



RFP # 2025-12

CONSTRUCTION OF A Packaged Wastewater Treatment Plant and Fire Pump House

ISSUE DATE: October 20, 2025

NOTICE TO BIDDERS:

The APDC is requesting sealed proposals from qualified vendors for the construction of both a Packaged Wastewater Treatment Plant and Fire Pump House (2-part bid) at the Port of Albany's Beacon Island Expansion site located at 340 River Rd, Glenmont, NY 12077. Qualified vendors are encouraged to bid on each project separately, or both as a combined proposal. Further information is contained in the Request for Proposal (2025-12) and may be obtained from the APDC by calling 518-463-8763.

Responses are due by **12:00 PM noon on Wednesday December 3, 2025**, at which time they will be opened and publicly read.

The Albany Port District Commission (APDC) invites qualified vendors to submit a proposal. The qualified Vendor will enable the APDC to improve operational effectiveness, enhance quality of services, minimize support costs, and maximize economic development in the region. A contract will be awarded to the most responsible and respondent vendor who provides the lowest bid. The APDC places great emphasis on the experience, skill-set and long-term viability of the vendor.

Albany Port District Commission

Richard Hendrick, Chief Executive Officer

APDC Mission Statement: The APDC strives to responsibly and effectively manage the publicly owned maritime Port of Albany-Rensselaer, driving the economy of the Capital Region and beyond while emphasizing transparency and public stewardship.

Please note other than the contact person identified in the proposal, or their designee, prospective proposers shall not approach APDC employees or APDC Board Members during the period of this RFP process about any matters related to this RFP or any other proposals submitted thereto. Questions about or clarifications to the technical specifications must be made in writing to the lead contact, Jessica Lansing, Compliance Procurement Coordinator, at jlansing@portofalbany.us

PURPOSE AND OBJECTIVES

Purpose: The APDC is seeking to engage the services of a responsible and responsive General Contractor(s) for the project which involves the following separate contract parts, with scopes as outlined on page 3 of 31 of this RFP, and as further detailed in the contract documents:

- A. The Construction of a Packaged Wastewater Treatment Plant**
- B. The Construction of a Fire Pump House with a potential alternate for an Inlet Structure located in the Hudson River.**

The APDC reserves the right to award both parts A and B combined or each part A or B separately. Additionally, the APDC may choose, at their sole discretion, to include the Hudson River Inlet Structure alternate in the part B base bid contract. The APDC reserves the right to reject any and all bids based upon the best interest of the APDC and in such instance, may or may not rebid work.

Objective: The APDC's primary objective is to install the packaged wastewater treatment plant and fire pump house to advance the readiness at the Port of Albany-Rensselaer Beacon Island fully permitted and graded 85 acre site.

SCHEDULE OF EVENTS	DATES
SOLICITATION OPEN RFP POSTED ON THE PORT'S WEBSITE, BIDNET, TIMES UNION AND THE NYS CONTRACT REPORTER	October 20, 2025
WRITTEN INQUIRIES Must be emailed to jlansing@portofalbany.us	WRITTEN INQUIRY DEADLINE: November 10, 2025
RESPONSE TO WRITTEN INQUIRIES Responses to all questions will be sent in the form of an addendum to all parties and posted to the APDC website,	RESPONSE To INQUIRIES Will Be Sent By: 4PM November 17, 2025
RFP DUE DATE Proposals will be opened and evaluated for accuracy and eligibility. Awards are expected to be announced within (30) thirty days.	PROPOSALS DUE: DECEMBER 3, 2025 No later than 12 noon on
Mandatory Pre-Bid Meeting and Walk-Through The meeting is mandatory for submission of bid and attendance is required. The meeting will include a site walk through Appropriate PPE for site walk is required. Bidders should pre-register their attendance at the meeting by emailing their name, company and contact information to Jessica Lansing jlansing@portofalbany.us (518-463-8763) not later than two days prior to the meeting. Failure to attend this meeting will result in a bid being rejected.	1pm on November 4, 2025 At project site.

SITE LOCATION: 340 River Road Glenmont, NY 12077

SUMMARY AND PROJECT BACKGROUND:

Located on the Upper Hudson River 124 nautical miles north of New York Harbor, the Port of Albany-Rensselaer is the largest inland Port in the Northeast United States. The Port consists of 450 acres on the east and west sides of the Hudson River across the four municipalities of Albany, Bethlehem, Rensselaer, and East Greenbush.

The Port has dedicated maritime operations on both sides of the Hudson River and connects New York State's Capital Region to the world. Primary cargo handled at the Port includes bulk and break bulk, including heavy lift/project cargo, steel, wood pulp, grain, molasses, scrap iron and petroleum products. We work together with maritime operations, the Albany Port Railroad and tenants to ensure the efficient, reliable and safe movement of goods. An economic impact study of the Port of Albany measured the Port's overall economic impact on New York State at more than \$813 million. The measure of the Port's significance to the Regional economy in terms of output was more than \$428 million.

In 2018, the Port acquired more than 80-acres adjacent to the Port's southwestern border in the town of Bethlehem, NY for expansion opportunities, adding 25% to the land area of the Port District. (Beacon Island Site) In 2021, the Port was selected through NYSERDA's competitive Round 2 Solicitation to develop the nation's first offshore wind tower manufacturing supply chain facility. The site was developed to support this proposed project with more than \$170 million of funding as part of an innovative public-private partnership. However, due to changed economic and supply chain conditions, considerations are being made toward alternative projects. Today, the fully graded and fully permitted (i.e., local, state, and federal permits in-hand) project, stands as a key opportunity to advance state and federal business investment, domestic manufacturing, and new and additional maritime commerce.

The Port of Albany-Rensselaer (APDC) has secured funds from the Empire State Development Fast NY Infrastructure Improvement Grant that will allow the Port to complete utility infrastructure work including the installation of a high-voltage substation, a sanitary wastewater treatment plant and the intake lines and pump station package for fire protection system. Additionally, this funding will assist with obtaining geotechnical data for future wharf construction. This infrastructure improvement project will bring the Beacon Island site to a completed "shovel ready" condition for various potential uses.

SCOPE OF WORK:

This request for proposals is for two separate project scopes with a potential added alternate as further described below, and as indicated in the RFP. Qualified vendors are encouraged to bid on each project scope separately, or both as a combined proposal. Please indicate in your proposal which project scope(s) you will be bidding on and provide costs for all associated items as detailed in the bid form.

A. The Construction of a Packaged Wastewater Treatment Plant- to furnish, construct, and commission a sanitary wastewater treatment package plant unit, influent and effluent piping/systems, and outfall to the Hudson River embankment. Work includes civil work, mechanical systems, utility piping/systems, energization, and start up and testing of the system.

B. The Construction of a Fire Pump House- furnish, construct, and commission a fire protection pump station. Work includes civil work, mechanical systems, utility piping/connections, energization, and startup and testing of the system.

(B1) Bid Alternate #1, Hudson River Inlet Structure. This scope of work is a potential added alternative to the contract. It includes the construction of the inlet structure (piping, airburst system components, debris screens) from the point indicated on the contract plans to the location of the inlet structure in the Hudson River and includes all associated marine work.

** The APDC reserves the right to award both parts A and B combined or each part A or B separately. Additionally, the APDC may choose, at their sole discretion, to include the Hudson River Inlet Structure alternate in the part B base bid contract.

Please refer to the Contract Drawings, General Conditions, Technical Specifications and other information attached in APPENDIX B

Prevailing Wage

Any work done pursuant to this contract is subject to the New York State prevailing wage requirements which can be found in Article 8 of the New York State Labor Law. Under Article 8 of the NYS Labor Law, the Department of Labor has assigned a Prevailing Rate Case Number

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To access the PDF file, click on

<https://apps.labor.ny.gov/wpp/publicViewProject.do?method=showIt&id=1597940> or copy and paste into your browser.

RECEIPT OF PROPOSALS:

Proposals shall be clearly labeled with the title of the project listed on the sealed bid RFP #2025-06 to prevent the bid from being opened before the opening date. Those submitting proposals do so entirely at their expense. Submission of any proposal indicates acceptance of the conditions and terms stated herein unless clearly and specifically noted otherwise. The APDC reserves the right to reject any and all proposals, in whole or in part, submitted in response to this RFP. Proposals will be examined and evaluated by APDC staff.

- A. Sealed proposal packages must be received by APDC, at its offices located at 106 Smith Boulevard, Albany, New York, 12202, NO LATER THAN noon on December 3, 2025. Bid packet must be clearly labeled **RFP 2025-12** and include title of bid, company name, and date and time of bid opening.
- B. Vendors are responsible for submitting their bids to the exact location indicated on the “Notice to Bidders” prior to the time indicated in the “Notice to Bidders”. No bids will be accepted after the designated time indicated in the “Notice to Bidders”. NOTE: This includes any changes listed on the latest addendum issued by the APDC, if any. **Delay in mail delivery is not an exception to the deadline for receipt of bids.**
- C. All proposals and accompanying documentation will become APDC property and will not be returned.
- D. Vendors are solely responsible for all costs incurred by preparing or submitting a bid, or otherwise responding to this RFP, or any negotiations incidental to its bid acceptance thereof.
- E. An official authorized to commit the company to a contract must sign the proposal and all related proposal documents.
- F. Emailed proposals will **NOT** be accepted for this bid opening. Proposals shall be hand delivered or mailed to the address located on page three of this solicitation.
- G. **Three (3) copies** of all bids shall be submitted, ONE SET OF WHICH MUST CONTAIN ORIGINAL SIGNATURES, including completed copies of any forms or certifications required for this RFP. Failure to respond to an RFP on any official form included in this RFP may result in disqualification of a bid as non-responsive. No bid form will be accepted which contains any additions, omissions, or erasures. Each bid shall be properly executed and signed by the bidder. Illegible, conditional bids and unsigned bids will be rejected as non-responsive.
- H. Vendors must notify APDC of any omissions, contradictions, or conflicts in consistency with the written inquiry due date noted in the event schedule of this document. APDC will provide necessary corrections or additions to plans and specifications by addendum. If Vendor does not notify APDC of any such condition it will be assumed that the vendor has included the necessary items in the bid to complete the specification.

PROPOSAL RESPONSE INSTRUCTIONS:

Vendors are required to prepare their proposals per the outline below.

1. Provide a straightforward, concise description of the vendor's capabilities to satisfy the requirements of this RFP.
2. Provide the name of your company and the names of the companies in your team if you are including subcontractors or joint ventures.
3. Provide a name and title of the person(s) authorized to bind the vendor, together with the main office address and telephone number.
4. Provide a scope of services which shall include a summary of the work being proposed and clearly identify exclusions.
5. Provide a schedule to perform work noting when the work should be complete.
6. Provide completed and signed bid calculation form identifying the total price which shall include, but not limited to the following: equipment, fuel, travel, materials, labor, disposal of waste, all permits, insurance and bonds (e.g., the APDC will not pay any additional fees other than that provided within the bidder's proposal).
7. Provide a bid bond in the amount of 5% of the bid proposal.
8. Provide MWBE & SDVOB proof of good faith efforts.
9. Provide MWBE & SDVOB completed goal forms. (See APPENDIX C)
10. Provide the minimum of three references. Including references for work similar to the work being proposed in this solicitation.
11. Complete, sign and notarize all requested forms within this RFP.
12. Vendors submitting alternate pricing products or services must do so as a separate bid package to be considered for award. Each bid must be submitted under separate cover and will be considered on its own merits.

The APDC is subject to New York State's Freedom of Information Law (FOIL). Should your submission to this RFP contain "trade secrets", or other information that the disclosure of which could reasonably be expected to be harmful to business interests, you must ensure that such information is clearly identified and marked as such. Identification must be specific by item or paragraph. Should marked information be the subject of a request under FOIL, you may be requested to either consent to the request or make representation explaining why the information should not be disclosed.

SERVICE STANDARDS:

1. The APDC seeks to hire a qualified professional contracting company that is able to provide the best quality work in the most cost-efficient manner...The contracting company shall be qualified and experienced in each of the trades necessary to perform this work.
2. The contractor shall conform to New York State Department of Transportation standard specifications and regulations, and all other federal, State, and local codes and regulations, including all utility company requirements.
3. The contractor shall adhere to all OSHA standards and regulations
4. The materials recommended in the engineering report, contract drawings and other information that accompanies this bid and are listed within the contractor bid form are provided as a minimum standard recommendation.
5. The contractor shall provide all labor, machinery, powered equipment, materials, tools, scaffolds, fencing, equipment, cranes, lifts, generators, and miscellaneous tools/equipment/machinery to complete the scope of work.
6. Copies of certified payrolls from all subcontractors must be attached and submitted with all invoices. No payment will be made for any invoices without a copy of certified payroll. The APDC has a 30-day pay policy. No more than one pay submittal will be processed within a 30-day period. The contractor will be required to submit to the Port copies of all insurance certificates.
7. Contractor Methods, Procedures, Equipment: The Contractor shall be solely and fully responsible for all means, methods, techniques, sequences, procedures, and equipment used in executing the Work, including all safety precautions and programs. Any methods, procedures, or equipment referenced in the Contract Documents are provided solely for performance criteria or coordination purposes and shall not be construed as direction or endorsement. In no event shall the Owner, its consultants, or the Contract Documents be interpreted to assume, share, or diminish the Contractor's sole responsibility for performing the Work in a safe, coordinated, and professional manner.
8. Contractor's service persons shall have tools and equipment common to the trade that may be necessary to perform required work. The Port will not pay for rental or replacement of any of the common tools and consumables associated with the type of work outlined in this contract. The contractor shall protect all existing and new equipment from damage from soot, scale, residue and other construction debris. The contractor shall clean, repair, and/or replace any damage at no additional cost to the APDC, that results from the contractor's non-compliance with this item.
9. Deliveries shall be made on regular business days and scheduled with the Construction Owner's Representative between the hours of 8:00 am and 5:00 pm unless otherwise agreed to by the contractor and APDC.
10. The Contractor may deliver and/or stockpile directly on site, however, it shall be the sole responsibility of the bidder to take care of and protect their materials and supplies. The APDC will not be responsible for any damage or theft of any materials or supplies. The contractor shall be responsible for removal of stockpiles at the completion of the work.
11. Any deviations from the Technical Specifications, Contract, Drawings and/or General Conditions will not be permitted unless prior approval by APDC has been given.
12. The Contractor shall provide to the APDC any manufacturer's warranties and guarantees normally given as customary trade practice. In addition, for contracts involving the furnishing and/or installing of electrical and mechanical equipment, the Contractor agrees to guarantee the satisfactory in-service operation of mechanical and electrical equipment and related components for a period of one year following contract acceptance, at no cost to the APDC for either parts or labor.

13. The Owner's Representative or Engineer may stop by written order any work or any part of the work under the contract if the methods or conditions are such that unsatisfactory work might result, or if improper material or workmanship is being used.
14. It is the intent that this be a completed project as far as the contract documents set forth. It is not the intent that different phases of work on this project be delegated to various trades and subcontractors by the contract documents. Contractors must make their own contracts with various subcontractors, setting forth the work these subcontractors will be held responsible for. The contractor alone will be held responsible to APDC for the completion of this project.
15. It is the contractor's responsibility during the course of the work to bring to the attention of APDC any defective materials discovered that were not previously identified.
16. The contractor shall be responsible for securing, at their own expense, all licenses and permits required for this project including, but not limited to utility connections, buildings, and site construction, prior to commencement of work.
17. A performance bond will be required at the time of contract execution.
18. Retainage will be applied to progress payments.
19. GREEN MARINE: The Port of Albany strives to conduct all activities in a sustainable manner defined as environmentally responsible, community driven, and economically beneficial. Acting for the environment is not only important for the Hudson River watershed and neighboring communities, but for sustaining the Port's operations in the long run. In 2016, the Port of Albany joined the Green Marine Program, a voluntary environmental certification. As a landowner, we must lead by example and thus we encourage all bidders to utilize the best environmental practices, materials, and products.

MWBE/SDVOB PARTICIPATION GOALS

This Contract Goal: MWBE: 30% SDVOB: 6%

Please see Appendix C for reporting and submittal instructions.

Pursuant to **New York State Executive Law Article 15-A**, the APDC recognizes its obligation under the law to promote opportunities for maximum feasible participation of certified minority- and women-owned businesses (MWBEs) in the performance of APDC contracts. The APDC advises all potential service providers that disadvantaged, minority and women-owned business enterprises will be afforded full opportunity to submit proposals in response to this notice and there will be no discrimination on the basis of race, creed, color, sex, national origin, disability or marital status in the award of the contract or any subcontract.

*The directory of New York State Certified MWBEs can be viewed at: <https://ny.newnycontracts.com>

Veteran's Services Law Article 3 provides 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. The APDC 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 APDC 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, Bidders are strongly encouraged and expected to consider SDVOBs in the fulfillment of the requirements of the Contract. Such participation may be as subcontractors, as protégés, or in other partnering or supporting roles.

The directory of New York State Certified SDVOBs can be viewed at: <https://ogs.ny.gov/Veterans/>.

M/WBE and SDVOB vendors with certifications are encouraged to apply and are requested to identify themselves within their bid submission.

METHOD OF AWARD:

The award of this solicitation will be given to the lowest, most responsive and responsible bidder.

In cases where two or more responsive/ responsible bidders submit identical bids as to price, the APDC may award the contract to any such bidders.

The APDC reserves the right to request additional information from bidders for the purpose of ascertaining whether or not the qualifications, facilities, and pricing offered by each bidder meet the requirements set forth in these specifications, sufficient to ensure the proper performance under the contract.

APDC reserves the right to conduct discussions with any Vendor who submits a proposal.

APDC reserves the right to reject any and all proposals, to waive any informality in proposals received, to accept or reject any or all of the items in the proposal, and to award the contract in whole or in part and/or negotiate any or all items with individual Vendors if it is deemed in APDC's best interest. Moreover, APDC reserves the right to not make a selection if proposals are deemed to be outside the fiscal constraint or not in the best interest of APDC.

AWARD OF BID

The award, if any, will be made within (45) forty-five calendar days of the opening date. All successful vendors shall be notified by the APDC of any contracts they have been awarded. An award letter will be sent to all successful Vendors by US mail. Unsuccessful bidders may not be informed.

TERM OF CONTRACT

All Vendors submitting proposals shall agree that their pricing will remain firm for 60 days from proposal submission and throughout the duration of the contract.

The term of the contract shall be through project completion. This contract and any potential renewals will be executed upon approval of the APDC Board of Commissioners.

TERMINATION CLAUSE

The APDC reserves the right to terminate any contract or any portion thereof and use an alternate or secondary source, should the awarded Vendor become unable to perform.

The APDC may terminate their contract with cause upon notification in writing.

The APDC may further terminate the contract without cause, or for convenience, on thirty (30) days' notice in writing.

The APDC may, by written notice, terminate the contract after determining that for reasons beyond either Albany Port District Commission or Contractor control, it is not feasible to proceed with or complete the work originally contracted for, and that termination would therefore be in the public interest.

NOTIFICATION OF AWARD

The successful bidder will be advised by the APDC through a "Letter of Intent to Award." Such award will be contingent on the prospective awardee executing a written contract with the APDC providing the terms and conditions of these services.

BIDDER DEBRIEFING

Unsuccessful bidders will be notified after a contract award is made.

REQUIREMENTS and GOVERNING LAWS

All bidders are required to comply with all applicable provisions of all local laws, the State of New York laws, and the United States of America laws in particular but not limited to the State's Labor Law, Workman's Compensation Law, State Unemployment Insurance Law, Environmental Law, and all State and Local Health Laws, rules and regulations.

1. All Vendors submitting proposals shall agree that their pricing will remain firm for 60 days from proposal submission and throughout the duration of the contract.
2. The Vendor shall not reassign any award made as the result of this RFP without the prior written consent from APDC.
3. The Vendor shall comply with all laws, ordinances, rules, regulations bearing on the conduct of the work specified in this RFP.
4. **TAX ON MATERIALS:** The APDC is exempt from Federal and State Sales Taxes. Such Taxes shall not be included within the bid prices or within invoices.
5. The provisions of Section 220 of the State's Labor Law are deemed a part of every proposal with the same force and effect as if set forth at length. Pursuant to Article 8 of the New York State Labor Law, no laborer, workman, or mechanic in the employ of the contractor, subcontractor, or other person doing or contracting to do the whole or part of the work contemplated by the contractor shall be permitted or required to work more than eight (8) hours in any one (1) calendar day or more than five (5) days in any week, except on cases of extraordinary emergency including fire, flood, or danger to life or property. No such person shall be employed more than eight (8) hours in any day or than five (5) days in one week except in such emergency. The wages to be paid for a legal day's work to laborers, workman or mechanic employed by the contractor, subcontractor, or other person performing the contract shall be provided the supplements required by that Article.
6. **EMPLOYEE VERIFICATION REQUIREMENTS:** All vendors providing services and/or products to the APDC under any contract resulting from an award of the attached bid are required to comply with all State, Federal, and local laws, rules and regulations as they pertain to the verification of the ability of each employee to legally work in this state and country. This includes all employees, subcontractors and their employees engaged in work covered by said contract. All vendors shall, upon request, supply the APDC with certified copies of Federal form I-9 for all employees, subcontractors, and their employees. These forms should be on file at the vendor's home office and are available online at <http://usics.gov/files/form/i-9.pdf>. By submitting a bid for consideration by the APDC the vendors acknowledge that they have complied with and will continue to comply with all regulations and statutes concerning the verification of the employee status.
7. **INDEMNIFICATION:** The successful proposer shall defend, indemnify, and save harmless the APDC, its officers, directors, members, employees and agents, from and against all claims, suits, damages, liabilities, losses, expenses (including without limitations, reasonable attorneys' fees) arising out of, or in consequence of, any negligent or intentional act or omission of the successful proposer, its employees or agents, to the extent of its or their responsibility for such claims, damages, losses, and expenses.
8. **JUDGEMENTS/LEGAL FINDINGS:** By submitting this bid for consideration, the vendor affirms that they currently have no judgments or other legal findings nor have any pending judgments or other legal findings against the company, its executives or any other person that will be employed in any fashion as a part of this contract, with any federal, state, or local government entities that in any way could impact or have the potential to impact their ability to legally complete any contract awarded them as a result of this bid. Failure to disclose any such judgments and or findings will result in the termination of any contracts and other penalties as deemed legal and appropriate by the APDC.
9. **INSPECTION:** Inspection and approval by the Owner, of finished Work or of Work being performed, or of materials and equipment at the place of manufacture or preparation, shall not relieve the Contractor of its obligation to

perform the Work in strict accordance with the Contract or of its obligation to protect its Employees from injury or harm for work performed under this Contract. Finished or unfinished Work not found to be in strict accordance with the Contract shall be replaced as directed by the Owner, even though such Work may have been previously approved and paid for. Such corrective work is Contract Work and shall not be deemed Extra Work.

- a. Rejected Work and materials shall be promptly taken down and removed from the Site, which must at all times be kept in a reasonably clean and neat condition.
- b. Nothing herein shall be interpreted to mean that the inspection authority provided to the APDC creates any obligation or duty on the APDC to protect the safety of Contractor's or Subcontractors Employees or to protect the safety, integrity or condition of any property, as said obligations and duties rest solely with the Contractor or Subcontractor.

10. **RESPONSIBILITY OF VENDOR:** The vendor shall be responsible for all labor, material, tools, supervision, and transportation to complete the scope of the work related to this project. The vendor shall adhere to all applicable local, state, and federal regulations in effect at the time the work is done. The vendor shall maintain all required insurance coverage during the life of the contract.
11. **USE OF BRAND NAMES:** References in the specifications to a particular trade name, manufacturer's catalog or model number are made for descriptive purposes to guide the bidder in interpreting the type and quality of materials or supplies or nature of work desired. Such descriptions should not be construed as excluding bids on other types of materials and supplies or for performing the work in a manner other than specified, providing that the materials and supplies and manner of performing the work are offered are of equal quality to that specified and equally acceptable to the APCD for its purposes. Exceptions must be clearly stated. The APCD will determine equal products or services.
12. **GUARANTEE:** The contractor shall guarantee that the material/equipment offered is standard new equipment, latest model of regular stock product and in current production and includes all parts regularly used with this type of equipment also that no attachment or part has been substituted or applied contrary to manufacturer's recommendations and standard practice.
13. **NON-DISCRIMINATION REQUIREMENTS.** To the extent required by Article 15 of the Executive Law (also Known as the Human Rights Law) and all other State and Federal statutory and constitutional non-discrimination provisions, the Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, national origin, sexual orientation, age, disability, genetic predisposition or carrier status, or marital status. Furthermore, in accordance with Section 220-e of the Labor Law, of this is a contract for the construction, alteration or repair of any public building or public work or for the manufacture, sale or distribution of materials, equipment or supplies, and to the extent that this contract shall be performed within the State of New York, Contractor agrees that neither it nor its subcontractors shall, by reason of race, creed, color, disability, sex, or national origin: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the work; (b) discriminate against or intimidate any employee hired for the performance of work under this contract. If this is a building service contract as defined in Section 230 of the Labor Law, then, in accordance with Section 239 thereof, Contractor agrees that neither it nor its subcontractors shall by reason of race, creed, color, national origin, age, sex or disability: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the work; (b) discriminate against or intimidate any employee hired for the performance of work under this contract. Contractor is subject to fines of \$50.00 per person per day for any violations of Section 220-e or Section 2399 as well as possible termination of this contract and forfeiture of all moneys due hereunder for a second or subsequent violation.
14. The successful vendor must comply with all clauses stated in Appendix A (NYS Clauses for Standard Contracts)

INSURANCE REQUIREMENTS

The successful Vendor hereby agrees that they will obtain and present proof of Workers' Compensation Insurance for all employees on- site prior to the commencement of work (e.g., independent (employee) contractors are not acceptable). This contract shall be void and of no effect unless the Contractor secures and delivers a certification of insurance dated within ten (10) days of the date of the signing of the contract, and Contractor shall maintain such insurance policies as will protect themselves, their subcontractors and, unless specified otherwise, the APDC (the owner), including their agents, servants and employees, from any and all claims for Bodily Injuries, Death or Property Damage which may arise from operations under this contract whether such operations be by himself/herself or by any subcontractor or anyone employed by him/her directly or indirectly, or any other party who may be injured, claim injuries or die. All policies shall name the Albany Port District Commission as an additional insured on a primary and non-contributory basis. The policies below are required to be maintained for the life of the contract.

The successful bidder will maintain Worker's Compensation during the life of any contract entered as a result of this bid, for the benefit of the bidder's employees.

The following insurance policies are required:

- (1) Workers' Compensation Insurance with statutory limits and employers' liability coverage.
- (2) Commercial General Liability (CGL) insurance including comprehensive form, premises- operations and broad form contractual with minimum limits of Two Million Dollars (\$2,000,000) each occurrence and Two Million Dollars (\$2,000,000) annual aggregate.

The Albany Port District Commission shall be included as insureds on the CGL, using ISO Additional Insured Endorsement CG 20 38 (04/13) or an equivalent coverage to the additional insureds. This insurance for the additional insureds shall be as broad as the coverage provided for the named insured Vendor/Contractor. It shall apply as primary insurance before any other insurance or self-insurance, including any deductible, maintained by, or provided to, the additional insured.

- (3) Automobile liability insurance for owned, hired, and non-owned vehicles with minimum limits of not less than One Million Dollars (\$1,000,000) combined single limit for bodily injury and property damage.
- (4) Umbrella or Excess liability insurance with a limit of Five Million Dollars (\$5,000,000) per occurrence and a general aggregate of Five Million Dollars (\$5,000,000).

Umbrella coverage must include as insureds all entities that are additional insureds on the CGL. Umbrella coverage for such additional insureds shall apply before any other insurance or self-insurance, including any deductible, maintained by, or provided to, the additional insured other than the CGL, Auto Liability and Employers Liability coverage maintained by the Subcontractor.

- (5) Disability Benefits- New York State Statutory Requirements.

The Albany Port District Commission shall be listed as an additional insured on a primary and noncontributing basis on all policies.

All insurance certificates shall be submitted prior to commencement of work.

PROPOSAL COMMUNICATION , RESTRICTIVE PERIOD, LEGAL PROVISIONS FOR PROCUREMENT CONTRACTS, AND OFFERER RESPONSIBILITY:

Pursuant to New York State Finance Law §§139-j and 139-k, this request for proposals (“RFP”) includes and imposes certain restrictions on communication between a Governmental Entity and an Offeror/Bidder during the procurement process. An Offeror/Bidder is restricted from making contacts from the earliest notice of intent to solicit offers through final award and approval of the Procurement Contract by the APDC and, if applicable, Office of the State Comptroller (“restricted period”) to other than designated staff unless it is a contact that is included among certain statutory exceptions set forth in State Finance Law §139-j (3) (a). The designated staff member for this RFP is (Jessica Lansing, Compliance Procurement Coordinator, and Roddy Yagan, Senior Construction Project Manager) Governmental Entity employees are also required to obtain certain information when contacted during the restricted period and make a determination of the responsibility of the Offeror/Bidder pursuant to these two statutes. Certain findings of non-responsibility can result in rejection of a contract award and in the event of two findings within a four-year period, the Offeror/Bidder is debarred from obtaining governmental Procurement Contracts. Further information about these requirements can be found in the appropriate statutes and on the New York State Office of General Services website under the link for the “Advisory Council on Procurement Lobbying.”

Additionally, the above law requires certain affirmations to be provided to the APDC by Offerors/Bidders and that certain provisions are contained within any contract/award resulting from this RFP. Specifically, the following information is provided:

1. All bidders must complete a “Bidder Questionnaire” with a signature/notary public acknowledgement.
2. The APDC must obtain from all Offerors/Bidders the required affirmation of understanding and agreement to comply with procedures on procurement lobbying restrictions regarding permissible contacts in the restricted period for a procurement contract in accordance with New York State Finance Law §§139-j and 139-k.
3. The APDC must include a disclosure request regarding prior non-responsibility determination in accordance with New York State Finance Law §139-k in its solicitation of proposals or bid documents or specifications or contract documents, as applicable, for procurement contracts.
4. The APDC must obtain from all Offerors a required certification that the information is complete, true, and accurate regarding any prior findings of non-responsibility, such as non-responsibility pursuant to New York State Finance Law §139-j. The Offeror/Bidder must agree to the certification and provide it to the procuring Government Entity.
5. New York State Public Authority Law § 2878 requires that all bidders on procurements involving goods and services complete a “Non-Collusive Bidding Certification.”
6. New York State Law §139-k (5) provides that every procurement contract award subject to the provisions of New York State Finance Law §§139-k and 139-j shall contain a provision authorizing the Governmental Entity to terminate the contract in the event that the certification is found to be intentionally false or intentionally incomplete. An example of such language is provided below:

The APDC reserves the right to terminate this contract in the event it is found that the certification filed by the Offeror in accordance with New York State Finance Law §139-k was intentionally false or intentionally incomplete. Upon such finding, the APDC may exercise its termination right by providing written notification to the Offeror in accordance with the written notification terms of this contract.

Forms meeting the requirements of 1-6 are provided below. All bids submitted must contain these completed forms to be considered responsive – failure to include any of these forms will result in the bid being rejected without any further review or consideration.

ALL ENCLOSED FORMS MUST BE COMPLETED, SIGNED AND INCLUDED WITH THE BID PROPOSAL
Failure to Complete ALL forms and ALL Insurance Certificates may result in rejection of bid proposal.

BID PROPOSAL/CALCULATION FORM (4 Pages)

- EXHIBIT A: BIDDER'S QUESTIONNAIRE
- EXHIBIT B: CORPORATE PARTNERSHIP OR INDIVIDUAL ACKNOWLEDGEMENT
- EXHIBIT C: APDC PERMISSIBLE CONTACTS
- EXHIBIT D: OFFERER CERTIFICATION
- EXHIBIT E: NON-COLLUSIVE BIDDING CERTIFICATION
- EXHIBIT F: DISCLOSURE OF PRIOR NON-RESPONSIBILITY DETERMINATION
- EXHIBIT G: IRAN ENERGY SECTOR DIVESTMENT COMPLIANCE
- EXHIBIT H: CERTIFICATION REGARDING SEXUAL HARRASSMENT
- EXHIBIT I: ENCOURAGING USE OF NYS BUSINESSES IN CONTRACT PERFORMANCE
- EXHIBIT J: EO177 CERTIFICATION
- EXHIBIT K: WORKERS COMPENSATION INSURANCE CERTIFICATION (3 PAGES)

Appendix A: NYS Clauses for Government Contracts

Appendix B: Contract Drawings, General Conditions, Technical Specifications and Other Information

Appendix C: MWBE Goal Procedures and Reporting Requirements

BID PROPOSAL /CALCULATION FORM (Page 1)

NAME OF VENDOR: _____ **PROJECT NUMBER** _____

1. The Vendor hereby declares that it has carefully examined all Bidding and Contract Documents therein, including any Addendum(s), and has satisfied itself as to all conditions, and understands that in signing this Proposal, it waives all right to plead any misunderstanding regarding the same.
2. The Vendor further understands and agrees that it is to perform and complete all work in accordance with the Contract Documents and to accept in full compensation in the amount and rates listed in this document with no further compensation.
3. **BID CALCULATION:** Please use the attached bid form to define your price of the work. Note descriptions below outlining specific aspects of your proposal.
 - Construction Contingency. The Construction Contingency shall originally consist of 10% of the Base Bids and Alternate 1 amount. The Construction Contingency shall be of use by the Vendor, as approved by the APDC, to pay for miscellaneous work items that are required to complete the projects that are not part of the current scope as defined by the contract documents. If, on completion of the Project, funds remain in the Construction Contingency, such funds shall remain unspent and shall be allocated to the APDC.
 - Fire Pump House - Alternate 1 (Hudson River Inlet Structure). The scope for the Fire Pump House – Alternate 1 (Hudson River Inlet Structure) generally consists of all work, including marine access and construction, associated with the installation of the inlet piping, airburst system, and inlet piping screens, from the point as denoted on the project plans to the inlet structure located in the Hudson River. Reference contract drawings SP-01 “Detailed Site Plan & Profile”, GR-01 “Grading and Drainage”, UT-01 “Utility Plan”, MD-01 “Miscellaneous Details”, and F-100P “Fire Pump Building Plans” for further details.
 - Combined Savings. The Combined Savings amount represents the bid price reduction for the APDC, in awarding a combination of the Packaged Wastewater Treatment Plant and Fire Pump House projects to a single Vendor. The APDC may elect to award individual bid packages, or a bundled package as described above, and will apply the savings toward project contingencies, enhancements, or other uses. The Vendor acknowledges that the APDC may use these savings as part of its evaluation criteria and that award decisions may be influenced by the total value offered through combined bidding. Note that Alternate 1 for the Fire Pump House will not be considered for award as a separate, standalone, package.

BID PROPOSAL /CALCULATION FORM (Page 2)

CONTRACT A: PACKAGED WASTEWATER TREATMENT PLANT	
a. Base Bid Amount – Packaged Wastewater Treatment Plant	
(In Figures)	\$
(In words)	
b. 10% Construction Contingency (10% of the Base Bid for the Packaged Wastewater Treatment Plant).	
(In Figures)	\$
(In words)	
c. Total proposed amount for the Packaged Wastewater Treatment Plant (e.g., no additional expenses will be permitted).	
(In Figures)	\$
(In words)	
d. EXPECTED PROJECT COMPLETION DATE (Packaged Wastewater Treatment Plant):	
CONTRACT B: FIRE PUMP HOUSE	
e. Base Bid Amount – Fire Pump House	
(In Figures)	\$
(In words)	
f. 10% Construction Contingency (10% of the Base Bid for the Fire Pump House).	
(In Figures)	\$
(In words)	
g. Total proposed amount for the base bid - Fire Pump House (e.g., no additional expenses will be permitted).	
(In Figures)	\$
(In words)	
h. EXPECTED PROJECT COMPLETION DATE (Fire Pump House):	
i. Alternate 1 Amount – Fire Pump House Hudson River Inlet Structure	
(In Figures)	\$
(In words)	
j. 10% Construction Contingency (10% of the Alternate 1 Amount).	
(In Figures)	\$
(In words)	

BID PROPOSAL /CALCULATION FORM (Page 3)

k. Total proposed amount for Alternate 1 (e.g., no additional expenses will be permitted).	
(In Figures)	\$
(In words)	
l. EXPECTED PROJECT COMPLETION DATE (Alternate 1 -Hudson River Inlet Structure):	
COMBINED SAVINGS	
m. Combined Savings – Reduction in price if awarded both the Base Bid for Packaged Wastewater Treatment Plant and the Base Bid for the Fire Pump House.	
(In Figures)	\$
(In words)	
n. Combined Savings – Reduction in price if awarded both the Base Bid for the Packaged Wastewater Treatment Plan and the Base Bid and Alternate 1 for the Fire Pump House	
(In Figures)	\$
(In words)	

4. UNIT PRICES

- a. The Vendor offers for the APDC's consideration and use, the following UNIT PRICES. The UNIT PRICES offered by the Vendor indicate the amount added to or deducted from the CONTRACT SUM for each item-unit combination. UNIT PRICES include all costs to the APDC, including those for materials, labor, equipment, tools of trade and labor, fees, taxes, insurance, bonding, overhead, profit, etc.
- b. The APDC reserves the right to include or not to include any of the following UNIT PRICES in the Contract and to negotiate the UNIT PRICES with the Vendor prior to including them in the Contract. The UNIT PRICES may be utilized by the APDC for reimbursement of work not currently identified on the plans and therefore not included in the CONTRACT SUM. Contract work identified on the plans for these items/scopes shall be included in the CONTRACT SUM.

ITEM	UNIT	ADD	DEDUCT
Unclassified Excavation (NYDOT Item 203.02)	C.Y.	\$	\$
Structure Excavation (NYDOT Item 206.01)	C.Y.	\$	\$
Select Structural Fill (NYDOT Type 2 Crushed Stone)	C.Y.	\$	\$

EXHIBIT A : BIDDER QUESTIONNAIRE

1. Are you a New York State resident business?	Yes	N
2. Total number of people employed by your firm?		
3. Total number of people employed by your firm in New York State?		
4. Is your company independently owned and operated?	Yes	No
5. Is your firm at least 51% owned and controlled by women, or 51% owned and controlled by minority group members, i.e., Black, Hispanic, Asian, Pacific Islander, American Indian, and Alaskan Native?	Yes	No
If yes, _____ Minority Owned _____ Women Owned		
If yes, have you been certified or registered?	Yes	No
If yes, List certificate or registration authority: _____		
6. Within the past five years has your firm, any affiliate, any predecessor company or entity, owner, director, officer, partner, or proprietor been the subject of:	(Circle any that apply. If "Yes", describe using additional pages.)	
a. An indictment, judgment, conviction, or a grant of immunity, including pending actions, for any business- related conduct constituting a crime under local, state, or federal law?	Yes	No
b. A federal, state, or local government suspension or debarment, rejection of any bid or disapproval of any bid or disapproval of any proposed subcontract, including pending actions, for lack of responsibility, denial, or revocation, of pre-qualification or a voluntary exclusion agreement?	Yes	No
c. Any federal or state determination of a violation of any public works law or regulation, or labor law or regulation, or any OSHA violation deemed "serious or willful"?	Yes	No
d. A consent order with NYS Department of Environmental Conservation, or a federal or state enforcement determination involving a violation of federal or state environmental laws?	Yes	No
7. Is your firm owned by a service-disabled veteran?	Yes	No
If yes, have you been certified or registered?		
If yes, List certificate or registration authority: _____	Yes	No

BIDDERS SIGNATURE _____

Print Name _____

Title _____

Date _____

Address _____

Federal ID # _____

Telephone # _____

EXHIBIT B:

CORPORATE, PARTNERSHIP OR INDIVIDUAL ACKNOWLEDGMENT STATE OF

)

) SS;

COUNTY OF

)

On the _____ day of _____ in the year 20 ____, before me personally appeared:

_____, known to me to be the person who executed the foregoing instrument, who, being duly sworn by me did depose and say that ___he resides at _____, City/Town of _____, County of _____, State of _____; and further that:

(Check One)

☐ (If an individual): ___he executed the foregoing instrument in His/her name and on his/her behalf.

☐ (If a corporation): ___he is the _____ of _____, the corporation described in said instrument; that, by authority of the Board of Directors of said corporation, ___he is authorized to execute the foregoing instrument on behalf of the corporation for purpose set forth therein; and that, pursuant to that authority, ___he executed the foregoing instrument in the name of and on behalf of said corporation as the act and deed of said corporation.

☐ (If a partnership): ___he is the _____ of _____, the corporation described in said instrument; that, by the terms of said partnership, ___he is authorized to execute the foregoing instrument on behalf of the partnership for the purpose set forth therein; and that, pursuant to that authority, ___he executed the foregoing instrument in the name and on behalf of said partnership as the act and deed of said partnership.

Notary Public

EXHIBIT C:

Offeror affirms that it understands and agrees to comply with the procedures of the APDC relative to permissible Contacts

By: _____

Date: _____

Name: _____

Title: _____

Offeror/Bidder Name: _____

Offeror/Bidder Address: _____

EXHIBIT D

Offeror Certification:

I certify that all information provided to the APDC with respect to State Finance Law §139-k is complete, true, and accurate.

By: _____ Date: _____

Name: _____

Title: _____

Offeror/Bidder Name: _____

Offeror/Bidder Address: _____

EXHIBIT E

NON-COLLUSIVE BIDDING CERTIFICATION

(Reference: Public Authorities Law Section 2878)

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:

1. The prices and terms in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
2. Unless otherwise required by law, the price and term which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly, or indirectly, to any other bidder or to any competitor; and
3. No attempt has been made or will be made by the bidder to induce any other person, partnership, or corporation to submit or not submit a bid for the purpose of restricting competition.

Name of Bidder: _____

Signature: _____ Date: _____

Title: _____

Address: _____

EXHIBIT F:

Project Number: _____

Date: _____

Albany Port District Commission
106 Smith Boulevard Albany, New York 12202

Offeror Disclosure of Prior Non-Responsibility Determinations

Name of Individual or Entity Seeking to Enter into the Procurement Contract: _____

Address: _____

Name and Title of Person Submitting this Form: _____

1. Has any Governmental Entity made a finding of non-responsibility regarding the individual or entity seeking to enter into the Procurement Contract in the previous four years? ☐ No ☐ Yes

If yes, please answer the next questions:

2. Was the basis for the finding of non-responsibility due to a violation of State Finance Law Section 139-j: No ☐ Yes ☐

Or Was the basis for the finding of non-responsibility due to the intentional provision of false information to a Governmental Entity? ☐ No ☐ Yes

3. If you answered "yes" to any of the above questions, please provide details regarding the finding of non-responsibility below.

Governmental Entity: _____ Date of Finding of Non-Responsibility: _____

Basis of Finding of Non-Responsibility: _____

(Add additional pages as necessary)

5. Has any Governmental Entity or other governmental agency terminated or withheld a Procurement Contract with the above-named individual or entity due to the intentional provision of false or incomplete information? ☐ No ☐ Yes

6. If yes, please provide details below.

Governmental Entity: _____ Date of Termination or Withholding of Contract: _____

Basis of Termination or Withholding: _____

(Add additional pages as necessary)

Offeror certifies that all information provided to Albany Port District Commission with respect to State Finance Law Section 139-k is complete, true and accurate. Submit form with original signature with Proposal.

By Signature: _____

Date: _____

EXHIBIT G:

Project Number: _____

Date: _____

Albany Port District Commission
106 Smith Boulevard Albany, New York 12202

IRAN ENERGY SECTOR DIVESTMENT COMPLIANCE

Printed Name of Entity Seeking to Enter into the Contract: _____

Address: _____

Printed Name and Title of Person Executing Certification: _____

Pursuant to New York State Finance Law §165-a, Iran Divestment Act of 2012 (Act), the Office of General Services is required to post on its web site a list of persons who have been determined to engage in investment activities in Iran ("prohibited entities list"), as defined by the Act. New York State Public Authorities Law § 2879-c, with certain exceptions, prohibits Albany Port District Commission from entering into or awarding a Contract with persons identified on the prohibited entities list.

CERTIFICATION:

By submission of this bid or proposal, each person (as defined in paragraph (e) of subdivision one of section one hundred sixty five-a of the state finance law) and each person signing on behalf of any other party certifies, and in the case of a joint bid or proposal or partnership each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each person is not on the list created pursuant to paragraph (b) of subdivision 3 of section 165-a of the State finance law.

STATE OF)
)ss.:
COUNTY OF)

The undersigned, being duly sworn, says (a) I am duly authorized to execute this Certification and (b) I hereby certify, under penalty of perjury, that the forgoing Certification is in all respects true and accurate.

Signature of Person Executing Certification: _____

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

Notary Public

Submit form with original signatures

EXHIBIT H:

**Albany Port District Commission
106 Smith Boulevard ● Albany, New York 12202**

Certification Regarding Sexual Harassment Prevention Policies Pursuant to State Finance Law §139-l

By submission of this proposal, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint proposal each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all of its employees. Such policy shall, at a minimum, meet the requirements of section two hundred one-g of the labor law.

I, _____, hereby affirm, under penalty of perjury, that

Printed Name of Person Executing Certification

I am _____ of the above-named bidder, that I am

Printed Title of Person Executing Certification

authorized to make this certification on behalf of such bidder, and I further certify that this certification is true, accurate and complete to the best of my knowledge and belief.

The undersigned, being duly sworn, says (a) I am duly authorized to execute this Certification and (b) I hereby certify, under penalty of perjury, that the forgoing Certification is in all respects true and accurate.

signature

STATE OF _____)
) ss.:
COUNTY OF _____)

On this _____ day of _____, 20____, before me personally came

_____, to me known and known to me to be the person(s)
described in and who executed the foregoing instrument and acknowledged that he/she executed the same.

Notary Public

Submit form with original signatures

EXHIBIT I:

ENCOURAGING USE OF NEW YORK STATE BUSINESSES IN CONTRACT PERFORMANCE

New York State businesses have a substantial presence in State contracts and strongly contribute to the economies of the state and the nation. In recognition of their economic activity and leadership in doing business in New York State, bidders/proposers for this contract for commodities, services or technology are strongly encouraged and expected to consider New York State businesses in the fulfillment of the requirements of the contract. Such partnering may be as subcontractors, suppliers, protégés or other supporting roles.

Bidders/proposers need to be aware that all authorized users of this contract will be strongly encouraged, to the maximum extent practical and consistent with legal requirements, to use responsible and responsive New York State businesses in purchasing commodities that are of equal quality and functionality and in utilizing services and technology. Furthermore, bidders/proposers are reminded that they must continue to utilize small, minority and women-owned businesses, consistent with current State law.

Utilizing New York State businesses in State contracts will help create more private sector jobs, rebuild New York's infrastructure, and maximize economic activity to the mutual benefit of the vendor and its New York State business partners. New York State businesses will promote the vendor's optimal performance under the contract, thereby fully benefiting the public sector programs that are supported by associated procurements.

Public procurements can drive and improve the State's economic engine through promotion of the use of New York businesses by its vendors. The State therefore expects bidders/proposers to provide maximum assistance to New York businesses in their use of the contract. The potential participation by all kinds of New York businesses will deliver great value to the State and its taxpayers.

Bidders/proposers can demonstrate their commitment to the use of New York State businesses by responding to the question below:

Will New York State Businesses be used in the performance of this contract? ☐ Yes ☐ No

Project Number: _____

If yes, identify New York State Business(es) that will be used; (list identifying information below).

(Attach additional identifying information with the bid as required)

By: _____ Date: _____

Signature

Print Name and Title: _____

Vendor Name: _____

Vendor Address: _____

EXHIBIT J:

Albany Port District Commission

H. Carl McCall SUNY Building 353 Broadway ● Albany, New York 12246

EO 177 Certification

The New York State Human Rights Law, Article 15 of the Executive Law, prohibits discrimination and harassment based on age, race, creed, color, national origin, sex, pregnancy or pregnancy-related conditions, sexual orientation, gender identity, disability, marital status, familial status, domestic violence victim status, prior arrest or conviction record, military status or predisposing genetic characteristics.

The Human Rights Law may also require reasonable accommodation for persons with disabilities and pregnancy-related conditions. A reasonable accommodation is an adjustment to a job or work environment that enables a person with a disability to perform the essential functions of a job in a reasonable manner. The Human Rights Law may also require reasonable accommodation in employment on the basis of Sabbath observance or religious practices.

Generally, the Human Rights Law applies to:

- all employers of four or more people, employment agencies, labor organizations and apprenticeship training programs in all instances of discrimination or harassment;
- employers with fewer than four employees in all cases involving sexual harassment; and,
- any employer of domestic workers in cases involving sexual harassment or harassment based on gender, race, religion or national origin.

In accordance with Executive Order No. 177, the Bidder hereby certifies that it does not have institutional policies or practices that fail to address the harassment and discrimination of individuals on the basis of their age, race, creed, color, national origin, sex, sexual orientation, gender identity, disability, marital status, military status, or other protected status under the Human Rights Law.

Executive Order No. 177 and this certification do not affect institutional policies or practices that are protected by existing law, including but not limited to the First Amendment of the United States Constitution, Article 1, Section 3 of the New York State Constitution, and Section 296(11) of the New York State Human Rights Law.

Vendor Name: _____

By: _____ Date: _____

Signature

Print Name and Title: _____

EXHIBIT K:

State of New York

WORKERS' COMPENSATION BOARD

THIS AGENCY EMPLOYS AND SERVES PEOPLE WITH DISABILITIES WITHOUT DISCRIMINATION. ROBERT R. SNASHAIL
CHAIRMAN

Dear Sir/Madam:

The Workers' Compensation Law requires that a New York State or municipal agency, department, board, commission, or office issues any permit or license, the applicant must submit, to such agency or department, proof that he or she has obtained the required workers' compensation and disability benefits coverage, or that he or she is not required to provide coverage under these Laws. (See attached copies of Section 57 of the Workers' Compensation Law and Section 220, subd. 8 of the Disability Benefits Law.) These requirements also apply to the renewal of an application for a permit or license, and any and all work covered by the permit or license, whether or not a governmental agency is involved.

In addition, effective April 7, 1993, Chapter 213 amended the above Laws to require that before a New York State or municipal agency, department, board, commission, or office enters into any contract, the contractor must also submit proof that he or she has obtained the required workers' compensation and disability benefits coverage, or that he or she is not required to provide coverage. These requirements also apply to the renewal of such contracts.

I would appreciate your notifying the permit-issuing and contract-making agencies or departments within your jurisdiction of these requirements so that they may be able to comply with the Law. State Agencies are specifically requested to notify each department or group within their agency, which issues licenses or permits or makes contracts, of the Law's requirements.

Enclosed are samples of Forms C-105.2 and DB-120.1 (Certificates of Insurance), and Form SI-12 (Affidavit Certifying That Compensation has Been Secured), which are designed to provide necessary proof of coverage when completed by the insurance canter and/or the Workers' Compensation Board. Also enclosed is a sample of Form DB-155 (Compliance with DB Law), which may be submitted by self-insured employers under Disability Benefits Law as acceptable proof that disability benefits coverage has been obtained.

Please note that it is acceptable for employers insured by the State Insurance Fund to submit the Fund's computer-generated certificate of insurance as proof of coverage, Form U-26.3 (sample enclosed), in place of prescribed Form C-105.2.

Employers who are not required by Law to provide workers' compensation and/or disability benefits coverage must submit Form C-

105.21 (Statement That Applicant Does Not Require W.C. or D.B. Coverage), which when completed by the Workers' Compensation Board is proof that the applicant is not required to carry either type of insurance.

Thank you for your assistance in the enforcement of the above. If you require additional information regarding this or any other workers' compensation or disability benefits matter, please feel free to contact Mr. Frank Rends, Director, WC Compliance, Workers' Compensation Board, 100 Broadway-Menands, Albany, New York 12241 [telephone number (518) 486-51171.

STATE OF NEW YORK WORKERS COMPENSATION BOARD
APPLICATION FOR CERTIFICATE OF WORKERS' COMPENSATION INSURANCE

The undersigned Employer desires to obtain a Certificate of Workers' Compensation Insurance from the

Insurance Carrier: _____

as satisfactory proof required under the provisions of Section 57 of the Workers' Compensation Law, to

e filed with Name: _____

(Name of Bureau, Department, Corporation, Firm or Individual)

Address: _____

Locations of operations: _____

Date operations to begin: _____

Telephone No.: _____

Signature: _____

(Name & Title)

(Name of Employer)

(Date)

NOTE: This application must be signed by the Employer if an individual, or if a co-partnership by member of the co-partnership, or by an officer if a corporation.

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE

This is to certify that _____
(Name of individual, partnership, or corporation)

is insured with _____
(Name of insurance provider)

under Policy No. _____ COV
ering the entire obligation of this employer for workers' compensation under the New York Workers'
Compensation Law with respect to the locations named in the foregoing application.

The policy term covers the period from _____

To _____. If said policy is changed or cancelled during its term in such manner
as to affect this Certificate, thirty (30) days written notice of such change or cancellation shall be provided to the
Owner, and ten (10) days written notice in the event of cancellation for non-payment of premiums.

Signature: _____

(Name, Title, Date)

Telephone No. _____

Title _____

THE WORKERS' COMPENSATION BOARD EMPLOYS AND SERVES PEOPLE WITH DISABILITIES WITHOUT
DISCRIMINATION

C-105.2(10-94

APPENDIX B-1

RFP # 2025-12

BEACON ISLAND PHASE 3
Packaged Wastewater Treatment Plant
and
Fire Pump House and Marine Inlet

GENERAL CONDITIONS

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GENERAL CONDITIONS

PART 1 - CONTRACT DOCUMENTS

1.1 DEFINITIONS

1.1.1 The Contract Documents

The Contract Documents consist of the Owner-Contractor Agreement, the General Conditions of the Contract, the Drawings, the Specifications, and all Addenda issued prior to, and all Modifications, issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a written interpretation issued by the Engineer pursuant to Subparagraph 2.2.8, or (4) a written order for a minor change in the work issued by the Engineer pursuant to Paragraph 12.6.

1.1.1.1 PRECEDENCE OF DOCUMENTS

In case of discrepancy between the Contract Documents, preference shall be given in the following order, with later dates taking preference over earlier dates:

- (1) Modifications
- (2) Agreement
- (3) General Conditions
- (4) Addenda
- (5) Request for Proposals
- (6) Revisions to the Drawings
- (7) Revisions to the Specifications
- (8) Drawings
 - (a) Schedules and piping and wiring diagrams take precedence over other data shown on the drawings.
 - (b) Notes take precedence over other data shown on the drawings, except schedules and piping and wiring diagrams.
- (9) Specifications

1.1.2 The Contract

The Contract Documents form the Contract for Construction. This Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by Modification as defined in Subparagraph 1.1.1. The Contract Documents shall not be construed to create any contractual relationship of any kind between

the Engineer and/or Owner's Representative and the Contractor, but the Engineer and/or Owner's Representative shall be entitled to performance of obligations intended for his/her or the Owner's benefit, and to enforcement thereof.

Nothing contained in the Contract Documents shall create any contractual relationship between the Owner or the Engineer and/or Owner's Representative and any Subcontractor or Sub-subcontractor.

1.1.2 The Work

The work comprises the completed construction required by the Contract Documents and includes all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction.

1.1.3 The Project

The Project is the total construction of which the work performed under the Contract Documents may be the whole or a part.

1.1.4 Project Site

The project site is the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of the project.

