk samples from the pump vault were collected and submitted for laboratory analysis to determine if these materials contained asbestos.

All samples were collected from miscellaneous materials and submitted as a representative sampling group with a positive stop protocol. The materials tested included mortar cement, window and door caulking, pipe flange gasket material, tan linoleum floor tile and black floor tile mastic, vinyl baseboard trim mastic, roofing material and roof flashing mastics.

All materials in the pump vault tested negative for asbestos. The results indicate that the following materials in the Control Building tested positive for asbestos:

- Flat roofing material; Wall C on roof
- Black mastic front and rear fan vent flashing; Roof
- Black mastic front and rear chimney flashing; Roof
- Black mastic front and rear center vent flashing; Roof Wall B
- Tan floor linoleum tile; Room #1 Pump Room Hall

### Lead

"Lead based paint" is defined by the U.S. Department of Housing and Urban Development (HUD) as a dried paint film containing equal to or greater than 1.0 milligrams of lead per square centimeter (mg/sq cm).

Negative XRF readings or readings of 0.0 and 0.1 mg/sq cm are statistically insignificant and are considered zero for lead. Readings of 1.0 mg/sq cm or greater are considered positive for lead. The "Action Level" for this inspection is 1.0 mg/sq cm.

All painted surfaces tested in both buildings were found to be below the Federal H.U.D. action level for lead based paint of 1.0 mg/sq cm except for the following locations:

Control Building - Interior Room #1 - interior areas of the Pump Room:

1. Green steel riser pipes located on wall B
2. Smaller horizontal pipe running along the ceiling at wall B

Pump Station/Drywell – Interior Room #1 – Pump Room:

1. All steel pump bodies
2. All steel and cast iron piping.
3. Gray steel float chamber located on wall B, right.

All positive lead readings are listed in the "Summary Report" section of the attached XRF results pages.

## V. Conclusions:

Lead was found in the paint on piping running along the ceiling as well as the two riser pipes located in the Control Building Pump Room. Lead paint was also found on the pump bodies and the piping in the Pump Station/Drywell Vault Pump Room. It should be assumed that all of the pumps and piping in the Pump Station/Drywell Pump Room are positive for lead.

It is recommended that when the renovations are being performed, lead safe work practices as defined by OSHA and the EPA be followed wherever lead paint was found.

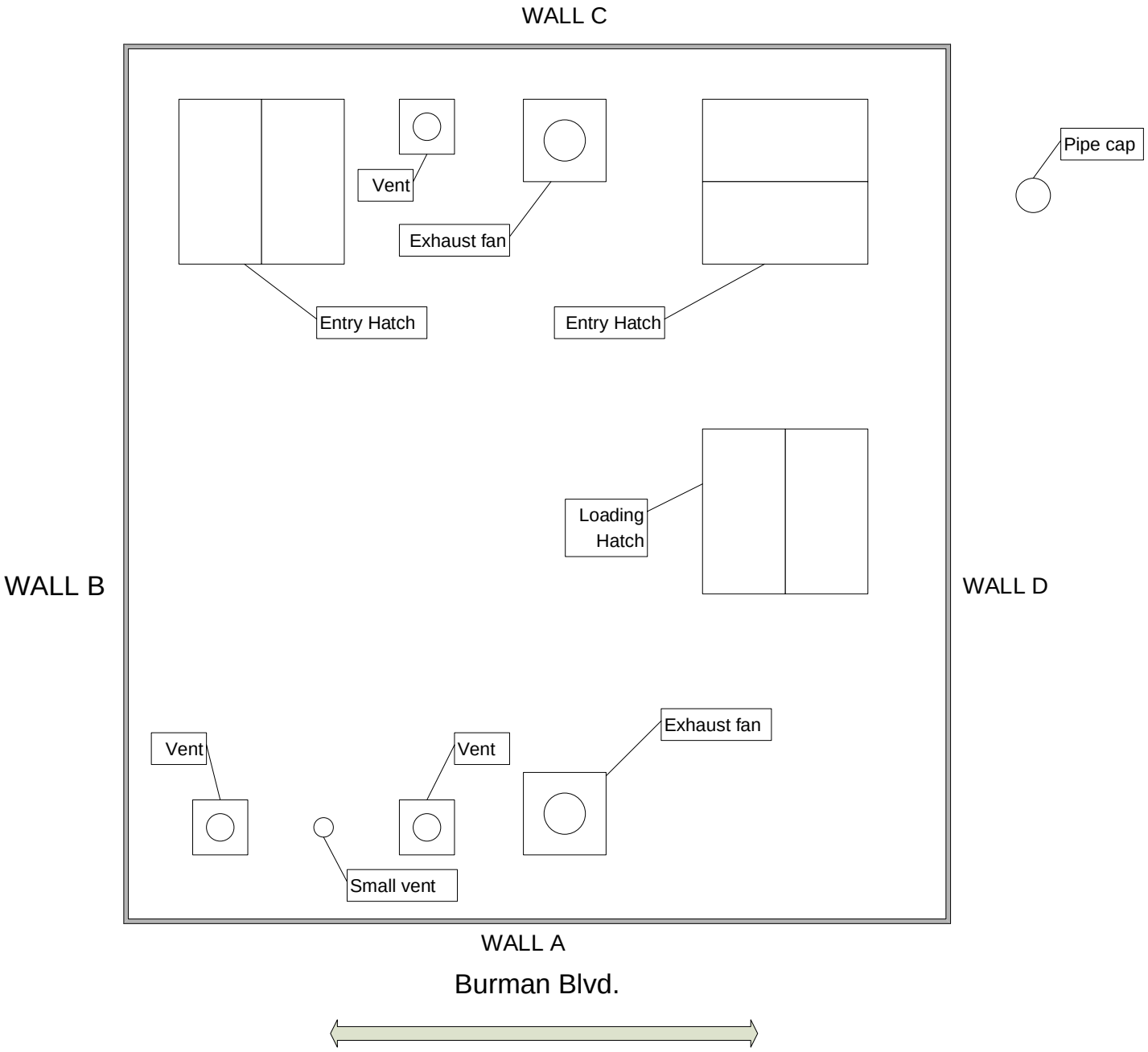
Surfaces that test negative for lead may in fact contain small amounts of lead that can be liberated as dust during renovation activities. Sound Environmental suggests that efforts be made to suppress and contain dust wherever painted surfaces are disturbed, regardless of whether those surfaces tested positive with XRF testing. Unprotected workers should be kept away from the premises when construction and demolition is under way.

The results of this survey determined the following materials were positive for asbestos:

- flat roofing material
- black mastic on front and rear vent on the roof
- Chimney roof flashing
- Black mastic on roof flashing.
- Tan floor linoleum floor tile in the pump room hall

These materials must be abated by a licensed asbestos contractor prior to demolition.

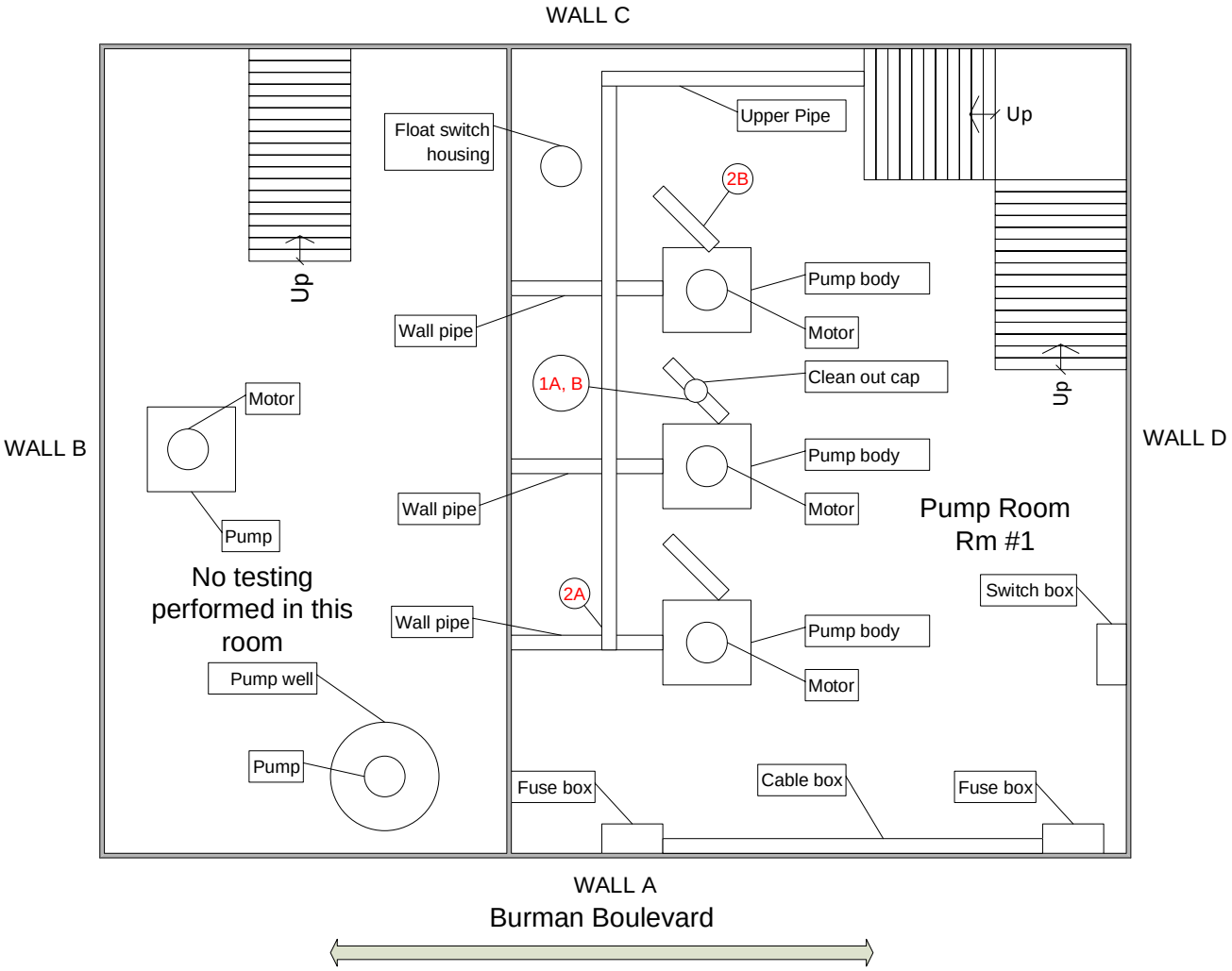
Roof Plan
Calverton Sewage Treatment Plant
Pump Vault
4062 Grumman Boulevard
Calverton, NY.



Floor Plan
Pump Vault
Calverton Sewage Treatment Plant
4062 Grumman Blvd.
Calverton, NY.

Drawing not to scale

Asbestos sample locations are indicated in red



# Appendix A-Asbestos Sample Results

OrderID: 061716779

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# Asbestos Chain of Custody

**EMSL Order Number** *(Lab Use Only)*: 061716779

PHONE:
FAX:

| | | | |
|---|---|---|---|
| **Company Name :** Sound Environmental | | **EMSL Customer ID:** | |
| **Street:** 23 Lighthouse Court | | **City:** Tompkins Cove | **State/Province:** N.Y. |
| **Zip/Postal Code:** 10986 | **Country:** USA | **Telephone #:** 631-356-5426 | **Fax #:** |
| **Report To (Name):** Erin Marsalisi | | **Please Provide Results:** ☐ Fax ☑ Email | |
| **Email Address:** erin@soundny.com | | **Purchase Order:** | |
| **Project Name/Number:** Calverton, NY. Sewage Pump Station - Control Bldg | | **EMSL Project ID** *(Internal Use Only)*: | |
| **U.S. State Samples Taken:** 4 | | **CT Samples:** ☐ Commercial/Taxable ☐ Residential/Tax Exempt | |

**EMSL-Bill to:** ☑ Same ☐ Different - If Bill to is Different note instructions in Comments**
*Third Party Billing requires written authorization from third party*

**Turnaround Time (TAT) Options* – Please Check**

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☐ 72 Hour ☐ 96 Hour ☐ 1 Week ☒ 2 Week

*For TEM Air 3 hr through 6 hr, please call ahead to schedule.*There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

**PCM - Air** ☐ Check if samples are from NY
☐ NIOSH 7400
☐ w/ OSHA 8hr. TWA

**PLM - Bulk (reporting limit)**
☐ PLM EPA 600/R-93/116 (<1%)
☐ PLM EPA NOB (<1%)
Point Count
☐ 400 (<0.25%) ☐ 1000 (<0.1%)
Point Count w/Gravimetric
☐ 400 (<0.25%) ☐ 1000 (<0.1%)
☑ NYS 198.1 (friable in NY)
☑ NYS 198.6 NOB (non-friable-NY)
☑ NYS 198.8 SOF-V
☐ NIOSH 9002 (<1%)

**TEM – Air** ☐ 4-4.5hr TAT (AHERA only)
☐ AHERA 40 CFR, Part 763
☐ NIOSH 7402
☐ EPA Level II
☐ ISO 10312

**TEM - Bulk**
☐ TEM EPA NOB
☑ NYS NOB 198.4 (non-friable-NY)
☐ Chatfield SOP
☐ TEM Mass Analysis-EPA 600 sec. 2.5

**TEM – Water:** EPA 100.2
Fibers >10µm ☐ Waste ☐ Drinking
All Fiber Sizes ☐ Waste ☐ Drinking

**TEM- Dust**
☐ Microvac - ASTM D 5755
☐ Wipe - ASTM D6480
☐ Carpet Sonication (EPA 600/J-93/167)

**Soil/Rock/Vermiculite**
☐ PLM EPA 600/R-93/116 with milling prep (<1%)
☐ PLM EPA 600/R-93/116 with milling prep (<0.25%)
☐ TEM EPA 600/R-93/116 with milling prep (<0.1%)
☐ TEM Qualitative via Filtration Prep
☐ TEM Qualitative via Drop Mount Prep
☐ Cincinnati Method EPA 600/R-04/004 – PLM/TEM (BC only)

**Other:**
☐

☑ **Check For Positive Stop – Clearly Identify Homogenous Group** | **Filter Pore Size (Air Samples):** ☑ 0.8µm ☐ 0.45µm

**Samplers Name:** Edward F. von Briesen | **Samplers Signature:**

| Sample # | Sample Description | Volume/Area (Air) HA # (Bulk) | Date/Time Sampled |
|---|---|---|---|
| | ROOF AREA: | | |
| 1A | Wall A, left - core sample - flat roofing material | >1950 sq ft | 9/26/17 PM |
| 1B | Wall C, right - core sample - flat roofing material | >1950 sq ft | 9/26/17 PM |
| 2A | Front fan vent flashing - front - black mastic | approx 6 ft | 9/26/17 PM |
| 2B | Front fan vent flashing - rear - black mastic | approx 6 ft | 9/26/17 |

**Client Sample # (s):** - **Total # of Samples:** 38

**Relinquished (Client):** Edward F. von Briesen **Date:** 9/28/17 **Time:**

**Received (Lab):** **Date:** 9/28/17 **Time:** 1107PM

**Comments/Special Instructions:**
Test PLM. If inconclusive, test TEM

Jonas Montalvo 10/10/17



TEM - 10/11/17

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# Asbestos Chain of Custody

**EMSL Order Number** *(Lab Use Only):*

061716779

PHONE:
FAX:

*Additional Pages of the Chain of Custody are only necessary if needed for additional sample information*

| Sample # | Sample Description | Volume/Area (Air) HA # (Bulk) | Date/Time Sampled |
|---|---|---|---|
| 3A | Chimney flashing - front - black mastic | approx 8 ft | 9/26/17 PM |
| 3B | Chimney flashing - rear- black mastic | approx 8 ft | 9/26/17 PM |
| 4A | Wall B, ctr - vent flashing - rear - black mastic | approx 6 ft | 9/26/17 PM |
| 4B | Wall B, ctr - vent flashing - front- black mastic | approx 6 ft | 9/26/17 PM |
| | BUILDING - INTERIOR - ROOM #1 - Pump room | | |
| 5A | Hall - tan floor linoleum tile | ap 300 sq ft | 9/26/17 PM |
| 5B | Hall - tan floor linoleum tile | ap 300 sq ft | 9/26/17 PM |
| 6A | Hall - black floor tile adhesive mastic | ap 300 sq ft | 9/26/17 PM |
| 6B | Hall - black floor tile adhesive mastic | ap 300 sq ft | 9/26/17 PM |
| 7A | Hall baseboard - brown mastic | aprox 150 ft | 9/26/17 PM |
| 7B | Hall baseboard - brown mastic | aprox 150 ft | 9/26/17 PM |
| 8A | Rear entry door - interior side jamb - white caulk | approx 20 ft | 9/26/17 PM |
| 8B | Rear entry door - interior side jamb - white caulk | approx 20 ft | 9/26/17 PM |
| 9A | Interior wall window - white perimeter caulk | approx 9 ft | 9/26/17 PM |
| 9B | Interior wall window - white perimeter caulk | approx 9 ft | 9/26/17 PM |
| 10A | Wall A - interior window - gray perimeter caulk | approx 14 ft | 9/26/17 PM |
| 10B | Wall A - interior window - gray perimeter caulk | approx 14 ft | 9/26/17 PM |
| 11A | Wall B, left-interior window-white perimeter caulk | approx 14 ft | 9/26/17 PM |
| 11B | Wall B,right-interior window-white perimeter caulk | approx 14 ft | 9/26/17 PM |
| 12A | Utility room partition wall - mortar cement | >1000 ft | 9/26/17 PM |
| | BUILDING INTERIOR - ROOM #2 - Utility room | | 9/26/17 PM |
| 12B | Wall A, left-window opening wall - mortar cement | >1000 ft | 9/26/17 PM |
| 13A | Wall A, left side - gray window caulk | approx 9 ft | 9/26/17 PM |

***Comments/Special Instructions:**

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# Asbestos Chain of Custody

**EMSL Order Number** *(Lab Use Only)*: 061716779

PHONE:
FAX:

*Additional Pages of the Chain of Custody are only necessary if needed for additional sample information*

| Sample # | Sample Description | Volume/Area (Air) HA # (Bulk) | Date/Time Sampled |
|---|---|---|---|
| | BUILDING INTERIOR ROOM #2 - Continued | | |
| 13B | Wall A, window - right side - gray window caulk | approx 9 ft | 9/26/17 PM |
| 14A | Wall C, door-interior side-gray buck frame caulk | approx 20 ft | 9/26/17 PM |
| 14B | Wall C, door-interior side-gray buck frame caulk | approx 20 ft | 9/26/17 PM |
| | BUILDING EXTERIOR - ROOMS #1 and #2 | | |
| 15A | Utility Rm. entry door - buck frame white caulk | approx 20 ft | 9/26/17 PM |
| 15B | Utility Rm. entry door - buck frame white caulk | approx 20 ft | 9/26/17 PM |
| 16A | Wall A, window frame - white perimeter caulk | approx 16 ft | 9/26/17 PM |
| 16B | Wall A, window frame - white perimeter caulk | approx 16 ft | 9/26/17 PM |
| 17A | Wall B, right-window frame-white perimeter caulk | approx 16 ft | 9/26/17 PM |
| 17B | Wall B,centr-window frame-white perimeter caulk | approx 16 ft | 9/26/17 PM |
| | PUMP ROOM - INTERIOR ROOM #1 | | |
| 18A | Riser pipe, wall B center - flange gasket | approx 1 ft | 9/27/17 AM |
| 18B | Smaller ceiling pipe, wall B, right - flange gasket | approx 1 ft | 9/27/17 AM |
| 19A | Wall B, right - pump flange gasket | approx 1 ft | 9/27/17 AM |
| 19B | Wall B, right - pump flange gasket | approx 1 ft | 9/27/17 AM |
| | | | |
| | | | |
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| | | | |
| | | | |

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***Comments/Special Instructions:**

Tomás Montalvo Oca 10/10/17



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10/9/17 63A

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http://www.EMSL.com carleplacelab@emsl.com

EMSL Order: 061716779
CustomerID: SOUN63
CustomerPO:
ProjectID:

Attn: **Erin Bubka**
**Sound Environmental Association**
**67 Heights Road**
**Stony Point, NY 10980**

Phone: (631) 414-7198
Fax: (631) 514-3697
Received: 09/28/17 1:07 PM
Analysis Date: 10/10/2017
Collected: 9/26/2017

Project: **Calverton, NY, Sewage Pump Station, Control Bldg.**

# Test Report:Asbestos Analysis of Bulk Material

| Test | Analyzed Date | Color | Non Asbestos Fibrous | Non Asbestos Non-Fibrous | Asbestos |
|---|---|---|---|---|---|
| **Sample ID** 1A *061716779-0001* | | **Description** Roof Area, Wall A, Left, Core Sample - Flat Roofing Material<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/10/2017 | Black | <1% Fibrous (other)<br><1% Glass | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | | | | | **Not Analyzed** |
| **Sample ID** 1B *061716779-0002* | | **Description** Roof Area, Wall C, Right-Core Sample - Flat Roofing Material<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/10/2017 | Black | <1% Glass | | **5.8% Chrysotile**<br>**5.8% Total** |
| **TEM NYS 198.4 NOB** | | | | | **Not Analyzed** |
| **Sample ID** 2A *061716779-0003* | | **Description** Roof Area, Front Fan Vent Flashing, Front - Black Mastic<br>**Homogeneity** Homogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Black | | | **13.0% Chrysotile**<br>**13.0% Total** |
| **TEM NYS 198.4 NOB** | 10/9/2017 | | | | **Not Analyzed** |
| **Sample ID** 2B *061716779-0004* | | **Description** Roof Area, Front Fan Vent Flashing, Rear - Black Mastic<br>**Homogeneity** | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | | | | **Positive Stop (Not Analyzed)** |
| **TEM NYS 198.4 NOB** | 10/9/2017 | | | | **Not Analyzed** |
| **Sample ID** 3A *061716779-0005* | | **Description** Roof Area, Chimney Flashing, Front - Black Mastic<br>**Homogeneity** Homogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Black | | | **8.2% Chrysotile**<br>**8.2% Total** |
| **TEM NYS 198.4 NOB** | 10/9/2017 | | | | **Not Analyzed** |

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EMSL Order: 061716779
CustomerID: SOUN63
CustomerPO:
ProjectID:

# Test Report:Asbestos Analysis of Bulk Material

| Test | | Color | Non Asbestos Fibrous | Non Asbestos Non-Fibrous | Asbestos |
|---|---|---|---|---|---|
| **Sample ID** 3B *061716779-0006* | | **Description** Roof Area, Chimney Flashing, Rear - Black Mastic **Homogeneity** | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | | | | **Positive Stop (Not Analyzed)** |
| **TEM NYS 198.4 NOB** | 10/9/2017 | | | | **Not Analyzed** |
| **Sample ID** 4A *061716779-0007* | | **Description** Roof Area, Wall B, Center, Vent Flashing, Rear - Black Mastic **Homogeneity** Homogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Black | | | **5.4% Chrysotile** **5.4% Total** |
| **TEM NYS 198.4 NOB** | 10/9/2017 | | | | **Not Analyzed** |
| **Sample ID** 4B *061716779-0008* | | **Description** Roof Area, Wall B, Center, Vent Flashing, Front - Black Mastic **Homogeneity** | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | | | | **Positive Stop (Not Analyzed)** |
| **TEM NYS 198.4 NOB** | 10/9/2017 | | | | **Not Analyzed** |
| **Sample ID** 5A *061716779-0009* | | **Description** Building, Interior, Room #1, Pump Room, Hall - Tan Floor Linoleum Tile **Homogeneity** Homogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Brown | | | **5.7% Chrysotile** **5.7% Total** |
| **TEM NYS 198.4 NOB** | 10/9/2017 | | | | **Not Analyzed** |
| **Sample ID** 5B *061716779-0010* | | **Description** Building, Interior, Room #1, Pump Room, Hall - Tan Floor Linoleum Tile **Homogeneity** | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | | | | **Positive Stop (Not Analyzed)** |
| **TEM NYS 198.4 NOB** | 10/9/2017 | | | | **Not Analyzed** |
| **Sample ID** 6A *061716779-0011* | | **Description** Building, Interior, Room #1, Pump Room, Hall - Black Floor Tile Adhesive Mastic **Homogeneity** Homogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Brown | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Brown | | | **None Detected** |

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EMSL Order: 061716779
CustomerID: SOUN63
CustomerPO:
ProjectID:

# Test Report:Asbestos Analysis of Bulk Material

| Test | | Color | Non Asbestos Fibrous | Non-Fibrous | Asbestos |
|---|---|---|---|---|---|
| **Sample ID** 6B<br>*061716779-0012* | | **Description**<br>**Homogeneity** | Building, Interior, Room #1, Pump Room, Hall - Black Floor Tile Adhesive Mastic<br>Heterogeneous | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Brown | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Brown | | | **<1% Chrysotile**<br>**<1% Total** |
| **Sample ID** 7A<br>*061716779-0013* | | **Description**<br>**Homogeneity** | Building, Interior, Room #1, Pump Room, Hall Baseboard - Brown Mastic<br>Homogeneous | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Brown | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Brown | | | **None Detected** |
| **Sample ID** 7B<br>*061716779-0014* | | **Description**<br>**Homogeneity** | Building, Interior, Room #1, Pump Room, Hall Baseboard - Brown Mastic<br>Homogeneous | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Brown | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Brown | | | **<1% Chrysotile**<br>**<1% Total** |
| **Sample ID** 8A<br>*061716779-0015* | | **Description**<br>**Homogeneity** | Building, Interior, Room #1, Pump Room, Rear Entry Door, Interior Side Jamb - White Caulk<br>Heterogeneous | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Brown/Gray | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Brown/Gray | | | **None Detected** |
| **Sample ID** 8B<br>*061716779-0016* | | **Description**<br>**Homogeneity** | Building, Interior, Room #1, Pump Room, Rear Entry Door, Interior Side Jamb - White Caulk<br>Heterogeneous | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Brown/Gray | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Brown/Gray | | | **None Detected** |
| **Sample ID** 9A<br>*061716779-0017* | | **Description**<br>**Homogeneity** | Building, Interior, Room #1, Pump Room, Interior Wall Window - White Perimeter Caulk<br>Heterogeneous | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray | | | **None Detected** |

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EMSL Order: 061716779
CustomerID: SOUN63
CustomerPO:
ProjectID:

# Test Report:Asbestos Analysis of Bulk Material

| Test | | Color | Non Asbestos Fibrous | Non-Fibrous | Asbestos |
|---|---|---|---|---|---|
| **Sample ID** 9B *061716779-0018* | | **Description** Building, Interior, Room #1, Pump Room, Interior Wall Window - White Perimeter Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray | | | **None Detected** |
| **Sample ID** 10A *061716779-0019* | | **Description** Building, Interior, Room #1, Pump Room, Wall A, Interior Window - Gray Perimeter Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray | | | **None Detected** |
| **Sample ID** 10B *061716779-0020* | | **Description** Building, Interior, Room #1, Pump Room, Wall A, Interior Window - Gray Perimeter Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray | | | **None Detected** |
| **Sample ID** 11A *061716779-0021* | | **Description** Building, Interior, Room #1, Pump Room, Wall B, Left, Interior Window - White Perimeter Caulk<br>**Homogeneity** Homogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray | | | **None Detected** |
| **Sample ID** 11B *061716779-0022* | | **Description** Building, Interior, Room #1, Pump Room, Wall B, Left, Interior Window - White Perimeter Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray | | | **None Detected** |
| **Sample ID** 12A *061716779-0023* | | **Description** Building, Interior, Room #1, Pump Room, Utility Room Partition Wall - Mortar Cement<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | 10/9/2017 | Tan/White | 55.00% Quartz<br>30.00% Ca Carbonate<br>15.00% Non-fibrous (other) | | **None Detected** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | | | | | **Not Analyzed** |
| **TEM NYS 198.4 NOB** | | | | | **Not Analyzed** |

Initial Report From 10/11/2017 20:12:50

**EMSL Analytical, Inc.**
**528 Mineola Avenue, Carle Place, NY 11514**
Phone/Fax: (516) 997-7251 / (516) 997-7528
http://www.EMSL.com carleplacelab@emsl.com

EMSL Order: 061716779
CustomerID: SOUN63
CustomerPO:
ProjectID:

# Test Report:Asbestos Analysis of Bulk Material

| Test | | Color | Non Asbestos Fibrous | Non-Fibrous | Asbestos |
|---|---|---|---|---|---|
| **Sample ID** 12B *061716779-0024* | | **Description** Building, Interior, Room #2, Utility Room, Wall A, Left, Window Opening Wall - Mortar Cement<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | 10/9/2017 | Tan/White | | 60.00% Quartz<br>20.00% Ca Carbonate<br>20.00% Non-fibrous (other) | **None Detected** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | | | | | **Not Analyzed** |
| **TEM NYS 198.4 NOB** | | | | | **Not Analyzed** |
| **Sample ID** 13A *061716779-0025* | | **Description** Building, Interior, Room #2, Utility Room, Wall A, Left Side - Gray Window Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray | | | **None Detected** |
| **Sample ID** 13B *061716779-0026* | | **Description** Building, Interior, Room #2, Utility Room, Wall A, Window, Right Side - Gray Window Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray | | | **None Detected** |
| **Sample ID** 14A *061716779-0027* | | **Description** Building, Interior, Room #2, Utility Room, Wall C, Door, Interior Side - Gray Buck Frame Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray/White | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray/White | | | **None Detected** |
| **Sample ID** 14B *061716779-0028* | | **Description** Building, Interior, Room #2, Utility Room, Wall C, Door, Interior Side - Gray Buck Frame Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray/White | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray/White | | | **None Detected** |
| **Sample ID** 15A *061716779-0029* | | **Description** Building Exterior, Rooms #1 & #2, Utility Room Entry Door - White Buck Frame Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Brown/Gray | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Brown/Gray | | | **None Detected** |

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**528 Mineola Avenue, Carle Place, NY 11514**
Phone/Fax: (516) 997-7251 / (516) 997-7528
http://www.EMSL.com carleplacelab@emsl.com

EMSL Order: 061716779
CustomerID: SOUN63
CustomerPO:
ProjectID:

# Test Report:Asbestos Analysis of Bulk Material

| Test | | Color | Non Asbestos Fibrous | Non-Fibrous | Asbestos |
|---|---|---|---|---|---|
| **Sample ID** 15B *061716779-0030* | | **Description** Building Exterior, Rooms #1 & #2, Utility Room Entry Door - White Buck Frame Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Brown/Gray | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Brown/Gray | | | **None Detected** |
| **Sample ID** 16A *061716779-0031* | | **Description** Building Exterior, Rooms #1 & #2, Wall A, Window Frame - White Perimeter Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray/Pink | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray/Pink | | | **None Detected** |
| **Sample ID** 16B *061716779-0032* | | **Description** Building Exterior, Rooms #1 & #2, Wall A, Window Frame - White Perimeter Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray/Pink | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray/Pink | | | **None Detected** |
| **Sample ID** 17A *061716779-0033* | | **Description** Building Exterior, Rooms #1 & #2, Wall B, Right, Window Frame - White Perimeter Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray/Pink | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray/Pink | | | **None Detected** |
| **Sample ID** 17B *061716779-0034* | | **Description** Building Exterior, Rooms #1 & #2, Wall B, Center, Window Frame - White Perimeter Caulk<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray/Pink | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray/Pink | | | **None Detected** |
| **Sample ID** 18A *061716779-0035* | | **Description** Building Exterior, Rooms #1 & #2, Riser Pipe, Wall B, Center - Flange Gasket<br>**Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray/Green | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray/Green | | | **None Detected** |

Initial Report From 10/11/2017 20:12:50

**EMSL Analytical, Inc.**
**528 Mineola Avenue, Carle Place, NY 11514**
Phone/Fax: (516) 997-7251 / (516) 997-7528
http://www.EMSL.com carleplacelab@emsl.com

| | |
|---|---|
| EMSL Order: | 061716779 |
| CustomerID: | SOUN63 |
| CustomerPO: | |
| ProjectID: | |

# Test Report:Asbestos Analysis of Bulk Material

| Test | | Color | Non Asbestos Fibrous | Non-Fibrous | Asbestos |
|---|---|---|---|---|---|
| **Sample ID** | 18B | **Description** | Building Exterior, Rooms #1 & #2, Smaller Ceiling Pipe, Wall B, Right - Flange Gasket | | |
| | *061716779-0036* | **Homogeneity** | Heterogeneous | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Brown/Green | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Brown/Green | | | **None Detected** |
| **Sample ID** | 19A | **Description** | Building Exterior, Rooms #1 & #2, Wall B, Right - Pump Flange Gasket | | |
| | *061716779-0037* | **Homogeneity** | Heterogeneous | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray/Red | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray/Red | | | **None Detected** |
| **Sample ID** | 19B | **Description** | Building Exterior, Rooms #1 & #2, Wall B, Right - Pump Flange Gasket | | |
| | *061716779-0038* | **Homogeneity** | Heterogeneous | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray/Red | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/11/2017 | Gray/Red | | | **None Detected** |

Analyst(s)

*Jackson Li*

*Steve Jusczuk*

*Tomas Montes De Oca*

Michelle McGowan, Laboratory Manager
or other approved signatory

NOB = Non Friable Organically Bound N/A = Not Applicable VCM = Vermiculite Containing Material

-In New York State, TEM is currently the only method that can be used to determine if NOB materials can be considered or treated as non-asbestos containing.
All samples examined for the presence of vermiculite when analyzed via NYS 198.1.
-NYS Guidelines for Vermiculite containing samples are available at http://www.wadsworth.org/labcert/elapcert/forms/VermiculiteInterimGuidance_Rev070913.pdf
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Samples analyzed by EMSL Analytical, Inc. Carle Place, NY NYS ELAP 11469

Initial Report From 10/11/2017 20:12:50

OrderID: 061716837

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

# Asbestos Chain of Custody

**EMSL Order Number** (Lab Use Only): 061716837

PHONE:
FAX:

| | | | |
|---|---|---|---|
| **Company Name:** Sound Environmental | | **EMSL Customer ID:** | |
| **Street:** 23 Lighthouse Court | | **City:** Tompkins Cove | **State/Province:** N.Y. |
| **Zip/Postal Code:** 10986 | **Country:** USA | **Telephone #:** 631-356-5426 | **Fax #:** |
| **Report To (Name):** Erin Marsalisi | | **Please Provide Results:** ☐ Fax ☑ Email | |
| **Email Address:** erin@soundny.com | | **Purchase Order:** | |
| **Project Name/Number:** Calverton, NY. Sewage Pump Station - Pump Pit | | **EMSL Project ID** (*Internal Use Only*): | |
| **U.S. State Samples Taken:** 4 | | **CT Samples:** ☐ Commercial/Taxable ☐ Residential/Tax Exempt | |

**EMSL-Bill to:** ☑ Same ☐ Different - If Bill to is Different note instructions in Comments**
*Third Party Billing requires written authorization from third party*

**Turnaround Time (TAT) Options* – Please Check**

☐ 3 Hour | ☐ 6 Hour | ☐ 24 Hour | ☐ 48 Hour | ☐ 72 Hour | ☐ 96 Hour | ☐ 1 Week | ☒ 2 Week

**For TEM Air 3 hr through 6 hr, please call ahead to schedule.*There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.*

**PCM - Air** ☐ Check if samples are from NY
☐ NIOSH 7400
☐ w/ OSHA 8hr. TWA

**PLM - Bulk (reporting limit)**
☐ PLM EPA 600/R-93/116 (<1%)
☐ PLM EPA NOB (<1%)
Point Count
☐ 400 (<0.25%) ☐ 1000 (<0.1%)
Point Count w/Gravimetric
☐ 400 (<0.25%) ☐ 1000 (<0.1%)
☑ NYS 198.1 (friable in NY)
☑ NYS 198.6 NOB (non-friable-NY)
☑ NYS 198.8 SOF-V
☐ NIOSH 9002 (<1%)

**TEM – Air** ☐ 4-4.5hr TAT (AHERA only)
☐ AHERA 40 CFR, Part 763
☐ NIOSH 7402
☐ EPA Level II
☐ ISO 10312

**TEM - Bulk**
☐ TEM EPA NOB
☑ NYS NOB 198.4 (non-friable-NY)
☐ Chatfield SOP
☐ TEM Mass Analysis-EPA 600 sec. 2.5

**TEM – Water:** EPA 100.2
Fibers >10µm ☐ Waste ☐ Drinking
All Fiber Sizes ☐ Waste ☐ Drinking

**TEM- Dust**
☐ Microvac - ASTM D 5755
☐ Wipe - ASTM D6480
☐ Carpet Sonication (EPA 600/J-93/167)

**Soil/Rock/Vermiculite**
☐ PLM EPA 600/R-93/116 with milling prep (<1%)
☐ PLM EPA 600/R-93/116 with milling prep (<0.25%)
☐ TEM EPA 600/R-93/116 with milling prep (<0.1%)
☐ TEM Qualitative via Filtration Prep
☐ TEM Qualitative via Drop Mount Prep
☐ Cincinnati Method EPA 600/R-04/004 – PLM/TEM (BC only)

**Other:**
☐

☑ **Check For Positive Stop – Clearly Identify Homogenous Group**

**Filter Pore Size (Air Samples):** ☑ 0.8µm ☐ 0.45µm

**Samplers Name:** Edward F. von Briesen

**Samplers Signature:**

| Sample # | Sample Description | Volume/Area (Air) HA # (Bulk) | Date/Time Sampled |
|---|---|---|---|
| 1A | Wall B, center - Horizontal pipe clean out gasket | approx 3 ft. | 9/27/17 AM |
| 1B | Wall B, center - Horizontal pipe clean out gasket | approx 3 ft. | 9/27/17 AM |
| 2A | Wall B, left - Top pipe flange gasket | aprox 20 ft | 9/27/17 AM |
| 2B | Wall B, right - Top pipe flange gasket | aprox 20 ft | 9/27/17 AM |
| | | | |

**Client Sample # (s):** 1A - 2B **Total # of Samples:** 4

**Relinquished (Client):** Edward F. von Briesen **Date:** 9/28/17 **Time:**

**Received (Lab):** **Date:** 9/28/17 **Time:** 10:00 AM

**Comments/Special Instructions:**
Test PLM. If inconclusive, test TEM



Controlled Document – Asbestos COC – R10 – 05/09/2016

9/28/17 9:42A

10/12/17

**EMSL Analytical, Inc.**
**528 Mineola Avenue, Carle Place, NY 11514**
Phone/Fax: (516) 997-7251 / (516) 997-7528
http://www.EMSL.com carleplacelab@emsl.com

EMSL Order: 061716837
CustomerID: SOUN63
CustomerPO:
ProjectID:

Attn: **Sheila Bubka**
**Sound Environmental Association**
**67 Heights Rd**
**Stony Point, NY 10980**

Phone: (631) 414-7198
Fax: (631) 514-3697
Received: 09/28/17 1:07 PM
Analysis Date: 10/12/2017
Collected: 9/27/2017

Project: **Calverton, NY, Sewage Pump Station, Pump Pit**

# Test Report:Asbestos Analysis of Bulk Material

| Test | Analyzed Date | Color | Non Asbestos Fibrous | Non Asbestos Non-Fibrous | Asbestos |
|---|---|---|---|---|---|
| **Sample ID** 1A *061716837-0001* | | **Description** Wall B, Center - Horizontal Pipe Clean Out Gasket **Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Tan | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/12/2017 | Tan | | | **None Detected** |
| **Sample ID** 1B *061716837-0002* | | **Description** Wall B, Center - Horizontal Pipe Clean Out Gasket **Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Tan | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/12/2017 | Tan | | | **None Detected** |
| **Sample ID** 2A *061716837-0003* | | **Description** Wall B, Left - Top Pipe Flange Gasket **Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray/Red | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/12/2017 | Gray/Red | | | **None Detected** |
| **Sample ID** 2B *061716837-0004* | | **Description** Wall B, Right - Top Pipe Flange Gasket **Homogeneity** Heterogeneous | | | |
| **PLM NYS 198.1 Friable** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 VCM** | | | | | **Not Analyzed** |
| **PLM NYS 198.6 NOB** | 10/9/2017 | Gray/Red | | | **Inconclusive: None Detected** |
| **TEM NYS 198.4 NOB** | 10/12/2017 | Gray/Red | | | **None Detected** |

Initial Report From 10/12/2017 11:47:14

**EMSL Analytical, Inc.**
**528 Mineola Avenue, Carle Place, NY 11514**
Phone/Fax: (516) 997-7251 / (516) 997-7528
http://www.EMSL.com carleplacelab@emsl.com

| | |
|---|---|
| EMSL Order: | 061716837 |
| CustomerID: | SOUN63 |
| CustomerPO: | |
| ProjectID: | |

# Test Report:Asbestos Analysis of Bulk Material

| Test | Color | Non Asbestos Fibrous | Non-Fibrous | Asbestos |
|---|---|---|---|---|

Analyst(s)

*Danny Sandhu*

*Steve Jusczuk*

Michelle McGowan, Laboratory Manager
or other approved signatory

NOB = Non Friable Organically Bound N/A = Not Applicable VCM = Vermiculite Containing Material

-In New York State, TEM is currently the only method that can be used to determine if NOB materials can be considered or treated as non-asbestos containing.
All samples examined for the presence of vermiculite when analyzed via NYS 198.1.
-NYS Guidelines for Vermiculite containing samples are available at http://www.wadsworth.org/labcert/elapcert/forms/VermiculiteInterimGuidance_Rev070913.pdf
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Samples analyzed by EMSL Analytical, Inc. Carle Place, NY NYS ELAP 11469

Initial Report From 10/12/2017 11:47:14

# Appendix B-Lead Sample Results

# LEAD PAINT INSPECTION REPORT

REPORT NUMBER: S#01379 - 09/26/17 10:15

INSPECTION FOR: Sound Environmental
67 Heights Road
Stony Point, N.Y. 10980

PERFORMED AT: Calverton Sewage Treatment Plant
Control Building
Burman Road (4062 Grumman Blvd)
Calverton, N.Y.

INSPECTION DATE: 09/26/17

INSTRUMENT TYPE: R M D
MODEL LPA-1
XRF TYPE ANALYZER
Serial Number: 01379

ACTION LEVEL: 1.0 mg/cm**2

OPERATOR LICENSE: Ct. Lic. #001381
E.P.A. Certificate #NY-R-5760-6

STATEMENT: This limited XRF lead based paint survey was conducted per all Federal H.U.D. test protocols for lead based paint in effect as of the date of this report. Only the pump room and utility room were tested per the instructions of the Client.

Edward F. von Briesen

SIGNED _____ DATE 09/26/17

Long Island Lead Assessment &
Control
P.O. Box 236
Mill Neck, N.Y. 11765
Phone: 516 - 922 - 0700

SEQUENTIAL REPORT OF LEAD PAINT INSPECTION FOR: Sound Environmental

Inspection Date: 09/26/17
Report Date: 9/26/2017
Abatement Level: 1.0
Report No. S#01379 - 09/26/17 10:15
Total Readings: 50
Job Started: 09/26/17 10:15
Job Finished: 09/26/17 11:35

Calverton Sewage Treatment Plant
Control Building
Burman Road (4062 Grumman Blvd)
Calverton, N.Y.

| Read No. | Rm | Room Name | Wall | Structure | Location | Member | Paint Cond | Substrate | Paint Color | Lead (mg/cm²) | Mode |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | CALIBRATION | | | | | | | | 0.9 | TC |
| 2 | | CALIBRATION | | | | | | | | 1.0 | TC |
| 3 | | CALIBRATION | | | | | | | | 1.0 | TC |
| 4 | | CALIBRATION | | | | | | | | 0.0 | TC |
| 5 | | CALIBRATION | | | | | | | | 0.0 | TC |
| 6 | | CALIBRATION | | | | | | | | 0.0 | TC |
| 7 | 001 | Pump Room | A | Wall | U Lft | | I | Concrete | Beige | 0.0 | QM |
| 8 | 001 | Pump Room | A | Wall | U Rgt | | I | Concrete | Beige | -0.1 | QM |
| 9 | 001 | Pump Room | B | Wall | U Ctr | | I | Concrete | Beige | 0.0 | QM |
| 10 | 001 | Pump Room | C | Wall | U Ctr | | I | Concrete | Beige | -0.1 | QM |
| 11 | 001 | Pump Room | D | Wall | U Lft | | I | Concrete | Beige | -0.3 | QM |
| 12 | 001 | Pump Room | D | Wall | U Rgt | | I | Concrete | Beige | 0.0 | QM |
| 13 | 001 | Pump Room | A | Ceiling | | | P | Concrete | Gray | -0.1 | QM |
| 14 | 001 | Pump Room | B | Floor | | | I | Concrete | Gray | -0.1 | QM |
| 15 | 001 | Pump Room | B | Riser pipe | Ctr | | I | Steel | Green | 1.0 | QM |
| 16 | 001 | Pump Room | B | Door | Rgt | U Rgt | I | Steel | Brown | 0.3 | QM |
| 17 | 001 | Pump Room | B | Door | Rgt | Rgt casing | I | Steel | Brown | 0.0 | QM |
| 18 | 001 | Pump Room | B | Door | Rgt | Lft jamb | I | Steel | Brown | 0.1 | QM |
| 19 | 001 | Pump Room | B | Ceiling pipe | Ctr | | I | Steel | Green | 1.0 | QM |
| 20 | 001 | Pump Room | B | Pump Body | Ctr | | I | Cast Iron | Gray | 0.1 | QM |
| 21 | 001 | Pump Room | B | Pump Motor | Ctr | | I | Cast Iron | Gray | 0.3 | QM |
| 22 | 001 | Pump Room | B | Pump Base | Ctr | | I | Steel | Gray | 0.4 | QM |
| 23 | 001 | Pump Room | B | Pump Body | Rgt | | I | Cast Iron | Gray | 0.1 | QM |
| 24 | 001 | Pump Room | B | Pump Motor | Rgt | | I | Cast Iron | Gray | 0.3 | QM |
| 25 | 001 | Pump Room | B | Pump Base | Rgt | | I | Steel | Gray | 0.0 | QM |
| 26 | 001 | Pump Room | C | Door | Ctr | U Rgt | I | Steel | Brown | 0.0 | QM |
| 27 | 001 | Pump Room | C | Door | Ctr | Lft casing | I | Steel | Brown | 0.2 | QM |
| 28 | 001 | Pump Room | C | Door | Ctr | Rgt jamb | I | Steel | Brown | 0.1 | QM |
| 29 | 001 | Pump Room | C | Ceiling pipe | Ctr | | I | Steel | Green | 0.0 | QM |
| 30 | 001 | Pump Room | C | Oil tank | Rgt | | I | Steel | Gray | 0.3 | QM |
| 31 | 001 | Pump Room | D | Door | Ctr | U Rgt | I | Steel | Brown | 0.0 | QM |
| 32 | 001 | Pump Room | D | Door | Ctr | Lft casing | I | Steel | Brown | 0.0 | QM |
| 33 | 001 | Pump Room | D | Door | Ctr | Rgt jamb | I | Steel | Brown | 0.1 | QM |
| 34 | 002 | Utility Rm | A | Wall | U Ctr | | I | Concrete | Beige | 0.0 | QM |
| 35 | 002 | Utility Rm | B | Wall | U Ctr | | I | Concrete | Beige | 0.0 | QM |
| 36 | 002 | Utility Rm | C | Wall | U Ctr | | I | Concrete | Beige | -0.1 | QM |
| 37 | 002 | Utility Rm | D | Wall | U Rgt | | I | Concrete | Beige | 0.0 | QM |
| 38 | 002 | Utility Rm | A | Ceiling | | | I | Concrete | White | -0.1 | QM |
| 39 | 002 | Utility Rm | C | Floor | | | P | Concrete | Gray | 0.0 | QM |
| 40 | 002 | Utility Rm | D | Door | Ctr | U Rgt | I | Steel | Brown | 0.0 | QM |
| 41 | 002 | Utility Rm | D | Door | Ctr | Lft casing | I | Steel | Brown | 0.0 | QM |
| 42 | 002 | Utility Rm | D | Door | Ctr | Rgt jamb | I | Steel | Brown | 0.0 | QM |
| 43 | 002 | Utility Rm | D | Floor Hatch | Rgt | | P | Steel | Gray | 0.3 | QM |
| 44 | 001 | Building #1 | D | Fascia | | | I | Aluminum | White | 0.0 | QM |
| 45 | | CALIBRATION | | | | | | | | 1.0 | TC |
| 46 | | CALIBRATION | | | | | | | | 1.0 | TC |
| 47 | | CALIBRATION | | | | | | | | 1.0 | TC |
| 48 | | CALIBRATION | | | | | | | | 0.0 | TC |
| 49 | | CALIBRATION | | | | | | | | 0.0 | TC |

| | | | |
|---|---|---|---|
| 50 | CALIBRATION | 0.0 | TC |

---- End of Readings ----

SUMMARY REPORT OF LEAD PAINT INSPECTION FOR: Sound Environmental

Inspection Date: 09/26/17
Report Date: 9/26/2017
Abatement Level: 1.0
Report No. S#01379 - 09/26/17 10:15
Total Readings: 50 Actionable: 2
Job Started: 09/26/17 10:15
Job Finished: 09/26/17 11:35

Calverton Sewage Treatment Plant
Control Building
Burman Road (4062 Grumman Blvd)
Calverton, N.Y.

| Read No. | Wall | Structure | Location | Member | Paint Cond | Substrate | Paint Color | Lead (mg/cm²) | Mode |
|---|---|---|---|---|---|---|---|---|---|
| Interior Room 001 Pump Room | | | | | | | | | |
| 015 | B | Riser pipe | Ctr | | I | Steel | Green | 1.0 | QM |
| 019 | B | Ceiling pipe | Ctr | | I | Steel | Green | 1.0 | QM |
| Comment: Windows are unpainted aluminum with no painted trim. Vent louvers are unpainted steel. | | | | | | | | | |
| Calibration Readings | | | | | | | | | |

---- End of Readings ----

DETAILED REPORT OF LEAD PAINT INSPECTION FOR: Sound Environmental

Inspection Date: 09/26/17
Report Date: 9/26/2017
Abatement Level: 1.0
Report No. S#01379 - 09/26/17 10:15
Total Readings: 50
Job Started: 09/26/17 10:15
Job Finished: 09/26/17 11:35

Calverton Sewage Treatment Plant
Control Building
Burman Road (4062 Grumman Blvd)
Calverton, N.Y.

| Read No. | Wall | Structure | Location | Member | Paint Cond | Substrate | Paint Color | Lead (mg/cm²) | Mode |
|---|---|---|---|---|---|---|---|---|---|
| Exterior Room 001 Building #1 | | | | | | | | | |
| 044 | D | Fascia | | | I | Aluminum | White | 0.0 | QM |
| Interior Room 001 Pump Room | | | | | | | | | |
| 007 | A | Wall | U Lft | | I | Concrete | Beige | 0.0 | QM |
| 008 | A | Wall | U Rgt | | I | Concrete | Beige | -0.1 | QM |
| 013 | A | Ceiling | | | P | Concrete | Gray | -0.1 | QM |
| 009 | B | Wall | U Ctr | | I | Concrete | Beige | 0.0 | QM |
| 014 | B | Floor | | | I | Concrete | Gray | -0.1 | QM |
| 017 | B | Door | Rgt | Rgt casing | I | Steel | Brown | 0.0 | QM |
| 018 | B | Door | Rgt | Lft jamb | I | Steel | Brown | 0.1 | QM |
| 016 | B | Door | Rgt | U Rgt | I | Steel | Brown | 0.3 | QM |
| 015 | B | Riser pipe | Ctr | | I | Steel | Green | 1.0 | QM |
| 019 | B | Ceiling pipe | Ctr | | I | Steel | Green | 1.0 | QM |
| 020 | B | Pump Body | Ctr | | I | Cast Iron | Gray | 0.1 | QM |
| 021 | B | Pump Motor | Ctr | | I | Cast Iron | Gray | 0.3 | QM |
| 022 | B | Pump Base | Ctr | | I | Steel | Gray | 0.4 | QM |
| 023 | B | Pump Body | Rgt | | I | Cast Iron | Gray | 0.1 | QM |
| 024 | B | Pump Motor | Rgt | | I | Cast Iron | Gray | 0.3 | QM |
| 025 | B | Pump Base | Rgt | | I | Steel | Gray | 0.0 | QM |
| 010 | C | Wall | U Ctr | | I | Concrete | Beige | -0.1 | QM |
| 028 | C | Door | Ctr | Rgt jamb | I | Steel | Brown | 0.1 | QM |
| 027 | C | Door | Ctr | Lft casing | I | Steel | Brown | 0.2 | QM |
| 026 | C | Door | Ctr | U Rgt | I | Steel | Brown | 0.0 | QM |
| 029 | C | Ceiling pipe | Ctr | | I | Steel | Green | 0.0 | QM |
| 030 | C | Oil tank | Rgt | | I | Steel | Gray | 0.3 | QM |
| 011 | D | Wall | U Lft | | I | Concrete | Beige | -0.3 | QM |
| 012 | D | Wall | U Rgt | | I | Concrete | Beige | 0.0 | QM |
| 033 | D | Door | Ctr | Rgt jamb | I | Steel | Brown | 0.1 | QM |
| 032 | D | Door | Ctr | Lft casing | I | Steel | Brown | 0.0 | QM |
| 031 | D | Door | Ctr | U Rgt | I | Steel | Brown | 0.0 | QM |
| Comment: Windows are unpainted aluminum with no painted trim. Vent louvers are unpainted steel. | | | | | | | | | |
| Interior Room 002 Utility Room | | | | | | | | | |
| 034 | A | Wall | U Ctr | | I | Concrete | Beige | 0.0 | QM |
| 038 | A | Ceiling | | | I | Concrete | White | -0.1 | QM |
| 035 | B | Wall | U Ctr | | I | Concrete | Beige | 0.0 | QM |
| 036 | C | Wall | U Ctr | | I | Concrete | Beige | -0.1 | QM |
| 039 | C | Floor | | | P | Concrete | Gray | 0.0 | QM |
| 037 | D | Wall | U Rgt | | I | Concrete | Beige | 0.0 | QM |
| 042 | D | Door | Ctr | Rgt jamb | I | Steel | Brown | 0.0 | QM |
| 041 | D | Door | Ctr | Lft casing | I | Steel | Brown | 0.0 | QM |
| 040 | D | Door | Ctr | U Rgt | I | Steel | Brown | 0.0 | QM |
| 043 | D | Floor Hatch | Rgt | | P | Steel | Gray | 0.3 | QM |
| Comment: Window is unpainted aluminum. Fan vent louver on wall A is unpainted steel. | | | | | | | | | |
| Calibration Readings | | | | | | | | | |

| | | |
|---|---|---|
| 001 | 0.9 | TC |
| 002 | 1.0 | TC |
| 003 | 1.0 | TC |
| 004 | 0.0 | TC |
| 005 | 0.0 | TC |
| 006 | 0.0 | TC |
| 045 | 1.0 | TC |
| 046 | 1.0 | TC |
| 047 | 1.0 | TC |
| 048 | 0.0 | TC |
| 049 | 0.0 | TC |
| 050 | 0.0 | TC |

---- End of Readings ----

# LEAD PAINT INSPECTION REPORT

REPORT NUMBER: S#01379 - 09/27/17 10:10

INSPECTION FOR: Sound Environmental
67 Heights Road
Stony Point, N.Y. 10980

PERFORMED AT: Pump Station - Dry Well
Calverton Sewage Treatment Plant
4062 Grumman Boulevard (Burman Blvd.), Calverton, N.Y.

INSPECTION DATE: 09/27/17

INSTRUMENT TYPE: R M D
MODEL LPA-1
XRF TYPE ANALYZER
Serial Number: 01379

ACTION LEVEL: 1.0 mg/cm**2

OPERATOR LICENSE: Ct. Lic. #001381
E.P.A. Certificate #NY-R-5760-6

STATEMENT: This limited XRF lead based paint survey was conducted per all Federal H.U.D. test protocols for lead based paint in effect as of the date of this report. Only areas designated by the Client were tested.