1.1.5 Testing Agencies

A testing agency is an independent entity engaged to perform specific inspections or tests, either at the project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.1.6 FURNISH

"Furnish" shall be considered to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations of all equipment and/or materials with necessary or appropriate accessories, essential to the performance of its function, or required in joining or adding to another thing.

1.1.7 INSTALL

"Install" shall be considered to mean operations including unloading, storage, unpacking, assembling, erecting, mounting, building, anchoring, applying, finishing, curing, cleaning, protecting or other similar operations to establish in-place equipment, materials, or systems as required for use or service.

1.1.8 CONNECT

"Connect" shall be considered to mean the labor and materials necessary to join or attach equipment, materials, or systems to perform the function intended.

1.1.9 PROVIDE

“Provide” shall be considered to mean furnish, install, and connect complete, ready for intended use.

1.2 INTENT

1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the work. The Contract Documents are complementary, and what is required by anyone shall be as binding as if required by all. Work not covered in the Contract Documents will not be required unless it is consistent therewith and is reasonably inferable therefrom as being necessary to produce the intended results. Words and abbreviations, which have well-known technical, or trade meanings are used in the Contract Documents in accordance with such, recognized meanings.

1.2.2 The organization of the specifications into divisions, sections and articles, and the arrangement of drawings shall not control the Contractor in dividing the work among Subcontractors or in establishing the extent of work to be performed by any trade.

1.3 SITE CONDITIONS

1.3.1 The Contractor shall satisfy itself concerning the nature and location of work and the general and local conditions, and particularly, but without limitation with respect to the following: those affecting transportation, access, disposal, handling and storage of materials, availability and quality of labor, climatic conditions and seasons; physical conditions at the work sites and the project area as a whole, topography and ground surface conditions, and nature and quantity of surface and subsurface materials to be encountered, equipment and facilities needed preliminary to and during performance of the Contract; and all other matters which can in any way affect performance of the Contract, or the cost associated with such performance. The failure of the Contractor to acquaint itself with any applicable condition will not relieve it from the responsibility for properly estimating either the difficulties or the costs of successfully performing the Contract.

1.3.2 By executing the Contract, the Contractor represents that he/she has visited the site, familiarized themselves with the local conditions under which the work is to be performed, and correlated his/her observations with the requirements of the Contract Documents.

1.3.3 Where the Owner has made investigations of sub-surface conditions in areas where work is to be performed under the Contract, such investigations are made only for the purpose of study and design. The records of such investigations are not a part of the Contract and are furnished solely for the convenience of the Contractor.

1.3.4 The Contractor shall promptly notify the Owner when site conditions are discovered which differ materially from those indicated in the Contract, or unknown physical conditions at the site, of any unusual nature, differ materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract. The Owner will, as promptly as practicable, investigate the conditions and make a determination. If it is determined that such conditions do materially so differ and cause an increase or decrease in

Contractor's cost of, or the time required for, performance of any part of any work under the Contract, whether or not changed as a result of such conditions, an equitable adjustment will be made and the Contract modified in writing accordingly. No claim of Contractor under this Article will be allowed unless the Contractor has given the required notice.

1.4 OWNERSHIP AND USE OF DOCUMENTS

- 1.4.1 All Drawings, Specifications and copies thereof furnished by the Engineer are and shall remain his/her property. They are to be used only with respect to this Project and are not to be used on any other project. With the exception of one contract set for each party to the Contract, such documents are to be returned or suitably accounted for to the Engineer at the completion of the work. Submission or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Engineer common law copyright or other reserved rights.

1.5 CONTRACT TIMES

- 1.5.1 The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

1.6 SUBSTANTIAL COMPLETION

- 1.6.1 The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

PART 2 – ENGINEER AND OWNER'S REPRESENTATIVE

2.1 DEFINITION

- 2.1.1 . The term Engineer means the Engineer of Record or his/her authorized representative.

2.2 ADMINISTRATION OF THE CONTRACT

- 2.2.1 The Owner's Representative will provide administration of the Contract as hereinafter described.
- 2.2.2 The Owner's Representative will advise and consult with the Owner. The Owner's instructions to the Contractor shall be forwarded through the Owner's Representative. The Owner's Representative will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified by written instrument in accordance with Subparagraph 2.2.16.
- 2.2.3 The Owner's Representative will visit the site at intervals appropriate to the stage of

- construction to familiarize himself generally with the progress and quality of the work and to determine in general if the work is proceeding in accordance with the Contract Documents.
- 2.2.4 The Owner's Representative will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the work, and he/she will not be responsible for the Contractor's failure to carry out the work in accordance with the Contract Documents. The Owner's Representative will not be responsible for or have control or charge over the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any of the work.
- 2.2.5 The Owner's Representative shall at all times have access to the work wherever it is in preparation and progress. The Contractor shall provide facilities for such access so the Owner's Representative may perform his/her functions under the Contract Documents.
- 2.2.6 Based on the Owner's Representative observations and an evaluation of the Contractor's Applications for Payment, the Owner's Representative will determine the amounts owing to the Contractor and will issue Certificates for Payment in such amounts, as provided in Paragraph 9.4.
- 2.2.7 The Owner's Representative will be the interpreter of the requirements of the Contract Documents and the judge of the performance thereunder by both the Owner and the Contractor.
- 2.2.8 The Owner's Representative will render interpretations necessary for the proper execution or progress of the work, with reasonable promptness and in accordance with any time limit agreed upon. The Contractor may make written request to the Owner's Representative for such interpretations.
- 2.2.9 Claims, disputes and other matters in question between the Contractor and the Owner relating to the execution or progress of the work or the interpretation of the Contract Documents shall be referred initially to the Owner's Representative for decision, which he/she will render in writing within a reasonable time.
- 2.2.10 All interpretations and decisions of the Owner's Representative shall be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings.
- 2.2.11 The Owner's Representative will have authority to reject work which does not conform to the Contract Documents. Whenever, in his/her opinion, he/she considers it necessary or advisable for the implementation of the intent of the Contract Documents, he/she will have authority to require special inspection or testing of the work in accordance with Subparagraph 7.7.2 whether or not such work be then fabricated, installed, or completed. However, neither the Owner's Representative authority to act under this Subparagraph 2.2.11, nor any decision made by him/her in good faith either to exercise or not to exercise such authority, shall give rise to any duty or responsibility of the Owner's Representative to the Contractor, any Subcontractor, any of their agents or employees, or any other person performing any of the work.

- 2.2.12 The Engineer will review or take other appropriate action upon Contractor's submittals such as shop drawings, product data, and samples, but only for conformance with the design concept of the work and with the information given in the Contract Documents. Such action shall be taken with reasonable promptness so as to cause no delay. The Engineer's review of a specific item shall not indicate approval of an assembly of which the item is a component.
- 2.2.13 The Engineer will prepare Change Orders in accordance with Article 12 and will have authority to order minor changes in the work as provided in Subparagraph 12.6. The Owner's Representative will conduct inspections to determine the dates of Substantial Completion and final completion, will receive and forward to the Owner for the Owner's review written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment upon compliance with the requirements of Paragraph 9.9.
- 2.2.14 If the Owner and Owner's Representative agree, the Owner's Representative will provide one or more Inspectors to assist the Owner's Representative in carrying out his/her responsibilities at the site. Inspectors shall be authorized to inspect all work done and all material furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. The Inspector is not authorized to revoke, alter or waive any requirements of the specification, nor is authorized to approve or accept any portion of the completed project. He/she shall call the attention of the Contractor to any failure of the work or materials to conform to the specifications and Contract and shall have the authority to reject materials. Any dispute between the Inspector and Contractor shall be referred to the Owner's Representative. Any advice which the Inspector may give the Contractor shall in no way be construed as binding the Owner's Representative in any way or releasing the Contractor from fulfilling any of the terms of the Contract.
- 2.2.15 The duties, responsibilities, and limitations of authority of the Owner's Representative during construction as set forth in the Contract Documents will not be modified or extended without written consent of the Owner and the Owner's Representative.
- 2.2.16 In case of the termination of employment of the Owner's Representative, the Owner may appoint an Owner's Representative against whom the Contractor makes no reasonable objection to whose status under the Contract Documents shall be that of the former Owner's Representative. The Owner may also elect to be the sole contract authority without external representation of an Owner's Representative.

PART 3 - OWNER

3.1 DEFINITION

- 3.1.1 The Owner is the entity identified as the Albany Port District Commission (APDC) in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number. The term Owner means the Owner or his/her authorized representative.

3.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

- 3.2.1 The Owner shall furnish all surveys describing the physical characteristics, legal limitations, and utility locations for the site of the project, and a legal description of the site.
- 3.2.2 Except as provided in Subparagraph 4.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for the construction, use or occupancy of permanent structures or for permanent changes in existing facilities.
- 3.2.3 Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness to avoid delay in the orderly progress of the work.
- 3.2.4 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, digital copies of all drawings and specifications reasonably necessary for the execution of the work.
- 3.2.5 The foregoing is in addition to other duties and responsibilities of the Owner enumerated herein and especially those in respect to work by Owner or by Separate Contractors, Payments and Completion, and Insurance in Articles 6, 9, and 11, respectively.

3.3 OWNER'S RIGHT TO STOP OR SUSPEND THE WORK

- 3.3.1 If the Contractor fails to correct defective work as required by Paragraph 13.2 or persistently fails to carry out the work in accordance with the Contract Documents, the Owner, by a written order signed personally or by an agent specifically so empowered by the Owner in writing, may order the Contractor to stop the work, or any portion thereof, until the cause for such order has been eliminated.
- 3.3.2 When there is no responsible agent to the Contractor on the work or if the Contractor fails to perform the work according to specifications, or if the Contractor does not follow permits under which the work is allowed to proceed, the Owner's Representative may order the work, or any part thereof, suspended and no extra payment will be due the Contractor for suspension on these grounds.
- 3.3.3 The Owner may, at any time and for any reason, terminate this Contract for convenience, in whole or in part by providing written notice to the Contractor. Upon receipt of such notice, the Contractor shall immediately cease work, secure the site, and take all reasonable steps to minimize costs. The Contractor shall be entitled to payment for:
 - 1. Work performed up to the termination date
 - 2. Reasonable demobilization costs
 - 3. Verified costs incurred due to termination
 - 4. No payment shall be made for anticipated profits or unperformed work.

3.4 OWNER'S RIGHT TO CARRY OUT THE WORK

- 3.4.1 The Owner has the right, in cases of improper or imperfect performance of the work, or failure to prosecute the work to insure its completion within the time limits specified by the Contract Documents, and upon recommendation of the Owner's Representative that

sufficient cause exists to justify action, to give written notice to the Contractor and the Surety stating said default. If the Contractor does not remedy such default within ten (10) days after such notice if given, the Owner has the right to suspend all work by the Contractor. When the Contractor and Surety are notified that the Owner has elected to suspend the work, the Contractor shall cease to have the right to occupancy of the work site, and the Owner shall have the right to forthwith take possession of the work site. The Surety shall have the right to complete the Contract, but in the event that performance has not been commenced by the Surety within ten (10) days from the date of the notice of suspension, the Owner has the right to continue in the possession of and utilize, for the completion of the Contract, any and all materials, tools, equipment and plans which the Contractor has had delivered upon the site of the work, and to prosecute the work to the completion, either by force account or by Contract.

- 3.4.2 Expenditures made by the Owner in completing the work under the Contract and in payment of valid claims arising under the terms of the Contract shall be deducted from monies due or which would have become due the Contractor upon completion of the Contract. No claims for "extras" arising from the Owner's actions in completing the work will be allowed. The Contractor and Surety shall be liable and shall reimburse the Owner for any costs, in excess of the Contract amount, required to complete the work.

3.5 OWNER'S RIGHT TO CLEAN UP

- 3.5.1 If a dispute arises between the Contractor and separate contractors as to their responsibility for cleaning up as required by Paragraph 4.15, the Owner may clean up and charge the cost thereof including a reasonable charge for the efforts of Owner, its agents, contractors and/or employees to the Contractors responsible therefore as the Owner's Representative shall determine to be just.

3.6 OWNER'S USE OF COMPLETED PORTIONS

- 3.6.1 The Owner shall have the right to take possession of and use any completed or partially completed portions of the work prior to the contractual completion date for the project, but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract.

PART 4 - CONTRACTOR

4.1 DEFINITION

- 4.1.1 The Contractor is the person or entity identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number. The term Contractor means the Contractor or his/her authorized representative.

4.2 REVIEW OF CONTRACT DOCUMENTS

- 4.2.1 The Contractor shall carefully study and compare the Contract Documents and shall at once report to the Engineer and/or Owner's Representative any error, inconsistency, or omission

he may discover. The Contractor shall perform no portion of the work at any time without Contract Documents or, where required, reviewed Shop Drawings, Product Data or Samples for such portion of the work.

- 4.2.2 Construction Methods and Procedures: Certain methods and procedures may be specifically required by the Contract Documents. All other methods and procedures, which the Contractor uses to perform the work, are his/her sole responsibility.
- 4.2.3 The Contractor shall be responsible for performing the work items specified or shown in specifications and accompanying drawings issued as a part of its Contract and shall coordinate its work with that of other Contractors.

4.3 SUPERVISION AND CONSTRUCTION PROCEDURES

- 4.3.1 The Contractor shall supervise and direct the work, using his/her best skill and attention. He/she shall be solely responsible for all construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the work under the Contract.
- 4.3.2 The Contractor shall be responsible to the Owner for the acts and omissions of his/her employees, Subcontractors and their agents and employees, and other persons performing any of the work under a contract with the Contractor.
- 4.3.3 The Contractor shall not be relieved from his/her obligations to perform the work in accordance with the Contract Documents either by the activities or duties of the Owner's Representative in his/her administration of the Contract, or by inspections, tests or approvals required or performed under Paragraph 7.7 by persons other than the Contractor.

4.4 LABOR AND MATERIALS

- 4.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the work, whether temporary or permanent, and whether or not incorporated or to be incorporated in the work.
- 4.4.2 The Contractor shall at all times enforce strict discipline and good order among his/her employees and shall not employ on the work any unfit person or anyone not skilled in the task assigned to him.

4.5 WARRANTY

- 4.5.1 The Contractor warrants to the Owner, and the Owner's Representative that all materials and equipment furnished under this Contract will be new unused or un-reconditioned, unless otherwise specified, and that all work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All work not conforming to these requirements, including substitutions not properly approved and authorized may be considered defective. The Contractor shall furnish satisfactory evidence as to the kind and

quality of materials and equipment. This warranty is not limited by the provisions of Paragraph 13.2.

4.6 TAXES

- 4.6.1 The APDC is exempt from Federal and State sales taxes. Such taxes shall not be included in the contract amount or the price of Change Orders.

4.7 PERMITS, FEES, AND NOTICES

- 4.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and for all other permits and governmental fees, licenses and inspections necessary for the proper execution and completion of the work, which are customarily secured after execution of the Contract, or which are legally required at the time bids are received.
- 4.7.2 The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations and lawful orders of any public authority bearing on the performance of the work.
- 4.7.3 It is the responsibility of the Engineer to make certain that the Contract Documents are in accordance with applicable laws, statutes, and building codes and regulations. If the Contractor observes that any of the Contract Documents are at variance therewith in any respect, he/she shall promptly notify the Engineer and Owner's Representative in writing, and any necessary changes shall be accomplished by appropriate modification.
- 4.7.4 If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer and/or Owner's Representative, he/she shall assume full responsibility, therefore, and shall bear all costs attributable thereto.

4.8 SUPERINTENDENT

4.8.1 The Contractor shall employ a competent full-time on-site superintendent and necessary assistants who shall be in attendance at the project site during the progress of the work. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be so confirmed by written request in each case. The Owner shall have the right to require replacement of the Superintendent.

4.9 PROGRESS SCHEDULE

- 4.9.1 The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Owner's, Engineer's, and Owner's Representative's information an estimated progress schedule for the work. The progress schedule shall be related to the entire Project to the extent required by the Contract Documents and shall provide for expeditious and practicable execution of the work. The progress schedule shall be developed in Critical Path Method (CPM) format utilizing current best practices. The schedule shall be developed utilizing the latest edition of Microsoft Project or Primavera scheduling software.
- 4.9.2 The Contractor shall prepare and submit a rolling three-week look-ahead schedule to the

Owner's Representative every Monday of each week of active construction work. Each schedule shall include:

1. Activities planned for the upcoming three weeks
2. Crew sizes and trades assigned
3. Material and equipment deliveries
4. Coordination with other trades and subcontractors
5. Identification of potential delays or constraints

The schedule shall be updated weekly and reflect actual progress. Failure to submit timely and accurate schedules may result in withholding of progress payments or other remedies as defined in this Contract.

4.9.3 As a prerequisite to the Application for Payment each month, the Contractor shall provide an update of the CPM schedule to the Owner's Representative which reflects actual progress to-date, and which forecasts the project completion date. If, in the opinion of the Owner's Representative, the updated Progress Schedule reflects significant delay in the project completion date, the Owner's Representative may require the Contractor to develop a Recovery Schedule. The Recovery Schedule shall show the methods the Contractor would execute to recover time lost, and to complete the project on time. Failure to submit timely either a monthly Progress Schedule, or a requested Recovery Schedule may result in withholding of progress payments or other remedies as defined in this Contract.

4.9.4 The Contractor will be required to attend and participate in a reoccurring bi-weekly Progress and Coordination meeting each month during active construction work. The contractor shall be prepared to discuss the status of the work, including progress made and the identification of potential delays or constraints to completing the project on time.

4.10 DOCUMENTS AND SAMPLES AT THE SITE

4.10.1 The Contractor shall maintain at the site for the Owner one record copy of all drawings, specifications, addenda, change orders, and other modifications, in good order and marked currently to record all changes made during construction, and reviewed shop drawings, product data and samples. These shall be available to the Engineer and/or Owner's Representative and shall be delivered to him for the Owner upon completion of the work.

4.10.2 The Contractor shall obtain at his/her expense one set of construction contract drawings in non-reproducible black and white prints, for the purpose of recording "as-built" conditions.

4.10.3 The Contractor shall be responsible for all survey work required for the location and construction of the work required to complete Record Drawings. Record Drawings shall, at a minimum, show the relative location by dimension with respect to each other of the final location of all work items.

4.10.4 It shall be the responsibility of the Contractor to mark each sheet of the non-reproducible drawings in sharp red pencil and to record thereon in a neat and current form, any and all approved field changes and conditions as they may occur. Sufficient detail shall be recorded

for the Owner to accurately locate the facilities following construction and restoration. A complete file of approved field sketches, diagrams, and other changes, as may become necessary during the progress of the work, shall also be maintained and attached to the record set of contract drawings. Record drawings shall be maintained current as the work progresses. The Owner's Representative will review the drawings before approving each progress payment and may withhold approval until such time as the drawings meet the above requirements. At completion of the work, each sheet of record prints, plus all approved field sketches and diagrams, shall be submitted to the Engineer for his/her approval and use in establishing a basis for semi-final payment.

- 4.10.5 Before semi-final payment, the Contractor shall deliver to the Owner's Representative the complete bound set of non-reproducible record drawings for the Owner's permanent files.

4.11 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- 4.11.1 Shop drawings are drawings, diagrams, schedules, and other data specially prepared for the work by the Contractor or any Subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the work.
- 4.11.2 Product data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product, or system for some portion of the work.
- 4.11.3 Samples are physical examples, which illustrate materials, equipment, or workmanship, and establish standards by which the work will be judged.
- 4.11.4 The Contractor shall review, approve, and submit, with reasonable promptness and in such sequence as to not cause delay in the work or in the work of the Owner or any separate contractor, all shop drawings, product data and samples required by the Contract Documents.
- 4.11.5 By approving and submitting shop drawings, product data and samples, the Contractor represents that he/she has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he/she has checked and coordinated the information contained within such submittals with the requirements of the work and of the Contract Documents.
- 4.11.6 The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Engineer's review of shop drawings, product data or samples under Subparagraph 2.2.12 unless the Contractor has specifically informed the Engineer in writing of such deviation at the time of submission and the Engineer has given written acknowledgment to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the shop drawings, product data, or samples by the Engineer's review thereof.
- 4.11.7 The Contractor shall direct specific attention, in writing or on resubmitted shop drawings, product data or samples, to revisions other than those requested by the Engineer on previous submittals.

4.11.8 No portion of the work requiring submission of shop drawings, product data or samples shall be commenced until the submittal has been reviewed by the Engineer as provided in Subparagraph 2.2.12. All such portions of the work shall be in accordance with reviewed submittals.

4.12 USE OF SITE

4.12.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, and the Contract Documents and shall not unreasonably encumber the site with any materials or equipment.

4.13 CUTTING AND PATCHING OF WORK

4.13.1 The Contractor shall be responsible for all cutting, fitting, or patching that may be required to complete the work or to make its several parts fit together properly.

4.13.2 The Contractor shall not damage or endanger any portion of the work or the work of the Owner, or any separate contractors by cutting, patching or otherwise altering any work, or by excavation. The Contractor shall not cut or otherwise alter the work of the Owner or any separate contractor except with the written consent of the Owner and of such separate contractor.

4.14 CLEANING UP

4.14.1 The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his/her operations. At the completion of the work, he/she shall remove all his/her waste materials and rubbish from and about the project as well as all his/her tools, construction equipment, machinery, and surplus materials. Contractor shall use a hydraulically driven broom to clean all streets and roadways at the end of each workday.

4.14.2 If the Contractor fails to clean up at the completion of the work, the Owner may do so as provided in Paragraph 3.4 and the cost thereof shall be charged to the Contractor.

4.15 ROYALTIES AND PATENTS

4.15.1 The Contractor shall pay all royalties and license fees. He/she shall defend all suits of claims for infringement of any patent rights and shall save the Owner harmless from any loss including, but not limited to, attorney's fees on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process, or the product of a particular manufacturer, or manufacturers is specified; but, if the Contractor has reason to believe that the design, process, or product specified is an infringement of a patent, he/she shall be responsible for such loss unless he/she promptly gives such information to the Owner's Representative. To save harmless provisions contained herein shall be additional to and shall not be interpreted to limit in any way the indemnification provisions contained in Section 4.16 below.

4.16 INDEMNIFICATION

4.16.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, the Engineer and the Owner's Representative against all claims, damages, losses, and expenses, including but not limited to attorney's fees, arising out of or resulting from the performance of the work, provided that any such claim, damage, loss or expense (1) 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 (2) 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 any of them 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 this Paragraph 4.16.

4.16.2 In any and all claims against the Owner or the Engineer and/or Owner's Representative, or any of their agents or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this Paragraph 4.16 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workers' or workmen's compensation acts, disability benefit acts, or other employee benefit acts.

4.17 HARASSMENT

4.17.1 The Contractor and its employees shall comply with all Local, State, and Federal regulations governing worker and employee conduct. The Contractor and his/her workers, employees, subcontractors, and their workers, etc., may not fraternize with local residents, or municipal personnel, or their representatives. At no time will it be appropriate to say anything derogatory or vulgar to any individuals. Harmful threats and harassment, verbal or otherwise, directed towards any individual will not be tolerated. If an incident of fraternizing or harassment arises, the Contractor will be directed to permanently remove the worker from the site and replace the worker at no additional cost to the Project.

PART 5 - SUBCONTRACTORS

5.1 DEFINITION

5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform any of the work at the site. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative thereof. .

5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform any of the work at the site. The term Sub-subcontractor is referred to throughout the Contract Documents and means a Sub-subcontractor or an authorized representative thereof.

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

- 5.2.1 Unless otherwise required by the Contract Documents or the Bidding Documents, the Contractor, as soon as practicable after the award of the Contract, shall furnish to the Owner and the Owner's Representative in writing the names of the persons or entities (including, but not limited to, those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the work. The Owner's Representative will promptly reply to the Contractor in writing stating whether or not the Owner or the Owner's Representative, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner or Owner's Representative to reply promptly shall constitute notice of no reasonable objection.
- 5.2.2 The Contractor shall not contract with any such proposed person or entity to whom the Owner's Representative has made reasonable objection under the provisions of Subparagraph 5.2.1. The Contractor shall not be required to contract with anyone to whom he/she has reasonable objection.
- 5.2.3 If the Owner or the Owner's Representative has reasonable objection to any such proposed person or entity, the Contractor shall submit a substitute to whom the Owner or the Owner's Representative has no reasonable objection and no increase in the Contract Sum shall be allowed for any such substitution.
- 5.2.4 The Contractor shall make no substitution for any Subcontractor, person, or entity previously selected if the Owner or Owner's Representative makes reasonable objection to such substitution.

5.3 SUBCONTRACTUAL RELATIONS

- 5.3.1 By an appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner and the Engineer and the Owner's Representative. Said agreement shall preserve and protect the rights of the Owner and the Engineer and the Owner's Representative under the Contract Documents with respect to the work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights, and shall allow the Subcontractor, unless specifically provided otherwise in the Contractor-Subcontractor agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by these Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with his/her Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the Subcontract, copies of the Contract Documents to which the Subcontractor will be bound by this Paragraph 5.3.1 and identify to the Subcontractor any terms and conditions of the proposed Subcontract which may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Documents available to his/her Sub-subcontractors.

PART 6 - WORK BY OWNER OR BY SEPARATE CONTRACTORS**6.1 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS**

6.1.1 The Owner reserves the right to perform work related to the project with his/her own forces, and to award separate contracts in connection with other portions of the project or other work on the site under these or similar Conditions of the Contract. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, he/she shall make such claim as provided elsewhere in the Contract Documents.

6.1.2 When separate contracts are awarded for different portions of the project or other work on the site, the term Contractor in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

6.1.3 The Owner will provide for the coordination of the work of his/her own forces and of each separate contractor with the work of the Contractor, who shall cooperate therewith as provided in Paragraph 6.2.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and shall connect and coordinate his/her work with theirs as required by the Contract Documents.

6.2.2 If any part of the Contractor's work depends for proper execution or results upon the work of the Owner or any separate contractor, the Contractor shall, prior to proceeding with the work, promptly report to the Owner's Representative any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acceptance of the Owner's or separate contractors' work as fit and proper to receive his/her work, except as to defects, which may subsequently become apparent in such work by others.

6.2.3 Any costs caused by defective or ill-timed work shall be borne by the party responsible, therefore.

6.2.4 Should the Contractor wrongfully cause damage to the work or property of any separate contractor, the Contractor shall upon due notice promptly attempt to settle with such other contractor by agreement, or otherwise to resolve the dispute. If such separate contractor sues or initiates an arbitration proceeding against the Owner on account of any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor who shall defend against such proceedings at the Contractor's expense, and if any judgement or award against the Owner arises therefrom, the Contractor shall pay or satisfy it and shall reimburse the Owner for all attorney's fees, court or arbitration costs, fine or penalties, if any, which the Owner has incurred.

PART 7 - MISCELLANEOUS PROVISIONS**7.1 GOVERNING LAW**

- 7.1.1 This Contract shall be governed by, and construed in accordance with, the laws of the State of New York, determined without reference to conflicts of law principles. All proceedings with respect to this Contract or any other dispute between the parties hereto shall be brought in federal or state court within Albany County in the State of New York, and the Parties consent both to the personal and subject matter jurisdiction of any such court.

7.2 SUCCESSORS AND ASSIGNS

- 7.2.1 The Owner and the Contractor each binds himself, his/her partners, successors, assigns, and legal representatives to the other party hereto and to the partners, successors, assigns, and legal representatives of such other party with respect to all covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any monies due or to become due to him hereunder, without the previous written consent of the Owner. Any assignment made in violation hereof shall be deemed void.

7.3 WRITTEN NOTICE

- 7.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or entity, or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified mail, to the last business address known to him who gives the notice.

7.4 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

- 7.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder if, and as required in the Bidding Documents or in the Contract Documents.

7.5 RIGHTS AND REMEDIES

- 7.5.1 The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights, and remedies otherwise imposed or available by law.
- 7.5.2 No action or failure to act by the Owner, Engineer and/or Owner's Representative, or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder or any subsequent breach thereunder, except as may be specifically agreed in writing.

7.6 TESTS

- 7.6.1 Where the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any portion of the work to be inspected, tested or approved, by a third party Special Inspection and/or Testing firm, the Contractor shall give the Owner's Representative timely notice of its readiness so the Owner's Representative may procure, schedule, and observe such inspection, testing, or approval.
- 7.6.2 If the Engineer and/or Owner's Representative determines that any work requires special inspection, testing, or approval which Subparagraph 7.6.1 does not include, he/she will, upon written authorization from the Owner, instruct the Contractor to order such special inspection, testing or approval. If such special inspection or testing reveals a failure of the work to comply with the requirements of the Contract Documents, the Contractor shall bear all costs thereof, including compensation for the Engineer and/or Owner's Representative additional services made necessary by such failure; otherwise the Owner shall bear such costs, and an appropriate Change Order shall be issued.
- 7.6.3 Required certificates of inspection, testing, or approval shall be secured by the Contractor and promptly delivered by him to the Owner's Representative and Engineer.
- 7.6.4 If the Owner's Representative is to observe the inspections, tests, or approvals required by the Contract Documents, he/she will do so promptly and, where practicable, at the source of the supply.

PART 8 - TIME

8.1 DEFINITIONS

- 8.1.1 Unless otherwise provided, the Contract Time is the number of calendar or working days shown in the Contract Documents representing the time allowed for the completion of work contemplated in the Contract.
- 8.1.2 The date of commencement of the work is the date established in a notice to proceed. If there is no notice to proceed, it shall be the date of the Owner-Contractor Agreement, or such other date as may be established therein.
- 8.1.3 The term day, as used in the Contract Documents, shall mean calendar days, Sundays and Holidays included, unless otherwise specifically designated.

8.2 PROGRESS AND COMPLETION

- 8.2.1 Time is of the essence with respect to the performance of each of the parties' obligations stated within the Contract Documents.
- 8.2.2 The Contractor shall begin the work on the date of commencement as defined in Subparagraph 8.1.2. He/she shall carry the work forward expeditiously with adequate forces

and shall complete the work within the Contract Time. No work shall begin prior to the date of commencement.

- 8.2.3 When the Contract Documents require completion of the Contract by a specific date, all work, including clean-up of the work site, must be complete by that date.

8.3 DELAYS AND EXTENSIONS OF TIME

- 8.3.1 The Owner's Representative or the Owner shall have the authority to immediately stop the work wholly or in part by written order for such period as he/she may deem necessary due to conditions considered unfavorable for the suitable prosecution of the work.
- 8.3.2 If the Contractor finds it is impossible to complete the work on or before the time specified for completion, he/she may make written request for an extension of time. He/she shall set forth fully in the request the reasons he/she believes justify the granting of the request.
- 8.3.3 Contractor agrees to make no monetary claim for delays, interferences or hindrances of any kind in the performance of this Agreement caused by any act or omission to act of the Owner or its employees or representatives and further agrees that any such claim shall be fully compensated for by an extension of time to complete performance of the work. The Owner may extend the contract time by Change Order for completion as appears reasonable and proper. The extended time for completion shall then be considered as in full force and effect as if it were the original time for completion.
- 8.3.4 Any claim for extension of time shall be made in writing to the Owner's Representative not more than twenty (20) days after the commencement of the delay; otherwise, it shall be waived. In the case of a continuing delay, only one claim is necessary. The Contractor shall provide an estimate of the probable effect of such delay on the progress of the work.
- 8.3.5 If no agreement is made stating the dates upon which interpretations as provided in Subparagraph 2.2.8 shall be furnished, then no claim for delay shall be allowed on account of failure to furnish such interpretations until fifteen (15) days after written request is made for them, and not then unless such claim is reasonable.

8.4 FAILURE TO COMPLETE WORK ON TIME

- 8.4.1 Failure to complete the specified sections of the work within the time required by the Contract, including extensions granted thereto as determined by the Owner's Representative, shall entitle the Owner to deduct from the monies due, or to become due to the Contractor, an amount equal to the actual cost of the delay to the Owner, including those as outlined in Section 8.5 below.
- 8.4.2 Permitting the Contractor or Surety to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the Owner of any of its rights under the Contract.

8.5 LIQUIDATED DAMAGES

8.5.1 If the Contractor fails to achieve Substantial Completion by the Contract Completion Date, due to action or inaction of their own, as adjusted by approved Change Orders, the Contractor shall be liable for liquidated damages equal to the actual documented costs incurred by the Owner as a direct result of such delay. Recoverable costs may include, but are not limited to:

1. Extended project management and supervision
2. Additional site security or utilities
3. Rental or lease extensions for temporary facilities
4. Loss of use or revenue
5. Consultant or inspection fees

The Owner shall provide reasonable documentation of such costs. The Contractor shall not be liable for consequential damages or costs not directly attributable to the delay. Liquidated damages under this clause shall not be construed as a penalty.

PART 9 - PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

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

9.2 APPLICATIONS FOR PAYMENT

9.2.1 At least ten (10) days before the date for each progress payment established in the Owner-Contractor Agreement, the Contractor shall submit to the Owner's Representative an itemized Application for Payment supported by such data substantiating the Contractor's right to payment as the Owner or the Owner's Representative may require.

9.2.2 Unless otherwise provided in the Contract Documents, partial payments may be made for some stored materials as follows and only if approved by the Owner in advance. Payments may be made on account of large quantities of materials or major equipment components not incorporated in the Work but delivered and suitably stored either at the site, or some other location agreed upon in writing with the Owner. Payments for materials or equipment stored on or off the site shall be conditioned upon submission by the Contractor of paid bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials or equipment or otherwise protect the Owner's interest, including applicable insurance and transportation to the site for those materials and equipment stored off the site.

9.2.3 The Contractor warrants that title to all work, materials, and equipment covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon the receipt of payment by the Contractor, whichever occurs first, free and clear of all liens,

claims, security interests or encumbrances, hereinafter referred to in this Article 9 as "liens"; and that no work, materials, or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

- 9.2.4 When requested by the Owner's Representative, the Contractor shall furnish a breakdown of the actual quantities and unit prices used in preparing his/her bid price for each item in the proposal. The breakdown must be balanced and not contain prices which are proportionally higher for work to be completed first. The Owner's Representative reserves the right to order such changes as may, in his/her opinion, be necessary to balance such breakdown.

9.3 CERTIFICATES FOR PAYMENT

- 9.3.1 After the receipt of the Contractor's Application for Payment, the Owner's Representative will either issue a Certificate for Payment to the Owner, with a copy to the Contractor for such amount as the Owner's Representative determines is properly due or notify the Contractor in writing his/her reasons for withholding a certificate as provided in Subparagraph 9.5.1.
- 9.3.2 The issuance of a Certificate for Payment will constitute a representation by the Owner's Representative to the Owner, based on his/her observations at the site and the data comprising of the Application for Payment, that the work has progressed to the point indicated; that, to the best of his/her knowledge, information and belief, the quality of the work is in accordance with the Contract Documents.

9.4 PROGRESS PAYMENTS

- 9.4.1 At least ten (10) days before each progress payment falls due (but not more often than once a month) the Contractor will submit to the Owner's Representative a partial payment estimate filled out and signed by the Contractor covering the work performed during the period covered by the partial payment estimate and supported by such data as the Owner's Representative may reasonably require. Requests shall be submitted on AIA G702/703 or similar format.
- 9.4.2 If payment is requested on the basis of materials and equipment not incorporated in the work but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the Owner, as will establish the Owner's title to the material and equipment and protect his/her interest herein, including applicable insurance.
- 9.4.3 The Owner's Representative will, within ten (10) days after receiving each partial payment estimate, either indicate in writing his/her approval of payment and present the partial payment estimate to the Owner, or return the partial payment estimate to the Contractor indicating in writing his/her reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate.
- 9.4.4 The Owner shall act on partial progress estimates approved by the Owner's Representative on the succeeding regularly scheduled meeting.

- 9.4.5 The Owner shall retain ten percent (10%) of each progress payment until Substantial Completion. Upon achieving Substantial Completion, the retainage may be reduced to five percent (5%), with final release subject to completion of all punch list items and submission of closeout documents. The sum or sums withheld by the Owner shall not exceed ten percent (10%) of the value completed, unless a dispute arises between one prime contractor occasioned by the delays or actions of the second prime contractor. If such a dispute arises, additional retainage in the sum of one and one-half (1-1/2) times the amount of possible liability may be withheld until such time as a final resolution is agreed to by all parties.
- 9.4.6 After the Owner's Representative has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents.
- 9.4.7 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's work. The Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payments to his/her Sub-subcontractors in a similar manner. The Contractor and all Subcontractors shall provide reasonable proof at the request of the Owner's Representative of timely payment of all sums due Subcontractors and/or Sub-subcontractors as required herein.
- 9.4.8 Neither the Owner or Owner's Representative shall have any obligation to pay or to see to the payment of any monies to any Subcontractor except as may otherwise be required by law.
- 9.4.9 No Certificate for a progress payment, nor any progress payment, nor any partial or entire use, or occupancy of the project by the Owner, shall constitute an acceptance of any work not in accordance with the Contract Documents.

9.5 PAYMENTS WITHHELD

- 9.5.1 The Owner's Representative may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any certificate to such extent as may be necessary in his/her reasonable opinion to protect the Owner from loss on account of:
1. Defective work not remedied.
 2. Claims filed or reasonable evidence indicating probable filing of claims.
 3. Failure of the Contractor to make payments properly to the Subcontractor(s) or for labor, materials, or equipment.
 4. A reasonable doubt that the Contract can be completed for the balance then unpaid.
 5. Damage to the Owner or another Contractor.
 6. Failure of the Contractor to comply with provisions of the Contract Documents

relating to the receipt of State and/or Federal aid for the project and after receiving notification from the Owner that said compliance is necessary.

7. Failure of the Contractor to provide a CPM Schedule Progress Update, and/or Recovery Schedule as requested by the Owner's Representative.

- 9.5.2 When the above grounds in Subparagraph 9.5.1 are removed, payment will be made for amounts withheld because of them.

9.6 PARTIAL ACCEPTANCE

- 9.6.1 Upon the request of the Owner pursuant to General Condition 3.6 or, when requested by the Contractor and upon specific approval of the Owner's Representative, prior to final inspection and acceptance, the Contractor may be relieved of maintenance of sections of the work which have been completed. Such partial acceptance and assumption of the maintenance by the Owner shall be covered by a written notice from the Owner's Representative to the Contractor, and such notice shall designate the sections of the work on which the Contractor is to be relieved of maintenance and shall also set forth the date upon which such notice will be effective.
- 9.6.2 The assumption of maintenance by the Owner, however, will not relieve the Contractor of any responsibility for defective workmanship, or materials, or for damages caused by his/her own operations.
- 9.6.3 Such action will not be construed to be a final inspection or acceptance of any part of the work, or waiver of any legal rights.

9.7 FINAL COMPLETION

- 9.7.1 The Owner's Representative will make an inspection of the work included in the Contract as soon as practical after notification by the Contractor that the entire work has, in its opinion, been completed and final cleanup performed.
- 9.7.2 Should the inspection disclose any work, in whole or in part, as being unsatisfactory, the Owner's Representative will give the Contractor the necessary instructions for correction of the same, and the Contractor shall immediately comply with and execute such instructions. Upon correction of the work, another inspection will be made. The Contractor shall bear all costs of re-inspection(s).
- 9.7.3 When all work included in the Contract has, in the opinion of the Owner's Representative, been completed, the Engineer will certify the date of completion of the work.

9.8 LIEN WAIVERS AND CLAIM RELEASE

- 9.8.1 Neither the final payment nor any part of the retained percentage shall become due until the Contractor, delivers to the Owner (1) a complete release of any claims arising out of the Contract, and (2) an affidavit which certifies that all labor and materials for which a lien could

be filed, have been paid in full.

- 9.8.2 Contractor does hereby covenant, promise and agree, that no mechanic's lien or other lien of any kind whatsoever shall be filed or maintained against the project or the property of the Owner by any subcontractor, materialmen, or laborer for work done or materials furnished under the Contract or by any other party acting through or under them or any of them for and above the project or any part thereof. The Contractor shall, at his/her own expense by bonding or otherwise, secure the prompt discharge of any liens which may be filed against the project as a result of this Contract.

9.9 FINAL ACCEPTANCE

- 9.9.1 When all of the Contractor's obligations under the Contract have, in the opinion of the Engineer, the Owner's Representative, and the Owner, been fully satisfactorily performed, the Owner's Representative will provide written notification to the Contractor establishing the final acceptance of the Project, and the date thereof.

9.10 FINAL PAYMENT

- 9.10.1 When the project has been finally completed and accepted the Contractor shall then be paid the entire sum found to be due after:

1. deducting all previous payments and all amounts to be deducted under the provisions of the Contract
2. delivery to and acceptance by the Engineer and Owner's Representative of the Record Drawings
3. acceptance of releases and affidavits as required under Paragraph 9.9 FINAL ACCEPTANCE

- 9.10.2 All prior estimates and payments shall be subject to correction in the final estimate and payment.

- 9.10.3 The acceptance by the Contractor of the "Final Payment" provided for in the Contract shall operate as, and shall be, a release to the Owner and its representatives from all claims by the Contractor for anything done or furnished for or relating to the work, or for any act or neglect of the Owner, or of any person relating to or affecting the work.

- 9.10.4 The making of final payment shall constitute a waiver of all claims by the Owner except those arising from:

1. Unsettled liens,
2. Failure of the work to comply with the requirements of the Contract Documents, or
3. Terms of any warranties required by the Contract Documents.

PART 10 - PROTECTION OF PERSONS AND PROPERTY**10.1 SAFETY PRECAUTIONS AND PROGRAMS**

- 10.1.1 The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work.
- 10.1.2 The Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations, and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.
- 10.1.3 The Contractor shall designate a responsible member of his/her organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and the Owner's Representative.

10.2 EMERGENCIES

- 10.2.1 In any emergency affecting the safety of persons or property, the Contractor shall act, at his/her discretion, to prevent threatened damage, injury, or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in Article 12 for Changes in the work.
- 10.2.2 In the event it becomes necessary for the Owner to perform emergency maintenance and protection, which is the responsibility of the Contractor under the Contract Documents, the cost of such work shall be billed to the Contractor and deducted from his/her final payment if not paid.

10.3 PROTECTION OF WORK-PUBLIC AND PRIVATE

- 10.3.1 During performance and up to the final acceptance of the work, the Contractor shall be under an absolute obligation to protect finished and unfinished work against any damage, loss or injury; and in the event of such damage, loss or injury he/she shall promptly replace or repair such work, whichever the Owner's Representative shall determine to be preferable.
- 10.3.2 All private properties shall be fully protected by the Contractor. All trees, bushes, shrubs, sod, etc., on private property damaged by the Contractor shall be repaired or replaced by the Contractor at no cost to the private owner, and to the satisfaction of the Owner's Representative.
- 10.3.3 Whenever the work is to be prosecuted through private property for which the Owner has obtained an easement, the Contractor must abide fully with the terms of the easement, a copy of which is on file with the Owner.

10.4 CLAIMS FOR DAMAGES – PERSONAL INJURY / PROPERTY DAMAGE

- 10.4.1 Should either party to the Contract suffer injury or damage to person or property because of

any act or omission of the other party or of any of his/her employees, agents or others for whose acts he/she is legally liable, claim shall be made in writing to such other party within a reasonable time after the first observance of such injury or damage.

10.5 STREET BARRICADES, SIGNS, AND WARNING DEVICES

10.5.1 The Contractor shall be responsible for the erection and maintenance of all barricades, lights, and signs necessary for public safety and convenience in accordance with all applicable requirements. Adequate protection shall be provided around all openings wherever required to safeguard the work for the public. In general, all hazards within the limits of the work or on detour around the work must be marked with well-painted, well-maintained barricades, reflectors, electrical lights, flashers, and warning and directional signs in sufficient quantity and size adequate to protect life and property. These safeguards shall be moved, changed, increased, or removed as required during the progress of the work to meet changing conditions.

10.5.2 When a street or road is closed to through traffic, barricades shall be placed at the adjacent intersections as well as at the locations of the obstruction. Detour signs shall be attached to the barricades at the adjacent intersections. Detour signs shall be adequately illuminated and/or reflectorized so as to be clearly visible at all times. All signs shall conform to the current New York State Manual of Uniform Traffic Control Devices. The Owner's Representative reserves the right to require that "snow fence" be installed at locations where streets or alleys are closed for the full width of the roadway. Barricades shall be maintained in rigidly assembled condition. All warning devices shall be kept clean and in good repair so as to be readily discernible at all times.

10.6 ACCESS TO PROPERTIES AND FACILITIES-PUBLIC AND PRIVATE

10.6.1 The Contractor shall maintain vehicular traffic as specified in the Contract Documents or as otherwise directed by the Owner's Representative. The Contractor shall neither shut off, nor unnecessarily interfere with, either pedestrian or vehicular access to property without the consent of the Owner's Representative.

10.6.2 Whenever the Contractor's operations obstruct or endanger a traffic lane, and no marked detour has been provided, he/she shall furnish a flagman to direct traffic through or around the congested area. The Owner's Representative shall have the right to require additional flagmen as he/she may deem necessary.

10.6.3 Access must always be maintained to fire hydrants, fire alarms and police call boxes, water and gas gate valves, catch basins, and sewer, water, utility, and other manholes. Whenever access to any such facility shall have been obstructed or interfered with during the progress of the work, the Contractor must immediately remove at his/her own expense such obstruction or interference.

10.6.4 The Contractor shall be responsible for immediate removal of snow from those sections of streets or project site areas which he/she has obstructed or occupied.

10.7 DRAINAGE

- 10.7.1 Drainage must not be obstructed at any time. When necessary, a continuous pipe or timber drain, of ample capacity, shall be laid to carry off the storm water. Such pipe shall be kept open and free of obstruction.
- 10.7.2 All storm or ground water, which is to be removed from the site of the work, must be conveyed to an inlet of a storm sewer, or, when so approved by the Owner's Representative, to some other point of disposal. All sanitary sewage must be conveyed by closed pipe or hose to an inlet of a sanitary sewer, or when so approved by the Owner's Representative, to some other point of disposal. Proper precautions must be taken to prevent excessive quantities of clay, sand, or silt from entering existing sewers or drainage channels. All existing structures which are disturbed must be restored to a condition at least equal to their original condition and to the satisfaction of Owner's Representative.

PART 11 - LIABILITY AND INSURANCE

11.1 HOLD HARMLESS

- 11.1.1 The Contractor shall hold harmless the Owner and Engineer and the Owner's Representative, from any claims and from any and all damages to the property of the Owner, whose name is given on the Contract Document cover, or any third part, or personal injuries sustained by anyone as the result of the operations of the Contractor on this Project.
- 11.1.2 The Contractor and the Surety will be held responsible for and shall save the Owner and Engineer and Owner's Representative harmless from all liability for damages occasioned by the digging up, use or occupancy of the street, alley, highway, public grounds and private grounds, or which may result therefrom, or which may result in any way from the negligence or carelessness of the Contractor, his/her agents, employees or workman; or by reason of the elements, unforeseen or unusual difficulties, obstructions, or obstacles encountered in the prosecution of the work; and they shall indemnify the Owner and Engineer and Owner's Representative for and save it harmless from all claims and liabilities, actions and causes of action, and liens for materials furnished or labor performed in the construction or execution of the work, and from all costs, charges and expenses incurred in defending such suits or actions, and from and against all claims and liabilities for injury or damage to persons or property emanating from defective or careless work methods, or from and against all claims or liabilities for royalties, license fees, actions, suits, charges and expenses or damage from infringement for reason of the use of any invention or improvement in tools, equipment or plant or any process, invention or improvement in tools, equipment or plant or any process, device, or combination of devices used in the construction of the work.
- 11.1.3 The indemnification hold harmless and/or save harmless provisions contained above shall not be interpreted to limit in any way the indemnification contained in Section 4.16 above.

11.2 INSURANCE – CONTRACTOR'S LIABILITY INSURANCE

- 11.2.1 The Contractor shall purchase from and maintain a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect

the Contractor from claims that may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them. Insurance requirements are as detailed in the RFP.

All insurance policies shall name the Owner, the Architect/Engineer, and the Owner's Representative, as additional insured on a primary and non-contributing basis. A copy of the Additional Insured Endorsement must be submitted with Certificate of Insurance.

The Contractor hereby agrees to deliver to the Owner, on or before the execution of this Agreement and prior to any equipment or personnel being brought onto the site of the Work or the Project site, certified copies of all insurance policies required by and in compliance with this Contract, procured by the Contractor. Each insurance carrier for the contractor and subcontractor(s) will complete and submit a Certificate of Insurance on the standard ACORD form, which is satisfactory to the Owner and Representative evidencing the required coverages with limits not less than those specified in the Contract Documents. The coverage afforded under any insurance policy obtained shall be primary to any valid and collectible insurance carried separately by any of the Indemnities naming each of them Additional Insureds. Further, all policies and Certificates of Insurance shall expressly provide that no less than sixty (60) days prior written notice shall be given to the Owner and Owner's Representative in the event of material alteration, cancellation, non-renewal, or expiration of the coverage contained in such policy as evidenced by such certificate copy of Certificate of Insurance. If the initial insurance expires prior to the end of the guarantee period, renewal certificates, in the form identical to the attached Certificate of Insurance, shall be furnished at least thirty (30) days prior to the date of expiration.

11.2.2 If the Contractor fails to purchase and maintain any insurance required by the Contract Documents, Owner may, but shall not be obligated to, upon five (5) days' written notice to the Contractor, purchase such insurance on behalf of the Contractor and shall be entitled to be reimbursed by the Contractor upon demand.

11.2.3 Any aggregate limit under the Contractor's liability insurance shall, by endorsement, apply to this Project separately.

11.3 CONTRACT BONDS

11.3.1 Contract Bonds are as detailed in the RFP. The bonds required herein shall be provided on the forms contained in these contract specifications or where no such form is provided in these contract specifications, on forms approved by the Owner. The bonds shall be T-listed in the Federal Registry. The amount of the bonds issued for the awarded Contract shall be the full amount of the Contract and shall be adjusted to incorporate all extras, credits, and change orders through a final payment.

11.4 WEEKLY PAYROLL RECORDS

11.4.1 The Contractor shall submit weekly a copy of all payrolls to the Owner's Representative. The Contractor shall be responsible for the submission of copies of payrolls of all Subcontractors. The copy shall be accompanied by a statement signed by the Contractor indicating that the payrolls are correct and complete, that the wage rates contained therein are not less than

those determined by the Secretary of Labor, and that the classifications set forth for each laborer or mechanic including apprentices and trainees, conform with the work he/she performed.

PART 12 - CHANGES IN THE WORK

12.1 CHANGE ORDERS

- 12.1.1 A Change Order is an agreement signed by the Owner, Contractor, and the Engineer, issued after execution of the Contract, authorizing a change in the work involving an adjustment in the contract sum and / or the contract time. The contract sum and the contract time may be changed only by a fully executed Change Order.
- 12.1.2 The Owner, without invalidating the Contract, may order changes in the work within the general scope of the Contract consisting of additions, deletions or other revisions, the contract sum and the contract time being adjusted accordingly. All such changes in the work shall be authorized by Change Order and shall be performed under the applicable conditions of the Contract Documents.
- 12.1.3 No extra work of any kind will be allowed unless ordered in writing by the Engineer and/or Owner's Representative prior to commencing work which will entail such extras. No verbal orders shall be construed as authorizing or laying the foundation for extra compensation for either work or materials, or for extra contract time. Verbal orders or suggestions may be given from time to time, as to the performance of the work, but in case they appear to the Contractor to involve extra work for which he/she should receive extra compensation, he/she must ask for a written Change Order.
- 12.1.4 The Owner's Representative will have authority to order minor changes in the work not involving adjustment in the contract sum or an extension of the contract time and not inconsistent with the intent of the Contract Documents. Such changes will be affected by written order and shall be binding on the Owner and the Contractor. The Contractor shall carry out such written orders promptly.
- 12.1.5 In the event of any disagreement as to the amount of work involved under any authorized order for extra work, it is hereby agreed that the decision of the Owner's Representative shall be binding and conclusive.
- 12.1.6 If the Owner deems it proper or necessary in the execution of the work to make any alteration, which will increase or diminish the quantity of labor or materials, or the cost of the work, such alteration shall not annul or vitiate the Contract or agreement, nor release the Surety. The Contractor shall furnish the necessary labor, material, etc., to complete the Contract as altered within the time limit originally specified or as extended by the Owner's Representative. Additions or deductions need not be accepted by the Contractor if the total cost of the additions or deductions exceeds twenty percent (20%) of the total cost of the project as originally bid by the Contractor. The value of the work so added or omitted shall be added or deducted from the amount otherwise due the Contractor, as the case may be, and shall be determined in accordance with the methods described in Subparagraph 12.1.7.

12.1.7 The method of determining the basis of payment or credit resulting from such altered work shall be:

1. For such items where the unit prices have been established in the Contract, the unit prices may, at the Owner's election, be utilized.
2. For such items for which unit prices have not been established in the Contract, by agreement with the Contractor following a request by the Owner's Representative for a written quotation for the item of work to be performed or the elimination of the work. Contractor shall submit quotations, which are properly itemized and supported by sufficient substantiating evidence to permit evaluation by the Owner's Representative.
3. If an agreement cannot be made between the Contractor and the Owner's Representative for items of work for which unit prices are not set forth in the Contract, then the value shall be determined by using the actual cost of labor, materials and use of equipment to be determined as the work progresses and as outlined in Paragraph 12.2 plus overhead and profit as outlined in Paragraph 12.3.

12.2 ACTUAL COST

12.2.1 Actual cost of labor and material shall be defined as the amount paid for the following items, to the extent determined reasonable and necessary.

1. Materials

Cost of materials delivered to the job site for incorporation into the Contract work.

2. Wages

Wages paid to workmen and foremen and wage supplements paid to labor organizations in accordance with current labor agreements.

3. Statutory Benefits

Premiums or taxes paid by the Contractor for workmen's compensation insurance, unemployment insurance, FICA tax, and other payroll taxes as required by law, net of actual and anticipated refunds and rebates.

4. Sales Tax

Sales taxes paid as required by law, unless the Owner is exempt from Federal, State, and local sales tax.

5. Equipment Rental

Allowance for use of construction equipment (exclusive of hand tools and minor equipment), as approved for use by the Owner's Representative. The rate on self-owned equipment used for periods of under one (1) week will be the Associated Equipment Distributor's published monthly rate divided by twenty two (22) days to establish a daily

rate and divided again by hours to establish an hourly rate. Equipment used for periods of five (5) days or more, will be billed at a rate equal to forty five percent (45%) of the published monthly rate. In the alternative, the Owner's Representative may approve for reimbursement at a rate representing the allowable costs of ownership.

6. Self-Owned Equipment

Self-owned equipment is defined to include equipment rented from controlled or affiliated companies. Rented equipment will be paid for at the actual rental cost. Gasoline, oil, and grease required for operation and maintenance will be paid for at the actual cost. When, in the opinion of the Contractor, and as approved by the Owner's Representative, suitable equipment is not available on the site, the moving of said equipment to and from the site will be paid for at actual cost.

7. Documentation and Verification

Claims for such work will not be considered unless the Contractor presents to the Owner's Representative a daily itemized statement in duplicate of the hours of labor, quantities of materials, etc. upon which payment is to be based. The Owner's Representative will check such amounts daily and will retain the original and return the copy to the Contractor. The approval of such items by the Owner's Representative shall not in itself, however, be construed as authorizing or accepting such claims. No claims will be considered until the original bills, receipts, or vouchers have been furnished to the Owner's Representative by the Contractor.