SIGNED Edward F. von Briesen DATE 09/27/17

Long Island Lead Assessment & Control
P.O. Box 236
Mill Neck, N.Y. 11765
Phone: 516 - 922 - 0700

SEQUENTIAL REPORT OF LEAD PAINT INSPECTION FOR: Sound Environmental

Inspection Date: 09/27/17
Report Date: 9/27/2017
Abatement Level: 1.0
Report No. S#01379 - 09/27/17 10:10
Total Readings: 39
Job Started: 09/27/17 10:10
Job Finished: 09/27/17 11:27

Pump Station - Dry Well
Calverton Sewage Treatment Plant
4062 Grumman Boulevard (Burman Blvd.), Calverton, N.Y.

| Read No. | Rm | Room Name | Wall | Structure | Location | Member | Paint Cond | Substrate | Paint Color | Lead (mg/cm²) | Mode |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | CALIBRATION | | | | | | | | 1.0 | TC |
| 2 | | CALIBRATION | | | | | | | | 1.1 | TC |
| 3 | | CALIBRATION | | | | | | | | 1.0 | TC |
| 4 | | CALIBRATION | | | | | | | | 0.0 | TC |
| 5 | | CALIBRATION | | | | | | | | 0.0 | TC |
| 6 | | CALIBRATION | | | | | | | | 0.0 | TC |
| 7 | 001 | Pump Room | A | Wall | U | Lft | P | Concrete | Cream | 0.0 | QM |
| 8 | 001 | Pump Room | B | Wall | U | Ctr | P | Concrete | Cream | 0.1 | QM |
| 9 | 001 | Pump Room | C | Wall | U | Ctr | P | Concrete | Cream | -0.1 | QM |
| 10 | 001 | Pump Room | D | Wall | U | Ctr | P | Concrete | Cream | 0.0 | QM |
| 11 | 001 | Pump Room | C | Ceiling | | | P | Concrete | Cream | 0.0 | QM |
| 12 | 001 | Pump Room | D | Floor | | | P | Concrete | Gray | 0.0 | QM |
| 13 | 001 | Pump Room | A | Fuse box | | Lft | I | Steel | Red | 0.0 | QM |
| 14 | 001 | Pump Room | A | Splice Box | | Ctr | I | Steel | Gray | 0.0 | QM |
| 15 | 001 | Pump Room | A | Transformer box | | Rgt | I | Steel | Gray | 0.0 | QM |
| 16 | 001 | Pump Room | B | Wall Pipe | | Lft | P | Steel | Gray | 1.8 | QM |
| 17 | 001 | Pump Room | B | Pump Body | | Lft | P | Steel | Gray | 2.3 | QM |
| 18 | 001 | Pump Room | B | Pump Motor | | Lft | I | Steel | Gray | 0.1 | QM |
| 19 | 001 | Pump Room | B | Wall Pipe | | Ctr | P | Steel | Gray | 1.7 | QM |
| 20 | 001 | Pump Room | B | Pump Body | | Ctr | P | Steel | Gray | 3.1 | QM |
| 21 | 001 | Pump Room | B | Pump Motor | | Ctr | I | Steel | Gray | 0.3 | QM |
| 22 | 001 | Pump Room | B | Wall Pipe | | Rgt | P | Steel | Gray | 3.5 | QM |
| 23 | 001 | Pump Room | B | Pump Body | | Rgt | P | Steel | Gray | 1.0 | QM |
| 24 | 001 | Pump Room | B | Pump Motor | | Rgt | I | Steel | Gray | 0.0 | QM |
| 25 | 001 | Pump Room | B | Riser pipe | | Lft | P | Steel | Gray | 4.1 | QM |
| 26 | 001 | Pump Room | B | Riser pipe | | Ctr | P | Steel | Gray | 3.8 | QM |
| 27 | 001 | Pump Room | B | Riser pipe | | Rgt | P | Steel | Gray | 2.5 | QM |
| 28 | 001 | Pump Room | C | Ceiling pipe | | Ctr | I | Steel | Gray | 1.7 | QM |
| 29 | 001 | Pump Room | B | Float cylinder | | Rgt | I | Steel | Gray | 3.2 | QM |
| 30 | 001 | Pump Room | D | Switch Box | | Rgt | I | Steel | Gray | 0.0 | QM |
| 31 | 001 | Roof Slab | A | Small vent base | | Lft | P | Steel | Gray | 0.2 | QM |
| 32 | 001 | Roof Slab | D | Pipe Cap | | Lft | P | Steel | Gray | 0.0 | QM |
| 33 | | CALIBRATION | | | | | | | | 1.0 | TC |
| 34 | | CALIBRATION | | | | | | | | 0.9 | TC |
| 35 | | CALIBRATION | | | | | | | | 0.9 | TC |
| 36 | | CALIBRATION | | | | | | | | 0.0 | TC |
| 37 | | CALIBRATION | | | | | | | | 0.0 | TC |
| 38 | | CALIBRATION | | | | | | | | 0.0 | TC |
| 39 | | CALIBRATION | | | | | | | | 0.0 | TC |

---- End of Readings ----

SUMMARY REPORT OF LEAD PAINT INSPECTION FOR: Sound Environmental

Inspection Date: 09/27/17
Report Date: 9/27/2017
Abatement Level: 1.0
Report No. S#01379 - 09/27/17 10:10
Total Readings: 39 Actionable: 11
Job Started: 09/27/17 10:10
Job Finished: 09/27/17 11:27

Pump Station - Dry Well
Calverton Sewage Treatment Plant
4062 Grumman Boulevard (Burman Blvd.), Calverton, N.Y.

| Read No. | Wall | Structure | Location | Member | Paint Cond | Substrate | Paint Color | Lead (mg/cm²) | Mode |
|---|---|---|---|---|---|---|---|---|---|
| Interior Room 001 Pump Room | | | | | | | | | |
| 016 | B | Wall Pipe | Lft | | P | Steel | Gray | 1.8 | QM |
| 017 | B | Pump Body | Lft | | P | Steel | Gray | 2.3 | QM |
| 025 | B | Riser pipe | Lft | | P | Steel | Gray | 4.1 | QM |
| 019 | B | Wall Pipe | Ctr | | P | Steel | Gray | 1.7 | QM |
| 020 | B | Pump Body | Ctr | | P | Steel | Gray | 3.1 | QM |
| 026 | B | Riser pipe | Ctr | | P | Steel | Gray | 3.8 | QM |
| 022 | B | Wall Pipe | Rgt | | P | Steel | Gray | 3.5 | QM |
| 023 | B | Pump Body | Rgt | | P | Steel | Gray | 1.0 | QM |
| 027 | B | Riser pipe | Rgt | | P | Steel | Gray | 2.5 | QM |
| 029 | B | Float cylinder | Rgt | | I | Steel | Gray | 3.2 | QM |
| 028 | C | Ceiling pipe | Ctr | | I | Steel | Gray | 1.7 | QM |

Comment: Stairways on walls C and D are unpainted galvanized steel. All roof hatches are unpainted galvanized steel. Roof vents and fans are unpainted metal.

Calibration Readings

---- End of Readings ----

DETAILED REPORT OF LEAD PAINT INSPECTION FOR: Sound Environmental

Inspection Date: 09/27/17
Report Date: 9/27/2017
Abatement Level: 1.0
Report No. S#01379 - 09/27/17 10:10
Total Readings: 39
Job Started: 09/27/17 10:10
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Pump Station - Dry Well
Calverton Sewage Treatment Plant
4062 Grumman Boulevard (Burman Blvd.), Calverton, N.Y.

| Read No. | Wall | Structure | Location | Member | Paint Cond | Substrate | Paint Color | Lead (mg/cm²) | Mode |
|---|---|---|---|---|---|---|---|---|---|
| Exterior Room 001 Roof Slab | | | | | | | | | |
| 031 | A | Small vent base | Lft | | P | Steel | Gray | 0.2 | QM |
| 032 | D | Pipe Cap | Lft | | P | Steel | Gray | 0.0 | QM |
| Comment: Roof vents and fans are unpainted metal. Roof hatches are unpainted galvanized steel. | | | | | | | | | |
| Interior Room 001 Pump Room | | | | | | | | | |
| 007 | A | Wall | U Lft | | P | Concrete | Cream | 0.0 | QM |
| 013 | A | Fuse box | Lft | | I | Steel | Red | 0.0 | QM |
| 014 | A | Splice Box | Ctr | | I | Steel | Gray | 0.0 | QM |
| 015 | A | Transformer box | Rgt | | I | Steel | Gray | 0.0 | QM |
| 008 | B | Wall | U Ctr | | P | Concrete | Cream | 0.1 | QM |
| 016 | B | Wall Pipe | Lft | | P | Steel | Gray | 1.8 | QM |
| 017 | B | Pump Body | Lft | | P | Steel | Gray | 2.3 | QM |
| 018 | B | Pump Motor | Lft | | I | Steel | Gray | 0.1 | QM |
| 025 | B | Riser pipe | Lft | | P | Steel | Gray | 4.1 | QM |
| 019 | B | Wall Pipe | Ctr | | P | Steel | Gray | 1.7 | QM |
| 020 | B | Pump Body | Ctr | | P | Steel | Gray | 3.1 | QM |
| 021 | B | Pump Motor | Ctr | | I | Steel | Gray | 0.3 | QM |
| 026 | B | Riser pipe | Ctr | | P | Steel | Gray | 3.8 | QM |
| 022 | B | Wall Pipe | Rgt | | P | Steel | Gray | 3.5 | QM |
| 023 | B | Pump Body | Rgt | | P | Steel | Gray | 1.0 | QM |
| 024 | B | Pump Motor | Rgt | | I | Steel | Gray | 0.0 | QM |
| 027 | B | Riser pipe | Rgt | | P | Steel | Gray | 2.5 | QM |
| 029 | B | Float cylinder | Rgt | | I | Steel | Gray | 3.2 | QM |
| 009 | C | Wall | U Ctr | | P | Concrete | Cream | -0.1 | QM |
| 011 | C | Ceiling | | | P | Concrete | Cream | 0.0 | QM |
| 028 | C | Ceiling pipe | Ctr | | I | Steel | Gray | 1.7 | QM |
| 010 | D | Wall | U Ctr | | P | Concrete | Cream | 0.0 | QM |
| 012 | D | Floor | | | P | Concrete | Gray | 0.0 | QM |
| 030 | D | Switch Box | Rgt | | I | Steel | Gray | 0.0 | QM |
| Comment: Stairways on walls C and D are unpainted galvanized steel. All roof hatches are unpainted galvanized steel. | | | | | | | | | |
| Calibration Readings | | | | | | | | | |
| 001 | | | | | | | | 1.0 | TC |
| 002 | | | | | | | | 1.1 | TC |
| 003 | | | | | | | | 1.0 | TC |
| 004 | | | | | | | | 0.0 | TC |
| 005 | | | | | | | | 0.0 | TC |
| 006 | | | | | | | | 0.0 | TC |
| 033 | | | | | | | | 1.0 | TC |
| 034 | | | | | | | | 0.9 | TC |
| 035 | | | | | | | | 0.9 | TC |
| 036 | | | | | | | | 0.0 | TC |
| 037 | | | | | | | | 0.0 | TC |
| 038 | | | | | | | | 0.0 | TC |
| 039 | | | | | | | | 0.0 | TC |

---- End of Readings ----

# Appendix C-Certifications

NYC DEP ASBESTOS CONTROL PROGRAM

ASBESTOS CERTIFICATE



**VONBRIESEN,**
EDWARD F
INVESTIGATOR
114341

EXPIRES: 9/21/2019
DOB:9/21/1948 M 6' 01"

MUST BE CARRIED ON ALL ASBESTOS PROJECTS

01213 0040541 84 90

**DMV ID: 962425349**

**This certificate must be shown to a NYCDEP representative upon request. Report loss immediately to NYCDEP Asbestos Control Program, 8th floor 59-17 Junction Blvd., Flushing, NY 11373**

# United States Environmental Protection Agency

## This is to certify that



Edward Fuller von Briesen

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor

## In the Jurisdiction of:

New York

This certification is valid from the date of issuance and expires September 14, 2018

NY-R-5760-6

Certification #

August 31, 2015

Issued On

John Gorman, Chief

Pesticides & Toxic Substances Branch

**H2M architects + engineers**
538 Broad Hollow Rd, 4th Floor East, Melville, NY 11747
tel 631.756.8000  fax 631.694.4122
www.h2m.com

# Town of Riverhead
# Calverton Sewer District

## Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)

### Suffolk County, NY

### H2M Project No. CASD 1602

### November 2018

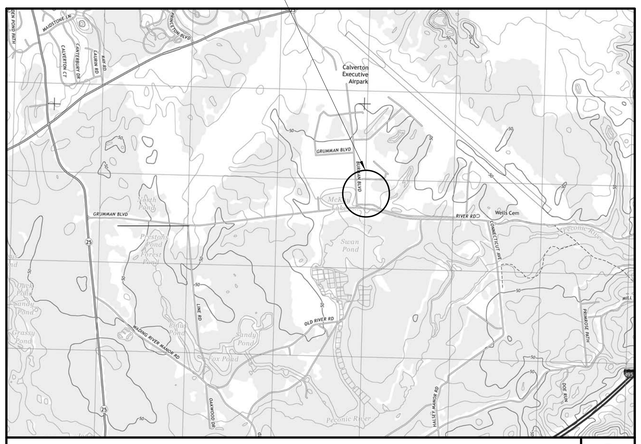
**CONTRACT G - GENERAL AND MECHANICAL CONSTRUCTION**

CONTRACT P - PLUMBING CONSTRUCTION

CONTRACT E - ELECTRICAL CONSTRUCTION

CONTRACT S - FORCE MAIN/RECHARGE BED CONSTRUCTION

PROJECT LOCATION




SCALE: 1" = 2,500'

**PROJECT LOCATION MAP**

N

## TOWN SUPERVISOR

HON. LAURA JENS-SMITH

## TOWN COUNCIL

CATHERINE KENT

JODI GIGLIO

TIMOTHY HUBBARD

JAMES WOOTEN

## ATTORNEY

ROBERT KOZAKIEWICZ, ESQ.

## SEWER DISTRICT SUPERINTENDENT

MICHAEL P. REICHEL


H2M architects + engineers

538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 • www.h2m.com


STATE OF NEW YORK
CHRISTOPHER A. REISP
No. 072204
LICENSED PROFESSIONAL ENGINEER

| DESIGNED BY: | DRAWN BY: | CHECKED BY: | REVIEWED BY: |
|---|---|---|---|
| TMN | TMN | | |

| PROJECT No: | DATE: | SCALE: |
|---|---|---|
| CASD 1602 | November 2018 | AS SHOWN |

CLIENT

**Town of Riverhead Calverton Sewer District**

Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)

Suffolk County, NY

STATUS

**FINAL BID DOCUMENT**

DRAWING No.

**G0.0**

SHEET No. 1 OF 49

C:\Users\hvordberg\Documents\CASD\1602_Central\17_MEP_hvordberg.rvt

11/12/2018 5:29:14 PM

## ALL CONTRACTS SHEET LIST

| SHEET COUNT | SHEET NUMBER | SHEET NAME |
|---|---|---|
| 1 | G0.0 | COVER SHEET |
| 2 | G1.0 | PROJECT SHEET LIST AND GENERAL NOTES |
| 3 | G2.0 | NEW YORK STATE CODE ANALYSIS, LINTEL SCHEDULE AND PARTITION TYPES |
| 4 | PD0.0 | PROCESS AND INSTRUMENTATION DIAGRAM LEGEND |
| 5 | PD1.0 | PROCESS AND INSTRUMENTATION DIAGRAM |
| 6 | HP1.0 | HYDRAULIC PROFILE AND MASS BALANCE DIAGRAM |
| 7 | D1.0 | WET WELL DEMOLITION VIEWS |
| 8 | D2.0 | AERATION TANKS DEMOLITION VIEWS AND DETAILS |
| 9 | D2.1 | SETTLING AND SLUDGE HOLDING TANK DEMOLITION VIEWS |
| 10 | D2.2 | SETTLING AND SLUDGE HOLDING TANK DEMOLITION DETAILS |
| 11 | D3.0 | CONTROL BUILDING DEMOLITION VIEWS |
| 12 | C1.0 | EXISTING SITE CONDITIONS |
| 13 | C1.1 | SITE REMOVALS PLAN |
| 14 | C2.0 | SITE IMPROVEMENTS PLAN |
| 15 | C2.1 | STAGING, INTERIM OPERATIONS, AND PHASING SITE PLAN |
| 16 | C2.2 | YARD PIPING PLAN |

## CONTRACT G SHEET LIST

| SHEET COUNT | SHEET NUMBER | SHEET NAME |
|---|---|---|
| 17 | C3.0 | SITE DETAILS |
| 18 | C3.1 | SITE PIPING DETAILS |
| 19 | S1.0 | VALVE VAULT, EFFLUENT FLOW METER AND INFLUENT PUMP STATION PLANS |
| 20 | S2.0 | PROCESS TANK OVERVIEW-TOP SLAB |
| 21 | S2.1 | CANOPY AND STAIR PLAN |
| 22 | S2.2 | PRE-EQUALIZATION AND EFFLUENT PUMP STATION PLAN |
| 23 | S2.3 | MBR ANOXIC AND SLUDGE HOLDING TANK PLAN |
| 24 | S2.4 | AUTOMATIC FINE SCREEN CHANNEL PLAN AND SECTION |
| 25 | S3.0 | STRUCTURAL DETAILS |
| 26 | S3.1 | STRUCTURAL DETAILS-2 |
| 27 | A1.0 | PROCESS TANKS AND INFLUENT PUMP STATION FLOOR PLANS |
| 28 | A2.0 | CONTROL BUILDING PARTIAL FIRST FLOOR PLAN |
| 29 | A3.0 | CONTROL BUILDING ROOF PLAN, DEMOLITION, ABATEMENT AND GENERAL NOTES |
| 30 | A3.1 | TYPICAL ROOF DETAILS |
| 31 | A4.0 | CONTROL BUILDING DOOR SCHEDULE, ELEVATIONS AND DETAILS, AND INTERIOR FINISH SCHEDULE |
| 32 | A4.1 | PROCESS TANKS GUARDRAIL DETAILS |
| 33 | M0.0 | GENERAL MECHANICAL INFORMATION |
| 34 | M1.0 | AUTOMATIC FINE SCREEN PLAN AND SECTION |
| 35 | M2.0 | INFLUENT PUMP STATION MECHANICAL PLAN VIEWS |
| 36 | M2.1 | INFLUENT PUMP STATION SECTION VIEWS |
| 37 | M3.0 | PROCESS TANKAGE MECHANICAL PLAN - ABOVE TOP SLAB |
| 38 | M3.1 | PROCESS TANKAGE MECHANICAL PLAN - BELOW TOP SLAB |
| 39 | M3.2 | PROCESS TANKAGE MECHANICAL SECTION VIEWS AND DETAILS |
| 40 | M3.3 | PROCESS TANKAGE MECHANICAL SECTION VIEWS |
| 41 | M3.4 | PROCESS TANKAGE MECHANICAL SECTION VIEWS |
| 42 | M4.0 | CONTROL BUILDING MECHANICAL EQUIPMENT PLAN |
| 43 | M5.0 | MECHANICAL DETAILS |
| 44 | M5.1 | MECHANICAL DETAILS |
| 45 | H0.0 | HVAC LEGENDS, SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES |
| 46 | H1.0 | INFLUENT PUMP STATION AND PIPING VAULTS HVAC PLANS |
| 47 | H2.0 | CONTROL BUILDING HVAC PLAN |
| 48 | H3.0 | HVAC SCHEDULES |
| 49 | H4.0 | HVAC DETAILS |

## SYMBOLS LEGEND

| | |
|---|---|
| ℄ | CENTERLINE |
| 1 / G1.0 | DETAIL |
| | DEMOLITION HATCH (TO BE REMOVED) |
| 1 Drawing Title SCALE | DRAWING |
| Level Name | ELEVATION |
| N | NORTH |
| TO PROCESS | PIPE |
| 1 | REVISION KEY |
| 1 / G1.0 | SECTION CUT |

## GENERAL CONSTRUCTION AND PROJECT NOTES:

1. INSPECT THE CONSTRUCTION SITE PRIOR TO SUBMISSION OF BIDS AND SHALL MAKE NO ADDITIONAL CLAIMS REGARDING SITE CONDITIONS THEREAFTER.
2. NOTIFY THE OWNER AT LEAST 24 HOURS PRIOR TO THE COMMENCEMENT OF THE WORK. THE SAME NOTICE SHALL BE REQUIRED WHEN RESUMING WORK AFTER ANY STOPPAGE OR DELAY.
3. LOCATION OF ALL UNDERGROUND UTILITIES, ELECTRIC AND TELEPHONE CONDUITS, STORM DRAINS AND UNDERGROUND PIPING WERE OBTAINED FROM EITHER OLD MAPS, SURVEYS, DRAWINGS AND RECORDS SUPPLIED BY OTHERS. THE OWNER AND ENGINEER DO NOT GUARANTEE OR ACCEPT RESPONSIBILITY FOR ANY DAMAGE TO SUCH FACILITIES DUE TO DISCREPANCIES IN LOCATION AND SIZE SHOWN ON THE PLANS, NOR WILL ANY COMPENSATION BE MADE TO THE CONTRACTOR FOR ANY INCONVENIENCES CAUSED TO HIM BY ENCOUNTERING THE AFOREMENTIONED UTILITIES WHICH ARE NOT SHOWN, OR ARE INCORRECTLY SHOWN ON THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE LOCATIONS OF ANY UNDERGROUND UTILITIES, GAS MAINS, ELECTRIC AND TELEPHONE CONDUITS.
4. PERFORM DAILY CLEAN-UP OPERATIONS WHICH INCLUDE REMOVAL OF DEBRIS AND EXCESS CONSTRUCTION MATERIAL TO THE SATISFACTION OF THE OWNER AND THE ENGINEER.
5. DURING ALL NON-WORKING HOURS, STORE ALL EQUIPMENT AND MATERIALS WITHIN THE DESIGNATED AREAS AT THE PROJECT SITE.
6. ALL DIMENSIONS SHOWN ARE APPROXIMATE AND SUBJECT TO THE APPROVAL OF THE OWNER AND THE ENGINEER.
7. CONFORM TO ALL APPLICABLE STATE AND LOCAL CODE REQUIREMENTS, THE CONTRACT, AND SUBJECT TO THE APPROVAL OF THE OWNER AND THE ENGINEER.
8. SECURE CONSTRUCTION SITE IN ACCORDANCE WITH ALL APPLICABLE SAFETY STANDARDS AND SUBJECT TO THE APPROVAL OF THE OWNER AND THE ENGINEER.
9. COORDINATE ACTIVITIES WITH THE OWNER SO AS TO MINIMIZE INTERRUPTION TO THE TREATMENT FACILITY.
10. ALL ELEVATIONS ARE BASED ON USGS, UNLESS OTHERWISE INDICATED.
11. PROTECT AND MAINTAIN ALL BENCHMARKS AND MONUMENTS. RESTORE ALL BENCHMARKS OR MONUMENTS DISTURBED BY THE CONTRACTOR'S WORK.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LAYOUT, SURVEY, ETC. AS REQUIRED TO COMPLETE THE WORK.
13. THE DRAWING AND SPECIFICATIONS ARE COMPLEMENTARY. THE PROJECT SPECIFICATIONS, SEPARATELY BOUND, CONTAIN THE CONDITIONS OF THE CONTRACT, PROCEDURES AND TECHNICAL SPECIFICATIONS.
14. ALL CONTRACTORS ARE TO VISIT THE SITE AND BECOME FAMILIAR WITH THE CONDITIONS OF THE SITE AND DIFFICULTIES ATTENDING THE WORK.
15. DO NOT SCALE MEASURE ANY DRAWING. VERIFY THE FIGURES, DIMENSIONS AND DESIGN INTENTION SHOWN ON THE DRAWINGS BEFORE BEGINNING LAYOUT OF THE WORK.
16. REPORT ANY ERRORS, INACCURACIES, MISSING DIMENSIONAL REQUIREMENTS OR CONFLICTS TO THE ARCHITECT/ENGINEER IN WRITING BEFORE BEGINNING ANY WORK.
17. VERIFY EXACT LAYOUT CAPABILITY WITH ALL EXISTING CONDITIONS AND COORDINATE ALL WORK TO BE UNDERTAKEN PRIOR TO BEGINNING ANY WORK. NOTIFY THE ARCHITECT/ENGINEER IN WRITING BEFORE BEGINNING WORK IF ANY DISCREPANCIES ARE FOUND WITH CONDITIONS ENCOUNTERED, AS WELL AS ITEMS COVERED IN 8 AND 9. CONTRACTOR WILL BE RESPONSIBLE FOR ALL TEMPORARY MEASURES, TIME LOST, CHANGES TO THE WORK SCOPE WITHOUT ANY ADDITIONAL COMPENSATION IF CONTRACTOR FAILS TO PROVIDE AFOREMENTIONED VERIFICATIONS AND COORDINATION PRIOR TO COMMENCING WORK.
18. DISTURB ONLY THOSE AREAS OF THE SITE AFFECTED BY NEW CONSTRUCTION, UNLESS NOTED OTHERWISE. PROTECT ALL OTHER AREAS. COMPLETELY RESTORE ALL AREAS DISTURBED DURING CONSTRUCTION, INCLUDING, BUT NOT LIMITED TO GRASS AREA, LANDSCAPING, PAVEMENTS, SIDEWALKS, CURBING AND IN-GROUND SPRINKLER SYSTEMS.
19. PROTECT ADJOINING PROPERTIES WHEN CONDUCTING WORK.
20. ALL WORK SHALL COMPLY WITH ALL APPLICABLE CODES, LAWS, AGENCIES HAVING JURISDICTION, AND STATUS AS REQUIRED.
21. STRICTLY ADHERE TO MANUFACTURER'S PRINTED INSTRUCTION.
22. VERIFY ALL CHANGES TO WORK IN WRITING WITH THE ARCHITECT/ENGINEER AND OWNER BEFORE BEGINNING RELATED WORK.
23. PROVIDE POSITIVE DRAINAGE AWAY FORM THE BUILDING PERIMETER, PITCH 1/4" PER FOOT. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES WITH THIS REQUIREMENT BEFORE PROCEEDING.
24. IF APPLICABLE, ALL CONTRACTS MUST REVIEW ALL DRAWINGS CONTAINED IN THE SET (INCLUDING ALL IN G, C, S, A, M, H, P, AND E DRAWINGS) SO AS TO BECOME FAMILIAR WITH THE WORK REQUIRED UNDER THEIR SCOPE AND THE WORK OF ALL OTHER CONTRACTORS. ADDITIONALLY, ALL CONTRACTORS ARE RESPONSIBLE FOR THE COORDINATION OF THEIR WORK WITH ALL OTHER TRADES AND CONTRACTORS.
25. DIMENSIONS NOTED AS "EQUAL" OR "EQ" WITHIN A ROOM REFER TO A DISTANCE RELATIONSHIP CONTAINED ONLY IN THAT ROOM AT AN OPPOSING OR PARALLEL WALL UNLESS NOTED OTHERWISE.
26. VERIFY AND ADJUST APPROXIMATE DIMENSIONS (+/-) IN THE FIELD. VERIFY WITH ARCHITECT/ENGINEER PRIOR TO CONSTRUCTION.
27. LOCATE ALL PENETRATIONS REQUIRED TO ACCOMMODATE ALL WORK DETAILED OR SPECIFIED FOR THEIR SCOPE, AND COORDINATE THIS WORK WITH OTHERS.
28. MAINTAIN WATER-TIGHT WEATHER PROTECTION THROUGHOUT ALL WORK AREA AND EXISTING AREAS IMMEDIATELY ADJACENT TO THOSE WORK AREAS, FOR THE DURATION OF THE ENTIRE PROJECT..
29. PROTECT ALL ADJACENT EXISTING CONSTRUCTION, ITEMS, FINISHES, ETC. AND SHALL PATCH, REPAIR AND/OR REPLACE, AND REFINISH AS REQUIRED TO RESTORE ANY AND ALL AREAS DAMAGED DURING CONSTRUCTION.
30. PROVIDE, AND COORDINATE THE INSTALLATION OF, ALL ACCESS PANELS THAT ARE NEEDED TO ACCESS OR SERVICE FOR ALL ITEMS INSTALLED AS PART OF THEIR SCOPE OF WORK.
31. PROVIDE TEMPORARY FENCING TO PROTECT ALL WORK AREAS.
32. MINIMIZE REMOVAL OF EXISTING TREES. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE LAYOUT, TAGGING AND REMOVAL OF TREES REQUIRED TO COMPLETE ALL WORK. OWNER SHALL APPROVE TREES TO BE REMOVED PRIOR TO ACTUAL REMOVALS. REMOVALS SHALL INCLUDE REMOVAL OF COMPLETE STUMP AND ROOT SYSTEM. CONTRACTOR SHALL NOT BE PERMITTED TO GRIND STUMPS.
33. CONCRETE SIDEWALKS SHALL BE SAWCUT BACK TO EXPANSION/CONTROL JOINTS.


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CLIENT

**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD 1792 — PAX ET PROSPERITAS PER PROGRESSUM

CONTRACT

**ALL CONTRACTS**

STATUS

**FINAL BID DOCUMENT**

SHEET TITLE

**PROJECT SHEET LIST AND GENERAL NOTES**

DRAWING # **G1.0**

SHEET # 2 OF 49

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## BUILDING CODE OF NEW YORK STATE

(NYS CODE CHAPTER 5)

| | ALLOWED | EXISTING |
|---|---|---|
| BUILDING OCCUPANCY | U AND B | U AND B |
| CONSTRUCTION CLASSIFICATION | TYPE II B | TYPE II B |
| HEIGHT (STORIES) | 2 STORIES | 1 STORY |
| HEIGHT (FEET) | 55'-0" | 12'-8" |
| FIRE AREA | 16,000 S.F. | 1,667 S.F. |

NOTES

1. AS PER NYS BUILDING CODE SECTION 508 AS PER NYS 2015 INTERNATIONAL BUILDING CODE. THIS PROJECT SHALL CONSIST OF NON-SEPARATED USES (508.3.1) AND THE MOST RESTRICTIVE, U (UTILITY) OCCUPANCY SHALL APPLY WHEN CALCULATING PERMITTED FIRE AREAS AND BUILDING HEIGHTS
2. AS PER NYS 2015 INTERNATION EXISTING BUILDING CODE. THIS PROJECT SHALL CONSIST OF A LEVEL 3 ALTERATION WERE 1,034 S.F. OF 1,666 S.F. WILL BE RENOVATED OR ALTERED.

## FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS

(NYS CODE TABLE 601)

BUILDING OCCUPANCY CLASSIFICATION: UTILITY GROUP U AND BUSINESS GROUP B
CONSTRUCTION CLASSIFICATION: TYPE II B

| BUILDING ELEMENT | HOURS |
|---|---|
| STRUCTURAL FRAME | 0 |
| EXTERIOR BEARING WALLS | 0 |
| EXTERIOR NON-BEARING WALLS | 0 |
| INTERIOR BEARING WALLS | 0 |
| NON-BEARING WALLS | 0 |
| FLOOR CONSTRUCTION | 0 |
| ROOF CONSTRUCTION | 0 |

1. AS PER NYS BUILDING CODE, TABLE 601, AND AS INDICATED ON PLANS.
2. SEE DWG. A0.0 FOR CONSTRUCTION/PARTITION TYPES.

## MINIMUM NUMBER OF EXITS PER OCCUPIED LOAD

(NYS CODE TABLE (1006.2.1)

| FLOOR AREA | OCCUPANT LOAD | MINIMUM REQ'D # OF EXITS | # OF EXITS PROVIDED |
|---|---|---|---|
| FIRST FLOOR | 16 | 1 | 4 |

PER NYS CODE TABLE 1006.2.1
1. MAXIMUM OCCUPANCY ALLOWED FOR SPACES WITH ONE EXIT OR EXIT ACCESS = 49 PEOPLE
2. TRAVEL DISTANCE FOR A NON-SPRINKLERED AND LESS THAN 30 OCCUPANT BUILDING = 100'-0"
3. EXIT ACCESS SIZING REQUIREMENTS 16PP X 0.2"/PP = 3.2" OR 32" MIN.

## ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE

EXTERIOR DESIGN CONDITIONS PER TABLE C301.1

COUNTY: SUFFOLK COUNTY, TOWN OF RIVERHEAD

HEATING DEGREE DAYS: CDD50°F < 4500 AND HDD65°F > 5400

ZONE: CLIMATE ZONE 4A - MIXED-HUMID

BUILDING ENVELOPE REQUIREMENTS PER TABLE 802.2(2), ECCCNYS

| | REQUIRED | PROPOSED |
|---|---|---|
| SLAB OR BELOW BELOW GRADE WALL | N/A | N/A |
| WINDOWS AND GLASS DOORS | N/A | N/A |
| ROOF ASSEBLY | R-30 CI | R-30 CI |
| ABOVE GRADE WALL (CMU 8" THICK) EXISTING | N/A | N/A |

CI = CONTINUOUS INSULATION

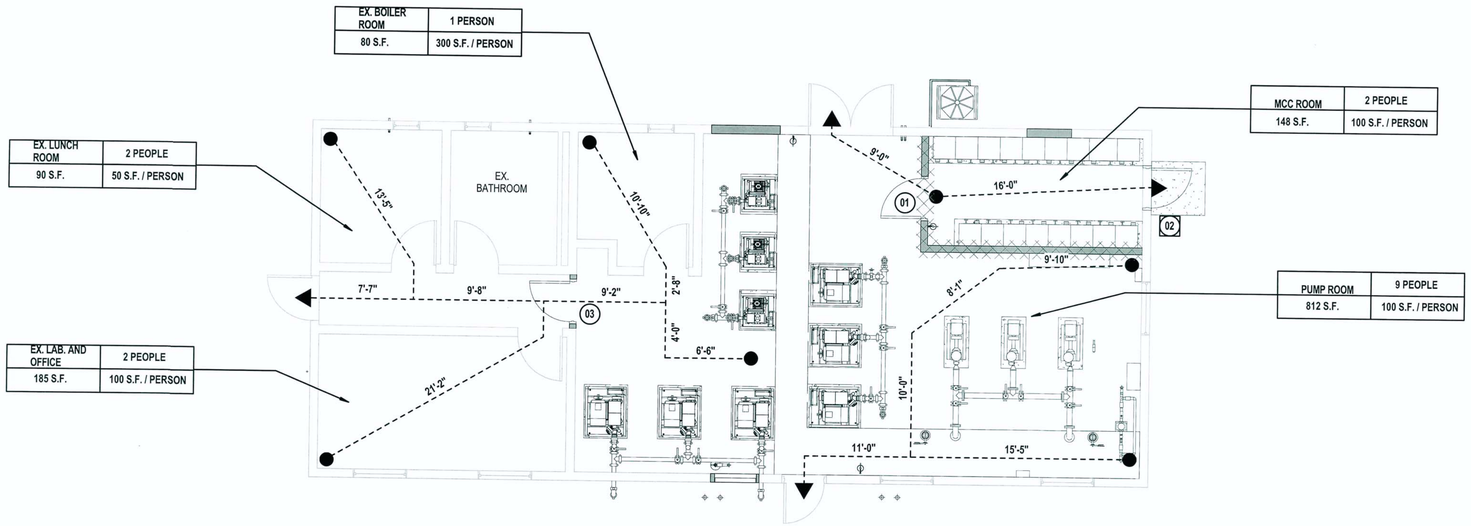
## GENERAL NOTES

1. ALL INTERIOR WALL AND CEILING FINISHES MUST MEET OR EXCEED THE REQUIREMENTS STATED IN TABLE 803.11
2. ALL GLAZING IN DOORS, FIXED SIDE PANELS ADJOINING DOORS, INTERIOR PARTITIONS WHERE GLAZING EXTENDS TO WITHIN 1'-6" OF FINISHED FLOOR AND GLASS PANELS GREATER THAN 50 SQ. FT. TO BE FULLY TEMPERED SAFETY GLASS PER NYS CODE CHAPTER 24.
3. THE MINIMUM CORRIDOR WIDTH SHALL NOT BE LESS THAN 44", PER 1016.2.
4. MAXIMUM ALLOWABLE TRAVEL DISTANCE SHALL NOT EXCEED 100'-0" FOR OCCUPANCY TYPE "U", 100'-0" FOR OCCUPANCY TYPE "B", IN ACCORDANCE WITH NYS BUILDING CODE SECTION 1006, TABLE 1006.2.1 (NON-SPRINKLERED). (NON-SEPARATED MIXED USE BUILDING, THEREFORE 100'-0" GOVERNS, AS MOST RESTRICTIVE.)

## LEGEND

OCCUPANCY — STORAGE — 1 PERSON — # OF PERSONS
AREA (SF) — 150 SF — 200 SF / PERSON — SQUARE FOOT/PERSON

| | |
|---|---|
| 101 | EXIT DOOR |
| 101 | EXIT ACCESS DOOR |
| | 1 HOUR FIRE RATED WALL WITH 3/4 HOUR RATED DOORS |




1 Control Building Egress Plan
SCALE: 3/16" = 1'-0"

## LINTEL SCHEDULE

| MARK | SIZE | DETAILS | COMMENTS |
|---|---|---|---|
| LL-1 | (2) L4 x 3-1/2x 5/16" (LLV) | | NOTES 1-5 |
| ML-1 | MASONRY LINTEL | 6" NOM. / 1" CLR. TYP. / (2) CON. # 5 BARS / M.O. SEE A** | |

NOTES:

1. LINTEL LENGTH SHALL BE M.O. + 1'-4" TO PROVIDE MIN. BEARING OF 8" ONTO SOLID MASONRY ON EACH SIDE.
2. ALL EXTERIOR LINTELS TO BE SHOP APPLIED HOT DIPPED GALVANIZED.
3. WELD VERTICAL REINFORCEMENT INTERRUPTED BY MASONRY OPENINGS TO TOP OF THE STEEL LINTELS, TYPICAL.
4. REFER TO ARCHITECTURAL FLOOR PLANS FOR LINTEL LOCATIONS.
5. VERTICAL LEGS OF DOUBLE ANGLES SHALL BE WELDED TOGETHER.

## PARTITION TYPES

| SYMBOL | CONSTRUCTION DESCRIPTION |
|---|---|
| | CONCRETE MASONRY UNIT, PAINT TO MATCH EXISTING WALLS - EACH SIDE; 5 3/4" / 6" NOM.; HORIZONTAL LADDER REINFORCEMENT EVERY TWO (2) COURSES; PAINT SURFACE TO MATCH EXISTING WALLS; 1 — 6" CONCRETE MASONRY WALL; NOTE: CONTRACTOR IS RESPONSIBLE TO SHIM AS REQUIRED FOR A LEVEL AND PLUMB INSTALLATION |
| | CONCRETE MASONRY UNIT, PAINT TO MATCH EXISTING WALLS - EACH SIDE; 7 3/4" / 8" NOM.; HORIZONTAL LADDER REINFORCEMENT EVERY TWO (2) COURSES; PAINT SURFACE TO MATCH EXISTING WALLS; 2 — 8" CONCRETE MASONRY WALL; NOTE: CONTRACTOR IS RESPONSIBLE TO SHIM AS REQUIRED FOR A LEVEL AND PLUMB INSTALLATION |


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CLIENT
**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

CONTRACT
ALL CONTRACTS

STATUS
FINAL BID DOCUMENTS

SHEET TITLE
NEW YORK STATE CODE ANALYSIS, LINTEL SCHEDULE AND PARTITION TYPES

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SHEET # 3 OF 49

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## VALVES AND PIPE ACCESSORIES

- AR — AIR RELIEF VALVE
- A — ANTI-SIPHON VALVE
- A — AUTOMATIC AIR VENT
- BV-1 — BALL VALVE
- BV-1 NC — BALL VALVE (NORMALLY CLOSED)
- BPV — BACK PRESSURE VALVE
- BF-1 — BUTTERFLY VALVE
- BF-1 NC — BUTTERFLY VALVE (NORMALLY CLOSED)
- CHECK VALVE
- LS — CHECK VALVE W/ LIMIT SWITCH
- DIAPHRAGM VALVE
- DIAPHRAGM VALVE W/ LIMIT SWITCH
- LS — DOUBLE CHECK VALVE
- FLEXIBLE PIPE CONNECTION
- GV-1 — GATE VALVE
- GV-1 NC — GATE VALVE (NORMALLY CLOSED)
- MBV-1 — MOTORIZED BALL VALVE
- MBV-1 NC — MOTORIZED BALL VALVE (NORMALLY CLOSED)
- MBF-1 — MOTORIZED BUTTERFLY VALVE
- MBF-1 NC — MOTORIZED BUTTERFLY VALVE (NORMALLY CLOSED)
- MPV-1 — MOTORIZED PLUG VALVE
- MPV-1 NC — MOTORIZED PLUG VALVE (NORMALLY CLOSED)
- PV-1 — PLUG VALVE
- PV-1 — PLUG VALVE (NORMALLY CLOSED)
- PRESSURE REDUCING VALVE
- PRESSURE RELIEF VALVE
- LS — PRESSURE RELIEF VALVE W/ LIMIT SWITCH
- RPZ DEVICE
- SG-1 — SLIDE GATE
- SG-1 NC — SLIDE GATE (NORMALLY CLOSED)
- SV-1 N — SOLENOID VALVE (NORMALLY OPEN)
- SV-1 NC — SOLENOID VALVE (NORMALLY CLOSED)
- WYE STRAINER
- CHEMICAL INJECTION POINT
- D — DIELECTRIC UNION
- PG — PRESSURE GAUGE AND COCK
- SP-1 — SAMPLE POINT
- SIGHT GLASS
- STATIC MIXER
- AR — PRESSURE GAUGE AND COCK

## PROCESS CONTROL SYMBOLS

- CL — CHLORINE ANALYZER
- S/m — CONDUCTIVITY ANALYZER
- DPG — DIFFERENTIAL PRESSURE GAUGE
- DPS — DIFFERENTIAL PRESSURE SWITCH
- DPT — DIFFERENTIAL PRESSURE TRANSMITTER
- DO — DISSOLVED OXYGEN SENSOR
- FL — FLOAT SWITCH
- FS — FLOW SWITCH
- FT — FLOW TRANSMITTER
- FL — FLUORIDE ANALYZER
- H2O — HYDROGEN PEROXIDE ANALYZER
- HFL — HIGH LEVEL FLOAT SWITCH
- HTT — HUMIDITY AND TEMPERATURE TRANSMITTER
- LE — LEVEL SWITCH
- LT — LEVEL TRANSMITTER
- LFL — LOW LEVEL FLOAT SWITCH
- LS — LIMIT SWITCH
- NO3 — NITRATE ANALYZER
- pH — pH ANALYZER
- PO4 — PHOSPHATE ANALYZER
- PS — PRESSURE SWITCH
- PT — PRESSURE TRANSDUCER
- TS — TEMPERATURE SWITCH
- TSS — TOTAL SUSPENDED SOLIDS ANALYZER
- NTU — TURBIDITY ANALYZER
- VOC — VOC ANALYZER

## FLOW CONTROL

- MA — ELECTROMAGNETIC FLOW METER
- ORIFICE PLATE
- TURBINE FLOW METER
- VENTURI FLOW METER

## LARGE PIPING FITTINGS

- BLIND FLANGE
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- EXISTING/NEW PIPE CONNECTION
- FLANGED CONNECTING PIPE JOINT
- FLEXIBLE CONNECTION
- PIPE PLUG
- PIPE CAP
- QUICK CONNECTION COUPLING
- VENT

## MECHANICAL EQUIPMENT

- 55 GALLON DRUM
- C-1 — AIR COMPRESSOR
- AIR DIFFUSER(S)
- AIR FILTER
- RDS-1 — ROTATING DRUM SCREN
- B-1 — BLOWER, FIXED SPEED
- B-1 V — BLOWER, VARIABLE SPEED
- P-1 — CENTRIFUGAL PUMP, FIXED SPEED
- P-1 V — CENTRIFUGAL PUMP, VARIABLE SPEED
- P-1 CL2 — CHEMICAL METERING PUMP
- COMBINATION SHOWER/EYEWASH
- P-1 — DECANT PUMP
- HORIZONTAL CHEMICAL BULK STORAGE TANK
- MEMBRANE FILTER
- P-1 — PROGRESSIVE CAVITY PUMP, FIXED
- P-1 V — PROGRESSIVE CAVITY PUMP, VARIABLE
- BAFFLE WALL
- STRUCTURE
- STRUCTURE NAME
- A-1 — SUBMERSIBLE AERATOR
- MX-1 — SUBMERSIBLE MIXER
- P-1 — DRY PIT SUBMERSIBLE PUMP, FIXED SPEED
- P-1 V — DRY PIT SUBMERSIBLE PUMP, VARIABLE SPEED
- VERTICAL CHEMICAL BULK STORAGE TANK
- WATER HEATER (ELECTRIC)

## PROCESS AREA ABBREVIATIONS

| | |
|---|---|
| AR | ANOXIC REACTOR |
| FS | FINE SCREENING |
| GS | GRAVITY SEWER |
| MBR | MEMBRANE BIOLOGICAL REACTOR |
| PREQ | PRE-EQUALIZATION |
| PS | PUMP STATION |
| PL | PLANT |
| SB | SPLITTER BOX |
| SHT | SLUDGE HOLDING TANK |
| PW | POTABLE WATER |

## SERVICE ABBREVIATIONS

| | |
|---|---|
| A | AIR |
| DA | DIFFUSER AIR |
| EFF | EFFLUENT |
| HE | HYDRAULIC EQUALIZATION |
| INF | INFLUENT |
| RT | RETURN |
| SA | SCOUR AIR |
| SUPA | SUPPLY AIR |

## PROCESS DIAGRAM ANNOTATION SYMBOLS

- SERVICE / PROCESS / NOMINAL PIPE — 6"Ø-PS-INF — FLOW DIRECTION (PIPE)
- SERVICE / PROCESS / CHANNEL / CHANNEL / CHANNEL — 36"x36"x36"-PRE-INF — FLOW DIRECTION (CHANNEL)
- SERVICE / PROCESS / NOMINAL PIPE — 6"Ø-PREQ-A — FLOW DIRECTION (AIR PIPING)
- SERVICE / PROCESS / NOMINAL PIPE — 6"Ø-SHT-INF — FLOW DIRECTION (SLUDGE)
- SERVICE / PROCESS — CS-EFF — FLOW DIRECTION (CONVEYOR)
- MATCH LINE
- (A) PD0.0 — TIE-IN (CONTINUED ELSEWHERE ON OTHER SHEET)
- A — TIE-IN (CONTINUED ELSEWHERE ON SAME SHEET)
- UNCONNECTED PROCESS LINE


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**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

CONTRACT

**ALL CONTRACTS**

STATUS

**FINAL BID DOCUMENT**

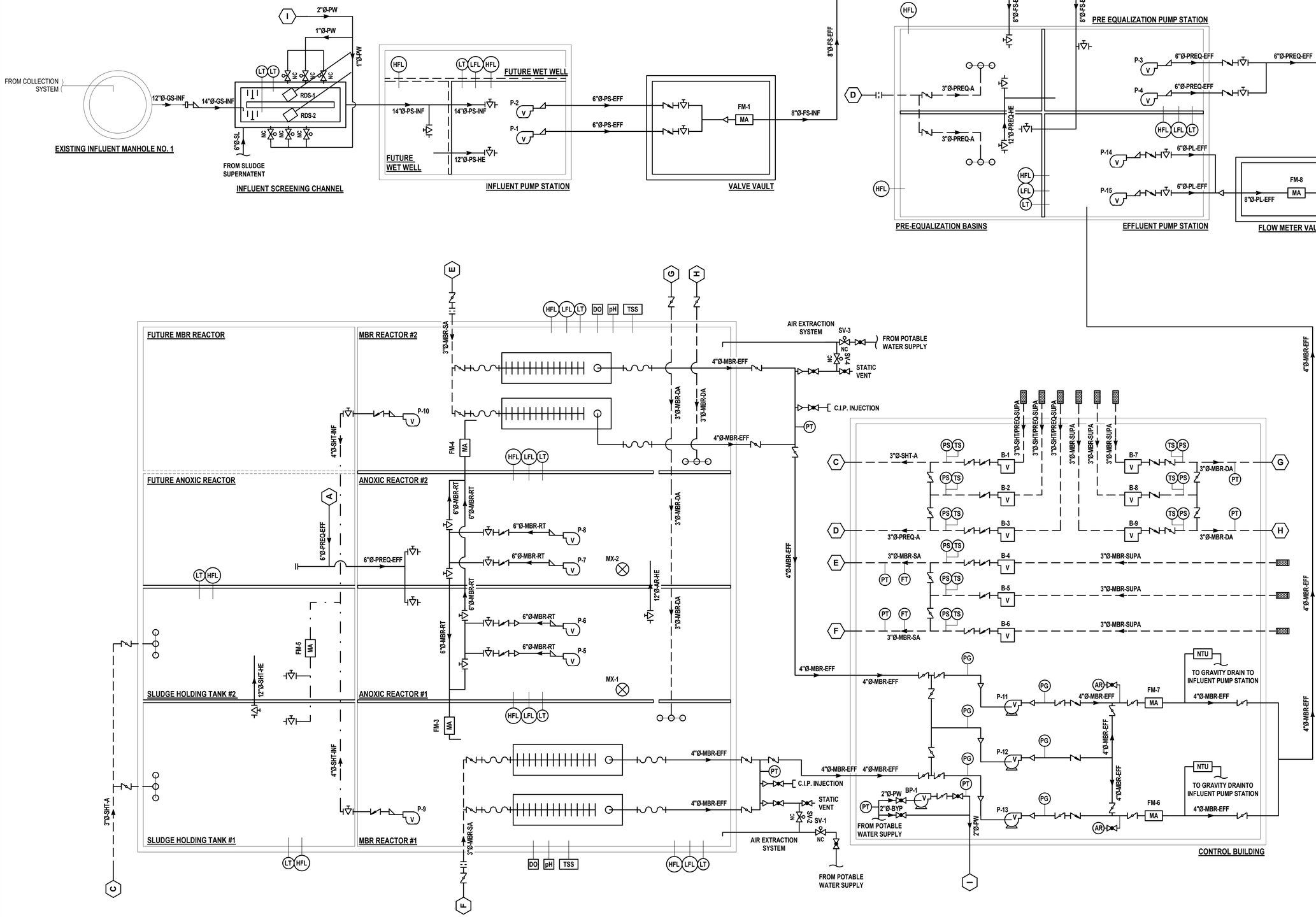
SHEET TITLE

**PROCESS AND INSTRUMENTATION DIAGRAM LEGEND**

| DRAWING # | SHEET # |
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| PD0.0 | 4 OF 49 |

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**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD — 1792 — PAX ET PROSPERITAS PER PROGRESSUM

CONTRACT

**ALL CONTRACTS**

STATUS

**FINAL BID DOCUMENT**

SHEET TITLE

**PROCESS AND INSTRUMENTATION DIAGRAM**

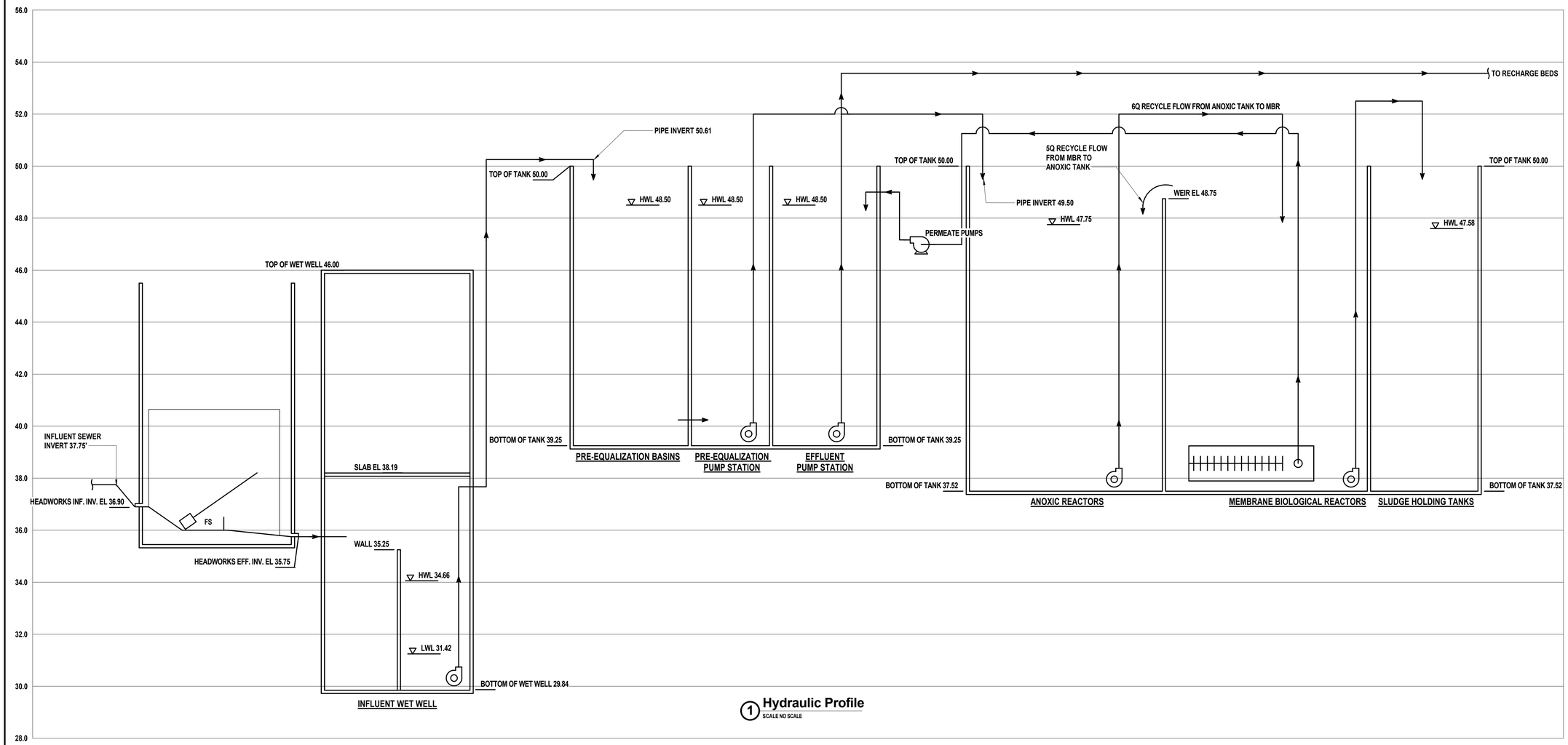
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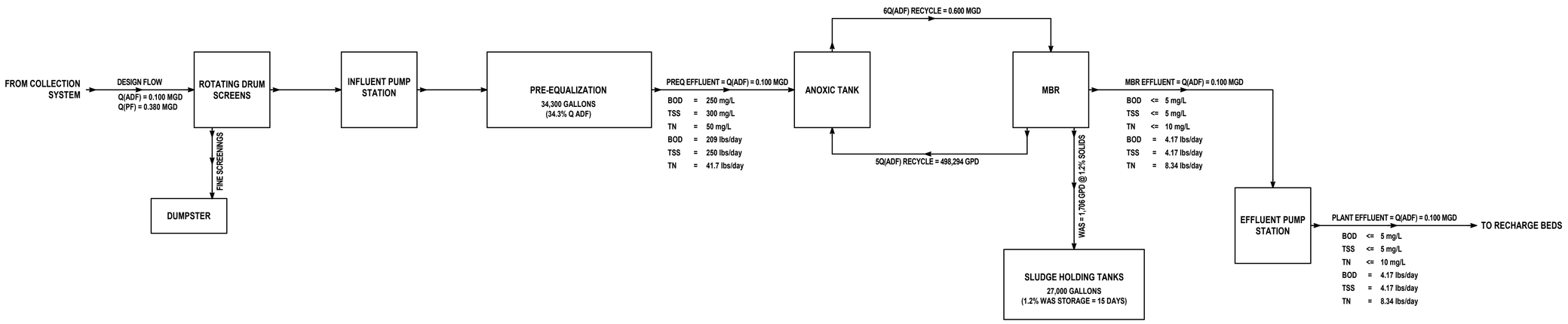
SHEET # 5 OF 49

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## 1 Hydraulic Profile
SCALE NO SCALE




## 2 Mass Balance Diagram
SCALE NO SCALE

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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

CONTRACT

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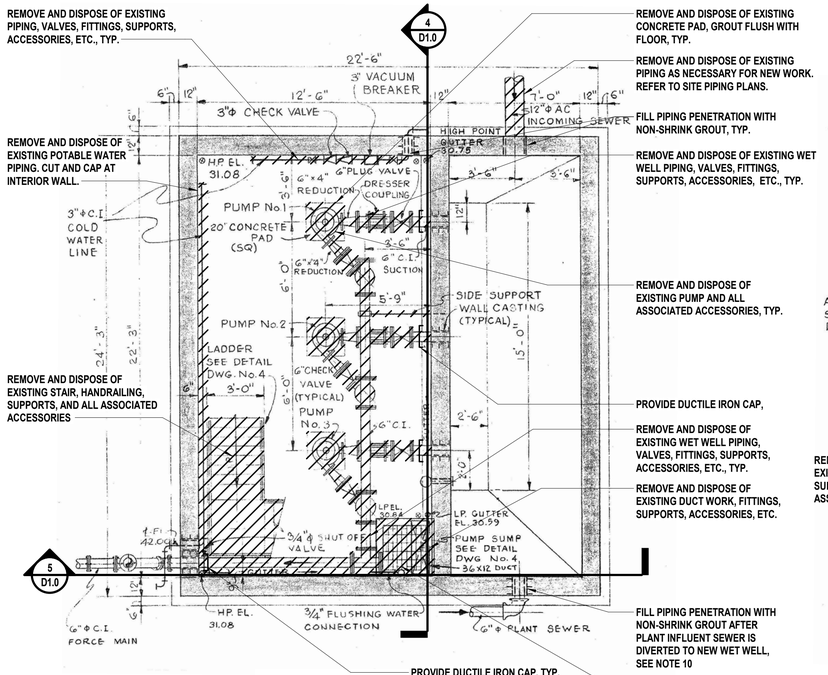
**HYDRAULIC PROFILE AND MASS BALANCE DIAGRAM**

DRAWING # **HP1.0**

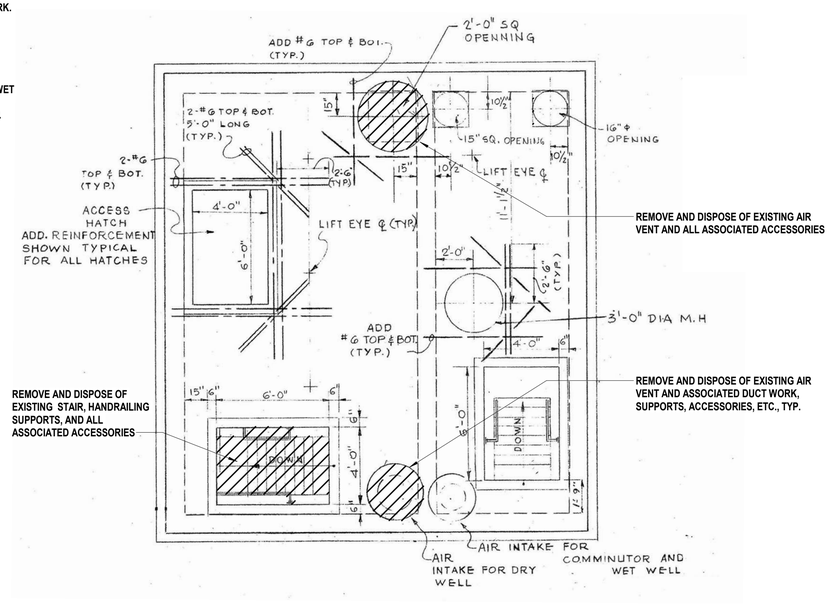
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## 1 Wet Well Demolition Plan
SCALE NO SCALE

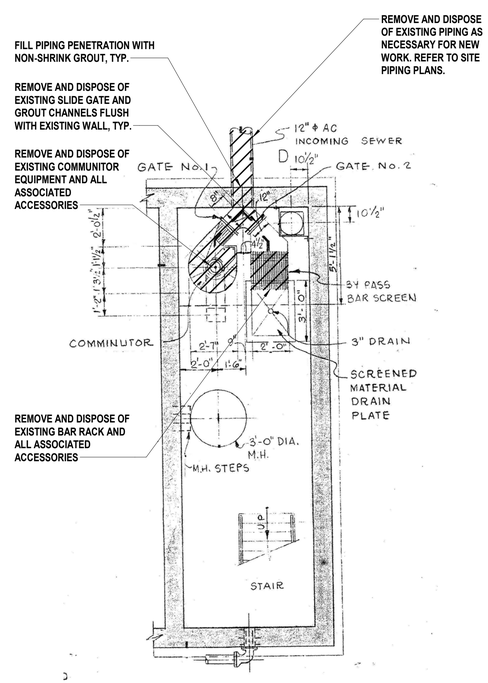



REMOVE AND DISPOSE OF EXISTING AIR VENT AND ALL ASSOCIATED ACCESSORIES

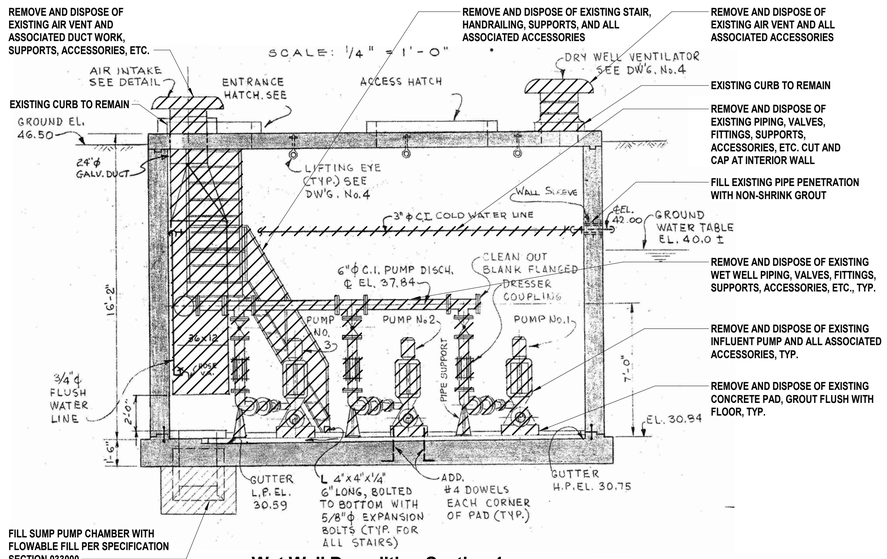
REMOVE AND DISPOSE OF EXISTING AIR VENT AND ASSOCIATED DUCT WORK, SUPPORTS, ACCESSORIES, ETC., TYP.

REMOVE AND DISPOSE OF EXISTING STAIR, HANDRAILING, SUPPORTS, AND ALL ASSOCIATED ACCESSORIES

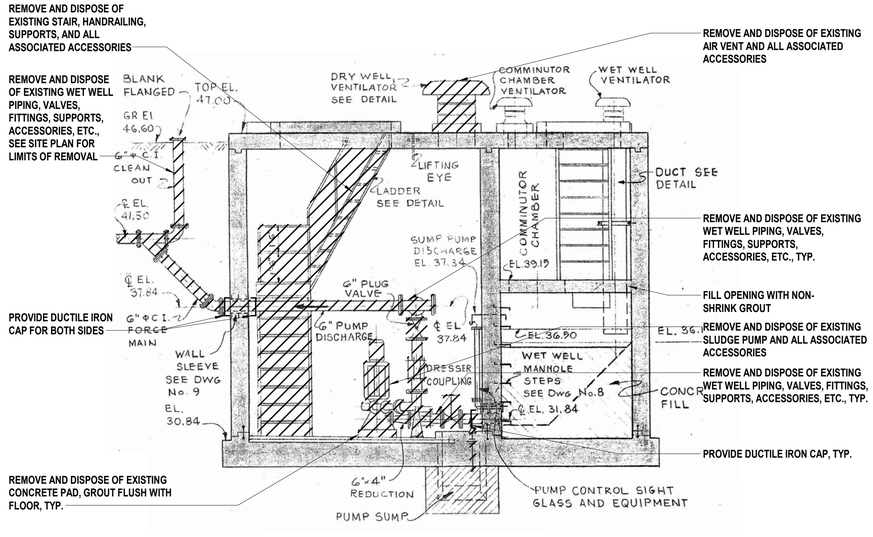
## 2 Wet Well Demolition Roof Plan
SCALE NO SCALE




## 3 Comminutor Chamber Demolition Plan
SCALE NO SCALE




## 4 Wet Well Demolition Section 1
SCALE 3/4" = 1'-0"




## 5 Wet Well Demolition Section 2
SCALE NO SCALE

## GENERAL DEMOLITION NOTES:

1. ALL VOIDS CREATED FROM THE REMOVAL OF AN EXISTING PIPE OR EQUIPMENT THROUGH WALL SHALL BE FILLED WITH NON-SHRINK GROUT UNLESS OTHERWISE NOTED.
2. REMOVAL OF CALLED OUT OR HATCHED EQUIPMENT SHALL INCLUDE REMOVAL AND DISPOSAL OF EQUIPMENT AND ALL ASSOCIATED ACCESSORIES INCLUDING, BUT NOT LIMITED TO, PIPING, VALVES, FITTINGS, SUPPORTS, MAINTENANCE PADS AND CONTROL EQUIPMENT UNLESS OTHERWISE NOTED.
3. DEMOLITION DRAWINGS WERE OBTAINED FROM RECORDS SUPPLIED BY OTHERS. THE OWNER AND ENGINEER DO NOT GUARANTEE OR ACCEPT RESPONSIBILITY FOR DISCREPANCIES IN LOCATION AND SIZE SHOWN ON THE PLANS, NOR WILL ANY COMPENSATION BE MADE TO THE CONTRACTOR FOR ANY INCONVENIENCES CAUSED FOR HIM BY ENCOUNTERING THE AFOREMENTIONED DISCREPANCIES WHICH ARE INCORRECTLY SHOWN ON THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING EXISTING CONDITIONS PRIOR TO COMMENCING THE WORK.
4. REVIEW ALL DEMOLITION WITH THE OWNER/ENGINEER TO CONFIRM DEMOLITION EXTENTS PRIOR TO BEGINNING THE WORK OF THIS PHASE. CONTRACTOR SHALL CLEARLY MARK ALL EQUIPMENT, GRATING, FRAMING, STAIRS, PIPING, VALVES, ETC. SCHEDULED FOR DEMOLITION PRIOR TO BEGINNING THE WORK.
5. SCHEDULE AND PERFORM ALL DEMOLITION TO STRICTLY ADHERE TO ALL THE REQUIREMENTS SET FORTH IN SPECIFICATION SECTION 017000 - MAINTENANCE OF PLANT OPERATIONS.
6. DISREGARD SECTION AND CALLOUTS SHOWN ON EXISTING PLANS.
7. ALL REMOVAL WORK SHALL BE CONDUCTED IN PHASES WITH NEW INSTALLATIONS IN ACCORDANCE WITH THE APPROVED PHASING PLAN. COORDINATE ANY BYPASS PUMPING WITH OWNER/ENGINEER.
8. ALL ELECTRICAL DEVICES AND BOXES SHALL BE REMOVED AND DISPOSED OF BY CONTRACT G. CONTRACT E SHALL DE-ENERGIZE ALL ELECTRICAL DEVICES AND REMOVE WIRES AND CONDUITS THAT ARE NOT REUSED BACK TO SUPPLY PANEL. CONTRACT G SHALL FILL ALL PENETRATIONS WITH NON-SHRINK GROUT PRIOR TO PLACING NEW WET WELL ONLINE.
9. THE OWNER WILL DRAIN THE CONTENTS OF THE INFLUENT PUMP STATION AND AERATION AND SETTLING TANKS TO WITHIN 3' OF THE BOTTOM. GENERAL CONTRACTOR RESPONSIBLE FOR REMOVAL OF REMAINING CONTENTS OF PROCESS TANKS AND INFLUENT WET WELL PRIOR TO PERFORMING CONVERSION WORK. REFER TO SECTION 024100 - DEMOLITION FOR ADDITIONAL INFORMATION AND AVAILABLE METHODS FOR DISPOSAL OF TANK CONTENTS.
10. EXISTING BUILDING SEWER TO REMAIN ACTIVE TO EXISTING WET WELL DURING INTERIM OPERATIONS. COORDINATE DIVERSION WITH THE STARTUP OF THE NEW WET WELL.
11. COAT CUT EXPOSED ENDS OF REINFORCEMENT WITH ZINC RICH PRIMER.
12. ALL WORK SHOWN ON DEMOLITION SHEETS SHALL BE PERFORMED BY CONTRACT G, UNLESS OTHERWISE NOTED.

## ASBESTOS ABATEMENT NOTES:

1. ASBESTOS ABATEMENT WORK SHALL CONFORM TO ALL APPLICABLE FEDERAL AND STATE CODE REQUIREMENTS AND THE CONTRACT SPECIFICATIONS. SEE INFORMATION DOCUMENTS SECTION OF THE PROJECT MANUAL FOR THE LABORATORY ASBESTOS ANALYSIS REPORT.
2. ASBESTOS PROJECT MONITORING - VISUAL CLEARANCE - PROJECT MONITORING SERVICE SHALL BE PERFORMED BY THE OWNER'S REPRESENTATIVE. CONTRACTOR SHALL COORDINATE AND SCHEDULE WITH OWNER'S THIRD PARTY ASBESTOS PROJECT MONITOR.
3. CONTRACTOR SHALL PROVIDE 10 DAYS NOTIFICATION TO ARCHITECT AND OWNER BEFORE COMMENCING ABATEMENT OPERATIONS ON SITE IN THE AREAS IDENTIFIED AS BEING POSITIVE FOR ASBESTOS. THE 'TAN LINOLUEM FLOORING' HAS BEEN IDENTIFIED AS AN ASBESTOS CONTAINING MATERIAL.
4. CONTRACTOR SHALL PAY FOR AND SECURE ALL PERMITS AND NOTIFICATIONS REQUIRED FOR ASBESTOS ABATEMENT WORK.
5. CONTRACTOR SHALL COORDINATE ALL ACTIVITIES WITH OWNER AND ARCHITECT.
6. CONTRACTOR SHALL SUBMIT COPIES OF ALL MANIFESTS AND LANDFILL RECEIPTS TO OWNER AND ARCHITECT.
7. CONTRACTOR IS TO VERIFY ALL QUANTITIES IN FIELD. THE COSTS ASSOCIATED WITH THE REMOVAL, CLEANING, REPAIR AND DISPOSAL OF ASBESTOS ARE TO BE INCLUDED IN THE CONTRACTOR'S BASE BID.
8. CONTRACTOR SHALL COMPLETELY REMOVE AND DISPOSE OF EXISTING TAN FLOORING LINOLEUM TILE DOWN TO CONCRETE SLAB BELOW. REMOVALS SHALL INCLUDE ABATEMENT OF TILE, COVE BASE AND ALL MASTIC. THE CONTRACTOR SHALL BE REPONSIBLE FOR INSPECTING THE CONDITIONS OF THE SLAB. PATCH AND LEVEL AS SPECIFIED TO ENSURE A LEVELED FLOOR FREE OF DIPS, WAVES, DEPRESSIONS AND TELEGRAPHING OF THE LEVELING COMPOUND OR IMPERFECTIONS IN THE SLAB FROM BELOW. THE CONTRACTOR SHALL PROVIDE SELF LEVELING COMPOUND FOR EACH ROOM.

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**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

CONTRACT

**ALL CONTRACTS**

STATUS

**FINAL BID DOCUMENT**

SHEET TITLE

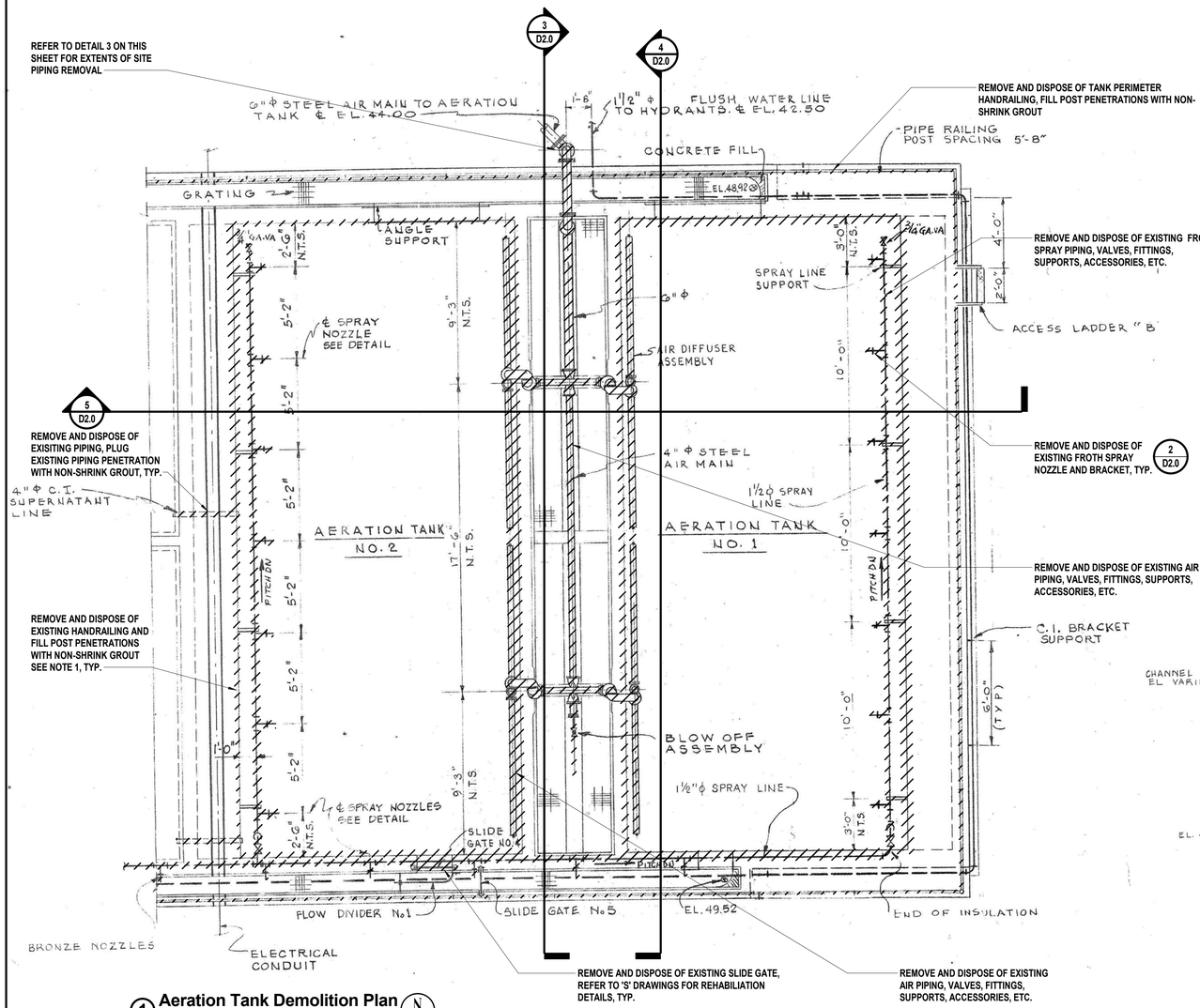
**WET WELL DEMOLITION VIEWS**

DRAWING # **D1.0**

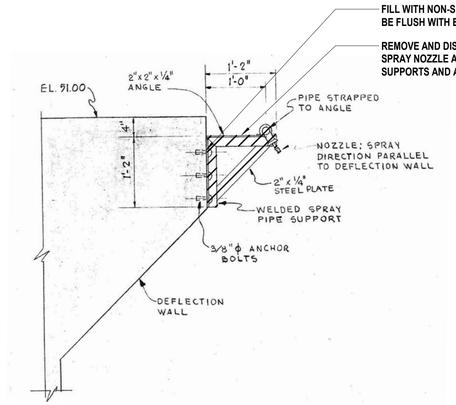
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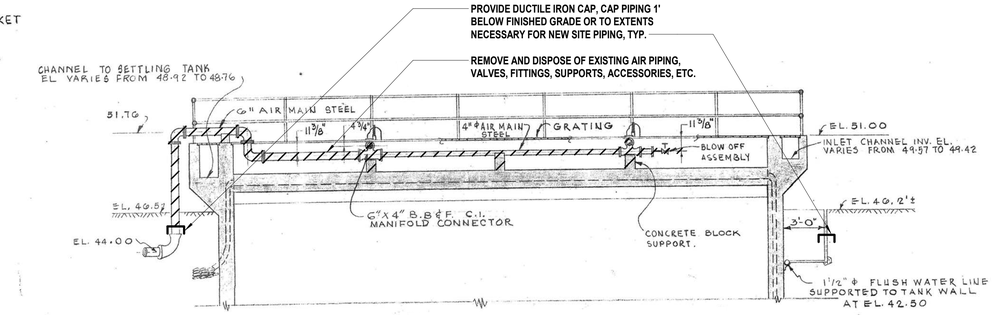
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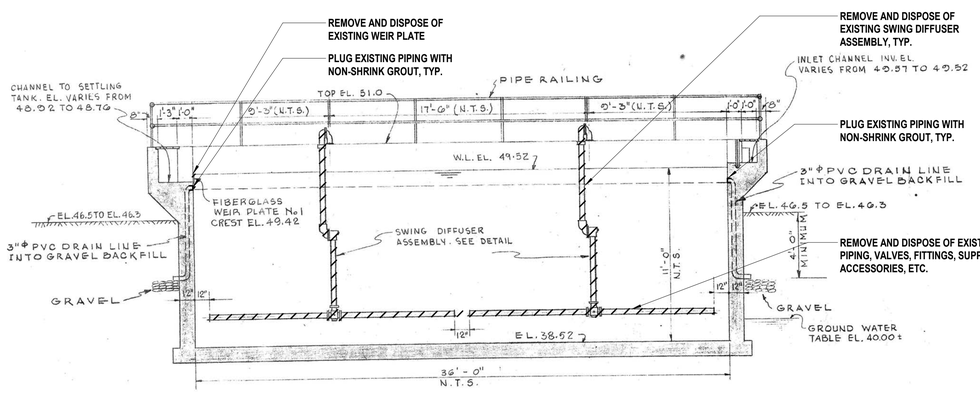

## 1 Aeration Tank Demolition Plan
SCALE NO SCALE



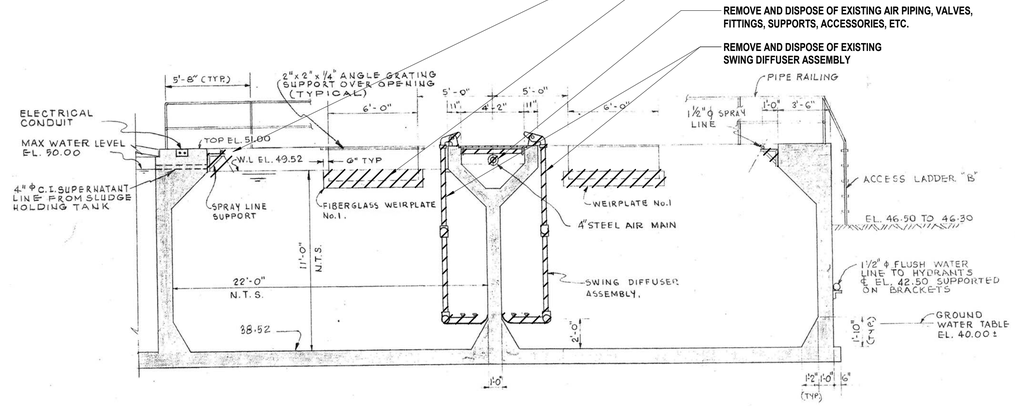

## 2 Spray Nozzle Demolition Detail
SCALE NO SCALE




## 3 Air Piping Channel Demolition Section
SCALE NO SCALE




## 4 Aeration Tank Demolition Section 1
SCALE NO SCALE




## 5 Aeration Tank Demolition Section 2
SCALE 1:5

**NOTES:**

1. REFER TO 'A' DRAWINGS AND SECTION 030130.71 - CONCRETE REHABILITATION FOR ADDITIONAL INFORMATION REGARDING HANDRAIL REMOVAL AND INSTALLATION REQUIREMENTS FOR NEW HANDRAIL.
2. FILL CHANNELS WITH WITH FLOWABLE FILL UPON COMPLETION OF ALL TANK CONVERSION WORK.

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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD — PAX ET PROSPERITAS PER PROGRESSUM — 1792

CONTRACT

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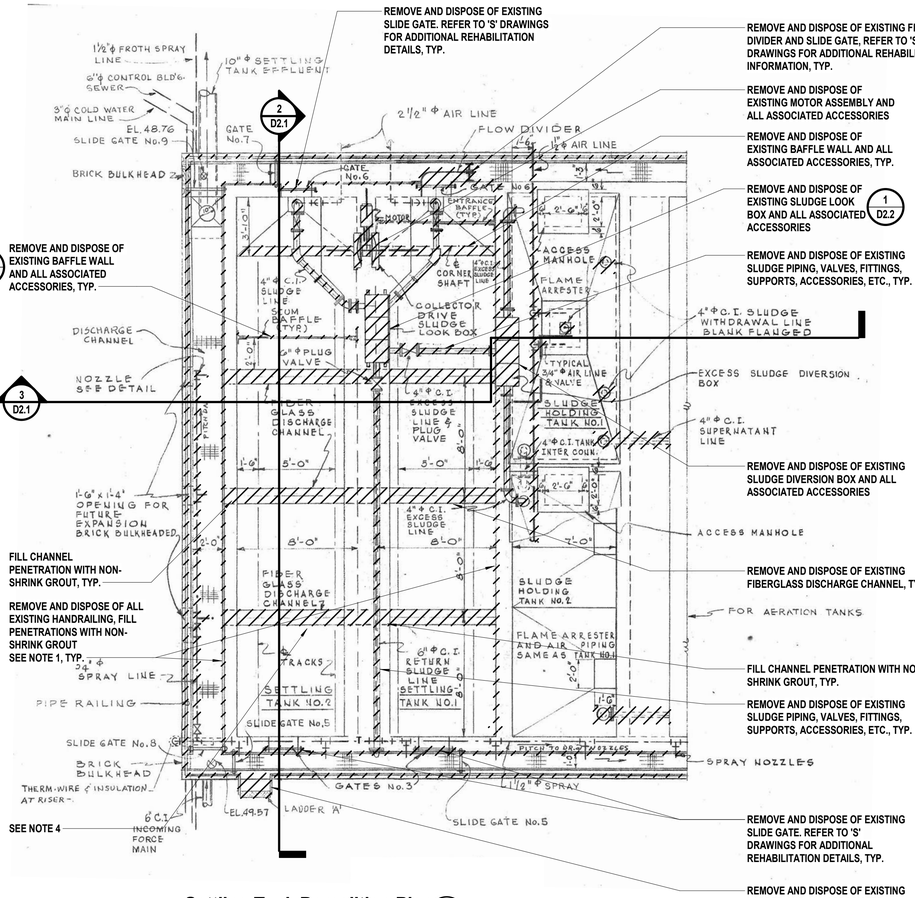
**AERATION TANKS DEMOLITION VIEWS AND DETAILS**

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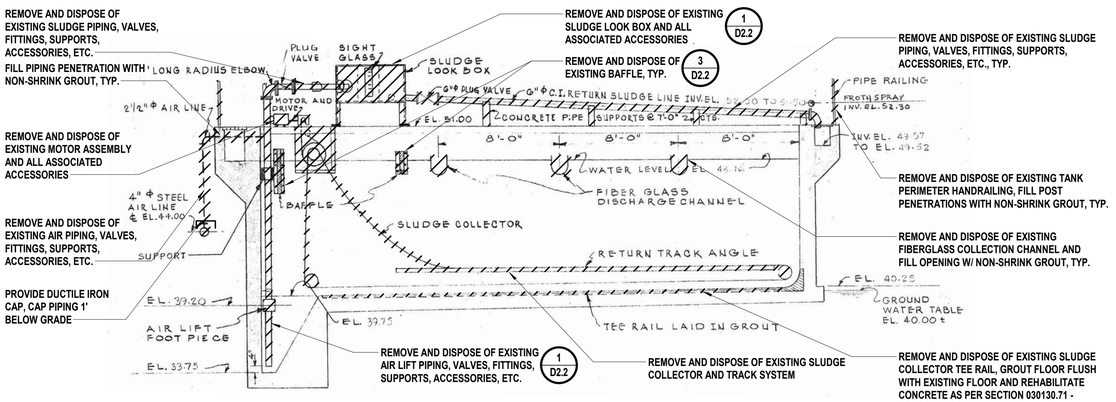
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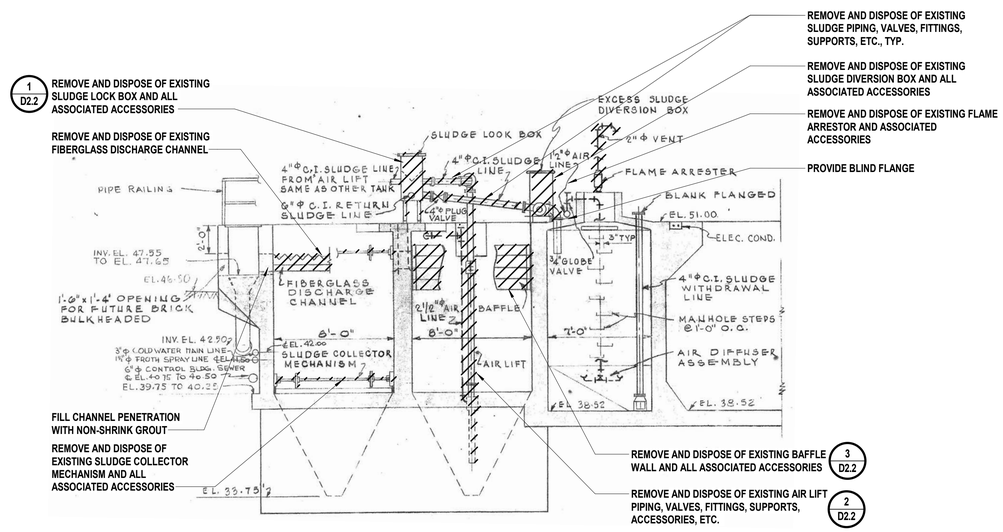
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## 1 Settling Tank Demolition Plan
SCALE NO SCALE




## 2 Settling Tank Demolition Section 1
SCALE NO SCALE




## 3 Settling Tank Demolition Section 2
SCALE NO SCALE

**NOTES:**

1. REFER TO 'A' DRAWINGS AND SECTION 030130.71 - CONCRETE REHABILITATION FOR ADDITIONAL INFORMATION REGARDING HANDRAIL REMOVAL AND INSTALLATION REQUIREMENTS FOR NEW HANDRAIL.
2. EMPTY AND CLEAN EXISTING SLUDGE TANK IN ACCORDANCE WITH SECTION 024100 - DEMOLITION PRIOR TO ABANDONMENT AT COMPLETION OF CONSTRUCTION. THE OWNER WILL DRAIN THE CONTENTS OF THE TANK TO WITHIN 3' FROM THE BOTTOM.
3. FILL CHANNELS WITH WITH FLOWABLE FILL UPON COMPLETION OF ALL TANK CONVERSION WORK.
4. COORDINATE PARTIAL REMOVAL OF EFFLUENT TROUGH TO ALLOW FOR NEW PRE-EQUALIZATION PUMP STATION WALL CONSTRUCTION WITH OWNER/ENGINEER TO MAINTAIN PROCESS EFFLUENT.

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TOWN OF RIVERHEAD — 1792 — TAX ET PROSPERITAS PER PROGRESSUM

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**SETTLING AND SLUDGE HOLDING TANK DEMOLITION VIEWS**

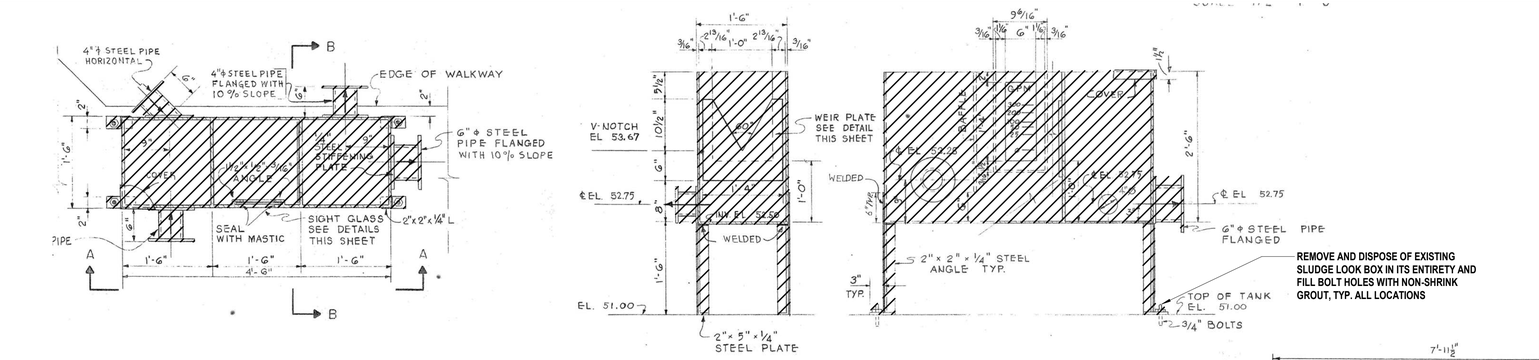
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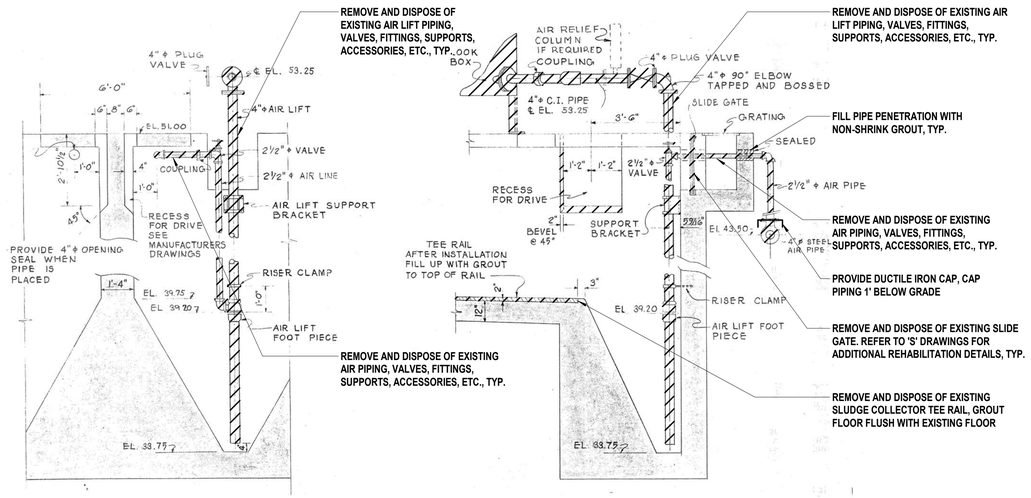
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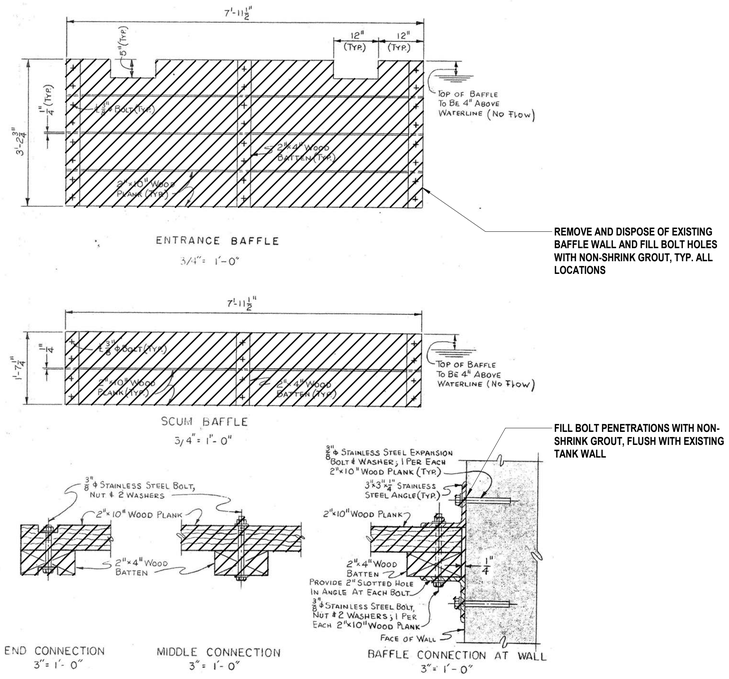



REMOVE AND DISPOSE OF EXISTING SLUDGE LOOK BOX IN ITS ENTIRETY AND FILL BOLT HOLES WITH NON-SHRINK GROUT, TYP. ALL LOCATIONS

## 1 Sludge Look Box Demolition Detail
SCALE NO SCALE




## 2 Settling Tank Airlift Demolition Details
SCALE NO SCALE




REMOVE AND DISPOSE OF EXISTING BAFFLE WALL AND FILL BOLT HOLES WITH NON-SHRINK GROUT, TYP. ALL LOCATIONS

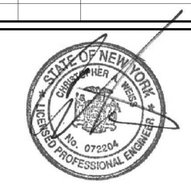
FILL BOLT PENETRATIONS WITH NON-SHRINK GROUT, FLUSH WITH EXISTING TANK WALL

## 3 Settling Tank Baffle Demolition Details
SCALE NO SCALE


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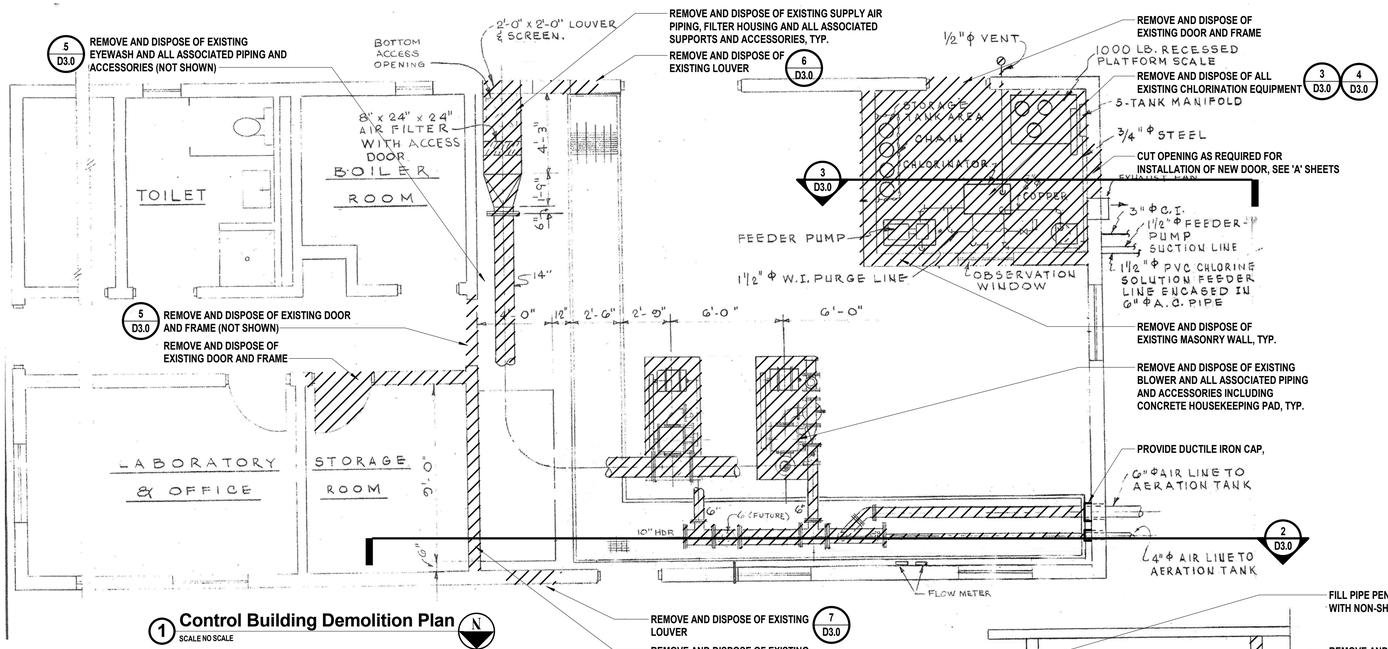
**SETTLING AND SLUDGE HOLDING TANK DEMOLITION DETAILS**

DRAWING # **D2.2**

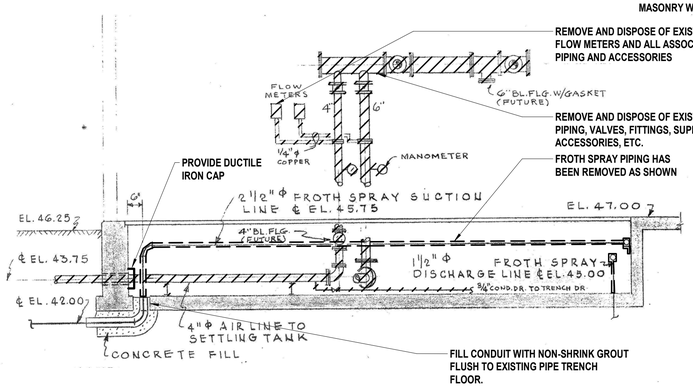
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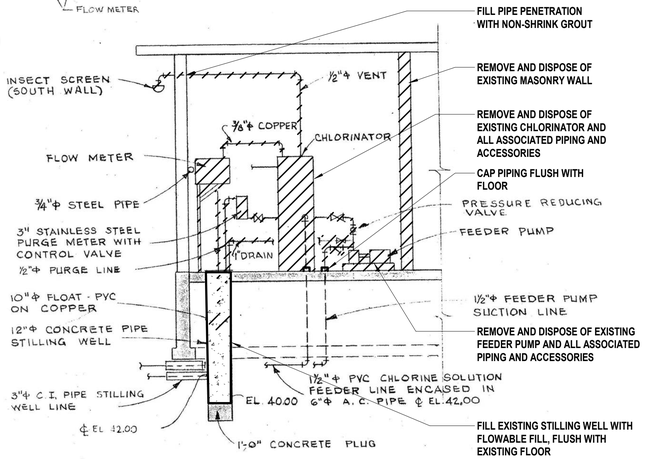
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## 1 Control Building Demolition Plan
SCALE NO SCALE




## 2 Pipe Trench Demolition Section
SCALE NO SCALE



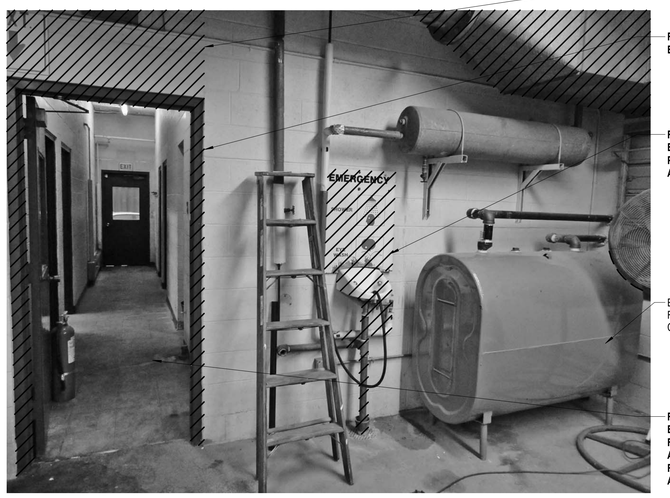

## 3 Chlorinator Demolition Section
SCALE NO SCALE

**NOTES:**

1. ALL EXISTING ROOFING MATERIALS TO BE REMOVED AND REPLACED. REFER TO 'A' DRAWINGS AND SECTION 075323.13 - ELASTOMERIC SHEET ROOFING FOR ADDITIONAL INFORMATION.
2. ALL EXISTING TAN LINOLEUM FLOORING CONTAINING ASBESTOS TO BE REMOVED FROM THE EXISTING STORAGE ROOM, BOILER ROOM, LABORATORY/OFFICE, BATHROOM, HALLWAY AND LUNCH/LOCKER ROOM. REFER TO PROJECT MANUAL FOR ADDITIONAL INFORMATION REGARDING ABATEMENT OF ASBESTOS CONTAINING MATERIALS.
3. EXISTING CHLORINE ROOM IS BEING USED FOR A TEMPORARY LIQUID SODIUM HYDROXIDE FEED SYSTEM. COORDINATE RELOCATION OF PUMP AND 55 GALLON DRUM WITH OWNER PRIOR TO DEMOLITION OF THIS AREA. ALL CONTENTS OF THIS ROOM TO BE REMOVED AND DISPOSED OF AFTER RELOCATION OF PUMP AND DRUM STORAGE.




## 4 Control Building Chlorine Room Demolition Plan
SCALE NO SCALE




## 5 Control Building Eyewash and Door Demolition Detail
SCALE NO SCALE




## 6 Control Building Louver Demolition Detail 1
SCALE NO SCALE




## 7 Control Building Louver Demolition Detail 2
SCALE NO SCALE

H2M architects + engineers
538 Broad Hollow Road, 4th Floor
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Melville, NY 11747

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**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD — 1792 — PAX ET PROSPERITAS, PER PROGRESSUM

CONTRACT

**ALL CONTRACTS**

STATUS

**FINAL BID DOCUMENT**

SHEET TITLE

**CONTROL BUILDING DEMOLITION VIEWS**

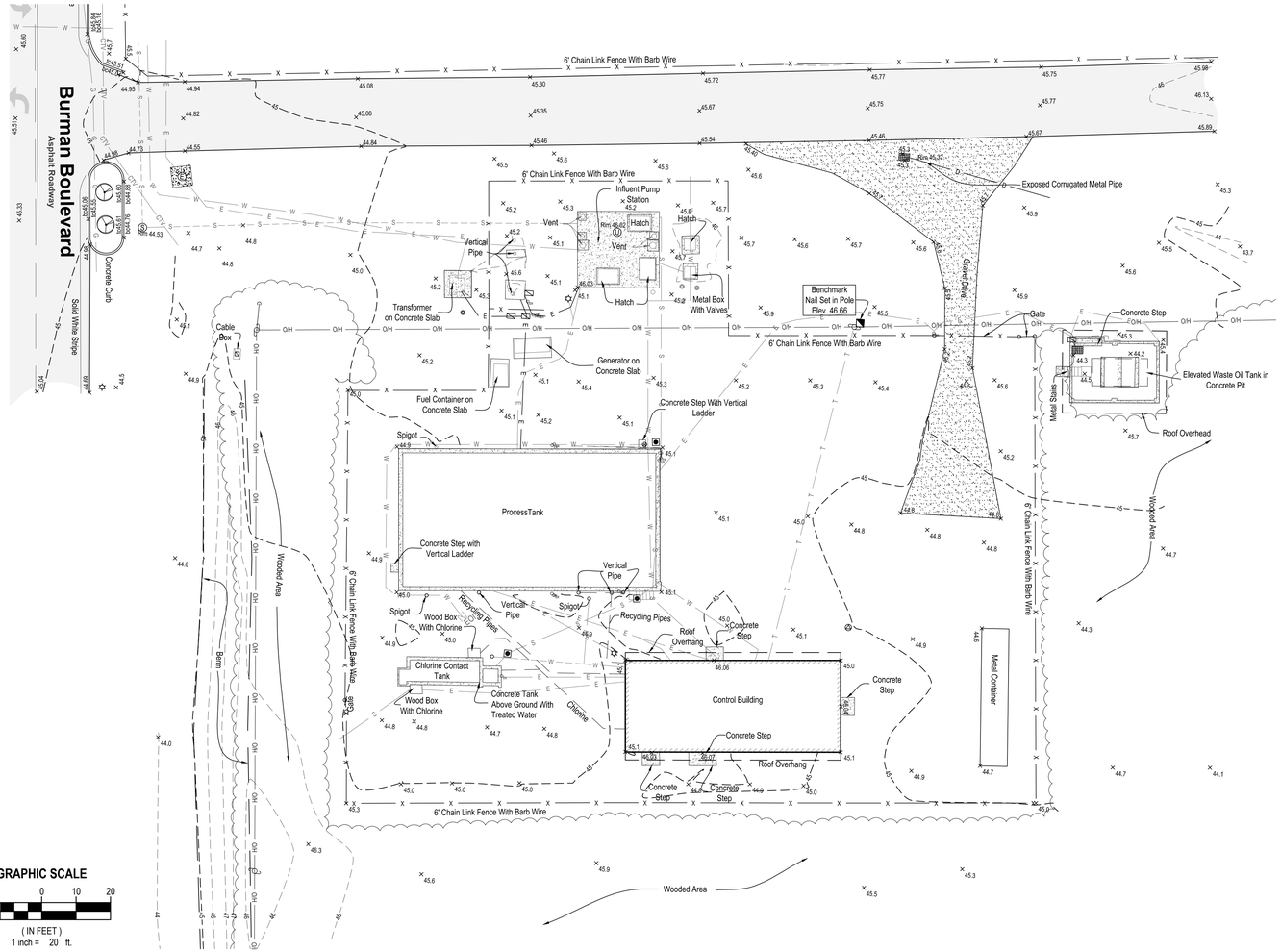
DRAWING #

**D3.0**

SHEET # 11 OF 49

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11/13/2018 5:33:29 PM




GRAPHIC SCALE

20 0 10 20

( IN FEET )
1 inch = 20 ft.

**Existing Site Conditions**
SCALE: 1" = 20'

## LEGEND

| DESCRIPTION | SYMBOL |
|---|---|
| BENCHMARK | |
| WATER METER | WM |
| WATER VALVE | |
| ROOF DRAINILEADER | L |
| SANITARY MANHOLE | S |
| INLET | |
| CLEAN OUT | |
| ELECTRIC MANHOLE | E |
| ELECTRIC RISER | ER |
| LIGHT | |
| UTILITY POLE/GUY POLE | |
| GUY WIRE | |
| PULL BOX | |
| MONITORING WELL | |
| MANHOLE | U |
| BOLLARD | |
| CURB | |
| OVERHEAD WIRES | OH |
| WATER MAIN | W |
| SANITARY SEWER | S |
| UNDERGROUND GAS | G |
| UNDERGROUND ELECTRIC | E |
| UNDERGROUND TELEPHONE | T |
| CABLE TV | CTV |
| FENCE | X |
| CONTOUR | 100 |
| SPOT ELEVATION | 100.50 |
| ASPHALT PAVEMENT | |
| CONCRETE PAVEMENT | |

## EXISTING CONDITIONS NOTES:

1. EXISTING SURVEY PREPARED BY H2M ARCHITECTS + ENGINEERS. DATED JANUARY 23, 2018.
2. MARKOUT OF UNDERGROUND UTILITIES COMPLETED BY SINGER UTILITY ENGINEERING P.C. ON JANUARY 2018.
3. BENCHMARK - NAIL SET IN POLE, NORTHEAST OF SITE, ELEVATION REFER TO N.A.V.D. 1988.
4. LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES BOTH PUBLIC AND CUSTOMER OWNED, WERE OBTAINED FROM EITHER OLD MAPS, SURVEYS, DRAWINGS/RECORDS SUPPLIED BY OTHERS AND/OR UTILITY MARKOUT. THE OWNER AND ENGINEER DO NOT GUARANTEE OR ACCEPT RESPONSIBILITY FOR ANY DAMAGE TO SUCH FACILITIES DUE TO DISCREPANCIES IN LOCATION AND SIZE SHOWN ON THE PLANS OR THOSE UTILITIES AND STRUCTURES NOT SHOWN.


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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD · 1792 · PAX ET PROSPERITAS · PER PROGRESSUM

**Suffolk County, NY**

CONTRACT

**ALL CONTRACTS**

STATUS

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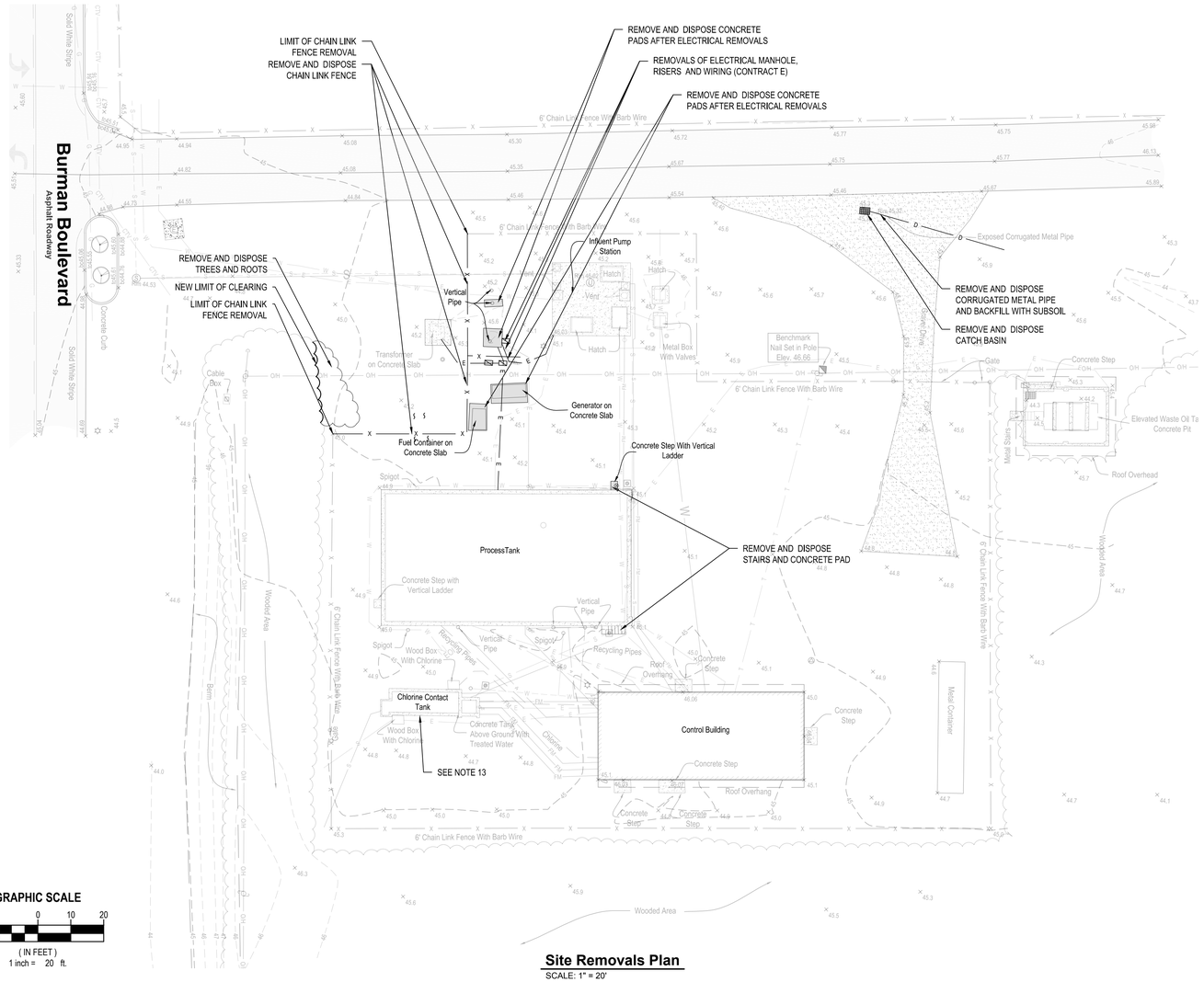
SHEET TITLE

**EXISTING SITE CONDITIONS**

DRAWING No.

**C1.0**

SHEET No. 12 OF 49




**Site Removals Plan**
SCALE: 1" = 20'

**GRAPHIC SCALE**
20 0 10 20
( IN FEET )
1 inch = 20 ft.

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## LEGEND

| DESCRIPTION | SYMBOL |
|---|---|
| REMOVE AND DISPOSE EXISTING CONCRETE | |
| REMOVE AND DISPOSE OF EXISTING CHAIN LINK FENCE | X — X |
| REMOVE AND DISPOSE OF EXISTING DRAINAGE INLET / CATCH BASIN | |
| REMOVE AND DISPOSE OF EXISTING DRAINAGE LINE | D — D |

## SITE REMOVAL NOTES:

1. REPORT ANY DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND THE PLANS TO THE ENGINEER IN WRITING IMMEDIATELY.
2. UNDERGROUND UTILITY INFORMATION SHOWN ON THESE PLANS WAS OBTAINED FOR DESIGN PURPOSES ONLY. PROVIDE FOR CONSTRUCTION MARKOUT AND LOCATE EXISTING UNDERGROUND UTILITIES. NO EXCAVATION CAN COMMENCE UNTIL UTILITY DOCUMENTATION HAS BEEN COMPLETED.
3. AFTER MARKOUT AND PRIOR TO DISTURBING THE SITE, UNCOVER ALL SUBSURFACE UTILITIES AND STRUCTURES WITHIN LIMITS OF DISTURBANCE TO CONFIRM THEIR LOCATION AND DEPTH.
4. NO COMPENSATION WILL BE MADE FOR ANY INCONVENIENCE CAUSED BY ENCOUNTERING UTILITIES AND STRUCTURES WHICH ARE NOT SHOWN, OR ARE INACCURATELY SHOWN ON THE PLANS.
5. REPAIR ANY DAMAGE TO EXISTING UTILITIES RESULTING FROM CONTRACTOR OPERATIONS IMMEDIATELY AT NO COST TO OWNER.
6. REPAIR ANY DAMAGE TO EXISTING SITE FEATURES SCHEDULED TO REMAIN RESULTING FROM CONTRACTOR OPERATIONS AT NO COST TO OWNER.
7. PROVIDE TEMPORARY FENCING TO PROTECT WORK AREAS.
8. INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLAN PRIOR TO ANY GROUND DISTURBANCE.
9. DELINEATE THE LIMITS OF CLEARING AND REVIEW WITH THE OWNER PRIOR TO COMMENCING WORK.
10. NOTIFY OWNER AND ENGINEER IMMEDIATELY IN WRITING WHEN UNKNOWN STRUCTURES OR SUSPECTED HAZARDOUS OR CONTAMINATED MATERIALS ARE ENCOUNTERED PRIOR TO REMOVAL OR DISTURBANCE.
11. TAKE APPROPRIATE MEASURES TO PROTECT PEDESTRIANS AND VEHICULAR TRAFFIC DURING REMOVAL ACTIVITIES, AND PROVIDE TEMPORARY MEASURES FOR THE PROTECTION AND SAFETY OF THE PUBLIC UNTIL FINAL ACCEPTANCE BY THE OWNER.
12. BACKFILL ALL VOIDS RESULTING FROM THE REMOVAL OF EXISTING SITE FEATURES. BACKFILL TO BE SOIL, FREE OF ORGANIC MATERIAL, DEBRIS, TRASH, CLAY AND STONES LARGER THAN 4 INCHES.
13. UPON SUCCESSFULL STURTUP OF NEW EFFUENT PUMP STATION, EMPTY AND CLEAN EXISTING CHLORINE CONTACT TANK. PROVIDE MINIMUM SIX 18"Ø HOLES IN BOTTOM FOR DRAINAGE AND FILL WITH CRUSHED STONE. CUT AND CAP EXISTING OUTFALL PIPING MAXIMUM 3' FROM EDGE OF TANK.
14. ALL WORK SHOWN ON THIS SHEET IS 'CONTRACT G' UNLESS OTHERWISE NOTED.

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**CALVERTON SEWER DISTRICT**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

**Suffolk County, NY**

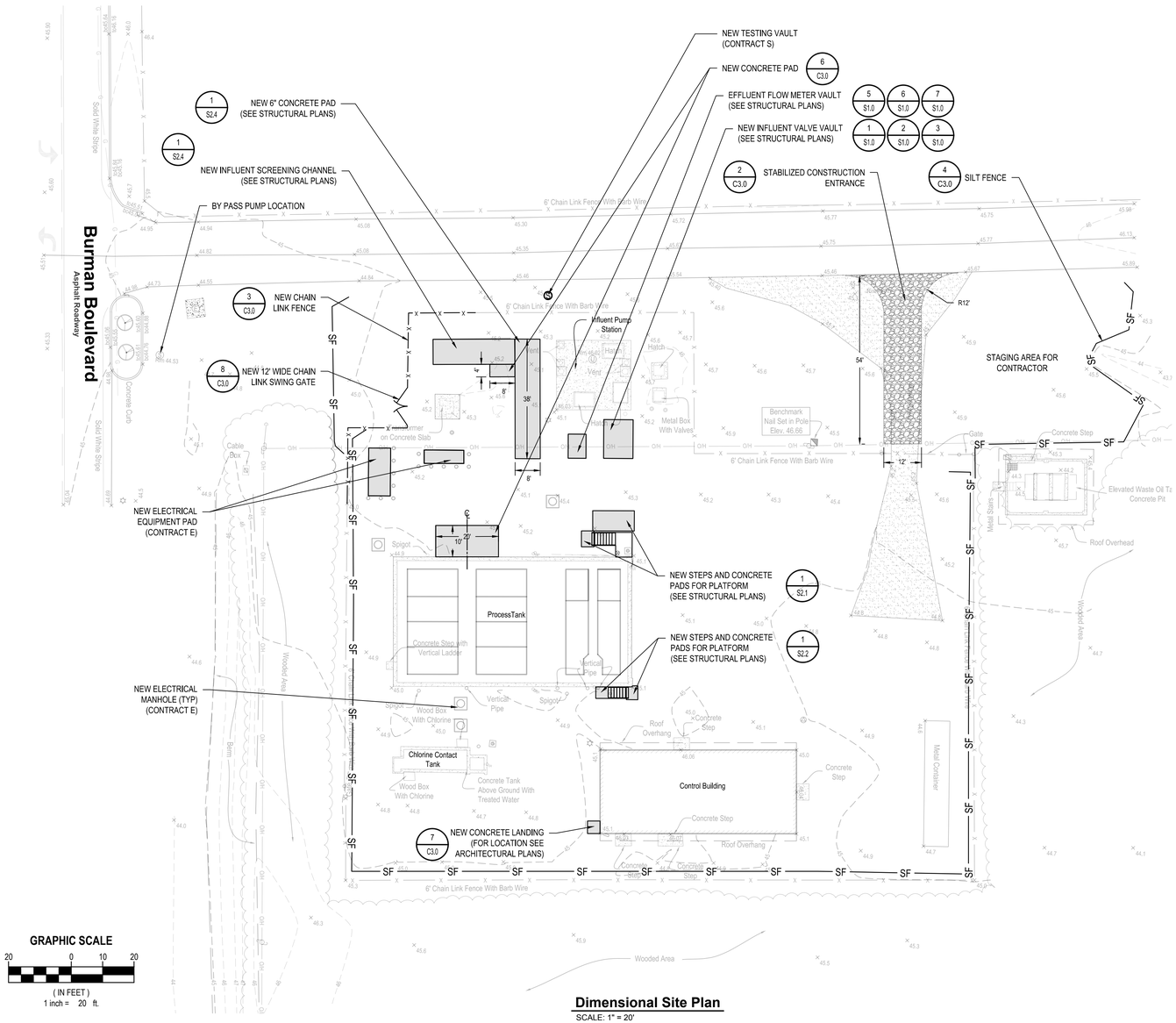
CONTRACT
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STATUS
**FINAL BID DOCUMENT**

SHEET TITLE
**SITE REMOVALS PLAN**

DRAWING No.
**C1.1**

SHEET No.
13 OF 49




**Dimensional Site Plan**
SCALE: 1" = 20'

**GRAPHIC SCALE**
20 0 10 20
( IN FEET )
1 inch = 20 ft.

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## LEGEND

| DESCRIPTION | SYMBOL |
|---|---|
| CONCRETE PAD | |
| ELECTRICAL PULL BOX | |
| CHAIN LINK FENCE | x x |

## SITE PLAN NOTES:

1. INSPECT THE SITE PRIOR TO SUBMISSION OF BIDS AND SHALL MAKE NO ADDITIONAL CLAIMS REGARDING SITE CONDITIONS THEREAFTER.
2. NOTIFY THE OWNER AND H2M (TELEPHONE 631-756-8000) AT LEAST 48 HOURS PRIOR TO THE COMMENCEMENT OF THE WORK. THE SAME NOTICE SHALL BE REQUIRED WHEN RESUMING WORK AFTER ANY STOPPAGE OR DELAY.
3. COMPLETE ALL SURVEY AND STAKEOUT AS REQUIRED TO PROPERLY COMPLETE THE WORK.
4. PERFORM DAILY CLEANUP OPERATIONS INCLUDING REMOVAL OF DEBRIS AND EXCESS CONSTRUCTION MATERIAL, AND DRIVEWAY/STREET CLEANING TO THE SATISFACTION OF THE OWNER.
5. ALL CONSTRUCTION TO CONFORM WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODE REQUIREMENTS.
6. INSTALL 30 BOLLARDS AT LOCATIONS DITECTED BY ENGINEER IN FIELD.
7. ALL WORK SHOWN ON THIS SHEET IS 'CONTRACT G' UNLESS OTHERWISE NOTED.