12.3 OVERHEAD AND PROFIT

12.3.1 Overhead shall be defined as an allowance to compensate for all costs, charges, and expenses, direct or indirect, except for the actual cost of labor and materials as defined by Subparagraph 12.2.1. Overhead shall be considered to include, but not be limited to, insurance (other than mentioned in Subparagraph 12.2.1) bond or bonds, field and office supervisors and assistants above the level of foreman, use of small tools and minor equipment, incidental job burdens, general office expense, etc.

12.3.2 The amounts allowed for overhead and profit shall not exceed the applicable percentages as established in the two following paragraphs, in reference to Subparagraph 12.1.6.

12.3.3 If the work is done directly by the Contractor, overhead in an amount of five percent (5%) may be added if method 12.1.6.2 or 12.1.6.3 is used, and to the cost of labor and materials plus overhead, there may be added ten (10%) percent for profit. The percentages for overhead and profit may vary according to the nature, extent and complexity of the work involved, but in no case shall exceed the percentages set forth in this paragraph and in the paragraph below.

12.3.4 No percentages for overhead and profit will be allowed on payroll taxes or on the premium portion of overtime pay.

12.3.5 If the work is done by a Subcontractor, Subcontractor's overhead in the amount of five percent (5%) may be added to cost of labor and materials if method 12.1.6.3 is used and to

the cost of labor and materials plus overhead, there may be added ten percent (10%) for the Subcontractor's profit. To this amount there may be added an amount not exceeding ten percent (10%) for the Contractor's combined overhead and profit. No percentage for overhead and profit will be allowed on payroll taxes or on the premium portion of overtime pay.

12.4 CONCEALED CONDITIONS

- 12.4.1 Should concealed conditions encountered in the performance of the work below the surface of the ground or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the Contract Documents, or should unknown physical conditions below the surface of the ground or should concealed or unknown conditions in an existing structure of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract, be encountered, the contract sum shall be equitably adjusted by Change Order upon claim by either party made within twenty (20) days after the first observance of the conditions.

12.5 CLAIMS FOR ADDITIONAL COST

- 12.5.1 If the Contractor wishes to make a claim for an increase in the contract sum, he/she shall give the Owner's Representative written notice thereof within twenty (20) days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the work, except in an emergency endangering life or property in which case the Contractor shall proceed in accordance with Paragraph 10.3. No such claim shall be valid unless so made. If the Owner and the Contractor cannot agree on the amount of the adjustment in the contract sum, it shall be determined by the Owner's Representative. Any change in the contract sum resulting from such claim shall be authorized by Change Order.
- 12.5.2 If the Contractor claims that additional cost is involved because of, but not limited to, (1) any written interpretation pursuant to Subparagraph 2.2.8, (2) any order by the Owner to stop the work pursuant to Paragraph 3.3 where the Contractor was not at fault, (3) any written order for a minor change in the work issued pursuant to Paragraph 12.4, or (4) failure of payment by the Owner pursuant to Paragraph 9.7, the Contractor shall make such claim as provided in Subparagraph 12.5.1.
- 12.5.3 The parties mutually waive claims against each other for consequential damages arising out of or in connection with the Project.
- #### 12.6 CONTINUING CONTRACT PERFORMANCE
- 12.6.1 Pending final resolution of a Claim or a disputed determination by the Owner's Representative, the Contractor shall proceed diligently with the performance of the Contract, and the Owner shall continue to make payments in accordance with the Contract Documents.

12.7 DISPUTE RESOLUTION

- 12.7.1 The Owner's Representative shall serve as the decision maker for all disputes arising out of or in connection with this Agreement.

PART 13 - UNCOVERING AND CORRECTION OF WORK

13.1 UNCOVERING OF WORK

- 13.1.1 All materials and each part or detail of the work shall be subject at all times to inspection by the Owner's Representative or his/her authorized representatives, and the Contractor will be held strictly to the true intent of the specifications in regard to quality of materials, workmanship, and the diligent execution of the Contract. Such inspection may include mill, plant, or shop inspection, and any material furnished under these specifications is subject to such inspection. The Engineer and/or Owner's Representative or his/her representatives shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Contractor as is determined by the Owner's Representative or his/her representative, to make a complete and detailed inspection.
- 13.1.2 If any portion of the work should be covered contrary to the request of the Engineer and/or Owner's Representative or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Engineer and Owner's Representative, be uncovered for his/her observation and shall be replaced at the Contractor's expense.
- 13.1.3 The Contractor shall, if the Engineer and/or Owner's Representative requests, remove or to uncover such portion of the finished work as the Engineer and/or Owner's Representative may direct before the final acceptance of the same. After the examination, the Contractor shall restore said portion of the work to the standard required by the specifications. If the work thus exposed or examined proves acceptable, the expense of uncovering and/or replacing of the parts removed shall be paid for as extra work; but, if the work so exposed or examined is unacceptable, the expense of uncovering and/or removing and replacing of the same in accordance with the specifications shall be borne by the Contractor.

13.2 CORRECTION OF WORK

- 13.2.1 The Contractor shall promptly correct all work rejected by the Owner's Representative as defective or as failing to conform to the Contract Documents whether observed before or after substantial completion and whether or not fabricated, installed, or completed. The Contractor shall bear all costs of correcting such rejected work, including compensation for the Architect's/Engineer's additional services made necessary thereby.
- 13.2.2 If, within one (1) year after the date of substantial completion of the work or designated portion thereof, or within one (1) year after acceptance by the Owner of designated equipment or within such longer period of time as may be prescribed by law or by terms of any applicable special warranty required by the Contract Documents, any of the work is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the Owner's Representative to do so

unless the Owner has previously given the Contractor a written acceptance of such condition. This obligation shall survive termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

13.2.3 All materials not conforming to the requirements of the Contract Documents shall be considered defective, and all such materials, whether in place or not, shall be rejected and shall be removed from the work by the Contractor at his/her expense. Upon failure on the part of the Contractor to comply with any order of the Owner's Representative relative to the provisions of this article, the Owner's Representative shall have authority to remove and replace such defective material and to deduct the cost of removal and replacement from any monies due or which may become due the Contractor.

13.2.4 The Contractor shall promptly remove from the premises all materials condemned by the Owner's Representative as failing to meet Contract requirements, whether incorporated in the work or not, and the Contractor shall promptly re-execute his/her own work in accordance with the Contract and without expense to the Owner and shall bear the expense of making good all work of other Contractor(s) destroyed or damaged by such removal or replacement.

13.2.5 If the Contractor does not remove such condemned work and materials within ten (10) days after written notice, the Owner may remove them and may store the materials at the expense of the Contractor. If the Contractor does not pay the expense of such removal within ten (10) days time thereafter, the Owner may, upon ten (10) days written notice, sell such materials at auction or at private sale and shall pay to the Contractor the net proceeds thereof, after deducting all the costs and expense that should have been borne by the Contractor, including compensation for the Architect's/Engineer's and Owner's Representative additional services made necessary thereby. If such proceeds of sale do not cover all costs which the Contractor should have borne, the difference shall be charged to the Contractor, and an appropriate change order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

13.2.6 Nothing contained in this Paragraph 13.2 shall be construed to establish a period of limitation with respect to any other obligation which the Contractor might have under the Contract Documents, including Paragraph 4.5 hereof. The establishment of the time period of one (1) year after the date of final acceptance or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents relates only to the specific obligation of the Contractor to correct the work, and has no relationship to the time within which proceedings may be commenced to establish the Contractor's liability with respect to his/her obligations other than specifically to correct the work.

13.3 ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK

13.3.1 If the Owner prefers to accept defective or non-conforming work, he/she may do so instead of requiring its removal and correction in which case a Change Order will be issued to reflect a reduction in the contract sum where appropriate and equitable. Such adjustment shall be affected whether or not final payment has been made.

APPENDIX B-2

RFP # 2025-12

BEACON ISLAND PHASE 3
Packaged Wastewater Treatment Plant
and
Fire Pump House and Marine Inlet

TECHNICAL DOCUMENTS

Technical Documents

Packaged Wastewater Treatment Plant

Technical Drawings:

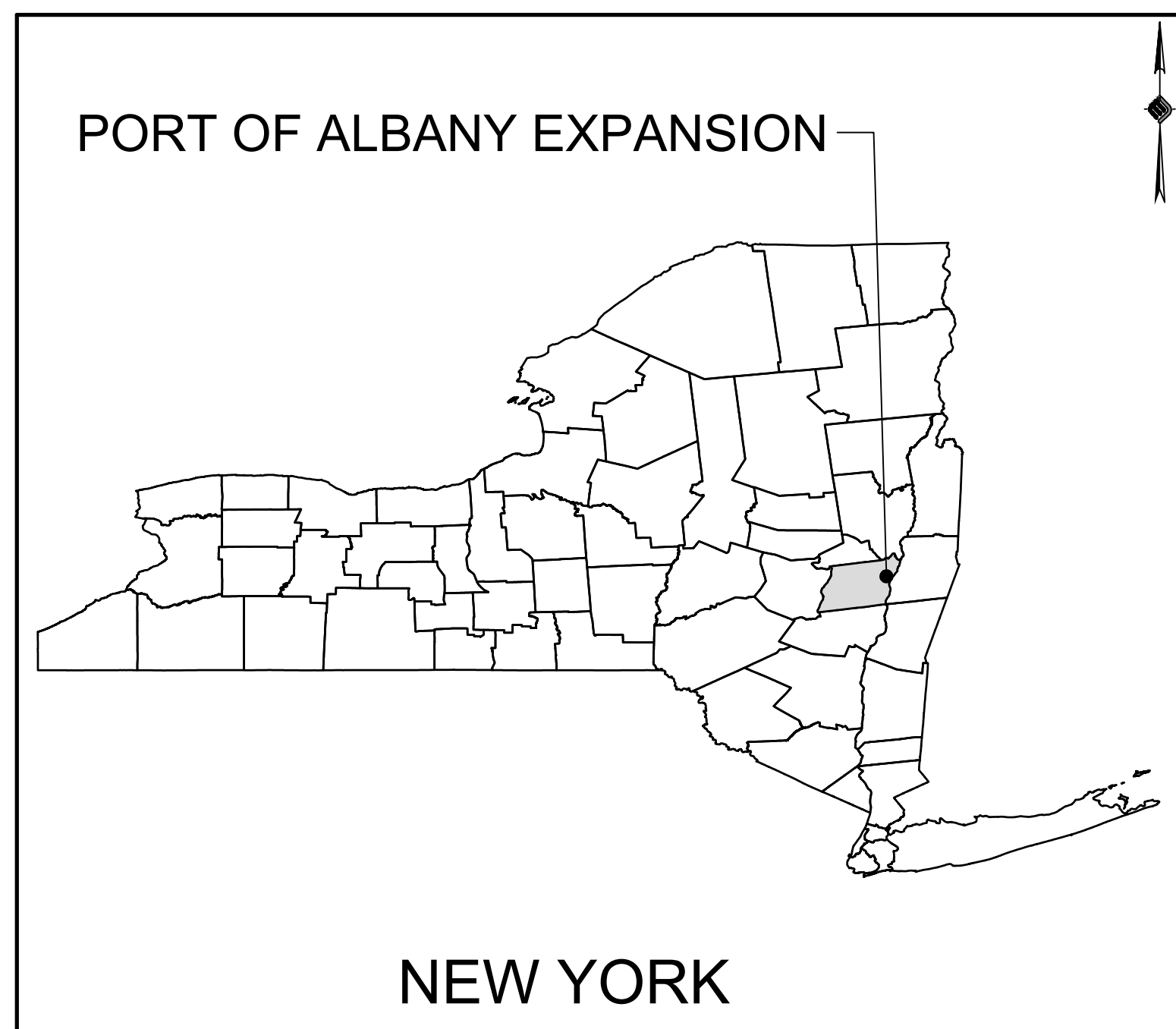
- COVR COVER SHEET
- GN-01 GENERAL NOTES
- SP-00 OVERALL SITE PLAN
- SP-01 SITE PLAN
- UT-01 UTILITY PLAN
- UT-02 UTILITY PLAN
- UT-03 UTILITY PLAN
- UT-04 UTILITY PLAN
- MD-01 MISCELLANEOUS DETAILS
- MD-02 MISCELLANEOUS DETAILS
- G1.0 WWTP COVER SHEET
- P1.0 WWTP PROCESS DIAGRAM
- C1.0 WWTP GENERAL ARRANGEMENT: PACKAGE PLANT
- C1.1 WWTP GENERAL ARRANGEMENT: LIFT STATION
- C1.2 WWTP GENERAL ARRANGEMENT: FLOW METER VAULT
- E-601S ELECTRICAL SINGLE LINE DIAGRAM

Technical Specifications:

- 033001 CAST IN PLACE CONCRETE (SAME AS FIRE PUMP HOUSE)
- 460753 PACKAGED WASTEWATER TREATMENT PLANT

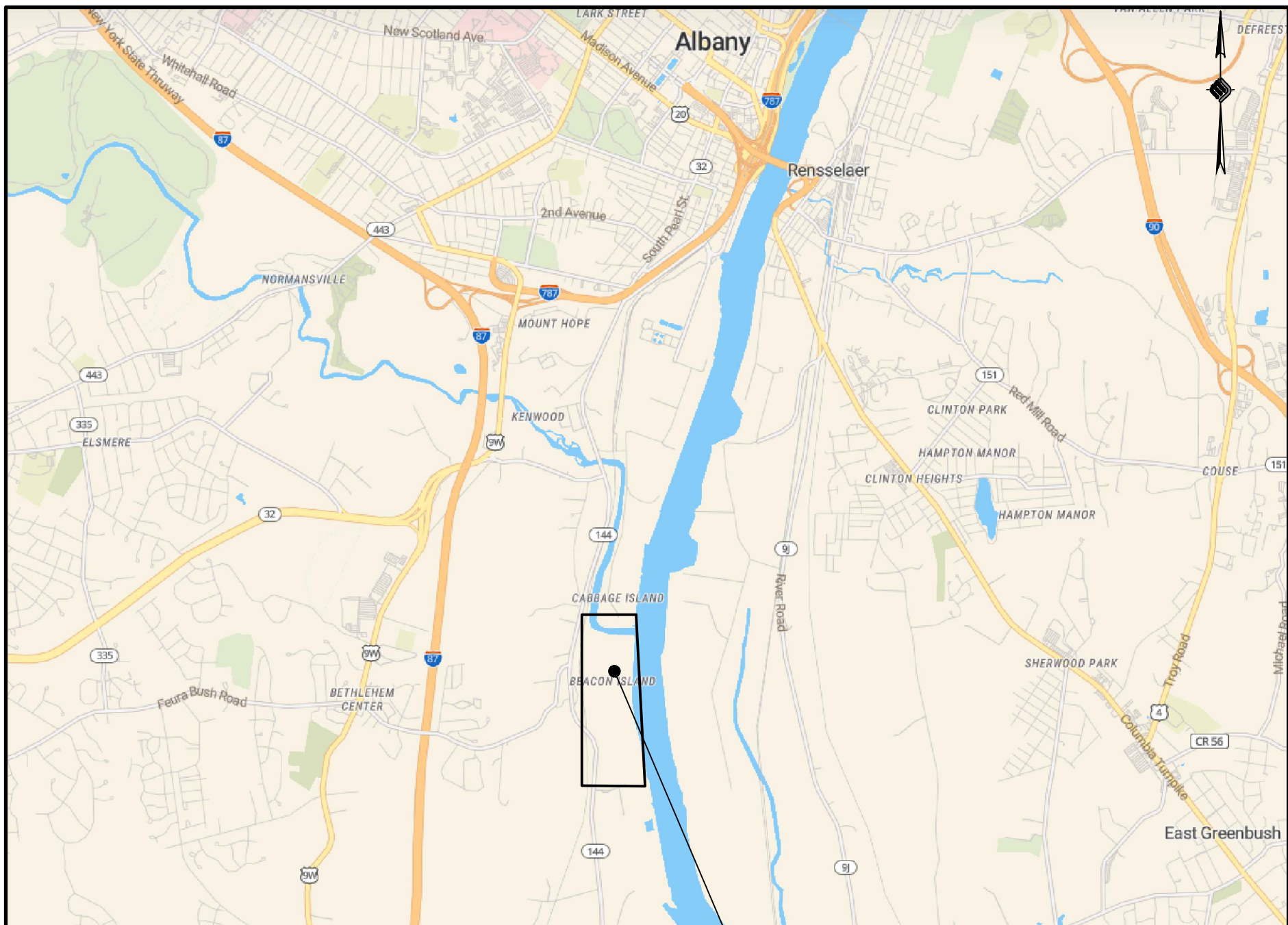
ALBANY PORT DISTRICT COMMISSION

BEACON ISLAND EXPANSION - PHASE 3



LOCATION MAP

ISSUED FOR BID SET
WASTE WATER
TREATMENT PLANT
AUGUST 13, 2025
TOWN OF BETHLEHEM
ALBANY COUNTY
NEW YORK



VICINITY MAP

PREPARED FOR:


PORT OF ALBANY

ALBANY PORT DISTRICT COMMISSION
106 SMITH BOULEVARD
ALBANY, NEW YORK
(518) 463-8763
WWW.ALBANY.GOV

PREPARED BY:


McFarland Johnson

90 EAST AVENUE
SARATOGA SPRINGS, NEW YORK 12866

McFARLAND JOHNSON PROJECT # 18641.06

PLANNING BOARD HTE# 21-00100006

SEALED	ADAM J. FROSINO
PE_NO	088870
PE_DATE	AUGUST 13, 2025



IT IS A VIOLATION OF THE LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

1. THE UNDERGROUND STRUCTURES AND UTILITIES SHOWN ON THESE PLANS HAVE BEEN PLOTTED FROM A SURVEY PREPARED BY MASER CONSULTING P.A. 18 COMPUTER DRIVE EAST SUITE 203, ALBANY, NY 12205, DATED JULY 10, 2018 AND AVAILABLE SURVEYS AND RECORD MAPS BY OTHERS. MCFARLAND JOHNSON DOES NOT CERTIFY TO THE ACCURACY OF THEIR LOCATION AND/OR COMPLETENESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION AND EXTENT OF ALL UNDERGROUND STRUCTURES AND UTILITIES PRIOR TO ANY DIGGING OR CONSTRUCTION ACTIVITIES IN THEIR VICINITY. THE CONTRACTOR SHALL HAVE ALL EXISTING UTILITIES FIELD STAKED BEFORE STARTING WORK BY CALLING 1-800-962-7962.
2. THE CONTRACTOR SHALL PERFORM ALL WORK IN COMPLIANCE WITH TITLE 29 OF FEDERAL REGULATIONS, PART 1926, SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION (OSHA).
3. HIGHWAY DRAINAGE ALONG ALL ROADS AND PRIVATE DRIVES SHALL BE KEPT CLEAN OF MUD, DEBRIS ETC. AT ALL TIMES. ALL CATCH BASINS AND STORM SEWER MANHOLES SHALL BE CLEANED PRIOR TO ACCEPTANCE BY THE TOWN.
4. THE CONTRACTOR SHALL CONSULT THE DESIGN ENGINEER BEFORE DEVIATING FROM THESE PLANS.
5. IN ALL TRENCH EXCAVATIONS, CONTRACTOR MUST LAY THE TRENCH SIDE SLOPES BACK TO A SAFE SLOPE, USE A TRENCH SHIELD OR PROVIDE SHEETING AND BRACING. THE MEANS AND METHODS SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER.
6. EXCAVATED WASTE MATERIAL REMOVED FROM THE SITE SHALL BE PLACED AT A LOCATION ACCEPTABLE TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.
7. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO MAINTAIN A MINIMUM OF 2' OF COVER OVER ALL EXISTING AND NEW STORM SEWER PIPES AND 4' OF COVER OVER ALL SANITARY PIPES DURING CONSTRUCTION.
8. ALL EXISTING SURFACE APPURTENANCES (I.E. WATER VALVES, CATCH BASIN FRAMES AND GRATES, MANHOLE COVERS) WITHIN THE PROJECT LIMITS SHALL BE ADJUSTED TO FINISHED GRADE. (NO SEPARATE PAYMENT).
9. AREAS DISTURBED OR DAMAGED AS PART OF THIS PROJECT'S CONSTRUCTION THAT ARE OUTSIDE OF THE PRIMARY WORK AREA SHALL BE RESTORED, AT THE CONTRACTORS EXPENSE, TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
10. UNLESS COVERED BY THE CONTRACT SPECIFICATIONS OR AS NOTED ON THE PLANS, ALL WORK SHALL CONFORM TO THE LATEST VERSION OF THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND ANY SUBSEQUENT REVISIONS OR ENGINEERING BULLETINS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE TO SECURE ALL PERMITS AND PROVIDE ALL BONDS REQUIRED FOR THIS WORK, INCLUDING BUT NOT LIMITED TO UTILITY CONNECTIONS, BUILDING AND SITE CONSTRUCTION.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODE AND/OR UTILITY SERVICE COMPANIES. THIS SHALL BE COMPLETED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL CONNECTION OF SERVICES.
13. MAINTENANCE AND PROTECTION OF TRAFFIC ALONG WITH SECURING THE WORK AREA SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
14. THE CONTRACTOR SHALL LOCATE, SAFEGUARD AND PRESERVE ALL SURVEY CONTROL MONUMENTS AND ROW MONUMENTS IN THE AREAS OF CONSTRUCTION.
15. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND SAFETY PROCEDURES. THE OWNER AND/OR ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUB CONTRACTOR OR THEIR AGENTS, EMPLOYEES OR ANY OTHER PERSON PERFORMING ANY OF THE WORK.
16. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATION ASSOCIATED WITH THIS PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS RELATIVE TO THE SPECIFICATION OR APPLICABLE CODES, IT IS THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE OWNERS REPRESENTATIVE IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE OWNERS REPRESENTATIVE SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS IN FULL CONFORMANCE WITH LOCAL REGULATIONS AND CODES.
17. ALL WORK INCLUDED IN THESE PLANS SUBJECT TO SECTION 128-49 OF THE TOWN ZONING SHALL BE CERTIFIED BY DESIGNATED PROFESSIONALS PURSUANT TO SECTION 128-49(f)(2)(i).
18. ANY GROUND DISTURBANCE WITHIN THE LIMITS OF THE PROPOSED SUBJECT PARCEL SHALL BE PERFORMED IN ACCORDANCE WITH THE SOIL MANAGEMENT PLAN - PORT OF ALBANY EXPANSION PROJECT, BEACON ISLAND PARCEL, BETHELHEM, ALBANY COUNTY, NEW YORK PREPARED BY ATL DATED "AUGUST 13, 2021".

1. HOLD A PRE-CONSTRUCTION MEETING WITH PROJECT MANAGER, OPERATOR'S ENGINEER, CONTRACTORS & SUB-CONTRACTORS, AND REPRESENTATIVES OF THE TOWN OF BETHLEHEM (MS4) PRIOR TO LAND DISTURBING ACTIVITIES.
2. HAVE A QUALIFIED PROFESSIONAL CONDUCT AN ASSESSMENT OF THE SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND CERTIFY IN AN INSPECTION REPORT THAT THE APPROPRIATE EROSION AND SEDIMENT CONTROLS DESCRIBED IN THE SWPPP AS REQUIRED BY THE GP-0-20-001 HAVE BEEN ADEQUATELY INSTALLED OR IMPLEMENTED TO ENSURE OVERALL PREPAREDNESS OF THE SITE FOR THE COMMENCEMENT OF CONSTRUCTION.
3. CONSTRUCT TEMPORARY STABILIZED CONSTRUCTION ENTRANCE AT LOCATION SHOWN ON THE DRAWINGS.
4. INSTALL PERIMETER CONTROLS AND INLET PROTECTION AT THE LOCATIONS SHOWN ON THE DRAWINGS.
5. CONSULT A QUALIFIED PROFESSIONAL TO PERFORM A SITE INSPECTION AND VERIFY THAT THE INITIAL PHASE OF EROSION CONTROL DEVICES HAVE BEEN INSTALLED PER THE DRAWINGS PRIOR TO COMMENCEMENT OF GROUND DISTURBANCE.
6. BEGIN CLEARING AND GRUBBING OPERATIONS. CLEARING AND GRUBBING SHALL ONLY BE DONE IN AREAS WHERE EARTHWORK WILL BE PERFORMED.
7. STRIP AND STOCKPILE TOPSOIL, INSTALL PERIMETER EROSION CONTROL AROUND STOCKPILES, SEED AND MULCH PER PLANS.
8. COMMENCE EARTHWORK CUTS AND FILLS. WORK SHALL BE PROGRESSED TO ALLOW A REASONABLE TRANSFER OF CUT AND FILL FOR ROUGH GRADING AND EARTH MOVING FOR BULK SITE GRADING.
9. STABILIZE ALL AREAS IDLE IN EXCESS OF 7 DAYS IN WHICH CONSTRUCTION WILL NOT COMMENCE WITHIN 7 DAYS.
10. ADJUST THE EROSION AND SEDIMENT CONTROL PRACTICES AS REQUIRED FOR CONTINUING CONSTRUCTION AS SHOWN ON THE EROSION & SEDIMENT CONTROL PLAN. THIS SHALL BE A PHASED ADJUSTMENT IN ORDER TO ENSURE THAT RUNOFF FROM ALL DISTURBED AREAS IS TREATED BY APPROPRIATE EROSION AND SEDIMENT CONTROL DEVICES.
11. BEGIN UTILITY INSTALLATION AND BACKFILL. UTILITY INSTALLATION AREA SHALL BE STABILIZED WITH SEED AND MULCH PROGRESSIVELY AT THE END OF EACH WORK DAY.
12. CONSTRUCT CATCH BASINS, AREA INLETS AND STORM SEWER MANHOLES, AS SHOWN ON THE PLANS.
13. INSTALL INLET/OUTLET PROTECTION PROGRESSIVELY AS THE STORM SEWER IS INSTALLED.
14. AS LAWN AREAS ARE BROUGHT TO GRADE, STABILIZE WITH TOPSOIL, SEED AND MULCH PER SPECIFICATIONS.
15. FINALIZE PAVEMENT SUB-GRADE PREPARATION.
16. INSTALL ASPHALT SUB-BASE MATERIAL AS REQUIRED FOR PAVEMENT.
17. CARRY OUT ALL FINAL GRADING, STABILIZE SLOPES GREATER THAN 3H:1V WITH HEIGHTS EXCEEDING 5 FEET WITH EROSION CONTROL MATTING/BLANKETS, AND SEED AND MULCH ALL DISTURBED AREAS.
18. A QUALIFIED PROFESSIONAL SHALL PERFORM A SITE ASSESSMENT TO CONFIRM THAT ALL PERMANENT STORMWATER DEVICES HAVE BEEN INSTALLED PER PLANS AND 80% UNIFORM GERMINATION/STABILIZATION HAS BEEN ACHIEVED PRIOR TO THE REMOVAL OF ALL REMAINING TEMPORARY EROSION AND SEDIMENT CONTROLS.

1. CONTRACTOR SHALL ENSURE CONFORMANCE WITH THE TOWN'S NOISE ORDINANCE. THIS INCLUDES BUT IS NOT LIMITED TO TAKING NOISE READINGS ON A REGULAR BASIS AT THE PROPERTY LINE AND PROVIDING DOCUMENTATION OF NOISE LEVELS. SHOULD NOISE LEVEL EXCEED THE TOWN'S ORDINANCE REQUIREMENTS, IT IS THE CONTRACTOR'S RESPONSIBILITY TO MODIFY THEIR MEANS AND METHODS TO REDUCE THE NOISE LEVELS AND/OR PROVIDE MITIGATION TO REDUCE THE NOISE LEVEL TO VALUES WITHIN THE TOWN REQUIREMENTS.
2. THE CONTRACTOR SHALL BE AWARE OF THE REQUIRED COMMUNITY AIR MONITORING PLAN (CAMP), PURSUANT TO THE NYSDEC DER 10, THAT WILL BE IMPLEMENTED BY THE OWNER WHENEVER GROUND DISTURBANCE IS OCCURRING WITHIN THE AREA KNOWN OR POTENTIALLY CONTAIN FLY ASH. SEE RULES 214-216 FOR GUIDANCE ON THE CONTENT OF THE CAMP. IN ADDITION THE CAMP SHALL COMPLY WITH SECTION 4.3 OF THE SITE'S SOIL MANAGEMENT PLAN WHICH IS PROVIDED AS APPENDIX H IN THE STORM WATER POLLUTION PREVENTION PLAN.



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[illegible]

ALBANY, NEW YORK

PROJECT:
BEACON ISLAND EXPANSION - PHASE 3
WASTE WATER TREATMENT PACKAGE PLANT

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

GENERAL NOTES

GN-01



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PROJECT MILESTONE
BID SET

NO.	DATE	DESCRIPTION

CLIENT: **ALBANY PORT DISTRICT COMMISSION**
ALBANY, NEW YORK

PROJECT: **BEACON ISLAND EXPANSION - PHASE 3**
WASTE WATER TREATMENT PACKAGE PLANT

DRAWN	JES
DESIGNED	NSO
CHECKED	AJF
SCALE	1"=40'
DATE	08/13/2025
PROJECT	18641.06



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

DRAWING TITLE
OVERALL SITE PLAN

DRAWING NUMBER
SP-00

2 OF 11

- PROJECT DATA
1. APPLICANT / LAND OWNER:
ALBANY PORT DISTRICT COMMISSION
106 SMITH BOULEVARDS
ALBANY, NEW YORK 12205
 2. EXISTING ZONING: HEAVY INDUSTRIAL
 3. LOT AREA: 81.62 ACRES (3,555,289 SF)

SITE DATA		
FEATURE	REQUIRED	PROPOSED
MINIMUM LOT SIZE, NONRESIDENTIAL	5 ACRES	81.62 ACRES
MINIMUM FRONT YARD, FROM RIGHT-OF-WAY	100 FEET	840 FT
MINIMUM FRONT YARD, FROM CENTER LINE	125 FEET	N/A
MINIMUM SIDE YARD	25 FEET	25 FEET
MINIMUM REAR YARD	50 FEET	50 FEET
MINIMUM HIGHWAY FRONTAGE	150 FEET	N/A
MAXIMUM HEIGHT	LESSER OF 4 STORIES OR 60 FEET	27 FEET
MINIMUM LOT DEPTH	200 FEET	2850 FEET
MINIMUM LOT WIDTH	150 FEET	757 FEET
MAXIMUM LOT COVERAGE	30%	X.0%

* WILL REQUEST A VARIANCE

ZONING:

EXISTING: ±81.62 ACRES HEAVY INDUSTRIAL

PROPOSED: ±81.62 ACRES HEAVY INDUSTRIAL

TAX ACCOUNT NUMBERS: 98 00-2-10 23
98 01-2-1

* ENTIRE SITE IS WITHIN 100-YR FLOODPLAIN

PARKING:

1 SPACE FOR EACH 2 EMPLOYEES ON MAXIMUM WORKING SHIFT.

TOTAL EMPLOYEES = 0

REQUIRED: 0 TOTAL SPACES REQUIRED

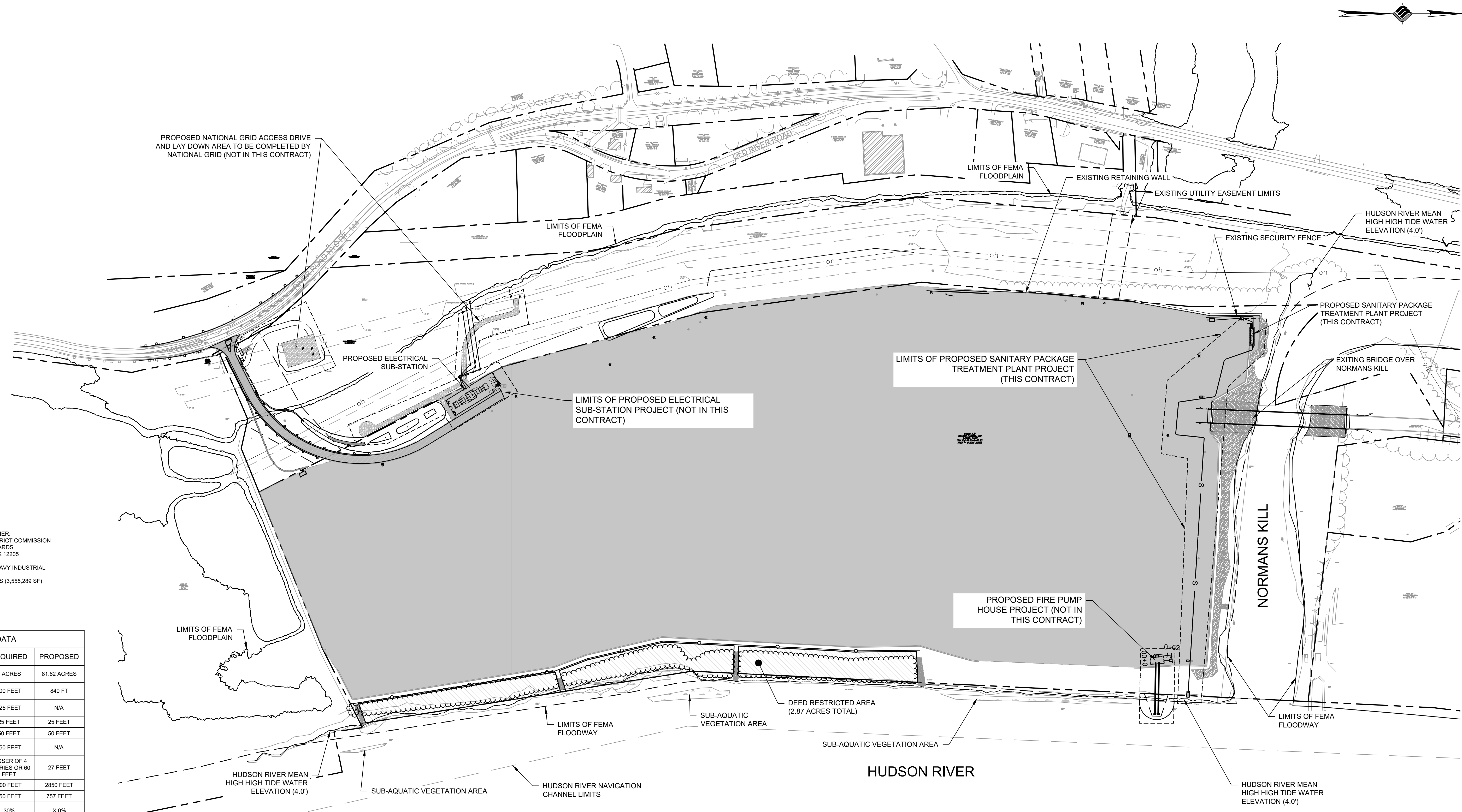
PROVIDED: 0 TOTAL SPACES PROVIDED

ADA SPACES REQUIRED:
PER 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN

REQUIRED (0 SPACE LOT): 0 SPACES (0 STANDARD & 0 VAN)
FOR TOTAL PARKING 0 SPACES

PROVIDED (0 SPACE LOT): 0 SPACES (0 STANDARD & 0 VAN)

NUMBER OF ALBANY PORT EXPANSION DRAWINGS SHEET FILES: SANITARY PACKAGE PLANTING DESIGN LAYOUT.DWG



PLANNING BOARD HTE# 21-00100006

LEGEND	
PROPERTY LINE	---
EASEMENT LIMITS	- - -
DITCH CENTERLINE	- . - .
ROADSIDE SWALE	---
BUILDING SETBACK	---
EXISTING BUILDING	▨
WETLAND AREA	▨
PAVEMENT AREA	▨
CONCRETE AREA	▨
RIP-RAP WATER EMBANKMENT STABILIZATION	▨
DEED RESTRICTED AREA	▨



LEGEND

PROPERTY LINE

PROPOSED BOX BEAM GUIDE RAIL

DITCH CENTERLINE

WETLAND AREA

SECURITY FENCE

EXISTING CONTOUR

EXISTING OVERHEAD ELECTRIC

EXISTING GAS LINE

EXISTING WATERLINE

PROPOSED CONCRETE

EXISTING GRAVEL YARD

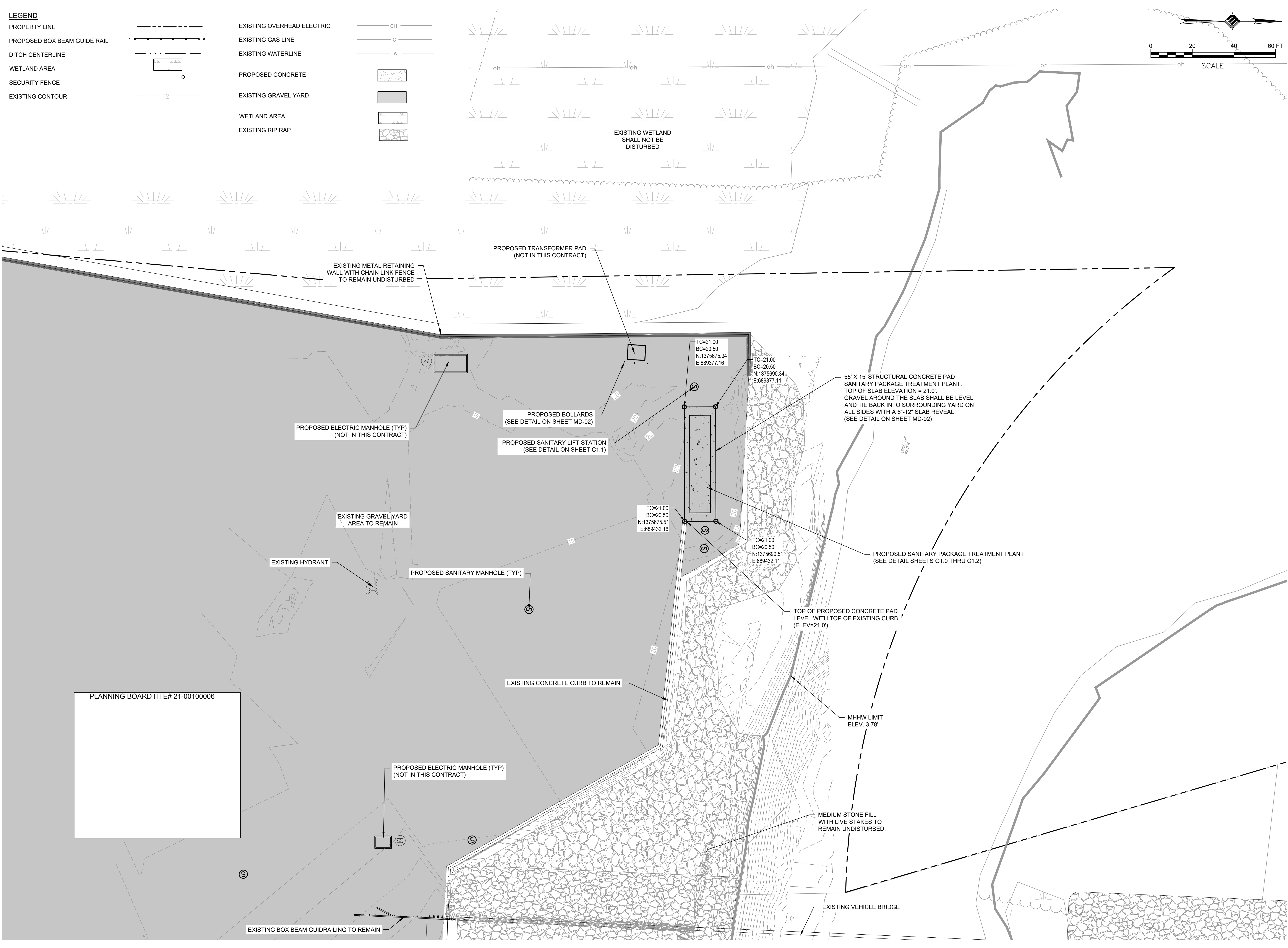
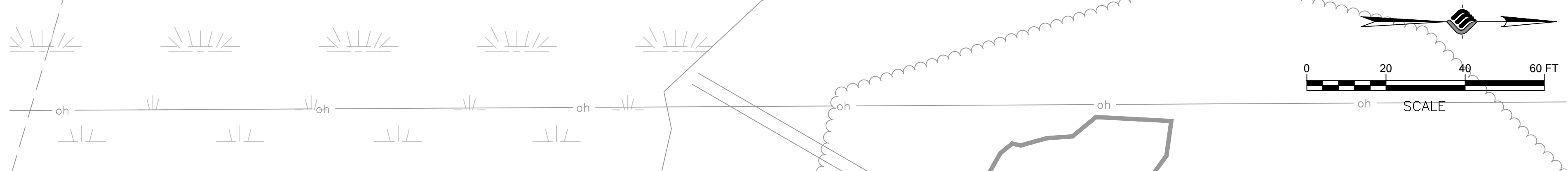
WETLAND AREA

EXISTING RIP RAP

OH

G

W



PLANNING BOARD HTE# 21-00100006



McFarland Johnson

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SaratogaROM@mjinc.com

PROJECT MILESTONE		
BID SET		
NO.	DATE	DESCRIPTION

CLIENT:

ALBANY PORT DISTRICT COMMISSION

PROJECT:

ALBANY, NEW YORK

BEACON ISLAND EXPANSION - PHASE 3

WASTE WATER TREATMENT PACKAGE PLANT

DRAWN	JES
DESIGNED	NSO
CHECKED	AJF
SCALE	AS SHOWN
DATE	08/13/2025
PROJECT	18641.06



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

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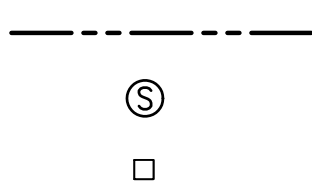
SITE PLAN

DRAWING NUMBER

SP-01

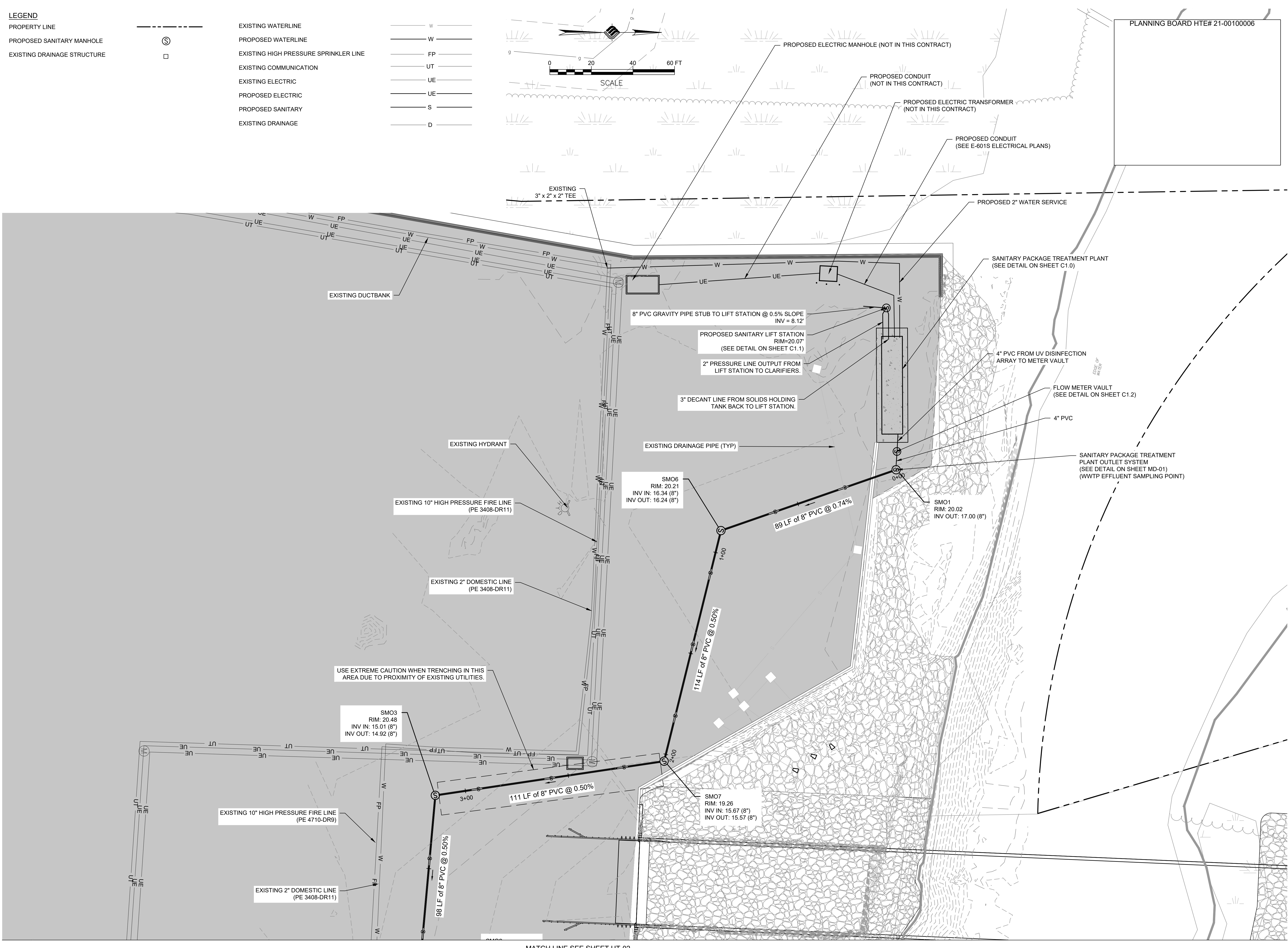
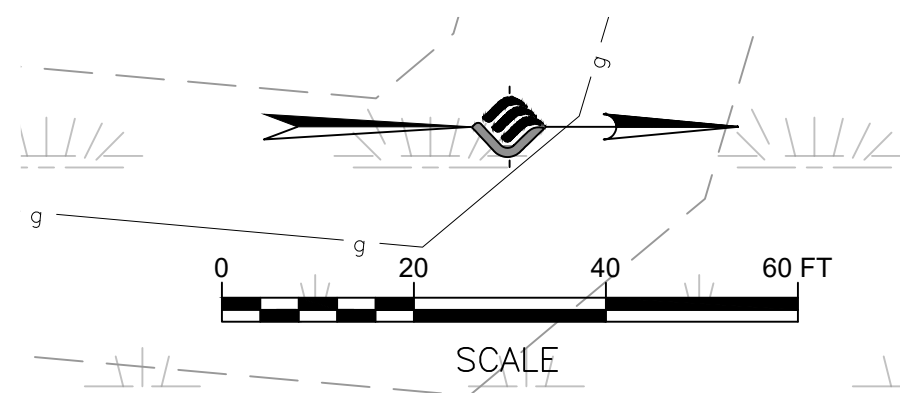
3 OF 11

- LEGEND
- PROPERTY LINE
- PROPOSED SANITARY MANHOLE
- EXISTING DRAINAGE STRUCTURE



- EXISTING WATERLINE
- PROPOSED WATERLINE
- EXISTING HIGH PRESSURE SPRINKLER LINE
- EXISTING COMMUNICATION
- EXISTING ELECTRIC
- PROPOSED ELECTRIC
- PROPOSED SANITARY
- EXISTING DRAINAGE

- W
- W
- FP
- UT
- UE
- UE
- S
- D



PLANNING BOARD HTE# 21-00100006



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DRAWING TITLE

UTILITY PLAN

DRAWING NUMBER

UT-01

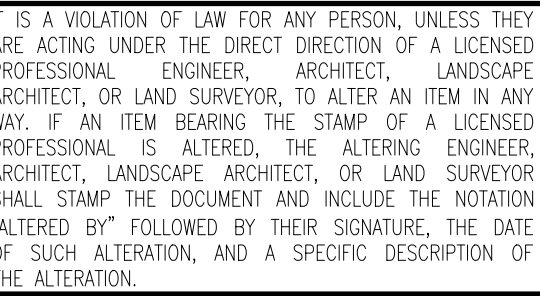
4 OF 11

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ALBANY, NEW YORK

PROJECT:
BEACON ISLAND EXPANSION - PHASE 3
WASTE WATER TREATMENT PACKAGE PLANT

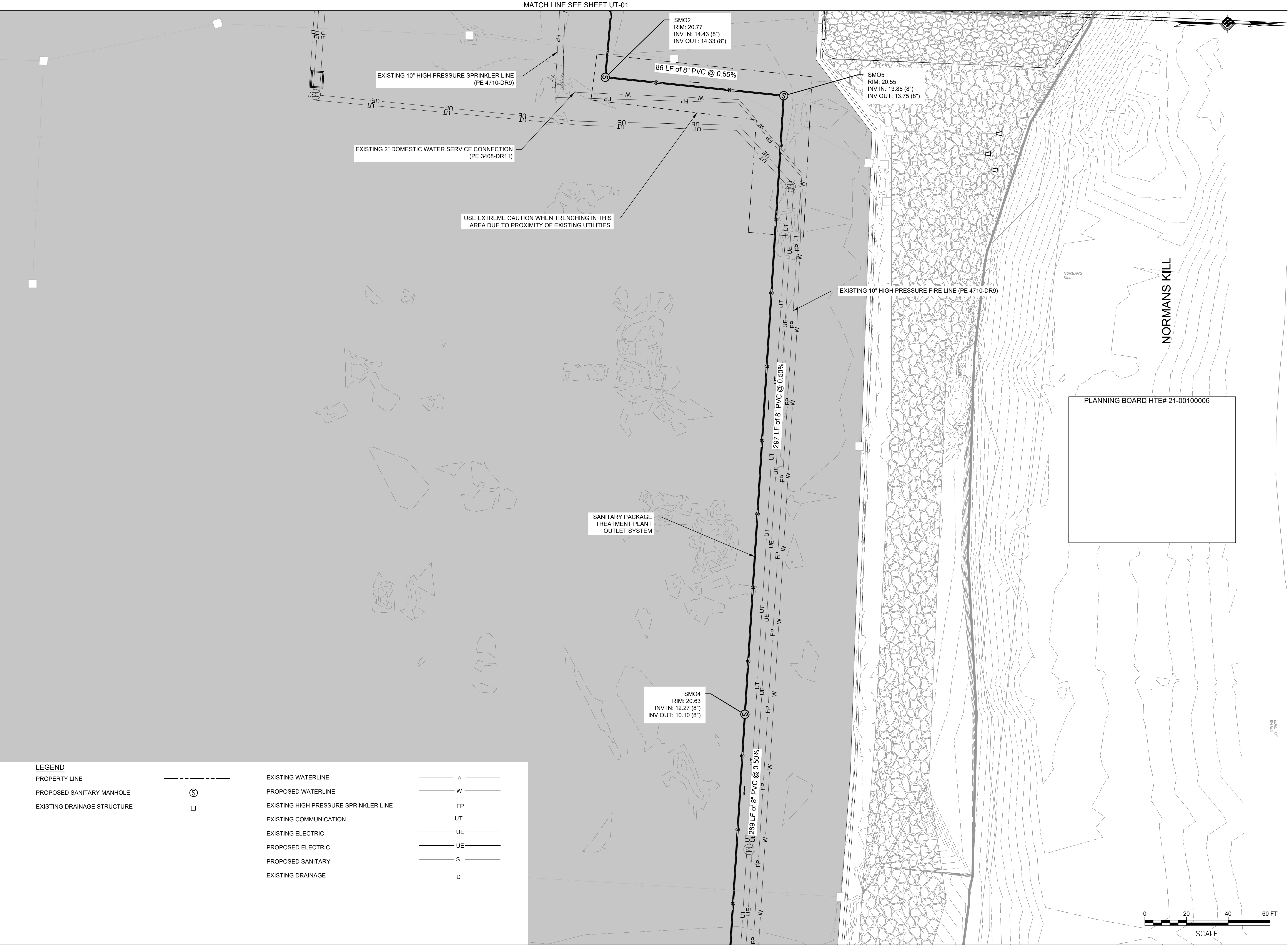
RAWN	JES
ESIGNED	NSO
CHECKED	AJF
SCALE	1"=40'
DATE	08/13/2025
PROJECT	18641.06



UTILITY PLAN

JT-02

OF 11



MATCH LINE SEE SHEET UT-03

[illegible]

ALBANY, NEW YORK

PROJECT: BEACON ISLAND EXPANSION - PHASE 3
WASTE WATER TREATMENT PACKAGE PLANT

RAWN	JES
ESIGNED	NSO
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SCALE	1"=40'
DATE	08/13/2025
PROJECT	18641.06

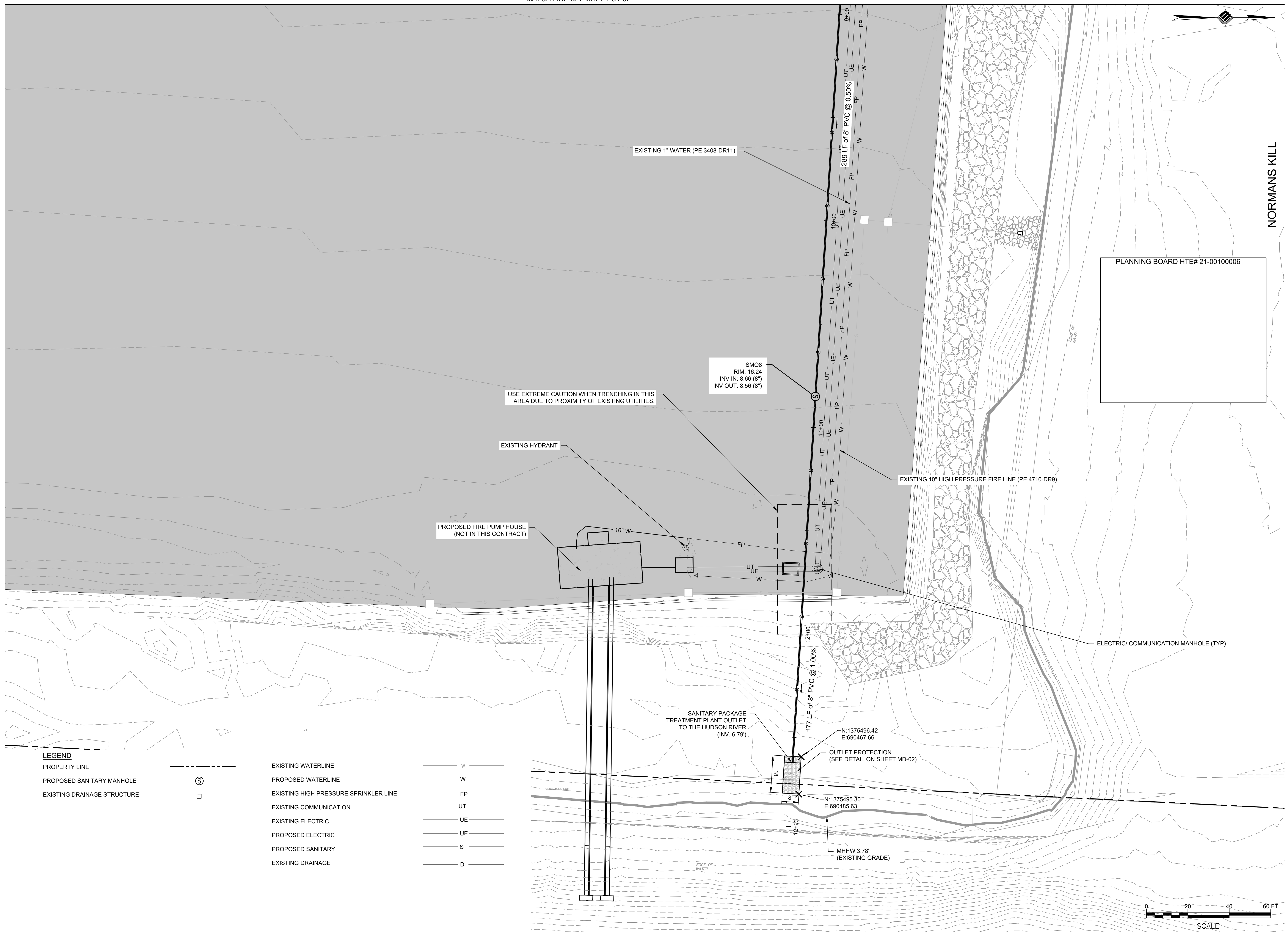


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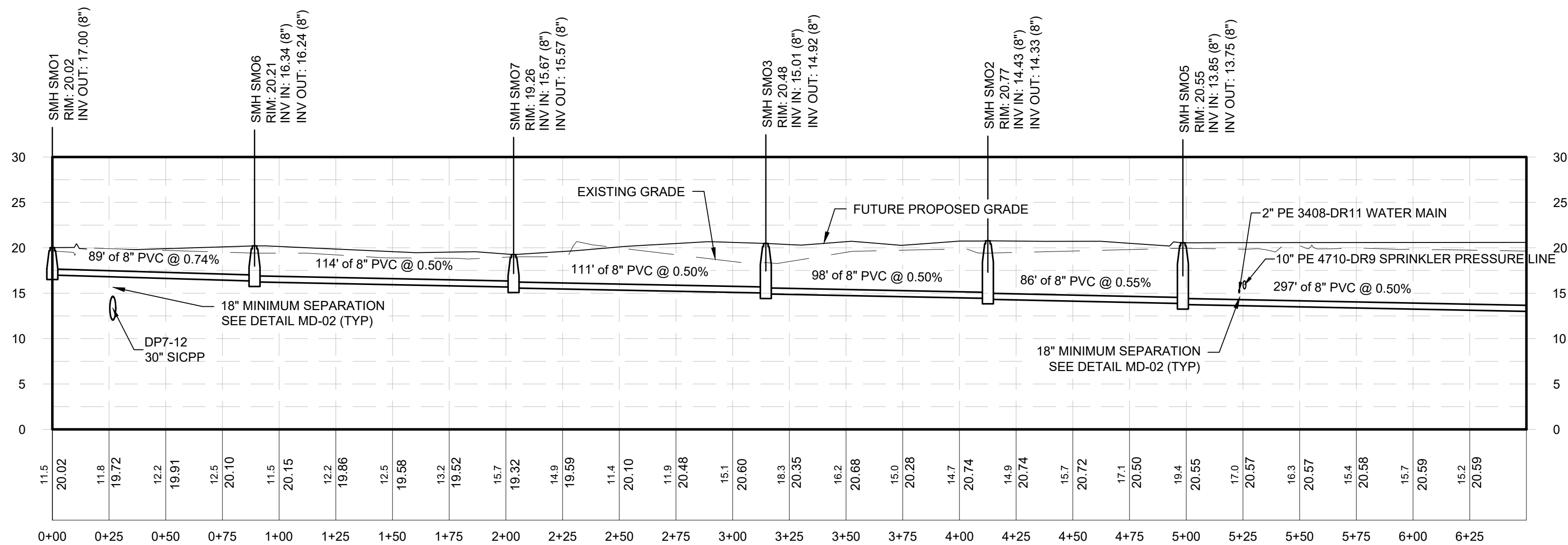
UTILITY PLAN