## GRADING AND DRAINAGE NOTES:

1. FOR NEW CONSTRUCTION THAT MEETS EXISTING CONDITIONS, ABUTTING SURFACES SHALL BE FLUSH AND ALIGNED.
2. ADJUST ALL EXISTING CASTINGS AND VALVE COVERS TO MEET PROPOSED GRADE.
3. CONSTRUCTION DEBRIS AND EXCESS SOIL SHALL BE REMOVED AND LEGALLY DISPOSED OFF SITE.
4. UNSUITABLE SOILS ENCOUNTERED DURING CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER IMMEDIATELY IN WRITING BEFORE REMOVAL OR DISTURBANCE.
5. REFER TO C2.2 (YARD PIPING PLANS) FOR INFORMATION REGARDING MECHANICAL PIPING.
6. BACKFILL AROUND NEW VAULTS AND EQUIPMENT PAD WITH SUBSOIL. MATCH EXISTING GRADES

## EROSION CONTROL NOTES:

1. DURING THE COURSE OF CONSTRUCTION, EROSION AND SEDIMENT CONTROL MEASURES ARE NECESSARY TO PREVENT THE TRANSPORT OF SEDIMENT TO UNDISTURBED AREAS, PONDS, WATER COURSES, DRAINAGE SYSTEMS, RECHARGE BASINS, AND ROADS. THE MINIMUM EROSION CONTROL MEASURES REQUIRED ARE INDICATED ON THIS PLAN. IN ADDITION, THE FOLLOWING GENERAL CONDITIONS SHALL BE OBSERVED:
   a. EXISTING VEGETATION SCHEDULED TO REMAIN SHALL BE PROTECTED AND REMAIN UNDISTURBED.
   b. INSTALL ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES AS REQUIRED TO PREVENT THE INCIDENTAL DISCHARGE OF SEDIMENT FROM THE SITE.
2. SPECIFIC METHODS AND MATERIALS EMPLOYED IN THE INSTALLATION AND MAINTENANCE OF EROSION CONTROL MEASURES MUST CONFORM TO THE LATEST EDITION OF THE "NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL".
3. INSTALL PROPRIETARY EROSION AND SEDIMENT CONTROL PRODUCTS IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
4. ADJUST EROSION AND SEDIMENT CONTROL MEASURES TO ACCOMMODATE CONSTRUCTION PHASING TO MAINTAIN EFFECTIVENESS OF EROSION AND SEDIMENT CONTROL MEASURES.
5. PROTECT EXISTING DRAINAGE INLETS WITHIN THE PROJECT LIMITS AND NEW DRAINAGE INLETS INSTALLED AS PART OF THIS PROJECT FROM SEDIMENT INTRUSION.
6. PERFORM INSPECTION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL MEASURES ON A WEEKLY BASIS AND AFTER HEAVY OR PROLONGED STORMS. MAINTENANCE MEASURES INCLUDE, BUT ARE NOT LIMITED TO, CLEANING AND REPAIR OF ALL EROSION AND SEDIMENT CONTROL MEASURES.
7. UTILIZE APPROPRIATE MEANS TO CONTROL DUST DURING CONSTRUCTION, INCLUDING BUT NOT LIMITED TO APPLYING WATER TO BARE SOIL SURFACES.
8. MAINTAIN THE STABILIZED CONSTRUCTION ENTRANCE TO PREVENT SOIL AND LOOSE DEBRIS FROM BEING TRACKED ONTO LOCAL ROADS. MAINTAIN THE CONSTRUCTION ENTRANCE WEEKLY UNTIL THE SITE IS PERMANENTLY STABILIZED.
9. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL DISTURBED AREAS ARE PERMANENTLY STABILIZED. AFTER PERMANENT STABILIZATION, REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AND ALL ACCUMULATED SEDIMENT AND DEBRIS FROM THE SITE AND DRAINAGE STRUCTURES.

**TOTAL LAND DISTURBANCE = 0.24 ACRES**


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**CALVERTON SEWER DISTRICT**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD · PAX ET PROSPERITAS · PER PROGRESSUM · 1792

**Suffolk County, NY**

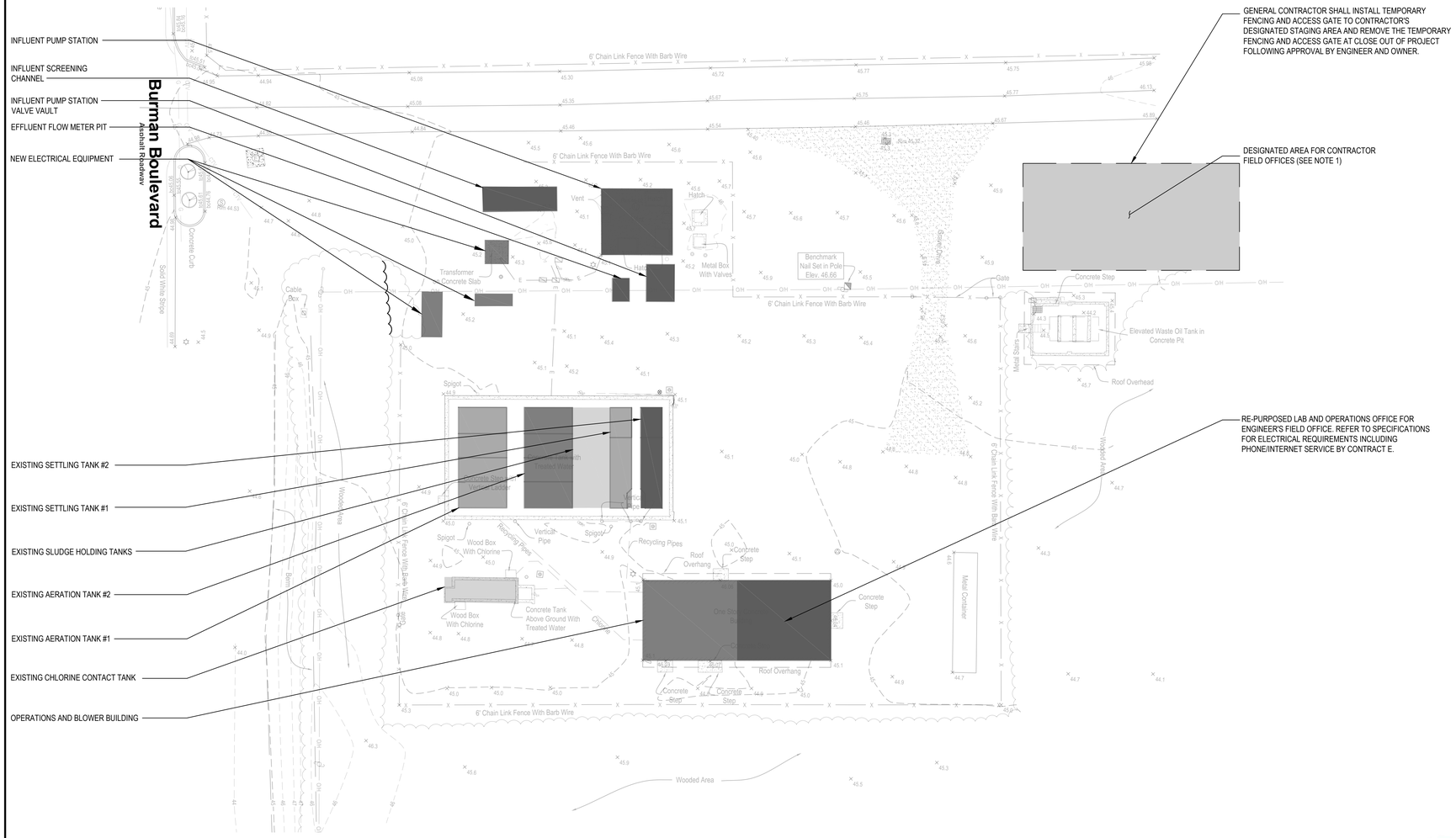
CONTRACT
**ALL CONTRACTS**

STATUS
**FINAL BID DOCUMENT**

SHEET TITLE
**SITE IMPROVEMENT PLAN**

DRAWING No.
**C2.0**

SHEET No.
14 OF 49




## Staging, Interim Operations and Staging Site Plan

SCALE: 1" = 20'

GRAPHIC SCALE

20 0 10 20

( IN FEET )
1 inch = 20 ft.

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LEGEND

- PHASE I
- PHASE II
- PHASE III
- PHASE IV
- FIELD OFFICE AND STAGING AREA

SITE STAGING AND INTERIM OPERATION NOTES:

1. STAGING AREA FOR CONTRACTORS SHALL BE COORDINATED WITH OWNER AND INCLUDED ON SITE UTILIZATION PLAN (SUP) PREPARED BY GENERAL CONTRACTOR. STAGING AREA LOCATIONS SHOWN ON THIS SHEET ARE GENERAL AND NOT INDICATIVE OF FINAL LOCATIONS APPROVED BY OWNER.
2. CONTRACTOR SHALL LOCATE FIELD OFFICES IN DESIGNATED AREA SHOWN. EXACT EXTENTS OF AREA SHALL BE COORDINATED IN FIELD AND APPROVED BY OWNER AND ENGINEER PRIOR TO STAGING OF FIELD OFFICES.
3. CONTRACTOR SHALL LEVEL GRADE IN AREAS WHERE OFFICES WILL BE PLACED AND PROVIDE COMPACTED SUB-GRADE TO PREVENT POTENTIAL SETTLEMENT.
4. SITUATE FIELD OFFICES IN LOCATIONS THAT DO NOT REQUIRE THE REMOVAL OF ANY EXISTING TREES AND AS APPROVED BY ENGINEER AND OWNER.
5. TEMPORARY FACILITIES SHALL BE PROVIDED IN ACCORDANCE WITH SPECIFICATIONS.
6. ALL EXISTING PAVEMENTS, DRIVES OR ANY OTHER AREAS USED AS A HAUL ROAD OR STAGING AREA BY ANY CONTRACTOR SHALL BE RESTORED IN-KIND TO THEIR PRE-CONSTRUCTION CONDITION OR TO THE SATISFACTION OF THE OWNER AND ENGINEER. THE COST OF MAINTAINING, REPAIRING, SEEDING/MULCHING OR CONSTRUCTING THESE PAVEMENTS SHALL BE INCIDENTAL TO THE CONTRACT.
7. ON-SITE MOBILIZATION SHALL NOT COMMENCE UNTIL THE SEQUENCING PLAN HAS BEEN APPROVED BY THE OWNER AND ENGINEER.
8. CONTRACTOR VEHICULAR TRAFFIC AND CONSTRUCTION ACTIVITIES SHALL YIELD TO WASTEWATER TREATMENT FACILITY OPERATIONS PERSONNEL, SHOULD IT BE NECESSARY FOR THE CONTRACTOR TO TEMPORARILY RELOCATE EQUIPMENT AT ANYTIME TO ALLOW FOR WASTEWATER TREATMENT FACILITIES OPERATION AND MAINTENANCE, THE CONTRACTOR SHALL DO SO AT NO ADDITIONAL COST TO THE OWNER.
9. WORK PERFORMED BY THE CONTRACTOR OUTSIDE OF DAYLIGHT HOURS SHALL BE PERFORMED UNDER SUFFICIENT ARTIFICIAL LIGHT TO ALLOW FOR PROPER CONSTRUCTION METHODS AND INSPECTIONS. LIGHTING SHALL BE AS APPROVED BY OWNER AND ENGINEER.
10. CONTRACTORS MATERIAL AND EQUIPMENT, WHEN NOT IN USE, SHALL BE STORED IN THE DESIGNATED STAGING AREA. ALL DELIVERIES, EQUIPMENT RE-FUELING, EQUIPMENT MAINTENANCE AND EQUIPMENT TRANSFERS SHALL TAKE PLACE WITHIN THE DESIGNATED STAGING AREA SO AS TO NOT INTERFERE WITH WASTEWATER TREATMENT FACILITY DAILY OPERATIONS.
11. EACH FIELD OFFICE SHALL HAVE A SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES ON-SITE SANITARY DISPOSAL SYSTEM.

## SITE SEQUENCING NOTES:

THE FOLLOWING IS A SEQUENCE OF CRITICAL WORK ITEMS THAT MUST BE PERFORMED TO MAINTAIN OPERATION OF THE TREATMENT PROCESS DURING CONSTRUCTION. AT A MINIMUM, CONSTRUCTION PHASING MUST ALLOW FOR THE COMPLETION OF THE MODIFIED INFLUENT PUMP STATION, NEW FINE SCREENING SYSTEMS AND PRE-EQUALIZATION TANK #1/PUMP STATION PRIOR TO THE START OF THE NEW MBR PROCESS SYSTEMS. FOLLOWING SUCCESSFUL STARTUP AND OPERATIONS OF THE NEW MBR PROCESS SYSTEMS, THE EXISTING PROCESS SYSTEMS CAN BE TAKEN OFFLINE TO COMPLETE THE PRE-EQUALIZATION TANK #2, EFFLUENT PUMP STATION AND SLUDGE HOLDING TANKS. ADDITIONAL WORK MAY BE COMPLETED AT ANY TIME, SUBJECT TO REVIEW BY THE OWNER AND ENGINEER. COORDINATE ALL MECHANICAL DEMOLITION WITH DE-ENERGIZATION OF ELECTRICAL COMPONENTS.

### PHASE I:

a. EMPTY AND CLEAN AERATION TANK #2 AND SETTLING TANK #2.

b. REMOVE EQUIPMENT FROM CLEANED TANKS.

c. CONVERSION OF EXISTING TANKS.
   1) AERATION TANK #2 TO MBR/ANOXIC TRAINS 1 AND 2.
      a) ADD NEW WALLS AND PIPING.
      b) INSTALL NEW EQUIPMENT IN MBR/ANOXIC TANKS.
   2) SETTLING TANK #2 TO PRE-EQUALIZATION TANK #1 AND PRE-EQUALIZATION PUMP STATION.
      a) ADD NEW WALLS AND PIPING.
      b) INSTALL NEW PUMPS AND AERATION DIFFUSERS.
   3) CONVERSION OF INFLUENT PS.
      a) REMOVE PUMP #3 FROM DRY WELL AND PIPING AS NECESSARY TO CREATE NEW WET WELL.
      b) BUILD DIVIDER WALL AND INSTALL NEW WET WELL EQUIPMENT.

d. CONCURRENT WITH CONVERSION OF TANKS, INSTALL NEW SCREENINGS CHANNEL AND NEW DISCHARGE PIPING WITH VALVES IN POSITION TO CONTINUE FLOW TO EXISTING WET WELL.

e. CONVERSION OF OPERATIONS BUILDING, INCLUDING INSTALLATION OF ALL NEW BLOWERS AND PERMEATE PUMPS, WITH TEMPORARY SETUP OF EXISTING BLOWERS TO MAINTAIN EXISTING TREATMENT PROCESS.

f. INSTALL NEW ROTARY DRUM SCREEN #1 WITH SUCCESSFUL STARTUP PRIOR TO DIVERTING FLOW TO NEW INFLUENT WET WELL, AND PRIOR TO STARTUP OF INFLUENT PUMP STATION AND PRE-EQUALIZATION SYSTEMS.

g. COMPLETE INFLUENT PS, SCREENINGS SYSTEM, PRE-EQUALIZATION TANK #1 AND PUMP STATION. THESE SYSTEMS MUST BE ONLINE PRIOR TO INTRODUCING FLOW TO NEW MBR/ANOXIC TANKS.

### PHASE II:

a. COMPLETE INSTALLATION AND STARTUP OF ROTARY DRUM SCREEN #2.

b. COMPLETE NEW MBR/ANOXIC SYSTEMS AND PLACE ONLINE.

c. SEND EFFLUENT THROUGH CHLORINE CONTACT TANK TEMPORARILY TO MAINTAIN DISINFECTION BY DIVERTING PERMEATE EFFLUENT PIPING TO EXISTING SETTLING TANK EFFLUENT TROUGH ON EAST SIDE OF PROCESS TANKAGE.

### PHASE III:

a. CLEAN AND EMPTY SETTLING TANK #1 AND AERATION TANK #1.

b. CONVERT SETTLING TANK #1 TO EFFLUENT PS AND PRE-EQUALIZATION TANK #2.

c. CONVERT AERATION TANK #1 TO NEW SLUDGE HOLDING TANKS.

d. CONCURRENT TO ALL WORK, THOUGH COMPLETE BEFORE COMPLETION OF EFFLUENT PUMP STATION, INSTALL EFFLUENT FORCE MAIN AND RECHARGE BEDS (CONTRACT S).

e. PLACE NEW EFFLUENT PUMP STATION, SLUDGE HOLDING TANKS, AND PRE-EQUALIZATION TANK #2 ONLINE.

### PHASE IV:

a. FINAL DEMOLITION INCLUDING CLEAN AND EMPTY EXISTING SLUDGE HOLDING TANKS AND CHLORINE CONTACT TANK.

b. SITE REHABILITATION.

c. COMPLETE ALL REMAINING CONTRACT WORK.

### ELECTRICAL SWITCHOVER:

1. INSTALL OUTDOOR SWITCHGEAR
2. REPLACE UTILITY TRANSFORMER
   a. RUN STP ON EXISTING EMERGENCY GENERATOR UNTIL COMPLETE
3. ENERGIZE NEW OUTDOOR SWITCHGEAR.
   a. TEMPORARY FEEDS TO
      i. INFLUENT PUMP STATION
      ii. EXISTING AERATION BLOWER IN TEMPORARY LOCATION
      iii. EXISTING 120V LOADS WITHIN CONTROL BUILDING
4. BUILD MCC ROOM
5. INSTALL NEW GENSET
6. ENERGIZE NEW MCC AND DISTRIBUTE POWER TO NEW EQUIPMENT
7. REMOVE TEMPORARY SET UPS AND ENERGIZE REMAINING LOADS FROM NEW MCC




1 Staging Area
SCALE: NTS

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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD 1792 · EX ET PROSPERITAS PER PROGRESSUM

**Suffolk County, NY**

CONTRACT

**ALL CONTRACTS**

STATUS

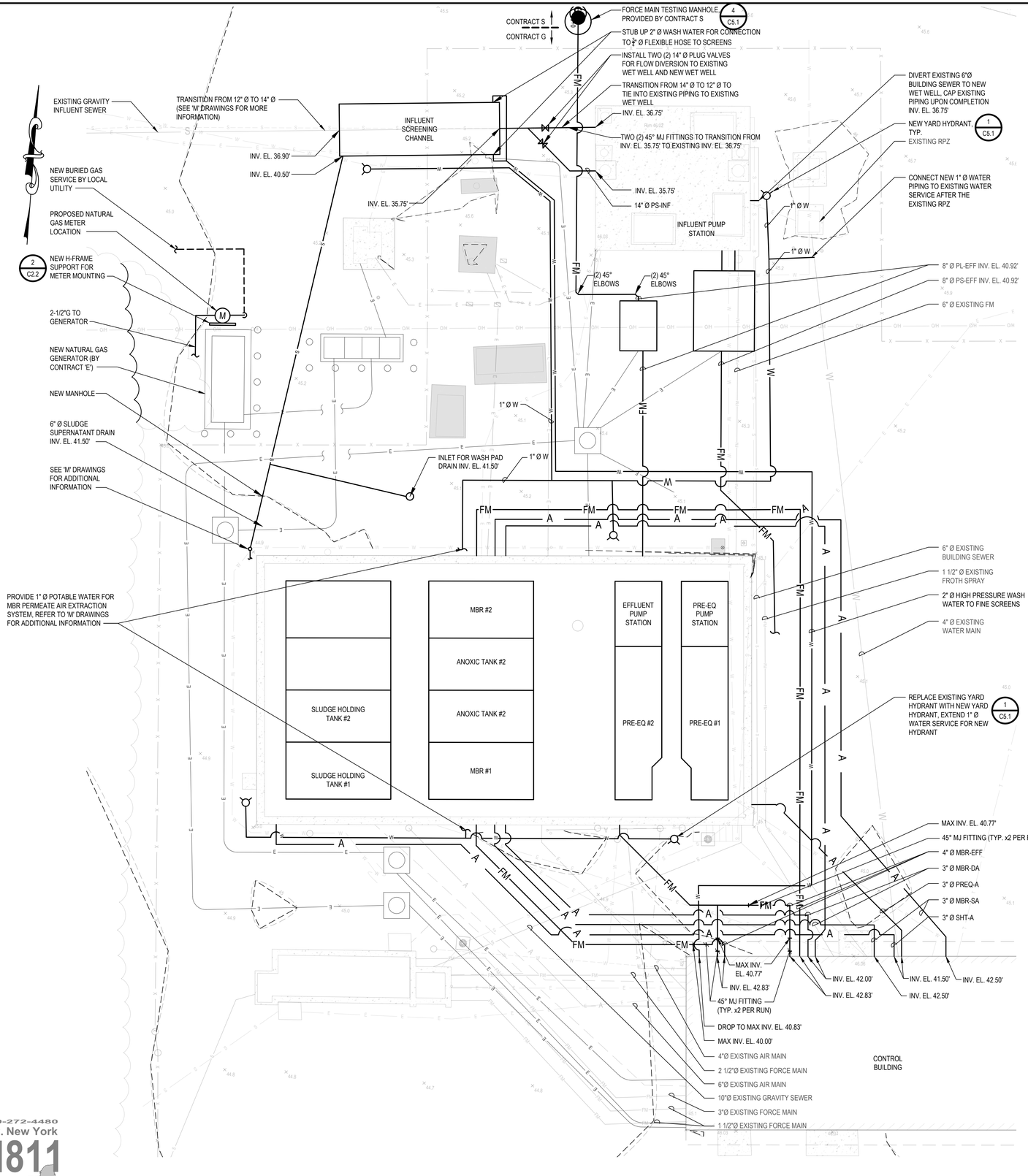
**FINAL BID DOCUMENT**

SHEET TITLE

**STAGING, INTERIM OPERATIONS AND PHASING SITE PLAN**

| DRAWING No. | SHEET No. |
|---|---|
| C2.1 | 15 OF 49 |

X:\CASD (Calverton Sewer District) - 1001\RCAS\1002 STP UPGRADE ES\2018\02-BIM-CADD\Con-docs\ss-ES\C2.1 Staging, Interim Operations and Phasing Site Plan.dwg Last Modified: Nov 12, 2018 - 3:07pm Plotted on: Nov 12, 2018 - 3:06pm By: hoolberg



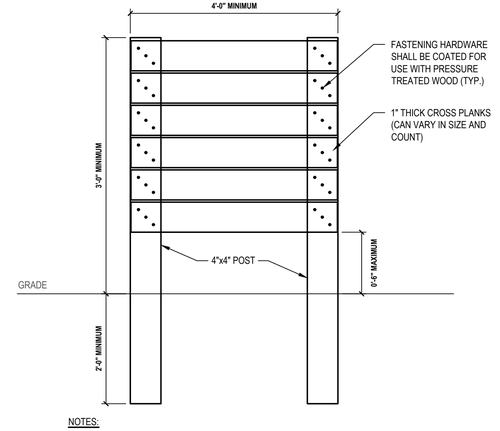

## 1 Yard Piping Plan
SCALE:1 1/2" = 1' - 0"

### NATURAL GAS SERVICE GENERAL NOTES:

1. PROVIDE NEW GAS HEADER FOR NEW NATURAL GAS METER AT THE LOCATION SHOWN. PROVIDE ALL HEADER PIPING, VALVES, REGULATORS, AND VENT PIPING IN ACCORDANCE WITH THE LOCAL GAS UTILITY REQUIREMENTS. GAS METER SIZE AND HEADER CONFIGURATION SHALL BE COORDINATED WITH LOCAL GAS UTILITY. COORDINATE FINAL LOCATION OF METER WITH OWNER. CONSTRUCT HEADER IN ACCORDANCE WITH ALL LOCAL UTILITY REQUIREMENTS. METER SHALL BE PROVIDED BY THE UTILITY.
2. LOCAL GAS UTILITY TO INSTALL GAS SERVICE FROM STREET MAIN UP TO NEW METER HEADER (INCLUDING NEW REGULATOR). UTILITY WILL SAWCUT, TRENCH, AND BACKFILL AS REQUIRED. CONTRACTOR RESPONSIBLE FOR ALL FINAL RESTORATION WORK INCLUDING ASPHALT, CONCRETE CURBS, SIDEWALKS, AND GRASS AREAS. CONTRACTOR RESPONSIBLE FOR COORDINATING ALL WORK AND FILING ALL APPLICATIONS WITH THE LOCAL UTILITY COMPANY.
3. CONTRACTOR RESPONSIBLE FOR THE INSTALLATION OF ALL "CUSTOMER OWNED" NATURAL GAS PIPING.
4. OWNER WILL PAY FEES CHARGED BY LOCAL UTILITY FOR INSTALLATION OF THE NEW GAS SERVICE AS SPECIFIED IN SPECIFICATION SECTION 012100 - ALLOWANCES.
5. SAW-CUT, TRENCH, BACKFILL, AND RESTORE EXISTING SITE AS REQUIRED FOR INSTALLATION OF "CUSTOMER OWNED" PIPING.
6. OBTAIN A MARK-OUT OF ALL BURIED UTILITIES PRIOR TO THE START OF ANY EXCAVATION WORK.
7. ALL EXTERIOR, ABOVE GROUND GAS PIPING SHALL BE GALVANIZED STEEL.
8. TERMINATE REGULATOR VENT PIPING IN ACCORDANCE WITH THE LOCAL UTILITY'S REQUIREMENTS.
9. PROVIDE SUPPORTS FOR INSTALLATION OF NEW GAS REGULATORS IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL UTILITY COMPANY.

### SITE PIPING GENERAL NOTES:

1. ALL BURIED LIQUID PIPING SHALL HAVE A MINIMUM OF 4 FEET OF GROUND COVERAGE, UNLESS OTHERWISE NOTED.
2. ALL EXPOSED LIQUID CARRYING PIPING SHALL BE HEAT TRACED AND INSULATED. CONTRACT G SHALL FURNISH AND INSTALL ALL INSULATION. CONTRACT E SHALL FURNISH AND INSTALL HEAT TRACING OUTLETS AND WIRING.
3. ALL BURIED AIR PIPING SHALL HAVE A MINIMUM OF 2 FEET OF GROUND COVERAGE, UNLESS OTHERWISE NOTED.
4. TEMPORARILY RE-ROUTE EXISTING FORCE MAIN AROUND NEW VALVE VAULT IN ORDER TO KEEP EXISTING INFLUENT PUMP STATION ONLINE PRIOR TO SUCCESSFUL STARTUP OF NEW PUMP STATION.
5. ALL EXISTING GRAVITY SEWER AND FORCE MAIN PIPING APPROXIMATELY AT INV. EL. 41' UNLESS OTHERWISE NOTED.
6. PRESSURE TEST MANHOLE SHALL BE INSTALLED BY CONTRACT S. CONTRACT G TO CONNECT EFFLUENT FORCE MAIN FROM FLOW METER VAULT AFTER THE MANHOLE IS INSTALLED.
7. EXISTING PIPING TO BE ABANDONED IN PLACE UNLESS OTHERWISE NOTED,
8. UNDERGROUND ELECTRIC SHOWN FOR INFORMATION ONLY, TO BE INSTALLED BY CONTRACT E.
9. ALL WORK THIS SHEET SHALL BE WORK UNDER CONTRACT G UNLESS OTHERWISE NOTED.




NOTES:

1. ALL WOOD USED SHALL BE PRESSURE TREATED.

## 2 H-Frame Gas Meter Support
SCALE:NTS

811 1-800-272-4480
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Melville, NY 11747
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CHRISTOPHER A. WEISS
No. 072204
LICENSED PROFESSIONAL ENGINEER

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**CALVERTON SEWER DISTRICT**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD 1792 PAX ET PROSPERITAS PER PROGRESSUM

**Suffolk County, NY**

CONTRACT
**ALL CONTRACTS**

STATUS
**FINAL BID DOCUMENT**

SHEET TITLE
**YARD PIPING PLAN**

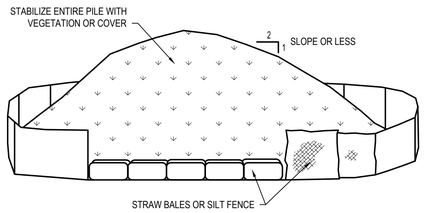
DRAWING No.
**C2.2**

SHEET No.
16 OF 49

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NOTES:

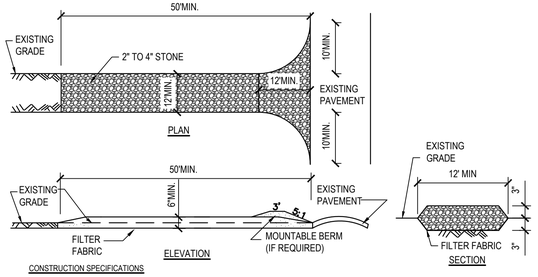
1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2:1.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAW BALES, THEN STABILIZED WITH VEGETATION OR COVERED.




TO BE USED WHERE TOPSOIL IS NECESSARY FOR REGRADING AND VEGETATING DISTURBED AREAS. TEMPORARY STOCKPILE STABILIZATION MEASURES INCLUDE VEGETATIVE COVER, MULCH, NONVEGETATIVE COVER, AND PERIPHERAL SEDIMENT TRAPPING BARRIERS. THE STABILIZATION MEASURE(S) SELECTED SHOULD BE APPROPRIATE FOR THE TIME OF YEAR, SITE CONDITIONS, AND REQUIRED PERIOD OF USE.

## 1 Temporary Soil Stockpile

NTS (312513.23 NYDC1) - U

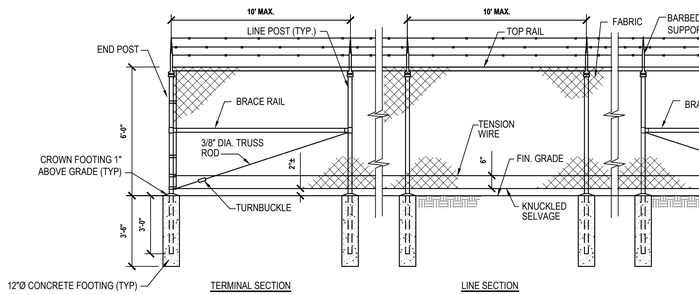



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE TO BE 2" TO 4".
2. LENGTH - NOT LESS THAN 50 FEET (UNLESS INDICATED OTHERWISE ON PLANS).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. PLACE FILTER FABRIC OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE. FILTER FABRIC TO BE TREVIRA SPUNBOND, 1135 MIRAFI 600X OR EQUIVALENT.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

## 2 Stabilized Construction Entrance

NTS (312513.19 NYDC1) - U

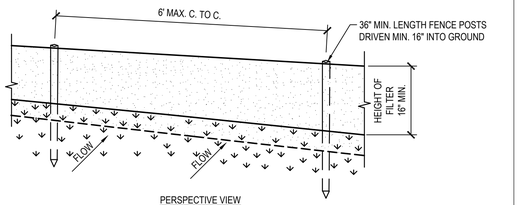


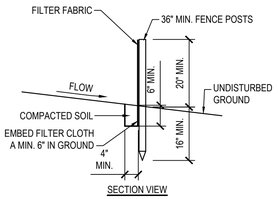

NOTES:

1. FABRIC: ASTM A392, 2" MESH, 6 GAUGE STEEL CHAIN LINK FENCE FABRIC. HOT DIPPED GALVANIZED AFTER WEAVING TO 1.2 OZ/SF.
2. TOP AND BRACE RAILS: ASTM F1043 1.66" O.D. (1.84 LBS./FT.) SS40 STEEL PIPE. HOT DIPPED GALVANIZED TO 1.8 OZ/SF IN ACCORDANCE WITH ASTM A123.
3. LINE POSTS: ASTM F1043 1.9" O.D. (2.28 LBS./FT.) SS40 STEEL PIPE. HOT DIPPED GALVANIZED TO 1.8 OZ/SF IN ACCORDANCE WITH ASTM A123.
4. END, CORNER & PULL POSTS: ASTM F1043 2.375" O.D. (3.12 LBS./FT.) SS40 STEEL PIPE. HOT DIPPED GALVANIZED TO 1.8 OZ/SF IN ACCORDANCE WITH ASTM A123.
5. FITTINGS AND ACCESSORIES: ASTM F626 MALLEABLE OR PRESSED STEEL. HOT DIPPED GALVANIZED TO 1.2 OZ/SF.
6. BOTTOM TENSION WIRE: ASTM A824 NO. 7 GAUGE STEEL-MARCELLED WIRE, HOT DIPPED GALVANIZED TO 1.2 OZ/SF.
7. STRETCHER BAR: 3/16" x 3/4" PRESSED STEEL, HOT DIPPED GALVANIZED TO 1.2 OZ/SF.
8. BARBED WIRE: GALVANIZED STEEL WIRE, DOUBLE STRAND 13-3/4 GAGE, 0.083 INCH TWISTED LINE WIRE WITH 4 POINT BARBS SPACES 3 INCHED ON CENTER.
9. CONCRETE TO ACHIEVE 4000 PSI STRENGTH AT 28 DAYS.

## 3 Chain Link Fence - Galvanized - Barbed Wire - 6' Height

NTS (323113.14 H2MX2) - U



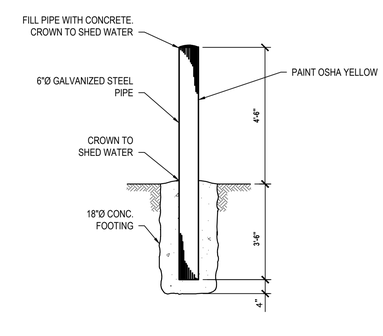




NOTES

1. POSTS SHALL BE 2" X 2" HARDWOOD OR APPROVED EQUIVALENT.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO POSTS AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED AND SECURE AT POST. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND ACCUMULATED SEDIMENT REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
5. REMOVE SILT FENCE UPON PERMANENT STABILIZATION OF UPLAND AREAS.

## 4 Silt Fence - Standard

NTS (312513.13NYDC1) - U

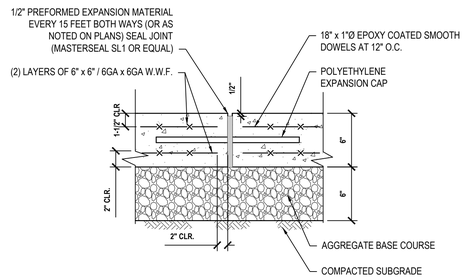



NOTE:

1. GENERAL CONTRACTOR SHALL PROVIDE 30 BOLLARDS INSTALLED AT LOCATIONS AS DIRECTED BY THE ENGINEER IN FIELD.
2. CONCRETE TO ACHIEVE 4000 PSI STRENGTH AT 28 DAYS.

## 5 Steel Bollard - 6" Diameter

NTS (323613.00 H2MX2)

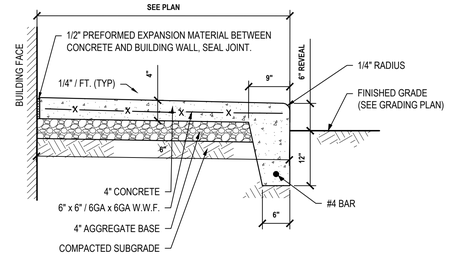



NOTE:

1. CONCRETE TO ACHIEVE 4,000 P.S.I. STRENGTH AT 28 DAYS.
2. APPLY BROOM FINISH PERPENDICULAR TO PRIMARY DIRECTION OF TRAVEL.
3. THIS DETAIL APPLIES TO ALL JOINTS IN NEW CONCRETE PAVEMENT AND WHEN NEW CONCRETE PAVEMENT ABUTS EXISTING CONCRETE PAVEMENT. WHEN ABUTTING EXISTING CONCRETE PAVEMENT, DRILL AND GROUT DOWELS INTO EXISTING CONCRETE PAVEMENT .
4. COMPACT SUBGRADE TO 92% MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D1557.

## 6 Concrete Pavement - Heavy Duty

NTS (321313.26 H2MX1) - U

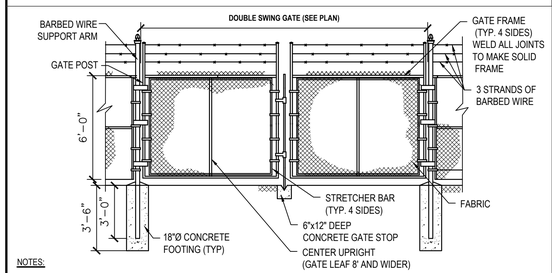



NOTES:

1. WOOD FLOAT AND BRUSH FINISH ON ALL SURFACES ABOVE GRADE.
2. CONCRETE TO ACHIEVE 4,000 P.S.I. AT 28 DAYS.
3. COMPACT SUBGRADE TO 92% MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D1557.

## 7 Concrete Landing

NTS (321315.00 H2MX1) - U




NOTES:

1. FABRIC: ASTM A392, 2" MESH, 6 GAUGE STEEL CHAIN LINK FENCE FABRIC. HOT DIPPED GALVANIZED AFTER WEAVING TO 1.2 OZ/SF.
2. FRAME: ASTM F900, 1.9" O.D. (2.28 LBS./FT.) STEEL PIPE. HOT DIPPED GALVANIZED TO 1.8 OZ/SF IN ACCORDANCE WITH ASTM A123 (SEE TABLE FOR SIZE AND WEIGHT).
3. GATE POST: ASTM F1043, SS40 STEEL PIPE. HOT DIPPED GALVANIZED TO 1.8 OZ/SF IN ACCORDANCE WITH ASTM A123 (SEE TABLE FOR SIZE AND WEIGHT).
4. HINGES: ASTM F900, NON-LIFT-OFF TYPE.
5. LATCH: ASTM F900 FORKED TYPE GRAVITY DROP WITH PROVISION FOR PADLOCK.
6. FITTINGS AND ACCESSORIES: ASTM F 626, MALLEABLE OR PRESSED STEEL, HOT DIPPED GALVANIZED TO 1.2 OZ/SF.
7. GATE KEEPER: ASTM F900.
8. PROVIDE GATE KEEPER FOR EACH SWING GATE.
9. BARBED WIRE: GALVANIZED STEEL WIRE, DOUBLE STRAND 13-3/4 GAGE, 0.083 INCH TWISTED LINE WIRE WITH 4 POINT BARBS SPACED 3 INCHES ON CENTER.
10. CONCRETE TO ACHIVE 4000 PSI STRENGTH AT 28 DAYS.

| GATE LEAF WIDTH | GATE POST OUTSIDE DIAMETER (INCHES) | MINIMUM WEIGHT (LB/FT) |
|---|---|---|
| UP TO 4' | 2.375 | 3.12 |
| 5' TO 10' | 2.875 | 4.64 |
| 11' TO 18' | 4.000 | 6.56 |

## 8 Chain Link Double Swing Gate - Galvanized - Barbed Wire - 6' Height

NTS (323113.24 H2MX2) - U


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**CALVERTON SEWER DISTRICT**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD — FAX ET PROSPERITAS PER PROGRESSUM — 1792

**Suffolk County, NY**

CONTRACT

**CONTRACT G**
**GENERAL CONSTRUCTION**

STATUS

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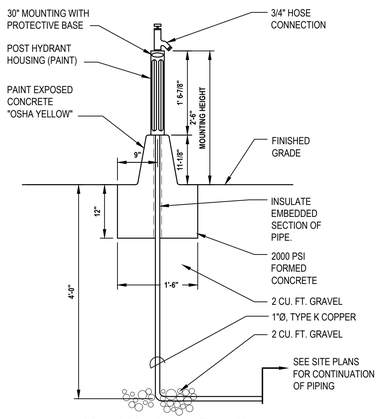
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**SITE DETAILS**

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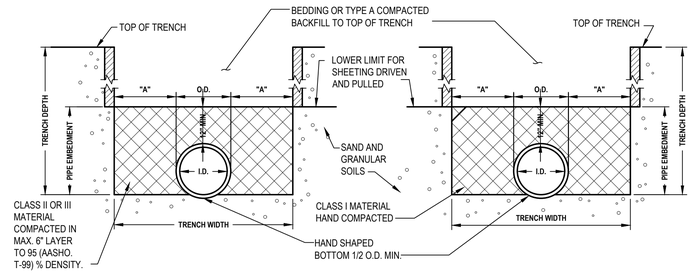
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## 1 Yard Hydrant Detail
NOT TO SCALE

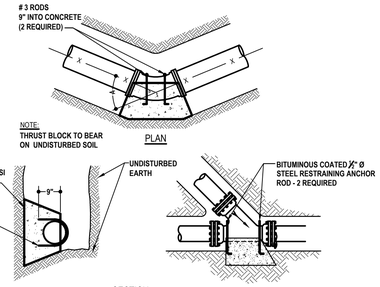
**NOTE:**
PROVIDE PIPE ADAPTER AS REQUIRED.




**ALTERNATE "A"** **ALTERNATE "B"**

## 2 Pipe Foundation in Granular Soils all Trench Depths
NOT TO SCALE

| I.D. | "A" (MAX) |
|---|---|
| 1-1/2" Ø TO 36" Ø | 12" |
| 42" Ø TO 84" Ø | 18" |
| 96" Ø TO 144" Ø | 24" |




THRUST BLOCK NOTES:

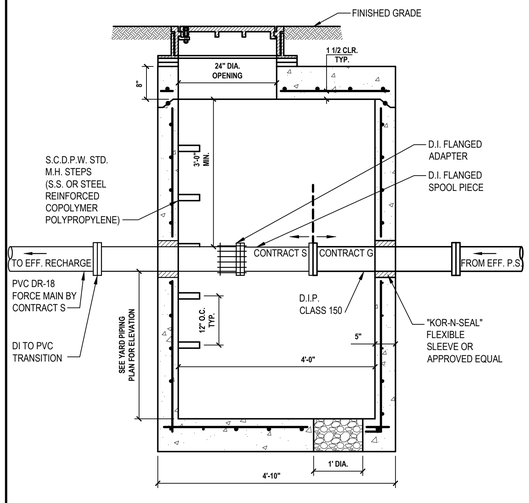
1. INSTALL CONCRETE BLOCKING ON ALL PIPE LINES 4-INCH IN DIAMETER AND LARGER AT ALL TEES, PLUGS, CAPS, AND AT BENDS DEFLECTING 22 1/2 DEGREES OR MORE. BLOCKING SHALL BE A CONCRETE MIX HAVING A COMPRESSIVE STRENGTH OF NOT LESS THAN 2,000 PSI. PLACE BLOCKING BETWEEN SOLID GROUND AND THE FITTING TO BE ANCHORED. PLACE BLOCKING SO THAT THE PIPE AND FITTING JOINTS WILL BE ACCESSIBLE FOR REPAIR.
2. FOR ALL PIPELINES, TIE RODS AND PIPE CLAMPS OR RETAINER GLANDS SHALL BE PROVIDED IN ADDITION TO CONCRETE BLOCKING SPECIFIED ABOVE AT AND IN THE VICINITY OF TEES, PLUGS CAPS AND BENDS DEFLECTING 22-1/2 DEGREES OR MORE.
3. FOR ALL VERTICAL BENDS, 3/4-INCH DIAMETER TIE RODS AND PIPE CLAMPS OR RETAINER GLANDS SHALL BE PROVIDED IN ADDITION TO THE CONCRETE BLOCKING SPECIFIED ABOVE FOR BENDS DEFLECTING 22-1/2 DEGREES OR MORE.

| PIPE SIZE | DEAD END OR TEE | 90° BEND | 45° BEND | 22½° BEND |
|---|---|---|---|---|
| 4" | 1 | 2 | 1 | ½ |
| 6" | 3 | 4 | 2 | 1 |
| 8" | 5 | 7 | 4 | 2 |
| 10" | 7 | 10 | 5 | 2½ |
| 12" | 10 | 15 | 7½ | 4 |
| 16",20",24" | 16 | 24 | 12 | 6 |

**THRUST BLOCK BEARING AREA**
SQUARE FOOT BEARING AREA OF BLOCKING ON UNDISTURBED EARTH

NOTE:
MAX. TEST PRESSURE 200 PSI

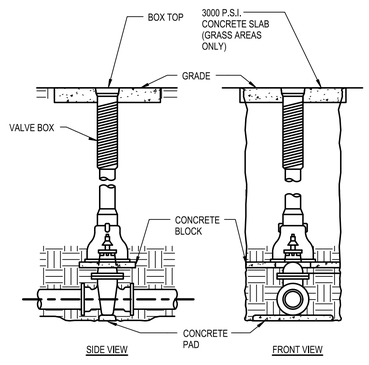
## 3 Thrust Block Detail
NOT TO SCALE




**NOTES:**

1. EFFLUENT FORCE MAIN PRESSURE TEST TO BE PERFORMED PRIOR TO PLACING EFFLUENT PUMP STATION ONLINE.
2. TEST MANHOLE TO BE FURNISHED AND INSTALLED AS PART OF CONTRACT S - FORCE MAIN/RECHARGE BED CONSTRUCTION.
3. GENERAL CONTRACTOR TO PROVIDE PIPE TO SPOOL PIECE. REMOVE SPOOL PIECE TO PERFORM PRESSURE TEST. REPLACE SPOOL PIECE UPON SUCCESSFUL PRESSURE TEST OF NEW PIPE.

## 4 Force Main Testing Manhole Detail
NO SCALE




## 5 Typical Valve Box/Curb Stop Detail
NO SCALE

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**CALVERTON SEWER DISTRICT**

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**Suffolk County, NY**

CONTRACT
**CONTRACT G**
**GENERAL CONSTRUCTION**

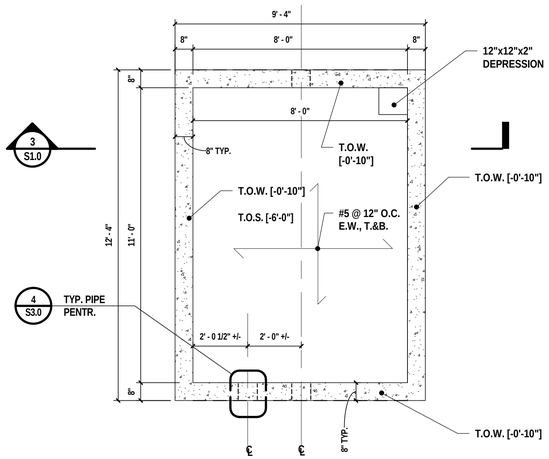
STATUS
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**YARD PIPING DETAILS**

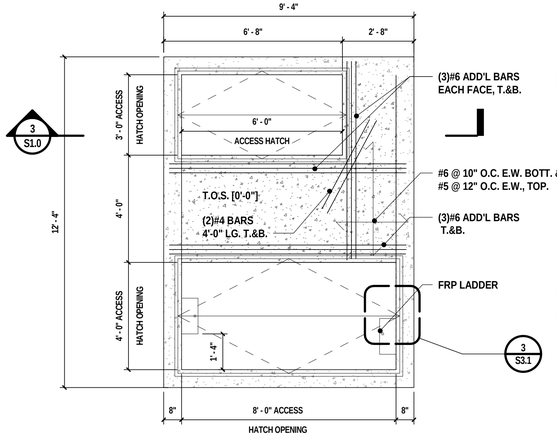
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18 OF 49

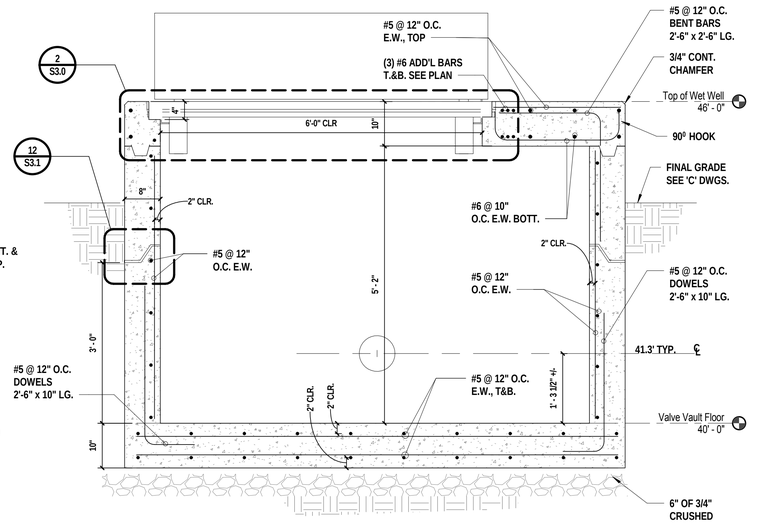
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1 **Precast Influent Valve Vault Foundation Plan**
SCALE: 3/8" = 1'-0"



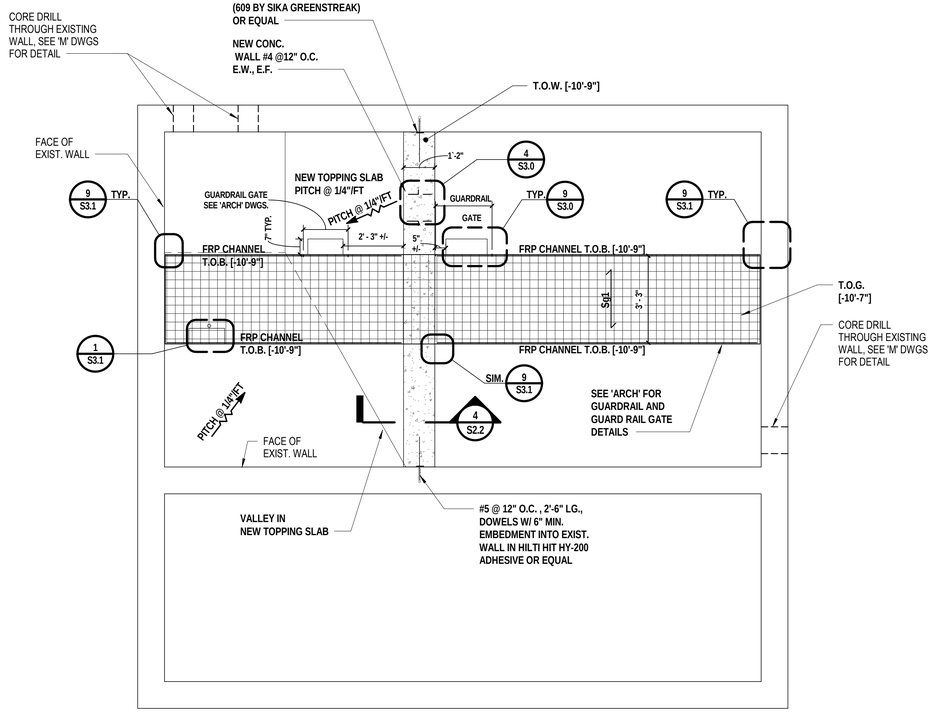

2 **Precast Influent Valve Vault Top Slab Plan**
SCALE: 3/8" = 1'-0"



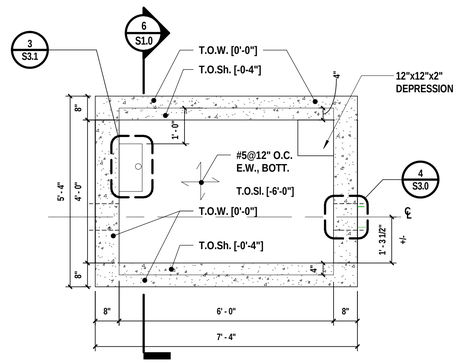

3 **Section at Precast Influent Valve Vault**
SCALE: 3/4" = 1'-0"

**LEGEND:**

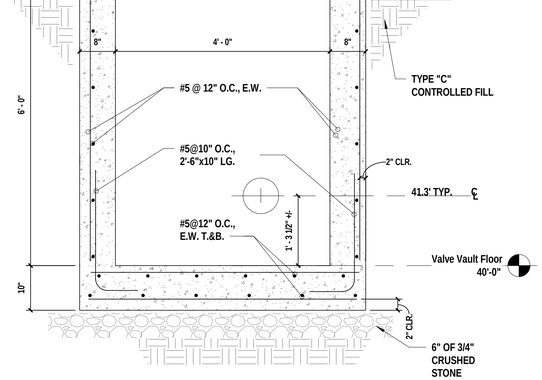
| | |
|---|---|
| T.O.B. = | TOP OF BEAM |
| E.O.S. = | EDGE OF SLAB |
| T.O.S. = | TOP OF SLAB |
| T.O.G. = | TOP OF GRATING |
| U.O.N. = | UNLESS OTHERWISE NOTED |
| T.O.W. = | TOP OF WALL |
| ℄ = | CENTERLINE |
| → | INDICATES PITCH DIRECTION OF SLAB |



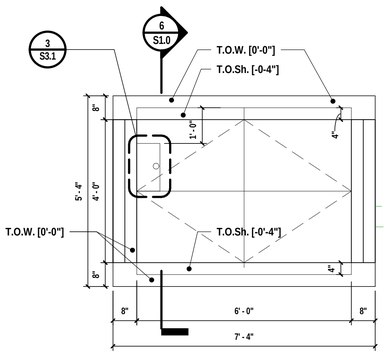

4 **Influent Pump Station Plan**
SCALE: 3/8" = 1'-0"




5 **Precast Effluent Flow Meter Vault Foundation Plan**
SCALE: 1/2" = 1'-0"




6 **Section at Effluent Flow Meter Vault**
SCALE: 3/4" = 1'-0"




7 **Precast Effluent Flow Meter Vault Slab Plan**
SCALE: 1/2" = 1'-0"

**FRP FLOOR FRAMING NOTES:**

1. DESIGN AND FABRICATION OF FRP STRUCTURES, INCLUDING FRAMING, GRATING, RAILINGS, AND ALL OTHER APPURTENANT CONNECTION HARDWARE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR'S FABRICATOR. REFER TO SPECIFICATION SECTION 068200 FOR ADDITIONAL REQUIREMENTS.
2. FIELD VERIFY DIMENSIONS OF FRP FRAMING.
3. FRP PLANS AND DETAILS ARE FOR GUIDE AND REFERENCE PURPOSE ONLY. MANUFACTURER SHALL BE RESPONSIBLE FOR LAYOUT OF FRAMING AND SUPPORT ASSEMBLY. SUBMIT SHOP DRAWINGS TO ENGINEER OF RECORD FOR REVIEW. FRP SHOP DRAWINGS, INCLUDING CONNECTIONS AND FRAMING CALCULATIONS SHALL BE SUBMITTED FOR REVIEW AFFIXED WITH A NEW YORK STATE PROFESSIONAL ENGINEER'S SEAL AND SIGNATURE.
4. NO WORK SHALL BE PERFORMED ON THIS ITEM UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED BY THE ENGINEER OF RECORD.
5. DESIGN FRP GRATING FOR A LIVE LOAD OF 100PSF.

**FOUNDATION PLAN NOTES:**

1. ELEVATIONS SHOWN THUS [ ] ARE RELATIVE TO TOP OF WET WELL ELEVATION [+/- 46'-0"].
2. ALL EXCAVATED EARTH SHALL BE REPLACED WITH TYPE 'C' CONTROLLED FILL IN ACCORDANCE WITH SPECIFICATION SECTION 312323.13.
3. CONTRACTOR SHALL COORDINATE SIZE AND LOCATIONS OF ALL REQUIRED PIPING AND CONDUIT PENETRATIONS THROUGH FOUNDATION WALL WITH ALL OTHER CONTRACTS. PROVIDE PIPE SLEEVES AND REINFORCEMENT AROUND PENETRATIONS AS PER DETAILS 6 ON SHEET S3.0.
4. REFER TO 'A' DWGS FOR WATERPROOFING REQUIREMENTS.
5. Sg1 INDICATES SPAN OF 2" FRP GRATING.

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**CONTRACT G**
**GENERAL CONSTRUCTION**

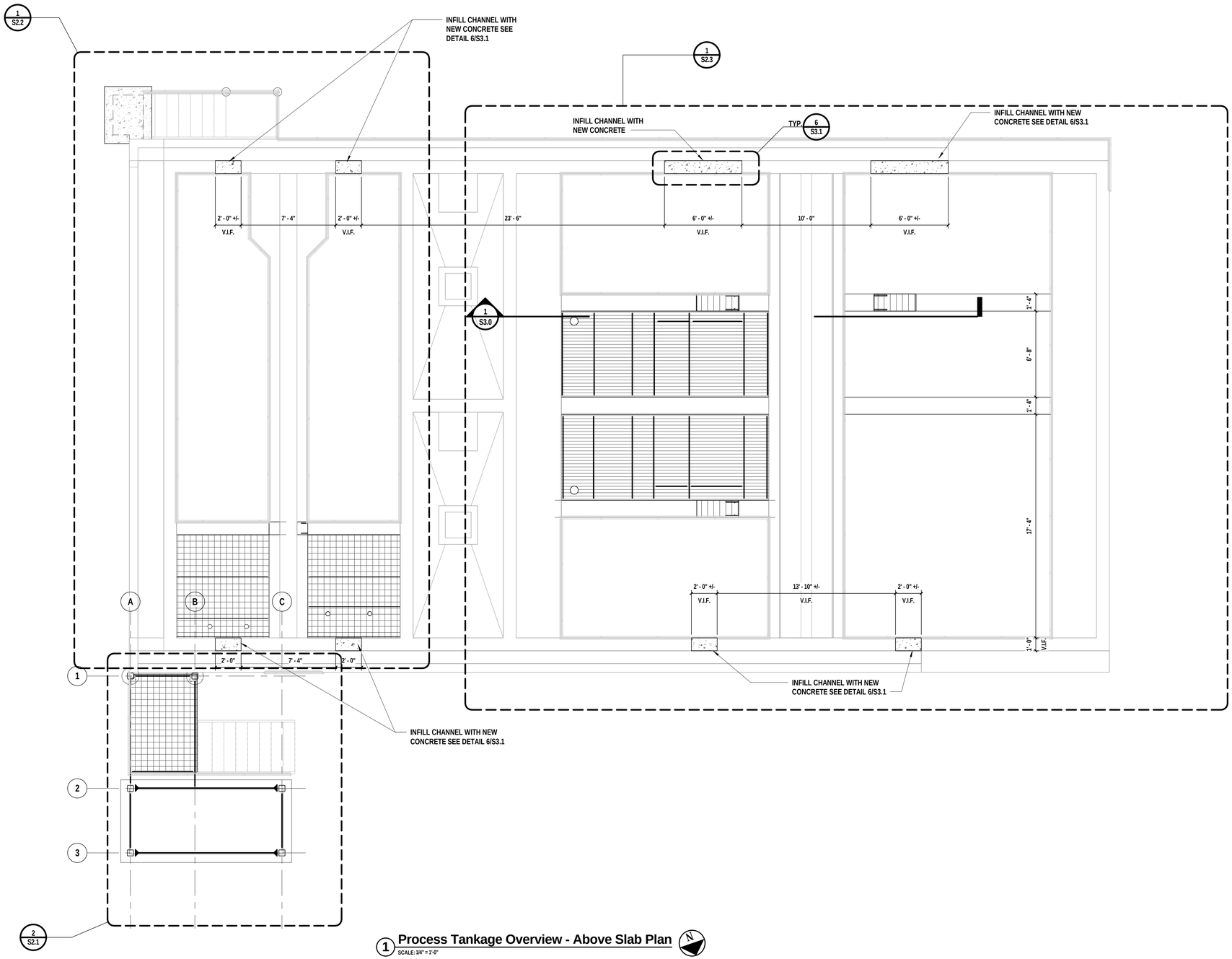
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**FINAL BID DOCUMENT**

SHEET TITLE
**VALVE VAULT, EFFLUENT FLOW METER AND INFLUENT PUMP STATION PLANS**

DRAWING # **S1.0**

SHEET # 19 OF 49

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## 1 Process Tankage Overview - Above Slab Plan

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


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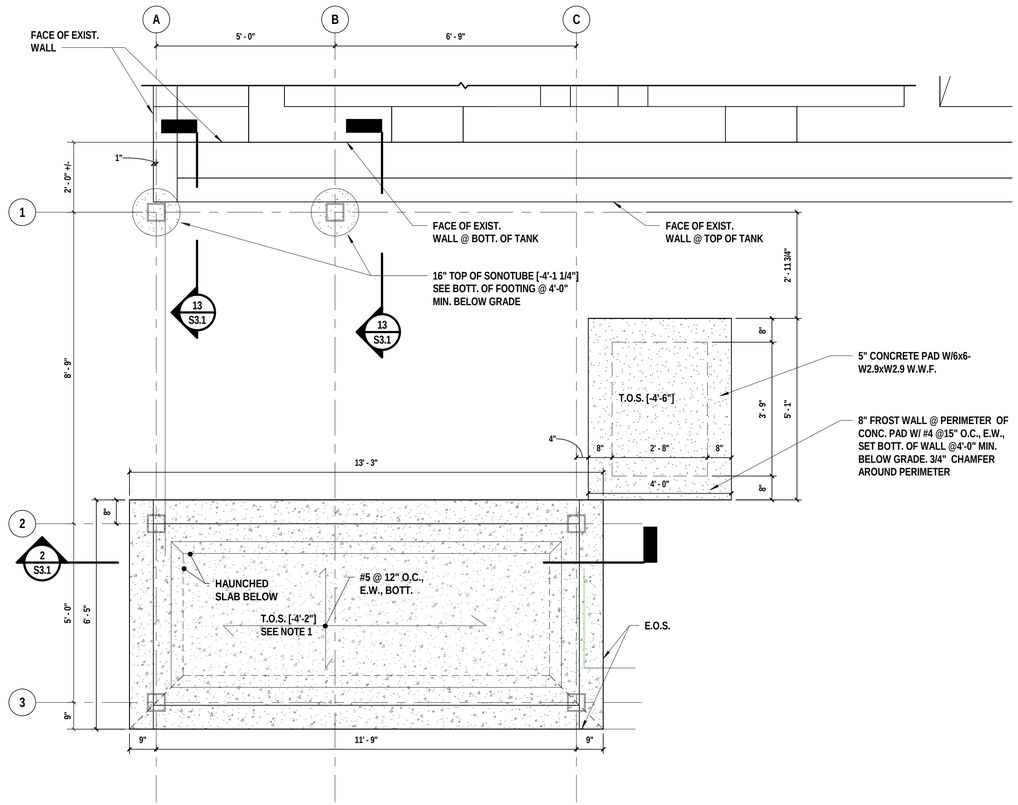
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**PROCESS TANK OVERVIEW-TOP SLAB**

| DRAWING # | SHEET # |
|---|---|
| S2.0 | 20 OF 49 |

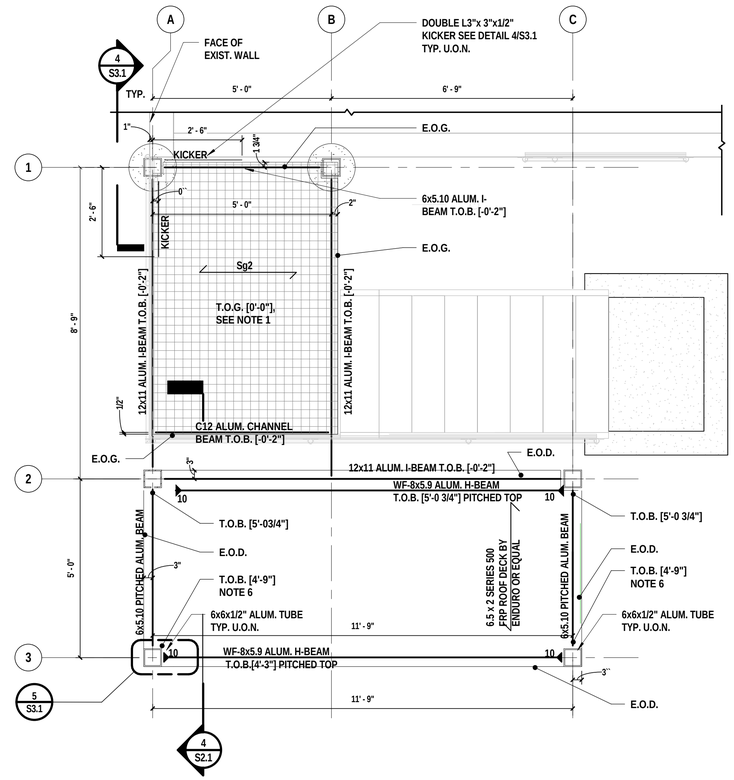
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## 1 Canopy and Stair Foundation Plan

SCALE: 1/2" = 1'-0"




## 2 Canopy and Stair Framing Plan

SCALE: 1/2" = 1'-0"

**LEGEND:**

E.O.S. = EDGE OF SLAB

E.O.G. = EDGE OF GRATING

T.O.B. = TOP OF BEAM

T.O.S. = TOP OF SLAB

**NOTES:**

1. ELEVATIONS SHOWN THUS [ ] ARE RELATIVE TO TOP OF PROCESS TANK ELEVATION [50'-0"].
2. Sg2 INDICATES SPAN OF 2" ALUMINUM GRATING, TYPE GAL-200 BY McNICHOLS Co., OR EQUAL.
3. INDICATES BEAM TO COLUMN MOMENT CONNECTION WITH THE NUMBER REPRESENTING THE A.S.D. MOMENT CAPACITY IN FT-KIPS.
4. ALUMINUM CONNECTION PIECE DETAILS SHALL BE SUBMITTED WITH CALCULATIONS SIGNED AND SEALED BY A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER. CONNECTION DESIGNER SHALL DESIGN ALL MOMENT CONNECTIONS AS LISTED ON DRAWINGS. SIMPLE SHEAR CONNECTIONS SHALL BE DESIGNED FOR A MINIMUM OF 4 KIPS. WHERE AXIAL FORCE IN BEAMS IN NOT LISTED IN DRAWINGS, IT SHALL BE TAKEN AS 10 KIPS ASD. ALL CONNECTIONS SHALL BE DESIGNED CONSIDERING AXIAL, SHEAR AND MOMENT FORCES SIMULTANEOUSLY AS REQUIRED BY BUILDING CODE. SEE SPECIFICATIONS FOR ADDITIONAL DESIGN LOADING REQUIREMENTS.
5. COORDINATE DIMENSIONS OF STAIR LANDING FRAMING WITH STAIR MANUFACTURER. SEE 'A' DWGS. FOR ADDITIONAL INFORMATION.
6. TOP OF PITCHED ROOF STEEL HAS BEEN NOTED THAT AS THE ELEVATION OF THE STEEL PROJECTED TO THE COLUMN LINE. ACTUAL TOP OF STEEL ELEVATION AT TERMINAL ENDS OF BEAM MAY DIFFER SLIGHTLY.
7. LOCATION OF PLATFORM FRAMING BEAMS HAVE BEEN SET TO ALIGN WITH EDGE OF BAR SCREEN BOX. CONTRACTOR SHALL COORDINATE THESE LOCATIONS WITH FABRICATION OF BOX PRIOR TO INSTALLATION OF FRAMING.

**DESIGN LOADS:**

1. PLATFORM DESIGN LOADS
   DEAD LOAD: 10 PSF
   LIVE LOAD : 60 PSF
2. SNOW LOADS:

| | |
|---|---|
| GROUND SNOW LOAD, | Pg = 20 PSF |
| (EXPOSURE) | Ce = 1.0 |
| (THERMAL) | Ct = 1.0 |
| (IMPORTANCE) | Is = 1.1 |
| FLAT ROOF SNOW LOAD | PF = Is * Pg = 22 PSF |

3. WIND LOADS:

| | |
|---|---|
| BASIC WIND SPEED: | 130 MPH |
| EXPOSURE: | B |
| OCCUPANCY CATEGORY: | II |
| WIND DIRECTIONALITY FACTOR: | 0.85 |
| VELOCITY PRES. EXPO COEFFICIENT: | 0.56 |
| TOPOGRAPHIC FACTOR: | 1.0 |
| NET PRESSURE COEFFICIENT | 1.2 |
| WIND PRESSURE | 28.67 PSF |
| NET UPLIFT | 14.5 PSF |

4. SEISMIC CRITERIA:
   SITE CLASS: E
   (IMPORTANCE) Ie = 1.25
   Fa = 2.5 FV = 3.5
   Ss = 0.165%g S1 = 0.057%g
   Sms = 0.411 Sm1 = 0.2
   Sds = 0.274 Sd1 = 0.133
   SEISMIC DESIGN CATEGORY: B
   EQUIVALENT LATERAL FORCE PROCEDURE
   ORDINARY STEEL MOMENT FRAME NOT SPECIFICALLY DESIGNED FOR SEISMIC.
   R = 3.0 Cs = 0.094
5. SOIL BEARING CAPACITY: 0.5 TONS/S.F.
   AS REFERENCED BY SUB-SURFACE SOILS INVESTIGATION PERFORMED BY J.R. HOLZMACHER P.E., LLC SEPTEMBER 26, 2017.

**COLUMN SCHEDULE**

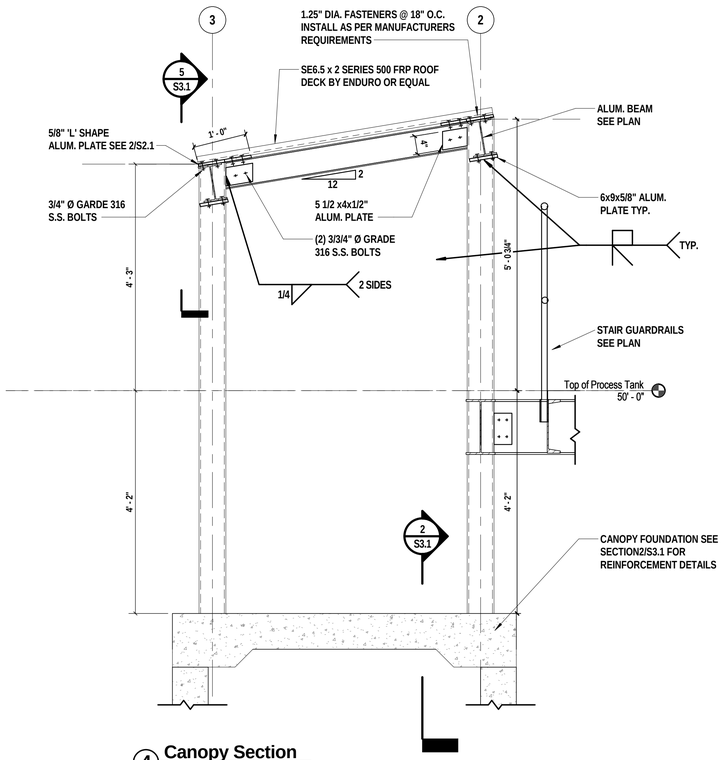
| COLUMN DESIGNATION | A | | | B | C | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 1 | 2 | 3 |
| TOP OF PROCESS TANK [+/- 51'-0"] | -0'-2" | PITCHED SEE 4/S2.1 | PITCHED SEE 4/S2.1 | -0'-2" | PITCHED SEE 4/S2.1 | PITCHED SEE 4/S2.1 |
| | 6x6x1/2" ALUM. TUBE | 6x6x1/2" ALUM. TUBE | 6x6x1/2" ALUM. TUBE | 6x6x1/2" ALUM. TUBE | 6x6x1/2" ALUM. TUBE | 6x6x1/2" ALUM. TUBE |
| | [-4'-1 1/4"] | [-4'-1 1/4"] | [-4'-1 1/4"] | [-4'-1 1/4"] | [-4'-1 1/4"] | [-4'-1 1/4"] |
| BASE PLATE TYPE | BP1 | BP1 | BP1 | BP1 | BP1 | BP1 |

**NOTES:**

1. INDICATES TOP OF COLUMN/TOP PLATE
2. INDICATES BOTTOM OF BASE PLATE
3. BP1 DESIGNATES A 12"x10"x1/2" COLUMN BASE PLATE
4. SEE BASE PLATE DETAIL AND SCHEDULE TO DETERMINE BOTTOM OF COLUMN ELEVATION.
5. ALL BASE PLATES TO BEAR ON CONCRETE SHALL BE SHIMMED USING 3/4" NON-METALLIC, NON-SHRINK GROUT.

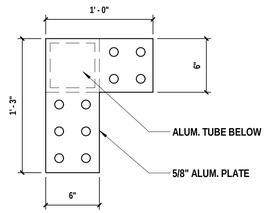
## 3 Column Schedule

SCALENTS




## 4 Canopy Section

SCALE: 3/4" = 1'-0"




## 5 Top 'L' Plate

SCALE: NTS


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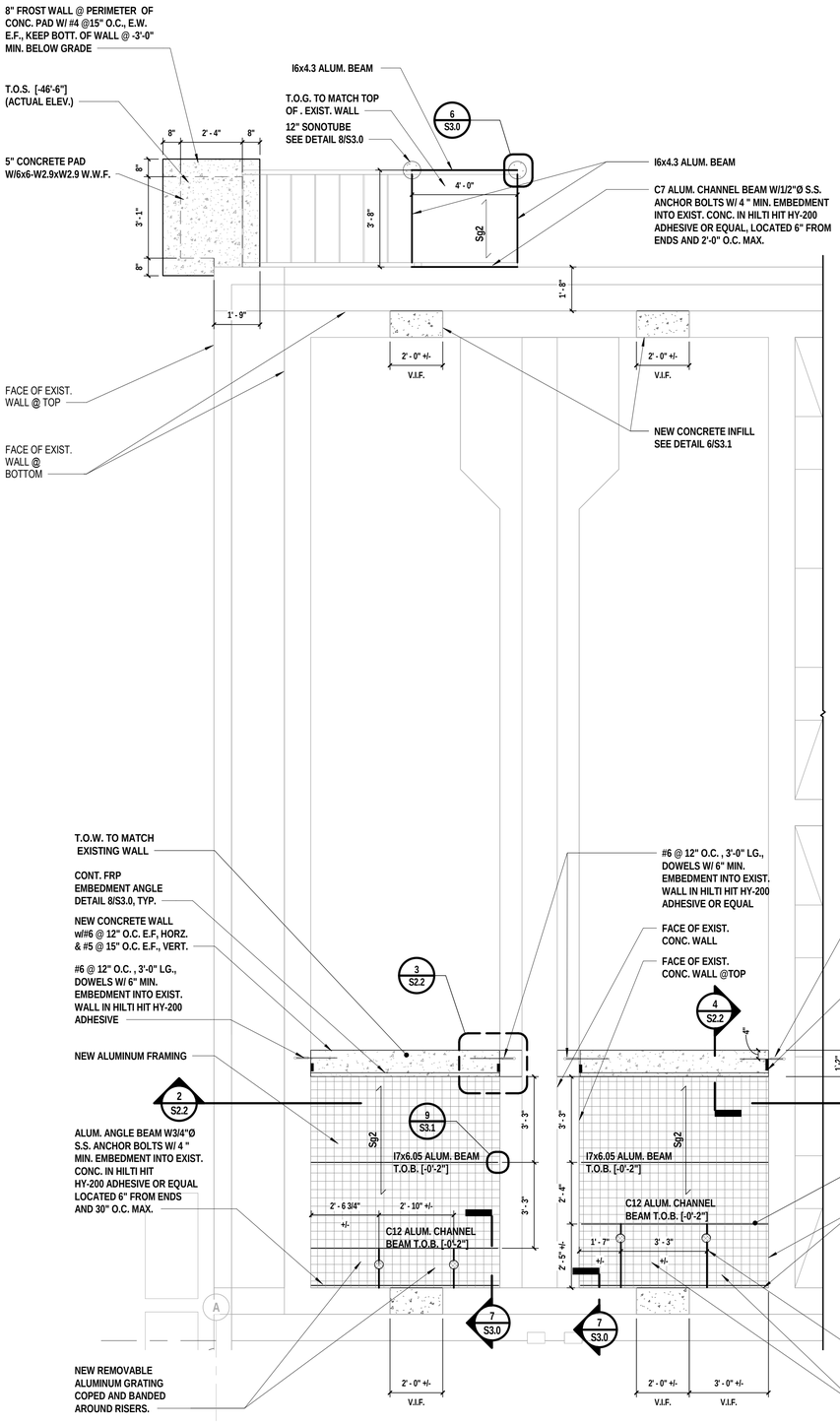
**CANOPY AND STAIR PLAN**

DRAWING # **S2.1**

SHEET # 21 OF 49

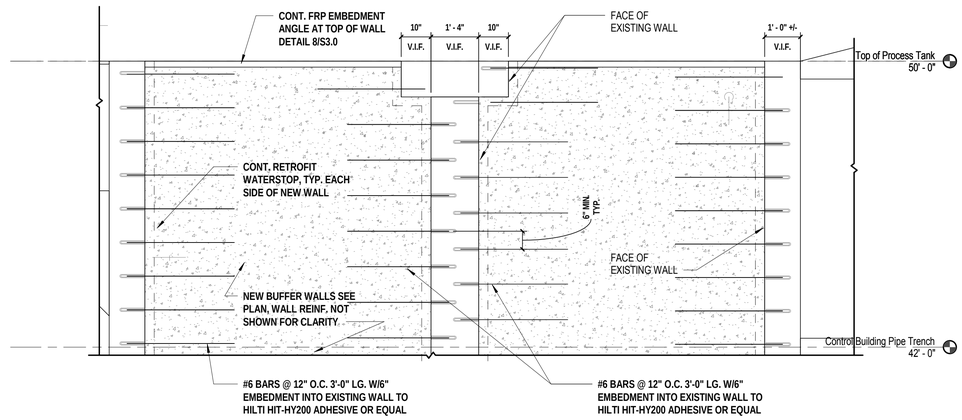
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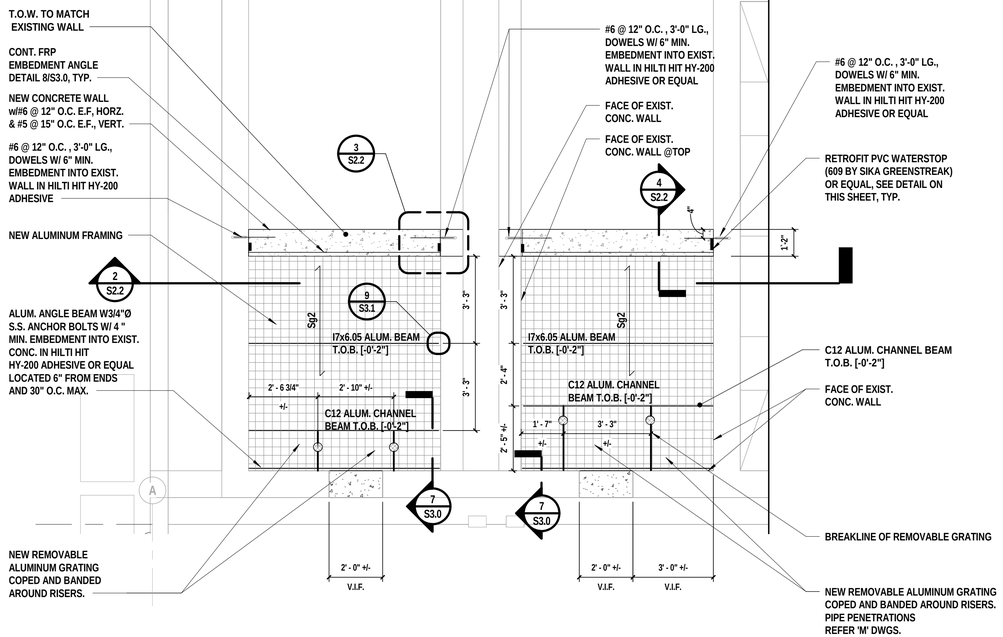
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## 2 Pre-Equalization and Effluent Pump Station Wall Section

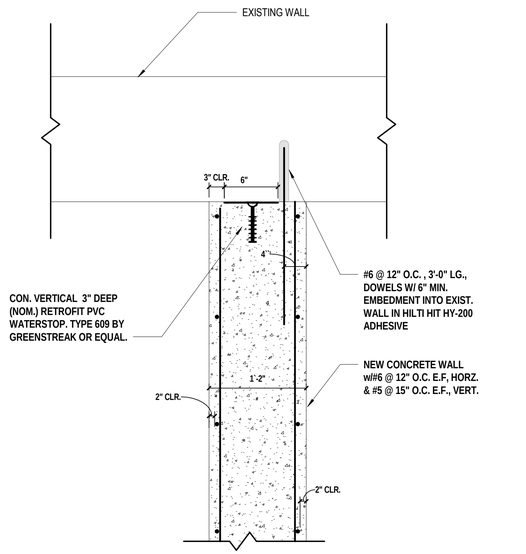
SCALE: 1/2" = 1'-0"




## 1 Pre-Equalization and Effluent Pump Station Plan

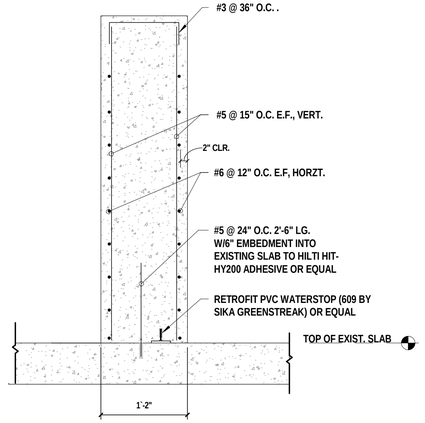
SCALE: 3/8" = 1'-0"




PLAN VIEW

## 3 Waterstop Detail @ 14" Wall

SCALE: NTS




## 4 New Wall Detail at Pre-Equalization Tank

SCALE:NTS

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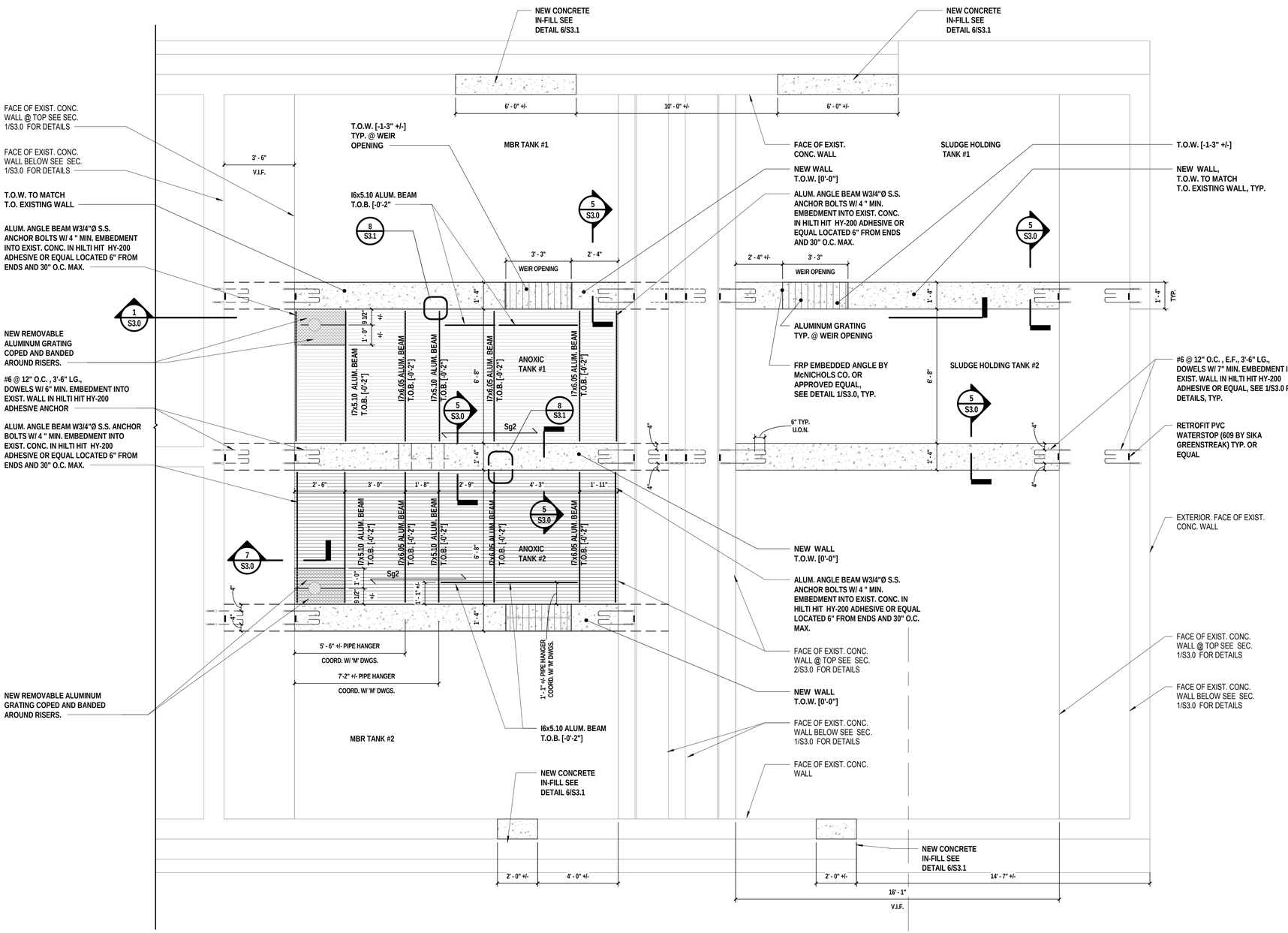
SHEET TITLE

**PRE-EQUALIZATION AND EFFLUENT PUMP STATION PLAN**

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| S2.2 | 22 OF 49 |

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## 1 MBR Anoxic and Sludge Holding Tanks Plan

SCALE: 3/8" = 1'-0"


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**MBR ANOXIC AND SLUDGE HOLDING TANK PLAN**

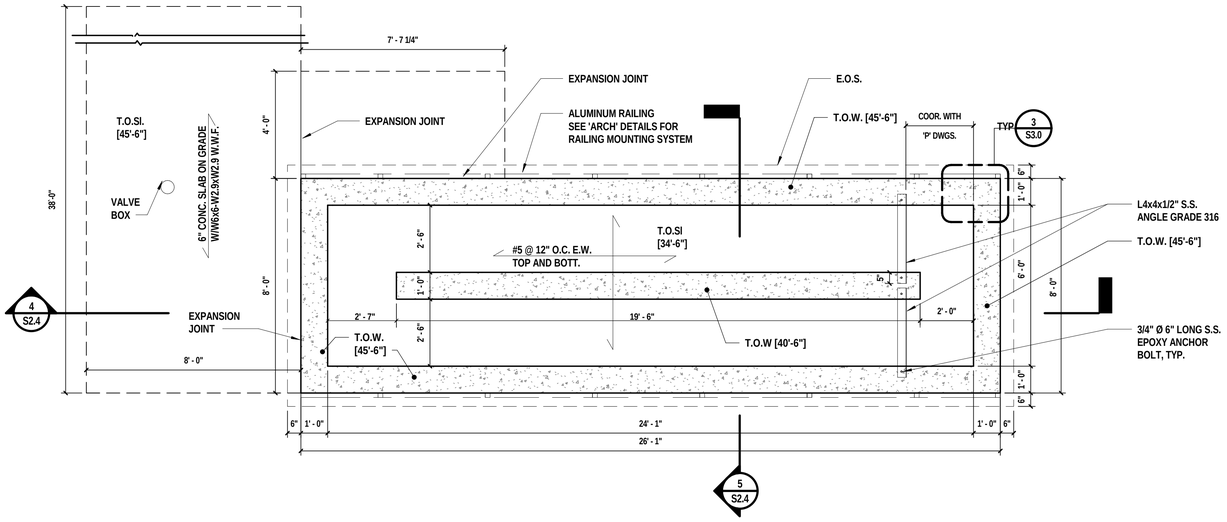
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**S2.3**

SHEET # 23 OF 49

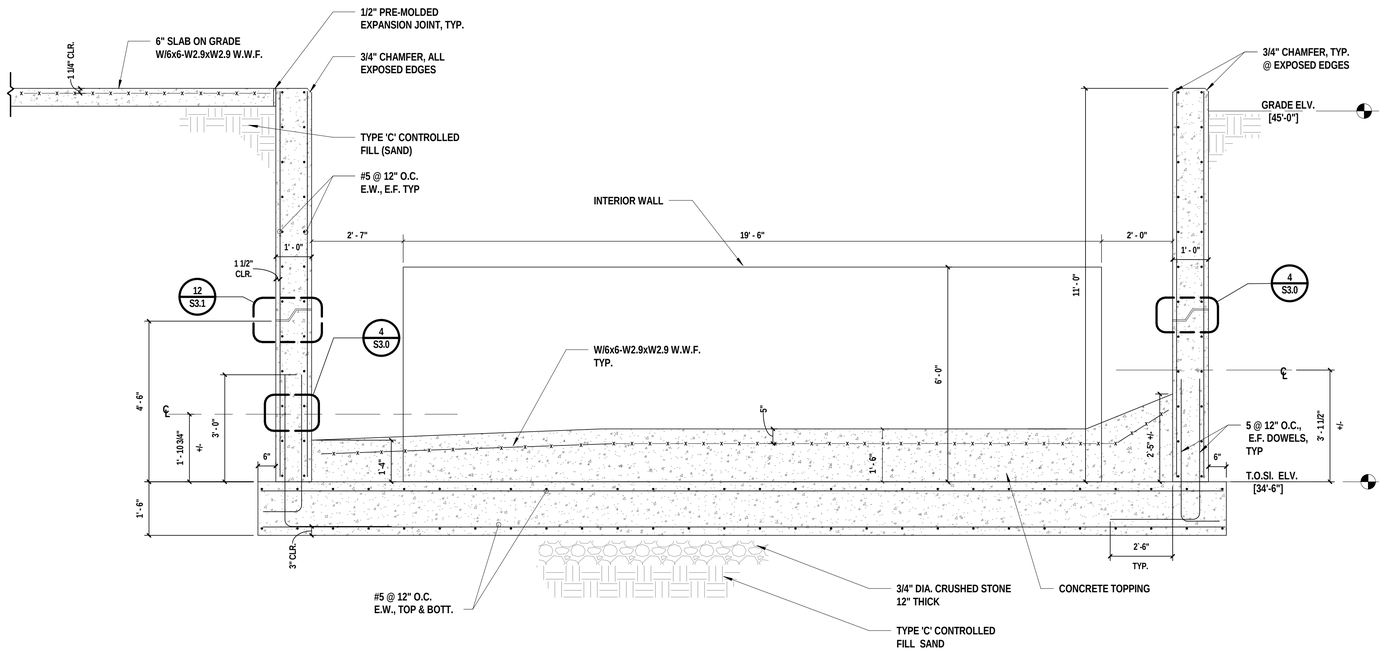
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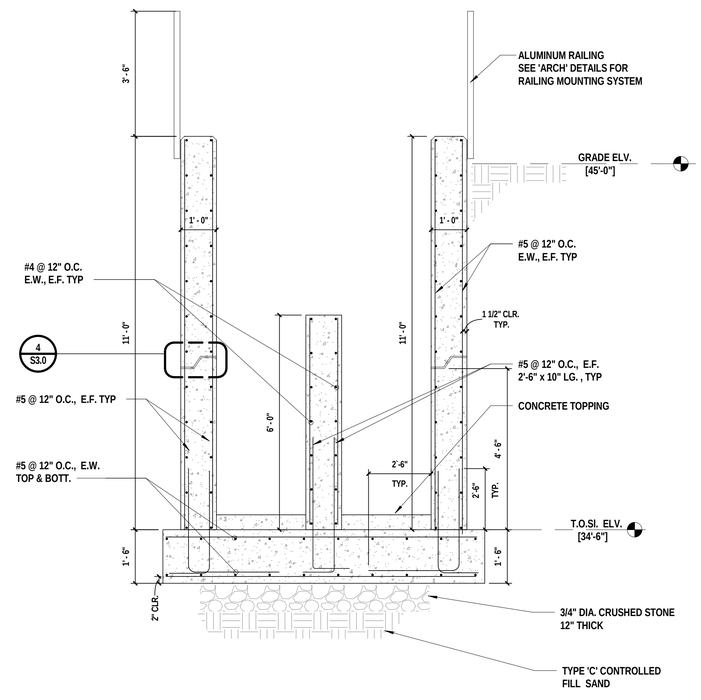

## 1 Precast Concrete Fine Screen -Foundation Plan

SCALE: 3/8" = 1'-0"




## 4 Section-Screening Channel

SCALE: 1/2" = 1'-0"




## 5 Section 2-Screening Channel

SCALE: 1/2" = 1'-0"

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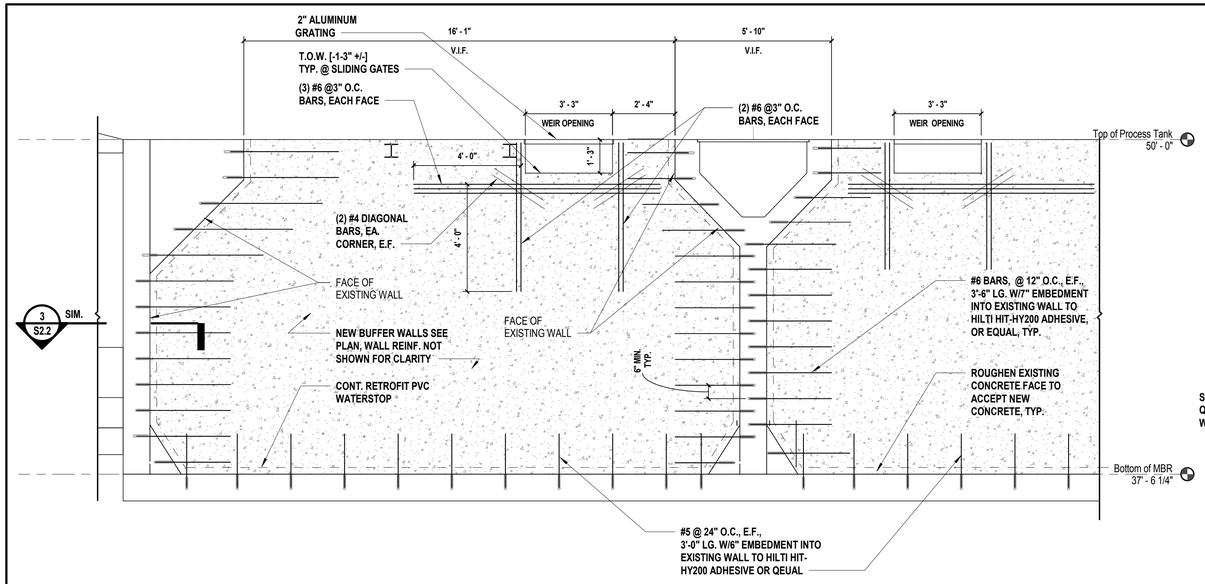
**AUTOMATIC FINE SCREEN CHANNEL PLAN AND SECTION**

DRAWING # **S2.4**

SHEET # 24 OF 49

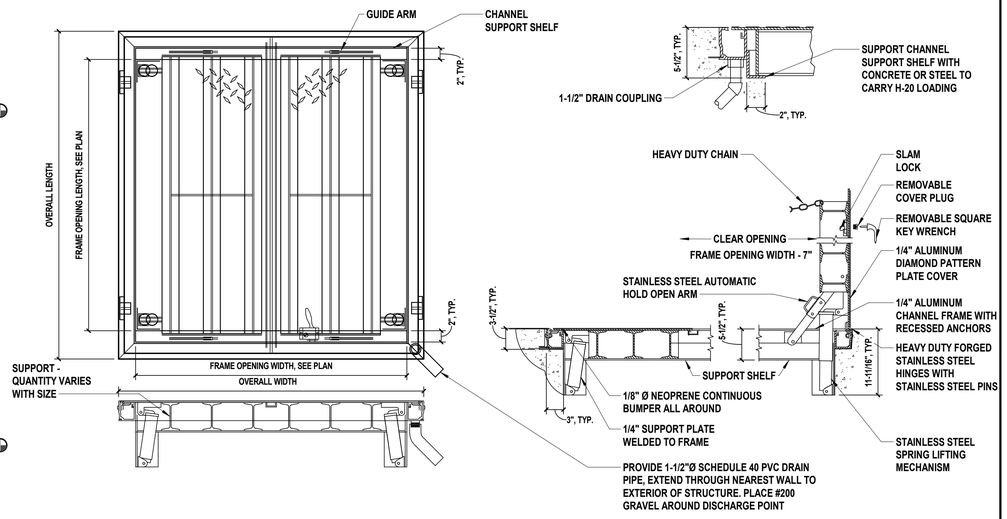
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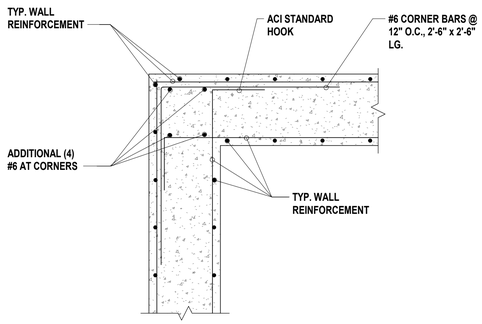

## 1 Typical New Buffer Walls to Existing Walls and Sliding Gate Detail

SCALE: 3/8" = 1'-0"



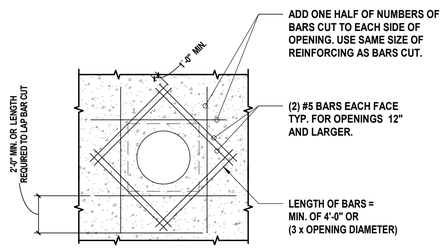

## 2 Double Leaf Access Hatch Detail

SCALE:NO SCALE



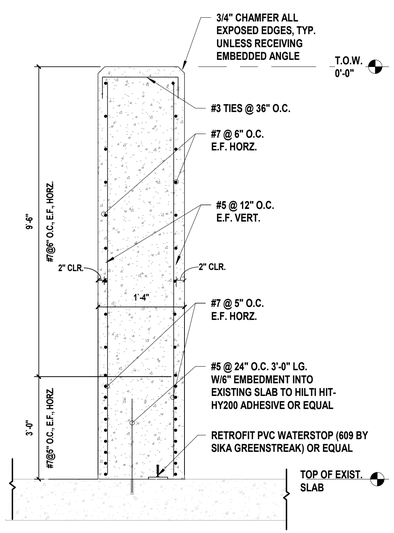

## 3 Wall Corner Reinforcement Typical

SCALE: 1" = 1'-0"



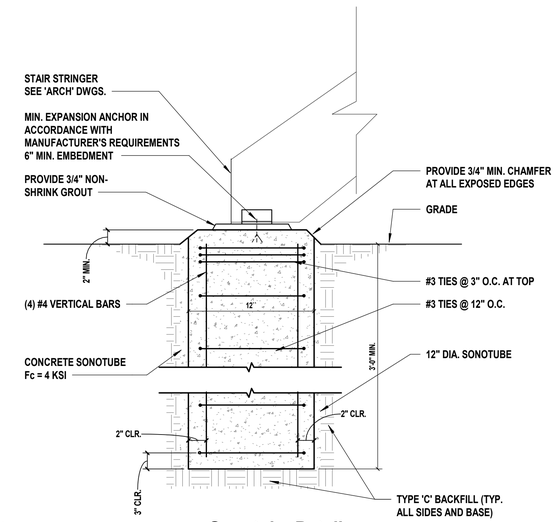

## 4 Pipe Penetration at Wall or Slab (Elevation)

SCALE:NTS



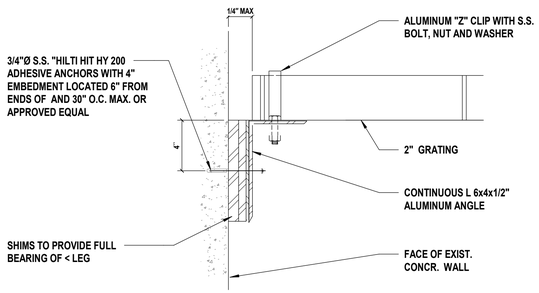

## 5 New Wall Reinforcement Detail at MBR and Anoxic Tanks

SCALE:N T S



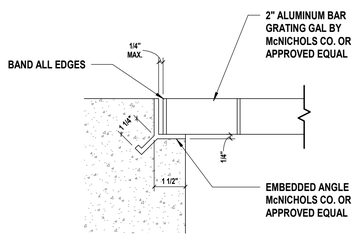

## 6 Sonotube Detail

SCALE: NTS



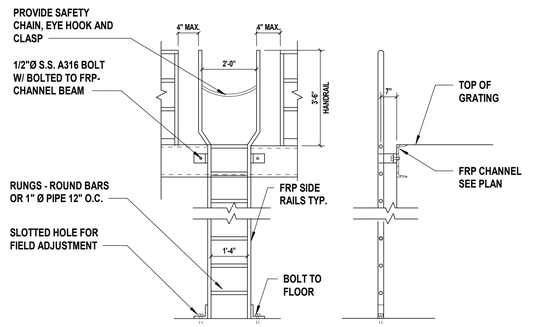

## 7 Grating Support Angle at Exist. Foundation Wall

SCALE:NTS




## 8 Grating Embedment At New Foundation Wall

SCALE:NTS




## 9 FRP- Ladder @ Influent Pump Station

SCALE:NTS

H2M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 www.h2m.com

CONSULTANTS:

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STATE OF NEW YORK · MICHAEL W McKEOWN · LICENSED PROFESSIONAL ENGINEER · NO. 062149

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**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

CONTRACT

**CONTRACT G GENERAL CONSTRUCTION**

STATUS

**FINAL BID DOCUMENT**

SHEET TITLE

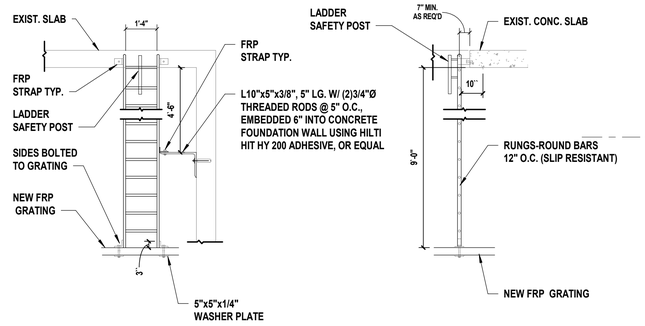
**STRUCTURAL DETAILS**

DRAWING # **S3.0**

SHEET # 25 OF 49

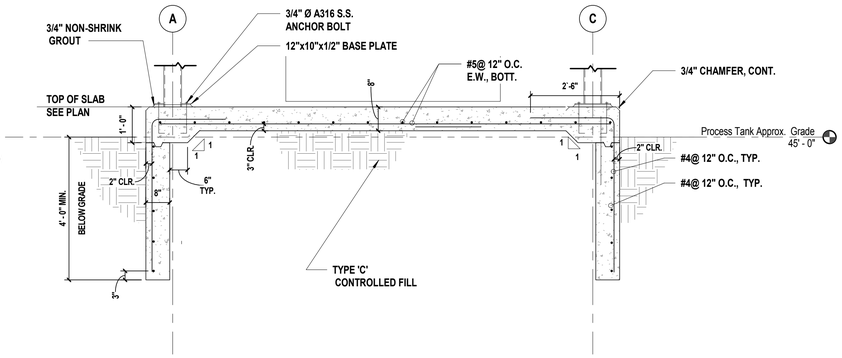
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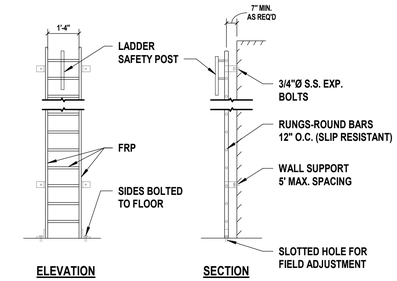

## 1 FRP- Ladder @ Influent Pump Station ( to Grating)

SCALE:NTS



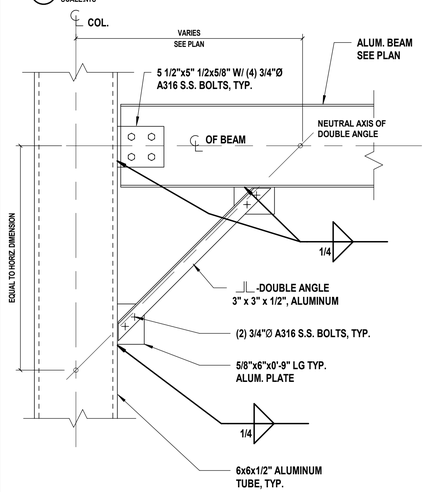

## 2 Aluminum Platform Mat Foundation

SCALE: 1/2" = 1'-0"



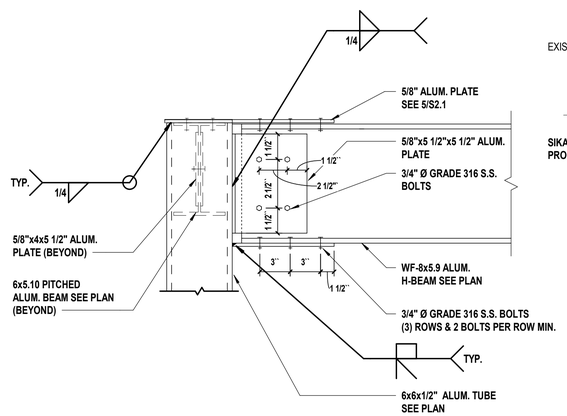

## 3 Ladder at Access Hatch w/ Ladder-Up

SCALE:NTS



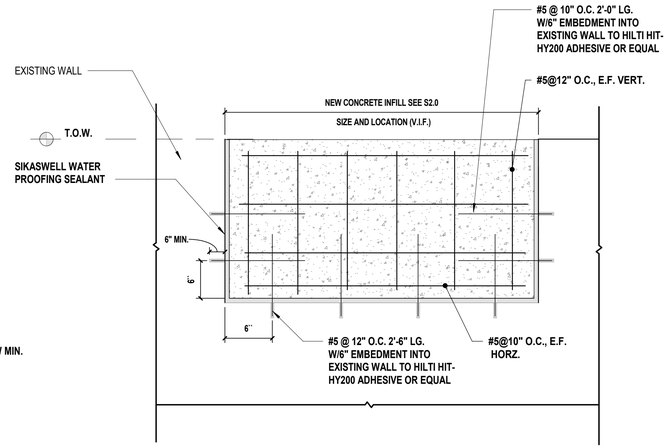

## 4 Kicker Detail

SCALE: NTS



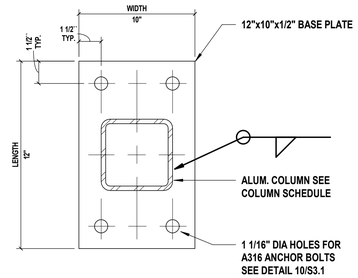

## 5 Beam to Column Moment Connection

SCALE:NTS



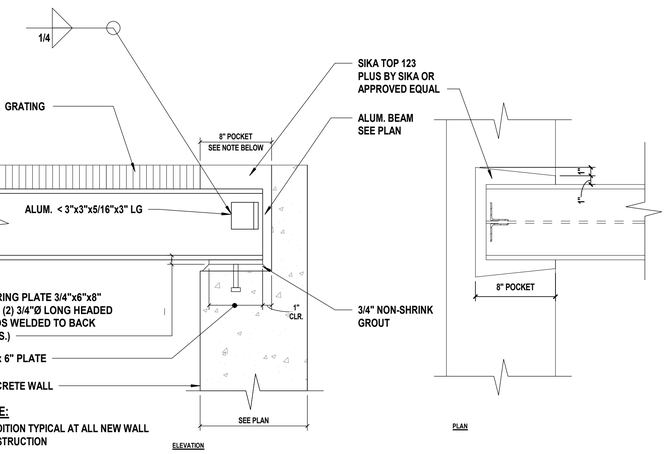

## 6 Channel In-fill Detail

SCALE: N T S



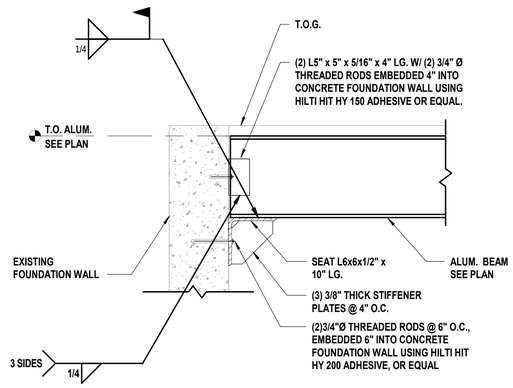

## 11 Base Plate Detail

SCALE: 1" = 1'-0"



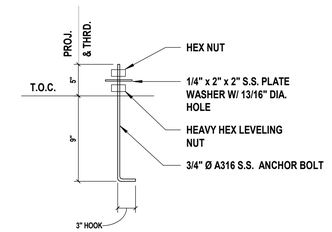

## 8 Beam Pocket at New Concrete Wall

SCALE:NTS



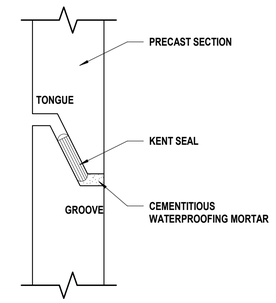

## 9 Beam Seat Connection Detail at Exist. Wall

SCALE:1" = 1'-0"



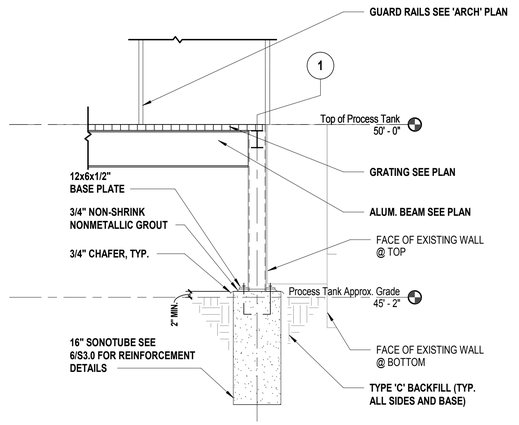

## 10 Anchor Bolt Detail

SCALE: 1" = 1'-0"




## 12 Precast Waterstop Joint

SCALE: 12" = 1'-0"




## 13 Sonotube Footing Detail

SCALE: 1/2" = 1'-0"


H 2 M architects + engineers

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Melville, NY 11747
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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

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CONTRACT

**CONTRACT G GENERAL CONSTRUCTION**

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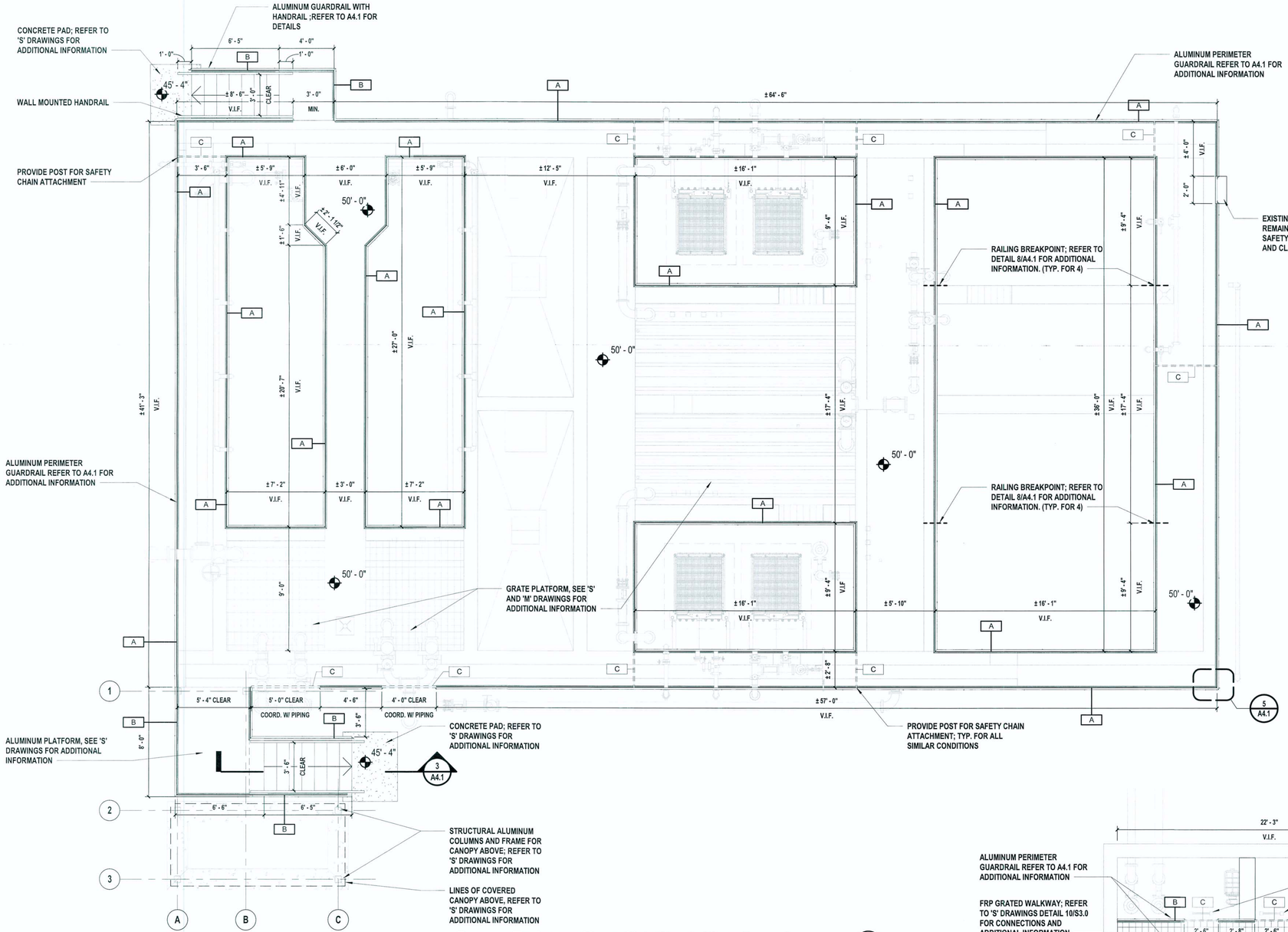
**STRUCTURAL DETAILS-2**