UT-03

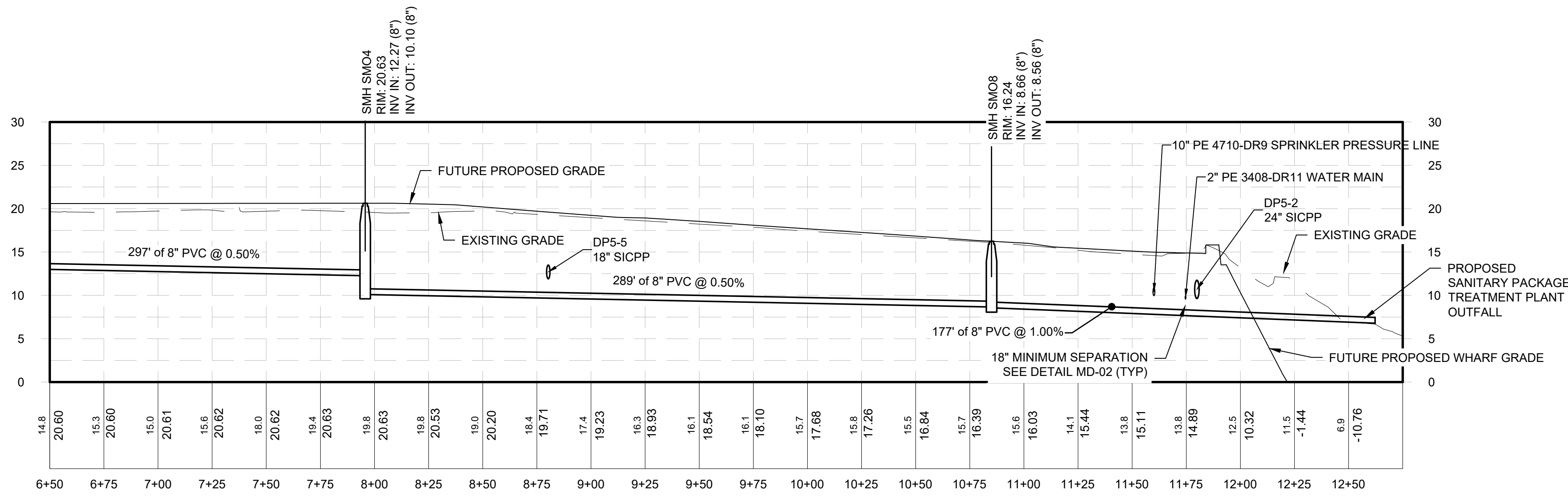
OF 11



N:\BIDD\10 ALBANY PORT EXPANSION\DRAWINGS\SHEET FILES\SANITARY PACKAGE PLANT\BIDD\DWG.SANITARY.PKG.DWG



PACKAGE PLANT OUTLET (1 OF 2)
Horizontal Scale: 1" = 40'
Vertical Scale: 1" = 10'



PACKAGE PLANT OUTLET (2 OF 2)
Horizontal Scale: 1" = 40'
Vertical Scale: 1" = 10'

PLANNING BOARD HTE# 21-00100006



McFarland Johnson
60 RAILROAD PLACE
SUITE 402
SARATOGA SPRINGS, NEW YORK 12866
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SaratogaROM@mjinc.com

PROJECT MILESTONE
BID SET

NO.	DATE	DESCRIPTION
1	06/08/22	GMP BID SET
2	10/28/22	GMP BID SET REVISIONS
7	05/29/24	MW CAP DETAIL

CLIENT:
ALBANY PORT DISTRICT COMMISSION

ALBANY, NEW YORK

PROJECT:
**BEACON ISLAND EXPANSION - PHASE 3
WASTE WATER TREATMENT PACKAGE PLANT**

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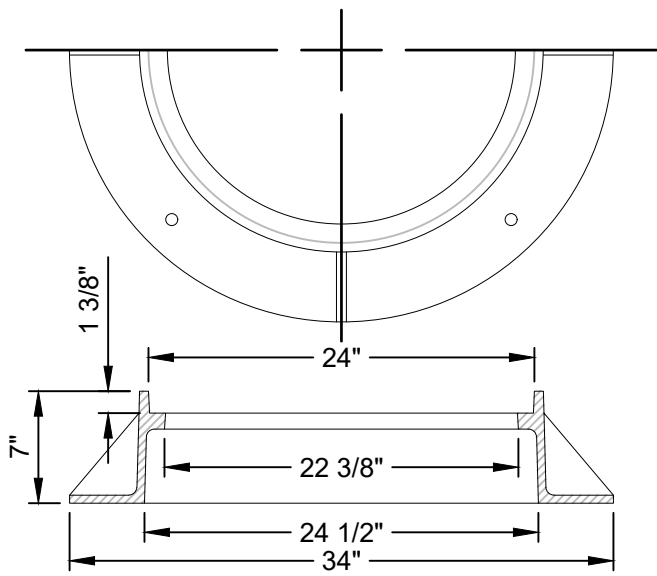
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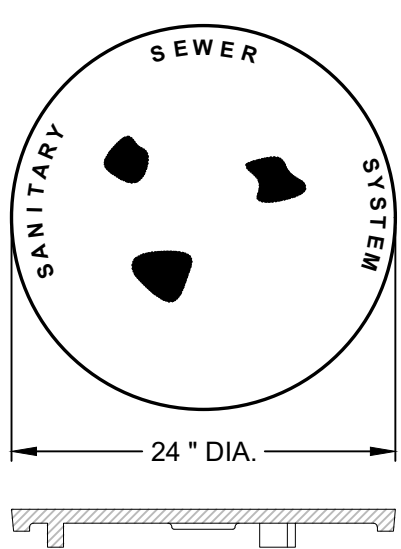
PROFILES

DRAWING NUMBER

UT-04



FRAME SECTION



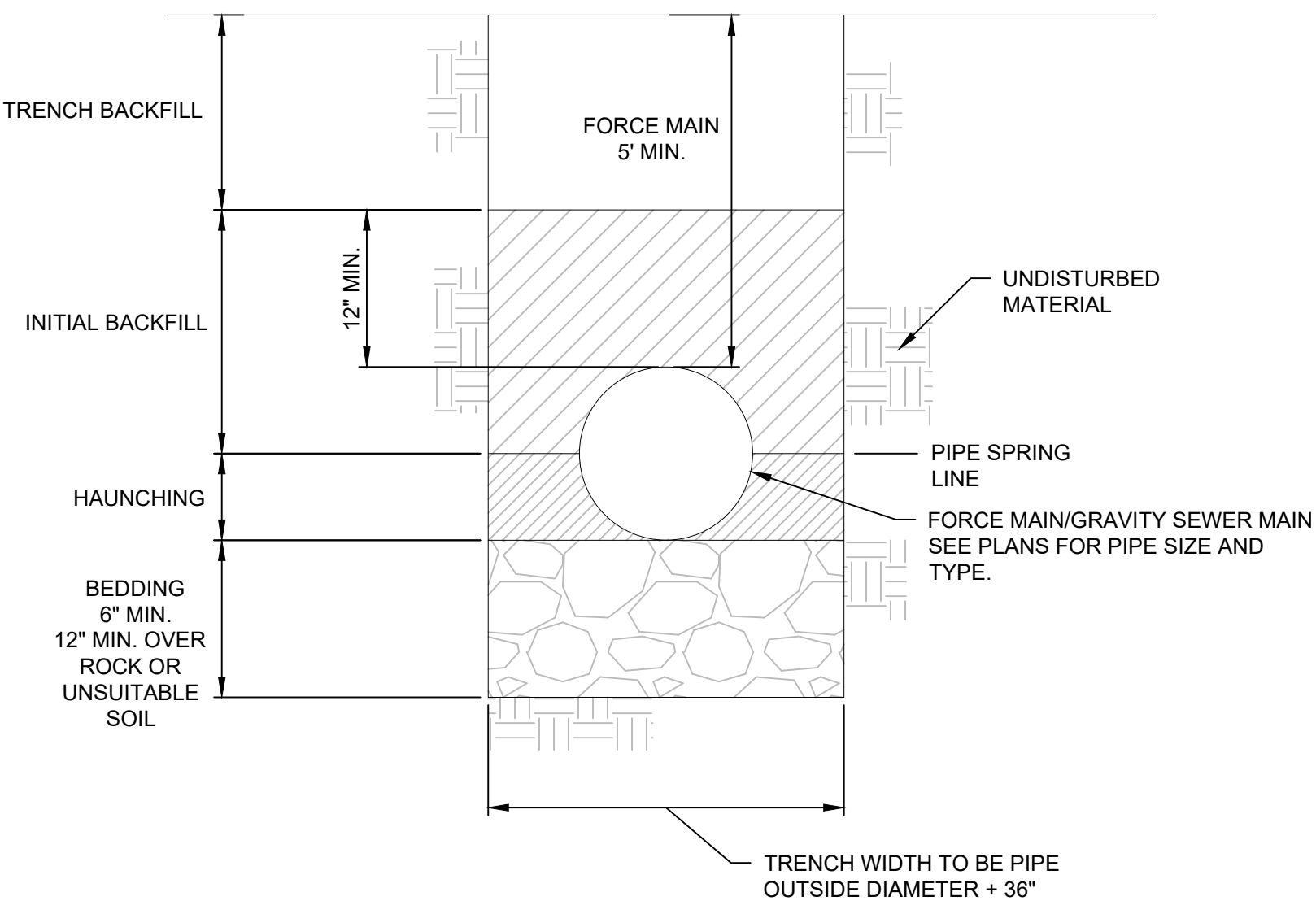
COVER SECTION

- NOTES:
1. MATERIAL SHALL BE GRAY CAST IRON CONFORMING TO A.S.T.M. A48 (LATEST REVISION) CLASS 30B.
 2. UNITS DESIGNED HEAVY DUTY FOR A.A.S.H.T.O. HS20-44 WHEEL LOADS.
 3. EACH FRAME AND COVER SHALL HAVE MACHINED HORIZONTAL BEARING SURFACES.

SANITARY SEWER MANHOLE FRAME & COVER

N.T.S.

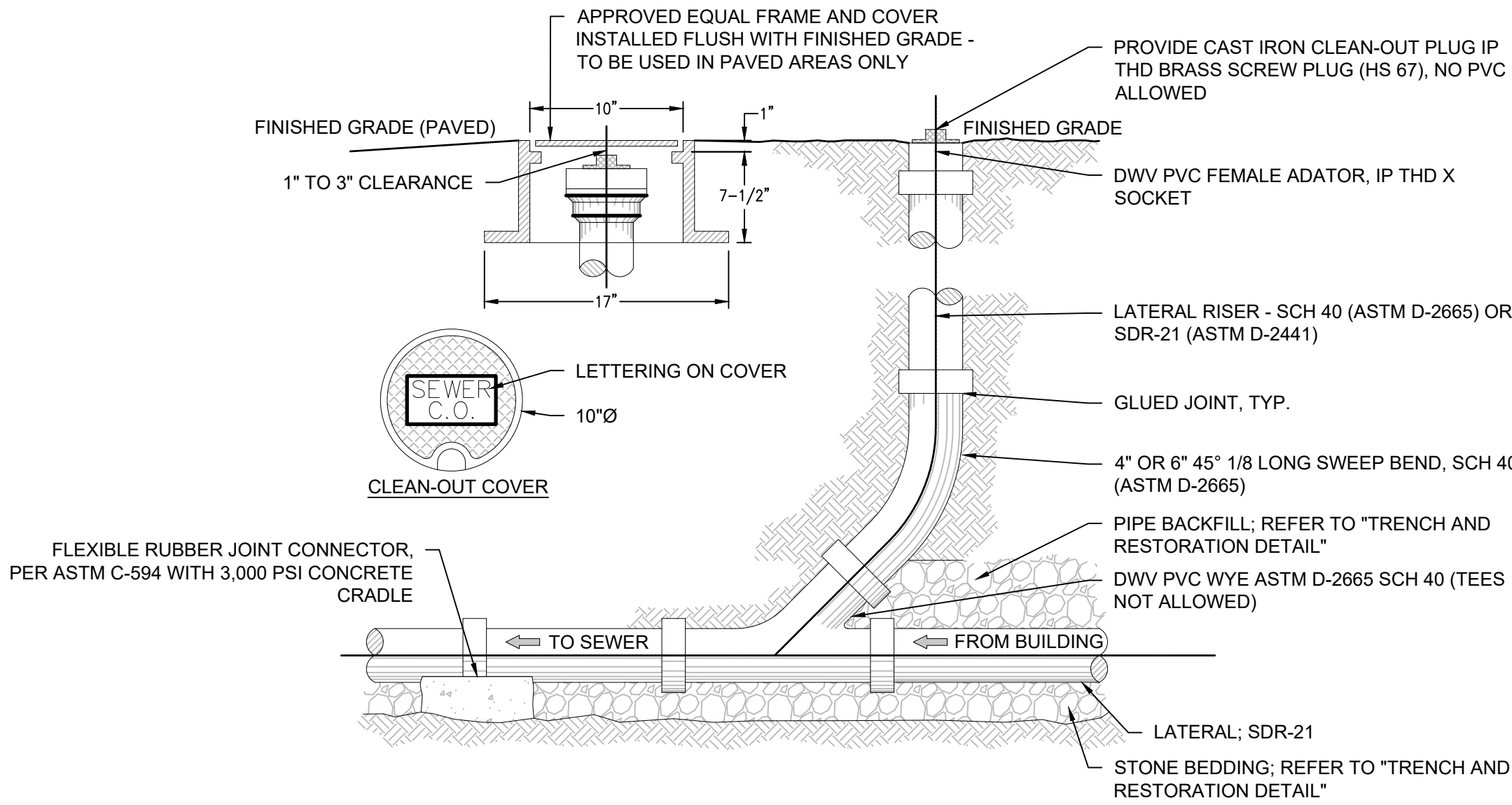
PIPE MATERIALS
SEE UTILITY PLANS FOR
PIPE SIZE AND MATERIAL



- NOTES:
1. ALL TRENCHING TO BE IN ACCORDANCE WITH OSHA STANDARDS AND NYS DEPT. OF LABOR INDUSTRIAL CODE 23
 2. BEDDING, HAUNCHING AND INITIAL BACKFILL SHALL CONSIST OF #1 AND #2 CRUSHED STONE BEDDING PER NYSDOT SPECIFICATION 703-02
 3. TRENCH BACKFILL - BACKFILL UNDER ROADS, DRIVES, SIDEWALKS, CURBS AND UTILITIES SHALL BE SELECT GRANULAR FILL PER NYSDOT SPECIFICATION 203-2.06, PLACED AND COMPACTED IN LIFTS NOT TO EXCEED 6". BACKFILL IN OTHER AREAS SHALL BE A SUITABLE EXCAVATED MATERIAL (NO STONES LARGER THAN 6"), PLACED AND COMPACTED IN LIFTS NO GREATER THAN 6" TO SAFETY COVER.

GRAVITY SEWER MAIN AND FORCE MAIN TRENCH

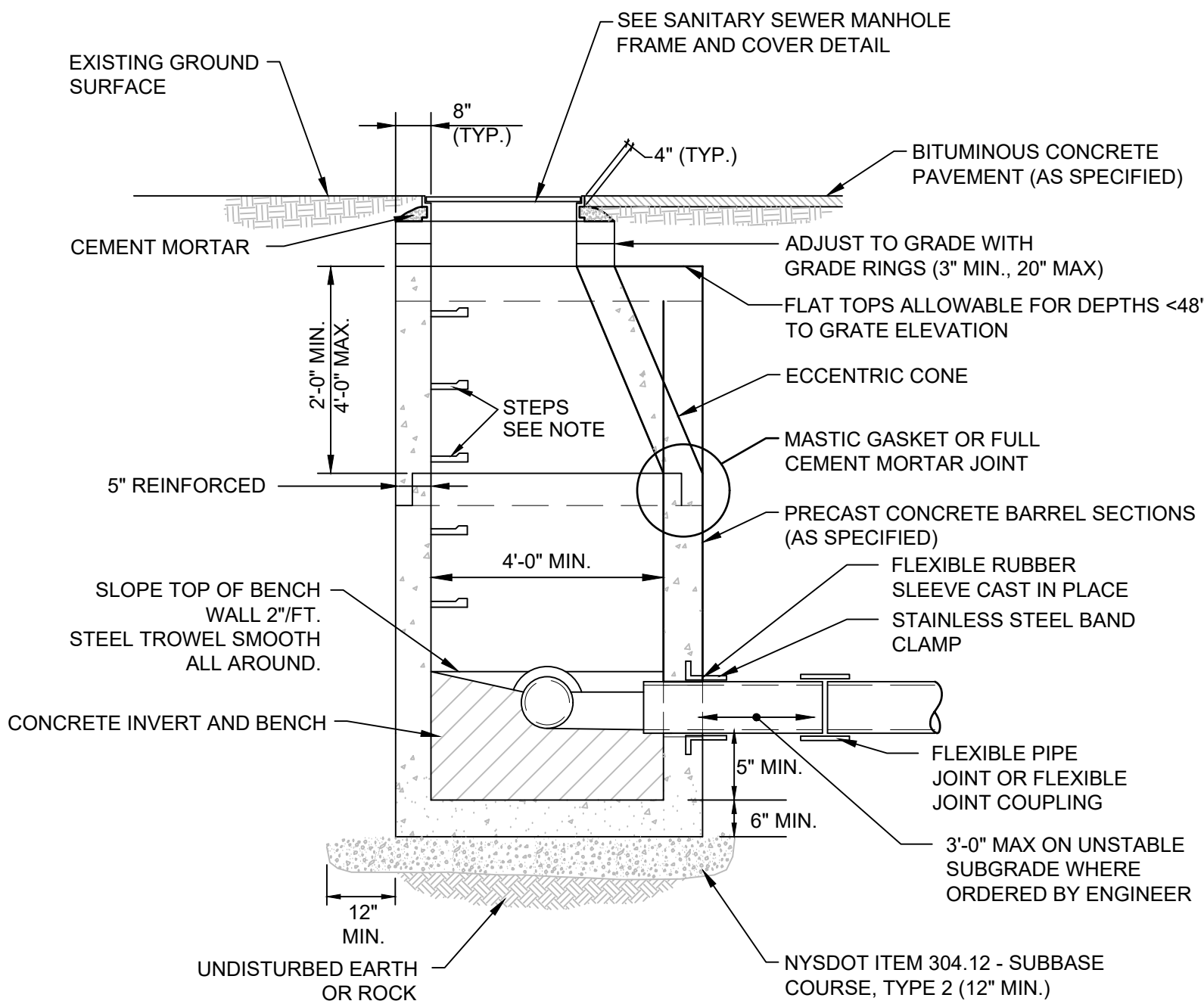
N.T.S.



- NOTES:
1. IT IS RECOMMENDED THAT ALL SOLVENT WELD JOINTS BE MADE AS FOLLOWS:
 - CLEAN DRY HUBS AND SPOTS
 - PRIMER APPLIED TO PARTS BEING CONNECTED
 - PVC SOLVENT WELD CEMENT APPLIED DIRECTLY OVER PRIMER
 - PVC TYPE I IS COMPATIBLE FOR SOLVENT WELDING TO SDR-21 OR ANY OTHER PVC TYPE I PIPE MADE TO "STEEL PIPE" OUTSIDE DIMENSIONS
 2. FILL SHALL BE PLACED IN 6" LIFTS AND TAMPED AFTER EACH LIFT.
 3. AVAILABLE LATERAL/CLEANOUT CONFIGURATIONS:
 - 4" x 4" x 4"
 - 6" x 6" x 6"
 - 6" x 6" X 4"

SANITARY SEWER LATERAL CLEAN-OUT

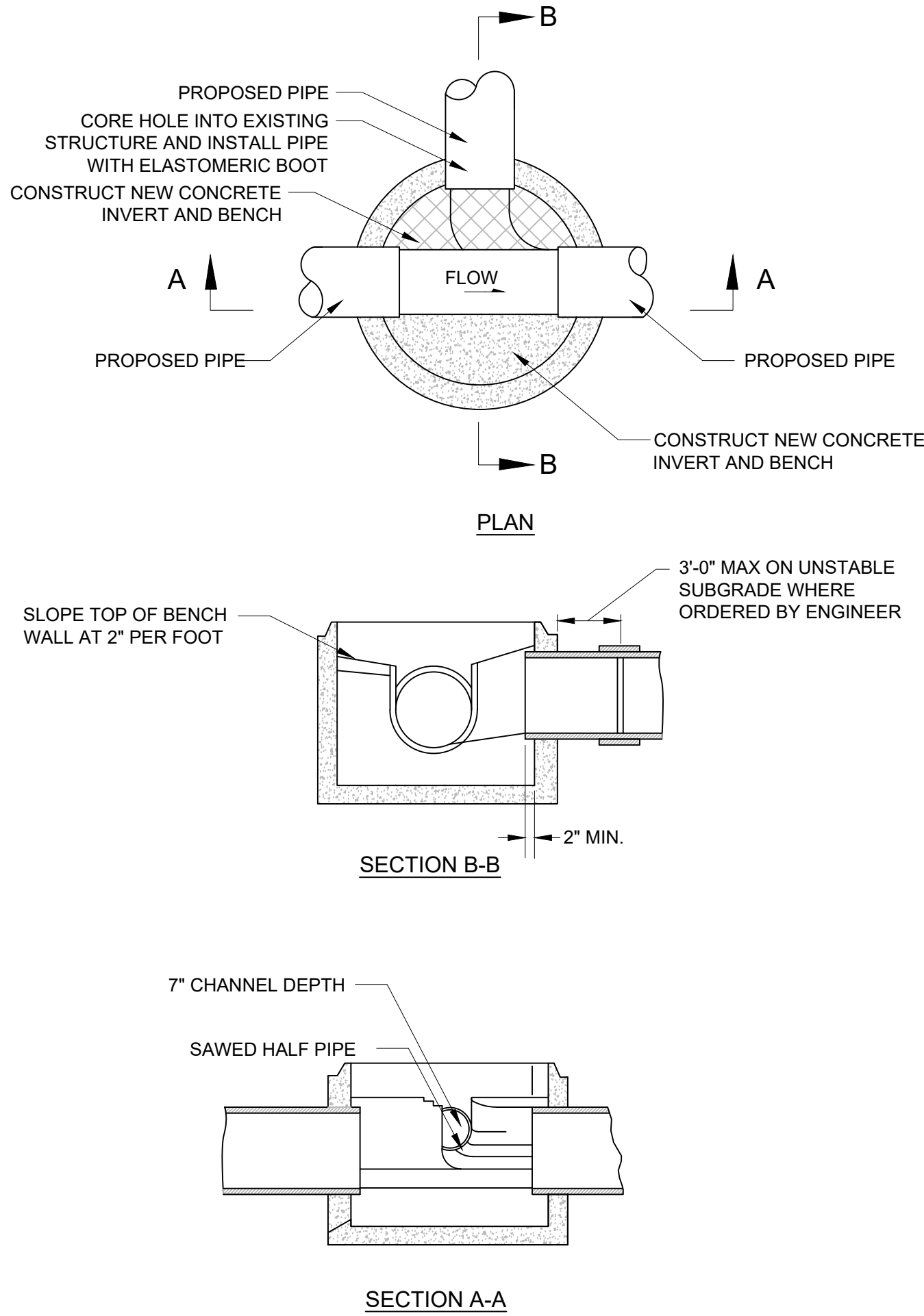
N.T.S.



- NOTES:
1. ALUMINUM OR PLASTIC MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
 2. PRECAST REINFORCED CONCRETE MANHOLE SHALL CONFORM TO ASTM C478.
 3. CONCRETE SHALL BE 4000 PSI AT 28 DAYS, 5% AIR ENTRAINED, AND MEET AASHTO H-20 LOADING AS MANUFACTURED BY FORT MILLER CO. OR APPROVED EQUAL.
 4. REINFORCING STEEL SHALL CONFORM TO ASTM A615 - A497.

PRECAST CONCRETE GRAVITY SEWER MANHOLE

N.T.S.



- NOTE:
1. CARE SHALL BE TAKEN TO ENSURE THAT THE INVERTS ARE A SMOOTH CONTINUATION.
 2. INVERT AND SHELF SHALL BE CAST-IN-PLACE CONCRETE 3000 PSI MIN. AND AIR ENTRAINED.

SEWER BOTTOM WITH CHANNEL

N.T.S.



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PROJECT MILESTONE

BID SET

NO.	DATE	DESCRIPTION

CLIENT:
ALBANY PORT DISTRICT COMMISSION

ALBANY, NEW YORK

PROJECT:
**BEACON ISLAND EXPANSION - PHASE 3
WASTE WATER TREATMENT PACKAGE PLANT**

DRAWN	JES
DESIGNED	NSO
CHECKED	AJF
SCALE	1"=40'
DATE	08/13/2025
PROJECT	18641.06



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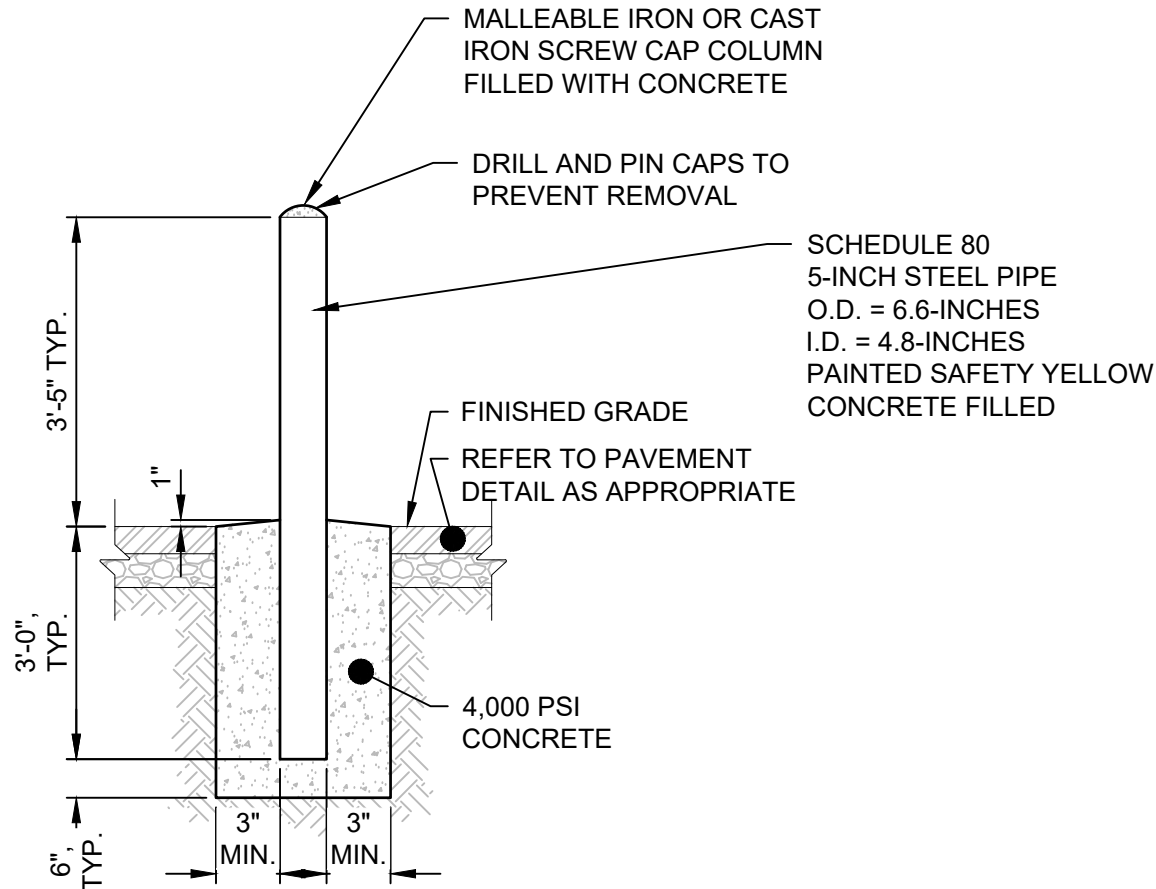
DRAWING TITLE

**MISCELLANEOUS
DETAILS**

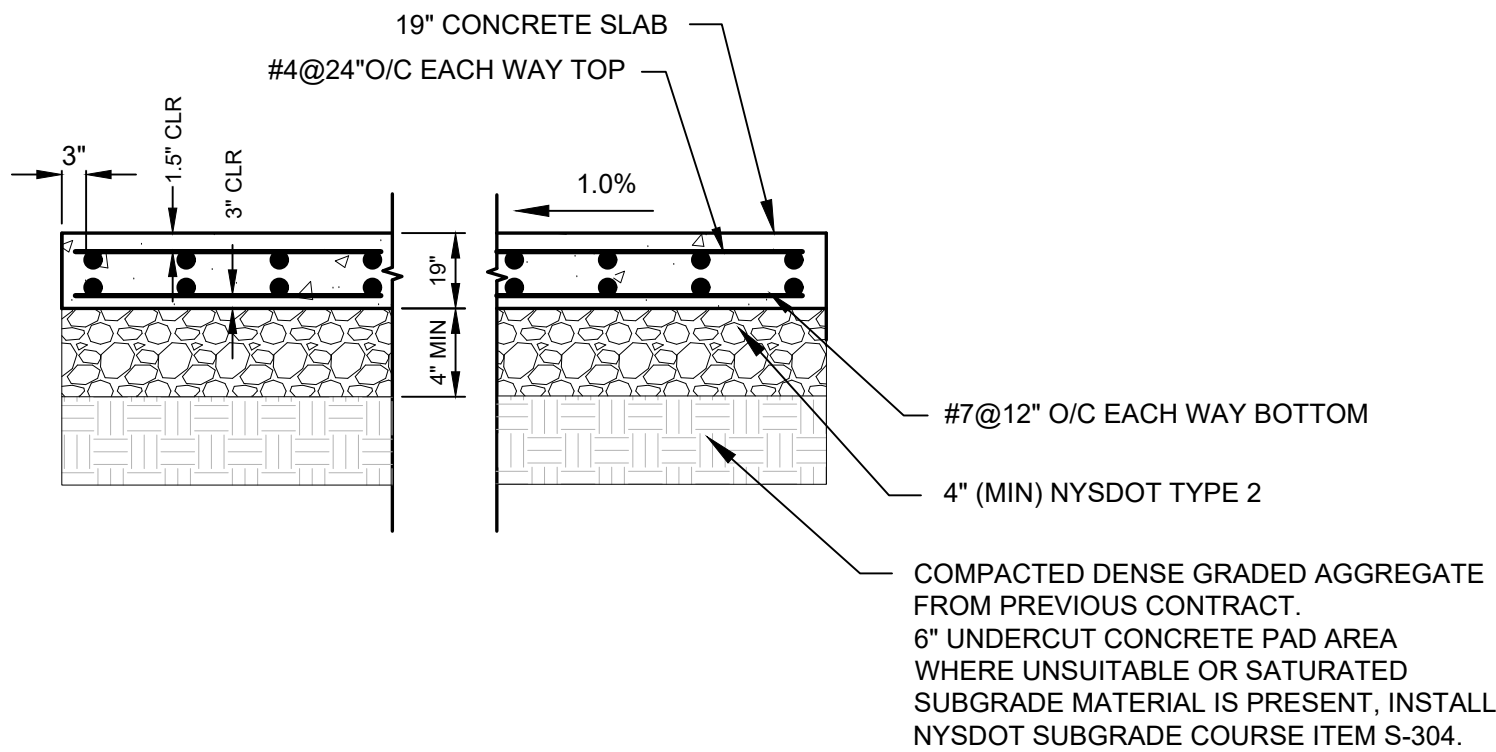
DRAWING NUMBER

MD-01

N:\BIDDING\ALBANY PORT EXPANSION\DRAWINGS\DWG FILES\SANITARY PACKAGE\PLAN\TBM1810 DOUTL.DWG

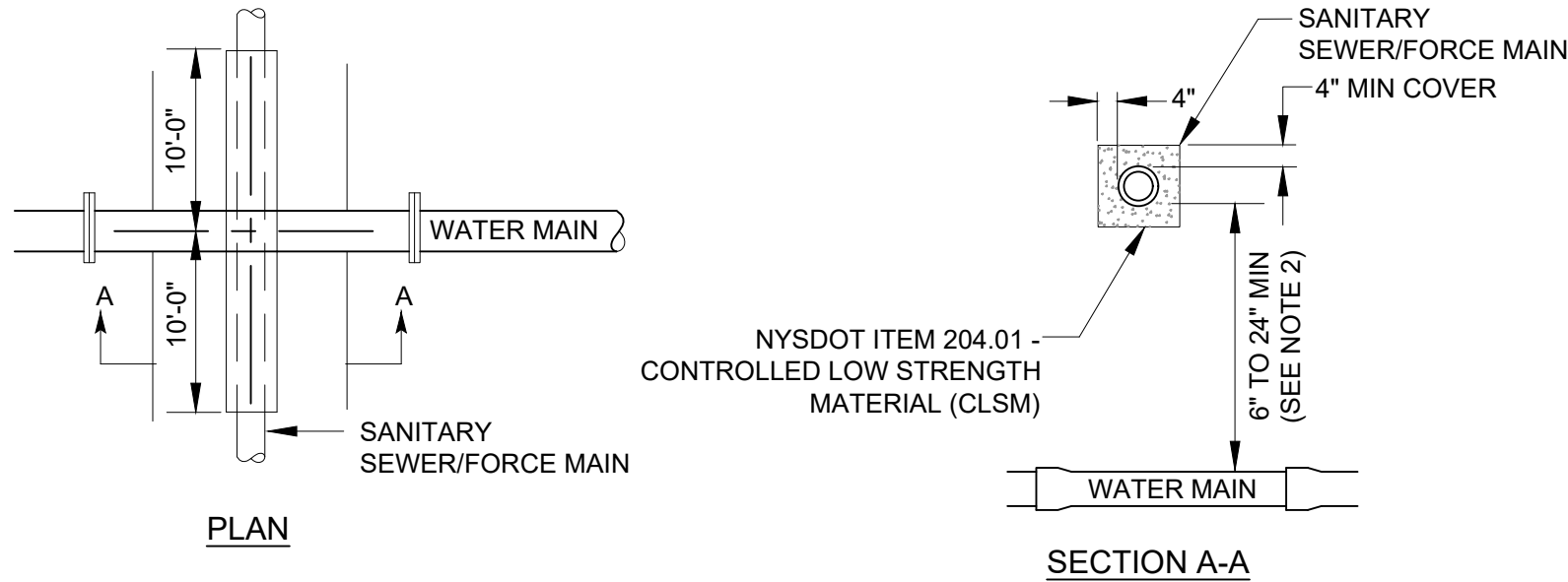


6" GALVANIZED STEEL PIPE BOLLARD
N.T.S.



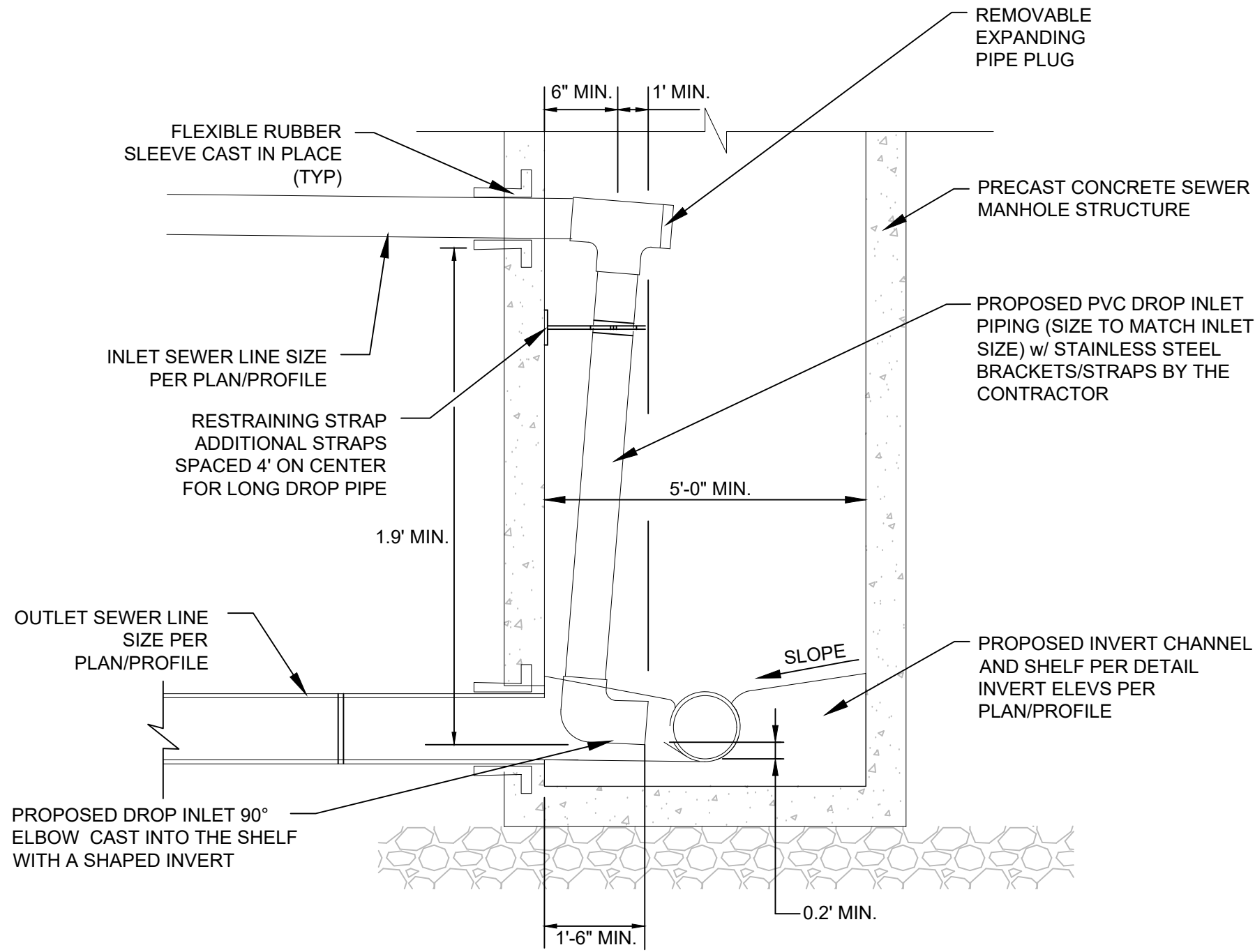
- NOTE:
1. CONCRETE TO MEET THE REQUIREMENTS OF NYSDOT CLASS A 4,000 PSI CONCRETE
 2. WHERE CONCRETE PAD MEETS EXISTING PAVEMENT PROVIDE 1/2" EXPANSION JOINT
 3. TOP OF SLAB TO RECEIVE TWO COATS OF A SURFACE APPLIED CORROSION INHIBITOR, SIKAFERROGARD-908, OR EQUAL.

CONCRETE - STUCTURAL SLAB DETAIL (WWTP)
NOT TO SCALE

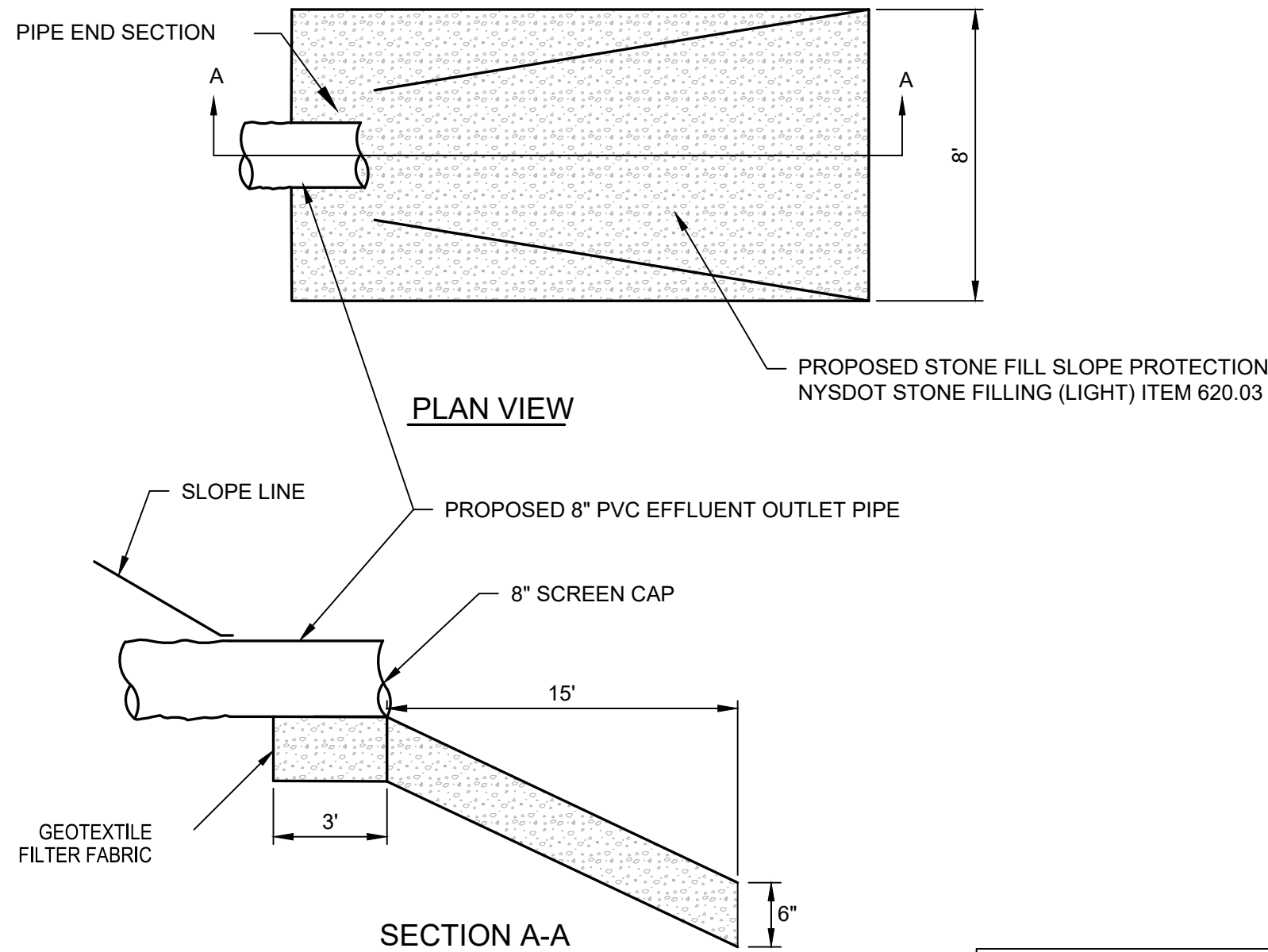


- NOTE:
1. WHENEVER POSSIBLE WATER MAIN PIPE JOINTS SHALL BE STAGGERED SO AS NOT TO BE LOCATED AT THE POINT OF CROSSING.
 2. CONCRETE ENCASEMENT NOT REQUIRED IF VERTICAL SEPARATION IS 24" OR GREATER

WATER MAIN/SEWER CROSSING DETAIL
N.T.S.



DROP MANHOLE
N.T.S.



PLANNING BOARD HTE# 21-00100006

WASTEWATER TREATMENT PLANT OUTLET TO HUDSON RIVER
N.T.S.



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	ALBANY, NEW YORK	
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PROJECT	18641.06



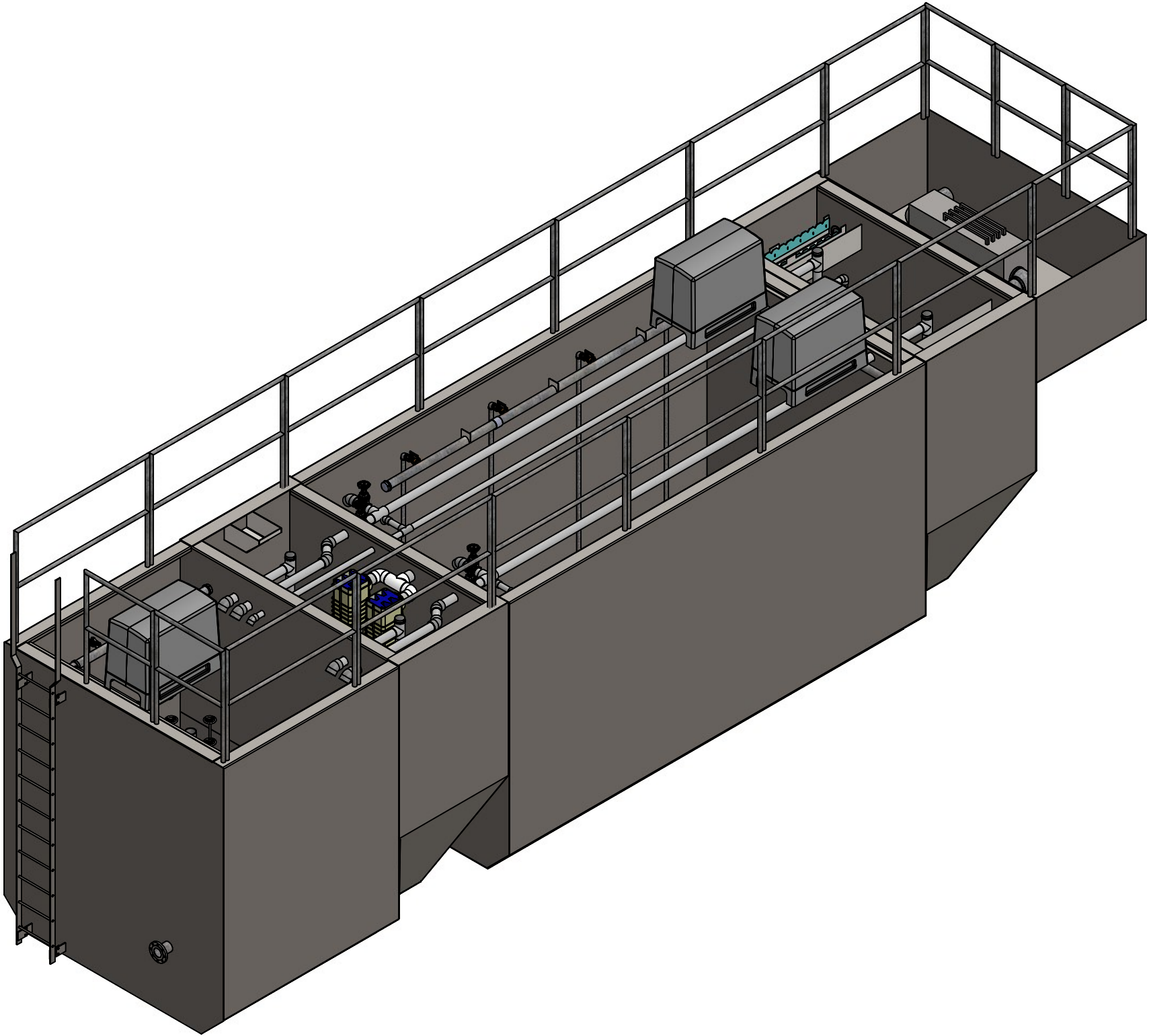
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

DRAWING TITLE
**MISCELLANEOUS
DETAILS**

DRAWING NUMBER
MD-02
9 OF 11

SHEET INDEX		
SHEET	DRAWING	TITLE
01	G1.0	COVER
02	P1.0	PROCESS DIAGRAM
03	C1.0	GENERAL ARRANGEMENT : PACKAGE PLANT
04	C1.1	GENERAL ARRANGEMENT : LIFT STATION
05	C1.2	GENERAL ARRANGEMENT : FLOW METER VAULT

3D MODEL AND ISOMETRIC VIEWS ARE SHOWN AS TYPICAL OF DELTA TREATMENT SYSTEMS PRODUCTS. THE MODEL ON THIS PROJECT MAY VARY SLIGHTLY FROM THE IMAGE SHOWN ON THE COVER SHEET. REFERENCE THE PROCESS AND GENERAL ARRANGEMENT SHEETS FOR ADDITIONAL DETAIL.



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PRELIMINARY

NO.	DATE	INITIALS	DESCRIPTION
A	01/25/23	KJS	REV'D PER DEC COMMENTS.



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PORT OF ALBANY EXPANSION WWTP
BETHLEHEM, NY

COVER

HORIZ. SCALE N/A	PROJECT NO. 21-0161
VERT. SCALE N/A	DATE 07/30/2021
DRAWN BY KJS	DESIGNED BY AOB
DRAWING NO. G1.0	SHEET NO. 01 of 05

PROCESS DIAGRAM NOTES

1. THE DRAWINGS DEPICTED HEREIN REPRESENT PRELIMINARY LAYOUT(S) OF A WASTEWATER TREATMENT SYSTEM CAPABLE OF TREATING THE DESIGN INFLUENT FLOW AND LOAD TO THE EFFLUENT WATER QUALITY DENOTED IN THE EFFLUENT WASTELOAD SUMMARY.

2. THE PROCESS SCHEMATIC SHOWS THE GENERAL FLOW LAYOUT. SPECIFIC REACTOR COMPONENTS, SIZES, AND CONFIGURATIONS MAY DIFFER. REFER TO ARRANGEMENT DRAWINGS FOR DETAILS.

3. PRELIMINARY BASIN SIZING IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. FINAL DESIGN VALUES SHALL BE ESTABLISHED BY THE ENGINEER OF RECORD.