DRAWING # **S3.1**

SHEET # 26 OF 49

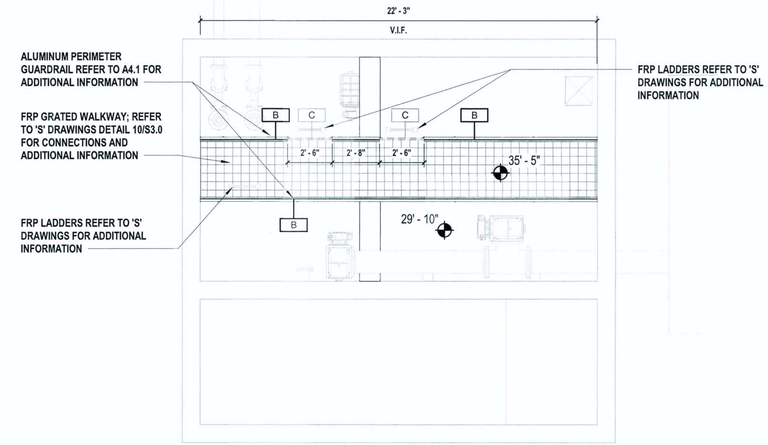
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## 1 Process Tankange Above Slab Plan (with walkways)

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




## 2 Influent Pump Station Floor Plan

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

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Melville, NY 11747
631.756.8000 www.h2m.com

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**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

CONTRACT

**CONTRACT G**
**GENERAL CONSTRUCTION**

STATUS

**FINAL BID DOCUMENTS**

SHEET TITLE

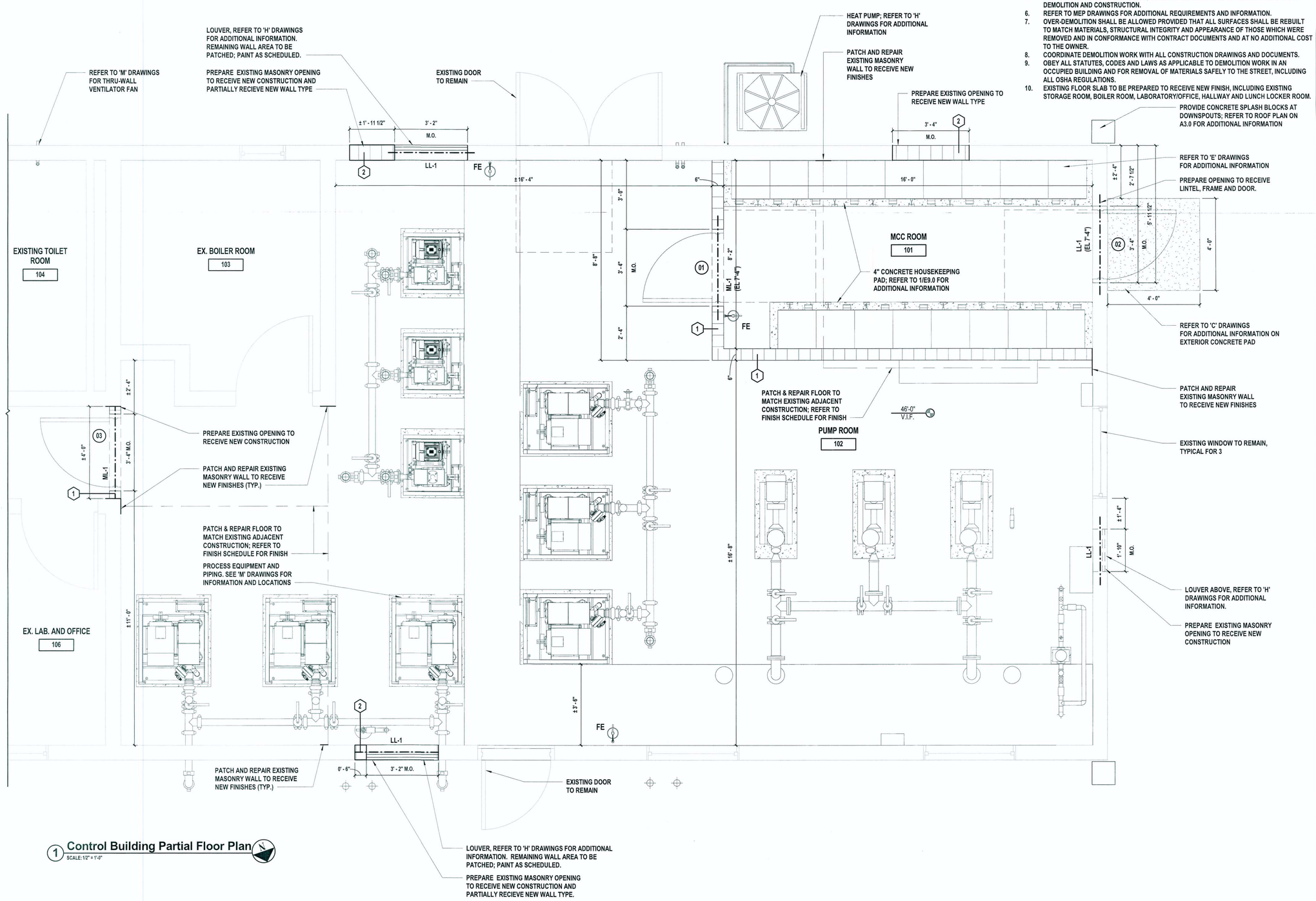
**PROCESS TANKS AND INFLUENT PUMP STATION FLOOR PLANS**

DRAWING # **A1.0**

SHEET # 27 OF 49

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## 1 Control Building Partial Floor Plan

SCALE: 1/2" = 1'-0"

**GENERAL NOTES:**

1. COORDINATE THE WORK INDICATED HERE WITH ALL CONTRACT DOCUMENTS, SPECIFICATIONS AND EXISTING SITE CONDITIONS.
2. FOR ALL WALL TYPES DENOTED, SEE DRAWING G2.0 FOR ADDITIONAL WALL PARTITION INFORMATION.
3. ALL DIMENSIONS PROVIDED ON THE FLOOR PLAN ARE APPROXIMATE DIMENSIONS. FIELD VERIFY ALL EXISTING CONDITIONS.
4. ACCOMODATE THE CONSTRUCTION TO ACCEPT ALL PIPING, CONDUITS, EQUIPMENT, ETC.
5. PROTECT ALL EXISTING EQUIPMENT , OBJECTS AND FURNITURE TO REMAIN THROUGHOUT DEMOLITION AND CONSTRUCTION.
6. REFER TO MEP DRAWINGS FOR ADDITIONAL REQUIREMENTS AND INFORMATION.
7. OVER-DEMOLITION SHALL BE ALLOWED PROVIDED THAT ALL SURFACES SHALL BE REBUILT TO MATCH MATERIALS, STRUCTURAL INTEGRITY AND APPEARANCE OF THOSE WHICH WERE REMOVED AND IN CONFORMANCE WITH CONTRACT DOCUMENTS AND AT NO ADDITIONAL COST TO THE OWNER.
8. COORDINATE DEMOLITION WORK WITH ALL CONSTRUCTION DRAWINGS AND DOCUMENTS.
9. OBEY ALL STATUTES, CODES AND LAWS AS APPLICABLE TO DEMOLITION WORK IN AN OCCUPIED BUILDING AND FOR REMOVAL OF MATERIALS SAFELY TO THE STREET, INCLUDING ALL OSHA REGULATIONS.
10. EXISTING FLOOR SLAB TO BE PREPARED TO RECEIVE NEW FINISH, INCLUDING EXISTING STORAGE ROOM, BOILER ROOM, LABORATORY/OFFICE, HALLWAY AND LUNCH LOCKER ROOM.

| LEGEND | |
|---|---|
| F.E. | SURFACE MOUNTED FIRE EXTINGUISHER |
| | LINTEL, REFER TO G2.0 |


H2M architects + engineers
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**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

CONTRACT

**CONTRACT G**
**GENERAL CONSTRUCTION**

STATUS

**FINAL BID DOCUMENTS**

SHEET TITLE

**CONTROL BUILDING PARTIAL FIRST FLOOR PLAN**

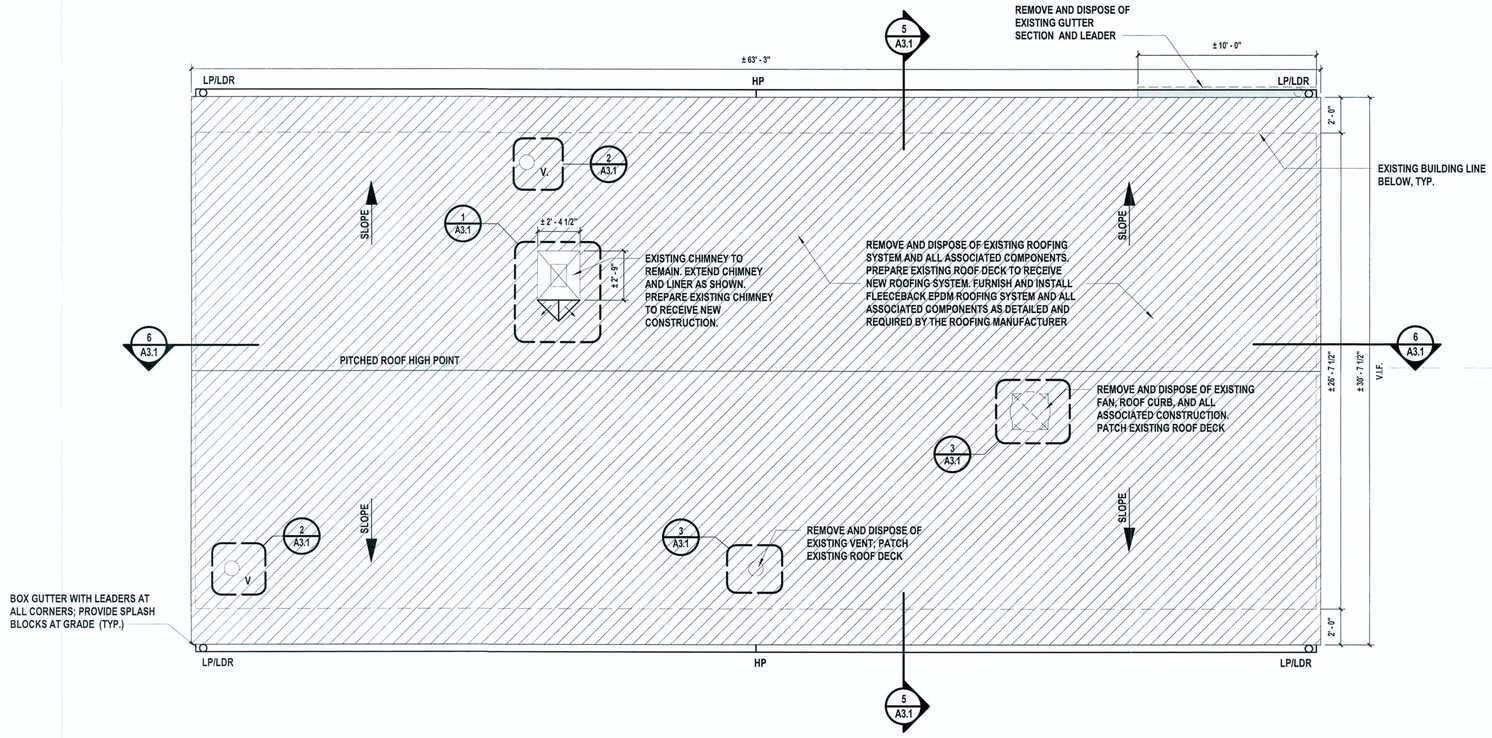
DRAWING #

**A2.0**

SHEET # 28 OF 49

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7 **Control Building Roof Plan**
SCALE: 1/4" = 1'-0"

## DEMOLITION ROOFING NOTES

1. THE INTENDED DEMOLITION SCOPE OF WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:
   - A. REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIAL AS NOTED AND LISTED IN THE PROJECT MANUAL.
   - B. REMOVAL AND DISPOSAL OF ALL EXISTING ROOFING MATERIALS DOWN TO SUBSTRATE, ALL ASSOCIATED ROOF BALLAST, ROOF FLASHING, INSULATION, CAULKING AND MASTIC.
2. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGES TO THE INTERIOR AND EXTERIOR OF THE BUILDING THAT RESULTED FROM AND DURING DEMOLITION WORK AND INCLUDES BUT IS NOT LIMITED TO ADHESIVE DRIPPINGS, CEILING TILES, WATER LEAKS, ETC.
3. OVER-DEMOLITION SHALL BE ALLOWED PROVIDED THAT ALL SURFACES SHALL BE REBUILT TO MATCH MATERIALS, STRUCTURAL INTEGRITY AND APPEARANCE OF THOSE WHICH WERE REMOVED AND IN CONFORMANCE WITH CONTRACT DOCUMENTS AND AT NO ADDITIONAL COST TO THE DISTRICT.
4. COORDINATE THE WORK OF THE DEMOLITION DRAWING WITH ALL CONSTRUCTION DRAWINGS AND DOCUMENTS.
5. VERIFY THE LOCATIONS, SIZES AND HEIGHTS OF ALL EXISTING ROOF PENETRATIONS, MECHANICAL EQUIPMENT, MECHANICAL DUCTWORK & MECHANICAL CURBS. PROTECT AT ALL TIMES ALL ROOF MOUNTED EQUIPMENT, ROOF MOUNTED DUCTWORK, DUCTWORK INSULATION AND VENT STACKS. DAMAGED ITEMS SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER.
6. ALL EXISTING PENETRATIONS AND ROOF TOP EQUIPMENT ARE TO REMAIN UNLESS NOTED OTHERWISE.
7. PERFORM ALL DEMOLITION AS REQUIRED TO COMPLETE WORK.
8. PROTECT ALL FINISHES IN ALL AREAS AFFECTED BY DEMOLITION AND CONSTRUCTION.
9. PROVIDE ADEQUATE TEMPORARY DRAINAGE FOR ALL PORTIONS OF THE ROOF, THROUGHOUT THE ENTIRE DURATION OF THE PROJECT.
10. OBEY ALL STATUTES, CODES AND LAWS AS APPLICABLE TO DEMOLITION WORK IN AN OCCUPIED BUILDING AND FOR REMOVAL OF MATERIALS SAFELY TO THE STREET, INCLUDING ALL OSHA REGULATIONS.
11. DISPOSE OF ALL UNWANTED MATERIALS AND OTHER DEMOLITION DEBRIS OFF SITE IN ACCORDANCE WITH CONTRACT REQUIREMENTS.
12. REMOVE ALL ITEMS THAT WILL BE ABANDONED AS A RESULT OF THE WORK BEING PERFORMED.
13. COORDINATE THE EXACT LOCATIONS OF ALL DUMPSTERS, AND MATERIALS STORED AT GRADE WITH THE ARCHITECT AND THE OWNER.
14. REMOVE DEBRIS IN A WAY THAT DOES NOT CONFLICT WITH THE DISTRICT OPERATIONS.
15. UPON REMOVAL OF DEMOLITION ITEMS, INSPECT CONDITION OF EXISTING DECKING AND REPORT FINDINGS TO OWNER/ARCHITECT.
16. DO NOT REMOVE MORE ROOFING THAN CAN BE REPLACED IN ONE WORK DAY.
17. THIS DRAWING IS A GENERAL LIST OF DEMOLITION ITEMS AND IS NOT EVERY ITEM REQUIRED FOR DEMOLITION. PROVIDE ALL DEMOLITION REQUIRED TO PERFORM ALL WORK INDICATED WITHIN THE PROJECT DRAWINGS AND SPECIFICATIONS AND TO PREPARE ALL AREAS FOR THE CONSTRUCTION WORK.
18. MODIFY/REMOVE AND REINSTALL EXISTING DUCTWORK AS REQUIRED TO COMPLETE DEMOLITION WORK.

## ASBESTOS ABATEMENT NOTES

1. ASBESTOS ABATEMENT WORK SHALL CONFORM TO ALL APPLICABLE FEDERAL AND STATE CODE REQUIREMENTS AND THE CONTRACT. SEE INFORMATION DOCUMENTS SECTION OF THE PROJECT MANUAL FOR THE ASBESTOS ABATEMENT SPECIFICATION AND LABORATORY ASBESTOS ANALYSIS REPORT.
2. ASBESTOS PROJECT MONITORING - VISUAL CLEARANCE - PROJECT MONITORING SERVICE SHALL BE PERFORMED BY THE OWNER'S REPRESENTATIVE. COORDINATE AND SCHEDULE WITH OWNERS THIRD PARTY ASBESTOS PROJECT MONITOR
3. PROVIDE 10 DAYS NOTIFICATION TO ARCHITECT AND OWNER BEFORE COMMENCING ABATEMENT OPERATIONS ON SITE IN THE AREAS IDENTIFIED AS BEING POSITIVE FOR ASBESTOS. THE FOLLOWING LOCATIONS HAVE BEEN IDENTIFIED AS HAVING AN ASBESTOS CONTAINING MATERIAL:
   - A. FLAT ROOFING MATERIAL
   - B. BLACK MASTIC FRONT AND REAR FAN VENT FLASHING
   - C. BLACK MASTIC FRONT AND REAR CHIMNEY FLASHING
   - D. BLACK MASTIC FRONT AND REAR CENTER VENT FLASHING
4. PAY FOR AND SECURE ALL PERMITS AND NOTIFICATIONS REQUIRED FOR ASBESTOS ABATEMENT WORK.
5. COORDINATE ALL ACTIVITIES WITH OWNER AND ARCHITECT.
6. SUBMIT COPIES OF ALL MANIFESTS AND LANDFILL RECEIPTS TO OWNER AND ARCHITECT.
7. VERIFY ALL QUANTITIES IN FIELD.
8. THE COSTS ASSOCIATED WITH THE REMOVAL, CLEANING, REPAIR AND DISPOSAL OF ASBESTOS SHALL BE INCLUDED IN THE CONTRACTOR'S BASE BID.
9. BUILDING SHALL REMAIN WATER TIGHT OR MADE WATER TIGHT BY THE END OF EACH DAY THROUGH ASBESTOS ABATEMENT WORK

## ROOFING NOTES

1. THIS DRAWING SERVES AS A LIST OF PRINCIPAL ROOFING ITEMS AND IS NOT A COMPLETE LIST OF EVERY ROOFING ITEM AND ACCESSORY. THIS DRAWING MUST BE COORDINATED WITH ALL OTHER DRAWINGS, ROOF DETAILS AND WITH ALL ITEMS SPECIFIED.
2. COORDINATE THE WORK REQUIRED ON THIS DRAWING WITH ALL STRUCTURAL, ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS, AND SPECIFICATIONS.
3. COORDINATE EXACT LOCATIONS OF PENETRATIONS TO BE MADE IN ALL ROOFS AND ROOF ASSEMBLIES.
4. CONTRACT "G" SHALL REVIEW, COORDINATE, AND INSTALL SLEEVES AND LOCATE ALL MECHANICAL PENETRATIONS REQUIRED TO ACCOMMODATE ALL WORK DETAILED OR SPECIFIED.
5. CONTRACT "G" IS RESPONSIBLE FOR PROVIDING FLASHING FOR ALL ROOF PENETRATIONS U.N.O.
6. CONTRACT "G" SHALL PROVIDE ALL TEMPORARY ROOF FLASHING WORK WHICH IS REQUIRED. IT IS THE RESPONSIBILITY OF CONTRACT "G" TO MAINTAIN A WEATHER TIGHT ROOF AT ALL TIMES.
7. PROVIDE MIN. ROOF PITCH AS INDICATED ON PLAN.
8. PROVIDE CRICKETS BEHIND ALL ROOFING ITEMS TO PROVIDE PITCH.
9. CONTRACT "G" SHALL PROVIDE ADEQUATE TEMPORARY DRAINAGE FOR ALL PARTITIONS OF THE ROOF, THROUGHOUT THE ENTIRE DURATION OF THE PROJECT.
10. CONTRACT "G" SHALL FURNISH AND INSTALL ALL ROOF GUTTERS AND LEADERS AND COORDINATE WITH CIVIL DRAWINGS FOR ADDITIONAL INFORMATION
11. ALL WORK SHOWN IS BY CONTRACT "G"UNLESS NOTED OTHERWISE.

## LEGEND

| | |
|---|---|
| | PROVIDE CRICKETS ON ALL ROOFING PENETRATIONS REQUIRED |
| | INDICATES AREA OF ASBESTOS CONTAINING FLAT ROOF MATERIAL AND MASTIC AT ALL PENETRATIONS AND FLASHING TO BE REMOVED AND DISPOSED OF. SEE NOTE 3A OF THE ASBESTOS ABATEMENT NOTES ON THIS SHEET FOR ADDITIONAL INFORMATION. SEE ROOFING NOTE 2 AND DEMOLITIONS NOTES FOR ADDITIONAL INFORMATION. ALSO INDICATES AREA OF NEW EPDM ROOFING SYSTEM AND TAPERED INSULATION, PROVIDE 5.2" MIN. THICKNESS OF TAPERED INSULATION. AT BUILDING EDGE. |
| | REMOVE AND DISPOSE OF EXISTING GUTTER AND LEADER |
| | BOX GUTTERS |
| HP | GUTTER HIGH POINT |
| LP/LDR | LOW POINT AND LEADER LOCATION - PROVIDE SPLASH BLOCK AT GRADE |
| V. | EXISTING VENT TO REMAIN |
| | REMOVE AND DISPOSE OF EXISTING VENT; PREPARE OPENING FOR ROOF SYSTEM |
| SLOPE | 1/8" : 12" MIN. TAPERED INSULATION SLOPE<br>1/4" : 12" MIN. CRICKET SLOPE |

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| PROJECT No: | DATE: | SCALE: |
|---|---|---|
| CASD 1602 | NOV 2018 | AS SHOWN |

CLIENT
**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

CONTRACT
**CONTRACT G GENERAL CONSTRUCTION**

STATUS
**FINAL BID DOCUMENTS**

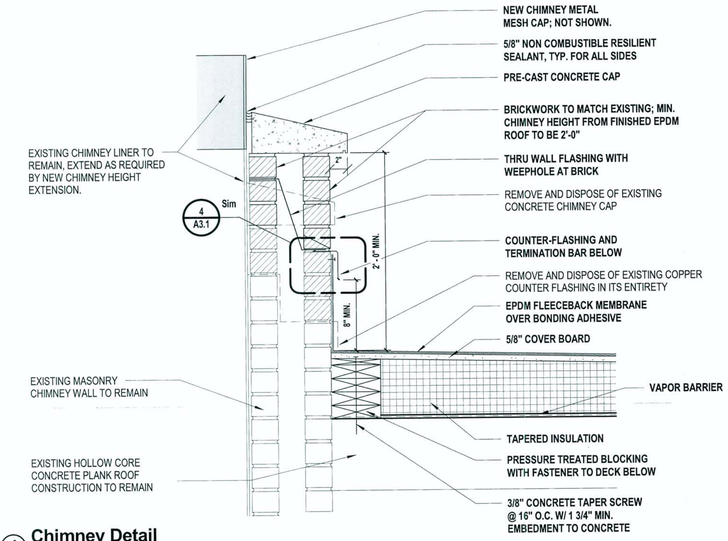
SHEET TITLE
**CONTROL BUILDING ROOF PLAN, DEMOLITION, ABATEMENT AND GENERAL NOTES**

DRAWING # **A3.0**

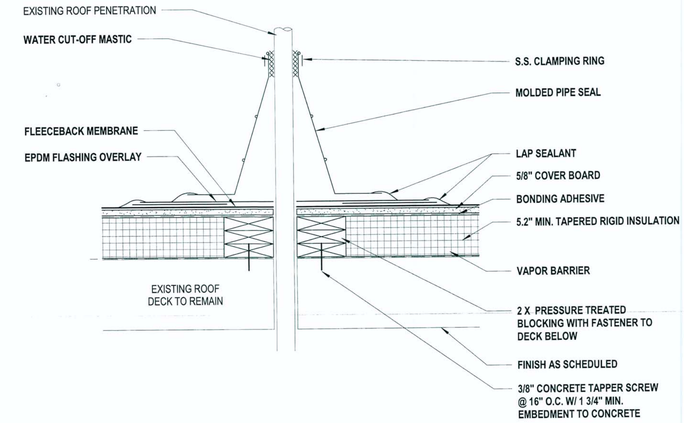
SHEET # 29 OF 49

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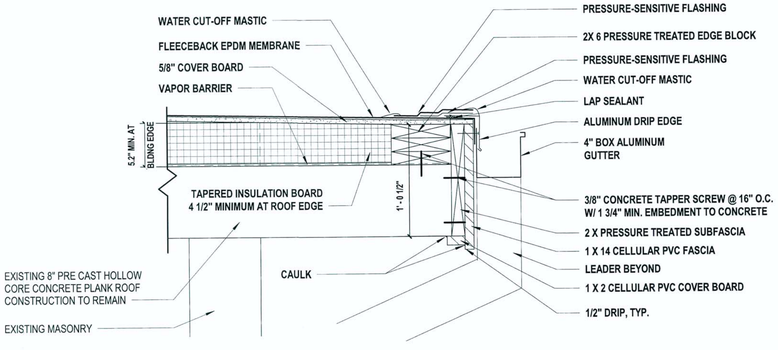
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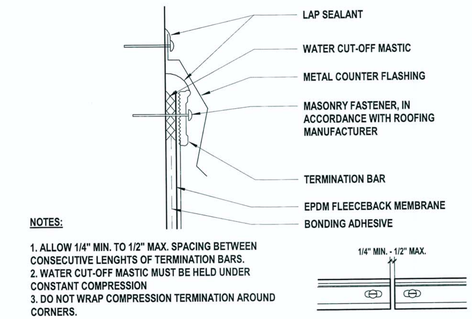

## 1 Chimney Detail
SCALE: 1 1/2" = 1'-0"




## 2 Typical Pipe Penetration Detail
SCALE: 1 1/2" = 1'-0"



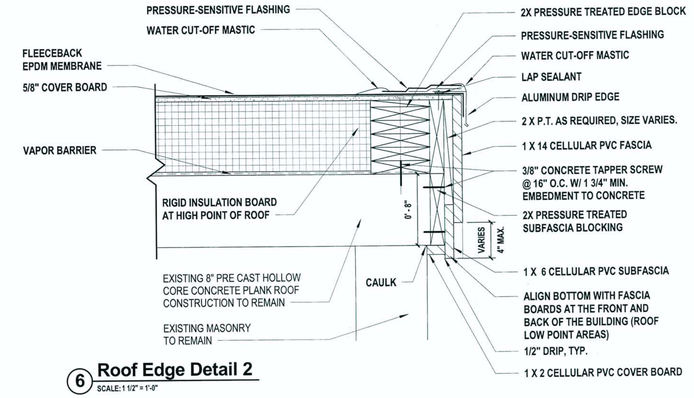

## 3 Typical Roof Deck Patching Detail
SCALE: 1 1/2" = 1'-0"




## 4 Typical Termination Bar Detail
SCALE: 1 1/2" = 1'-0"




## 5 Roof Edge Detail 1
SCALE: 1 1/2" = 1'-0"




## 6 Roof Edge Detail 2
SCALE: 1 1/2" = 1'-0"

H 2 M architects + engineers
538 Broad Hollow Road, 4th Floor East
Melville, NY 11747
631.756.8000 www.h2m.com

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TOWN OF RIVERHEAD 1792 PAX ET PROSPERITAS FER PROGRESSUM

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STATUS

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SHEET TITLE

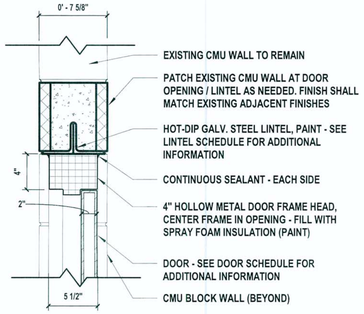
**TYPICAL ROOF DETAILS**

DRAWING # **A3.1**

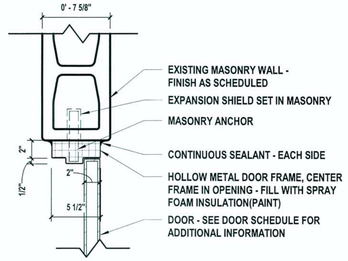
SHEET # 30 OF 49

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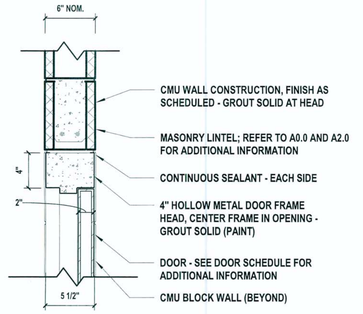
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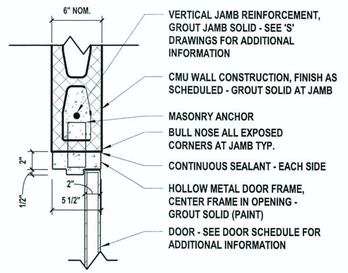

## 1A Door Jamb Detail
SCALE: 1 1/2" = 1'-0"



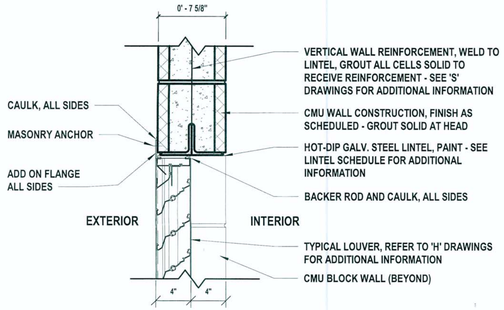

## 1 Door Jamb Detail
SCALE: 1 1/2" = 1'-0"



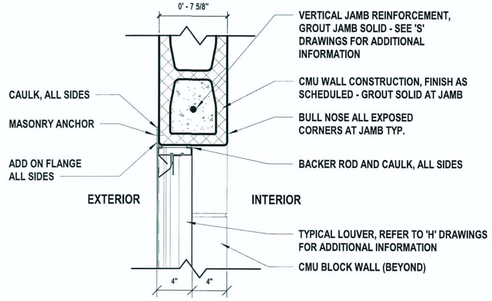

## 2 Door Head Detail
SCALE: 1 1/2" = 1'-0"




## 3 Door Jamb Detail
SCALE: 1 1/2" = 1'-0"




## 4 Louver Head Detail
SCALE: 1 1/2" = 1'-0"




## 5 Louver Jamb Detail
SCALE: 1 1/2" = 1'-0"

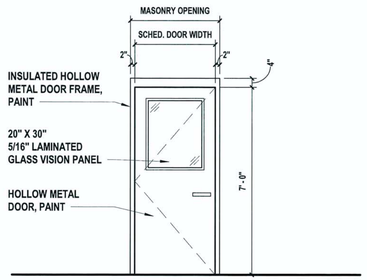
### FINISH SCHEDULE

| NUMBER | NAME | FLOOR MAT. | FLOOR BASE | FLOOR FIN. | WALLS NORTH MAT. | WALLS NORTH FIN. | WALLS EAST MAT. | WALLS EAST FIN. | WALLS SOUTH MAT. | WALLS SOUTH FIN. | WALLS WEST MAT. | WALLS WEST FIN. | CEILING MAT. | CEILING FIN. | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 101 | MCC ROOM | CONC. | PT. | PT. | BLOCK | PT | BLOCK | PT | BLOCK | PT | BLOCK | PT | EX. CONC | PT. | |
| 102 | PUMP ROOM | CONC. | PT. | PT. | BLOCK | PT | BLOCK | PT | BLOCK | PT | BLOCK | PT | EX. | PT. | |

### DOOR SCHEDULE

| DOOR NO. | LOCATION | DOOR OPENING SIZE WIDTH | DOOR OPENING SIZE HEIGHT | DOOR TYPE | MATERIAL | FINISH | FRAME DETAIL | SADDLE | LABEL | SELF CLOSING | ROOM SIGNAGE | SECURITY ACCESS | WEATHER - STRIPPING | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | MCC ROOM | 3' - 0" | 7' - 0" | A | HM | PT | 2/3 | S2 | 3/4 FR | Yes | Yes | No | No | PROVIDE PANIC HARDWARE; 4" HEADS (FRAME) |
| 02 | MCC ROOM | 3' - 0" | 7' - 0" | A | HM | PT | 1/1A | S1 | | Yes | Yes | Yes | Yes | PROVIDE PANIC HARDWARE; 4" HEADS (FRAME) |
| 03 | PUMP ROOM | 3' - 0" | 7' - 0" | A | HM | PT | 2/3 | S2 | | Yes | Yes | No | No | |

### DOOR TYPES



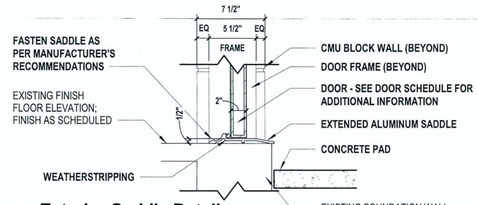

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**GENERAL DOOR NOTES:**

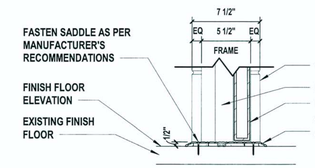
1. ALL EXTERIOR DOORS TO BE SELF CLOSING.
2. MCC ROOM DOORS RECEIVE PANIC DEVICE HARDWARE.
3. WEATHERSTRIP EXTERIOR DOORS
4. ALL GLASS LIGHTS IN DOORS SHALL BE 5/16" LAMINATED GLASS.
5. ALL INTERIOR DOORS SHALL HAVE A 5/8" UNDERCUT. UNDERCUT SHALL BE MEASURED FROM THE TOP OF SADDLE. VERIFY IN FIELD AND COORDINATE WITH FINISHES.
6. SEE SPECIFICATIONS FOR DOOR HARDWARE TYPES.

**DOOR SCHEDULE ABBREVIATIONS**

PT PAINT
HM HOLLOW METAL




## S1 Exterior Saddle Detail
SCALE: 1 1/2" = 1'-0"




## S2 Saddle Detail
SCALE: 1 1/2" = 1'-0"


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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

CONTRACT

**CONTRACT G GENERAL CONSTRUCTION**

STATUS

**FINAL BID DOCUMENTS**

SHEET TITLE

**CONTROL BUILDING DOOR SCHEDULE, ELEVATIONS AND DETAILS, AND INTERIOR FINISH SCHEDULE**

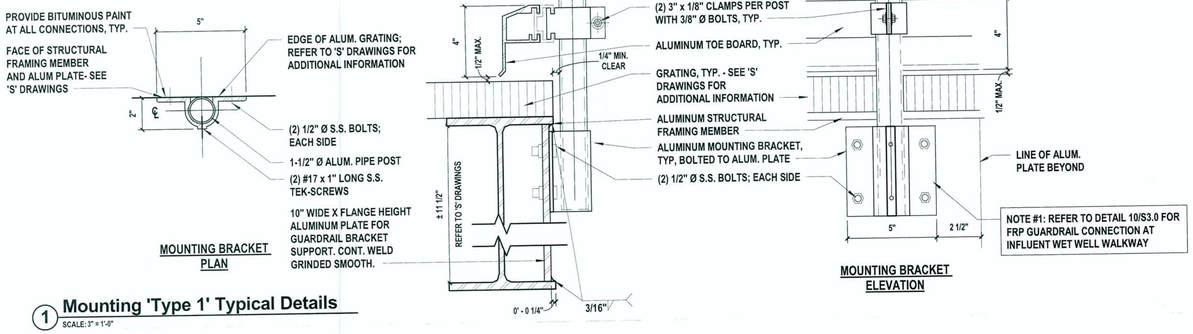
DRAWING #

**A4.0**

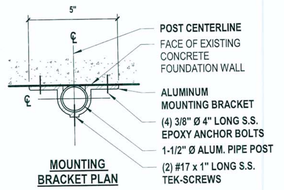
SHEET # 31 OF 49

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## 1 Mounting 'Type 1' Typical Details
SCALE: 3" = 1'-0"




MOUNTING BRACKET PLAN




NOTE: PROVIDE EXPANSION JOINTS IN ALL RAILS AND TOEBOARDS (ALIGN) IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS

## 4 Typical Guardraill Expansion Joint
SCALE: 3" = 1'-0"




MOUNTING BRACKET ELEVATION

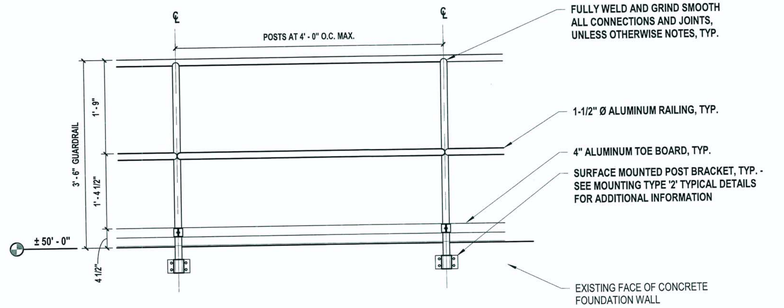
## 2 Mounting 'Type 2' Typical Details
SCALE: 3" = 1'-0"



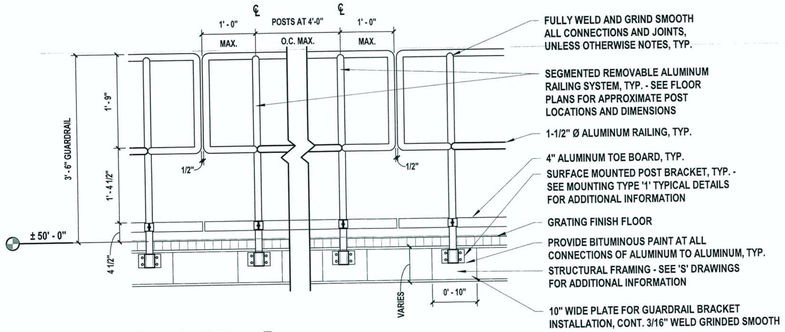

## 5 Corner Guardrail Detail
SCALE: 1 1/2" = 1'-0"



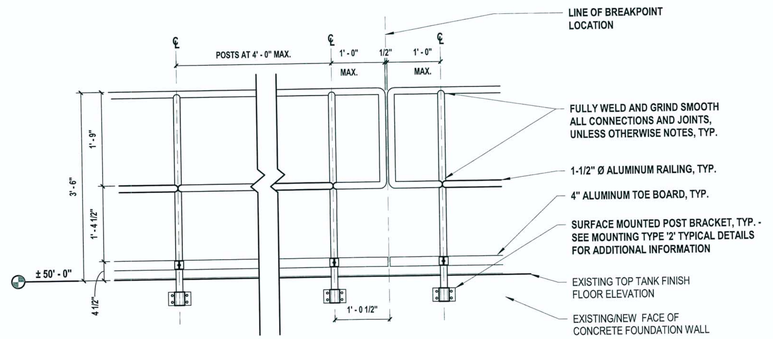

## 3 Typical Stair Section
SCALE: 1/2" = 1'-0"



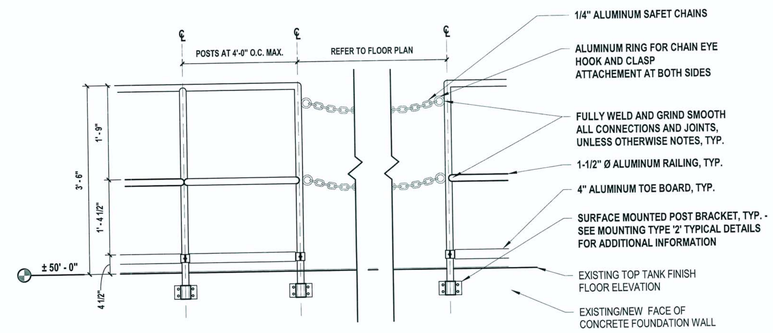

## 6 Guardrail Type A
SCALE: 3/4" = 1'-0"




## 7 Guardrail Type B
SCALE: 3/4" = 1'-0"




## 8 Typical Guardrail Breakpoint Detail
SCALE: 3/4" = 1'-0"




## 9 Guardrail Chain Type C
SCALE: 3/4" = 1'-0"

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Melville, NY 11747
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TOWN OF RIVERHEAD 1792 PAX ET PROSPERITAS PER PROGRESSUM

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SHEET TITLE
**PROCESS TANKS GUARDRAIL DETAILS**

DRAWING # **A4.1**

SHEET # 32 OF 49

## EQUIPMENT DESIGNATION SCHEDULE

| DESCRIPTION | EQUIPMENT ID |
|---|---|
| PREQ/SHT BLOWER | B-1 |
| PREQ/SHT BLOWER | B-2 |
| PREQ/SHT BLOWER | B-3 |
| MBR AIR SCOUR BLOWER | B-4 |
| MBR AIR SCOUR BLOWER | B-5 |
| MBR AIR SCOUR BLOWER | B-6 |
| MBR AERATION BLOWER | B-7 |
| MBR AERATION BLOWER | B-8 |
| MBR AERATION BLOWER | B-9 |
| WASHWATER BOOSTER PUMP | BP-1 |
| INFLUENT PUMP STATION FLOW METER | FM-1 |
| PRE-EQUALIZATION EFFLUENT FLOW METER | FM-2 |
| MBR #1 INFLUENT RECYCLE FLOW METER | FM-3 |
| MBR #2 INFLUENT RECYCLE FLOW METER | FM-4 |
| SHT INFLUENT FLOW METER | FM-5 |
| MBR #1 PERMEATE FLOW METER | FM-6 |
| MBR #2 PERMEATE FLOW METER | FM-7 |
| PLANT EFFLUENT FLOW METER | FM-8 |
| ANOXIC BASIN #1 MIXER | MX-1 |
| ANOXIC BASIN #2 MIXER | MX-2 |
| INFLUENT PUMP STATION SUBMERSIBLE PUMP | P-1 |
| INFLUENT PUMP STATION SUBMERSIBLE PUMP | P-2 |
| PRE-EQUALIZATION SUBMERSIBLE PUMP | P-3 |
| PRE-EQUALIZATION SUBMERSIBLE PUMP | P-4 |
| ANOXIC BASIN #1 RECYCLE SUBMERSIBLE PUMP | P-5 |
| ANOXIC BASIN #1 RECYCLE SUBMERSIBLE PUMP | P-6 |
| ANOXIC BASIN #2 RECYCLE SUBMERSIBLE PUMP | P-7 |
| ANOXIC BASIN #2 RECYCLE SUBMERSIBLE PUMP | P-8 |
| MBR #1 SLUDGE WASTE SUBMERSIBLE PUMP | P-9 |
| MBR #2 SLUDGE WASTE SUBMERSIBLE PUMP | P-10 |
| MBR PERMEATE CENTRIFUGAL PUMP | P-11 |
| MBR PERMEATE CENTRIFUGAL PUMP | P-12 |
| MBR PERMEATE CENTRIFUGAL PUMP | P-13 |
| EFFLUENT PUMP STATION SUBMERSIBLE PUMP | P-14 |
| EFFLUENT PUMP STATION SUBMERSIBLE PUMP | P-15 |

NOTES:

1. COORDINATE WITH CONTRACT 'E' FOR LABELING OF ALL EQUIPMENT AT MCC'S.
2. SCHEDULE ABOVE ONLY SHOWS NEW EQUIPMENT.

## PIPING SCHEDULE

| ABBREVIATION | DESCRIPTION | PIPE TYPE |
|---|---|---|
| PREQ-EFF | PRE-EQUALIZATION TANK EFFLUENT | SEE NOTE 2 |
| MBR-RT | MBR RETURN | SEE NOTE 2 |
| PL-EFF | PLANT EFFLUENT | SEE NOTE 2 |
| MBR-EFF | MBR EFFLUENT | SEE NOTE 2 |
| MBR-SA | MBR SCOUR AIR | SEE NOTES 3,4 |
| MBR-DA | MBR DISSOLVED AIR | SEE NOTES 3,4 |
| FS-EFF | FINE SCREEN EFFLUENT | SEE NOTE 2 |
| SHT-INF | SLUDGE HOLDING TANK INFLUENT | SEE NOTE 2 |
| PREQ-HE | PRE-EQUALIZATION HYDRAULIC EQUALIZATION | SEE NOTE 2 |
| PS-EFF | PUMP STATION EFFLUENT | SEE NOTE 2 |
| PS-INF | PUMP STATION INFLUENT | SEE NOTE 2 |
| PREQ/SHT-A | PRE-EQUALIZATION / SLUDGE HOLDING TANK AIR | SEE NOTES 3,4 |
| AR-HE | ANOXIC REACTOR HYDRAULIC EQUALIZATION | SEE NOTE 2 |
| MBR-SUPA | MBR BLOWER SUPPLY AIR | SEE NOTE 3 |
| PREQ/SHT-SUPA | PREQ/SHT BLOWER SUPPLY AIR | SEE NOTE 3 |

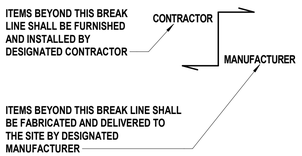
NOTES:

1. PIPE SIZE SHALL BE AS INDICATED ON THE DRAWINGS
2. PIPE SIZE SHALL BE C.L.D.I. CLASS 150 FLANGED OR DUCTILE IRON GROOVED PIPING (SEE NOTES THIS SHEET) WITHIN PROCESS TANKS AND ABOVE GRADE AND C.L.D.I. MECHANICAL JOINT BELOW GRADE
3. PIPE TYPE SHALL BE UNLINED DUCTILE IRON GROOVED PIPING ABOVE GRADE AND UNLINED DUCTILE IRON MECHANICAL JOINT PIPING BELOW GRADE. PIPING CONNECTIONS SHALL UTILIZE HIGH TEMPERATURE GASKETS AS SPECIFIED.
4. PIPE TYPE WITHIN THE PROCESS TANK UP TO AND INCLUDING THE AIR HEADER SHALL BE SCHEDULE 10 WELDED STAINLESS STEEL.
5. ALL EXPOSED LIQUID PIPING SHALL BE HEAT TRACED AND INSULATED. INSULATION SHALL BE PROVIDED BY CONTRACT G AND HEAT TRACE SHALL BE PROVIDED BY CONTRACT E.

## ABBREVIATIONS

| ABBREVIATION | DEFINITION |
|---|---|
| % | PERCENT |
| @ | AT |
| A.F.F. | ABOVE FINISHED FLOOR |
| BOD | BIOCHEMICAL OXYGEN DEMAND |
| C.L.D.I. | CEMENT-LINED DUCTILE IRON |
| CFM | CUBIC FEET PER MINUTE |
| CL | CENTERLINE |
| DCV | DOUBLE CHECK VALVE |
| EL. | ELEVATION |
| FLG | FLANGED |
| FPT | FEMALE PIPE THREAD |
| FRP | FIBERGLASS REINFORCED PLASTIC |
| GAC | GRANULAR ACTIVATED CARBON |
| GAL | GALLONS |
| GHS | GLOBALLY HARMONIZED SYSTEM |
| GPD | GALLONS PER DAY |
| GPM | GALLONS PER MINUTE |
| HP | HORSE POWER |
| I.D. | INSIDE DIAMETER |
| INV | INVERT |
| LB | POUNDS |
| MAX. | MAXIMUM |
| MGD | MILLION GALLONS PER DAY |
| MIN. | MINIMUM |
| MPT | MALE PIPE THREAD |
| N.C. | NORMALLY CLOSED |
| N.O. | NORMALLY OPEN |
| NO. | NUMBER |
| NPT | NATIONAL PIPE THREAD |
| O.C. | ON CENTER |
| O.C.E.W. | ON CENTER EACH WAY |
| O.D. | OUTSIDE DIAMETER |
| PE | PLAIN END |
| PSI | POUNDS PER SQUARE INCH |
| PVC | POLYVINYL CHLORIDE |
| Q ADF | AVERAGE DAILY FLOW |
| Q PF | PEAK DAILY FLOW |
| RPZ | REDUCED PRESSURE ZONE DEVICE |
| S.S. | STAINLESS STEEL |
| SQ. FT | SQUARE FEET |
| T&B | TOP AND BOTTOM |
| T&C | THREADED AND COUPLED |
| TN | TOTAL NITROGEN |
| TSS | TOTAL SUSPENDED SOLIDS |
| TYP. | TYPICAL |
| W/ | WITH |
| WL | WATER LEVEL |
| ° | DEGREES |
| ± | PLUS OR MINUS, APPROXIMATELY |
| Ø | DIAMETER |

CONTRACT DESIGNATION




## MECHANICAL NOTES:

1. THE CONTRACTOR SHALL SUBMIT, FOR THE ENGINEER'S REVIEW, PIPING LAYOUT DRAWINGS TO A SCALE OF 1/4" = 1'-0". DO NOT INSTALL INSERTS IN CONCRETE OR BOX FOR WALL AND DECK OPENINGS UNTIL THE LOCATIONS AND ELEVATIONS OF ALL SLAB AND WALL PENETRATIONS HAVE BEEN VERIFIED AND CHECKED FOR ACCURACY BY THE CONTRACTOR. THE LOCATIONS OF WALL SLEEVES, OPENINGS AND OTHER CONCRETE INSERTS SHOWN ON THE DRAWINGS ARE BASED ON EQUIPMENT AND VALVES WHICH MAY OR MAY NOT HAVE DIMENSIONS EQUAL TO THAT BEING USED FOR THE PROJECT. LAYOUT DRAWINGS SHALL BE PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFICATIONS. THE LAYOUT DRAWINGS SHALL USE THE DIMENSIONS OF EQUIPMENT AND VALVES BEING USED FOR THE PROJECT OR PROVISIONS SHALL BE MADE TO ACCOUNT FOR DIMENSIONAL DIFFERENCES IN EQUIPMENT. THE CONTRACTOR SHALL SUBMIT THE LAYOUT DRAWINGS FAR ENOUGH IN ADVANCE SO THAT CONCRETE INSERTS CAN BE ORDERED AND INSTALLED IN SEQUENCE AND IN ACCORDANCE WITH THE CONSTRUCTION SCHEDULE. PREPARE PIPE LAYOUT DRAWINGS AND DETAILS OF SUPPORT FOR ALL PROCESS PIPING, BOTH BURIED AND EXPOSED, WITH A DIAMETER EQUAL TO OR GREATER THAN 4".
2. SUPPORT AND ANCHOR ALL EXPOSED PIPING IN ACCORDANCE WITH THE PERFORMANCE REQUIREMENT CONTAINED IN THE SPECIFICATIONS. WHERE METHODS OF SUPPORT ARE SHOWN, SUCH METHODS SHALL BE CONSIDERED AS SUGGESTED. SUCH SUGGESTED METHODS SHALL NOT RELIEVE THE CONTRACTOR FROM INSTALLING ALL PIPING IN ACCORDANCE WITH THE SPECIFIED REQUIREMENTS.
3. SUBMIT DETAILS OF ALL SUPPORT FOR ALL PIPING GREATER THAN 4" IN DIAMETER.
4. ALL GRATING SHALL BE SUPPORTED AS DETAILED ON THE 'S' DRAWINGS. ALL GRATING SHALL BE PROVIDED WITH PERIMETER BANDING. BANDING SHALL ALSO BE PROVIDED WHERE PIPE PENETRATES GRATING. PROVIDE BANDED OPENINGS FOR ALL PROCESS PIPES GREATER THAN OR EQUAL TO 4" IN DIAMETER. FIELD VERIFY GRATING DIMENSIONS PRIOR TO FABRICATION. DO NOT FABRICATE GRATING UNTIL ALL PIPE HAS BEEN INSTALLED AND SUPPORTED. ALL GRATING SHALL BE SET FLUSH WITH THE FINISHED FLOOR.
5. PROVIDE MECHANICAL IDENTIFICATION AS SPECIFIED.
6. ENGRAVED PLASTIC LAMINATE SIGNS SHALL BE FURNISHED AND INSTALLED AT LOCATIONS SELECTED BY THE ENGINEER. ALL DANGER SIGNS SHALL BE ALUMINUM OSHA PLATES. ALL CAUTION AND WARNING SIGNS SHALL BE GRAPHIC OSHA SIGNS. THE FOLLOWING SIGNS SHALL BE PROVIDED, QUANTITY AS INDICATED IN PARENTHESIS:
   - "CAUTION - THIS EQUIPMENT STARTS AND STOPS AUTOMATICALLY" (3)
   - "WARNING - HIGH VOLTAGE KEEP AWAY" (2)
   - "CAUTION - EAR PROTECTION REQUIRED" (3)
   - "DANGER - KEEP HANDS CLEAR" (3)
   - "CAUTION - DO NOT OPERATE WITHOUT GUARDS" (3)

   SEE SPECIFICATIONS FOR ADDITIONAL SIGNAGE REQUIREMENTS.
7. INSTALL MEASUREMENT AND CONTROL PRIMARY ELEMENTS IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. MAINTAIN MANUFACTURER'S REQUIRED DISTANCE UPSTREAM AND DOWNSTREAM BETWEEN FLOW METERS AND PIPING ELEMENTS SUCH AS FITTINGS AND VALVES. SHOW SEPARATION DISTANCES ON PIPING LAYOUT DRAWINGS SPECIFIED TO BE PROVIDED.
8. UNUSED MANUFACTURER SUPPLIED FIELD SERVICES SHALL BE CREDITED TO THE OWNER AS SPECIFIED.
9. ALL VALVE OPERATORS (MOTORIZED OR MANUAL HANDLES) SHALL BE EXTENDED TO AN OPERATING LEVEL AS SHOWN. UNLESS OTHERWISE NOTED, ALL EXTENSIONS STEMS SHALL BE SUPPORTED AS NEEDED TO PROVIDE PLUMB AND SECURE VALVE OPERATION. MANUAL HANDLE FOR VALVES REQUIRING STEM EXTENSIONS SHALL BE TEE TYPE HANDLE OPERATORS. ALL MANUAL HANDLES FOR VALVES INSIDE TANK AREAS SHALL DISENGAGE FROM THE VALVES' STEM RISER AT THE TANK TOP LEVEL SUCH THAT CONNECTION TO STEM EXTENSION IS ABOVE THE TANK WATER LEVEL.
10. MECHANICAL JOINT FITTINGS SHALL BE PROVIDED WITH THRUST BLOCKING AS DETAILED IN THE DRAWINGS. IN ADDITION TO THRUST BLOCKING, EACH MECHANICAL JOINT FITTING SHALL BE MECHANICALLY RESTRAINED. THE MECHANICAL JOINT RESTRAINT FOR FITTING JOINTS SHALL BE AS SPECIFIED. INSTALL MECHANICAL JOINT RESTRAINTS ON UPSTREAM AND DOWNSTREAM SIDES OF ALL TEE FITTINGS USED FOR IN-LINE CLEANOUTS WHERE SHOWN ON THE DRAWINGS. PROVIDE THRUST BLOCKING TO SUPPORT EACH TEE.
11. IN ADDITION TO FLANGED ADAPTERS SHOWN ON THE DRAWINGS AND SPECIFIED TO BE PROVIDED, THE CONTRACTOR SHALL ALSO FURNISH AND INSTALL FLANGED ADAPTERS WHERE DIRECTED BY THE ENGINEER FOR THE PURPOSE OF EASILY REPAIRING OR REPLACING VALVES AND METERS IN THE FUTURE.
12. ALL EXPOSED TEE FITTINGS SHALL BE FURNISHED AS BASE TEES.
13. ALL EXPOSED ELBOWS SHALL BE FURNISHED AS BASE ELBOWS.
14. POUR CONCRETE SUPPORT PEDESTALS FOR ALL BASE TEES AND BASE ELBOWS MEASURING 14" SQUARE. HEIGHT AS REQUIRED TO SUPPORT FITTING. ANCHOR ALL BASE TEES AND ELBOWS USING 5/8" CONCRETE SHIELDS WITH 4" PROJECTION. ALL HARDWARE SHALL BE STAINLESS STEEL. PEDESTALS SHALL BE POURED USING A BAG MIX AND DOWELED INTO THE SLAB WITH FOUR (4) 5/8"Ø THREADED ROD WITH A MINIMUM PROJECTION OF 6", EQUALLY SPACED.
15. CONSTRUCT THRUST BLOCKS AND PIPE SUPPORT PIERS WHERE SHOWN ON THE DRAWINGS AND AS NECESSARY TO SUPPORT PIPING.
16. INSULATE PIPING TO THE EXTENT SHOWN AND/OR AS SPECIFIED.
17. GROOVED PIPING MAY BE USED IN LIEU OF FLANGED PIPING IN ACCORDANCE WITH THE SPECIFIED REQUIREMENTS.
18. PROVIDE AND INSTALLED FLANGED BY GROOVED ENDED PIPE ADAPTERS FOR ALL PLUG, CHECK AND BUTTERFLY VALVES TO MAKE GROOVE ENDED JOINTS TO FLANGED FITTINGS AND EQUIPMENT. GROOVE ENDED VALVES WILL BE PERMITTED ON THIS PROJECT.
19. PROVIDE AND INSTALL FLANGED BY GROOVE ENDED SPOOL PIECE TO MAKE JOINTS FOR EQUIPMENT, PUMPS, CONSTANT HEAD BOXES, FLOW METERS AND OTHER IN-LINE EQUIPMENT. SPOOL PIECES SHALL BE AT LEAST EQUAL TO FIVE (5) TIMES THE PIPE DIAMETER. ADAPTERS WILL NOT BE PERMITTED IN THIS INSTANCE.
20. SMALL DIAMETER PIPING, VALVES AND ACCESSORIES SHALL COMPLY WITH THE SPECIFIED REQUIREMENTS.
21. ALL MOUNTING HARDWARE, REGARDLESS OF LOCATION AND/OR APPLICATION, SHALL BE 304 STAINLESS STEEL.
22. VALVES LOCATED UNDER TANK TOP GRATING OR TANK TOP SLABS SHALL HAVE THE OPERATING STEM EXTENDED TO 3 INCHES BELOW THE BOTTOM OF THE GRATING OR SLAB. PROVIDE A BANDED GRATING OPENING OR SLAB PENETRATION OPENING WITH ALUMINUM REMOVABLE CAP/COVER FOR ACCESS TO THE VALVE OPERATING NUT WITH A STANDARD TEE VALVE OPERATING HANDLE. SUPPORT STEM EXTENSION AS REQUIRED.
23. THE TERMS 'INFLUENT PUMP STATION', 'INFLUENT WET WELL' AND 'WET WELL' MEAN THE SAME THING AND MAY BE USED INTERCHANGEABLY THROUGHOUT THE DRAWINGS.
24. STILLING WELLS FOR LEVEL DEVICES SHALL BE PROVIDED AS PART OF THE GENERAL CONSTRUCTION CONTRACT.