4. SEE THE PROJECT SPECIFIC QUOTE FOR MORE INFORMATION REGARDING SCOPE OF SUPPLY AND CORRESPONDING TERMS AND CONDITIONS.

5. ENTIRE SYSTEM TO BE PROVIDED WITH CONTROL PANEL(S) FOR ALL EQUIPMENT.

-  DIAPHRAGM VALVE
-  GLOBE/NEEDLE VALVE
-  BALL VALVE
-  CHARACTERIZED BALL VALVE
-  BALL CHECK VALVE
-  PLUG VALVE
-  BUTTERFLY VALVE
-  GATE VALVE
-  3-WAY VALVE

-  CHECK VALVE
-  BLOWER
-  MECHANICAL PUMP
-  AIR LIFT PUMP
-  MIXER
-  FLOW METER
-  CHEMICAL DOSING PUMP
-  FILTER
-  ULTRAVIOLET DISINFECTION UNIT
-  BAR SCREEN
-  MECHANICAL BAR SCREEN
-  TABLET FEEDER
-  DISC FILTER

WASTELOAD SUMMARY:

INFLUENT WASTELOAD AS PROVIDED BY ENGINEER OF RECORD

280 mg/L (26 LB/D) BOD₅

300 mg/L (28 LB/D) TSS

7.0-8.0 pH (ASSUMED)

68 F (20 C) WATER TEMPERATURE (ASSUMED)

EFFLUENT TARGETS

30 mg/L BOD₅ 30-D AVERAGE

30 mg/L TSS 30-D AVERAGE

200 N/100 mL FCB 30-D GEO. MEAN

ORGANIC LOADING

14.9 LB BOD/D/KCF (EXTENDED AERATION)

IWT MODEL BASIS A-13.0 (w/ MODIFICATIONS)

AERATION SYSTEM DESIGN

AOR: 43 LB O₂/D

SOTR: 68 LB O₂/D

PROCESS AIR DEMAND: 54 SCFM

RAS/WAS AIRLIFT DEMAND: 40 SCFM

SCUM AIRLIFT DEMAND: 32 SCFM

TOTAL MAIN AIR DEMAND: 126 SCFM

SITE ELEVATION: 50 FT AMSL (ASSUMED)

MAXIMUM AIR TEMPERATURE: 115 F (ASSUMED)

MINIMUM PROCESS AIR INLET FLOW: 148 ICFM

BLOWER AIRFLOW: 1 DUTY/1 STANDBY, 148 ICFM @ 4.8 PSIG

SELECTED BLOWER: GARDNER DENVER MODEL 4M @ 1,700 RPM

SELECTED MOTOR: 7.5 HP

SOLIDS HOLDING MIXING AIR DEMAND

30 SCFM / 1,000 CF x 0.76 KCF = 23 SCFM :: 27 ICFM

BLOWER AIRFLOW: 1 DUTY/0 STANDBY, 27 ICFM @ 4.8 PSIG

SELECTED BLOWER: GARDNER DENVER MODEL 2M @ 2,680 RPM

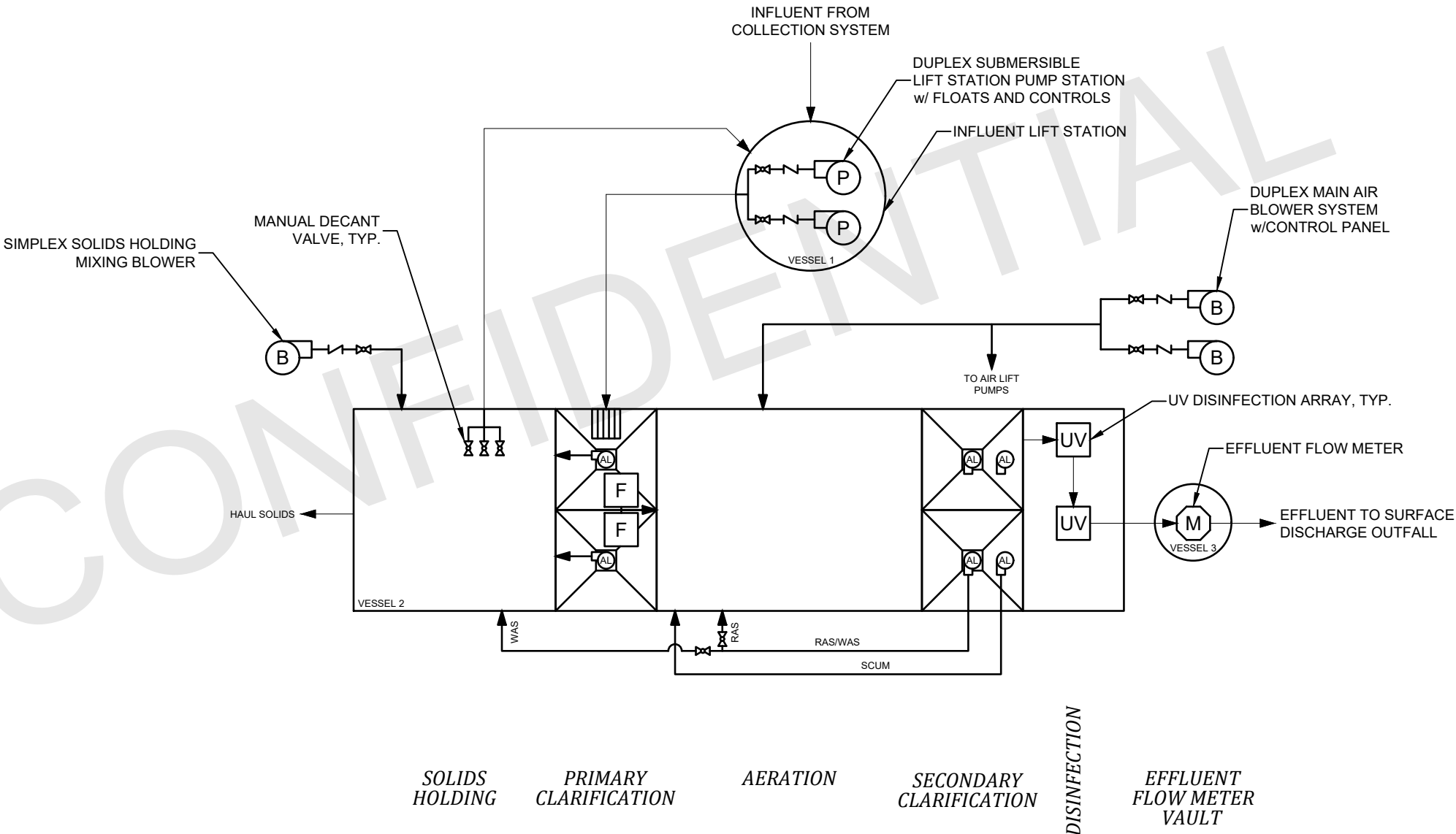
SELECTED MOTOR: 1.5 HP

TANK SIZES							
TANK	VESSEL #	QTY	WIDTH (FT)	LENGTH (FT)	HEIGHT (FT)	SWD (FT)	VOLUME (GAL)
LIFT STATION	1	1	4 (DIA.)	4 (DIA.)	17.5	1.5 MIN. 4 MAX.	380 TOTAL 230 OPERATIONAL
PRIMARY CLARIFIER	2	1	10	5	11	9.5	2,400
AERATION	2	1	10	19	11	9.25	13,100
SECONDARY CLARIFIER	2	1	10	5	11	9.25	2,300
DISINFECTION	2	1	10	5	3.33	0.1*	-
SOLIDS HOLDING	2	1	10	8	11	9.5	5,700
TOTAL VESSEL 2	-	-	10	42	11	-	-
EFFLUENT FLOW METER VAULT	3	1	4 (DIA.)	4 (DIA.)	6	-	-

ALL DIMENSIONS ARE INSIDE OF TANK UNLESS NOTED OTHERWISE.
*DIMENSION REPRESENTS EFFLUENT INVERT, NOT SWD.

MOTOR LOADS					
DEVICE	QTY	CONCURRENTLY OPERATING	POWER (HP)	VOLTAGE (V)	FULL LOAD CURRENT (A)
LIFT STATION PUMP	2	1	0.5	460V - 3PH	2.7
MAIN AIR BLOWER	2	1	7.5	460V - 3PH	9.5
UV SYSTEM	2	2	0.34	115V - 1PH	2.8
EFFLUENT FLOW METER	1	1	N/A	N/A	N/A
SOLIDS HOLDING MIXING BLOWER	1	1	1.5	260V - 3PH	1.9

FLOW SUMMARY			
FLOW PARAMETER	GPD	GPH	GPM
AVERAGE DAILY FLOW (ADF)	11,200	470	7.8
PEAK DAILY FLOW (PDF)	28,000	1,200	19
PEAK HOURLY FLOW (PHF)	44,800	1,900	31
RAS/WAS @ 0.5 x ADF	5,600	230	3.9
RAS/WAS @ 1.5 x ADF	16,800	700	12



REV.	DATE	INITIALS	DESCRIPTION
A	06/30/21	AOB	QA/QC REVISIONS
B	07/01/21	AOB	EFFLUENT UNIT OPS ADDED
C	04/06/22	KJS	REVISED FLOW PER EOR
D	04/27/22	KJS	MOTOR LOAD/EQUIP. TABLE ADDED
E	06/16/22	JLS	REVISED SITE POWER TO 3PH 460V
F	01/25/23	JLS	REV'D PER DEC COMMENTS
G	08/22/25	KUJ	ADDED UV CHAMBER, UPDATE DESIGN



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PORT OF ALBANY EXPANSION WWTP
BETHLEHEM, NY

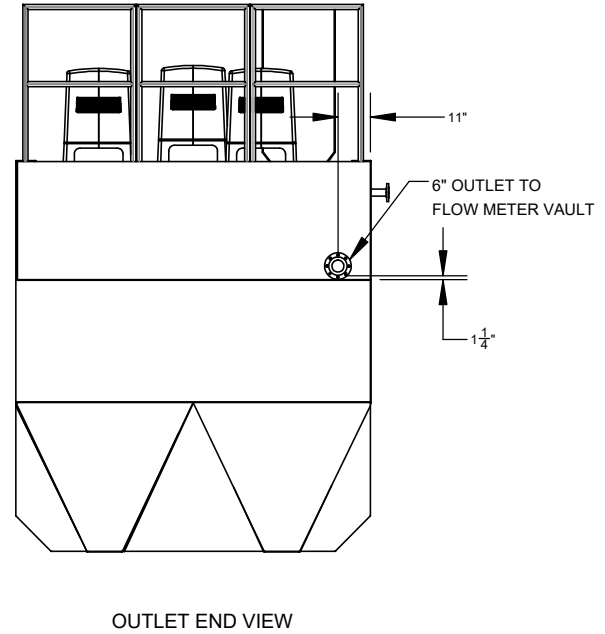
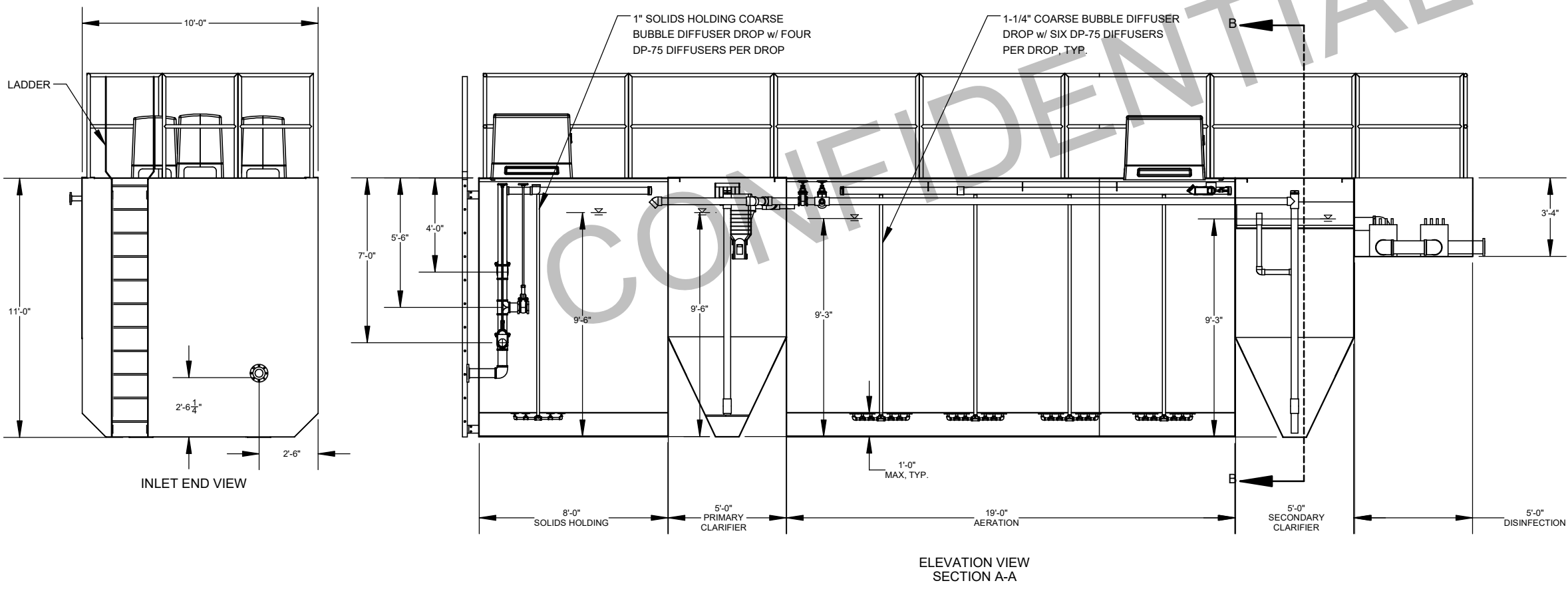
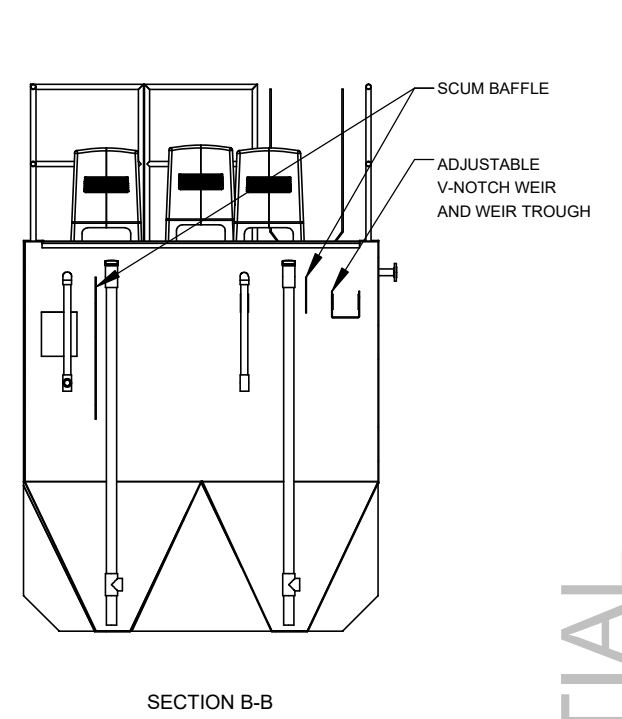
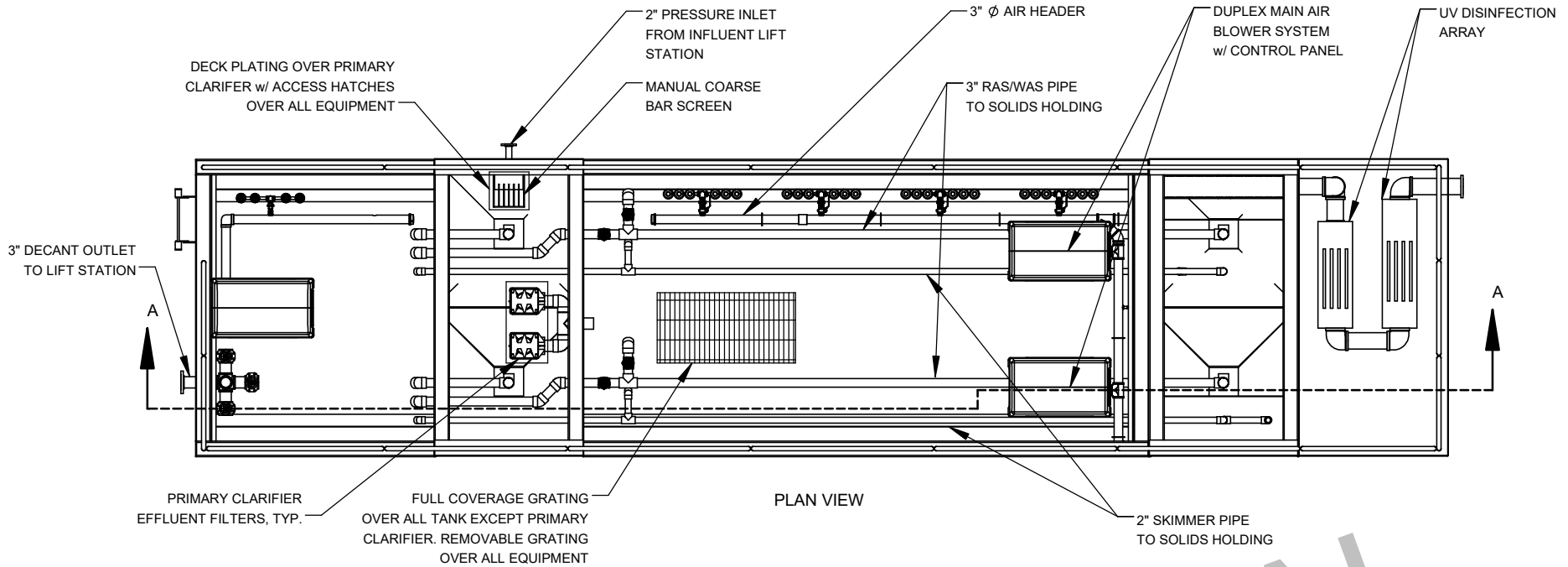
PROCESS DIAGRAM

HORIZ. SCALE N/A	PROJECT NO. 21-0161
VERT. SCALE N/A	DATE 06/29/2021
DRAWN BY AOB	DESIGNED BY AOB
DRAWING NO. P1.0	SHEET NO. 02 of 05

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PRELIMINARY

- GENERAL ARRANGEMENT NOTES
- THESE DRAWINGS DEPICT PRELIMINARY LAYOUT(S) OF A WASTEWATER TREATMENT SYSTEM CAPABLE OF TREATING THE DESIGN AVERAGE INFLUENT FLOW AND LOAD TO THE EFFLUENT WATER QUALITY DENOTED IN THE WASTELOAD SUMMARY.
 - THE EQUIPMENT ARRANGEMENT/LAYOUT IS SCHEMATIC IN NATURE AND SOME OBJECTS MAY NOT BE DRAWN TO SCALE. REFER TO THE ENGINEER-OF-RECORD PROJECT DOCUMENTS FOR FINAL SITE AND/OR EQUIPMENT ARRANGEMENT.
 - ALL REACTORS SHALL BE CONSTRUCTED OF A36 CARBON STEEL, MINIMUM 1/4" THICKNESS, PER ENGINEER-OF-RECORD REQUIREMENTS.
 - BLOWERS, WEIRS, CONTROL PANELS, AND VARIOUS SMALL PARTS SHALL BE SHIPPED UNASSEMBLED AND SECURELY PACKAGED, TO BE INSTALLED BY CONTRACTOR. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR ADDITIONAL DETAIL.
 - CONTRACTOR TO PROVIDE AND INSTALL ALL FIELD PIPING AND SECURE ALL EQUIPMENT CONNECTIONS AS SHOWN IN THE ENGINEER OF RECORD'S PROJECT DOCUMENTS.
 - REACTORS AND INTERNAL DEVICES SHALL BE INSTALLED PLUMB AND LEVEL.
 - SEE THE PROJECT SPECIFIC QUOTE FOR MORE INFORMATION REGARDING SCOPE OF SUPPLY AND CORRESPONDING TERMS AND CONDITIONS.



EQUIPMENT LIST			
DESCRIPTION	QTY.	MAKE	MODEL
PRIMARY EFFLUENT FILTER	2	POLYLOK	PL525
MAIN AIR BLOWER	2	GARDNER DENVER	4M w/ 7.5 HP GENERAL DUTY, TEFC MOTOR
CONTROL PANEL*	1	IWT	CUSTOM
COARSE BUBBLE DIFFUSER	28	DIFFUSED GAS TECHNOLOGIES	DP-75
UV DISINFECTION	2	AQUA AZUL	AZ-400
SOLIDS HOLDING MIXING BLOWER	1	GARDNER DENVER	2M w/ 1.5 HP GENERAL DUTY, TEFC MOTOR
DECANT VALVE	3	TBD	TBD

*EQUIPMENT NOT DISPLAYED IN GENERAL ARRANGEMENT

NO.	DATE	INITIALS	DESCRIPTION
A	04/07/22	KJS	REVISED FLOW PER EOR
B	01/25/23	KJS	REV'D PER DEC COMMENTS
C	08/22/25	KJS	ADDED UV CHAMBER, UPDATE DESIGN



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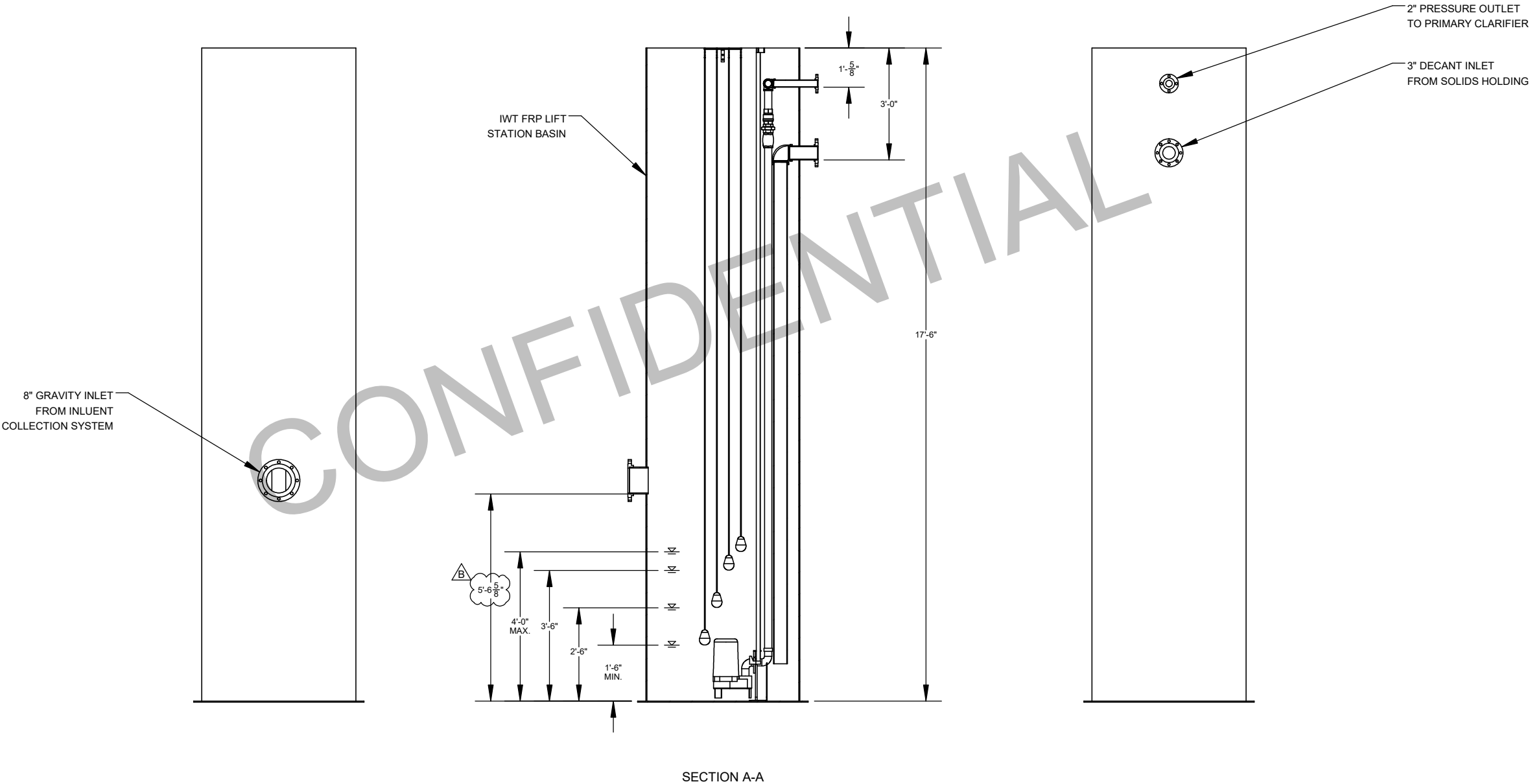
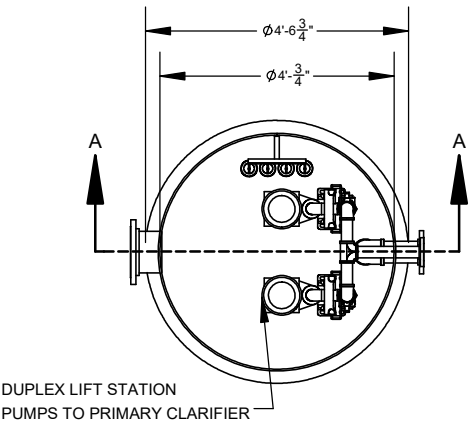
GENERAL ARRANGEMENT : PACKAGE PLANT

HORIZ. SCALE 1:65	PROJECT NO. 21-0161
VERT. SCALE 1:65	DATE 08/02/2021
DRAWN BY KJS	DESIGNED BY AOB
DRAWING NO. C1.0	SHEET NO. 03 of 05

PRELIMINARY

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 - ALL REACTORS SHALL BE CONSTRUCTED OF FRP FIBERGLASS, PER ENGINEER-OF-RECORD REQUIREMENTS.
 - BLOWERS, WEIRS, CONTROL PANELS, AND VARIOUS SMALL PARTS SHALL BE SHIPPED UNASSEMBLED AND SECURELY PACKAGED, TO BE INSTALLED BY CONTRACTOR. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR ADDITIONAL DETAIL.
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EQUIPMENT LIST			
DESCRIPTION	QTY.	MAKE	MODEL
LIFT STATION PUMP	2	CHAMPION	CPSE542, 0.5 HP

NO.	DATE	INITIALS	DESCRIPTION
A	08/22/25	KJS	ADDED UV CHAMBER, UPDATE DESIGN
B	08/28/25	KJS	UPDATED INLET INVERT



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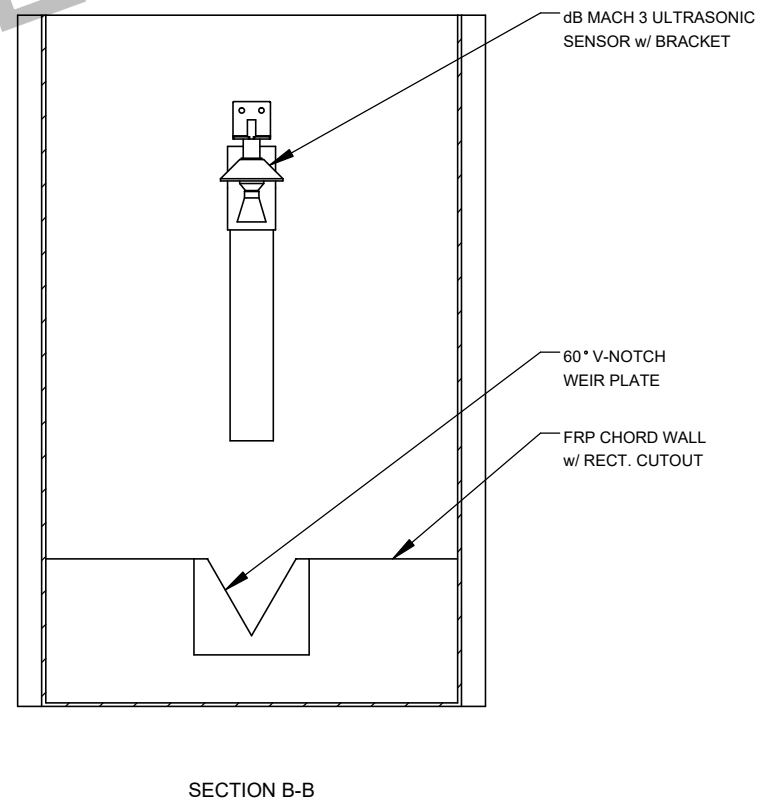
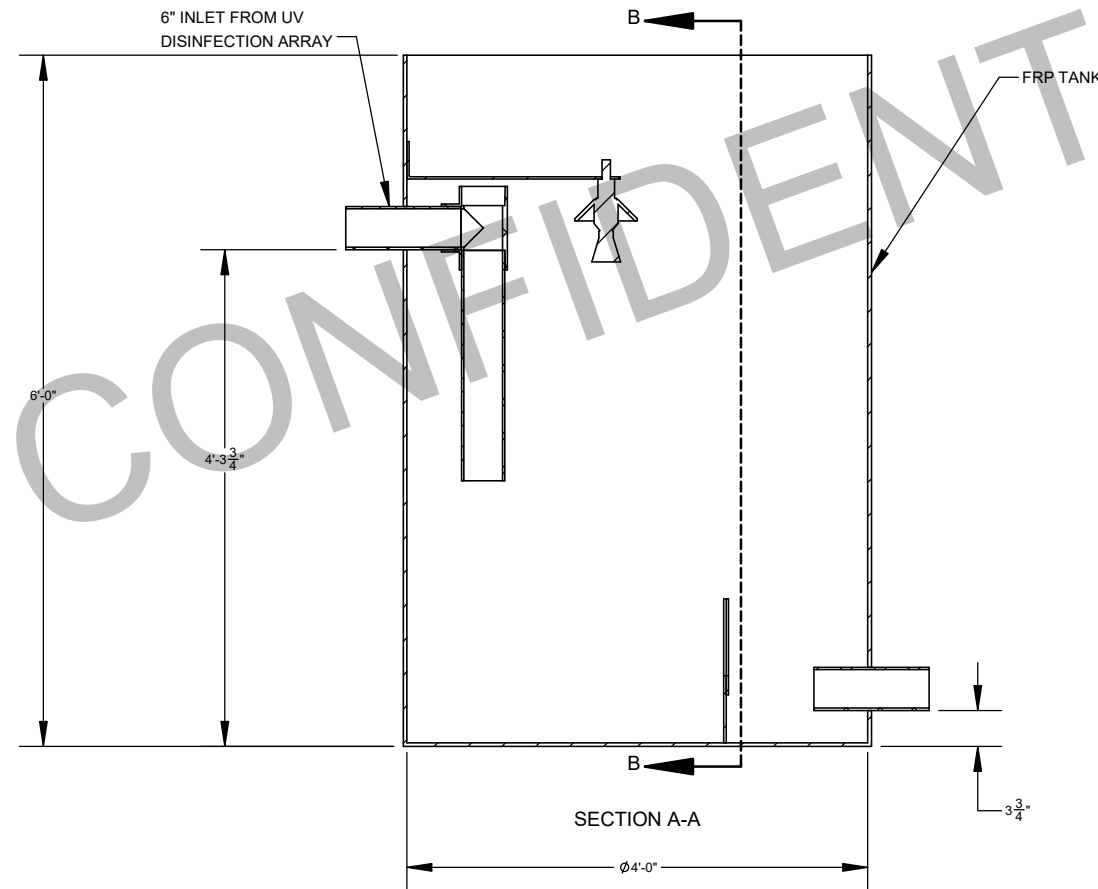
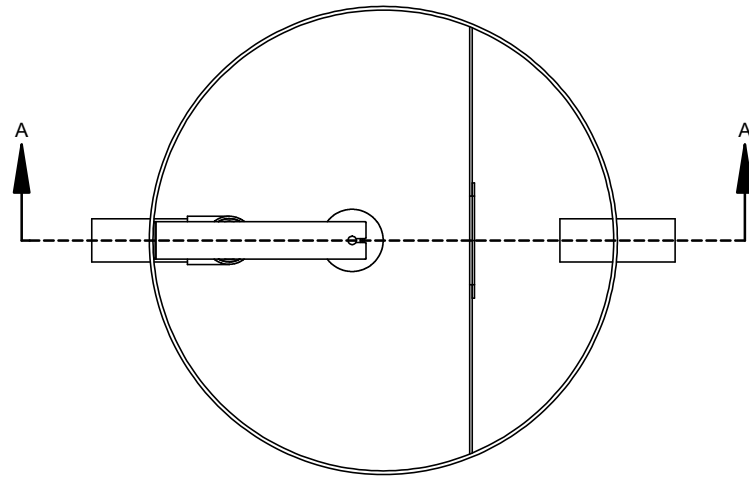
GENERAL ARRANGEMENT : LIFT STATION

HORIZ. SCALE 1:40	PROJECT NO. 21-0161
VERT. SCALE 1:40	DATE 01/25/2023
DRAWN BY KJS	DESIGNED BY AOB
DRAWING NO. C1.1	SHEET NO. 04 of 05

PRELIMINARY

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1. THESE DRAWINGS DEPICT PRELIMINARY LAYOUT(S) OF A WASTEWATER TREATMENT SYSTEM CAPABLE OF TREATING THE DESIGN AVERAGE INFLUENT FLOW AND LOAD TO THE EFFLUENT WATER QUALITY DENOTED IN THE WASTELOAD SUMMARY.
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5. CONTRACTOR TO PROVIDE AND INSTALL ALL FIELD PIPING AND SECURE ALL EQUIPMENT CONNECTIONS AS SHOWN IN THE ENGINEER OF RECORD'S PROJECT DOCUMENTS.
6. REACTORS AND INTERNAL DEVICES SHALL BE INSTALLED PLUMB AND LEVEL.
7. SEE THE PROJECT SPECIFIC QUOTE FOR MORE INFORMATION REGARDING SCOPE OF SUPPLY AND CORRESPONDING TERMS AND CONDITIONS.



PRELIMINARY

EQUIPMENT LIST			
DESCRIPTION	QTY.	MAKE	MODEL
ULTRASONIC FLOW METER	1	PULSAR	ULTRA 4 CONTROLLER w/ dB MACH 3 TRANSDUCER

[illegible]

Infiltrator
Water Technologies
Part of **ADS**

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PORT OF ALBANY EXPANSION WWTP
BETHLEHEM, NY

GENERAL ARRANGEMENT : FLOW METER VAULT

HORIZ. SCALE 1:20	PROJECT NO. 21-0161
VERT. SCALE 1:20	DATE 08/04/2021
DRAWN BY KJS	DESIGNED BY AOB
DRAWING NO. C1.2	SHEET NO. 05 of 05

CONFIDENTIAL

SECTION 033001
CAST-IN PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

1.02 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.03 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct a virtual or in person conference at Project site.
1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Concrete Subcontractor.
 2. Review the following:
 - a. Special inspection and testing and inspecting agency procedures for field quality control.
 - b. Construction joints, control joints, isolation joints, and joint-filler strips.
 - c. Semirigid joint fillers.
 - d. Vapor-retarder installation.
 - e. Anchor rod and anchorage device installation tolerances.

- f. Cold and hot weather concreting procedures.
- g. Concrete finishes and finishing.
- h. Curing procedures.
- i. Forms and form-removal limitations.
- j. Shoring and reshoring procedures.
- k. Methods for achieving specified floor and slab flatness and levelness.
- l. Floor and slab flatness and levelness measurements.
- m. Concrete repair procedures.
- n. Concrete protection.

1.04 ACTION SUBMITTALS

A. Product Data: For each of the following.

- 1. Portland cement.
- 2. Fly ash.
- 3. Slag cement.
- 4. Blended hydraulic cement.
- 5. Silica fume.
- 6. Performance-based hydraulic cement
- 7. Aggregates.
- 8. Admixtures:
 - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
- 9. Vapor retarders.
- 10. Floor and slab treatments.

11. Liquid floor treatments.
 12. Curing materials.
 - a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.
 13. Joint fillers.
 14. Repair materials.
 15. Water Stops
- B. Design Mixtures: For each concrete mixture, include the following:
1. Mixture identification.
 2. Minimum 28-day compressive strength.
 3. Durability exposure class.
 4. Maximum w/cm.
 5. Slump limit.
 6. Air content.
 7. Nominal maximum aggregate size.
 8. Intended placement method.
 9. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Shop Drawings:
1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - a. Location of construction joints is subject to approval of the Architect.
- D. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:
1. Concrete Class designation.
 2. Location within Project.
-

3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment if any.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.
2. Testing agency: Include copies of applicable ACI certificates.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Floor and slab treatments.
5. Bonding agents.
6. Adhesives.
7. Vapor retarders.
8. Semirigid joint filler.
9. Joint-filler strips.
10. Repair materials.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Slag cement.

4. Blended hydraulic cement.
 5. Silica fume.
 6. Performance-based hydraulic cement.
 7. Aggregates.
 8. Admixtures.
- D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances.
- E. Research Reports: For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
- F. Preconstruction Test Reports: For each mix design.
- G. Field quality-control reports.
- H. Minutes of preinstallation conference.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs Project personnel qualified as a ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician with experience installing and finishing concrete, incorporating permeability-reducing admixtures.
1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.
- B. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated, and employing an ACI-certified Concrete Quality Control Technical Manager.
1. Personnel performing laboratory tests shall be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
- C. Field Quality Control Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests shall be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

1.07 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.
 1. Include the following information in each test report:
 - a. Admixture dosage rates.
 - b. Slump.
 - c. Air content.
 - d. Seven-day compressive strength.
 - e. 28-day compressive strength.
 - f. Permeability.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ASTM C94/C94M and ACI 301.

1.09 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.
 1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 2. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M).
 3. Do not use frozen materials or materials containing ice or snow.
 4. Do not place concrete in contact with surfaces less than 35 deg F (1.7 deg C), other than reinforcing steel.
 5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F (35 deg C).
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 PRODUCTS

2.01 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301.

2.02 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
2. Obtain aggregate from single source.
3. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I/II.
2. Fly Ash: ASTM C618, Class C or F.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
4. Blended Hydraulic Cement: ASTM C595/C595M, Type IP, portland-pozzolan.
5. Silica Fume: ASTM C1240 amorphous silica.

C. Normal-Weight Aggregates: ASTM C33/C33M, Class M coarse aggregate or better, graded. Provide Class S coarse aggregate for all exterior concrete. Provide aggregates from a single source.

1. Alkali-Silica Reaction: Comply with one of the following:

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- a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.
 - b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567.
 - c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301 (ACI 301M).
2. Maximum Coarse-Aggregate Size: 1-1/2 inches for slabs-on-grade, 1 inch for structural concrete nominal.
 3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Air-Entraining Admixture: ASTM C260/C260M.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride [in steel-reinforced concrete].
1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 2. Retarding Admixture: ASTM C494/C494M, Type B.
 3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
 5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
 6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.
- F. Water and Water Used to Make Ice: ASTM C94/C94M, potable.

2.03 VAPOR RETARDERS

- A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A not less than 10 mils (0.25 mm) thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.04 LIQUID FLOOR TREATMENTS

- A. Cure-Densifier-Hardener: Transparent, chemically reactive, water-based treatment that penetrates into the concrete surface, forming a chemical reaction of crystalline growth that fills in the natural pores and voids in the concrete surface.
- B. Basis of Design: Ashford Formula of Curecrete Distribution, Inc.; or equal
- C. Abrasion Resistance to Revolving Disks: ASTM C779.
- D. Surface Adhesion: ASTM D3359.
- E. Hardening: ASTM C39:
- F. Rebound Number: ASTM C805.
- G. Light Exposure Degradation: ASTM G23.
- H. Test Method for Measuring Wet SCOF of Common Hard-Surface Floors in accordance with ANSI B101.1.
- I. Test Method for Measuring Wet DCOF of Common Hard-Surface Floors in accordance with ANSI B101.3.

2.05 CURING MATERIALS

- A. Evaporation Retarder: Other than Cure-Densifier-Hardener, Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.
 - 1. Color:
 - a. Ambient Temperature Below 50 deg F (10 deg C): Black.
 - b. Ambient Temperature between 50 deg F (10 deg C) and 85 deg F (29 deg C): Any color.
 - c. Ambient Temperature Above 85 deg F (29 deg C): White.
- D. Curing Paper: Eight-feet- (2438-mm-) wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.

- E. Water: Potable or complying with ASTM C1602/C1602M.
- F. Clear, Waterborne, Membrane-Forming, Nondissipating Curing Compound: ASTM C309, Type 1, Class B, certified by curing compound manufacturer to not interfere with bonding of floor covering.

2.06 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 in accordance with ASTM D2240.
- C. Epoxy Bonding Adhesive: ASTM C881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types I and II, nonload bearing, Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- D. Floor Slab Protective Covering: Eight-feet- (2438-mm-) wide cellulose fabric.
- E. Waterstops: U.S. Army Corps of Engineers CRD-C 513, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
 - 1. Profile: Ribbed with center bulb.
 - 2. Dimensions: 6 inches by 3/8 inch thick, nontapered.

2.07 REPAIR MATERIALS

- A. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
 - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.

4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.

2.08 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.
 1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 1. Fly Ash or Other Pozzolans: 25 percent by mass.
 2. Slag Cement: 50 percent by mass.
 3. Silica Fume: 10 percent by mass.
 4. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
 1. Use high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, and concrete with a w/cm below 0.50.

2.09 CONCRETE MIXTURES

- A. Class A: Normal-weight concrete used for footings, piers, grade beams, and tie beams.
 1. Exposure Class: ACI 318 F2.
 2. Minimum Compressive Strength: 4000 psi at 28 days.
 3. Maximum w/cm: 0.50.

4. Slump Limit: 4 inches (100 mm), plus or minus 1 inch.
 5. Air Content:
 - a. Exposure Classes F2 and F3: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size.
 6. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- B. Class B: Normal-weight concrete used for mat foundations and foundation walls.
1. Exposure Class: ACI 318 F2.
 2. Minimum Compressive Strength: 4000 psi at 28 days.
 3. Maximum w/cm: 0.50.
 4. Slump Limit: 4 inches, plus or minus 1 inch.
 5. Air Content:
 - a. Exposure Classes F2 and F3: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1.5-inch nominal maximum aggregate size.
 6. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- C. Class C: Normal-weight concrete used for interior slabs-on-ground (slabs less than 10" thick).
1. Exposure Class: ACI 318 F0.
 2. Minimum Compressive Strength: 4000 psi at 28 days.
 3. Maximum w/cm: 0.50.
 4. Slump Limit: 4 inches, plus or minus 1 inch.
 5. Air Content:
 - a. Do not use an air-entraining admixture or allow total air content to exceed 2 percent for concrete used in trowel-finished floors.
 6. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
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D. Class I: Normal-weight concrete used for interior metal pan stairs and landings:

1. Exposure Class: ACI 318 F0.
2. Minimum Compressive Strength: 3000 psi at 28 days.
3. Maximum w/cm: 0.5.
4. Maximum Size Aggregate: 3/8 inch.
5. Slump Limit: 3 inches, plus 1 inch or minus 2 inches.
6. Air Content: 0 percent, plus or minus 0.5 percent at point of delivery.
7. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
8. Retarding Admixture: Not allowed.
9. Accelerating Admixture: Not allowed.

E. Class J: Normal-weight concrete used for exterior retaining walls.

1. Exposure Class: ACI 318 F2.
2. Minimum Compressive Strength: 4000 psi at 28 days.
3. Maximum w/cm: 0.50.
4. Slump Limit: 4 inches, plus or minus 1 inch.
5. Air Content:
 - a. Exposure Classes F2 and F3: [6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size.
6. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

2.10 CONCRETE MIXING

- A. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.

3.03 INSTALLATION OF VAPOR RETARDER

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.

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4. Lap joints 6 inches and seal with manufacturer's recommended tape.
 5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
 6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
 7. Protect vapor retarder during placement of reinforcement and concrete.
 - a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

3.04 JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
 1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Engineer.
 2. Place joints perpendicular to main reinforcement.
 - a. Continue reinforcement across construction joints unless otherwise indicated.
 3. Locate horizontal joints in walls and columns at underside slabs and at the top of footings.
 4. Space vertical joints in walls as indicated on Drawings.
 5. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
 1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
- D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints:

1. Install dowel bars and support assemblies at joints where indicated on Drawings.
2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.

F. Dowel Plates: Install dowel plates at joints where indicated on Drawings.

3.05 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer in writing, but not to exceed the amount indicated on the concrete delivery ticket.
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
1. If a section cannot be placed continuously, provide construction joints as indicated.

2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
 - a. Do not use vibrators to transport concrete inside forms.
 - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
 - c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
 - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 1. Do not place concrete floors and slabs in a checkerboard sequence.
 2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 3. Maintain reinforcement in position on chairs during concrete placement.
 4. Screed slab surfaces with a straightedge and strike off to correct elevations.
 5. Level concrete, cut high areas, and fill low areas.
 6. Slope surfaces uniformly to drains where required.
 7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
 8. Do not further disturb slab surfaces before starting finishing operations.

3.06 FINISHING FORMED SURFACES

- A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.
 - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
 - b. Remove projections larger than 1/4 inch.
 - c. Patch tie holes.
 - d. Surface Tolerance: ACI 117 Class B.
 - e. Locations: Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.
- B. Rubbed Finish: Apply the following to as cast surface finishes exposed to public view:
 1. Smooth-Rubbed Finish:
 - a. Perform no later than one day after form removal.
 - b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.
 - c. If sufficient cement paste cannot be drawn from the concrete by the rubbing process, use a grout made from the same cementitious materials used in the in-place concrete.
- C. Related Unformed Surfaces:
 1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
 2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.07 FINISHING FLOORS AND SLABS

- A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish:

1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
2. Use stiff brushes, brooms, or rakes to produce a profile depth of 1/4 inch (6 mm) in one direction.
3. Apply scratch finish to surfaces to receive concrete floor toppings and at exterior walk ways.

C. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 (ACI A117M) tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish.

D. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface.
5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
7. Finish surfaces to the following tolerances, in accordance with ASTM E1155 (ASTM E1155M), for a randomly trafficked floor surface:

- a. Slabs on Ground:
 - 1) Specified overall values of flatness, FF 30; and of levelness, FL 25; with minimum local values of flatness, FF 24; and of levelness, FL 17.
- 8. For concrete with embedded rails, finish and measure surface, so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch or 1/4" in 20 feet.
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.
 - 1. Coordinate required final finish with Architect before application.
 - 2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
 - 2. Coordinate required final finish with Architect before application.

3.08 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

- A. Filling In:
 - 1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
 - 2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
 - 3. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Equipment Bases and Foundations:
 - 1. Coordinate sizes and locations of concrete bases with actual equipment provided.
 - 2. Construct concrete bases 4 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.

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3. Minimum Compressive Strength: 4000 psi at 28 days.
 4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 16-inch (450-mm) centers around the full perimeter of concrete base.
 5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
 6. Prior to pouring concrete, place and secure anchorage devices.
 - a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - b. Cast anchor-bolt insert into bases.
 - c. Install anchor bolts to elevations required for proper attachment to supported equipment.
- C. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items.
1. Cast-in inserts and accessories, as shown on Drawings.
 2. Screed, tamp, and trowel finish concrete surfaces.

3.09 CONCRETE CURING

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
 2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply in accordance with manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Curing Formed Surfaces: Comply with ACI 308.1 as follows:
1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
 2. If forms remain during curing period, moist cure after loosening forms.

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3. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
 - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
 - b. Continuous Sprinkling: Maintain concrete surface continuously wet.
 - c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
 - d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
 - e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 1) Recoat areas subject to heavy rainfall within three hours after initial application.
 - 2) Maintain continuity of coating and repair damage during curing period.
- D. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:
1. Begin curing immediately after finishing concrete.
 2. Interior Concrete Floors:
 - a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
 - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - (a) Lap edges and ends of absorptive cover not less than 12-inches.
 - (b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.

- (a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - (b) Cure for not less than seven days.
 - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - (a) Water.
 - (b) Continuous water-fog spray.
- b. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:
 - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - (a) Lap edges and ends of absorptive cover not less than 12 inches.
 - (b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
 - (a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - (b) Cure for not less than seven days.
 - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - (a) Water.
 - (b) Continuous water-fog spray.
- c. Floors to Receive Curing Compound:

- 1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
 - 3) Maintain continuity of coating, and repair damage during curing period.
 - 4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer[unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project].
- d. Floors to Receive Curing and Sealing Compound:
- 1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
 - 3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3.10 TOLERANCES

- A. Conform to ACI 117.

3.11 APPLICATION OF LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with manufacturer's written instructions.
1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 2. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
 3. Rinse with water; remove excess material until surface is dry.
 4. Apply a second coat in a similar manner if surface is rough or porous.

- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

3.12 JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least one month.
 - 2. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints.
- D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.13 CONCRETE SURFACE REPAIRS

- A. Defective Concrete:
 - 1. Repair and patch defective areas when approved by Engineer.
 - 2. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.
 - a. Limit cut depth to 3/4 inch.
 - b. Make edges of cuts perpendicular to concrete surface.
 - c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.

- d. Fill and compact with patching mortar before bonding agent has dried.
 - e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
- 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
 - a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
 - b. Compact mortar in place and strike off slightly higher than surrounding surface.
- 3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Engineer.

D. Repairing Unformed Surfaces:

- 1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
 - a. Correct low and high areas.
 - b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
- 2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
- 3. After concrete has cured at least 14 days, correct high areas by grinding.
- 4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.
 - a. Finish repaired areas to blend into adjacent concrete.
- 5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
 - a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - b. Feather edges to match adjacent floor elevations.

6. Correct other low areas scheduled to remain exposed with repair topping.
 - a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
 - b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
 - a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
 - b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
 - c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
 - d. Place, compact, and finish to blend with adjacent finished concrete.
 - e. Cure in same manner as adjacent concrete.
8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.
 - a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
 - b. Dampen cleaned concrete surfaces and apply bonding agent.
 - c. Place patching mortar before bonding agent has dried.
 - d. Compact patching mortar and finish to match adjacent concrete.
 - e. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Engineer's approval.

3.14 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.
- B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
 - 1. Testing agency shall immediately report to Engineer, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
 - 2. Testing agency shall report results of tests and inspections, in writing, to Owner, Engineer, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
 - a. Test reports shall include reporting requirements of ASTM C31/C31M and ASTM C39/C39M, including the following as applicable to each test and inspection:
 - 1) Project name.
 - 2) Name of testing agency.
 - 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
 - 4) Name of concrete manufacturer.
 - 5) Date and time of inspection, sampling, and field testing.
 - 6) Date and time of concrete placement.
 - 7) Location in Work of concrete represented by samples.
 - 8) Date and time sample was obtained.
 - 9) Truck and batch ticket numbers.
 - 10) Design compressive strength at 28 days.
 - 11) Concrete mixture designation, proportions, and materials.
 - 12) Field test results.
 - 13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.

14) Type of fracture and compressive break strengths at seven days and 28 days.

- C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.
- D. Inspections:
 - 1. Headed bolts and studs.
 - 2. Verification of use of required design mixture.
 - 3. Concrete placement, including conveying and depositing.
 - 4. Curing procedures and maintenance of curing temperature.
 - 5. Batch Plant Inspections: On a random basis, as determined by Engineer.
- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M shall be performed in accordance with the following requirements:
 - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
 - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 2. Slump: ASTM C143/C143M:
 - a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete.
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 4. Concrete Temperature: ASTM C1064/C1064M:

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- a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C31/C31M:
 - a. Cast and laboratory cure two sets of four 6-inch by 12-inch cylinder specimens for each composite sample.
 - b. Cast and field cure two sets of four standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C39/C39M.
 - a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.
 - b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
 - c. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is less than or equal to 5000 psi.
 9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
 10. Additional Tests:
 - a. Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer.
 - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Engineer.
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- 1) Acceptance criteria for concrete strength shall be in accordance with ACI 301, section 1.6.6.3.
 11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 72 hours of completion of floor finishing and promptly report test results to Engineer.

3.15 PROTECTION

- A. Protect concrete surfaces as follows:
1. Protect from petroleum stains.
 2. Diaper hydraulic equipment used over concrete surfaces.
 3. Prohibit vehicles from interior concrete slabs.
 4. Prohibit use of pipe-cutting machinery over concrete surfaces.
 5. Prohibit placement of steel items on concrete surfaces.
 6. Prohibit use of acids or acidic detergents over concrete surfaces.
 7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION

SECTION 46 07 53 – PACKAGED WASTEWATER TREATMENT PLANT

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This section describes the general work required to furnish and install the complete package wastewater treatment plant (package treatment system), specified herein and as shown in the drawings. The CONTRACTOR shall provide all labor, materials, tools, and equipment required to furnish and install said system in accordance with the project plans and specifications. The package treatment system shall be an Infiltrator Water Technologies (IWT) ENVIRO-AIRE System, modified Model A-13.0 or approved equal, with prefabricated steel construction as manufactured by Infiltrator Water Technologies, LLC or approved equal.
- B. The package treatment system shall contain all essential tank basins and ancillary equipment necessary for proper operation of the plant. The package treatment system shall be fabricated and assembled off-site to the greatest extent possible, taking into consideration shipping and installation limitations.
- C. It shall be the responsibility of the CONTRACTOR to coordinate equipment vendor to supply the package treatment system and aeration systems complete and in compliance with the requirements of the project. Deviations from these Specifications or Contract Documents that affect the overall cost of the project shall be the CONTRACTOR's responsibility to resolve.

1.2 DEFINITIONS

- A. OWNER: The company responsible for managing and operating the package treatment system after delivery and installation.
- B. ENGINEER: The company responsible for verifying the system meets the intent of all governing building, electrical, and treatment requirements.
- C. CONTRACTOR: The company responsible for installation/assembly of the System, including but not limited to, site preparation, tank installation, and electrical/mechanical connections.
- D. MANUFACTURER: The company responsible for providing all materials, equipment, and ancillary services as described herein.
- E. Contract Documents: Prints, specifications, and other formal documents prepared by the ENGINEER for specific use on this project.
- F. Package Treatment System: Shop fabricated wastewater treatment system designed to meet the requirements of the Contract Documents.

1.3 REFERENCE STANDARDS

- A. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
 - 1. Standards of the American Society of Testing and Materials (ASTM).
 - 2. American National Standards Institute (ANSI).
 - 3. National Electric Code (NEC).
 - 4. National Electrical Manufacturers Association (NEMA).
 - 5. Institute of Electrical and Electronic Engineers (IEEE).
 - 6. American Welding Society (AWS).
 - 7. American Society of Mechanical Engineers (ASME).
 - 8. American Society of Civil Engineers (ASCE).

9. Great Lakes Upper Mississippi River Basin (GLUMRB) Recommended Standards for Wastewater Facilities, latest edition (Ten States Standards).

10. Underwriters Laboratories (UL)

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Equipment and materials shall be protected from damage, deterioration, severe weather, excessive temperature, dirt, dust, and contaminants from the time of shipment until installation is completed and the equipment and materials are ready for operation. Equipment shall be marked and stored to permit easy identification and inspection. A complete packing list and bill of material shall be included with each shipment.
- B. Materials stored at the job site shall be staged above ground and adequately supported and protected to prevent rusting, damage, warping, or other deterioration that may reduce the cross-sectional area or change the shape of the material.
- C. Materials shall be handled with adequately designed lifting devices and in a manner that shall not cause stress to the material and abrasion of the shop-applied coatings.

1.5 QUALITY ASSURANCE

- A. The package treatment system, including all ancillary equipment including but not limited to, pumps, mixers, blowers, level sensors, control panels, and other tertiary equipment listed herein, shall be supplied by a single manufacturer.
- B. Qualifications of the MANUFACTURER:
 - 1. Shall have a minimum 30 years of experience in the design and fabrication of the equipment described herein, used for similar applications.
 - 2. Shall have a minimum 25 years of documented and proven history of field support and troubleshooting expertise.
 - 3. Shall be actively engaged in research and development of sewage treatment facilities.
- C. All equipment furnished under this section shall be new and unused and shall be the standard products of the MANUFACTURER.
- D. All welding shall be performed by certified welders in accordance with AWS. Welder certificates shall be provided to the ENGINEER upon request.
- E. The equipment shall be manufactured by IWT.
- F. Alternative manufacturers shall submit their qualifications and design and product details to the ENGINEER at least fourteen (14) days prior to the scheduled bid date. Alternative manufacturers will not be allowed unless explicitly pre-approved by the ENGINEER in writing prior to the bid date.

1.6 SUBMITTALS

- A. The CONTRACTOR shall furnish general arrangement drawings, catalog data, operation and maintenance manuals, installation instructions, control details and electrical wiring diagrams, equipment design data, testing data, and reports to show full compliance with these Contract Documents.
- B. The CONTRACTOR shall provide a complete and detailed list of all proposed deviations from the Contract Documents.

1.7 WARRANTY

- A. The MANUFACTURER of the wastewater treatment system shall guarantee for one (1) year from the date of shipment that the system and all component equipment shall be free from defective materials and workmanship. The MANUFACTURER shall furnish replacement parts for any component considered in the opinion of the ENGINEER and agreed upon by the MANUFACTURER to be defective during this warranty period.

- B. Warranty shall be voided in the event of Acts of God or if the facility is misused, neglected, is not operated in substantial accordance with the MANUFACTURER's Operation and Maintenance Manual and industry standard operations procedures.

PART 2 – PRODUCTS

2.1 DESIGN CONDITIONS

- A. Influent flows and loads shall be as shown in the Contract Documents.
- B. Influent waste loads shall be biologically degradable. Non-biodegradable substances shall not be introduced to the system in quantities which are toxic to biological microorganisms.

2.2 MATERIALS

- A. Unless noted otherwise, the materials of construction shall be:
 - 1. Package treatment system tank basins shall be fabricated from structural grade steel plate per ASTM A36 requirements. Structural shapes shall be per AISC preferred material specification.
 - 2. Air piping shall be constructed of a minimum of Schedule 40 galvanized steel pipe or HSS. Air valves shall be brass with PTFE seats.
 - 3. Pumped water piping, including Return Activated Sludge/Waste Activated Sludge (RAS/WAS) and Scum skimmer airlift piping shall be constructed of schedule 80 PVC.
 - 4. Walkway grating shall be constructed of serrated galvanized carbon steel.
 - 5. Treaded floor plating shall be constructed of ¼" A36 steel.
 - 6. Handrails shall be constructed of ASTM A36/A529 or A500 Gr. B HSS and shall be galvanized or shop-coated in accordance with the Finishing and Coatings section of this specification. Handrails shall be per OSHA regulations with mid-rail and toeboards.
 - 7. Ladder shall be constructed of angle with 1" round bar spaced in accordance with OSHA guidelines.
- B. External piping connections to the package treatment system shall consist of either an NPT coupling or a flange connection, as shown on the Contract Documents.

All pipes All pipes and fittings shall be installed in accordance with:

- 1. the MANUFACTURER's instructions;
 - 2. the lines and grades shown on the Contract Documents; and
 - 3. as required for complete installation.
- C. Electrical equipment provided by the Manufacturer with the Wastewater Treatment Plant shall be rated for the following site power, 3PH 460V.

2.3 UNIT OPERATIONS

- A. Lift Station
 - 1. A lift station basin shall be provided as an integral section of the treatment system.
 - 2. The lift station basin shall be constructed in accordance with the Contract Documents and will include duplex pumps, a liquid level control system, and electrical controls.
 - 3. Each lift station pump shall be supplied with a 2-inch discharge, slide rail assembly, brass check valve, and SCH 80 PVC ball valve.
 - 4. The capacity of each lift station pump shall be 40 gpm at 32 feet Total Dynamic Head.
 - 5. The lift station pump manufacturer shall be Champion Pump Company, Inc. model CPSE542, or equal.

6. Pumps shall operate on standard lead/lag operation and alternate on successive cycles, as designed by the ENGINEER and as shown in the Contract Documents.
7. The lift station basin shall be provided with level switches, which shall be mounted by the CONTRACTOR after installing the filter tank.
8. Switches shall be weighted Opti-Float type with adjustable cable grip for depth changes.

B. Screening

1. Manual Coarse Bar Screen

- a. A manually cleaned coarse bar screen shall be provided at the inlet to the treatment system. The screen shall be located above the normal water level of the adjacent treatment basin and shall be manually cleanable with a rake.
- b. The screen shall be no narrower than 12" wide and no deeper than 9".
- c. The bars shall be constructed of 1/4"-thick A36 steel and spaced at 2" apart on a 45-degree incline.
- d. The manually cleaned bar screen shall be fully accessible from the top of the package treatment vessel.

C. Primary Clarifier Basin

1. The primary clarifier basin shall have proper baffling to prevent short circuiting and to provide maximum uniform solids settling area.
2. Settled sludge shall be returned from the primary clarifier floor hopper by the sludge return system, as shown on the Contract Documents.
3. The primary clarifier effluent shall pass through two effluent filters before entering the aeration basin. Primary effluent filters shall be Polylok model PL-525, or equal.

D. Aeration Basin

1. The aeration basin shall provide a minimum total liquid volume of 13,100 gallons. The aeration basin shall be shaped on each side to prevent sludge accumulation, to enhance the rotation to the contents, and to minimize scum and froth accumulation. The velocity of rotation shall be enough to scour the bottom and prevent sludge filletting from occurring.
2. Coarse Bubble Diffusers
 - a. All necessary diffuser bars, drop in pipes and air headers shall be installed in the aeration basin, and shall be constructed of materials as specified in the Contract Documents.
 - b. Each diffuser drop assembly shall be equipped with a ball valve, disconnecting union, and a diffuser bar with 3/4" FNPT air diffuser connections threaded to the tee bar.
 - c. The air diffuser shall be of the coarse bubble air check diaphragm type constructed with a diaphragm mounted on top of the diffuser body.
 - d. Diffuser manufacturer shall be Diffused Gas Technologies, Inc. model DP-75, or equal.
3. Blowers
 - a. For supplying air requirements of the wastewater treatment system, duplex positive displacement blower packages shall be furnished and installed at the locations shown on the Contract Documents.
 - b. Each blower motor shall have the capacity of supplying 100% of the wastewater system's air requirements.
 - c. Each unit shall be factory assembled and serviced before shipping.

- d. The blower shall be connected to the motor by means of a “V” belt drive unit. The belt drive unit shall be designed for easy adjustment and shall enable speed adjustment of the blower unit in application where flow varies. A removable belt cover shall be provided if the blower is not installed in enclosure.
 - e. The motor shall be furnished with an adjustable motor mounting base.
 - f. Each blower shall be fitted with an air inlet filter type noise silencer. For connecting to the air manifold, the blower shall be fitted with a flexible rubber hose coupling with stainless steel clamps.
 - g. All blowers and motors not located inside buildings shall be mounted on a fiberglass base and enclosed in a fiberglass weatherproof enclosure. The weatherproof hood shall be designed for easy access to service the blower, motor, filter, and belt drive unit. It shall be equipped with a lifting handle and locking facilities. All enclosure surfaces shall be properly prepared in a neat manner to obtain a smooth, clean, dry surface and shall have a light-colored finish.
 - h. A pressure relief valve and pressure gauge shall be mounted in the air manifold for determining the blower performance.
 - i. The blower manufacturer shall be Gardner Denver, Inc. Sutorbilt Series 4M, or equal.
 - j. The blower motor shall be 3PH 460V general duty, totally enclosed fan cooled (TEFC), and rated for 7.5hp.
- E. Secondary Clarifier Basin
- 1. The secondary clarifier basin shall have proper baffling to prevent short circuiting and to provide maximum uniform solids settling area.
 - 2. Settled sludge shall be returned from the secondary clarifier floor hopper by the sludge return system, as shown on the Contract Documents.
 - 3. Floating solids shall be returned from the secondary clarifier to the aeration basin by the scum return system, as shown on the Contract Documents.
 - 4. The secondary clarifier effluent shall pass over the edge of the baffled adjustable effluent weir into the effluent trough and then out the basin.
 - 5. The weir plate shall be constructed of 1/8” stainless steel or PVC sheet.
- F. Air Lift Scum Return System
- 1. A positive scum and skimming re-circulation system shall be installed within each clarifier basin for controlling and returning the floatables and scum.
 - 2. The positive scum and skimming re-circulation system shall consist of airlift skimming devices, sized and located per the Contract Documents.
 - 3. The skimming devices shall be of the positive airlift pump type, located in a position to skim and return floating material to the aeration basin.
 - 4. The airline supplying air to the skimming device shall be equipped with an isolation valve to regulate the rate of return.
 - 5. The scum intake shall be equipped with an adjustable assembly which will enable exact positioning of the skimmer at water level.
 - 6. The return line shall be sized and located per the Contract Documents.
- G. Air Lift Solids Return System
- 1. A positive sludge re-circulation system for returning settled solids shall be installed within the clarifier basin.

2. The airlift pump system shall have the re-circulation capacity ranging from 50% to 150% of the design flow.
3. The airline supplying air to the pump shall be equipped with an isolation valve which varies the flow capacity of the pump.
4. The airlift pump shall be firmly supported.
5. The airlift pump shall be equipped with a clean-out plug to allow for easy cleaning and maintenance.
6. The return line shall be sized and located per the Contract Documents.

H. UV System

1. An ultraviolet (UV) chamber shall be included to achieve disinfection of the final effluent and shall be designed to provide a UV radiation dose effective for disinfection of the effluent before final discharge.
2. The UV disinfection system shall include two (2 ea) open channel vessel reactors sized to deliver the minimum required UV design dose at the state specified flow conditions.
3. A local control panel, separate from the main control panel, shall be included, providing at minimum lamp bank on/off indication, low intensity alarm, and a lamp failure alarm.
4. The system shall incorporate a weir level control device for ensuring that the UV lamp banks remain submerged at all times.
5. The UV disinfection system shall be by AquaAzul, model AZ-400, or equal.

I. Effluent Flow Metering

1. An ultrasonic flow sensor with meter and transmitter with totalizing capabilities shall monitor the effluent wastewater stream and calculate the instantaneous and 24-hour flows.
2. The meter/totalizer shall be provided in a separate Flow Meter Vault.
3. The meter/totalizer shall output a 4-20 mA scaled signal to indicate instantaneous flow.

J. Solids Holding Basin

1. The solids holding basin shall be provided as an integral section of the main system and shall be of enough capacity to provide a minimum total basin volume of 5,700 gallons. The basin shall be shaped to prevent sludge densification.
2. The flow into the solids holding basin shall be from the Air Lift Solids Return System. The piping and valving shall be arranged to allow the OWNER to manually waste solids from the clarifier underflow.
3. The solids holding basin shall be provided with an aeration mixing system.
 - a. The mixing system shall be constructed with coarse bubble air diffusers, placed longitudinally along one side of the basin to provide air to the basin at 30 CFM per 1,000 cubic feet of liquid capacity.
 - b. All necessary diffuser bars, drop in pipes and air headers shall be installed in the aeration basin, and shall be constructed of materials as specified in the Contract Documents.
 - c. Each diffuser drop assembly shall be equipped with a ball valve, disconnecting union, and a diffuser bar with 3/4" FNPT air diffuser connections threaded to the tee bar.
 - d. The air diffuser shall be of the coarse bubble air check diaphragm type constructed with a diaphragm mounted on top of the diffuser body.
 - e. Diffuser manufacturer shall be Diffused Gas Technologies, Inc. model DP-75, or equal.
4. A gravity decant system shall be provided to drain supernatant from the solids holding basin to the influent lift station.

- a. A series of manually actuated quarter turn valves shall be installed at various water levels to allow various elevations of decanting capabilities as shown in the Contract Documents.
- b. Each valve shall have an extended stem that is operable from the upper surface of the basin.
- c. The drain piping shall be sized and routed per the Contract Documents.

2.4 FOUNDATION AND ANCHORING

- A. A level concrete foundation pad or compacted fill subgrade shall be designed by the ENGINEER and constructed by the CONTRACTOR and shall conform to the Contract Documents.
- B. The MANUFACTURER shall provide anchoring lugs at the base and along each side of the tank. The CONTRACTOR shall provide and install anchoring bolts, clips, clevises, straps, and/or any other anchoring materials as directed in the Contract Documents.

2.5 INTEGRATION AND CONTROLS

A. Master Control Panel

- 1. An electrical control panel shall be installed within a wall mounted NEMA 4X weatherproof enclosure, as shown in the Contract Documents.
- 2. The electrical panel shall control the operation of all the auxiliary component equipment requiring electrical power, except for those operations specifically requiring separate local control panels, as described in this document. The blower motor unit operation time will be controlled by the blower clock. The plant operator shall control the operation time. The necessary selector switches shall be provided to allow either automatic or manual operation of the auxiliary equipment.
- 3. The electrical controls shall consist of IEC starters, timers, and selector switches necessary. Properly sized circuit breakers or fuses shall protect all electrical equipment and circuitry.
- 4. The electrical control panel shall be furnished with blower failure and local alarms. It shall also include an alarm silencer switch.
- 5. All wiring and electrical conduit required shall be furnished by and installed by the CONTRACTOR. The electrical control panel shall be detached for shipping purposes. A power block in the control panel shall be supplied for the electrical connection.
- 6. **A neutral connection shall be provided by the CONTRACTOR at the electrical control panel site prior to installation.**
- 7. The control panel shall be completely factory assembled and tested prior to shipment.
- 8. Controls shall be mounted to a removable sub-panel within the enclosure and shall be wired and spaced in accordance with the latest National Electric Code.
- 9. All wiring conductors within the control console shall be UL type MTW, stranded #16 AWG minimum, rated at 600V. Control wiring shall be numbered on each end with a permanent heat-shrinkable sleeving made of flexible, irradiated, flame-retardant polyolefin.

2.6 FINISHES AND COATINGS

- A. All internal and external carbon steel surfaces shall be painted.
- B. Stainless steel and plastic surfaces and piping shall not be painted.
- C. Type A Coating: Outdoor Installation, Vessel Exterior
 - 1. Prepare external tank surfaces to commercial blast standards with 3 mil profile in accordance with ASTM D4417. Surface prep shall be per SSPC-SP6/NACE WAB-3, free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, or other foreign matter.

2. Primer Coat: Apply epoxy primer coat with Sherwin Williams Macropoxy 646, or equal, 5.0 mils DFT minimum.
 3. Intermediate Coat: Apply epoxy intermediate coat with Sherwin Williams Macropoxy 646, or equal, 5.0 mils DFT minimum.
 4. Finish Coat: Apply epoxy finish coat with Sherwin Williams Hi-Solids Polyurethane (HSP), or equal, 3.0 mils DFT minimum.
- D. Type C Coating: Outdoor or Indoor Installation, Vessel Interior
1. Prepare internal tank surfaces to commercial near white blast standards with 3 mil profile in accordance with ASTM D4417. Surface prep shall be per SSPC-SP10/NACE WAB-2, free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, or other foreign matter.
 2. Finish Coat: Apply coal tar epoxy finish coat with Sherwin Williams TARGUARD, or equal, 10.0 mils DFT minimum.
- 2.7 SPARE PARTS
- A. One (1 ea) set of seals for each different model of blower.
 - B. Ten percent (10%) spare aeration diffusers (rounded up) of each type installed.
 - C. Two (2 ea) UV lamps. (FRAGILE - must be properly stored to prevent damage.)
 - D. Two (2 ea) UV quartz sleeves.
 - E. Two (2 ea) UV ballasts.
 - F. Other standard spare parts as recommended by sub-equipment manufacturers.

PART 3 – EXECUTION

3.1 GENERAL

- A. All components of the package treatment system shall be handled with care during transportation, storage, and installation. The CONTRACTOR shall follow the MANUFACTURER's guidelines for storage and handling.
- B. The MANUFACTURER shall not be responsible for on-site installation of any components or parts of the package treatment system.

3.2 EXAMINATION

- A. The CONTRACTOR shall verify that field conditions are acceptable and suitably prepared to receive equipment prior to delivery.
- B. Upon delivery the CONTRACTOR shall review the shipping manifest and validate that all items have been delivered. If discrepancies are documented the CONTRACTOR shall immediately recover or replace missing and/or damaged items.

3.3 ASSEMBLY AND INSTALLATION

- A. The package treatment system shall be completely installed by the CONTRACTOR at the location shown on the Contract Documents. It shall be installed in accordance with the MANUFACTURER's recommendations and guidelines. The MANUFACTURER is required to conduct a preconstruction conference with any CONTRACTOR personnel present who will be involved in the project.
- B. All structural and building manufacturing and modification other than the package treatment system, including all painting shall be performed by the CONTRACTOR in accordance with the ENGINEER's specifications and Contract Documents.
- C. The following activities shall be completed by the CONTRACTOR upon delivery of the package treatment system. These items are part of the package treatment system pay items and no additional payment will be made for these items or any other work normally considered to be ancillary to a package treatment system.

1. Construct a suitably sized access road to the delivery site to enable delivery and offloading of the system.
2. Install the package treatment system subgrade/foundation per the Contract Documents.
3. Install the package treatment system onto the subgrade/foundation and attach anchors/buoyancy control as required, per the Contract Documents.
4. Assemble ancillary equipment that may have been shipped loose due to shipping restrictions, including but not limited to, piping, valving, sensors, and wiring which may have been disconnected to protect the equipment during transportation.
5. Prepare and apply touch up paint as needed.
6. Install service handrails.
7. Install and connect all site utilities to the system. The electrical power requirements at the main power block or main circuit breaker shall be per the Contract Documents. Connect each subpanel as noted in the Contract Documents.
8. Fill the package treatment system with water after installing drain plugs. Fill water shall be provided by the OWNER.
9. Finish grade and place gravel and fencing around the outside perimeter of the system in accordance with the Contract Documents.

3.4 STARTUP

- A. At the time the wastewater treatment system is filled with water or sewage, all power connections will have been completed, and all equipment will be ready for operation. A representative of the MANUFACTURER shall instruct the OWNER's representative on the proper operation and maintenance of the wastewater treatment system including instructions on conducting all required operational tests. Within two weeks of system startup the MANUFACTURER's representative shall furnish a service manual on the equipment installed within the wastewater system.
- B. Start-Up Testing
 1. After all the equipment and structures have been completely installed, and the installation approved by the MANUFACTURER's representative and the ENGINEER in writing, an initial start-up test of the system shall be conducted as directed by the MANUFACTURER's representative to demonstrate the proper functioning of the system and all components and parts thereof.
 2. Upon Completion of the above test, a written report shall be furnished by the MANUFACTURER and shall describe the representative's observations. This report shall describe any deficiencies noted.
 3. The ENGINEER may require any deficiencies noted to be corrected by the CONTRACTOR, by repairing or replacing the defective component and retesting the component and/or system until it meets the approval of the ENGINEER, at no additional cost to the OWNER.
- C. Field Training
 1. CONTRACTOR shall submit the proposed lesson plan of field instruction 30 days prior to commencement of scheduled training. Field training shall cover each item contained in the operating maintenance manuals.
 2. The elements presented in the following outline shall be included in the instruction as a minimum:
 - a. Equipment operation.
 - b. Detailed component description.
 - c. Equipment preventative maintenance.
 - d. Equipment troubleshooting.

- e. Equipment corrective maintenance.
- f. Hands-on demonstrations.

END OF SECTION 46 07 53

Technical Documents

Fire Pump House

Technical Drawings:

- COVR COVER SHEET
- GN-01 GENERAL NOTES
- SP-00 OVERALL SITE PLAN
- SP-01 DETAILED SITE PLAN & PROFILE
- GR-01 GRADING & DRAINAGE PLAN
- UT-01 UTILITY PLAN
- MD-01 MISCELLANEOUS DETAILS
- F-100P FIRE PUMP BUILDING PLAN
- G-100P STANDARD NOTES & DETAILS
- S-100P PLANS & SECTIONS
- 209-06 NYSDOT TURBIDITY CURTAIN STANDARD DETAIL
- E-601S ELECTRICAL SINGLE LINE DIAGRAM

Technical Specifications:

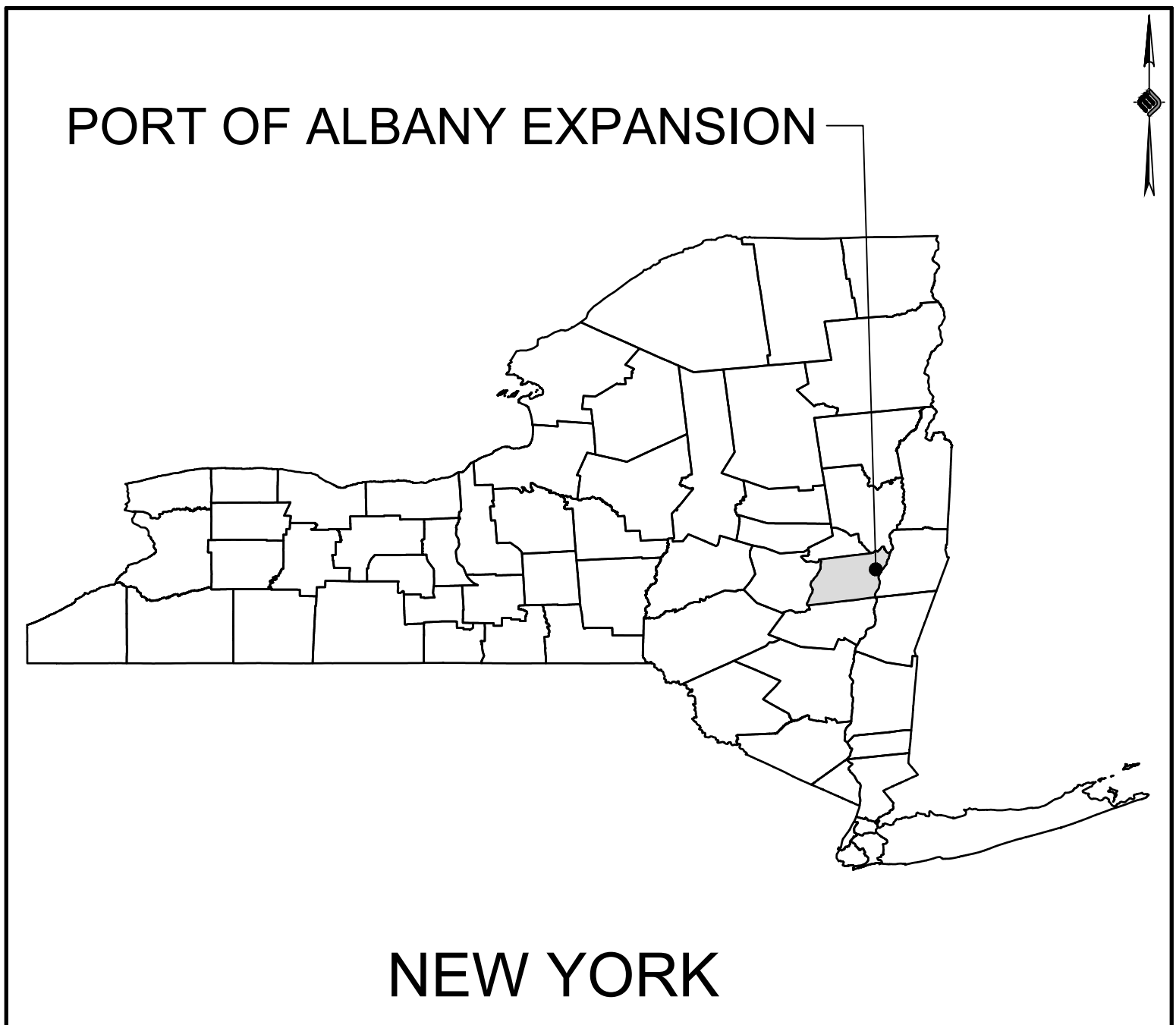
- 033001 CAST IN PLACE CONCRETE
- 210500 COMMON WORK RESULTS FOR FIRE SUPPRESSION
- 210523 GENERAL DUTY VALVES FOR WATER-BASED FIRE-SUPPRESSION
PIPPING
- 210553 IDENTIFICATION FOR FIRE SUPPRESSION PIPING AND EQUIPMENT
- 211300 FIRE SUPPRESSION SPRINKLER SYSTEMS
- 213000 FIRE PUMPS
- 213419 PREMANUFACTURED FIRE PUMP BUILDING
- 284601 FIRE DETECTION AND ALARM

ALBANY PORT DISTRICT COMMISSION

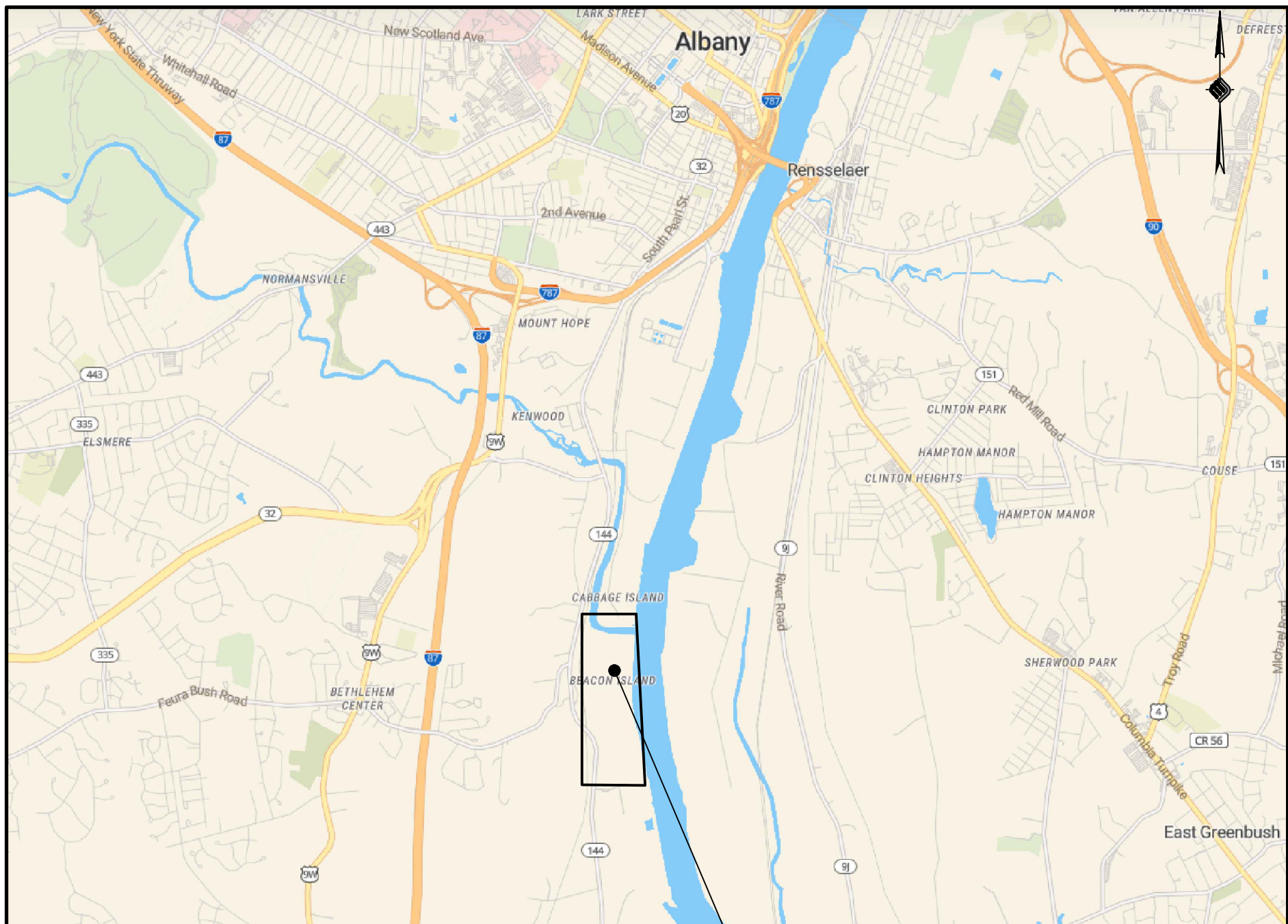
BEACON ISLAND EXPANSION - PHASE 3

ISSUED FOR BID SET
FIRE SERVICE PUMP HOUSE
SEPTEMBER 02, 2025

TOWN OF BETHLEHEM
ALBANY COUNTY
NEW YORK



LOCATION MAP



VICINITY MAP

PREPARED FOR:


PORT OF ALBANY

ALBANY PORT DISTRICT COMMISSION
106 SMITH BOULEVARD
ALBANY, NEW YORK
(518) 463-8763
WWW.ALBANY.GOV

PREPARED BY:


McFarland Johnson

90 EASE AVENUE
SARATOGA SPRINGS, NEW YORK 12866

McFARLAND JOHNSON PROJECT # 18641.06

PLANNING BOARD HTE# 21-00100006

SEALED _____ ADAM J. FROSINO _____

PE_NO _____ 088870 _____

PE_DATE _____ SEPTEMBER 02, 2025 _____



IT IS A VIOLATION OF THE LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

N:\BID\10 ALBANY PORT EXPANSION\DRAWINGS\GENERAL NOTES.DWG

GENERAL NOTES:

1. THE UNDERGROUND STRUCTURES AND UTILITIES SHOWN ON THESE PLANS HAVE BEEN PLOTTED FROM A SURVEY PREPARED BY MASER CONSULTING P.A. 18 COMPUTER DRIVE EAST SUITE 203, ALBANY, NY 12205, DATED JULY 10, 2018 AND AVAILABLE SURVEYS AND RECORD MAPS BY OTHERS. MCFARLAND JOHNSON DOES NOT CERTIFY TO THE ACCURACY OF THEIR LOCATION AND/OR COMPLETENESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION AND EXTENT OF ALL UNDERGROUND STRUCTURES AND UTILITIES PRIOR TO ANY DIGGING OR CONSTRUCTION ACTIVITIES IN THEIR VICINITY. THE CONTRACTOR SHALL HAVE ALL EXISTING UTILITIES FIELD STAKED BEFORE STARTING WORK BY CALLING 1-800-962-7962.
2. THE CONTRACTOR SHALL PERFORM ALL WORK IN COMPLIANCE WITH TITLE 29 OF FEDERAL REGULATIONS, PART 1926, SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION (OSHA).
3. HIGHWAY DRAINAGE ALONG ALL ROADS AND PRIVATE DRIVES SHALL BE KEPT CLEAN OF MUD, DEBRIS ETC. AT ALL TIMES. ALL CATCH BASINS AND STORM SEWER MANHOLES SHALL BE CLEANED PRIOR TO ACCEPTANCE BY THE TOWN.
4. THE CONTRACTOR SHALL CONSULT THE DESIGN ENGINEER BEFORE DEVIATING FROM THESE PLANS.
5. IN ALL TRENCH EXCAVATIONS, CONTRACTOR MUST LAY THE TRENCH SIDE SLOPES BACK TO A SAFE SLOPE, USE A TRENCH SHIELD OR PROVIDE SHEETING AND BRACING. THE MEANS AND METHODS SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER.
6. EXCAVATED WASTE MATERIAL REMOVED FROM THE SITE SHALL BE PLACED AT A LOCATION ACCEPTABLE TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.
7. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO MAINTAIN A MINIMUM OF 2' OF COVER OVER ALL EXISTING AND NEW STORM SEWER PIPES AND 4' OF COVER OVER ALL SANITARY PIPES DURING CONSTRUCTION.
8. ALL EXISTING SURFACE APPURTENANCES (I.E. WATER VALVES, CATCH BASIN FRAMES AND GRATES, MANHOLE COVERS) WITHIN THE PROJECT LIMITS SHALL BE ADJUSTED TO FINISHED GRADE. (NO SEPARATE PAYMENT).
9. AREAS DISTURBED OR DAMAGED AS PART OF THIS PROJECT'S CONSTRUCTION THAT ARE OUTSIDE OF THE PRIMARY WORK AREA SHALL BE RESTORED, AT THE CONTRACTORS EXPENSE, TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
10. UNLESS COVERED BY THE CONTRACT SPECIFICATIONS OR AS NOTED ON THE PLANS, ALL WORK SHALL CONFORM TO THE LATEST VERSION OF THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND ANY SUBSEQUENT REVISIONS OR ENGINEERING BULLETINS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE TO SECURE ALL PERMITS AND PROVIDE ALL BONDS REQUIRED FOR THIS WORK, INCLUDING BUT NOT LIMITED TO UTILITY CONNECTIONS, BUILDING AND SITE CONSTRUCTION.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODE AND/OR UTILITY SERVICE COMPANIES. THIS SHALL BE COMPLETED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL CONNECTION OF SERVICES.
13. MAINTENANCE AND PROTECTION OF TRAFFIC ALONG WITH SECURING THE WORK AREA SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
14. THE CONTRACTOR SHALL LOCATE, SAFEGUARD AND PRESERVE ALL SURVEY CONTROL MONUMENTS AND ROW MONUMENTS IN THE AREAS OF CONSTRUCTION.
15. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND SAFETY PROCEDURES. THE OWNER AND/OR ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUB CONTRACTORS OR THEIR AGENTS, EMPLOYEES OR ANY OTHER PERSON PERFORMING ANY OF THE WORK.
16. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATION ASSOCIATED WITH THIS PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS RELATIVE TO THE SPECIFICATION OR APPLICABLE CODES, IT IS THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE OWNERS REPRESENTATIVE IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE OWNERS REPRESENTATIVE SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS IN FULL CONFORMANCE WITH LOCAL REGULATIONS AND CODES.
17. ALL WORK INCLUDED IN THESE PLANS SUBJECT TO SECTION 128-49 OF THE TOWN ZONING SHALL BE CERTIFIED BY DESIGNATED PROFESSIONALS PURSUANT TO SECTION 128-49(f)(2)(i).
18. ANY GROUND DISTURBANCE WITHIN THE LIMITS OF THE PROPOSED SUBJECT PARCEL SHALL BE PERFORMED IN ACCORDANCE WITH THE SOIL MANAGEMENT PLAN - PORT OF ALBANY EXPANSION PROJECT, BEACON ISLAND PARCEL, BETHLEHEM, ALBANY COUNTY, NEW YORK PREPARED BY ATL DATED "AUGUST 13, 2021".

SEQUENCE OF CONSTRUCTION

1. HOLD A PRE-CONSTRUCTION MEETING WITH PROJECT MANAGER, OPERATOR'S ENGINEER, CONTRACTORS & SUB-CONTRACTORS, AND REPRESENTATIVES OF THE TOWN OF BETHLEHEM (MS4) PRIOR TO LAND DISTURBING ACTIVITIES.
2. HAVE A QUALIFIED PROFESSIONAL CONDUCT AN ASSESSMENT OF THE SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND CERTIFY IN AN INSPECTION REPORT THAT THE APPROPRIATE EROSION AND SEDIMENT CONTROLS DESCRIBED IN THE SWPPP AS REQUIRED BY THE GP-9-20-001 HAVE BEEN ADEQUATELY INSTALLED OR IMPLEMENTED TO ENSURE OVERALL PREPAREDNESS OF THE SITE FOR THE COMMENCEMENT OF CONSTRUCTION.
3. CONSTRUCT TEMPORARY STABILIZED CONSTRUCTION ENTRANCE AT LOCATION SHOWN ON THE DRAWINGS.
4. INSTALL PERIMETER CONTROLS AND INLET PROTECTION AT THE LOCATIONS SHOWN ON THE DRAWINGS.
5. CONSULT A QUALIFIED PROFESSIONAL TO PERFORM A SITE INSPECTION AND VERIFY THAT THE INITIAL PHASE OF EROSION CONTROL DEVICES HAVE BEEN INSTALLED PER THE DRAWINGS PRIOR TO COMMENCEMENT OF GROUND DISTURBANCE.
6. BEGIN CLEARING AND GRUBBING OPERATIONS. CLEARING AND GRUBBING SHALL ONLY BE DONE IN AREAS WHERE EARTHWORK WILL BE PERFORMED.
7. STRIP AND STOCKPILE TOPSOIL, INSTALL PERIMETER EROSION CONTROL AROUND STOCKPILES, SEED AND MULCH PER PLANS.
8. COMMENCE EARTHWORK CUTS AND FILLS. WORK SHALL BE PROGRESSED TO ALLOW A REASONABLE TRANSFER OF CUT AND FILL FOR ROUGH GRADING AND EARTH MOVING FOR BULK SITE GRADING.
9. STABILIZE ALL AREAS IDLE IN EXCESS OF 7 DAYS IN WHICH CONSTRUCTION WILL NOT COMMENCE WITHIN 7 DAYS.
10. ADJUST THE EROSION AND SEDIMENT CONTROL PRACTICES AS REQUIRED FOR CONTINUING CONSTRUCTION AS SHOWN ON THE EROSION & SEDIMENT CONTROL PLAN. THIS SHALL BE A PHASED ADJUSTMENT IN ORDER TO ENSURE THAT RUNOFF FROM ALL DISTURBED AREAS IS TREATED BY APPROPRIATE EROSION AND SEDIMENT CONTROL DEVICES.
11. BEGIN UTILITY INSTALLATION AND BACKFILL. UTILITY INSTALLATION AREA SHALL BE STABILIZED WITH SEED AND MULCH PROGRESSIVELY AT THE END OF EACH WORK DAY.
12. CONSTRUCT CATCH BASINS, AREA INLETS AND STORM SEWER MANHOLES, AS SHOWN ON THE PLANS.
13. INSTALL INLET/OUTLET PROTECTION PROGRESSIVELY AS THE STORM SEWER IS INSTALLED.
14. AS LAWN AREAS ARE BROUGHT TO GRADE, STABILIZE WITH TOPSOIL, SEED AND MULCH PER SPECIFICATIONS.
15. FINALIZE PAVEMENT SUB-GRADE PREPARATION.
16. INSTALL ASPHALT SUB-BASE MATERIAL AS REQUIRED FOR PAVEMENT.
17. CARRY OUT ALL FINAL GRADING, STABILIZE SLOPES GREATER THAN 3H:1V WITH HEIGHTS EXCEEDING 5 FEET WITH EROSION CONTROL MATTING/BLANKETS, AND SEED AND MULCH ALL DISTURBED AREAS.
18. A QUALIFIED PROFESSIONAL SHALL PERFORM A SITE ASSESSMENT TO CONFIRM THAT ALL PERMANENT STORMWATER DEVICES HAVE BEEN INSTALLED PER PLANS AND 80% UNIFORM GERMINATION/STABILIZATION HAS BEEN ACHIEVED PRIOR TO THE REMOVAL OF ALL REMAINING TEMPORARY EROSION AND SEDIMENT CONTROLS.

TOWN OF BETHLEHEM SEQRA NOTES:

1. CONTRACTOR SHALL ENSURE CONFORMANCE WITH THE TOWN'S NOISE ORDNANCE. THIS INCLUDES BUT IS NOT LIMITED TO TAKING NOISE READINGS ON A REGULAR BASIS AT THE PROPERTY LINE AND PROVIDING DOCUMENTATION OF NOISE LEVELS. SHOULD NOISE LEVEL EXCEED THE TOWN'S ORDINANCE REQUIREMENTS, IT IS THE CONTRACTORS RESPONSIBILITY TO MODIFY THEIR MEANS AND METHODS TO REDUCE THE NOISE LEVELS AND/OR PROVIDE MITIGATION TO REDUCE THE NOISE LEVEL TO VALUES WITHIN THE TOWN REQUIREMENTS.
2. THE CONTRACTOR SHALL BE AWARE OF THE REQUIRED COMMUNITY AIR MONITORING PLAN (CAMP), PURSUANT TO THE NYSDEC DER 10, THAT WILL BE IMPLEMENTED BY THE OWNER WHENEVER GROUND DISTURBANCE IS OCCURRING WITHIN THE AREA KNOWN TO POTENTIALLY CONTAIN FLY ASH. SEE PAGES 211-216 FOR GUIDANCE ON THE CONTENT OF THE CAMP. IN ADDITION THE CAMP SHALL COMPLY WITH SECTION 4.3 OF THE SITE'S SOIL MANAGEMENT PLAN WHICH IS PROVIDED AS APPENDIX H IN THE STORM WATER POLLUTION PREVENTION PLAN.

Sheet List Table		
DRAWING	SHEET TITLE	DRAWING NUMBER
COVR	COVER SHEET	--
GN-01	GENERAL NOTES	1
SP-00	OVERALL SITE PLAN	2
SP-01	DETAILED SITE PLAN & PROFILE	3
GR-01	GRADING & DRAINAGE	4
UT-01	UTILITY PLAN	5
MD-01	MISCELLANEOUS DETAILS	6
F-100P	FIRE PUMP BUILDING PLANS	--
G-100P	STANDARD NOTES & DETAILS	--
S-100P	PLANS & SECTIONS	--
E-601S	ELECTRICAL SINGLE LINE DIAGRAM	--



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PROJECT MILESTONE		
BID SET		
NO.	DATE	DESCRIPTION

CLIENT:

ALBANY PORT DISTRICT COMMISSION

ALBANY, NEW YORK

PROJECT:

BEACON ISLAND EXPANSION - PHASE 3
FIRE SERVICE PUMP HOUSE

DRAWN	JES
DESIGNED	NSO
CHECKED	AJF
SCALE	AS SHOWN
DATE	09/02/2025
PROJECT	18641.06

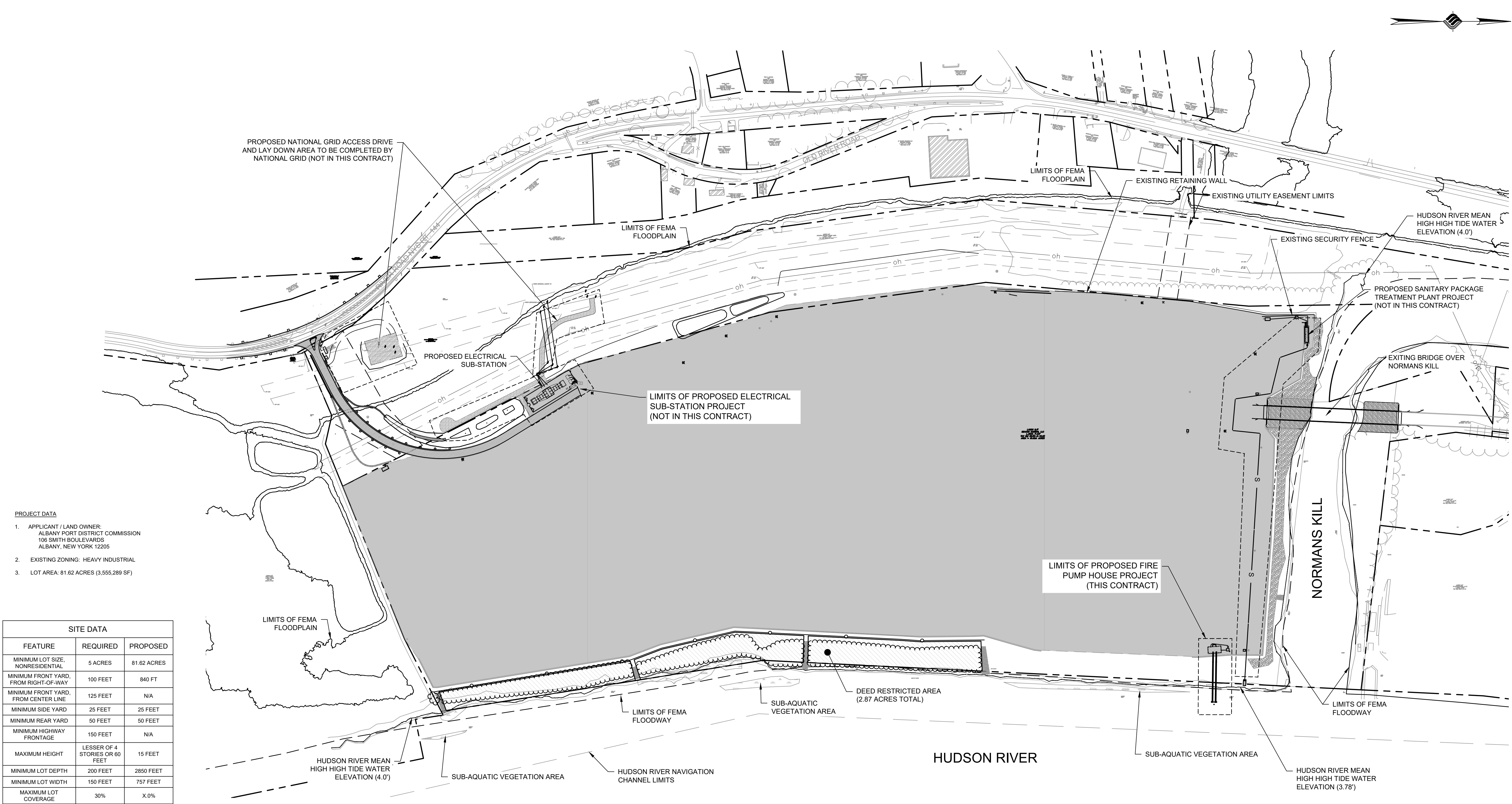


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DRAWING TITLE	
GENERAL NOTES	
DRAWING NUMBER	
GN-01	
1	OF 6

PLANNING BOARD HTE# 21-00100006

N:\186410\ALBANY PORT EXPANSION\DRAWINGS\SP-01-01-000006.DWG



- PROJECT DATA
1. APPLICANT / LAND OWNER:
ALBANY PORT DISTRICT COMMISSION
105 SMITH BOULEVARDS
ALBANY, NEW YORK 12205
 2. EXISTING ZONING: HEAVY INDUSTRIAL
 3. LOT AREA: 81.62 ACRES (3,555,289 SF)

SITE DATA		
FEATURE	REQUIRED	PROPOSED
MINIMUM LOT SIZE, NONRESIDENTIAL	5 ACRES	81.62 ACRES
MINIMUM FRONT YARD, FROM RIGHT-OF-WAY	100 FEET	840 FT
MINIMUM FRONT YARD, FROM CENTER LINE	125 FEET	N/A
MINIMUM SIDE YARD	25 FEET	25 FEET
MINIMUM REAR YARD	50 FEET	50 FEET
MINIMUM HIGHWAY FRONTAGE	150 FEET	N/A
MAXIMUM HEIGHT	LESSER OF 4 STORIES OR 60 FEET	15 FEET
MINIMUM LOT DEPTH	200 FEET	2850 FEET
MINIMUM LOT WIDTH	150 FEET	757 FEET
MAXIMUM LOT COVERAGE	30%	X.0%

* WILL REQUEST A VARIANCE

ZONING:

EXISTING: ±81.62 ACRES HEAVY INDUSTRIAL

PROPOSED: ±81.62 ACRES HEAVY INDUSTRIAL

TAX ACCOUNT NUMBERS: 98 00-2-10 23
98 01-2-1

* ENTIRE SITE IS WITHIN 100-YR FLOODPLAIN

PARKING:

1 SPACE FOR EACH 2 EMPLOYEES ON MAXIMUM WORKING SHIFT.

TOTAL EMPLOYEES = 0

REQUIRED: 0 TOTAL SPACES REQUIRED

PROVIDED: 0 TOTAL SPACES PROVIDED

ADA SPACES REQUIRED:
PER 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN

REQUIRED (0 SPACE LOT): 0 SPACES (0 STANDARD & 0 VAN)
FOR TOTAL PARKING 0 SPACES

PROVIDED (0 SPACE LOT): 0 SPACES (0 STANDARD & 0 VAN)

PLANNING BOARD HTE# 21-00100006

- LEGEND**
- PROPERTY LINE ————
- EASEMENT LIMITS ————
- DITCH CENTERLINE ————
- ROADSIDE SWALE ————
- BUILDING SETBACK ————
- EXISTING BUILDING [Hatched Pattern]

- WETLAND AREA [Stippled Pattern]
- PAVEMENT AREA [Solid Grey]
- CONCRETE AREA [Dotted Pattern]
- RIP-RAP WATER EMBANKMENT STABILIZATION [Cross-hatched Pattern]
- DEED RESTRICTED AREA [Diagonal Line Pattern]



McFarland Johnson

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SARATOGA SPRINGS, NEW YORK 12866
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SaratogaROM@mjinco.com

PROJECT MILESTONE		
BID SET		
NO.	DATE	DESCRIPTION

CLIENT: **ALBANY PORT DISTRICT COMMISSION**

ALBANY, NEW YORK

PROJECT: **BEACON ISLAND EXPANSION - PHASE 3**
FIRE SERVICE PUMP HOUSE

DRAWN	JES
DESIGNED	NSO
CHECKED	AJF
SCALE	1"=40'
DATE	09/02/2025
PROJECT	18641.06



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DRAWING TITLE

OVERALL SITE PLAN

DRAWING NUMBER

SP-00

2 OF 6



McFarland Johnson
60 RAILROAD PLACE
SUITE 402
SARATOGA SPRINGS, NEW YORK 12866
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PROJECT MILESTONE
BID SET

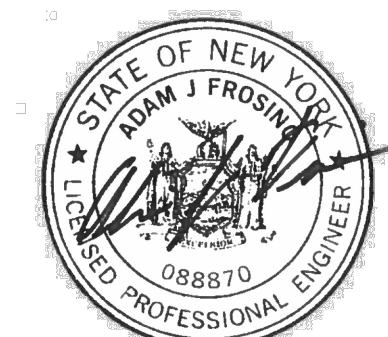
NO.	DATE	DESCRIPTION

CLIENT:
ALBANY PORT DISTRICT COMMISSION

ALBANY, NEW YORK

PROJECT:
**BEACON ISLAND EXPANSION - PHASE 3
FIRE SERVICE PUMP HOUSE**

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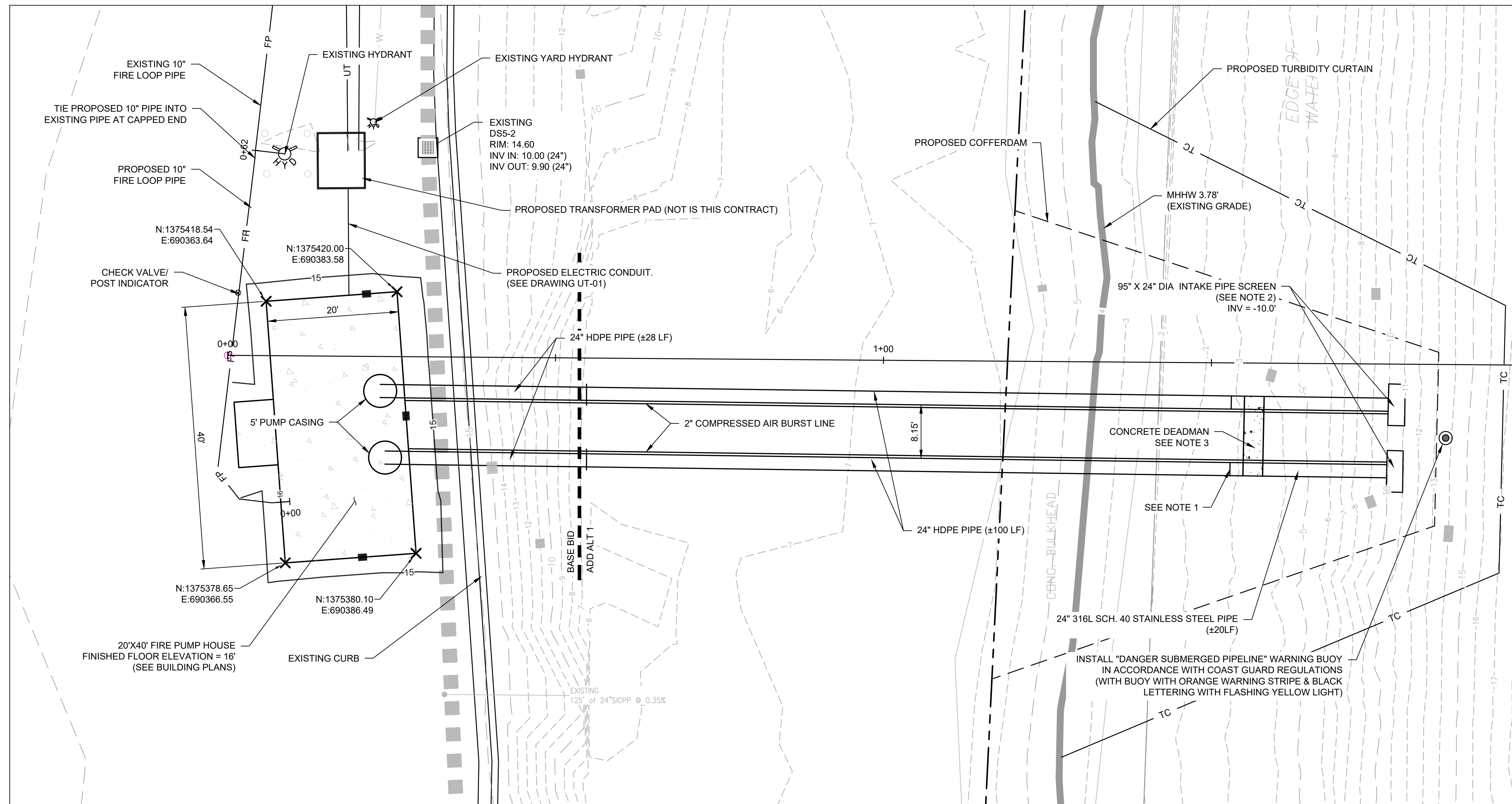
DRAWING TITLE

**DETAILED SITE PLAN
& PROFILE**

DRAWING NUMBER

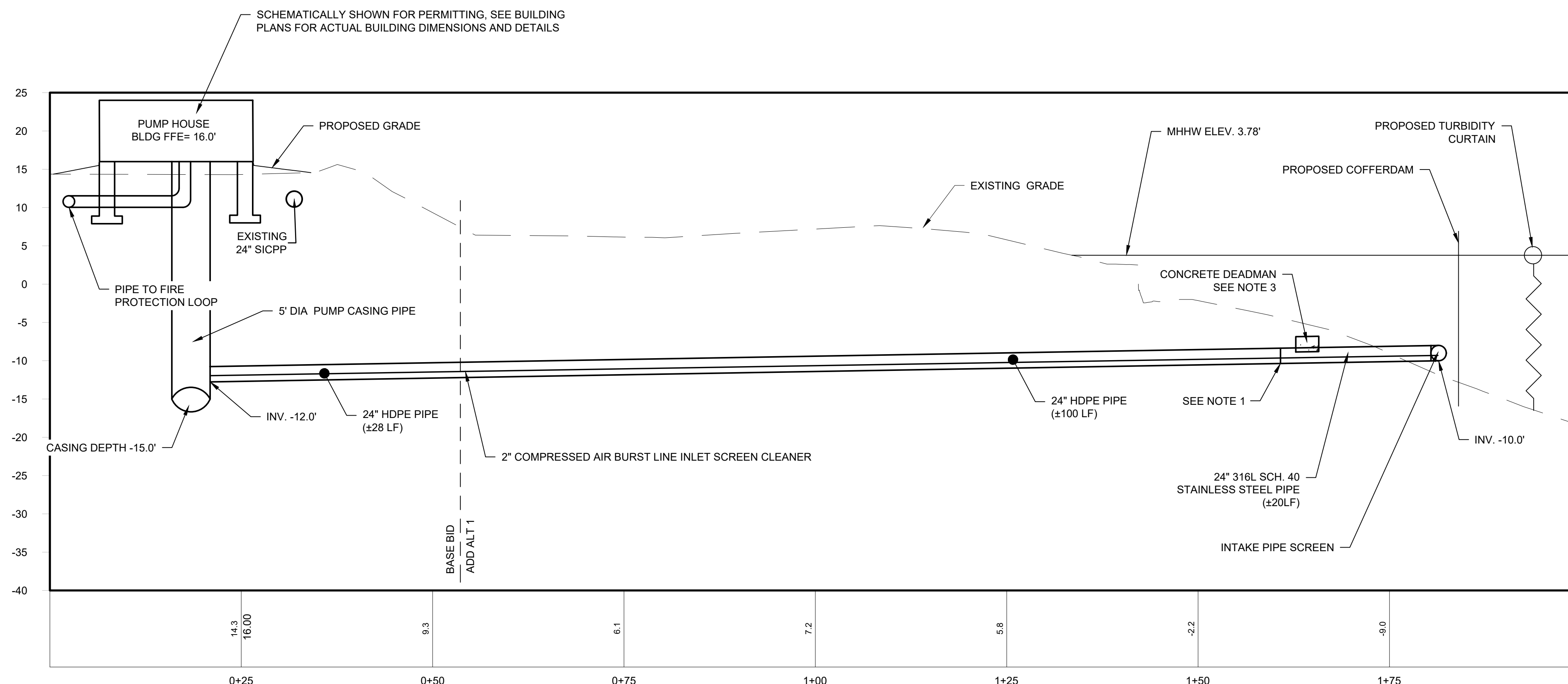
SP-01

3 OF 6



** REFER TO F-100P FOR DETAILS ON THE PUMPHOUSE.
ALL BUILDING INFORMATION SHOWN ON THIS PLAN IS
SCHEMATIC IN NATURE FOR THE ENVIRONMENTAL
PERMITTING AND NOT INTENDED FOR CONSTRUCTION.