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CHRISTOPHER A. WEBER
No. 072204
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**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD 1792 DAT ET PROSPERITAS PER PROGRESSUM

CONTRACT

**CONTRACT G**
**GENERAL CONSTRUCTION**

STATUS

**FINAL BID DOCUMENT**

SHEET TITLE

**GENERAL MECHANICAL INFORMATION**

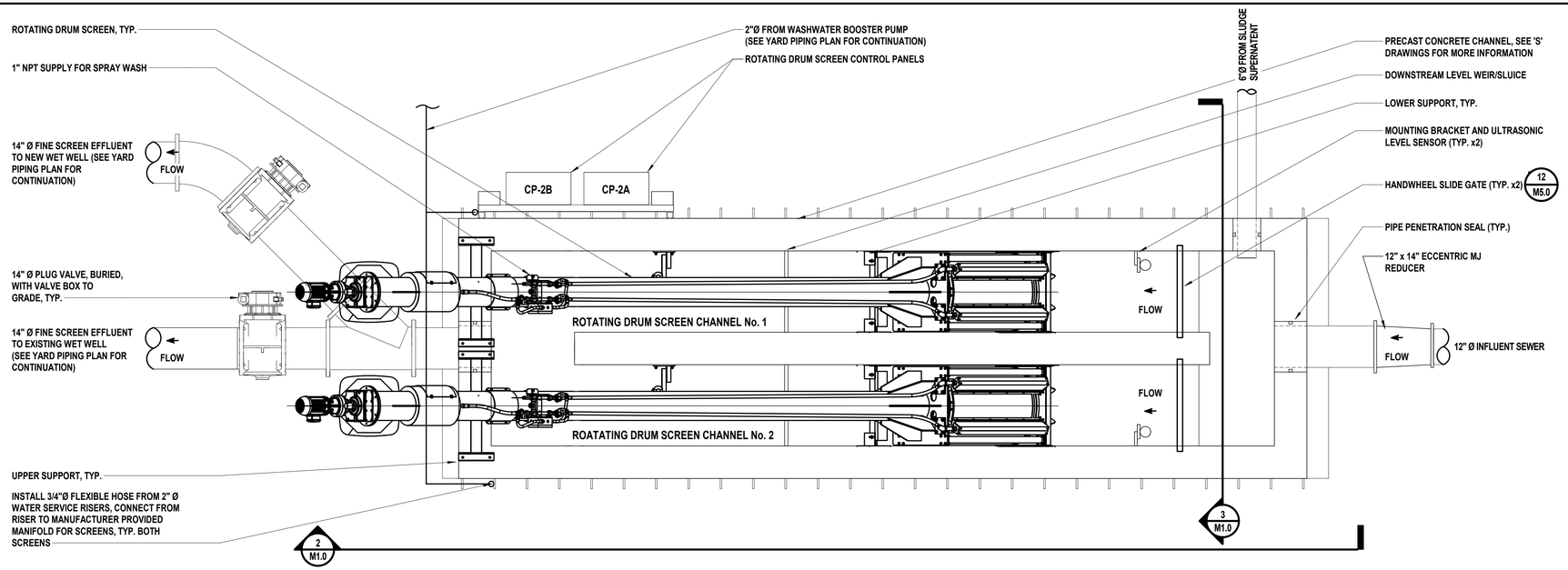
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SHEET # 33 OF 49

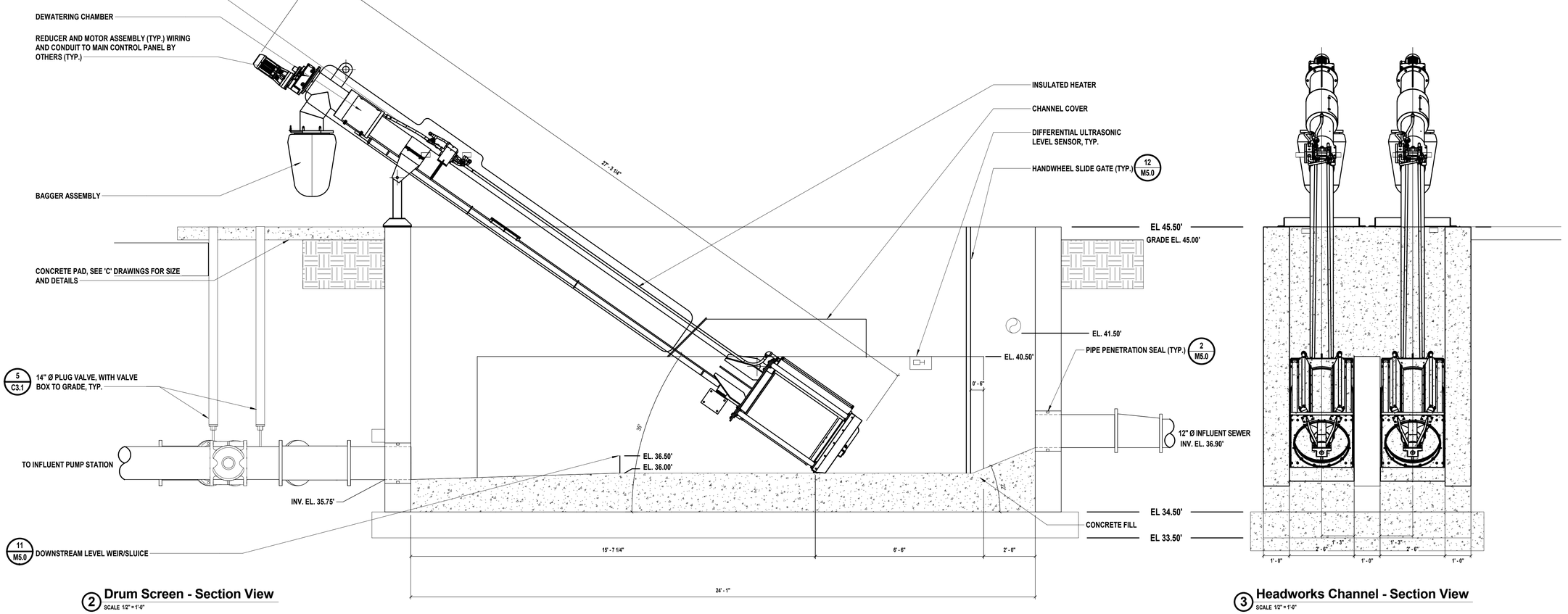
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## 1 Headworks Channel with Drum Screen

SCALE 1/2" = 1'-0"




## 2 Drum Screen - Section View

SCALE 1/2" = 1'-0"

## 3 Headworks Channel - Section View

SCALE 1/2" = 1'-0"

**NOTES:**

1. REFER TO PHASING PLAN FOR SEQUENCE OF INSTALLATION TO MAINTAIN FLOW TO THE EXISTING INFLUENT PUMP STATION DURING INSTALLATION OF DRUM SCREEN No. 1. DRUM SCREEN No. 2 MAY BE INSTALLED AFTER SUCCESSFUL STARTUP OF DRUM SCREEN No. 1.
2. DRUM SCREEN CONTROL PANELS CP-2A AND CP-2B SHALL BE SUPPLIED WITH DRUM SCREEN BY CONTRACT G. CONTROL PANELS TO BE INSTALLED BY CONTRACT E.
3. ULTRASONIC LEVEL TRANSMITTER SHALL BE SUPPLIED AND INSTALLED BY CONTRACT G AS PART OF DRUM SCREEN PACKAGE AND WIRED BY CONTRACT E.
4. MOTORS (x1 PER SCREEN) AND SOLENOID VALVES (x3 PER SCREEN) SHALL BE SUPPLIED AS PART OF DRUM SCREEN ASSEMBLY BY CONTRACT G, WIRED BY CONTRACT E.
5. COORDINATE EQUIPMENT WITH PRECAST MANUFACTURER FOR NECESSARY DIMENSIONS.
6. CONCRETE PADS NOT SHOWN IN PLAN VIEW FOR CLARITY, SEE CIVIL SITE PLANS FOR CONCRETE WORK AROUND CHANNEL AND UNDER CONTROL PANELS.
7. HEAT TRACING FOR SCREEN COMPONENTS TO BE SUPPLIED BY SCREEN MANUFACTURER. TURN OVER TO CONTRACT E FOR INSTALLATION. CONTRACT E SHALL FURNISH HEAT TRACING FOR WASHWATER SUPPLY PIPING.


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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD 1792 — PAX ET PROSPERITAS FIER PROGRESSUS

CONTRACT

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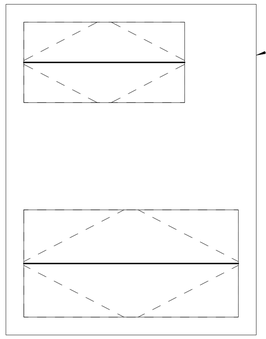
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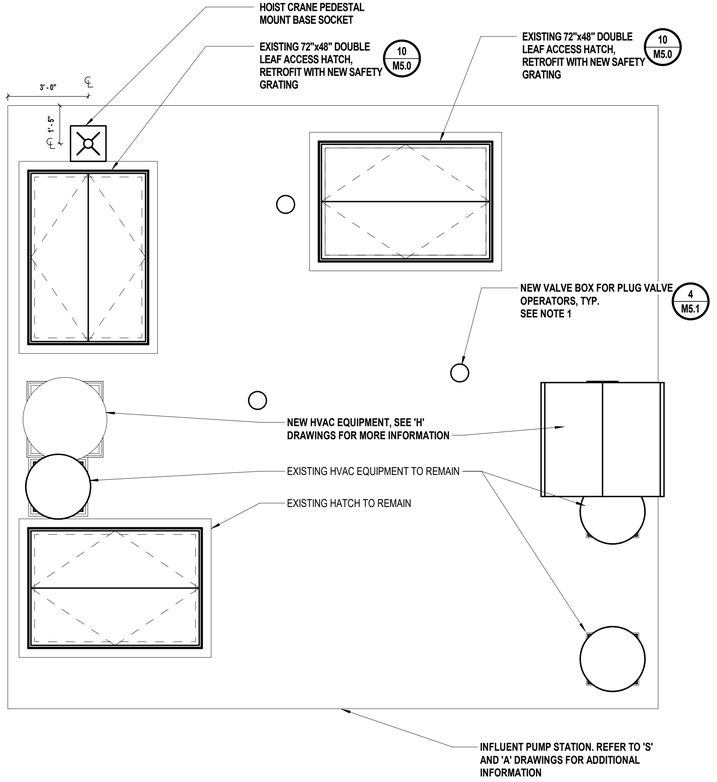
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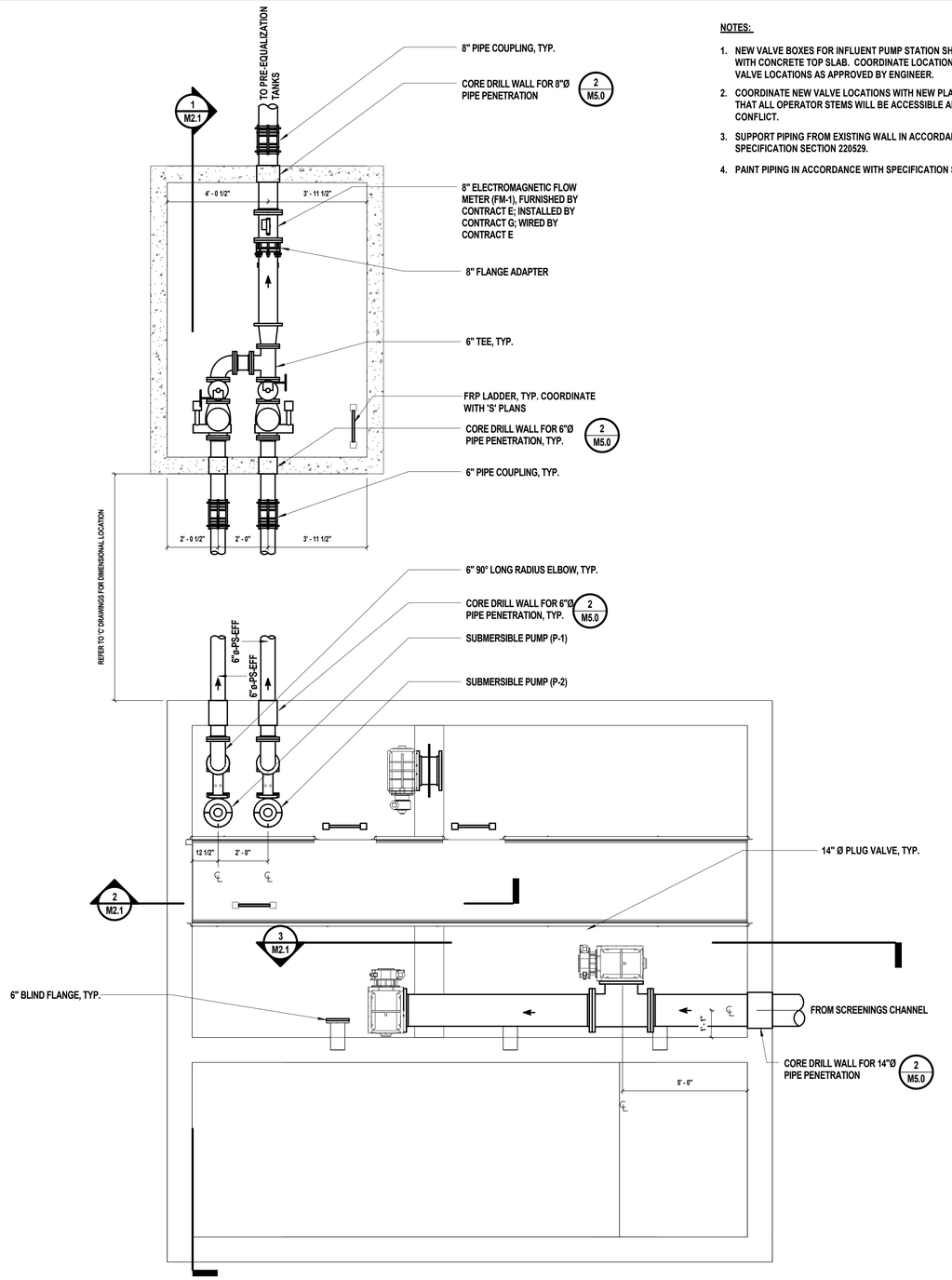
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2 **Influent Pump Station Mechanical Plan - Above Top Slab**
SCALE 3/8" = 1'-0"




1 **Influent Pump Station Mechanical Plan - Below Top Slab**
SCALE 3/8" = 1'-0"

**NOTES:**

1. NEW VALVE BOXES FOR INFLUENT PUMP STATION SHALL BE FLUSH WITH CONCRETE TOP SLAB. COORDINATE LOCATIONS WITH NEW VALVE LOCATIONS AS APPROVED BY ENGINEER.
2. COORDINATE NEW VALVE LOCATIONS WITH NEW PLATFORM SUCH THAT ALL OPERATOR STEMS WILL BE ACCESSIBLE AND WITHOUT CONFLICT.
3. SUPPORT PIPING FROM EXISTING WALL IN ACCORDANCE WITH SPECIFICATION SECTION 220529.
4. PAINT PIPING IN ACCORDANCE WITH SPECIFICATION SECTION 099000.

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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD — PAX ET PROSPERITAS PER PROGRESSUM — 1792

CONTRACT

**CONTRACT G**
**GENERAL CONSTRUCTION**

STATUS

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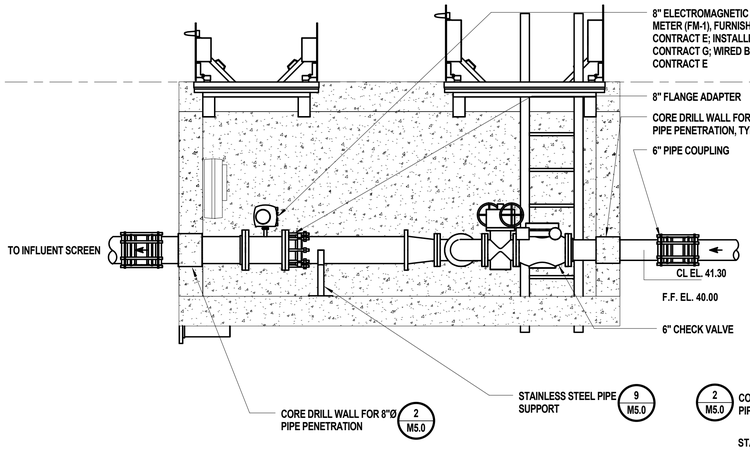
**INFLUENT PUMP STATION MECHANICAL PLAN VIEWS**

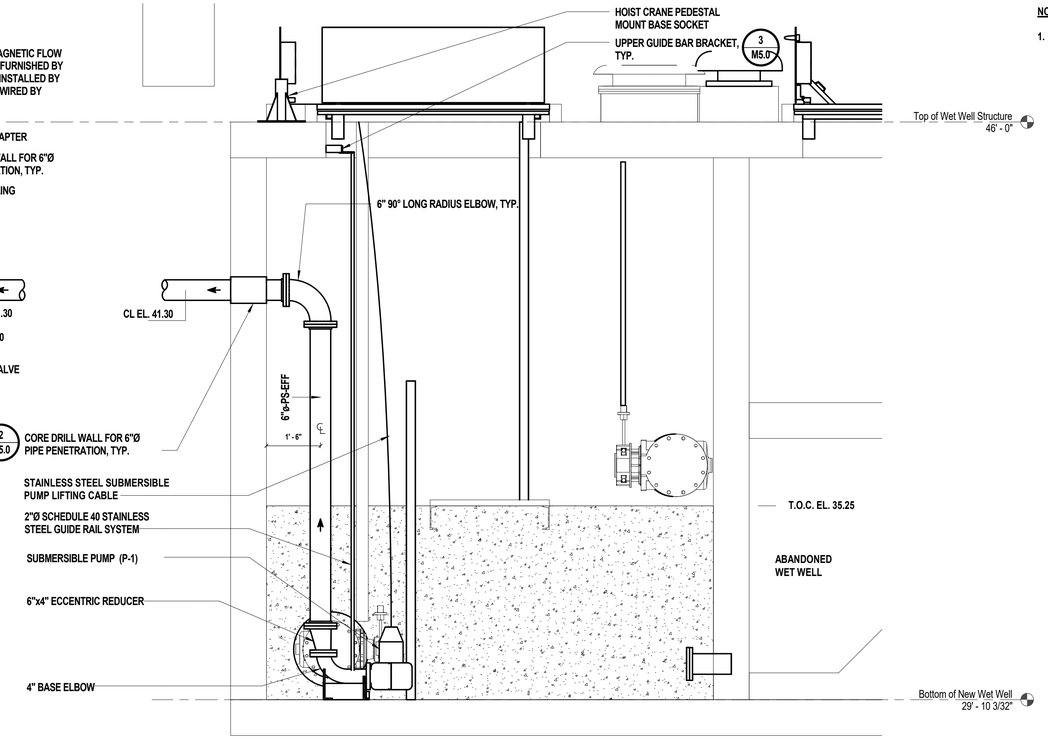
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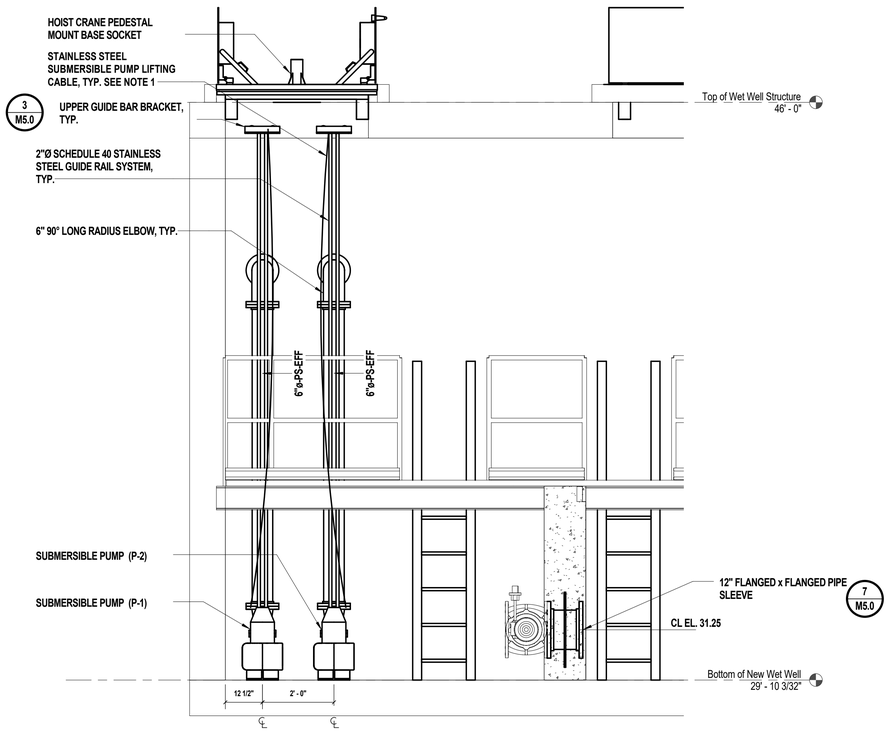


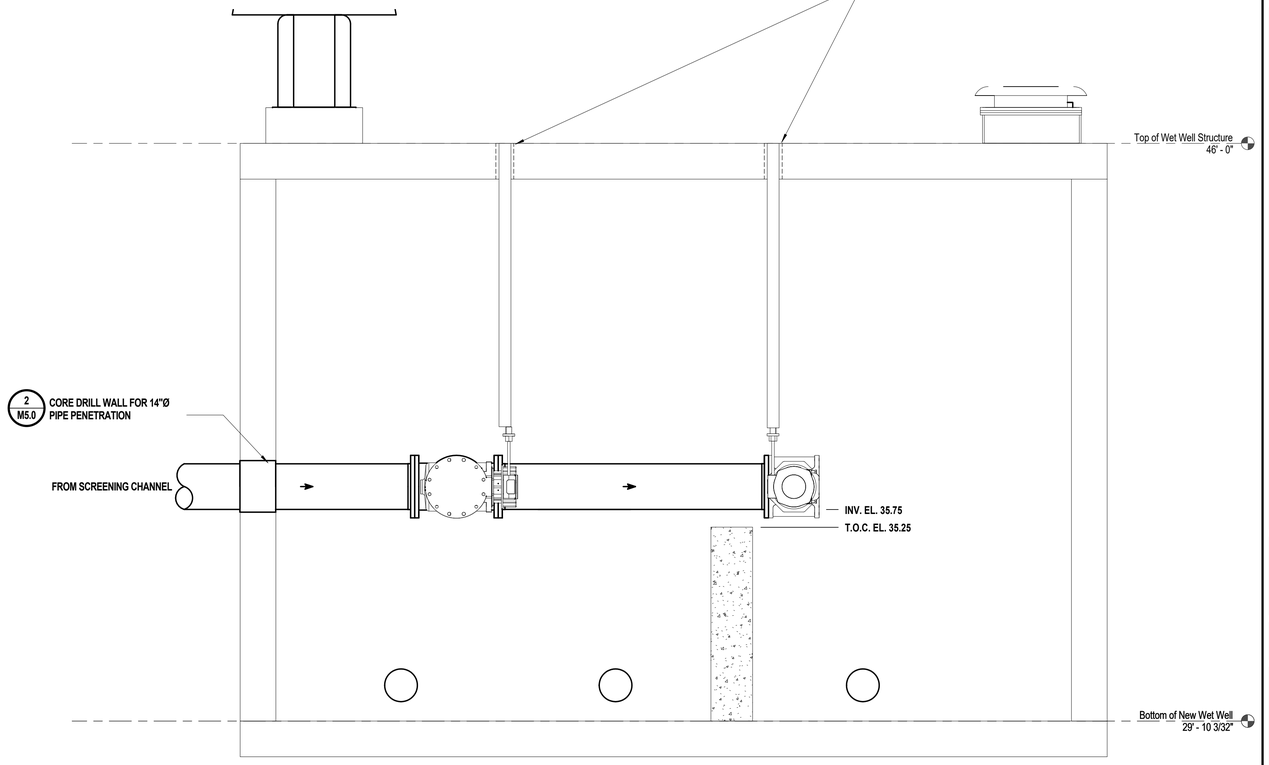

**NOTES:**

1. MOUNT NEW PUMP CABLE HOOK ACCESSORY TO INSIDE FACE OF CONCRETE OPENING AT ACCESS HATCH.

## 1 Influent Pump Station Mechanical Section
SCALE 1/2" = 1'-0"




## 2 Influent Pump Station Mechanical Section
SCALE 1/2" = 1'-0"




## 3 Influent Gravity Sewer Mechanical Section
SCALE 1/2" = 1'-0"


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**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

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**INFLUENT PUMP STATION SECTION VIEWS**

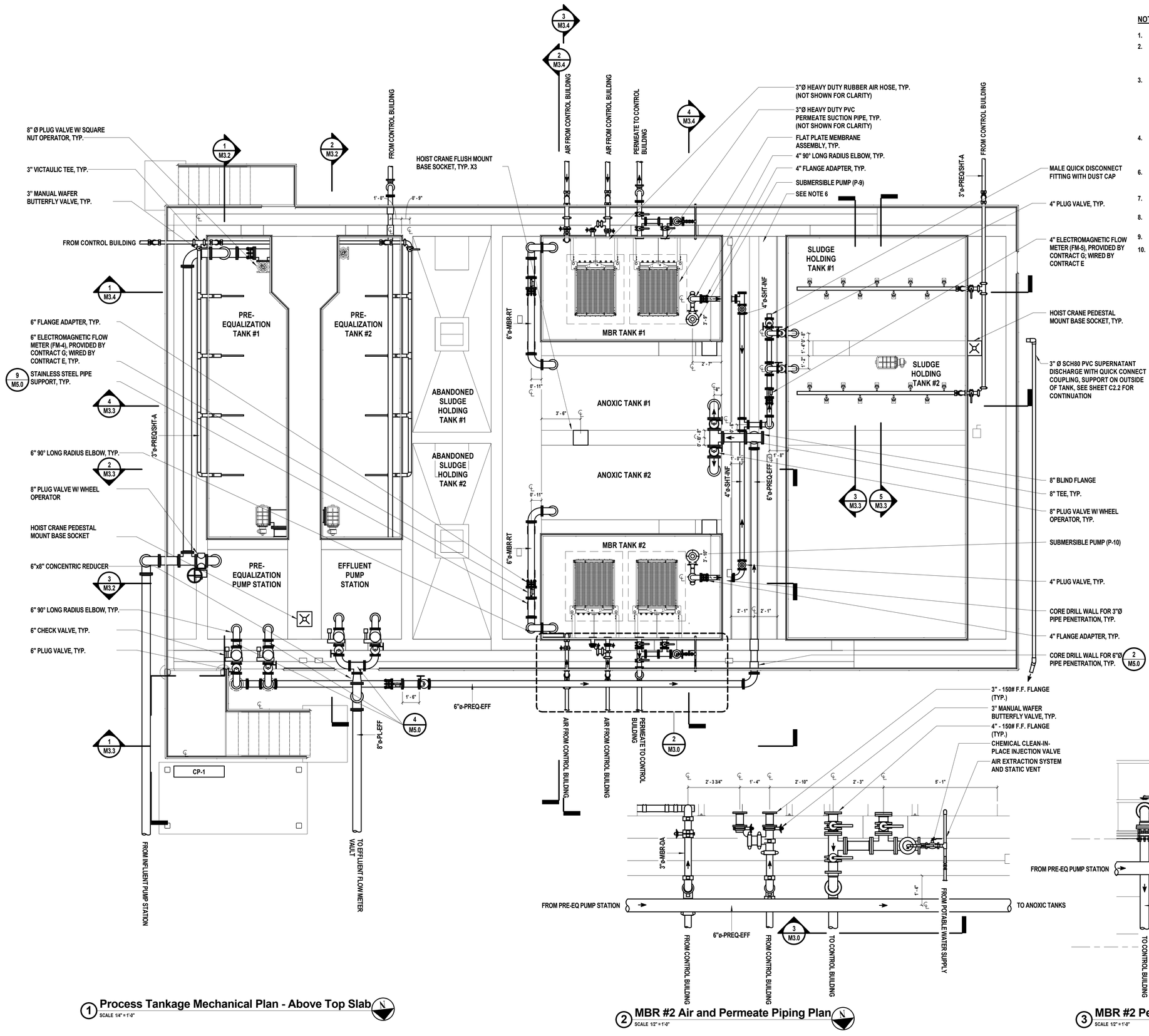
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**1** Process Tankage Mechanical Plan - Above Top Slab
SCALE 1/4" = 1'-0"

**2** MBR #2 Air and Permeate Piping Plan
SCALE 1/2" = 1'-0"

**3** MBR #2 Permeate Piping Section
SCALE 1/2" = 1'-0"

**NOTES:**

1. HEAT TRACE AND INSULATE ALL EXPOSED LIQUID PROCESS PIPING.
2. GENERAL CONTRACTOR RESPONSIBLE FOR AIR PIPING FOR PRE-EQUALIZATION AND SLUDGE HOLDING TANKS UP TO THE BUTTERFLY VALVE PRIOR TO DROP PIPING. AIR DIFFUSER MANUFACTURER TO PROVIDE MATERIALS FOR WITHIN THE TANK FOOTPRINT.
3. GENERAL CONTRACTOR RESPONSIBLE FOR AIR SCOUR AND PERMEATE PIPING UP TO AND INCLUDING THE FLANGE PRIOR TO THE FLEXIBLE HOSE. CONTRACTOR ALSO RESPONSIBLE FOR SUPPLEMENTAL AIR PIPING UP TO THE BUTTERFLY VALVE PRIOR TO DROP PIPING. MEMBRANE SYSTEM SUPPLIER TO PROVIDE FLEX HOSES WITH FLANGE FITTINGS FOR AIR SCOUR AND PERMEATE PIPING FOR WITHIN THE TANK FOOTPRINT, NOT SHOWN FOR CLARITY.
4. MEMBRANE SYSTEM SUPPLIER TO PROVIDE ALL MECHANICAL EQUIPMENT AND INSTRUMENTATION AND CONTROLS FOR THE MBR AND ANOXIC TANKS. GENERAL CONTRACTOR TO SUPPLY ALL MANUAL VALVES AND PIPING TO COMPLETE THE INSTALLATION.
6. PROVIDE POSITIVE DRAINAGE FROM INSIDE OF Y-WALL TO ELIMINATE STANDING WATER. DRAIN SHALL EXTEND OUTSIDE OF PROCESS TANKAGE FOOTPRINT.
7. ALL OUTER CHANNELS SHALL BE FILLED WITH FLOWABLE FILL AS PER SECTION 033000 - CONCRETE AFTER PROCESS UPGRADE IS COMPLETE.
8. PROVIDE A RECESSED 3'X2' SUMP, 4" DEEP FOR SUBMERSIBLE PUMPS P-9 AND P-10 TO ALLOW THE TANKS TO BE DRAINED.
9. SUPPORT PIPING IN ACCORDANCE WITH SPECIFICATION SECTION 220529.
10. MBR #1 AIR AND PERMEATE PIPING ARE A MIRROR IMAGE OF THE MBR #2 DETAIL SHOWN ON THIS SHEET.

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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD 1792 — DAT ET PROSPERITAS PER PROGRESSUM

CONTRACT

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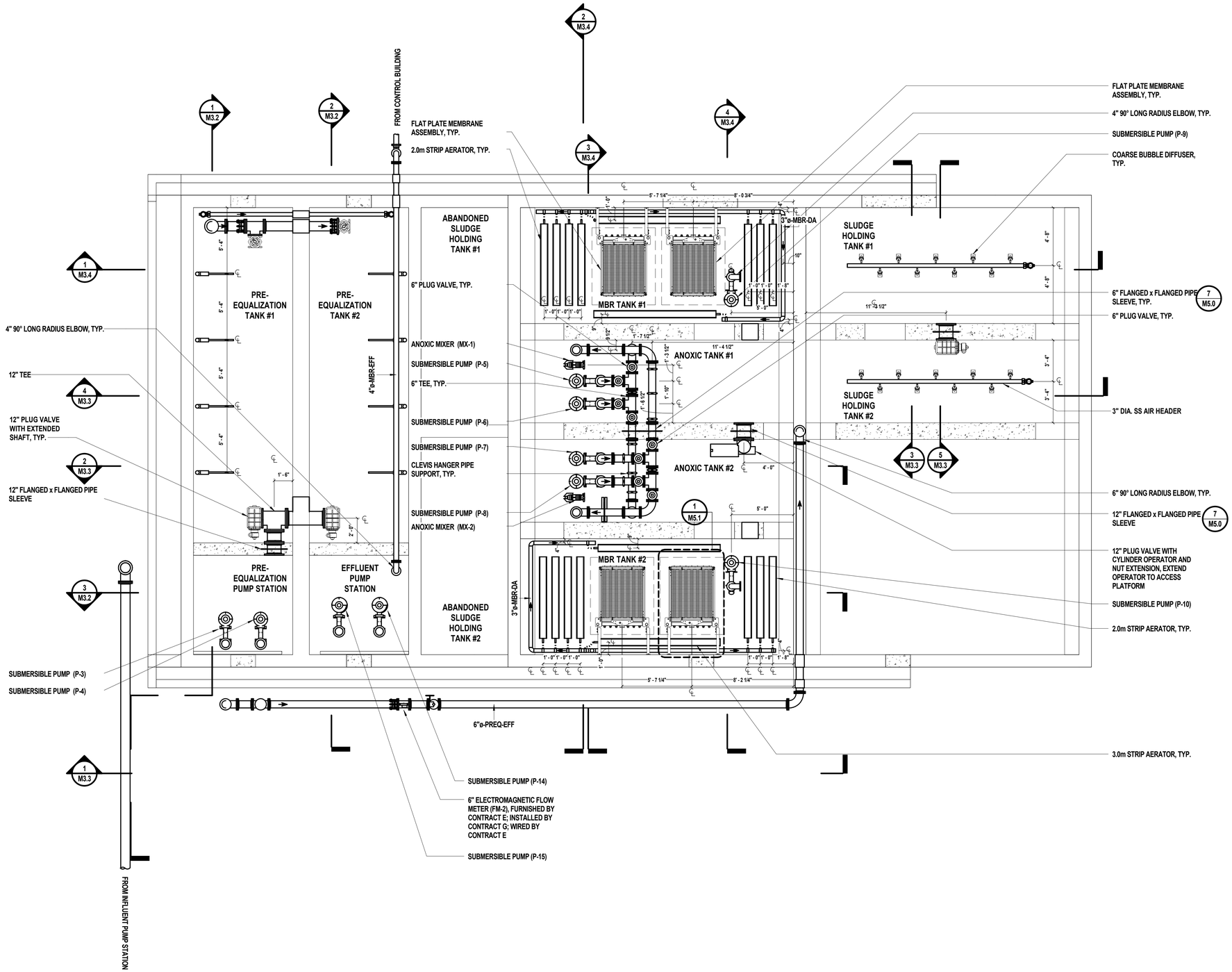
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**PROCESS TANKAGE MECHANICAL PLAN - ABOVE TOP SLAB**

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## 1 Process Tankage Mechanical Plan - Below Top Slab

SCALE 1/4" = 1'-0"


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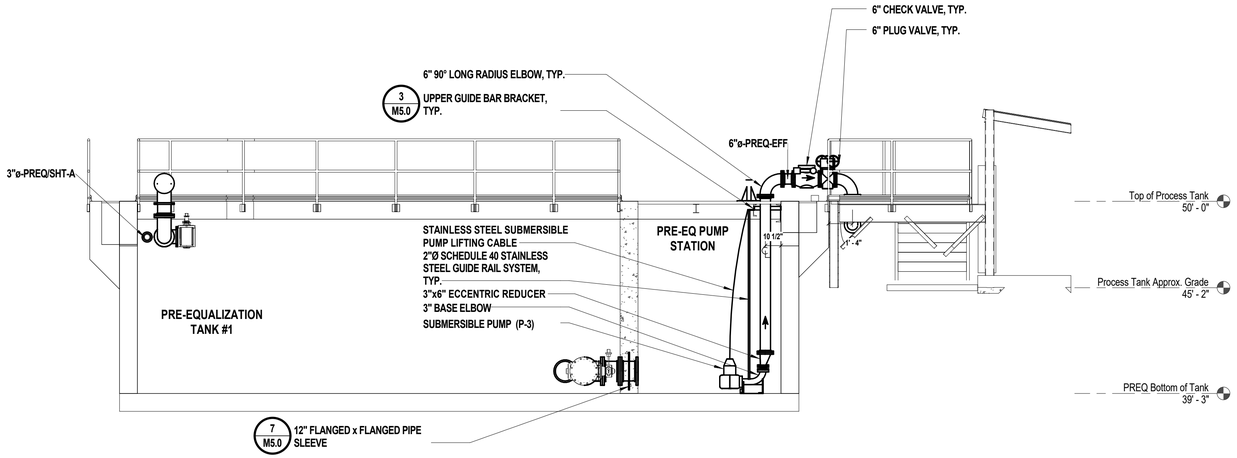
**PROCESS TANKAGE MECHANICAL PLAN - BELOW TOP SLAB**

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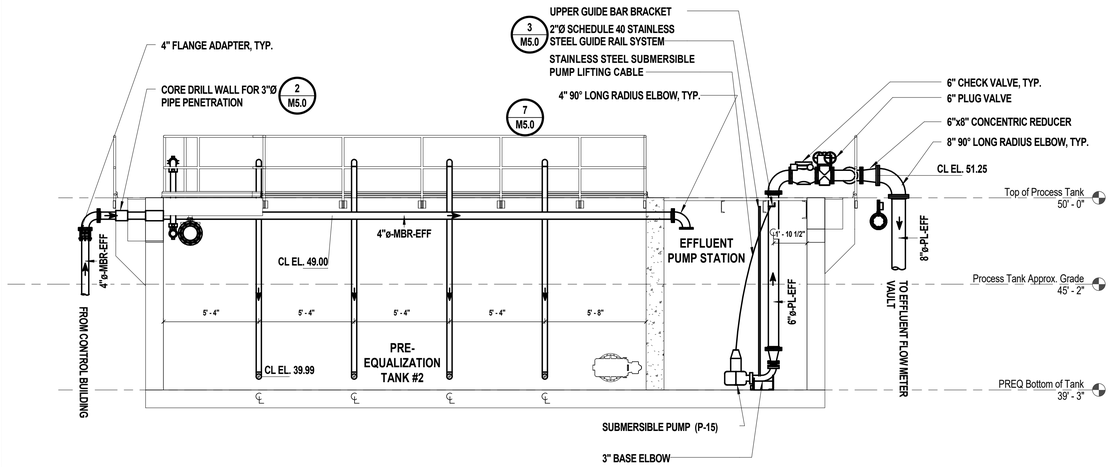
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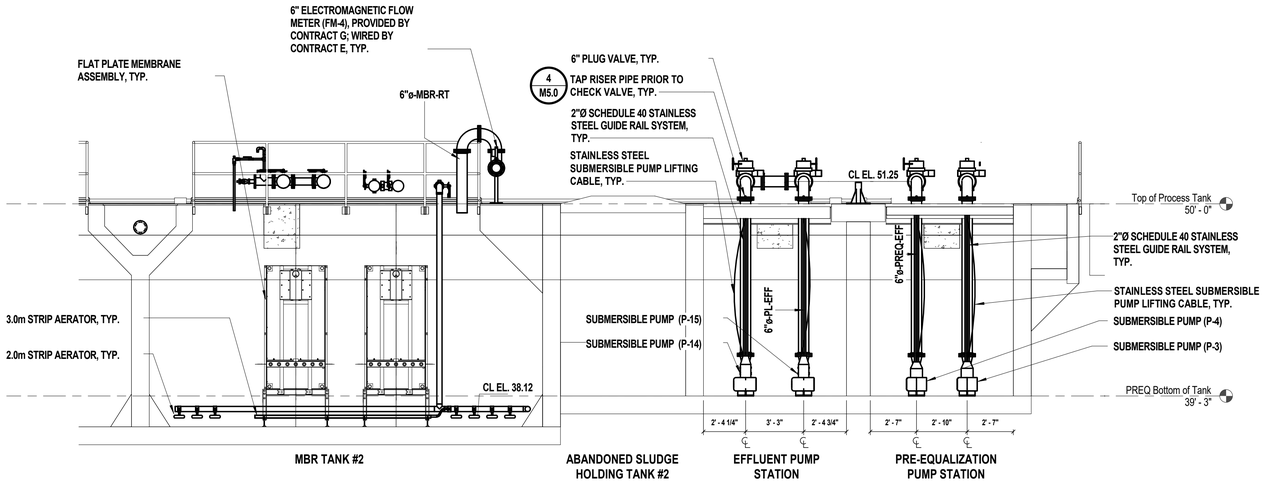

## 1 Pre-Equalization Tank #1 and Pump Station Mechanical Section

SCALE 1/4" = 1'-0"



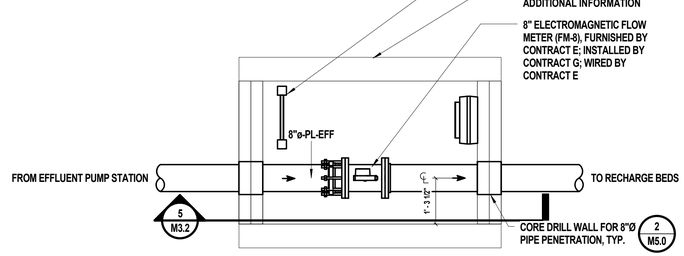

## 2 Pre-Equalization Tank #2 and Effluent Pump Station Mechanical Section

SCALE 1/4" = 1'-0"



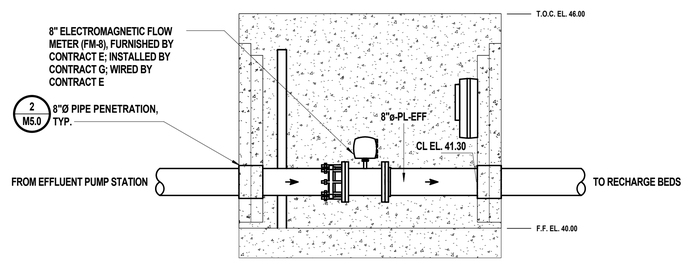

## 3 Process Tankage Mechanical Section

SCALE 1/4" = 1'-0"




## 4 Effluent Flow Meter Vault Plan

SCALE 1/2" = 1'-0"




## 5 Effluent Flow Meter Vault Section

SCALE 1/2" = 1'-0"

H 2 M architects + engineers
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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

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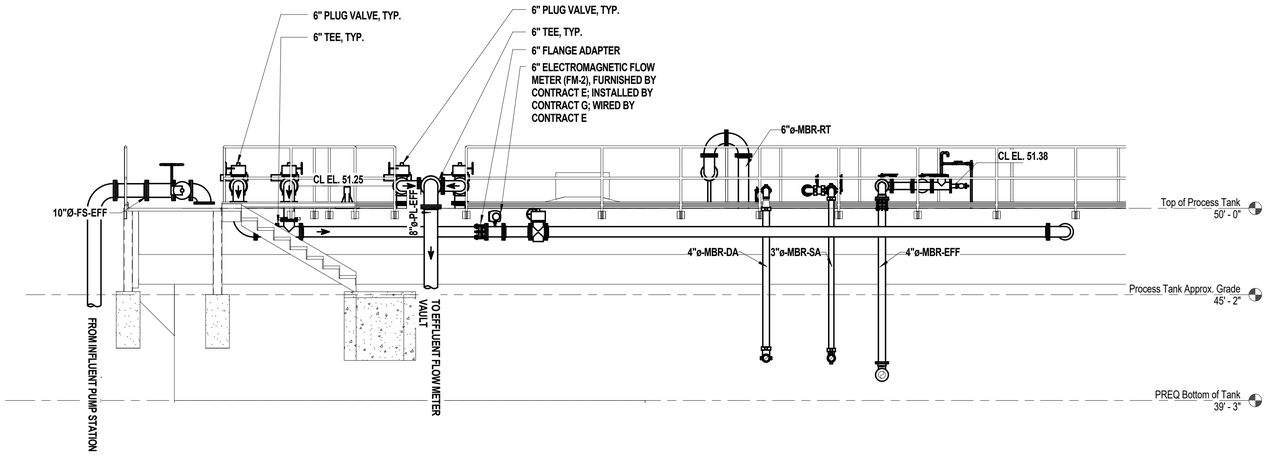
SHEET TITLE

**PROCESS TANKAGE MECHANICAL SECTION VIEWS AND DETAILS**

| DRAWING # | SHEET # |
|---|---|
| M3.2 | 39 OF 49 |

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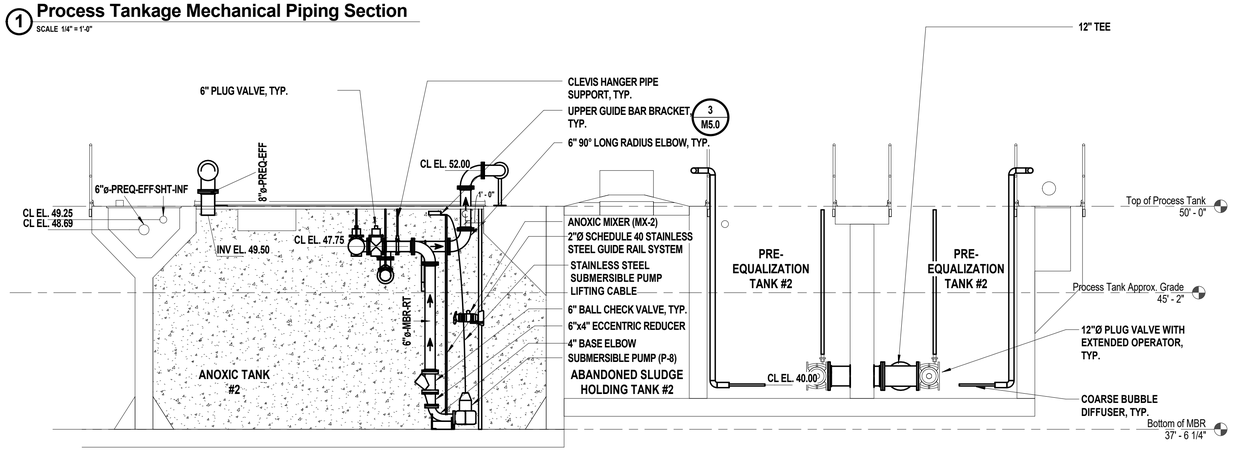



## 1 Process Tankage Mechanical Piping Section

SCALE 1/4" = 1'-0"

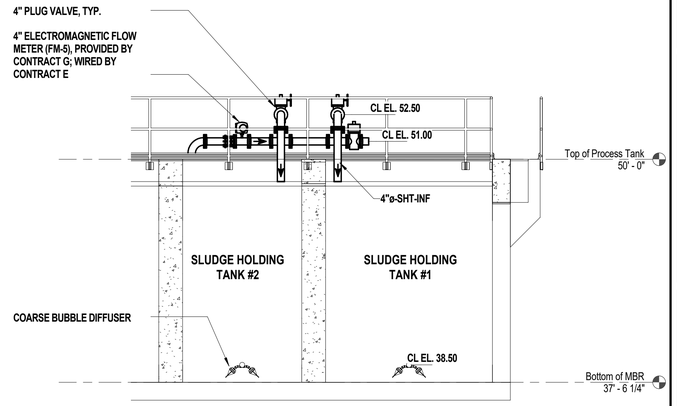
**NOTES:**

1. SUBMERGED BALL CHECK VALVES SHALL BE SUPPLIED WITH STAINLESS STEEL HARDWARE.
2. PROVIDE FLEXIBLE COUPLINGS ON ALL PIPING RISERS AT TRANSITION FROM BURIED TO EXPOSED PIPING.



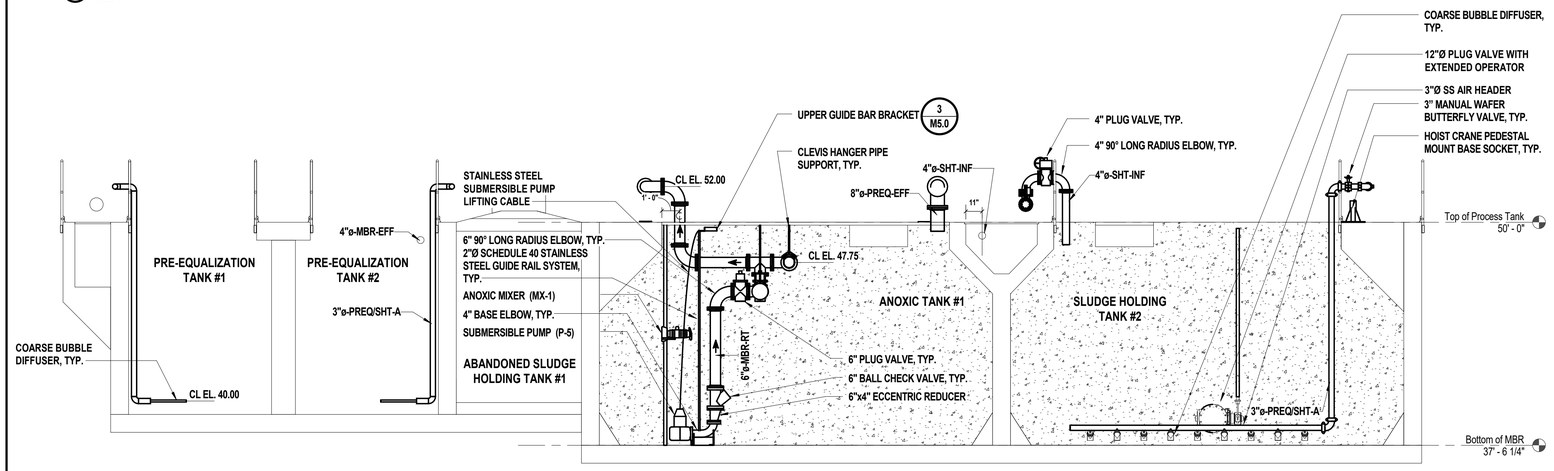

## 2 Process Tankage Mechanical Section

SCALE 1/4" = 1'-0"



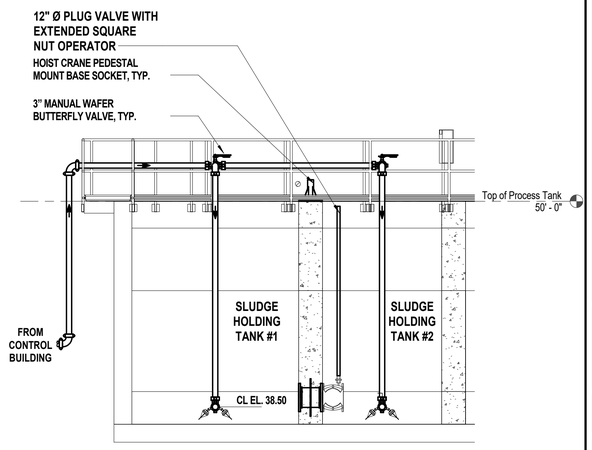

## 3 Sludge Holding Tank Mechanical Section

SCALE 1/4" = 1'-0"




## 4 Process Tankage Mechanical Section

SCALE 1/4" = 1'-0"




## 5 Sludge Holding Tank Mechanical Section

SCALE 1/4" = 1'-0"

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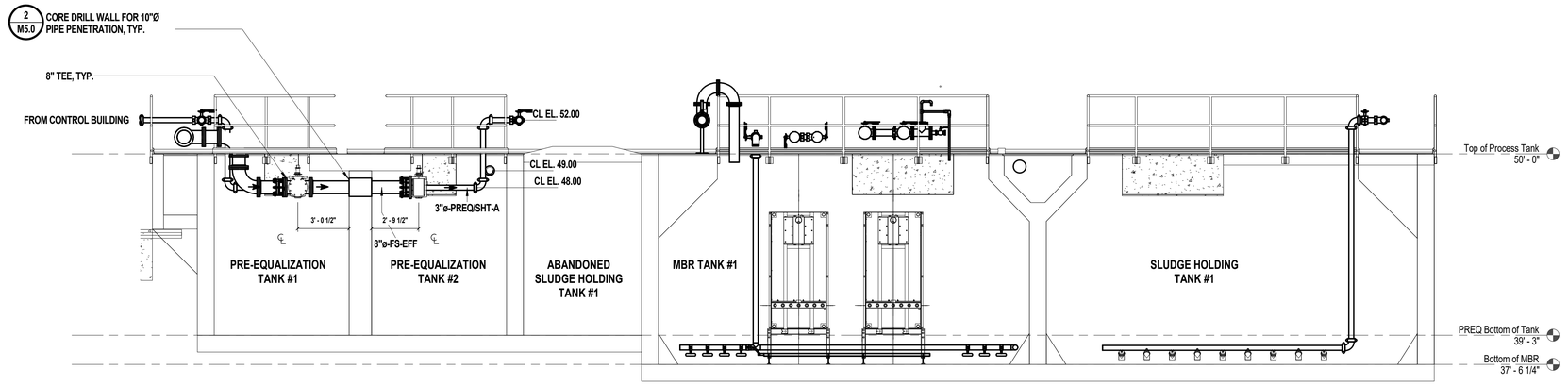
**PROCESS TANKAGE MECHANICAL SECTION VIEWS**

DRAWING # **M3.3**

SHEET # 40 OF 49

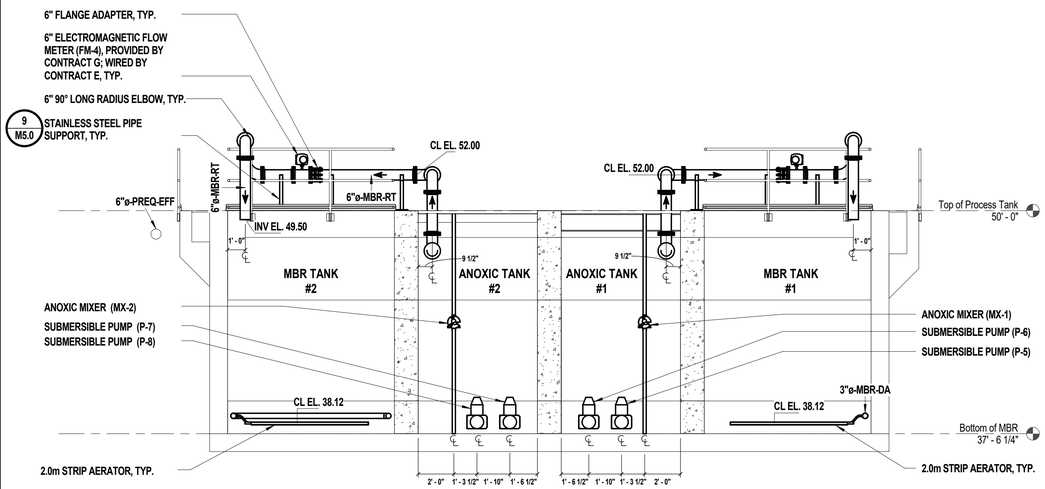
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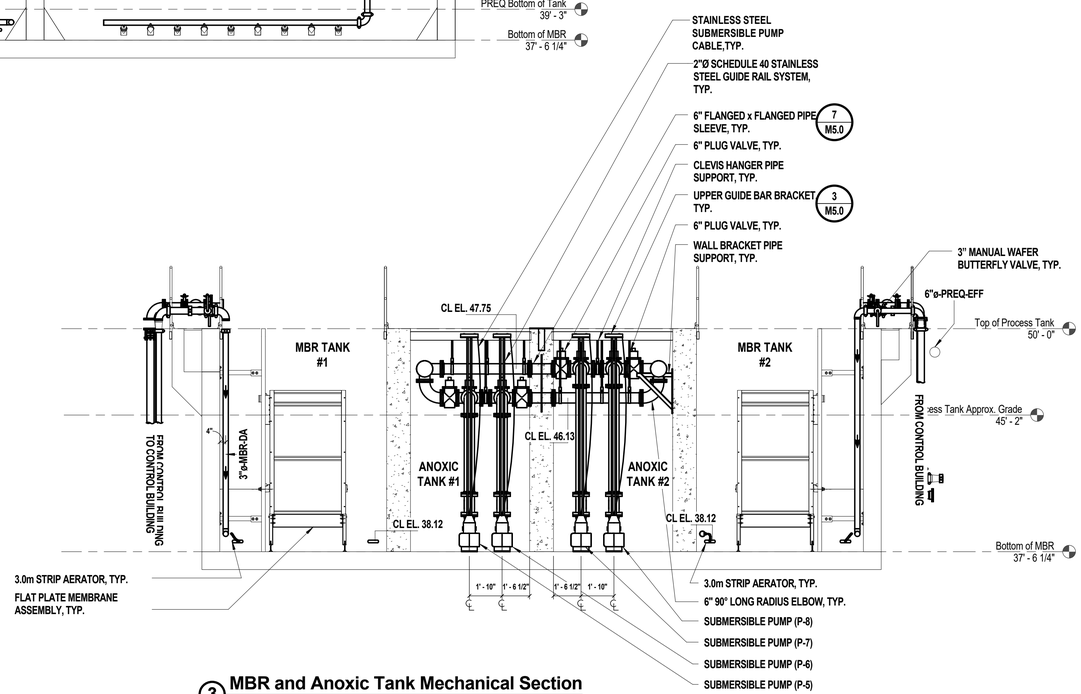
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## 1 Process Tankage Mechanical Section

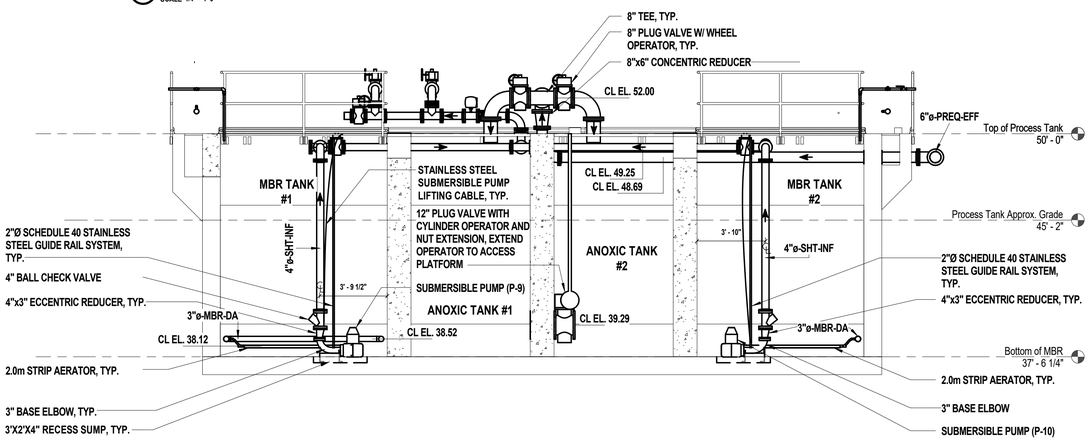
SCALE 1/4" = 1'-0"




## 3 MBR and Anoxic Tank Mechanical Section

SCALE 1/4" = 1'-0"




## 4 MBR and Anoxic Tank Mechanical Section

SCALE 1/4" = 1'-0"

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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD — 1792 — PAX ET PROSPERITAS PER PROGRESSUM

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**PROCESS TANKAGE MECHANICAL SECTION VIEWS**

DRAWING #

**M3.4**

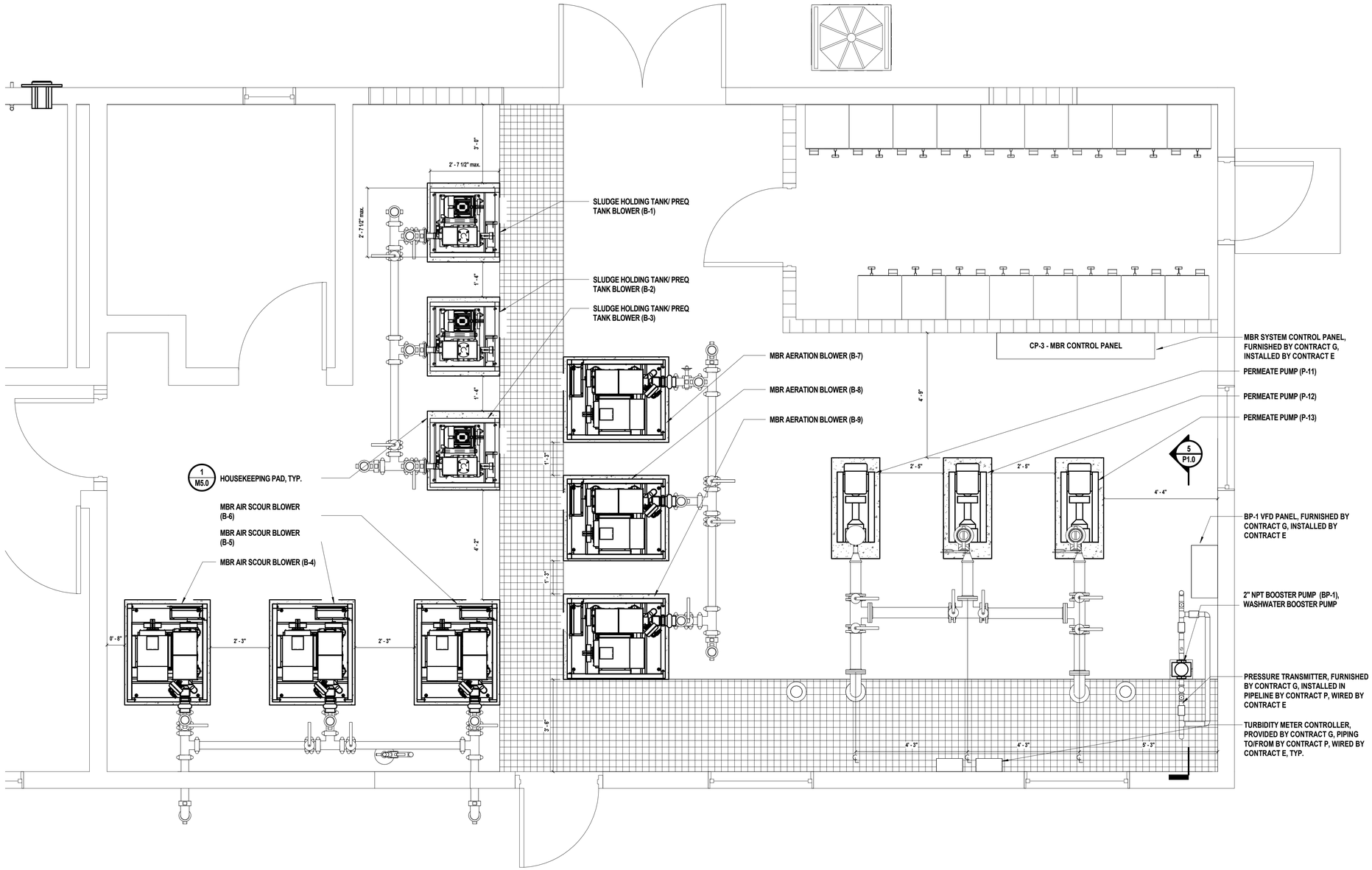
SHEET # 41 OF 49

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**NOTE:**

1. COORDINATE WORK OF THIS DRAWING WITH CONTRACT P FOR PIPING LIMITS AND LOCATION OF EQUIPMENT. NEW OVERHEAD PIPING NOT SHOWN FOR CLARITY.
2. PROVIDE RUBBER MATTING TO COVER THE LIMITS OF THE EXISTING PIPE TRENCH GRATING.
3. CONTRACT G SHALL BE RESPONSIBLE FOR ALL SITE PIPING. CONTRACT G SHALL CORE DRILL AND STUB INTO THE CONTROL BUILDING 1' FOR CONNECTION TO CONTRACT P PIPING.
4. CONTRACT G SHALL BE RESPONSIBLE FOR PROVIDING BOOSTER PUMP BP-1, CONTRACT P SHALL BE RESPONSIBLE FOR INSTALLATION OF PIPING WITHIN CONTROL BUILDING AND CONNECTION TO BOOSTER PUMP BP-1, CONTRACT E SHALL BE RESPONSIBLE FOR WIRING AND TERMINATIONS. SEE NOTE 3 FOR LIMITS OF PIPING RESPONSIBILITIES.