PLANNING BOARD HTE# 21-00100006



Section 1
Horizontal Scale: 1" = 10'
Vertical Scale: 1" = 10'



N:\BID\18641\06 ALBANY PORT EXPANSION\DRAWINGS\SP-01 FIRE PUMP HOUSE\18641.DWG

LEGEND

PROPERTY LINE

BUILDING SETBACK

EXISTING CONTOUR

PROPOSED CONTOUR

DITCH CENTERLINE

PROPOSED CHECK DAM

PROPOSED SPOT ELEVATIONS

WETLAND AREA

EXISTING DRAINAGE PIPE

EXISTING RIP RAP

MATERIAL STORAGE AREA

HUDSON RIVER DREDGING

EXCAVATION FOR WHARF

NOTE:

1. TURBIDITY CURTAIN SHALL BE INSTALLED IN ACCORDANCE WITH NYSDOT STANDARD SPECIFICATION SECTION 219 IN COMPLIANCE WITH NYSDOT ITEM 219.1501 AND NYSDOT STANDARD SHEET 209-06. ENGINEER SHALL REVIEW AND APPROVE THE CONTRACTOR PROPOSED TURBIDITY CURTAIN INCLUDING INSTALLATION METHODS, PRIOR TO INSTALLATION IN THE FIELD.
2. DEWATERING AREA SHALL BE COMPLETE WITH A TEMPORARY COFFERDAM. THE COFFERDAM SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH NYSDOT STANDARD SPECIFICATION SECTION 553 IN COMPLIANCE WITH A TYPE 1 COFFERDAM. NYSDOT ITEM 553.01. ENGINEER AND THE NYSDEC SHALL REVIEW AND APPROVE THE PROPOSED COFFERDAM PRIOR TO INSTALLATION IN THE FIELD.
3. ALL WORK BELOW THE MHHWL SHALL BE IN ACCORDANCE WITH ALL REQUIREMENTS OF THE NYSDEC ARTICLE 11 AND 15 PERMITS ISSUED. THIS INCLUDES SEASONAL TIME OF YEAR RESTRICTIONS FOR IN WATER WORK TO ONLY BE AUTHORIZED BETWEEN SEPTEMBER 1ST AND OCTOBER 31ST. NO WORK WITHIN THE MHHW MAY TAKE PLACE WITHOUT PRIOR NYSDEC APPROVAL OF THE PROPOSED WORK PLAN, INCLUDING ALL PROPOSED EQUIPMENT AND ACCESS PATHS. ANY PROPOSED PLAN SHOULD MINIMIZE DISTURBANCE TO THE SHORELINE AND RIVER BOTTOM. CONTRACTOR SHOULD SCHEDULE FOR A 90-DAY REVIEW AND APPROVAL PROCESS WITH NYSDEC.



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CLIENT:

ALBANY PORT DISTRICT COMMISSION

PROJECT:

ALBANY, NEW YORK
BEACON ISLAND EXPANSION - PHASE 3
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DATE	09/02/2025
PROJECT	18641.06

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY, IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

DRAWING TITLE

GRADING & DRAINAGE

DRAWING NUMBER

GR-01

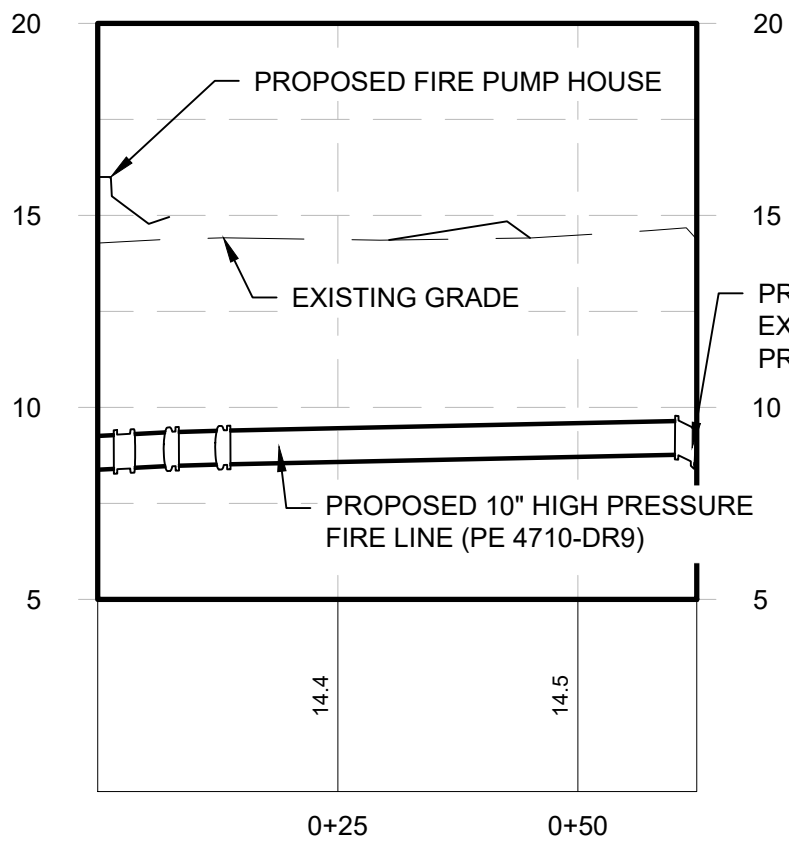
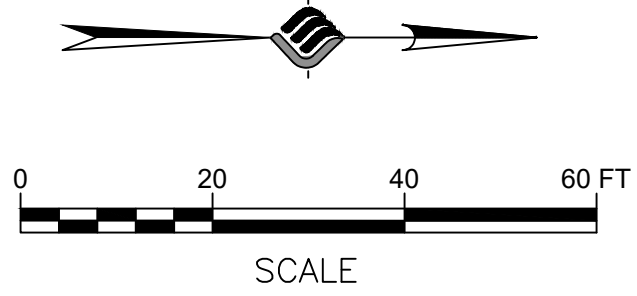
4 OF 6

LEGEND

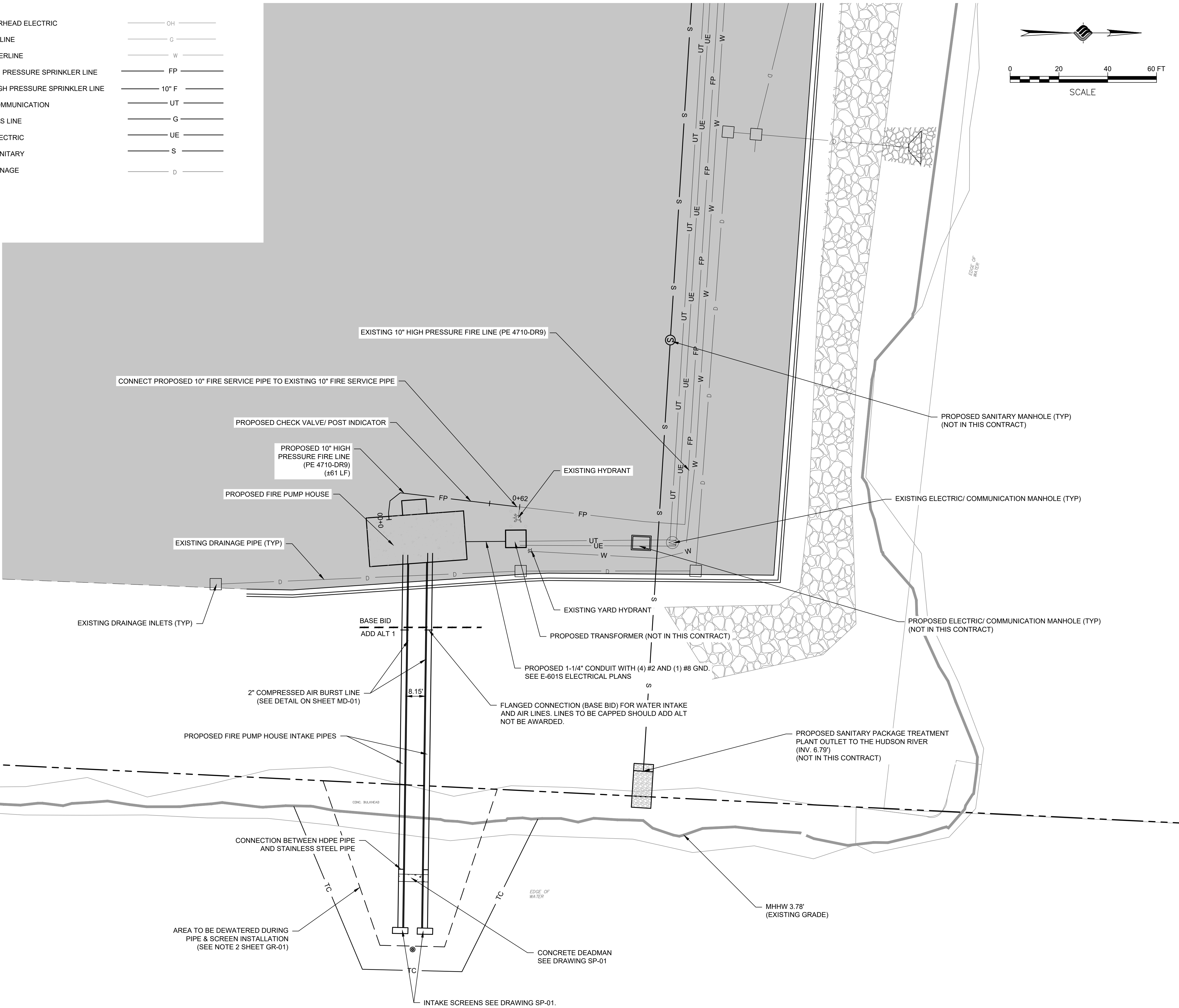
- PROPERTY LINE
WETLAND AREA
SECURITY FENCE
PROPOSED SANITARY MANHOLE
PROPOSED DRAINAGE INLET

- EXISTING OVERHEAD ELECTRIC
EXISTING GAS LINE
EXISTING WATERLINE
EXISTING HIGH PRESSURE SPRINKLER LINE
PROPOSED HIGH PRESSURE SPRINKLER LINE
PROPOSED COMMUNICATION
PROPOSED GAS LINE
PROPOSED ELECTRIC
PROPOSED SANITARY
EXISTING DRAINAGE

- OH
G
W
FP
10" F
UT
G
UE
S
D



FIRE HOUSE CONNECTION
Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 5'



PLANNING BOARD HTE# 21-00100006

McFarland Johnson
90 EAST AVENUE
SARATOGA SPRINGS, NEW YORK 12866
P:518-580-9380 F:518-580-9383
SaratogaROM@mjinc.com

PROJECT MILESTONE
BID SET

NO.	DATE	DESCRIPTION

CLIENT: **ALBANY PORT DISTRICT COMMISSION**
ALBANY, NEW YORK
PROJECT: **BEACON ISLAND EXPANSION - PHASE 3**
FIRE SERVICE PUMP HOUSE

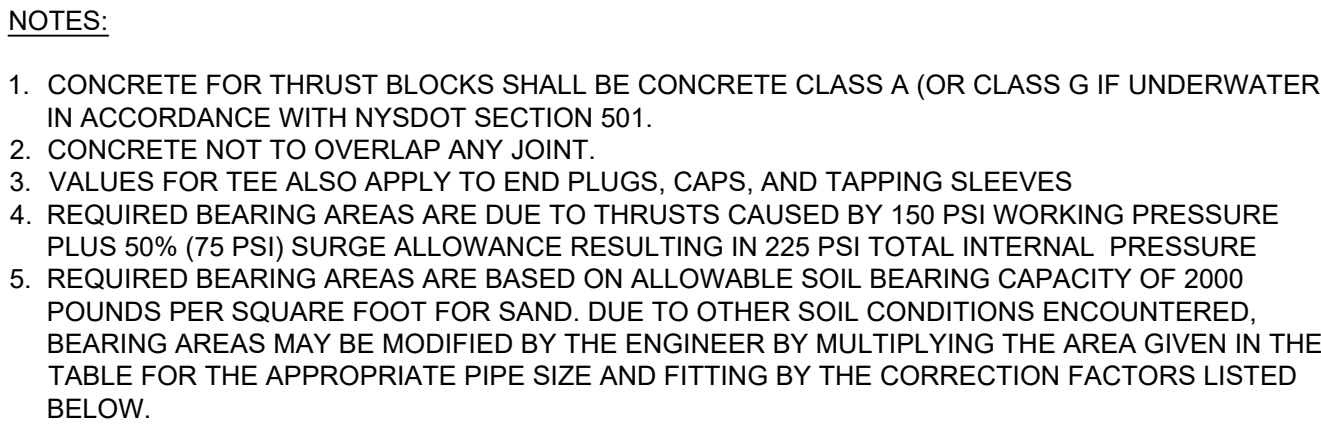
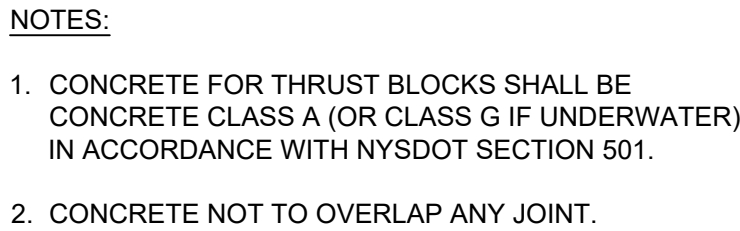
DRAWN	JES
DESIGNED	NSO
CHECKED	AJF
SCALE	AS SHOWN
DATE	09/02/2025
PROJECT	18641.06



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

DRAWING TITLE
UTILITY PLAN

DRAWING NUMBER
UT-01

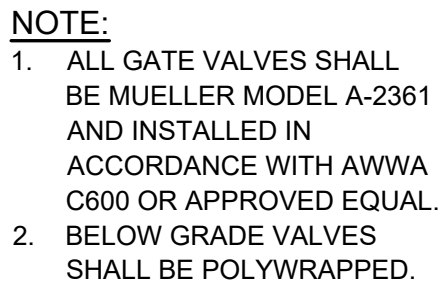
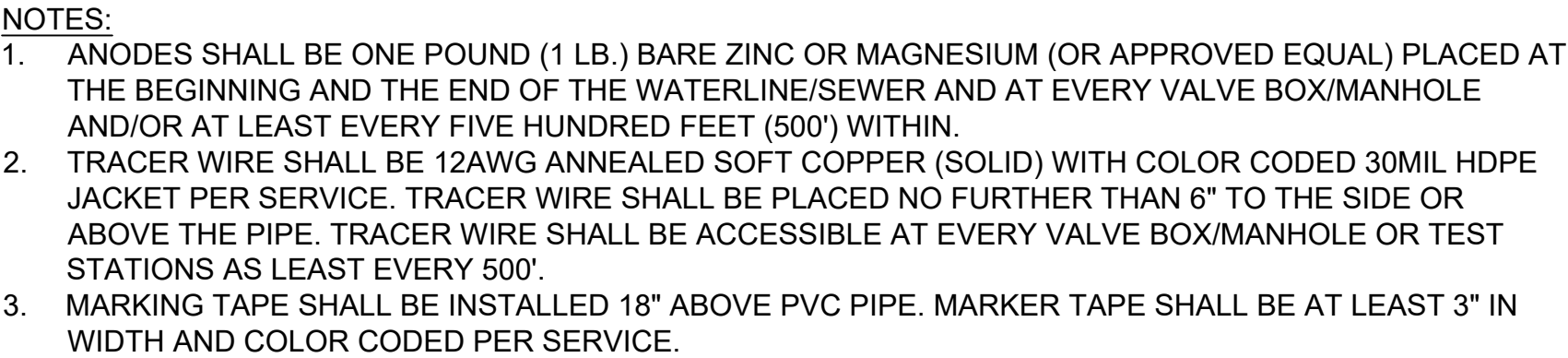
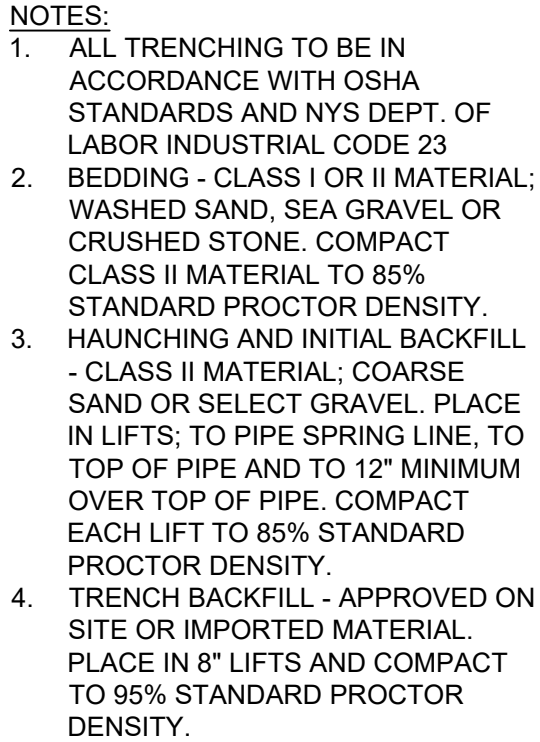


REQUIRED BEARING AREAS & DIMENSIONS FOR CONCRETE THRUST BLOCKS (DIMENSIONS SHOWN IN FT)										
TEE			90° BEND		45° BEND		22-1/2° BEND		11-1/4° BEND	
PIPE SIZE (IN)	AREA (SQFT)	DIM D X L	AREA (SQFT)	DIM D X L	AREA (SQFT)	DIM D X L	AREA (SQFT)	DIM D X L	AREA (SQFT)	DIM D X L
6	3.2	1.5 X 2.5	4.5	2.0 X 2.5	2.4	1.5 X 2.0	1.2	1.0 X 1.5	0.6	0.5 X 1.5
8	5.7	2.0 X 3.0	8	2.0 X 4.0	4.3	2.0 X 2.5	2.2	1.5 X 1.5	1.1	1.0 X 1.5
12	12.7	3.5 X 3.5	18.0	4.0 X 4.5	9.7	2.5 X 4.0	5.0	2.0 X 2.5	2.5	1.5 X 2.0

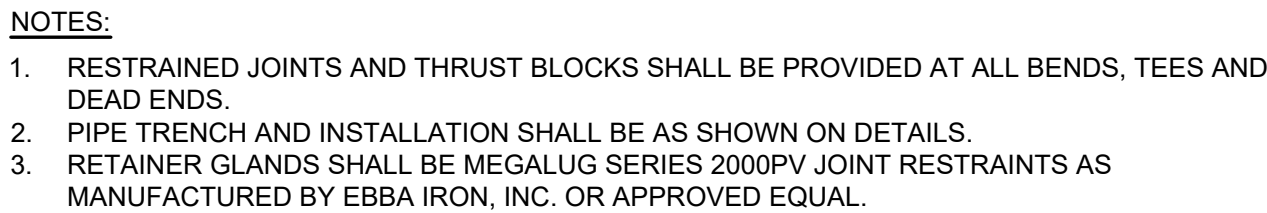
<u>SOIL</u>	<u>ALLOWABLE SOIL PRESSURE (LBS/SQ.FT)</u>	<u>CORRECTION FACTOR</u>
SOFT CLAY	1,000	2.00
SAND	2,000	1.00
SAND & GRAVEL	3,000	0.67
SAND AND GRAVEL CEMENTED WITH CLAY	4,000	0.50
HARD SHALE	10,000	0.20

6. IN MUCK, PEAT, OR RECENTLY PLACED FILL ALL THRUST BLOCKS SHALL BE RESISTED BY PILES OF TIE RODS TO SOLID FOUNDATIONS, OR BY REMOVAL OF SUCH UNSTABLE MATERIAL AND REPLACEMENT WITH BALLAST OF SUFFICIENT STABILITY TO RESIST THE THRUSTS, ALL AS REQUIRED BY THE ENGINEER.

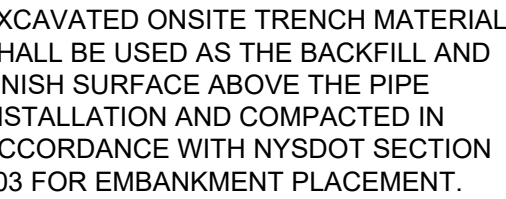
N.T.S.



N.T.S.



N.T.S.



- NOTES:**
1. ALL TRENCHING TO BE IN ACCORDANCE WITH OSHA STANDARDS AND NYS DEPT. OF LABOR INDUSTRIAL CODE 23
 2. BEDDING - CLASS I OR II MATERIAL: WASH SAND, SEA GRAVEL OR CRUSHED STONE. COMPACT CLASS II MATERIAL TO 85% STANDARD PROCTOR DENSITY.
 3. HAUNCHING AND INITIAL BACKFILL - CLASS II MATERIAL; COARSE SAND OR SELECT GRAVEL. PLACE IN LIFTS; TO PIPE SPRING LINE. TO TOP OF PIPE AND TO 12" MINIMUM OVER TOP OF PIPE. COMPACT EACH LIFT TO 85% STANDARD PROCTOR DENSITY.
 4. TRENCH BACKFILL - APPROVED ON SITE IMPORTED MATERIAL. PLACE IN 6" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY.
 5. EXCAVATION SHALL BE COMPLETED IN ACCORDANCE WITH NYS DOT SPECIFICATION 206-TRENCH, CULVERT AND STRUCTURE EXCAVATION.

N.T.S.



PROJECT MILESTONE

BID SET

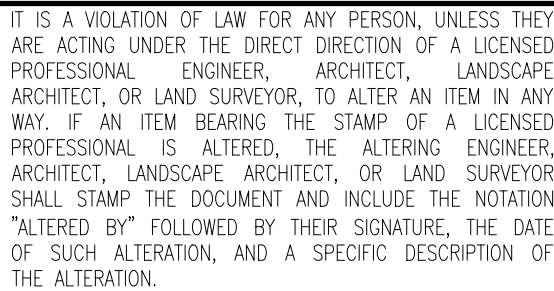
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CLIENT:
ALBANY PORT DISTRICT COMMISSION

ALBANY, NEW YORK

PROJECT: BEACON ISLAND EXPANSION - PHASE 3
FIRE SERVICE PUMP HOUSE

DRAWN	JES
DESIGNED	NSO
CHECKED	AJF
SCALE	1"=40'
DATE	09/02/2025
PROJECT	18641.06



DRAWING TITLE

MISCELLANEOUS DETAILS

DRAWING NUMBER

MD-01

6 OF 6

- FOUNDATION NOTES
- ALL STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE SITE, ARCHITECTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS AND THE SPECIFICATIONS.
 - ALL CONCRETE WORK SHALL COMPLY WITH THE LATEST RECOMMENDATIONS AND SPECIFICATIONS OF THE AMERICAN CONCRETE INSTITUTE (ACI) AND THE LOCAL BUILDING CODES.
 - ACI 211.1 - RECOMMENDED PRACTICE FOR SELECTING PROPORTIONS FOR NORMAL WEIGHT CONCRETE.
 - ACI 212 - GUIDE FOR USE OF ADMIXTURES IN CONCRETE - COMMITTEE REPORT.
 - ACI 214 - RECOMMENDED PRACTICE FOR EVALUATION OF COMPRESSION TEST RESULTS OF FIELD CONCRETE.
 - ACI 301 - SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.
 - ACI 302 - RECOMMENDED PRACTICE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION.
 - ACI 304 - GUIDE FOR MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE.
 - ACI 305 - RECOMMENDED PRACTICE FOR HOT WEATHER CONCRETING.
 - ACI 306 - RECOMMENDED PRACTICE FOR COLD WEATHER CONCRETING.
 - ACI 308 - RECOMMENDED PRACTICE FOR CURING CONCRETE.
 - ACI 309 - RECOMMENDED PRACTICE FOR CONSOLIDATION OF CONCRETE.
 - ACI 315 - MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES.
 - ACI 318 - BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
 - ACI 347 - RECOMMENDED PRACTICE FOR CONCRETE FORMWORK.
 - SEE SPECIFICATIONS FOR DESIGN MIX REQUIREMENTS. USE 1 1/2" AGGREGATE FOR ALL SLABS-ON-GRADE. SUBMIT A CURRENT (MAXIMUM 18 MONTHS OLD) DESIGN MIX OF THE EXACT SAME MIX TO BE USED ON THE PROJECT, WITH 28 DAY COMPRESSIVE STRENGTH TESTS, TO THE ENGINEER FOR REVIEW PRIOR TO STARTING CONSTRUCTION.
 - ALL REINFORCING STEEL SHALL COMPLY WITH ASTM A615, GRADE 60 EXCEPT AS OTHERWISE NOTED.
 - LAP ALL BARS AT SPLICES PER REQUIREMENTS OF ACI 318 UNLESS INDICATED OTHERWISE ON THE DRAWINGS. TOP BARS TO BE SPLICED AT MIDSPAN AND BOTTOM BARS AT SUPPORTS.
 - REINFORCEMENT SHALL BE SECURELY TIED IN ITS PROPER PLACE BEFORE AN DURING POURING OPERATIONS USING APPROVED CHAIRS AND SPACERS AS REQUIRED. NO BARS SHALL BE CUT OR OMITTED IN THE FIELD WITH THE APPROVAL OF THE ENGINEER. USE PLASTIC TYPED ACCESSORIES IN CONCRETE EXPOSED TO WEATHER, WATER OR VIEW.
 - WHERE CONTINUOUS BARS ARE CALLED FOR, INDICATED OR REQUIRED, THEY SHALL BE RUN CONTINUOUSLY AROUND CORNERS, DOWELED INTO INTERSECTING WALLS AND LAPPED AT NECESSARY SPLICES WITH SPLICES STAGGERED WHEREVER POSSIBLE.
 - THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCEMENT:
 - CONCRETE CAST AGAINST EARTH 3"
 - FORMED CONCRETE EXPOSED TO EARTH OR WEATHER
 - #5 (16) AND SMALLER 1 1/2"
 - #6 (#19) AND LARGER 2"
 - CONCRETE NOT EXPOSED TO EARTH OR WEATHER
 - SLABS, WALLS AND JOISTS 3/4"
 - BEAMS AND COLUMNS 1 1/2"
 - THE CONCRETE CONTRACTOR SHALL INSTALL (OR GIVE OTHER TRADES AMPLE OPPORTUNITY TO INSTALL) ALL ANCHORS, BOLTS, PLATE, NAILERS, SLOTS, CHASES, PIPE SLEEVES, ETC., AS REQUIRED BY OTHER TRADES. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE SETTING SCREEDS AND FORMS. FORM RELEASE OIL TO BE AN APPROVED LIQUID.
 - FOOTINGS SHALL REST ON A MINIMUM 3FT DEEP BED OF COMPACTED SELECT STRUCTURAL FILL OVER SUITABLE PRE-LOADED AND SURCHARGED SUBGRADES HAVING A MINIMUM BEARING CAPACITY OF 3000 PSF. ELEVATIONS OF BOTTOM OF FOOTINGS ARE SHOWN ON PLANS, BUT ARE SUBJECT TO REVISION WHEN TRUE SOIL CONDITIONS ARE EXPOSED BY EXCAVATION. THE ENGINEER SHALL BE NOTIFIED PROMPTLY OF ANY WEAK STRATA, WATER CONDITIONS OR OTHER POOR BEARING CONDITIONS.
 - CONTRACTOR SHALL REFER TO PROJECT GEOTECHNICAL REPORT BY TERRACON DATED FEBRUARY 4, 2022 FOR ALL SITE PREPARATION, PRE-LOADING AND SURCHARGING REQUIREMENTS.
 - FOOTING EXCAVATIONS SHALL BE DONE IN SUCH A MANNER AS TO DRAIN AWAY ALL SURFACE AND GROUND WATER. EXCAVATION EQUIPMENT AND PROCEDURES SHALL BE USED SUCH THAT FIRM SOIL BEARING CONDITIONS ARE MAINTAINED.
 - UNLESS OTHERWISE NOTED, ALL FOOTINGS, PILES, CAISSONS AND PIERS SHALL BE CENTERED UNDER SUPPORTED MEMBER.
 - SLABS AND BEAMS SHALL BE POURED MONOLITHICALLY EXCEPT WHERE OTHERWISE SHOWN AND SHALL BE FINISHED AS INDICATED IN THE SPECIFICATIONS. CONSTRUCTION JOINTS IN FRAMED SLABS SHALL BE LOCATED SO THAT EACH INDIVIDUAL POUR DOES NOT EXCEED 750 SQUARE FEET IN AREA NOR 30 FEET IN ANY DIRECTION. SLABS SHALL BE POURED IN ALTERNATE PANELS.
 - CONTRACTOR SHALL REPAIR, AT HIS EXPENSE, ALL CONCRETE SLAB DEFECTS SUCH AS CURLING OR CRACKING, GRINDING, PATCHING, ETC. REPAIR PROCEDURES SHALL BE APPROVED BY THE ENGINEER PRIOR TO STARTING WORK.
 - CHAMFER EDGES OF EXPOSED BEAMS AND COLUMNS.
 - CONCRETE TEMPERATURE DURING THE FIRST SEVEN DAYS SHALL BE MAINTAINED BETWEEN 50 DEG.F AND 90 DEG.F. RAPID DRYING MUST BE PREVENTED.
 - ALLOW 7 DAYS BETWEEN ALL ADJACENT POURS.

- CURING
- HORIZONTAL SURFACES SHALL BE KEPT CONTINUOUSLY MOIST FOR A MINIMUM OF SEVEN DAYS.
 - VERTICAL SURFACES SHALL RECEIVE 2 COATS (ONE AT TIME OF STRIPPING AND ANOTHER 3 DAYS LATER) OF AN APPROVED CURING COMPOUND.
- BACKFILLING AGAINST FOUNDATION WALLS SHALL BE DONE BY PLACING SIMULTANEOUS LEVEL LAYERS ON BOTH SIDES OF THE WALL SUCH THAT THE DIFFERENCE BETWEEN ONE SIDE AND THE OTHER DOES NOT EXCEED 24 INCHES.
- SELECT BACKFILL OUTSIDE OF FOUNDATION WALL:
- AN APPROVED MATERIAL FREE OF BOULDERS LARGER THAN 6", ORGANIC MATERIAL, TOPSOIL AND DEBRIS.
 - PLACE IN MAXIMUM 8" LIFTS AND COMPACT TO 95% MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DEFINED BY ASTM D-1557.
- CONTRACTOR TO DESIGN, FURNISH AND INSTALL ALL TEMPORARY SHEETING, SHORING AND BRACING NECESSARY TO SAFELY COMPLETE THE CONSTRUCTION.
- THE CONTRACTOR SHALL PROVIDE THE NECESSARY EQUIPMENT AND CONTINUOUSLY DEWATER THE SITE TO FACILITATE CONSTRUCTION AND SAFE WORKING CONDITIONS.
- SHOP DRAWINGS PREPARED IN ACCORDANCE WITH ACI STANDARDS WILL BE REQUIRED FROM THE CONTRACTOR FOR REINFORCING STEEL PRIOR TO CONSTRUCTION. THE REUSE, OR REPRODUCTION, OR ANY PORTION OF THESE DOCUMENTS FOR USE AS SHOP DRAWINGS IS STRICTLY PROHIBITED WITHOUT THE WRITTEN PERMISSION OF MCFARLAND-JOHNSON, INC.
- THE OWNER WILL EMPLOY A QUALIFIED INDEPENDENT ENGINEERING TESTING FIRM TO PERFORM STANDARD FIELD TESTING OF THE CONCRETE WORK. CONCRETE SHALL BE TESTED FOR:
- COMPRESSIVE STRENGTH (AS INDICATED IN THE SPECIFICATIONS) TAKE TWO SETS OF FOUR (4) 6" X 12" CYLINDERS FOR EACH PLACEMENT AND NOT LESS THAN TWO SETS FOR EACH 50 CUBIC YARDS.
 - SLUMP (BEFORE AND AFTER PLASTICIZER IF USED).
 - TEMPERATURE (AIR AND CONCRETE).
 - AIR CONTENT.
 - UNIT WEIGHT.

COLD WEATHER CONSTRUCTION PROCEDURES

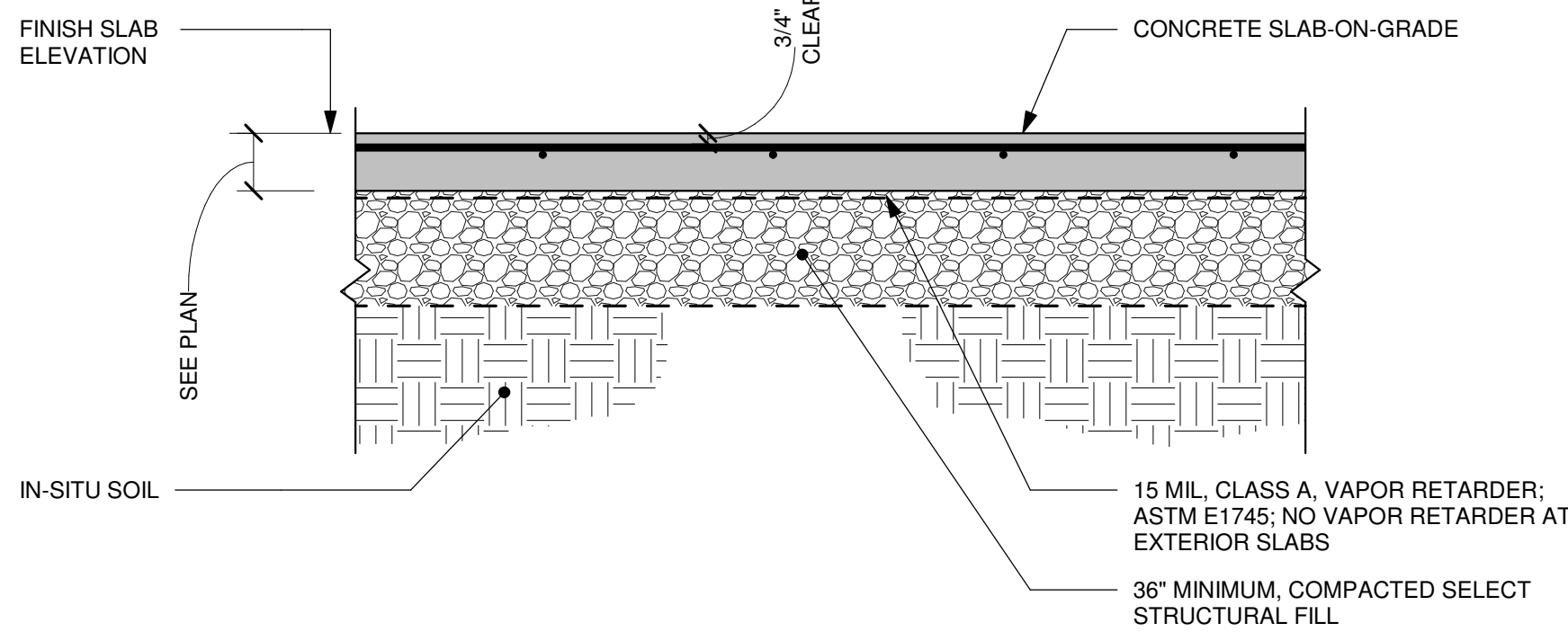
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTINUOUSLY PROTECT SOILS, CONCRETE, MASONRY AND OTHER BUILDING MATERIALS FROM DAMAGE DUE TO COLD TEMPERATURES UNTIL THE BUILDING HAS BEEN TURNED OVER TO THE OWNER. THIS SHALL INCLUDE TEMPORARY ENCLOSURES, INSULATED BLANKETS AND TEMPORARY HEATING.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE ANY DAMAGED OR DEFECTIVE WORK, IN A MANNER APPROVED BY THE ENGINEER.
- ALL PROTECTIVE AND CORRECTIVE WORK SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

DESIGN LOADS

ROOF LOAD
COLLATERAL = 10 PSF
 $P_s = 40$ PSF
 $I_s = 1.2$

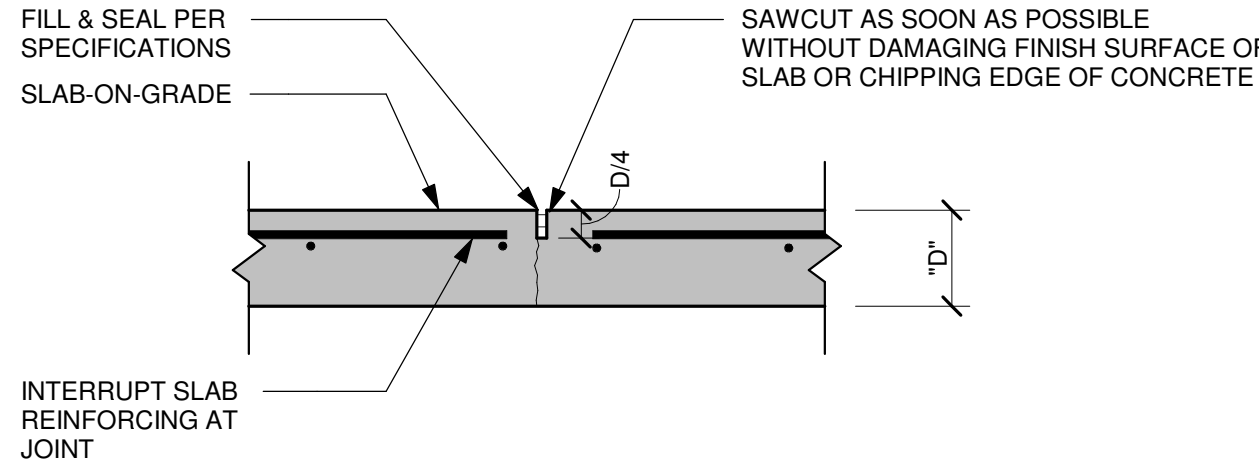
EARTHQUAKE LOAD
RISK CATEGORY = IV
 $S_s = 0.198$
 $S_1 = 0.060$
 $S_{D1} = 0.211$
 $S_{D1} = 0.096$
 $I_s = 1.5$
SEISMIC DESIGN CATEGORY = C
SITE CLASS = D

WIND LOAD
BASIC WIND SPEED = 115 MPH
EXPOSURE = C
 $G_{CF} = 30.18$



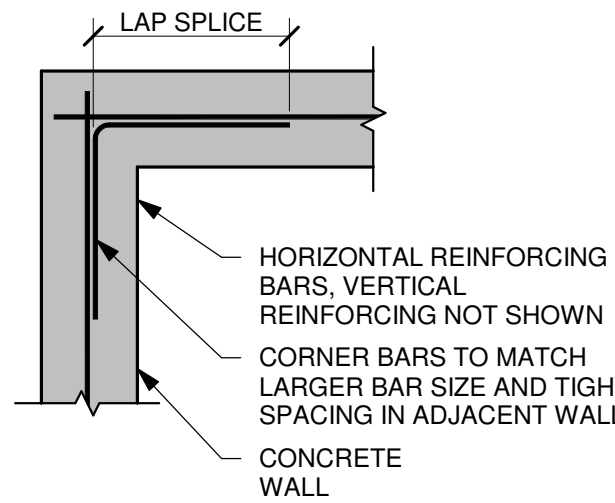
TYPICAL DETAIL OF SLAB-ON-GRADE PROFILE

SCALE: 1" = 1'-0"



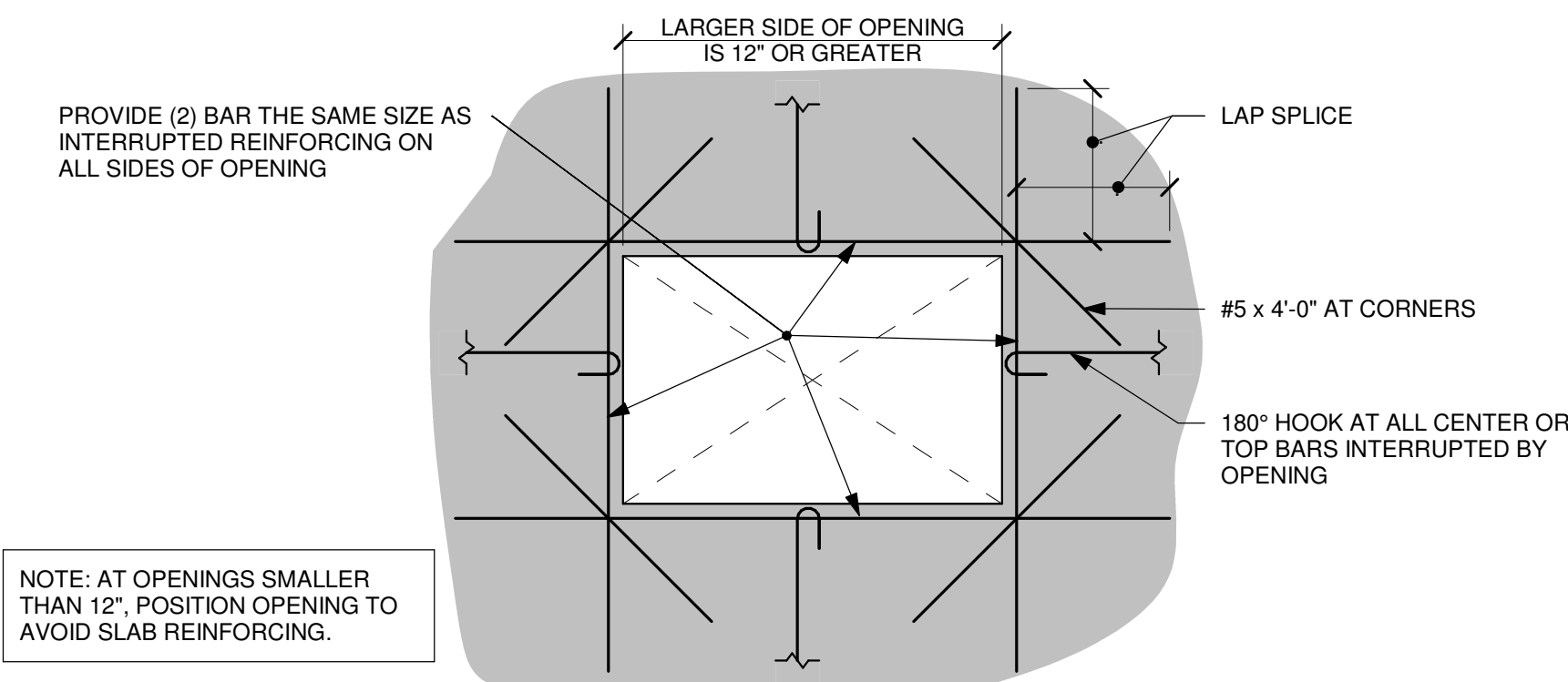
TYPICAL DETAIL AT SLAB-ON-GRADE CONTROL JOINT

SCALE: 1" = 1'-0"



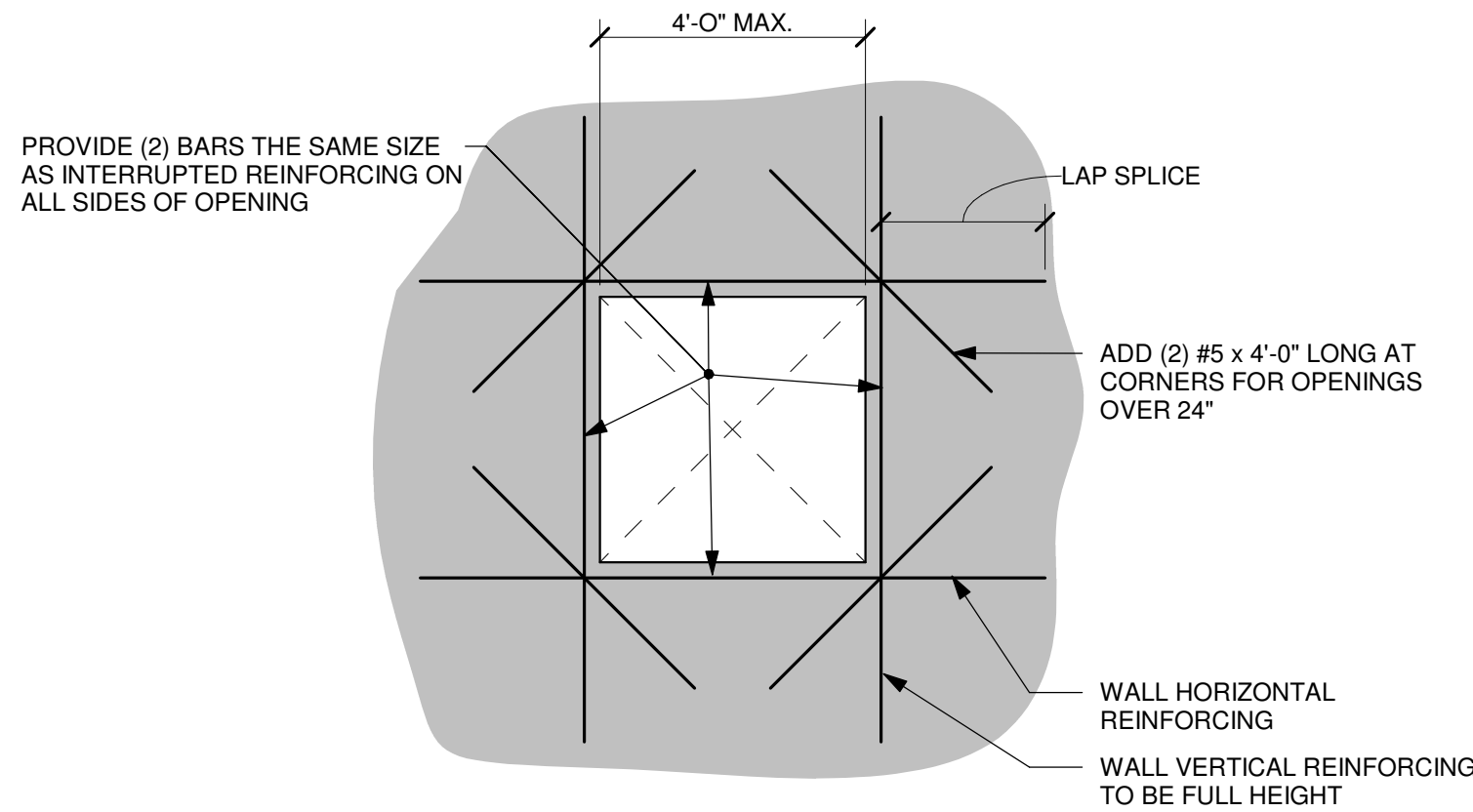
TYPICAL DETAIL AT WALL CORNER: SINGLE LAYER OF REINFORCING

SCALE: 1/2" = 1'-0"



TYPICAL DETAIL OF REINFORCING AT SLAB-ON-GRADE OPENINGS

SCALE: 1/2" = 1'-0"



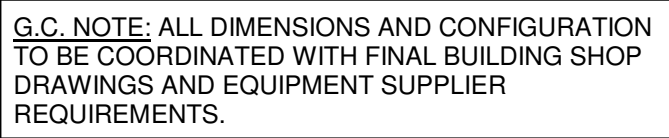
TYPICAL DETAIL OF REINFORCING AT CONCRETE WALL OPENINGS

SCALE: 1/2" = 1'-0"

SCHEDULE OF SPECIAL INSPECTION SERVICES					
PROJECT	MATERIAL / ACTIVITY	SERVICE	APPLICABLE TO THIS PROJECT		
			Y/N	EXTENT	AGENT / DATE COMPLETED
1704.2.5.1 Inspection of Fabrications	Verify fabrication quality control procedures	Insight review (3)	Y	Periodic	
	1705.1.1 Special Cases (work unusual in nature, including but not limited to alternative materials and systems, unusual design applications, materials and systems with special manufacturer's requirements)	Submit/review, shop (3) and/or field inspection	N		
1705.2 Steel Construction	1. Fabricator and erector documents. Verify reports and certificates as required by AWS D1.1, Chapter 1, paragraph 3.2 for compliance with construction documents.	Submit/Review	Y	Each submit	
	2. Material verification of structural steel	Shop (3) and field inspection	Y	Periodic	
1705.3 Welding	1. Fabrications (Verify diameter, grade, wall length, weldment size, 1705.3 for and/or).	Field inspection	Y	Periodic	
	2. Verify member locations, braces, girders, and application of joint details at each connection comply with construction documents.	Field inspection	Y	Periodic	
1705.4 Nondestructive Testing	a. Inspection tasks Prior to Welding (Observe, or perform for each welded joint or member, the CA tasks listed in AWS D1.1, Table 10.4.1)	Shop (3) and field inspection	Y	Observe or Perform as noted (4)	
	b. Inspection tasks During Welding (Observe, or perform for each welded joint or member, the CA tasks listed in AWS D1.1, Table 10.4.2)	Shop (3) and field inspection	Y	Observe or Perform as noted (4)	
1705.5 Inspection After Welding	c. Inspection tasks After Welding (Observe, or perform for each welded joint or member, the CA tasks listed in AWS D1.1, Table 10.4.3)	Shop (3) and field inspection	Y	Observe or Perform as noted (4)	
	d. Nondestructive testing (NDT) of welded joints - Commentary				
1705.6 Corrosion Protection	1. Complete joint penetration groove welds 5/16" or greater in size category B	Shop (3) or field ultrasonic testing - 100%	Y	Final Pump Building only	
	2. Complete joint penetration groove welds 5/16" or greater in size category B	Shop (3) or field ultrasonic testing - 10% of welds minimum	Y	Periodic	
1705.7 Welded Joints Subject to Fatigue	1. Welded joints subject to fatigue test required by AWS D1.1, Appendix A, Table A-3.1	Shop (3) or field radiographic or Ultrasonic testing	Y	Periodic	
	2. Fabrications (Verify reports when fabricator performs NDT)	Verify reports	Y	Each submit (5)	
1705.8 Structural Steel Bolting	a. Inspection tasks Prior to Bolting (Observe, or perform tasks for each bolted connection in accordance with CA tasks listed in AWS D1.1, Table 10.5.1)	Shop (3) and field inspection	Y	Observe or Perform as noted (4)	
	b. Inspection tasks During Bolting (Observe the CA tasks listed in AWS D1.1, Table 10.5.2)		Y	Observe (4)	
1705.9 Pre-tensioned and Slip Critical Joints	1. Pre-tensioned and slip critical joints				
	a. Turn of nut with matching nutplate	Y	Periodic		
1705.10 Direct tension indicator	1. Direct tension indicator	Y	Periodic		
	2. Field of type tension control	Y	Periodic		
1705.11 Turn of nut without matching nutplate	1. Turn of nut without matching nutplate	Y	Continuous		
	2. Calibrated wrench	Y	Periodic		
1705.12 Inspection After Bolting	c. Inspection tasks After Bolting (Perform tasks for each bolted connection in accordance with CA tasks listed in AWS D1.1, Table 10.5.3)		Y	Perform (4)	

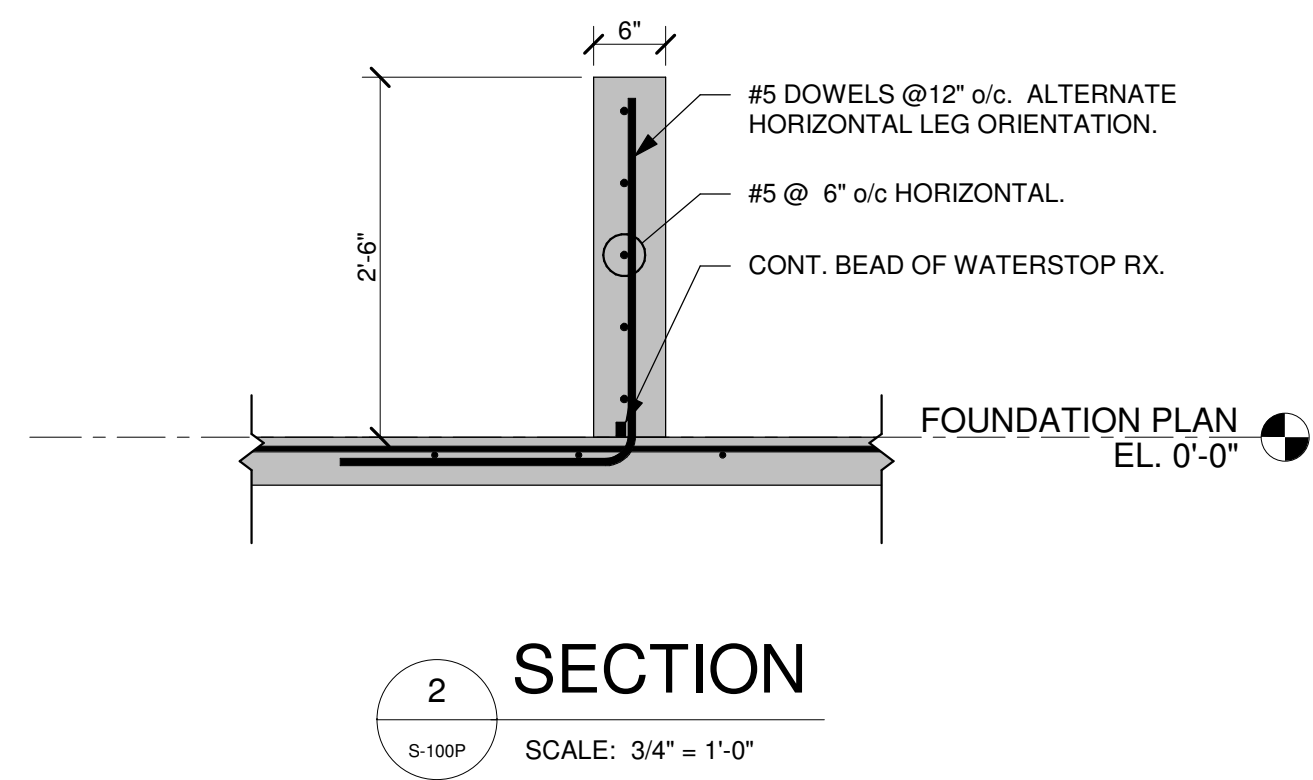
SCHEDULE OF SPECIAL INSPECTION SERVICES					
PROJECT			APPLICABLE TO THIS PROJECT		
MATERIAL / ACTIVITY	SERVICE	Y/N	EXTENT	AGENT*	DATE COMPLETED
1705.2.2 Cold-Formed Steel Deck					
1. Inspection of cold-formed steel floor and roof deck in accordance with the built-up assurance inspection requirements of SJI QACQC	Field inspection	Y		Periodic	
1705.3 Concrete Construction					
1. Inspection of reinforcing steel and prestressing steel construction	Shop (3) and field inspection	Y		Periodic	
2. Rebar/rod for welding	Field inspection	N			
3. Verify weldability of reinforcing steel after heat treatment	Field inspection	N			
4. Inspect end area, field welds, and heat treatment	Field inspection	N			
5. Inspection of concrete cast in concrete	Shop (3) and field inspection	Y		Periodic	
6. Inspect anchors post-installed in hardened concrete members					
7. Adhesive anchors installed horizontally or vertically in concrete	Field inspection	Y		Continuous	
8. Mechanical anchors and adhesive anchors not defined in 4.4	Field inspection	Y		Periodic	
9. Verify use of approved design mix	Shop (3) and field inspection	Y		Periodic	
10. Fresh concrete sampling, proper curing and air content tests and determine temperature of concrete	Shop (3) and field inspection	Y		Continuous	
11. Inspection of concrete and admixtures placement for proper application techniques	Shop (3) and field inspection	Y		Continuous	
12. Inspection for maintenance of specified curing temperature and moisture	Shop (3) and field inspection	Y		Periodic	
13. Inspection of prestressing concrete	Shop (3) and field inspection	Y			
14. Application of prestressing force		N			
15. Grouting of bonded prestressing tendons		N			
16. Erection of precast concrete members		N			
17. Inspection in accordance with construction documents	Field inspection	N			
18. Perform inspections of welding and bolting in accordance with Section 1705.2	Field inspection	N			
19. Verification of in-situ concrete strength using a nondestructive method in performance concrete and/or prior to removal of shores and shoring from beams and structural walls	Review field testing and laboratory reports	N			
20. Inspection of formwork for shape, location and dimensions	Field inspection	Y		Periodic	

SCHEDULE OF SPECIAL INSPECTION SERVICES					
PROJECT	MATERIAL / ACTIVITY	SERVICE	Y/N	APPLICABLE TO THIS PROJECT	DATE COMPLETED
1705.6 Soils					
	1. Verify material data sheets (provisions are adequate to achieve design bearing capacity)	Field inspection	Y	Periodic	
	2. Verify excavations are extended to proper depth and have reached proper material	Field inspection	Y	Periodic	
	3. Perform classification and testing of imported fill materials	Field inspection	Y	Periodic	
	4. Verify use of proper materials, densities, and fill techniques during placement and compaction of imported fill	Field inspection	Y	Continuous	
	5. Prior to placement of compacted fill, inspect subgrade and verify that any has been prepared properly	Field inspection	Y	Periodic	
1705.12.4 Designated Seismic Systems Verification					
	Inspect and verify that the component load, anchorage or resulting conforms to the certificate of compliance	Field inspection	Y	Final Pump Building only	Periodic
1705.12.6 Plumbing, Mechanical and Electrical Components Special Inspections for Seismic Resistance					
	1. Inspection during the anchorage of electrical equipment for emergency or standby power systems	Field inspection	Y	Final Pump Building only	Periodic
	2. Inspection during the anchorage of other electrical equipment	Field inspection	N		Periodic
	3. Inspection during installation and anchorage of piping systems designed to carry hazardous materials, and their associated mechanical units	Field inspection	N		Periodic
	4. Inspection during the installation and anchorage of HVAC systems that will contain hazardous materials	Field inspection	N		Periodic
	5. Inspection during the installation and anchorage of elevator isolation systems	Field inspection	N		Periodic
	6. Inspection of clearances of installed mechanical and electrical equipment where automatic fire sprinkler systems are installed in SDC C, D, E, or F buildings	Field inspection	Y	Final Pump Building only	Periodic
1705.13.2 Seismic Certification of Nonstructural Components					
	Review certificate of compliance for seismic qualification	Certificate of compliance review	Y	Final Pump Building only	Each submit
1705.13.3 Designated Seismic Systems					
	Review certificate of compliance for designated seismic system	Certificate of compliance review	Y	Final Pump Building only	Each submit
Notes:					
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192. The project and issuing agency shall be assigned by the Owner or the Owner's Agent, and the Contractor					



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

1. SLAB ON GRADE B-6 CONCRETE SLAB REINFORCED WITH #4@12" O/C EA WAY TOP. THICKEN AS INDICATED AT PERIMETER. PROVIDE ASTM E1745 VAPOR RETARDER UNDER SLAB.
2. ELEVATION TOP OF SLAB = 0'-0" (RELATIVE ELEVATION) UNLESS INDICATED AS (+) OR (-) ON PLAN. THIS ELEVATION REFERENCES A4 - INVERT/ELEVATION = 16'-0".
3. ELEVATION BOTTOM OF FOOTING INDICATED THIS [] ON PLAN REFERENCES ELEVATION TOP OF SLAB.
4. ELEVATIONS TOP OF TOP OF WALL INDICATED ON PLAN REFERENCE ELEVATION TOP OF SLAB.
5. REFER TO GEOTECHNICAL REPORT BY TERRACON DATED FEBRUARY 4, 2022 FOR FOUNDATION AND SITE PREPARATION REQUIREMENTS.