## 1 Control Building Mechanical Equipment Plan

SCALE 1/2" = 1'-0"


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**GENERAL CONSTRUCTION**

STATUS

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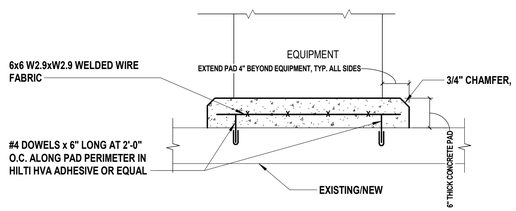
**CONTROL BUILDING MECHANICAL EQUIPMENT PLAN**

DRAWING # **M4.0**

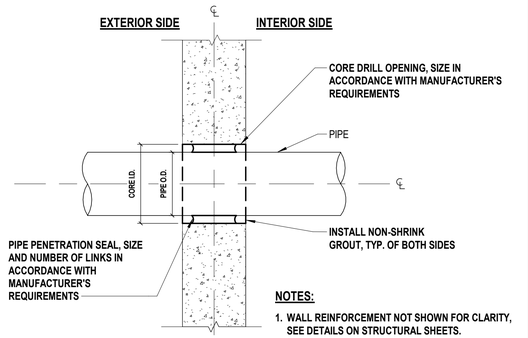
SHEET # 42 OF 49

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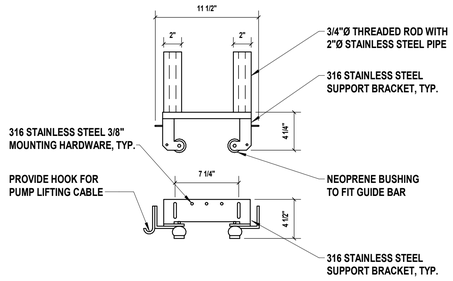

## 1 Concrete House Keeping Pad Detail
SCALE NO SCALE



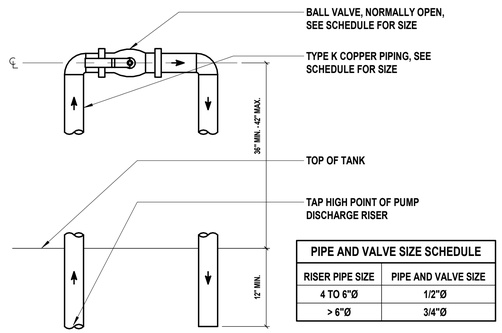

**NOTES:**

1. WALL REINFORCEMENT NOT SHOWN FOR CLARITY, SEE DETAILS ON STRUCTURAL SHEETS.
2. CONTRACTOR MAY UTILIZE CAST-IN-PLACE SLEEVES WITH WATER STOPS FOR NEW CONSTRUCTION IN LIEU OF CORE DRILLS AND LINK SEALS, SUBJECT TO THE APPROVAL OF THE ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL COORDINATION THAT IS REQUIRED.
3. COAT CUT ENDS OF REINFORCEMENT IN STRUCTURE WITH ZINC RICH PRIMER.

## 2 Pipe Penetration Core and Link Seal Detail
SCALE NO SCALE

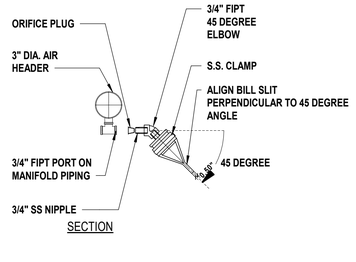



## 3 Upper Guide Bar Bracket Detail
SCALE 1 1/2" = 1'-0"

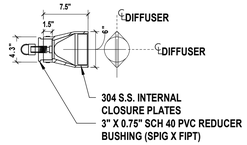



| PIPE AND VALVE SIZE SCHEDULE | |
|---|---|
| RISER PIPE SIZE | PIPE AND VALVE SIZE |
| 4 TO 6"Ø | 1/2"Ø |
| > 6"Ø | 3/4"Ø |

## 4 Riser Pipe Tap Detail
SCALE NO SCALE

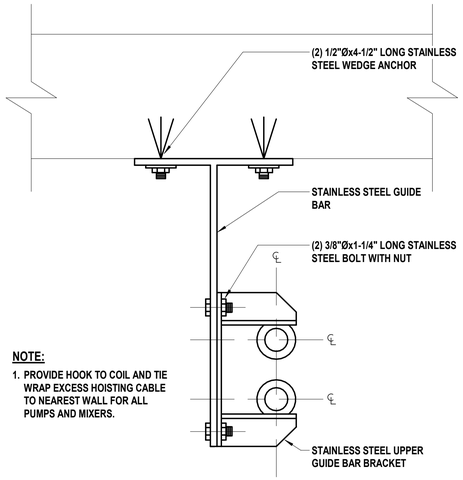



SECTION




PLAN AND END VIEW

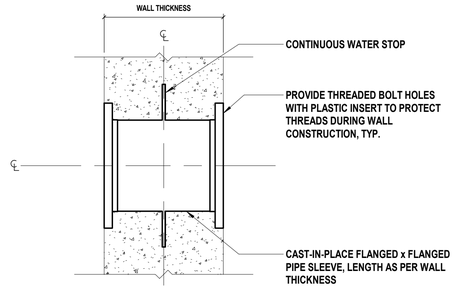
## 5 Coarse Bubble Diffuser
SCALE 1" = 1'-0"




**NOTE:**

1. PROVIDE HOOK TO COIL AND TIE WRAP EXCESS HOISTING CABLE TO NEAREST WALL FOR ALL PUMPS AND MIXERS.

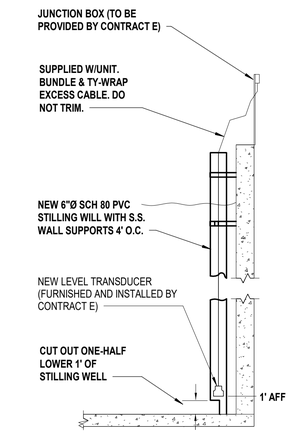
## 6 Side Bracket Pump Guiderail Detail
SCALE NO SCALE



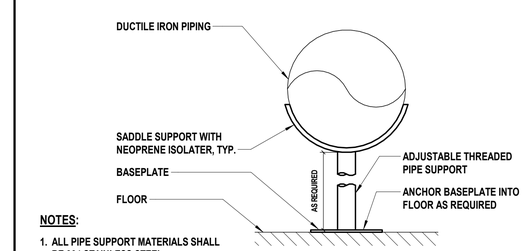

**NOTE:**

CONNECT NEW FLANGED PIPING, VALVES, FITTINGS, ETC. AFTER WALL IS CONFIRMED TO HAVE MET CONCRETE STRENGTH.

## 7 Flanged x Flanged Pipe Sleeve
SCALE NO SCALE



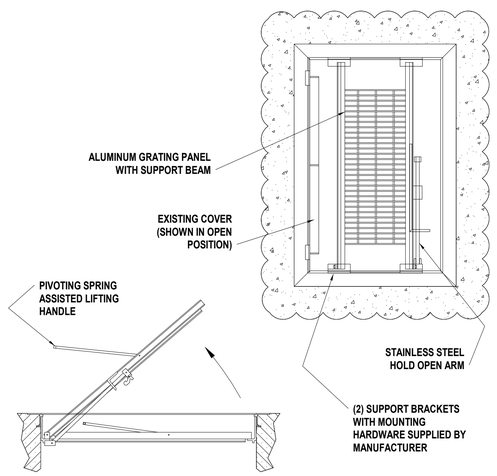

## 8 Stilling Well Detail
SCALE 3/16" = 1'-0"



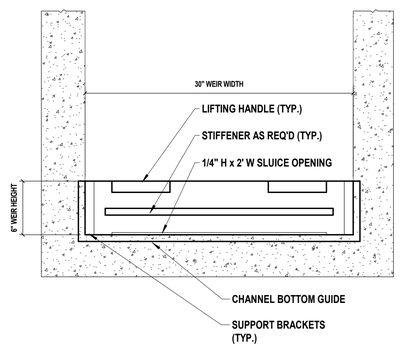

**NOTES:**

1. ALL PIPE SUPPORT MATERIALS SHALL BE 304 STAINLESS STEEL.
2. PIPING SUPPORTS SHALL BE UTILIZED FOR PIPING ≥ 4"Ø AND SPACED NO LESS THAN 10' - 0" O.C.

## 9 Single Pipe Saddle Support Detail
SCALE NO SCALE



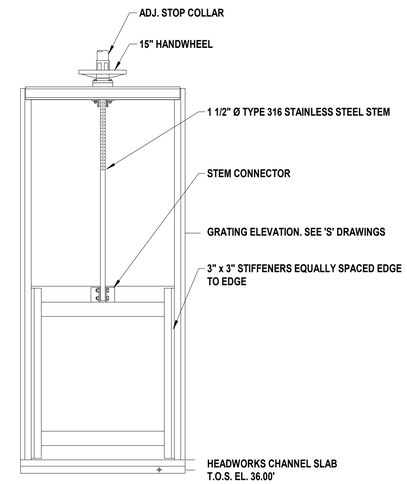

## 10 Retrofit Safety Gate Detail
SCALE 1" = 1'-0"




**NOTE:**

COORDINATE WITH PRECAST SCREEN CHANNEL MANUFACTURER.

## 11 Sluice/Weir Detail
SCALE 1 1/2" = 1'-0"




## 12 Handwheel Slide Gate Front View
SCALE 1/4" = 1'-0"


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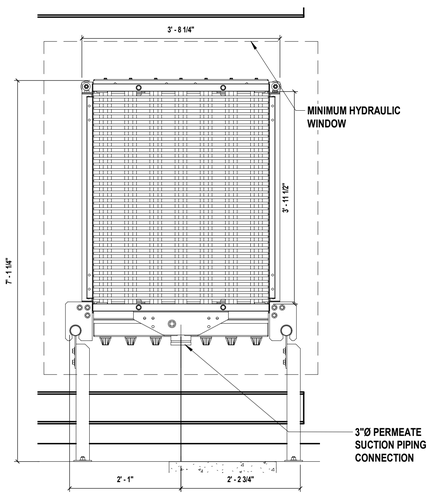
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**MECHANICAL DETAILS**

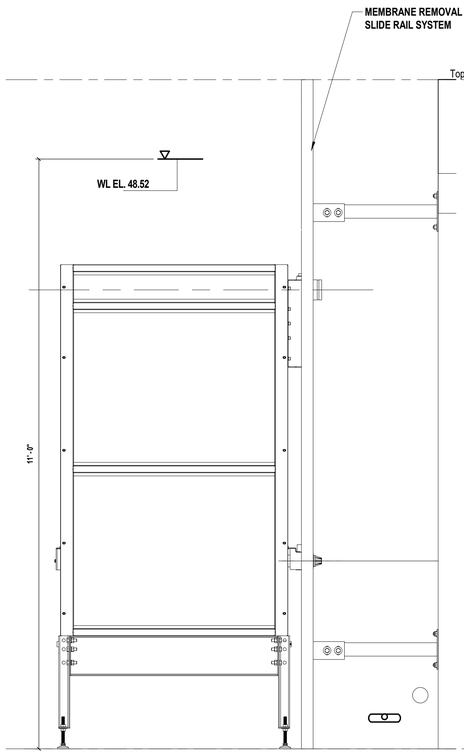
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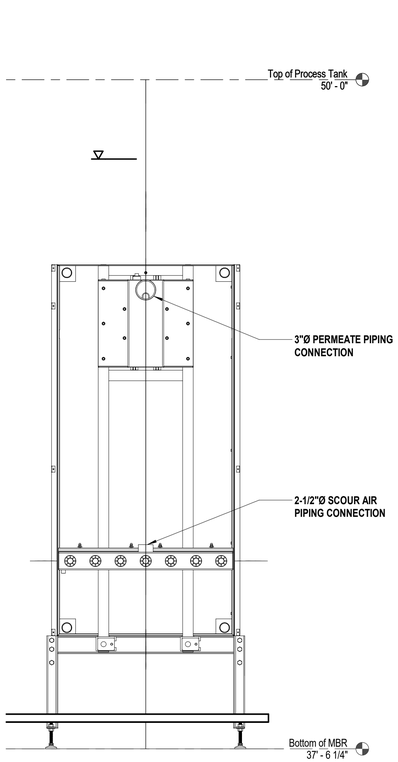
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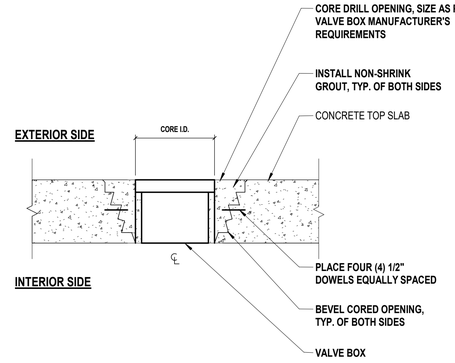

1 **MBR Dimensional Plan**
SCALE 3/4" = 1'-0"




2 **MBR Front Elevation**
SCALE 3/4" = 1'-0"




3 **MBR Rear Elevation**
SCALE 3/4" = 1'-0"




4 **Repair Detail at Valve Box**
SCALE NO SCALE

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**MECHANICAL DETAILS**

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SHEET # 44 OF 49

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## ABBREVIATIONS

| | |
|---|---|
| AFF | ABOVE FINISHED FLOOR |
| BCU | BUILDING CONTROL UNIT |
| BTU | BRITISH THERMAL UNIT |
| CFH | CUBIC FEET PER HOUR |
| CFM | CUBIC FEET PER MINUTE |
| CLG | CEILING |
| COMM. | COMMUNICATION |
| CV | CONTROL VALVE |
| (D) | DEMOLISHED |
| DB | DRY BULB |
| DCV | DEMAND CONTROLLED VENTILATION |
| DEG. F | DEGREES FAHRENHEIT |
| DIA | DIAMETER |
| DX | DIRECT EXPANSION |
| 'E' | ELECTRICAL CONTRACTOR |
| (E) | EXISTING |
| EA | EACH |
| EAT | ENTERING AIR TEMPERATURE |
| EER | ENERGY EFFICIENCY RATING |
| ESP | EXTERNAL STATIC PRESSURE |
| FAI | FRESH AIR INTAKE |
| FD | FLOOR DRAIN |
| FLA | FULL LOAD AMPS |
| FT. H20 | FEET OF WATER |
| 'G' | GENERAL CONSTRUCTION CONTRACT |
| GPM | GALLONS PER MINUTE |
| GPH | GALLONS PER HOUR |
| H | HEIGHT |
| HP | HORSEPOWER |
| IN. | INCHES |
| IN. W.C. | INCHES WATER COLUMN (WATER GAUGE) |
| KW | KILOWATTS |
| L | LENGTH |
| LAT | LEAVING AIR TEMPERATURE |
| LBS | POUNDS |
| LCD | LIQUID CRYSTAL DISPLAY |
| LDB | LEAVING DRY BULB TEMPERATURE |
| LWB | LEAVING WET BULB TEMPERATURE |
| LWT | LEAVING WATER TEMPERATURE |
| M | METER |
| MAX | MAXIMUM |
| MBH | 1,000 BTU PER HOUR |
| MCA | MINIMUM CIRCUIT AMPACITY |
| MIN | MINIMUM |
| MNF | MANUFACTURER |
| N.C. | NORMALLY CLOSED |
| N.O. | NORMALLY OPEN |
| NFPA | NATIONAL FIRE PROTECTION AGENCY |
| NPT | NATIONAL PIPE THREAD |
| NTS | NOT TO SCALE |
| OAI | OUTSIDE AIR INTAKE |
| OD | OUTER DIAMETER |
| OED | OPEN ENDED DUCT |
| 'P' | PLUMBING CONTRACTOR |
| PD | PRESSURE DROP |
| PSIG | LBS / PER SQUARE INCH (GAUGE PRESSURE) |
| RD | ROOF DRAIN |
| RPM | REVOLUTIONS PER MINUTE |
| RPZ | REDUCED PRESSURE ZONE |
| SAT | SUPPLY AIR TEMPERATURE |
| SEER | SEASONAL ENERGY EFFICIENCY RATING |
| TEMP | TEMPERATURE |
| TG | TRANSFER GRILLE |
| TYP | TYPICAL |
| VFD | VARIABLE FREQUENCY DRIVE |
| W | WIDTH |
| WB | WET BULB |
| WMS | WIRE MESH SCREEN |

## DUCTWORK LEGEND

| SYMBOL | ABBREV | DESCRIPTION |
|---|---|---|
| | | NEW DUCTWORK WITH 45 DEGREE TAKE OFF |
| | VD | VOLUME DAMPER |
| | CD | ROUND SUPPLY CEILING DIFFUSER |
| | SEE AIR DEVICE SCHEDULE | SIDEWALL SUPPLY, RETURN OR EXHAUST |
| | SEE AIR DEVICE SCHEDULE | SQUARE SUPPLY CEILING DIFFUSER |
| | SEE AIR DEVICE SCHEDULE | CEILING RETURN OR EXHAUST GRILLE |
| | FC | FLEXIBLE CONNECTION |
| | | TURNING VANES |
| | | RECTANGULAR TO ROUND TRANSITION |
| | AL | ACOUSTICAL LINING |
| | | END CAP |
| | SEE AIR DEVICE SCHEDULE | SUPPLY DIFFUSER WITH DIRECTIONAL FLOW (SOLID HATCH INDICATES BLANK OFF PANEL) |
| | | SUPPLY DUCT DROP |
| | | RETURN/EXHAUST DUCT DROP |
| | | SUPPLY DUCT RISE |
| | | RETURN/EXHAUST DUCT RISE |
| DSD | DSD | DUCT SMOKE DETECTOR |
| M | MD | MOTORIZED DAMPER WITH ACTUATOR |
| OR | AD | ACCESS DOOR |
| | FD/AD | FIRE DAMPER WITH ACCESS DOOR |
| | FSD/AD | FIRE SMOKE DAMPER WITH ACCESS DOOR |
| | | FAN |
| | | DUCTWORK/ EQUIPMENT TO BE REMOVED |
| | | POINT OF DISCONNECTION FROM EXISTING |
| | | POINT OF RECONNECTION TO EXISTING |

## CONTROLS LEGEND

| SYMBOL | ABBREV | DESCRIPTION |
|---|---|---|
| T | | THERMOSTAT |

## PIPING LEGEND

| SYMBOL | ABBREV | DESCRIPTION |
|---|---|---|
| | | NEW WORK |
| | | PIPING DOWN/ PIPING UP |
| | | BALL VALVE WITH HOSE END CONNECTION |
| | TH | THERMOMETER |
| | U | UNION |
| | FPC | FLEXIBLE PIPE CONNECTION |
| | | DIRECTION OF FLOW |
| | PSR | PRESSURE SAFETY AND RELIEF VALVE |
| | PRV | PRESSURE REDUCING VALVE |
| | BV | BALL VALVE |
| | BA | BALANCING VALVE |
| | BFV | BUTTERFLY VALVE |
| | | TEMPERATURE SENSOR WITH THERMOWELL |
| | GA | GATE VALVE |
| | GB | GLOBE VALVE |
| | AV | AUTOMATIC AIR VENT |
| | CV | 2-WAY ELECTRONIC CONTROL VALVE |
| | CV | 3-WAY ELECTRONIC CONTROL VALVE |
| | CV | 2-WAY PNEUMATIC CONTROL VALVE |
| | CV | 3-WAY PNEUMATIC CONTROL VALVE |
| | STR | STRAINER WITH BLOW OFF VALVE WITH HOSE END CONNECTION |
| | FD | FLOOR DRAIN |
| S | | AIR SEPARATOR |
| F&T | | STEAM TRAPS (INDICATE TYPE) |
| | CH | CHECK VALVE |
| | PG | PRESSURE GAUGE WITH GAUGE COCK |
| | RED | REDUCER |
| | CO | CLEANOUT END CAP |
| | | PIPE GUIDE |
| | | PIPE ANCHOR |
| | | CAPPED PIPE |
| | | PUMP |
| | | POINT OF DISCONNECTION FROM EXISTING |
| | | POINT OF RECONNECTION TO EXISTING |
| | TDV | TRIPLE DUTY VALVE |

GENERAL NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
2. THE CONTRACTOR, BY PRESENTING THEIR BID FOR THE WORK, REPRESENTS THAT HE/SHE HAS INSPECTED THE SITE AND IS COMPLETELY FAMILIAR WITH THE SCOPE OF WORK AND ALL FIELD CONDITIONS RELATED TO, AND AFFECTING THE WORK AND ITS PERFORMANCE. EXCEPTIONS AFFECTING THE WORK AND ITS PERFORMANCE, OR CONFLICTS BETWEEN FIELD CONDITIONS, SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO THE SUBMISSION OF BIDS.
3. PERFORM ALL WORK IN ACCORDANCE WITH THE PLUMBING CODE, FIRE CODE, MECHANICAL CODE, ENERGY CONSERVATION CONSTRUCTION CODE, AND FUEL GAS CODE OF NEW YORK STATE AND REQUIREMENTS OF THE LOCAL AUTHORITIES HAVING JURISDICTION.
4. COMPLY WITH THE NATIONAL ELECTRIC CODE AND THE REQUIREMENTS OF DIVISION 26 FOR ALL ELECTRICAL INSTALLATIONS.
5. FIRE STOP ALL OPENINGS IN FIRE RATED CONSTRUCTION FOR PIPING, DUCTWORK, CONDUIT, ETC. PROVIDE FIRE DAMPERS AND ACCESS DOORS IN ALL OPENINGS IN FIRE RATED FLOORS, PARTITIONS, AND WALLS FOR DUCTWORK AS PER THE MECHANICAL CODE OF NEW YORK STATE. (SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF FIRE RATED CONSTRUCTION.)
6. DO NOT SCALE DRAWINGS. DRAWINGS FOR HVAC WORK ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE. COORDINATE CONTRACT DOCUMENTS, PROJECT REQUIREMENTS, WORK OF OTHERS, AND EQUIPMENT AND MATERIALS PURCHASED WITH FIELD DIMENSIONS. INSTALL ALL EQUIPMENT AS PER MANUFACTURER'S REQUIREMENTS TO PROVIDE PROPER CLEARANCE FOR INSTALLATION, OPERATION, AND MAINTENANCE. CONTRACTOR'S INTENDED MEANS AND METHODS OF INSTALLATION AND CONTRACTOR'S FABRICATED ITEMS SHALL ENSURE A PROPER "FIT" AND INSTALLATION. BRING ANY CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER DURING THE SUBMITTAL PHASE FOR RESOLUTION PRIOR TO PURCHASING ANY EQUIPMENT.
7. MAINTAIN MAXIMUM HEADROOM AND SPACE CONDITIONS AT ALL POINTS. WHERE HEADROOM AND SPACE CONDITIONS APPEAR INADEQUATE, NOTIFY THE ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH INSTALLATION. MAINTAIN A MINIMUM OF 6'-8" CLEARANCE FROM FINISHED FLOOR TO UNDERSIDE OF PIPES, DUCTS, CONDUITS, SUSPENDED EQUIPMENT ETC., THROUGHOUT ACCESS ROUTES IN MECHANICAL ROOMS.
8. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION. MAKE MODIFICATIONS IN THE LAYOUT AS NEEDED TO PREVENT CONFLICT WITH WORK JF OTHER TRADES OR FOR PROPER EXECUTION OF THE WORK. OBTAIN THE APPROVAL OF THE ARCHITECT/ENGINEER FOR MODIFICATIONS.
9. PROVIDE PRODUCTS OF ONE MANUFACTURER WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF MATERIAL OR EQUIPMENT IS REQUIRED.
10. INSTALL ALL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS. REFER TO DETAILS FOR ADDITIONAL PIPING AND EQUIPMENT INSTALLATION REQUIREMENTS.
11. LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH STRAIGHT SECTION OF PIPE OR DUCT UP- AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER TO ENSURE MANUFACTURER CERTIFIED ACCURACY.
12. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL PIPING AND DUCT TRANSITIONS REQUIRED FOR FINAL CONNECTIONS TO EQUIPMENT.
13. COORDINATE LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS WITH ALL OTHER TRADES. COORDINATE ALL PIPING AND EQUIPMENT SUPPORTED FROM STRUCTURE WITH GENERAL CONSTRUCTION WORK.
14. COORDINATE INSTALLATION OF SUPPLY AND RETURN GRILLES WITH INSTALLATION OF FINISHED CEILINGS.
15. COMPLETE ALL PRESSURE TESTS BEFORE ANY MECHANICAL EQUIPMENT, DUCTWORK, OR PIPING INSULATION IS APPLIED.
16. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). PERFORM ALL TESTING, ADJUSTING, AND BALANCING IN ACCORDANCE WITH THE SPECIFICATIONS.
17. MAKE ALL ATTACHMENTS TO JOISTS, TRUSSES, OR JOIST GIRDERS AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. THE USE OF C-CLAMPS IS NOT PERMITTED.
18. PROVIDE CONCRETE PADS A MINIMUM OF 6 INCHES HIGH FOR ALL FLOOR MOUNTED EQUIPMENT. EXTEND PAD 4 INCHES BEYOND THE EQUIPMENT ON ALL SIDES.
19. PROVIDE TRAPPED DRAIN PIPING FROM DRAIN PANS OF ALL COOLING COILS, FANS, AND OTHER ACTIVE DRAINS EXPOSED TO SYSTEM AIR STREAM. PROVIDE TRAP AT CONNECTION, WATER SEAL DEPTH 1 INCH GREATER THAN UNIT OPERATING PRESSURE. DIRECT DRAINS TO NEAREST FLOOR DRAIN, MOP SINK, OR OTHER LOCATION APPROVED BY ARCHITECT/ENGINEER.
20. INSTALL PIPING, DUCTWORK, AND CONDUIT CONCEALED IN AREAS HAVING HUNG CEILINGS AND/OR FURRED SPACES UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
21. FURNISH AND INSTALL ALL NECESSARY CONTROL WIRING, CONDUIT, AND ACCESSORIES AS REQUIRED TO PROVIDE FULLY FUNCTIONING SYSTEMS AND SEQUENCES OF OPERATION.

WORK IN EXISTING AREAS

1. EXISTING CONDITIONS, INCLUDING EQUIPMENT, DUCT AND PIPE SIZES AND LOCATIONS, INDICATED ON THE DRAWINGS ARE DIAGRAMMATIC. CONFIRM ALL EXISTING CONDITIONS PRIOR TO PROCEEDING WITH THE WORK.
2. CUT AND ROUGH PATCH EXISTING CONSTRUCTION AS REQUIRED FOR THE PERFORMANCE OF THE WORK. FINISH PATCHING AND FLASHING REQUIREMENTS ARE SHOWN ON THE ARCHITECTURAL DRAWINGS. PERFORM ALL CUTTING AND PATCHING WORK IN A MANNER SUCH THAT EXISTING WARRANTEES/GUARANTEES ARE NOT VOIDED, USE QUALIFIED PERSONNEL IN PERFORMANCE OF WORK.

LEGENDS/ABBREVIATIONS NOTES

1. ABBREVIATIONS AND SYMBOLS ON THIS SHEET DO NOT DEFINE THE SCOPE OF WORK.

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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

TOWN OF RIVERHEAD — PAX ET PROSPERITAS FER PROGRESSUM — 1792

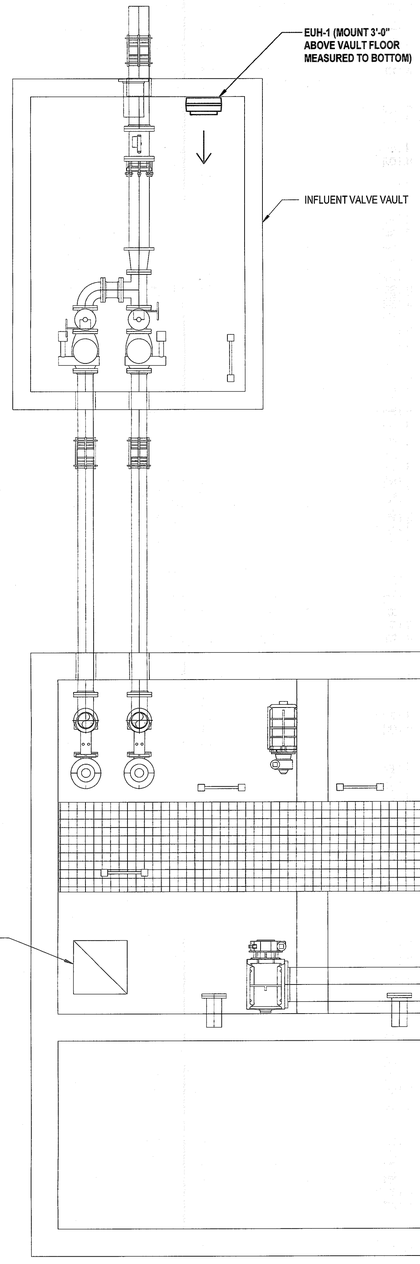
CONTRACT
**CONTRACT G GENERAL CONSTRUCTION**

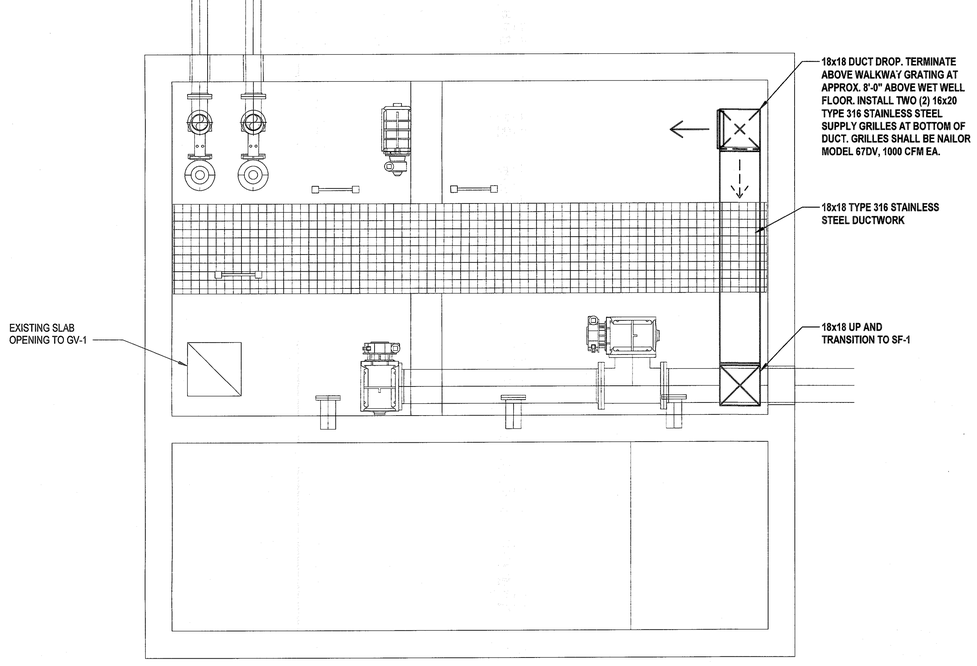
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**HVAC LEGENDS, SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES**

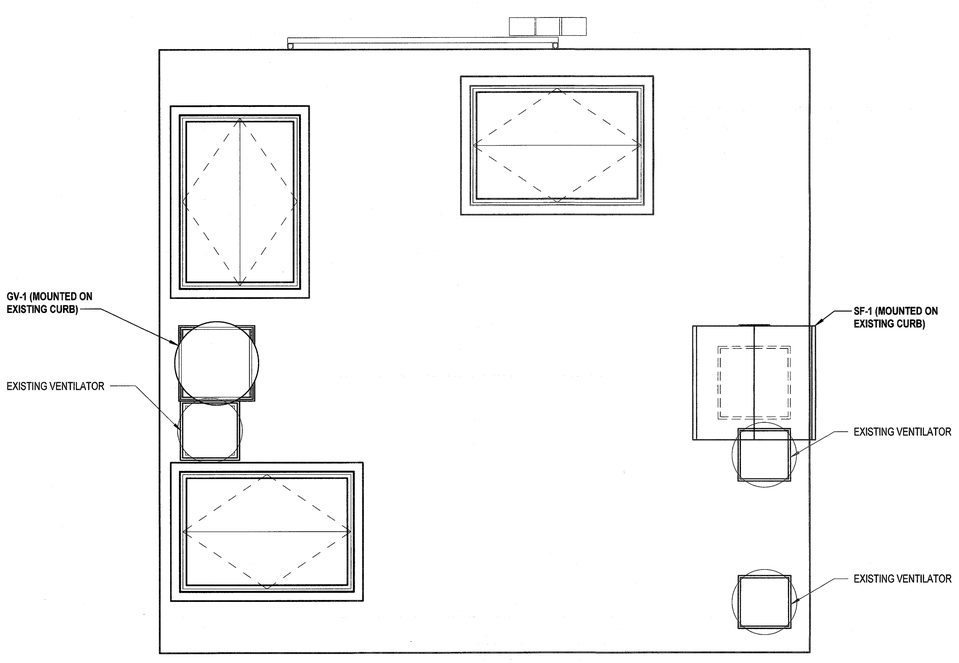
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SHEET # 45 OF 49

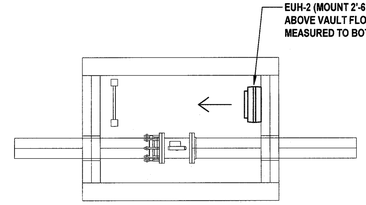



**1 Influent Pump Station Below Slab HVAC Plan**
SCALE 3/8" = 1'-0"




**2 Influent Pump Station Above Slab HVAC Plan**
SCALE 3/8" = 1'-0"




**3 Effluent Flow Meter Vault HVAC Plan**
SCALE 3/8" = 1'-0"

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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

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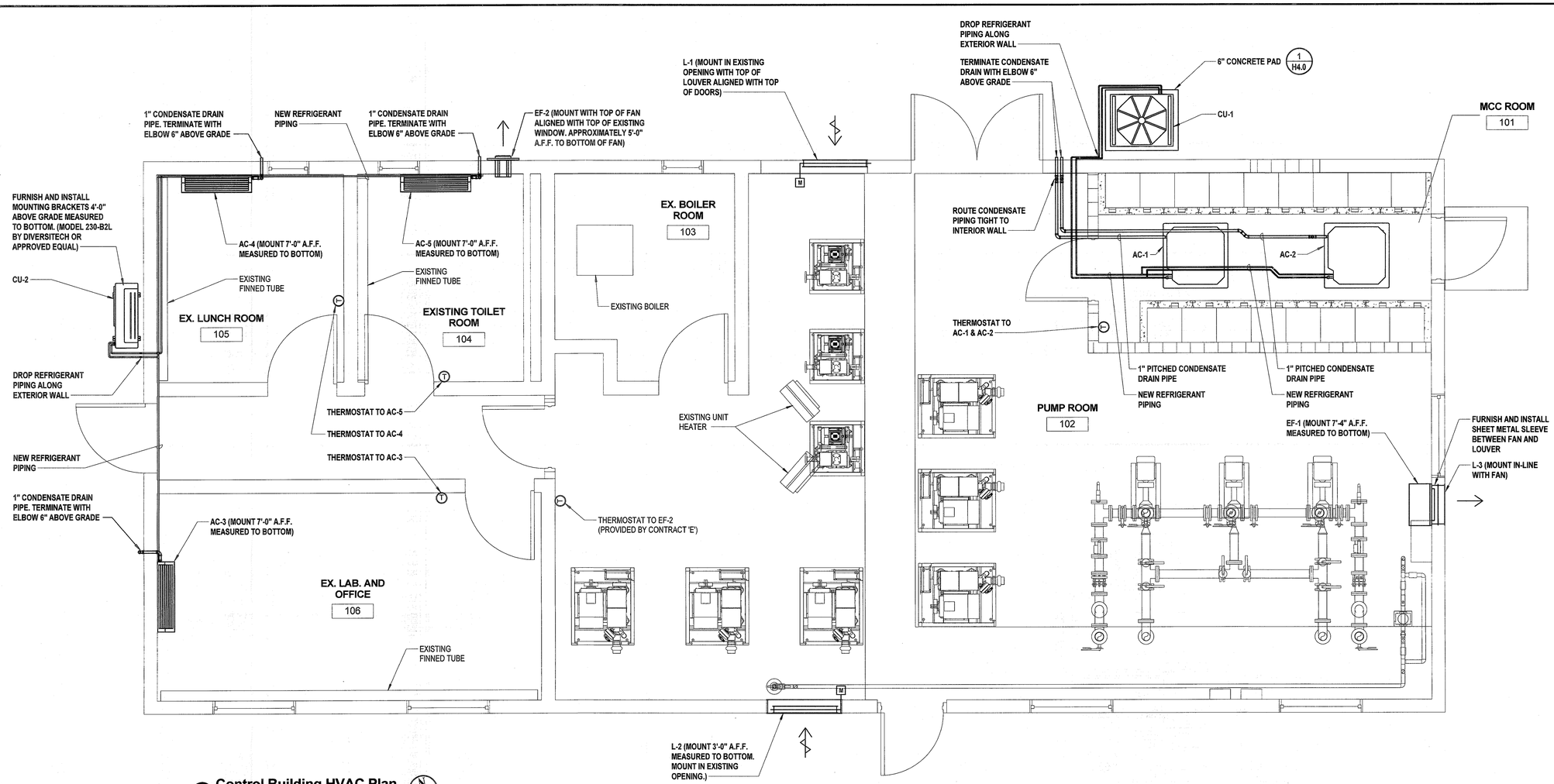
SHEET TITLE

**INFLUENT PUMP STATION AND PIPING VAULTS HVAC PLANS**

DRAWING #

**H1.0**

SHEET # 46 OF 49




## 1 Control Building HVAC Plan

SCALE: 3/8" = 1'-0"

**NOTES:**

1. ROUTING OF NEW REFRIGERANT AND CONDENSATE DRAIN PIPING NOT PERMITTED ABOVE ELECTRICAL EQUIPMENT.
2. CONDENSATE DRAIN PIPE SHALL BE SCHEDULE 40 PVC.
3. CONCEAL ALL NEW REFRIGERANT AND CONDENSATE DRAIN PIPING ROUTED ALONG WALLS IN LINESET ENCLOSURE.
4. SIZING OF REFRIGERANT PIPING SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
5. THERMOSTATS FOR AC-1 THRU AC-5 SHALL BE PROVIDED BY CONTRACT 'G', INSTALLED AND WIRED BY CONTRACT 'E', AND PROGRAMMED BY CONTRACT 'G' .

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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

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**CONTRACT G**
**GENERAL CONSTRUCTION**

STATUS

**FINAL BID DOCUMENT**

SHEET TITLE

**CONTROL BUILDING HVAC PLAN**

DRAWING #

**H2.0**

SHEET # 47 OF 49

## HVAC FANS

| EQUIPMENT NO. | LOCATION | SERVICE | PERFORMANCE/ CONSTRUCTION REQUIREMENTS | | | | | | BASIS OF DESIGN INFORMATION | | | | | | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AIR FLOW (CFM) | EXT S.P. (IN. W.G.) | FAN RPM | BHP | DRIVE TYPE | FAN TYPE | MNF | MODEL NO. | NOMINAL DIMENSIONS L x W x H (IN.) | NOMINAL OPERATING WEIGHT (LBS.) | NOMINAL ROOF OPENING (IN.) | NOMINAL WALL OPENING (IN.) | ELECTRICAL DATA: VOLTAGE/ PHASE | ELECTRICAL DATA: MOTOR POWER | ELECTRICAL DATA: AMPS | ELECTRICAL DATA: MOTOR RPM | INLET SOUND POWER DATA (SONES) [dBA] | |
| EF-1 | CONTROL BUILDING | EXHAUST | 1250 | 0.75 | 1750 | 0.37 | DIRECT | SIDEWALL PROPELLER | GREENHECK | SE2-18-411-A5 | 12.0 x 24.1 x 24.1 | 78 | - | 20.5 x 20.5 | 115/1 | 1/2 HP | - | 1750 | (24) | 7-9 |
| EF-2 | CONTROL BUILDING | EXHAUST | 180 | 0.1 | 1925 | - | DIRECT | SIDEWALL VENTILATOR | BROAN | 509 | 12.0 x 14.3 x 14.3 | 14 | - | 8.5 x 8.5 | 120/1 | - | 1.5 | 1925 | (6.5) | 10 |
| SF-1 | INFLUENT PUMP STATION | SUPPLY | 2000 | 0.3 | 937 | 0.35 | BELT | INLINE CENTRIFUGAL | GREENHECK | TCBRS-1-16-5 | 51.0 x 55.0 x 47.5 | 196 | 22 x 22 | - | 115/1 | 1/2 HP | - | 1725 | [57] | 1-6 |

1. EXPLOSION PROOF MOTOR ENCLOSURE
2. NEMA-7 AND 9 DISCONNECT SWITCH
3. ALUMINUM BIRDSCREEN
4. CLASS B SPARK RESISTANCE
5. HI-PRO POLYESTER COATING ON FAN AND ALL ACCESSORIES
6. ALUMINUM CURB ADAPTER (VERIFY EXACT SIZE IN FIELD)
7. NEMA-1 DISCONNECT SWITCH
8. OSHA APPROVED MOTOR SIDE GUARD
9. PERMATECTOR COATING ON FAN AND ALL ACCESSORIES
10. BUILT-IN BACKDRAFT DAMPER

## LOUVERS

| EQUIPMENT NO. | LOCATION | PERFORMANCE/ CONSTRUCTION REQUIREMENTS | | | | | BASIS OF DESIGN INFORMATION | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | AIR FLOW (CFM) | MAX. PD (IN. W.C.) | MINIMUM FREE AREA REQUIRED (SQ. FT.) | OVERALL NOMINAL DIMENSIONS (IN.) (W x H) | SERVICE | MNF | MODEL NO. | |
| L-1 | CONTROL BUILDING | 625 | 0.1 | 1.3 | 36 x 24 | INTAKE | ARROW UNITED | EA-450-D | 1-3 |
| L-2 | CONTROL BUILDING | 625 | 0.1 | 1.3 | 36 x 24 | INTAKE | ARROW UNITED | EA-450-D | 1-3 |
| L-3 | CONTROL BUILDING | 1250 | 0.5 | 1.6 | 22 x 22 | EXHAUST | ARROW UNITED | 377 | 3-5 |

1. 120V MOTORIZED ACTUATOR. POWER OPEN, SPRING RETURN (MS4120F1006 BY HONEYWELL)
2. ALUMINUM INSECT SCREEN
3. KYNAR COATING (COORDINATE COLOR WITH OWNER)
4. INTEGRAL GRAVITY BACKDRAFT DAMPER
5. ALUMINUM BIRDSCREEN

## GRAVITY VENTILATORS

| EQUIPMENT NO. | LOCATION | PERFORMANCE/CONSTRUCTION REQUIREMENTS | | | | BASIS OF DESIGN INFORMATION | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | CFM | EXT S. P. (IN. W. G.) | THROAT VELOCITY (FPM) | THROAT DIAMETER (IN.) | MNF | MODEL NO. | NOMINAL ROOF OPENING (IN.) | NOMINAL OPERATING WEIGHT (LBS.) | |
| GV-1 | INFLUENT PUMP STATION | 2000 | 0.1 | 617 | 24.5 | GREENHECK | GRSI-24 | 30.5 x 30.5 | 29 | 1-3 |

1. ALUMINUM BIRDSCREEN
2. ALUMINUM CURB ADAPTER (VERIFY EXACT SIZE IN FIELD)
3. HI-PRO POLYESTER COATING ON VENTILATOR AND ALL ACCESSORIES

## ELECTRIC HEATERS

| EQUIPMENT NO. | LOCATION | TYPE | PERFORMANCE/CONSTRUCTION REQUIREMENTS | | | | BASIS OF DESIGN INFORMATION | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | FAN DATA: AIR FLOW (CFM) | TOTAL CAPACITY (MBH) | ELECTRIC HEATING DATA: VOLTAGE/ PHASE | ELECTRIC HEATING DATA: KW | MNF | MODEL NO. | NOMINAL DIMENSIONS L x W x H (IN.) | NOMINAL OPERATING WEIGHT (LBS.) | |
| EUH-1 | INFLUENT VAULT | WALL HEATER | 100 | 10.2 | 208/1 | 3.0 | QMARK | AWH4404 | 5.3 x 15.8 x 19.2 | 25.0 | 1-3 |
| EUH-2 | EFFLUENT VAULT | WALL HEATER | 100 | 10.2 | 208/1 | 3.0 | QMARK | AWH4404 | 5.3 x 15.8 x 19.2 | 25.0 | 1-3 |

1. INTEGRAL THERMOSTAT
2. DISCONNECT SWITCH
3. SURFACE MOUNTING FRAME

## VARIABLE REFRIGERANT FLOW HEAT PUMP INDOOR UNITS

| EQUIPMENT NO. | LOCATION | TYPE | PERFORMANCE/CONSTRUCTION REQUIREMENTS | | | | BASIS OF DESIGN INFORMATION | | | | ELECTRICAL DATA | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | REFRIGERANT TYPE | SUPPLY UNIT DATA: AIR FLOW (CFM) LOW-MED-HIGH | SUPPLY UNIT DATA: TOTAL COOLING CAPACITY (MBH) | SUPPLY UNIT DATA: SENSIBLE COOLING CAPACITY (MBH) | SUPPLY UNIT DATA: HEATING CAPACITY (MBH) | MNF | MODEL NO. | NOMINAL DIMENSIONS L x W x H (IN.) | NOMINAL OPERATING WEIGHT (LBS.) | VOLTAGE/ PHASE | AMPS | |
| AC-1 | CONTROL BUILDING - 101 | CEILING CASSETTE | R-410A | 706-812-918 | 36.2 | 26.8 | 32.5 | LG | ARNU363TMA4 | 33.1 x 33.1 x 11.3 | 71 | 208/1 | 1.3 | 1-6 |
| AC-2 | CONTROL BUILDING - 101 | CEILING CASSETTE | R-410A | 635-741-812 | 28.0 | 21.3 | 25.2 | LG | ARNU363TMA4 | 33.1 x 33.1 x 11.3 | 71 | 208/1 | 1.3 | 1-6 |
| AC-3 | CONTROL BUILDING - 106 | WALL MOUNTED | R-410A | 406-449-494 | 24.2 | 16.4 | 21.8 | LG | ARNU243SCL4 | 9.9 x 40.6 x 12.8 | 31 | 208/1 | 0.29 | 1-3 |
| AC-4 | CONTROL BUILDING - 105 | WALL MOUNTED | R-410A | 194-247-290 | 9.6 | 6.5 | 8.7 | LG | ARNU093SBL4 | 8.1 x 35.3 x 11.4 | 22 | 208/1 | 0.16 | 1-3 |
| AC-5 | CONTROL BUILDING - 104 | WALL MOUNTED | R-410A | 194-210-230 | 5.5 | 4.1 | 4.9 | LG | ARNU053SBL4 | 8.1 x 35.3 x 11.4 | 22 | 208/1 | 0.16 | 1-3 |

1. COOLING CAPACITY BASED ON INDOOR TEMP. OF 80/67°F (DB/WB) AND OUTDOOR TEMP. OF 95°F (DB)
2. HEATING CAPACITY BASED ON INDOOR TEMP. OF 68/57°F (DB/WB) AND OUTDOOR TEMP. OF 10°F (DB)
3. WIRED REMOTE CONTROLLER (LG MODEL PREMTBVC0)
4. INTEGRAL CONDENSATE PUMP
5. GRILLE KIT (LG MODEL PT-UMC)
6. CEILING CASSETTE COVER (LG MODEL PTDCM)

## VARIABLE REFRIGERANT FLOW HEAT PUMP OUTDOOR UNIT

| EQUIPMENT NO. | LOCATION | SYSTEM SERVED | PERFORMANCE/CONSTRUCTION REQUIREMENTS | | | | | | BASIS OF DESIGN INFORMATION | | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | OUTISDE AIR TEMP.: COOLING RANGE (°F) | OUTISDE AIR TEMP.: HEATING RANGE (°F) | NOMINAL COOLING CAPACITY (MBH) | NOMINAL HEATING CAPACITY (MBH) | REFRIGERANT TYPE | EER | MNF | MODEL NO. | NOMINAL DIMENSIONS L x W x H (IN.) | NOMINAL OPERATING WEIGHT (LBS.) | ELECTRICAL DATA: VOLTAGE/ PHASE | ELECTRICAL DATA: MCA | ELECTRICAL DATA: MOCP | |
| CU-1 | CONTROL BUILDING | AC-1, AC-2 | 5-122 | -13-61 | 72.0 | 81.0 | R-410A | 13.4 | LG | ARUM072DTE5 | 29.9 x 36.6 x 66.5 | 430 | 460/3 | 12.8 | 20 | - |
| CU-2 | CONTROL BUILDING | AC-3, AC-4, AC-5 | 23-122 | -4-61 | 48.0 | 54.0 | R-410A | 9.5 | LG | ARUN048GSS4 | 13.0 x 37.4 x 54.3 | 207 | 208/1 | 30 | 50 | - |


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| CASD 1602 | November 2018 | AS SHOWN |

CLIENT
**Town of Riverhead Calverton Sewer District**

**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

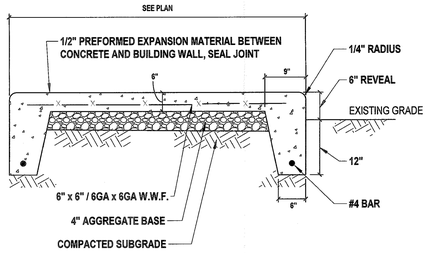
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STATUS
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SHEET TITLE
**HVAC SCHEDULES**

DRAWING # **H3.0**

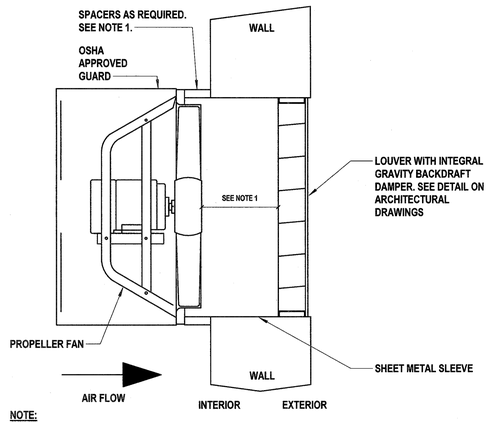
SHEET # 48 OF 49




NOTES:

1. WOOD FLOAT AND BRUSH FINISH ON ALL SURFACES ABOVE GRADE.
2. CONCRETE TO ACHIEVE MINIMUM 4,000 PSI AT 28 DAYS.
3. COMPACT SUBGRADE TO 92% MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D 1557.

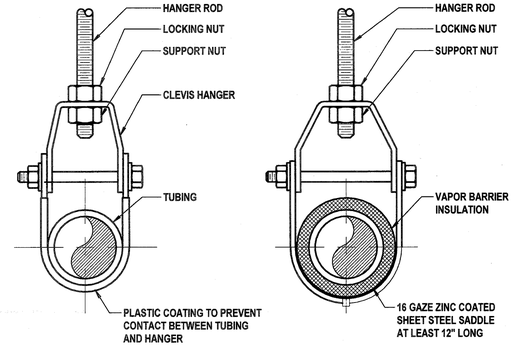
## 1 Condensing Unit Concrete Pad
SCALE NTS




NOTE:

1. MAINTAIN MINIMUM CLEARANCE BETWEEN FAN PROPELLER AND LOUVER IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION MANUAL. PROVIDE SPACERS AS NECESSARY TO MAINTAIN CLEARANCE CALLED FOR IN MANUAL. SPACERS SHALL BE PRESSURE TREATED LUMBER. FOR MASONRY WALLS, FASTENERS SHALL BE 1/4" MASONRY SCREWS WITH MAXIMUM 8" BETWEEN FASTENERS. FOR FRAMED WALLS, FASTENERS SHALL BE 16D NAILS WITH MINIMUM 2 NAILS PER STUD. ALL FASTENERS SHALL BE COATED FOR USE WITH PRESSURE TREATED LUMBER.

## 2 Exhaust Fan Detail
SCALE NTS




## 3 Pipe Hanger Detail
SCALE NTS

H2M architects + engineers
538 Broad Hollow Road, 4th Floor
East
Melville, NY 11747

CONSULTANTS:

| MARK | DATE | DESCRIPTION |
|---|---|---|
| | | |

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**Upgrade of the Sewage Treatment Plant - Enterprise Park at Calverton Module No. 1 (0.100 MGD)**

CONTRACT

**CONTRACT G**
**GENERAL CONSTRUCTION**

STATUS

**FINAL BID DOCUMENT**

SHEET TITLE

**HVAC DETAILS**

DRAWING # **H4.0**

SHEET # 49 OF 49