Albany Port District Commission
Town of Bethlehem, NY

BEACON ISLAND EXPANSION SITE-PHASE 3

Building P - 309 River Road, Glenmont, NY 12077

CLIENT:	PROJECT
DRAWN	CEP
DESIGNED	CEP
CHECKED	KCM
SCALE	AS NOTED
DATE	9/2/2025
PROJECT	18824.00

[illegible]

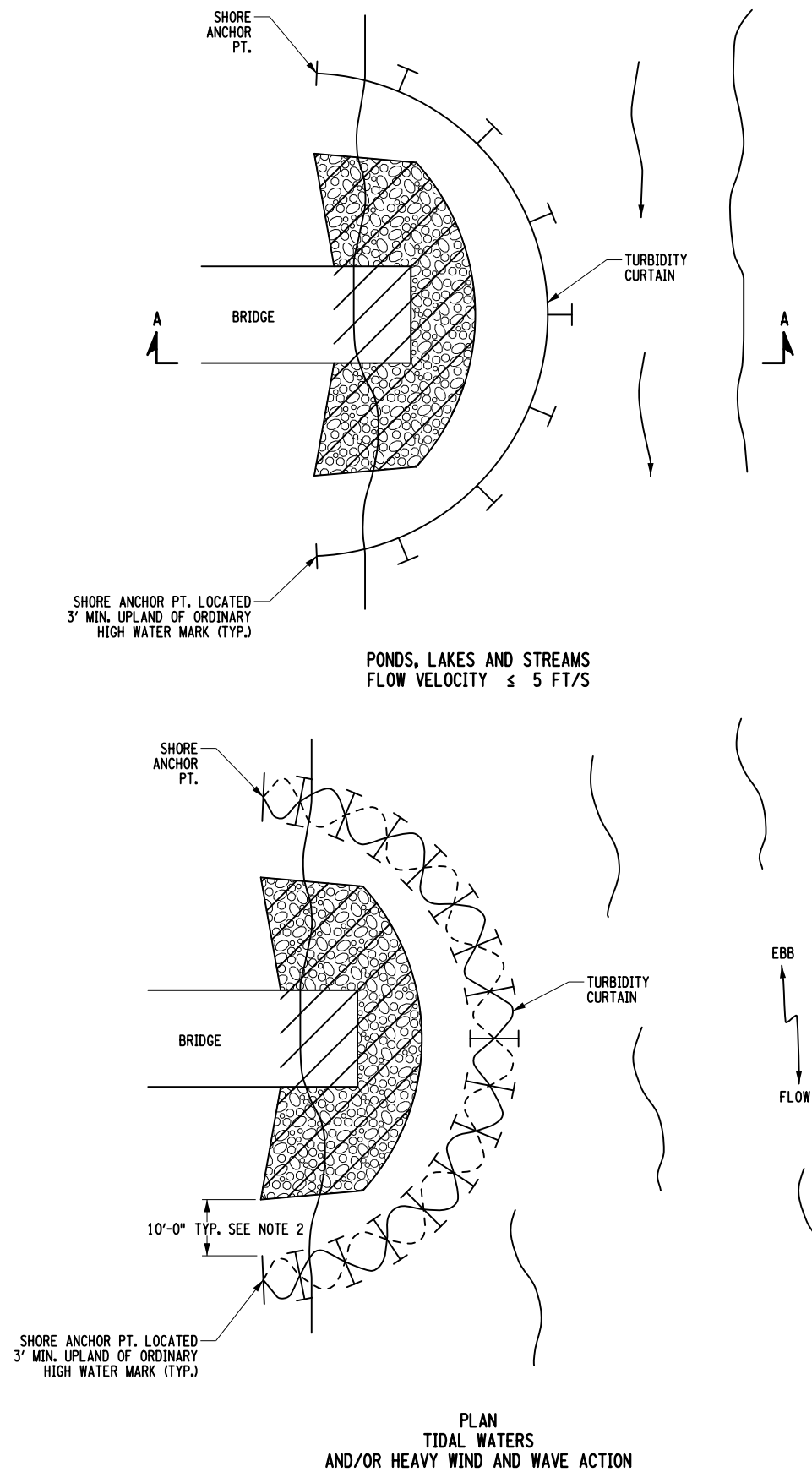
NO.	REVISIONS	DATE
DRAWING TITLE		

PLANS & SECTIONS

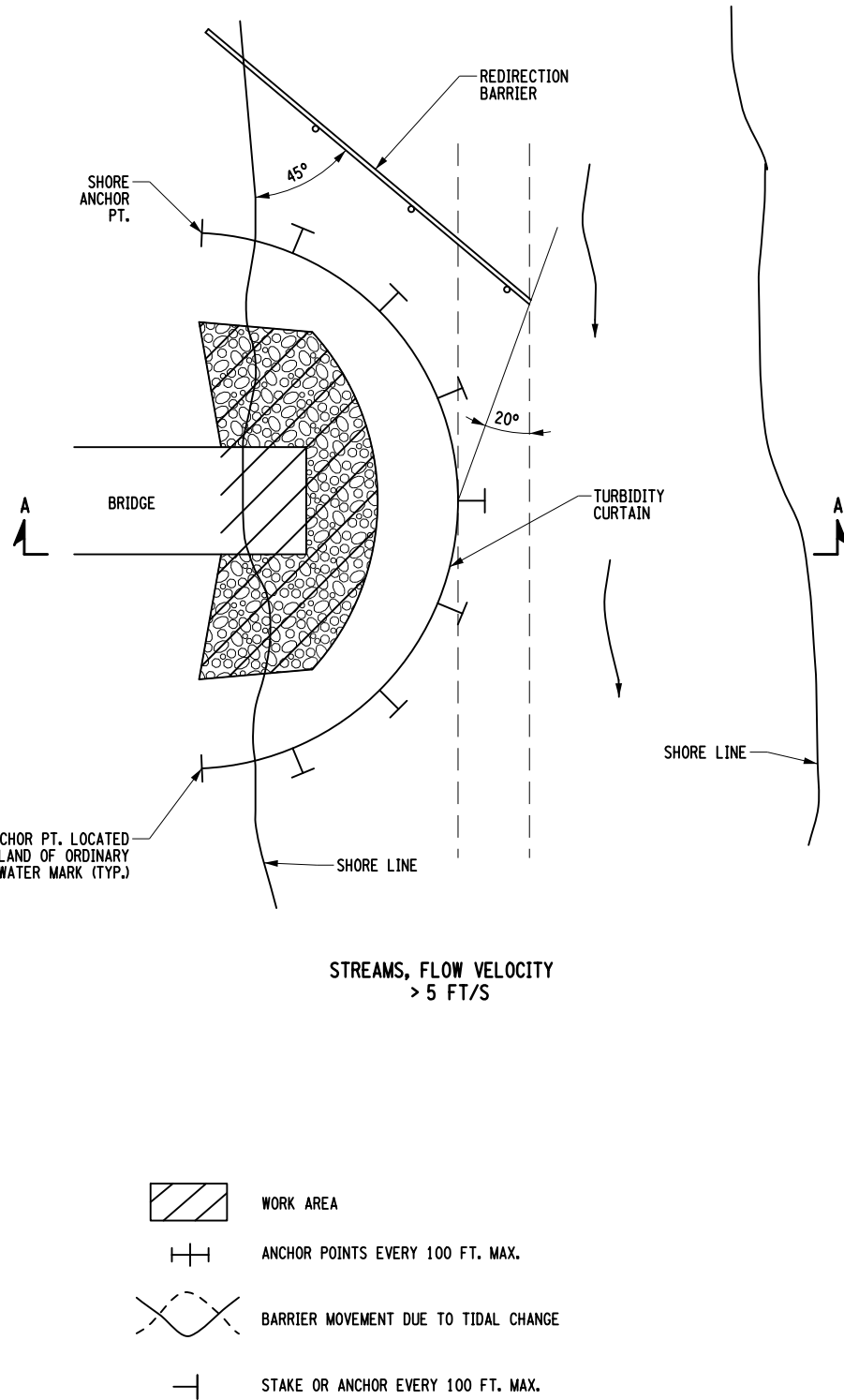
DRAWING NUMBER

S-100P

FILE NAME = 209-06.dgn
DATE/TIME = 22-NOV-2011 12:00
USER = rlohse



TYPICAL TURBIDITY CURTAIN LAYOUTS

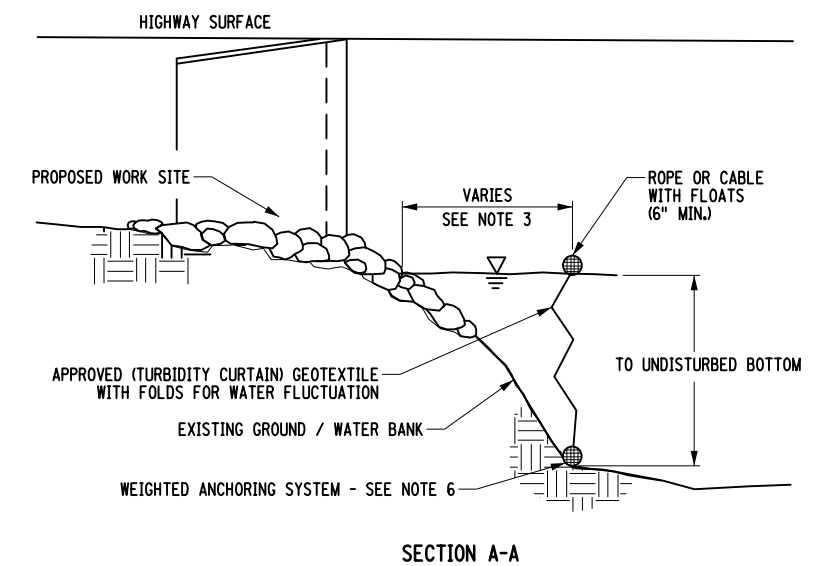


APPLICATION NOTES:

- THE PURPOSE OF A TURBIDITY CURTAIN IS TO SEPARATE WORK AREAS IN OR ADJACENT TO WATERWAYS, TO PREVENT TURBIDITY FROM ENTERING THE WATERWAY.
- TURBIDITY CURTAIN SHALL NOT BE PLACED ACROSS A FLOWING WATERWAY.
- CONCENTRATED FLOW OUTLETS SUCH AS CULVERT OUTLETS, DITCHES, ETC. SHALL NOT BE LOCATED BEHIND TURBIDITY CURTAIN.

GENERAL NOTES:

- THE DETAIL DEPICTS WORK AT A BRIDGE LOCATION, BUT TURBIDITY CURTAIN MAY BE APPLIED AT OTHER LOCATIONS.
- TURBIDITY CURTAIN SHALL BE A MAXIMUM OF 100' LONG FOR EACH SECTION OF CURTAIN REQUIRED. END SECTIONS SHALL TERMINATE 10' BEYOND THE LIMIT OF DISTURBANCE.
- THE TURBIDITY CURTAIN SHALL BE PLACED AS CLOSE TO THE WORK AS POSSIBLE WITHOUT INTERFERING WITH CONSTRUCTION OPERATIONS.
- THE CONTRACTOR SHALL CONTINUALLY MONITOR THE INSTALLATION, TAKING INTO ACCOUNT WEATHER PATTERNS AND PREVAILING WIND DIRECTIONS THAT MAY AFFECT WATER LEVELS, VELOCITY AND MOVEMENT OF THE TURBIDITY CURTAIN.
- THE TURBIDITY CURTAIN SHALL BE REMOVED BY PULLING TOWARD THE SHORE TO MINIMIZE ESCAPE OF SEDIMENTS INTO THE WATERWAY.
- THE WEIGHTED ANCHOR SYSTEM SHALL BE A TYPE THAT ALLOWS THE CURTAIN TO CONFORM TO THE CONTOUR OF THE BOTTOM ON THE WATERWAY.
- FOR FLOW VELOCITIES > 5 FT/SEC, USE A REDIRECTION BARRIER SUCH THAT FLOW EXPANDING AT 20° FROM THE BARRIER WILL REACH THE CURTAIN AT A POINT WHERE THE CURTAIN IS ESSENTIALLY PARALLEL TO STREAM FLOW.
- THE REDIRECTION BARRIER MAY CONSIST OF CONCRETE BARRIER, PLANKING OR OTHER MATERIAL SUCH THAT IT CAN BE QUICKLY REMOVED OR WASHED OUT IN THE EVENT OF HIGH FLOWS. IT SHOULD NOT BE SUCH THAT IT WILL REMAIN IN PLACE AND BE OVERTOPPED.



	STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION	
	U.S. CUSTOMARY STANDARD SHEET	
	TURBIDITY CURTAIN	
APPROVED FEBRUARY 09, 2010 /S/ RICHARD W. LEE, P.E. FOR THE DEPUTY CHIEF ENGINEER (DESIGN)	ISSUED UNDER EB 09-036	209-06

EFFECTIVE DATE: 09/02/2010

SECTION 033001
CAST-IN PLACE CONCRETE - FIRE PUMP BUILDING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

1.02 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.03 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct a virtual or in person conference at Project site.
1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Concrete Subcontractor.
 2. Review the following:
 - a. Special inspection and testing and inspecting agency procedures for field quality control.
 - b. Construction joints, control joints, isolation joints, and joint-filler strips.
 - c. Semirigid joint fillers.
 - d. Vapor-retarder installation.
 - e. Anchor rod and anchorage device installation tolerances.

- f. Cold and hot weather concreting procedures.
- g. Concrete finishes and finishing.
- h. Curing procedures.
- i. Forms and form-removal limitations.
- j. Shoring and reshoring procedures.
- k. Methods for achieving specified floor and slab flatness and levelness.
- l. Floor and slab flatness and levelness measurements.
- m. Concrete repair procedures.
- n. Concrete protection.

1.04 ACTION SUBMITTALS

A. Product Data: For each of the following.

- 1. Portland cement.
- 2. Fly ash.
- 3. Slag cement.
- 4. Blended hydraulic cement.
- 5. Silica fume.
- 6. Performance-based hydraulic cement
- 7. Aggregates.
- 8. Admixtures:
 - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
- 9. Vapor retarders.
- 10. Floor and slab treatments.

11. Liquid floor treatments.
 12. Curing materials.
 - a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.
 13. Joint fillers.
 14. Repair materials.
 15. Water Stops
- B. Design Mixtures: For each concrete mixture, include the following:
1. Mixture identification.
 2. Minimum 28-day compressive strength.
 3. Durability exposure class.
 4. Maximum w/cm.
 5. Slump limit.
 6. Air content.
 7. Nominal maximum aggregate size.
 8. Intended placement method.
 9. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Shop Drawings:
1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - a. Location of construction joints is subject to approval of the Architect.
- D. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:
1. Concrete Class designation.
 2. Location within Project.
-

3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment if any.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.
2. Testing agency: Include copies of applicable ACI certificates.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Floor and slab treatments.
5. Bonding agents.
6. Adhesives.
7. Vapor retarders.
8. Semirigid joint filler.
9. Joint-filler strips.
10. Repair materials.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Slag cement.

4. Blended hydraulic cement.
 5. Silica fume.
 6. Performance-based hydraulic cement.
 7. Aggregates.
 8. Admixtures.
- D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances.
- E. Research Reports: For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
- F. Preconstruction Test Reports: For each mix design.
- G. Field quality-control reports.
- H. Minutes of preinstallation conference.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs Project personnel qualified as a ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician with experience installing and finishing concrete, incorporating permeability-reducing admixtures.
1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.
- B. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated, and employing an ACI-certified Concrete Quality Control Technical Manager.
1. Personnel performing laboratory tests shall be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
- C. Field Quality Control Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests shall be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

1.07 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.
 1. Include the following information in each test report:
 - a. Admixture dosage rates.
 - b. Slump.
 - c. Air content.
 - d. Seven-day compressive strength.
 - e. 28-day compressive strength.
 - f. Permeability.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ASTM C94/C94M and ACI 301.

1.09 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.
 1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 2. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M).
 3. Do not use frozen materials or materials containing ice or snow.
 4. Do not place concrete in contact with surfaces less than 35 deg F (1.7 deg C), other than reinforcing steel.
 5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F (35 deg C).
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 PRODUCTS

2.01 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301.

2.02 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
2. Obtain aggregate from single source.
3. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I/II.
2. Fly Ash: ASTM C618, Class C or F.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
4. Blended Hydraulic Cement: ASTM C595/C595M, Type IP, portland-pozzolan.
5. Silica Fume: ASTM C1240 amorphous silica.

C. Normal-Weight Aggregates: ASTM C33/C33M, Class M coarse aggregate or better, graded. Provide Class S coarse aggregate for all exterior concrete. Provide aggregates from a single source.

1. Alkali-Silica Reaction: Comply with one of the following:

-
- a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.
 - b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567.
 - c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301 (ACI 301M).
2. Maximum Coarse-Aggregate Size: 1-1/2 inches for slabs-on-grade, 1 inch for structural concrete nominal.
 3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Air-Entraining Admixture: ASTM C260/C260M.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride [in steel-reinforced concrete].
1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 2. Retarding Admixture: ASTM C494/C494M, Type B.
 3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
 5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
 6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.
- F. Water and Water Used to Make Ice: ASTM C94/C94M, potable.

2.03 VAPOR RETARDERS

- A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A not less than 10 mils (0.25 mm) thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.04 LIQUID FLOOR TREATMENTS

- A. Cure-Densifier-Hardener: Transparent, chemically reactive, water-based treatment that penetrates into the concrete surface, forming a chemical reaction of crystalline growth that fills in the natural pores and voids in the concrete surface.
- B. Basis of Design: Ashford Formula of Curecrete Distribution, Inc.; or equal
- C. Abrasion Resistance to Revolving Disks: ASTM C779.
- D. Surface Adhesion: ASTM D3359.
- E. Hardening: ASTM C39:
- F. Rebound Number: ASTM C805.
- G. Light Exposure Degradation: ASTM G23.
- H. Test Method for Measuring Wet SCOF of Common Hard-Surface Floors in accordance with ANSI B101.1.
- I. Test Method for Measuring Wet DCOF of Common Hard-Surface Floors in accordance with ANSI B101.3.

2.05 CURING MATERIALS

- A. Evaporation Retarder: Other than Cure-Densifier-Hardener, Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.
 - 1. Color:
 - a. Ambient Temperature Below 50 deg F (10 deg C): Black.
 - b. Ambient Temperature between 50 deg F (10 deg C) and 85 deg F (29 deg C): Any color.
 - c. Ambient Temperature Above 85 deg F (29 deg C): White.
- D. Curing Paper: Eight-feet- (2438-mm-) wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.

- E. Water: Potable or complying with ASTM C1602/C1602M.
- F. Clear, Waterborne, Membrane-Forming, Nondissipating Curing Compound: ASTM C309, Type 1, Class B, certified by curing compound manufacturer to not interfere with bonding of floor covering.

2.06 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 in accordance with ASTM D2240.
- C. Epoxy Bonding Adhesive: ASTM C881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types I and II, nonload bearing, Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- D. Floor Slab Protective Covering: Eight-feet- (2438-mm-) wide cellulose fabric.
- E. Waterstops: U.S. Army Corps of Engineers CRD-C 513, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
 - 1. Profile: Ribbed with center bulb.
 - 2. Dimensions: 6 inches by 3/8 inch thick, nontapered.

2.07 REPAIR MATERIALS

- A. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
 - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.

-
4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.

2.08 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.
 1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 1. Fly Ash or Other Pozzolans: 25 percent by mass.
 2. Slag Cement: 50 percent by mass.
 3. Silica Fume: 10 percent by mass.
 4. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
 1. Use high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, and concrete with a w/cm below 0.50.

2.09 CONCRETE MIXTURES

- A. Class A: Normal-weight concrete used for footings, piers, grade beams, and tie beams.
 1. Exposure Class: ACI 318 F2.
 2. Minimum Compressive Strength: 4000 psi at 28 days.
 3. Maximum w/cm: 0.50.

4. Slump Limit: 4 inches (100 mm), plus or minus 1 inch.
 5. Air Content:
 - a. Exposure Classes F2 and F3: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size.
 6. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- B. Class B: Normal-weight concrete used for mat foundations and foundation walls.
1. Exposure Class: ACI 318 F2.
 2. Minimum Compressive Strength: 4000 psi at 28 days.
 3. Maximum w/cm: 0.50.
 4. Slump Limit: 4 inches, plus or minus 1 inch.
 5. Air Content:
 - a. Exposure Classes F2 and F3: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1.5-inch nominal maximum aggregate size.
 6. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- C. Class C: Normal-weight concrete used for interior slabs-on-ground (slabs less than 10" thick).
1. Exposure Class: ACI 318 F0.
 2. Minimum Compressive Strength: 4000 psi at 28 days.
 3. Maximum w/cm: 0.50.
 4. Slump Limit: 4 inches, plus or minus 1 inch.
 5. Air Content:
 - a. Do not use an air-entraining admixture or allow total air content to exceed 2 percent for concrete used in trowel-finished floors.
 6. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
-

D. Class I: Normal-weight concrete used for interior metal pan stairs and landings:

1. Exposure Class: ACI 318 F0.
2. Minimum Compressive Strength: 3000 psi at 28 days.
3. Maximum w/cm: 0.5.
4. Maximum Size Aggregate: 3/8 inch.
5. Slump Limit: 3 inches, plus 1 inch or minus 2 inches.
6. Air Content: 0 percent, plus or minus 0.5 percent at point of delivery.
7. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
8. Retarding Admixture: Not allowed.
9. Accelerating Admixture: Not allowed.

E. Class J: Normal-weight concrete used for exterior retaining walls.

1. Exposure Class: ACI 318 F2.
2. Minimum Compressive Strength: 4000 psi at 28 days.
3. Maximum w/cm: 0.50.
4. Slump Limit: 4 inches, plus or minus 1 inch.
5. Air Content:
 - a. Exposure Classes F2 and F3: [6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size.
6. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

2.10 CONCRETE MIXING

- A. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.

3.03 INSTALLATION OF VAPOR RETARDER

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.

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4. Lap joints 6 inches and seal with manufacturer's recommended tape.
 5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
 6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
 7. Protect vapor retarder during placement of reinforcement and concrete.
 - a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

3.04 JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
 - B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
 1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Engineer.
 2. Place joints perpendicular to main reinforcement.
 - a. Continue reinforcement across construction joints unless otherwise indicated.
 3. Locate horizontal joints in walls and columns at underside slabs and at the top of footings.
 4. Space vertical joints in walls as indicated on Drawings.
 5. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
 1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
 - D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
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1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints:

1. Install dowel bars and support assemblies at joints where indicated on Drawings.
2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.

F. Dowel Plates: Install dowel plates at joints where indicated on Drawings.

3.05 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer in writing, but not to exceed the amount indicated on the concrete delivery ticket.
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
1. If a section cannot be placed continuously, provide construction joints as indicated.

2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
 - a. Do not use vibrators to transport concrete inside forms.
 - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
 - c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
 - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 1. Do not place concrete floors and slabs in a checkerboard sequence.
 2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 3. Maintain reinforcement in position on chairs during concrete placement.
 4. Screed slab surfaces with a straightedge and strike off to correct elevations.
 5. Level concrete, cut high areas, and fill low areas.
 6. Slope surfaces uniformly to drains where required.
 7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
 8. Do not further disturb slab surfaces before starting finishing operations.

3.06 FINISHING FORMED SURFACES

- A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.
 - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
 - b. Remove projections larger than 1/4 inch.
 - c. Patch tie holes.
 - d. Surface Tolerance: ACI 117 Class B.
 - e. Locations: Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.
- B. Rubbed Finish: Apply the following to as cast surface finishes exposed to public view:
 1. Smooth-Rubbed Finish:
 - a. Perform no later than one day after form removal.
 - b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.
 - c. If sufficient cement paste cannot be drawn from the concrete by the rubbing process, use a grout made from the same cementitious materials used in the in-place concrete.
- C. Related Unformed Surfaces:
 1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
 2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.07 FINISHING FLOORS AND SLABS

- A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish:

1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
2. Use stiff brushes, brooms, or rakes to produce a profile depth of 1/4 inch (6 mm) in one direction.
3. Apply scratch finish to surfaces to receive concrete floor toppings and at exterior walk ways.

C. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 (ACI A117M) tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish.

D. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface.
5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
7. Finish surfaces to the following tolerances, in accordance with ASTM E1155 (ASTM E1155M), for a randomly trafficked floor surface:

- a. Slabs on Ground:
 - 1) Specified overall values of flatness, FF 30; and of levelness, FL 25; with minimum local values of flatness, FF 24; and of levelness, FL 17.
- 8. For concrete with embedded rails, finish and measure surface, so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch or 1/4" in 20 feet.
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.
 - 1. Coordinate required final finish with Architect before application.
 - 2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
 - 2. Coordinate required final finish with Architect before application.

3.08 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

- A. Filling In:
 - 1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
 - 2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
 - 3. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Equipment Bases and Foundations:
 - 1. Coordinate sizes and locations of concrete bases with actual equipment provided.
 - 2. Construct concrete bases 4 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.

3. Minimum Compressive Strength: 4000 psi at 28 days.
 4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 16-inch (450-mm) centers around the full perimeter of concrete base.
 5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
 6. Prior to pouring concrete, place and secure anchorage devices.
 - a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - b. Cast anchor-bolt insert into bases.
 - c. Install anchor bolts to elevations required for proper attachment to supported equipment.
- C. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items.
1. Cast-in inserts and accessories, as shown on Drawings.
 2. Screed, tamp, and trowel finish concrete surfaces.

3.09 CONCRETE CURING

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
 2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply in accordance with manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Curing Formed Surfaces: Comply with ACI 308.1 as follows:
1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
 2. If forms remain during curing period, moist cure after loosening forms.

3. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
 - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
 - b. Continuous Sprinkling: Maintain concrete surface continuously wet.
 - c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
 - d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
 - e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 1) Recoat areas subject to heavy rainfall within three hours after initial application.
 - 2) Maintain continuity of coating and repair damage during curing period.
- D. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:
 1. Begin curing immediately after finishing concrete.
 2. Interior Concrete Floors:
 - a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
 - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - (a) Lap edges and ends of absorptive cover not less than 12-inches.
 - (b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.

- (a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - (b) Cure for not less than seven days.
 - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - (a) Water.
 - (b) Continuous water-fog spray.
- b. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:
 - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - (a) Lap edges and ends of absorptive cover not less than 12 inches.
 - (b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
 - (a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - (b) Cure for not less than seven days.
 - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - (a) Water.
 - (b) Continuous water-fog spray.
- c. Floors to Receive Curing Compound:

- 1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
 - 3) Maintain continuity of coating, and repair damage during curing period.
 - 4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer[unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project].
- d. Floors to Receive Curing and Sealing Compound:
- 1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
 - 3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3.10 TOLERANCES

- A. Conform to ACI 117.

3.11 APPLICATION OF LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with manufacturer's written instructions.
1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 2. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
 3. Rinse with water; remove excess material until surface is dry.
 4. Apply a second coat in a similar manner if surface is rough or porous.

- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

3.12 JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least one month.
 - 2. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints.
- D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.13 CONCRETE SURFACE REPAIRS

- A. Defective Concrete:
 - 1. Repair and patch defective areas when approved by Engineer.
 - 2. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.
 - a. Limit cut depth to 3/4 inch.
 - b. Make edges of cuts perpendicular to concrete surface.
 - c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.

- d. Fill and compact with patching mortar before bonding agent has dried.
- e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
- 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
 - a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
 - b. Compact mortar in place and strike off slightly higher than surrounding surface.
- 3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Engineer.

D. Repairing Unformed Surfaces:

- 1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
 - a. Correct low and high areas.
 - b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
- 2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
- 3. After concrete has cured at least 14 days, correct high areas by grinding.
- 4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.
 - a. Finish repaired areas to blend into adjacent concrete.
- 5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
 - a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - b. Feather edges to match adjacent floor elevations.

6. Correct other low areas scheduled to remain exposed with repair topping.
 - a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
 - b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
 - a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
 - b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
 - c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
 - d. Place, compact, and finish to blend with adjacent finished concrete.
 - e. Cure in same manner as adjacent concrete.
8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.
 - a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
 - b. Dampen cleaned concrete surfaces and apply bonding agent.
 - c. Place patching mortar before bonding agent has dried.
 - d. Compact patching mortar and finish to match adjacent concrete.
 - e. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Engineer's approval.

3.14 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.
- B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
 - 1. Testing agency shall immediately report to Engineer, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
 - 2. Testing agency shall report results of tests and inspections, in writing, to Owner, Engineer, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
 - a. Test reports shall include reporting requirements of ASTM C31/C31M and ASTM C39/C39M, including the following as applicable to each test and inspection:
 - 1) Project name.
 - 2) Name of testing agency.
 - 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
 - 4) Name of concrete manufacturer.
 - 5) Date and time of inspection, sampling, and field testing.
 - 6) Date and time of concrete placement.
 - 7) Location in Work of concrete represented by samples.
 - 8) Date and time sample was obtained.
 - 9) Truck and batch ticket numbers.
 - 10) Design compressive strength at 28 days.
 - 11) Concrete mixture designation, proportions, and materials.
 - 12) Field test results.
 - 13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.

14) Type of fracture and compressive break strengths at seven days and 28 days.

- C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.
- D. Inspections:
 - 1. Headed bolts and studs.
 - 2. Verification of use of required design mixture.
 - 3. Concrete placement, including conveying and depositing.
 - 4. Curing procedures and maintenance of curing temperature.
 - 5. Batch Plant Inspections: On a random basis, as determined by Engineer.
- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M shall be performed in accordance with the following requirements:
 - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
 - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 2. Slump: ASTM C143/C143M:
 - a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete.
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 4. Concrete Temperature: ASTM C1064/C1064M:

- a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C31/C31M:
 - a. Cast and laboratory cure two sets of four 6-inch by 12-inch cylinder specimens for each composite sample.
 - b. Cast and field cure two sets of four standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C39/C39M.
 - a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.
 - b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
 - c. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is less than or equal to 5000 psi.
 9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
 10. Additional Tests:
 - a. Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer.
 - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Engineer.
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- 1) Acceptance criteria for concrete strength shall be in accordance with ACI 301, section 1.6.6.3.
 11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 72 hours of completion of floor finishing and promptly report test results to Engineer.

3.15 PROTECTION

- A. Protect concrete surfaces as follows:
1. Protect from petroleum stains.
 2. Diaper hydraulic equipment used over concrete surfaces.
 3. Prohibit vehicles from interior concrete slabs.
 4. Prohibit use of pipe-cutting machinery over concrete surfaces.
 5. Prohibit placement of steel items on concrete surfaces.
 6. Prohibit use of acids or acidic detergents over concrete surfaces.
 7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION

**SECTION 210500
COMMON WORK RESULTS FOR FIRE SUPPRESSION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Pipe, fittings, sleeves, escutcheons, seals, and connections for sprinkler systems.
- B. Expansion joints.
- C. Expansion loops.

1.02 REFERENCE STANDARDS

- A. ASME A112.18.1 - Plumbing Supply Fittings; 2018, with Errata.
- B. ASME BPVC-IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators - Welding Brazing and Fusing Qualifications; 2019.
- C. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2015.
- D. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2016.
- E. ASME B16.4 - Gray Iron Threaded Fittings: Classes 125 and 250; 2016.
- F. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2018).
- G. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2018.
- H. ASTM A536 - Standard Specification for Ductile Iron Castings; 1984 (Reapproved 2014).
- I. ASTM A795/A795M - Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use; 2013 (Reapproved 2020).
- J. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type); 2016.
- K. AWWA C110/A21.10 - Ductile-Iron and Gray-Iron Fittings; 2012.

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- L. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; 2017.
 - M. AWWA C606 - Grooved and Shouldered Joints; 2015.
 - N. FM (AG) - FM Approval Guide; current edition.
 - O. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's catalog information. Indicate valve data and ratings.
- C. Shop Drawings: Indicate pipe materials used, jointing methods, supports, and floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.
- D. Manufacturer's Qualification Statement.
- E. Installer's Qualification Statement.
- F. Project Record Documents: Record actual locations of components and tag numbering.
- G. Operation and Maintenance Data: Include installation instructions and spare parts lists.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section.
- C. Comply with FM (AG) requirements.
- D. Products Requiring Electrical Connection: Listed and classified as suitable for the purpose specified and indicated.
- E. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store valves in shipping containers, with labeling in place.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

1.06 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 FIRE PROTECTION SYSTEMS

- A. Sprinkler Systems: Comply with NFPA 13 and FM Global Standards.
- B. Welding Materials and Procedures: Comply with ASME BPVC-IX.

2.02 BURIED PIPING

- A. Ductile Iron Pipe: AWWA C151/A21.51.
 - 1. Fittings: AWWA C110/A21.10, standard thickness.
 - 2. Joints: AWWA C111/A21.11, styrene-butadiene rubber (SBR) or vulcanized SBR gasket.
 - 3. Mechanical Couplings: Shaped composition sealing gasket, steel bolts, nuts, and washers.

2.03 ABOVE GROUND PIPING

- A. Steel Pipe: ASTM A795 Schedule 10 or ASTM A53 Schedule 40, black.
 - 1. Cast Iron Fittings: ASME B16.1, flanges and flanged fittings and ASME B16.4, threaded fittings.
 - 2. Malleable Iron Fittings: ASME B16.3, threaded fittings and ASTM A47/A47M.
 - 3. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.

2.04 PIPE SLEEVES

- A. Vertical Piping:
 - 1. Sleeve Length: 1 inch above finished floor.
 - 2. Provide sealant for watertight joint.
- B. Plastic, Sheet Metal, or Moisture-Resistant Fiber: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.
- C. Pipe Passing Through Below Grade Exterior Walls:
 - 1. Zinc-coated or cast-iron pipe.
 - 2. Provide watertight space with link rubber or modular seal between sleeve and pipe on both pipe ends.
- D. Pipe Passing Through Concrete Beam Flanges, except where Brass Pipe Sleeves are Specified:
 - 1. Galvanized steel pipe or black iron pipe with asphalt coating.
 - 2. Connect sleeve with floor plate except in mechanical rooms.
- E. Not required for wall hydrants for fire department connections or in drywall construction.

2.05 MANUFACTURED SLEEVE-SEAL SYSTEMS

- A. Modular/Mechanical Seal:
 - 1. Synthetic rubber interlocking links continuously fill annular space between pipe and wall/casing opening.
 - 2. Provide watertight seal between pipe and wall/casing opening.
 - 3. Elastomer element size and material in accordance with manufacturer's recommendations.
 - 4. Glass-reinforced plastic pressure endplates.

2.06 ESCUTCHEONS

- A. Material:
 - 1. Metals and Finish: Comply with ASME A112.18.1.

B. Construction:

1. One-piece for mounting on chrome-plated tubing or pipe and split-pattern type elsewhere.
2. Internal spring tension devices or setscrews to maintain a fixed position against a surface.

2.07 PIPE HANGERS AND SUPPORTS

- A. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
- B. Hangers for Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.
- C. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- D. Wall Support for Pipe Sizes to 3 inches: Cast iron hook.
- E. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.
- F. Vertical Support: Steel riser clamp.
- G. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

2.08 EXPANSION LOOPS - HOSE AND BRAID

- A. Provide flexible loops with two flexible sections of hose and braid, two 90-degree elbows, and 180-degree return with support bracket and air release or drain plug.
- B. Provide flexible loops capable of movement in the x, y, and z planes. Flexible loops to impart no thrust loads to the building structure.

2.09 MECHANICAL COUPLINGS

- A. Rigid Mechanical Couplings for Grooved Joints:
 1. Dimensions and Testing: Comply with AWWA C606.
 2. Minimum Working Pressure: 300 psig.
 3. Housing Material: Fabricate of ductile iron complying with ASTM A536.
 4. Housing Coating: Factory applied orange enamel.

5. Gasket Material: EPDM suitable for operating temperature range from minus 30 degrees F to 230 degrees F.
6. Bolts and Nuts: Hot-dipped-galvanized or zinc-electroplated steel.

PART 3 EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

- A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13.
- B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- C. Install piping to conserve building space, to not interfere with use of space and other work.
- D. Group piping whenever practical at common elevations.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Pipe Hangers and Supports:
 1. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 2. Place hangers within 12 inches of each horizontal elbow.
 3. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 4. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
 5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

- G. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- H. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc-rich primer to welding.
- I. Provide sleeves when penetrating footings, floors, walls, and partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.
 - 1. Underground Piping: Caulk pipe sleeve watertight with lead and oakum or mechanically expandable chloroprene inserts with bitumen sealed metal components.
 - 2. Aboveground Piping:
 - a. Pack solid using mineral fiber complying with ASTM C592.
 - b. Fill space with an elastomer caulk to a depth of 0.50 inch where penetrations occur between conditioned and unconditioned spaces.
- J. Manufactured Sleeve-Seal Systems:
 - 1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
 - 2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
 - 3. Locate piping in center of sleeve or penetration.
 - 4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
 - 5. Tighten bolting for a watertight seal.
 - 6. Install in accordance with manufacturer's recommendations.
- K. Escutcheons:
 - 1. Install and firmly attach escutcheons at piping penetrations into finished spaces.
 - 2. Provide escutcheons on both sides of partitions separating finished areas through which piping passes.

3. Use chrome plated escutcheons in occupied spaces and to conceal openings in construction.
- L. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, unions, and couplings for servicing are consistently provided.

3.03 CLEANING

- A. Upon completion of work, clean all parts of the installation.
- B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

END OF SECTION

SECTION 210523
GENERAL-DUTY VALVES FOR WATER-BASED FIRE-SUPPRESSION PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Two-piece ball valves with indicators.
- B. Iron butterfly valves with indicators.
- C. Check valves.
- D. Iron OS&Y gate valves.
- E. NRS gate valves.
- F. Trim and drain valves.

1.02 ABBREVIATIONS AND ACRONYMS

- A. EPDM: Ethylene-propylene diene monomer.
- B. NRS: Non-rising stem.
- C. OS&Y: Outside screw and yoke.
- D. PTFE: Polytetrafluoroethylene.

1.03 REFERENCE STANDARDS

- A. FM (AG) - FM Approval Guide; current edition.
- B. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

- C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- D. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listings.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Obtain valves for each valve type from single manufacturer.
 - 2. Company must specialize in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Where listed products are specified, provide products listed, classified, and labeled by FM (AG), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for the purpose indicated.
- C. Installer Qualifications:
 - 1. Company specializing in performing the work of this section with minimum five years documented experience.
 - 2. Trained and approved by manufacturer to design, install, test and maintain the equipment specified herein.
 - 3. Complies with manufacturer's certification requirements.
 - 4. Complies with manufacturer's insurance requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads and flange faces.
 - 3. Set valves open to minimize exposure of functional surfaces.
- B. Use the following precautions during storage:
 - 1. Maintain valve end protection and protect flanges and specialties from dirt.

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- a. Provide temporary inlet and outlet caps.
 - b. Maintain caps in place until installation.
 - 2. Store valves in shipping containers and maintain in place until installation.
 - a. Store valves indoors and maintain at higher than ambient dew point temperature.
 - b. If outdoor storage is unavoidable, store valves off the ground in watertight enclosures.
 - C. Use the following precautions for handling:
 - 1. Use sling to handle large valves, rigged to avoid damage to exposed parts.
 - 2. Do not use operating handles or stems as lifting or rigging points.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. FM Global Approved: Provide valves listed in FM (AG) Approval Guide under the following headings:
 - 1. Automated Sprinkler Systems:
 - a. Indicator posts.
 - b. Valves:
 - 1) Gate valves.
 - 2) Single check valves.
 - 3) Miscellaneous valves.
- B. Comply with FM Global Standards for valves.
- C. Valve Pressure Ratings: Not less than minimum pressure rating indicated or higher as required.
- D. Valve Sizes: Same as upstream piping unless otherwise indicated.

2.02 TWO-PIECE BALL VALVES WITH INDICATORS

- A. Description:
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1. Minimum Pressure Rating: 250 psig (1200 kPa).
 2. Body Design: Two piece.
 3. Body Material: Forged brass or bronze.
 4. Port Size: Full or standard.
 5. Seat: PTFE.
 6. Stem: Bronze or stainless steel.
 7. Ball: Chrome-plated brass.
 8. Actuator: Worm gear or traveling nut.

2.03 IRON BUTTERFLY VALVES WITH INDICATORS

- A. Minimum Pressure Rating: 250 psig (1200 kPa).
- B. Body Material: Cast or ductile iron with nylon, EPDM, epoxy, or polyamide coating.
- C. Seat: EPDM.
- D. Stem: Stainless steel.
- E. Disc: Ductile iron, nickel plated.
- F. Actuator: Worm gear or traveling nut.
- G. Supervisory Switch: Internal or external.
- H. Body Design: Grooved-end connections.

2.04 CHECK VALVES

- A. Minimum Pressure Rating: 250 psig (1200 kPa).
- B. Type: Center guided check valve.
- C. Body Material: Cast iron, ductile iron.
- D. Center guided check with elastomeric seal.
- E. Hinge Spring: Stainless steel.

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- F. End Connections: Flanged, grooved, or threaded.

2.05 IRON OS&Y GATE VALVES

- A. Minimum Pressure Rating: 250 psig (1200 kPa).
- B. Body and Bonnet Material: Cast or ductile iron.
- C. Wedge: Cast or ductile iron, or bronze with elastomeric coating.
- D. Wedge Seat: Cast or ductile iron, or bronze with elastomeric coating.
- E. Stem: Brass or bronze.
- F. Packing: Non-asbestos PTFE.
- G. Supervisory Switch: External.
- H. End Connections: Flanged.

2.06 NRS GATE VALVES

- A. Minimum Pressure Rating: 250 psig (1200 kPa).
- B. Body and Bonnet Material: Cast or ductile iron.
- C. Wedge: Cast or ductile iron with elastomeric coating.
- D. Stem: Brass or bronze.
- E. Packing: Non-asbestos PTFE.
- F. Supervisory Switch: External.
- G. End Connections: Flanged.

2.07 TRIM AND DRAIN VALVES

- A. Ball Valves:
 - 1. Description:
 - a. Pressure Rating: 250 psig.
 - b. Body Design: Two piece.

- c. Body Material: Forged brass or bronze.
- d. Port Size: Full or standard.
- e. Seat: PTFE.
- f. Stem: Bronze or stainless steel.
- g. Ball: Chrome-plated brass.
- h. Actuator: Hand-lever.

B. Angle Valves:

1. Description:

- a. Pressure Rating: 250 psig.
- b. Body Material: Brass or bronze.
- c. Ends: Threaded.
- d. Stem: Bronze.
- e. Disc: Bronze.
- f. Packing: Asbestos free.
- g. Handwheel: Malleable iron, bronze, or aluminum.

C. Globe Valves:

1. Description:

- a. Pressure Rating: 250 psig.
- b. Body Material: Bronze with integral seat and screw-in bonnet.
- c. Ends: Threaded.
- d. Stem: Bronze.
- e. Disc Holder and Nut: Bronze.
- f. Disc Seat: Nitrile.

- g. Packing: Asbestos free.
- h. Handwheel: Malleable iron, bronze, or aluminum.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Confirm valve interior to be free of foreign matter and corrosion.
- B. Remove packing materials.
- C. Examine guides and seats by operating valves from the fully open position to the fully closed position.
- D. Examine valve threads and mating pipe for form and cleanliness.
- E. Examine mating flange faces for conditions that might cause leakage.
 - 1. Check bolting for proper size, length, and material.
 - 2. Verify gasket for size, defects, damage, and suitable material composition for service.
 - 3. Replace all defective valves with new valves.

3.02 INSTALLATION

- A. Install valves in accessible locations to allow for operation, inspections, tests, and maintenance.
- B. Install listed valves in accordance with their listing.
- C. Install valves in accordance with manufacturer's instructions.
- D. Support valves independently of adjacent piping.
- E. Install valves in horizontal piping with stem at or above pipe center.
- F. Install OS&Y valves with full clearance for rising stem. Install surrounding components so they do not interfere with nor are they impacted by full extension of rising stem.
- G. Comply with specific valve installation requirements and application in the following Sections:

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- H. Install listed fire protection shutoff valves supervised-open, located to control sources of water supply except from fire department connections.
 - I. Valves in horizontal piping installed with stem at or above the pipe center.
 - J. Position valves to allow full stem movement.
 - K. Install valve tags. Comply with Section 210553 requirements for valve tags, schedules, and signs on surfaces concealing valves; and the appropriate NFPA standard applying to the piping system in which valves are installed.

END OF SECTION

SECTION 210553
IDENTIFICATION FOR FIRE SUPPRESSION PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nameplates.
- B. Tags.
- C. Pipe markers.
- D. Ceiling tacks.

1.02 REFERENCE STANDARDS

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2015.
- B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2017.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
- C. Product Data: Provide manufacturers catalog literature for each product required.
- D. Manufacturer's Installation Instructions: Indicate special procedures, and installation instructions.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

- A. Automatic Controls: Tags.
- B. Control Panels: Nameplates.
- C. Instrumentation: Tags.
- D. Major Control Components: Nameplates.
- E. Piping: Pipe markers.

- F. Pumps: Nameplates.
- G. Relays: Tags.
- H. Small-sized Equipment: Tags.

2.02 NAMEPLATES

- A. Description: Laminated three-layer plastic with engraved letters.
 - 1. Letter Color: White.
 - 2. Letter Height: 1/4 inch.
 - 3. Background Color: Black.
 - 4. Thickness: 1/8 inch.
 - 5. Plastic: Comply with ASTM D709.

2.03 TAGS

- A. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

2.04 PIPE MARKERS

- A. Color: Comply with ASME A13.1.
- B. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
- C. Underground Plastic Pipe Markers: Bright colored continuously printed plastic ribbon tape, minimum 6 inches wide by 4 mil thick, manufactured for direct burial service.
- D. Color code as follows:
 - 1. Fire Quenching Fluids: Red with white letters.

2.05 CEILING TACKS

- A. Description: Steel with 3/4 inch diameter color coded head.

PART 3 EXECUTION

3.01 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

- A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install tags with corrosion resistant chain.
- C. Install plastic pipe markers in accordance with manufacturer's instructions.
- D. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
- E. Use tags on piping 3/4 inch diameter and smaller.
 - 1. Identify service, flow direction, and pressure.
 - 2. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
- F. Locate ceiling tacks to locate valves above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION

**SECTION 211300
FIRE-SUPPRESSION SPRINKLER SYSTEMS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wet-pipe sprinkler system.
- B. System design, installation, and certification.
- C. Fire department connections.

1.02 REFERENCE STANDARDS

- A. FM (AG) - FM Approval Guide; current edition.
- B. NFPA 1963 - Standard for Fire Hose Connections; 2019.
- C. UL (DIR) - Online Certifications Directory; Current Edition.
- D. UL 405 - Fire Department Connection Devices; Current Edition; Including All Revisions.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
- C. Shop Drawings:
 - 1. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components, and accessories. Indicate system controls.
 - 2. Submit shop drawings to Authorities Having Jurisdiction for approval. Submit proof of approval to Engineer.
- D. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds specified requirements and code requirements.
- E. Designer's Qualification Statement.
- F. Manufacturer's Qualification Statement.

- G. Installer's Qualification Statement.
- H. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.
- I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Sprinklers: Type and size matching those installed in quantity required by referenced NFPA design and installation standard.
 - 3. Sprinkler Wrenches: For each sprinkler type.
- J. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.

1.04 QUALITY ASSURANCE

- A. Comply with FM (AG) requirements.
- B. Designer Qualifications: Design system under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in New York.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years experience and approved by manufacturer.
- D. Equipment and Components: Provide products that bear FM (AG) label or marking.
- E. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

PART 2 PRODUCTS

2.01 SPRINKLER SYSTEM

- A. Sprinkler System: Provide coverage for entire building.
- B. Occupancy: Comply with FM Global.

- C. Water Supply: Determine volume and pressure from water flow test data.
- D. Provide fire department connections where indicated.
- E. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

2.02 SPRINKLERS

- A. Exposed Area Type: Upright typewith guard where necessary.
 - 1. Response Type: Quick.
 - 2. Coverage Type: Standard.
 - 3. Fusible Link: Fusible solder link type temperature rated for specific area hazard.
- B. Sidewall Type: Semi-recessed horizontal sidewall type with matching push on escutcheon plate.
 - 1. Response Type: Quick.
 - 2. Coverage Type: Standard.
 - 3. Fusible Link: Fusible solder link type temperature rated for specific area hazard.
- C. Guards: Finish to match sprinkler finish.

2.03 PIPING SPECIALTIES

- A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber-faced clapper to automatically actuate water motor alarm, pressure retard chamber and variable pressure trim with the following additional capabilities and features:
 - 1. Activate electric alarm.
 - 2. Test and drain valve.
 - 3. Replaceable internal components without removing valve from installed position.
- B. Electric Alarm: Electrically operated red enameled gong with pressure alarm switch.
- C. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts; rated 10 amp at 125 volt AC and 2.5 amp at 24 volt DC.
- D. Fire Department Connections:

1. Type: Exposed, projected wall mount made of corrosion resistant metal complying with UL 405.
 - a. Inlets: Two way, 2-1/2 inch swivel fittings, internal threaded. Thread size and inlets according to NFPA 1963 or Authority Having Jurisdiction. Brass caps with gaskets, chains, and lugs.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with referenced NFPA design and installation standard.
- B. Install equipment in accordance with manufacturer's instructions.
- C. Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent siamese connectors to allow full swing of fire department wrench handle.
- D. Locate outside alarm gong on building wall as indicated.
- E. Place pipe runs to minimize obstruction to other work.
- F. Place piping in concealed spaces above finished ceilings.
- G. Center sprinklers in two directions in ceiling tile and provide piping offsets as required.
- H. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.
- I. Flush entire piping system of foreign matter.
- J. Install guards on sprinklers where necessary.
- K. Hydrostatically test entire system.
- L. Require test be witnessed by Authority Having Jurisdiction.

3.02 INTERFACE WITH OTHER PRODUCTS

- A. Ensure required devices are installed and connected as required to fire alarm system.

END OF SECTION

SECTION 213000
FIRE PUMPS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fire pump package, including fire pump, diesel engine drive, controller, and accessories.
- B. Electric jockey pump.

1.02 REFERENCE STANDARDS

- A. FM (AG) - FM Approval Guide; current edition.
- B. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. NFPA 20 - Standard for the Installation of Stationary Pumps for Fire Protection; 2018.
- D. NFPA 37 - Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines; 2018.
- E. UL (DIR) - Online Certifications Directory; Current Edition.
- F. UL 448 - Centrifugal Stationary Pumps for Fire-Protection Service; Current Edition, Including All Revisions.
- G. UL 778 - Standard for Motor-Operated Water Pumps; Current Edition, Including All Revisions.
- H. UL 1247 - Diesel Engines for Driving Centrifugal Fire Pumps; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers literature including general assembly, pump curves showing performance characteristics with pump and system, operating point indicated, NPSH curve, controls, wiring diagrams, and service connections.
- C. Shop Drawings: Indicate layout, general assembly, components, dimensions, weights, clearances, and methods of assembly.

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- D. Certificates: Certify that fire pumps meet or exceed specified requirements at specified operating conditions and that the installation complies with regulatory requirements. Submit summary and results of shop tests performed in accordance with NFPA 20
 - E. Test Reports: Indicate results of hydrostatic test and field acceptance tests.
 - F. Manufacturer's Instructions: Indicate support details, connection requirements, for fire pump system.
 - G. Designer's Qualification Statement.
 - H. Manufacturer's Qualification Statement.
 - I. Installer's Qualification Statement.
 - J. Operation Data: Include manufacturers instructions, start-up data, trouble-shooting check lists, for pumps, drivers, and controllers.
 - K. Maintenance Data: Include manufacturers literature, cleaning procedures, replacement parts lists, and repair data for pumps, drivers and controllers.
 - L. Project Record Documents: Record actual locations of components and accessories.

1.04 QUALITY ASSURANCE

- A. Comply with NFPA 13 and NFPA 20; where requirements differ comply with the most stringent.
- B. Design fire pump system under direct supervision of a Professional Engineer experienced in design of this work and licensed at New York.
- C. Equipment and Components: Bearing FM (AG) label or marking.
- D. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- E. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- F. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years experience.
- G. Provide certificate of compliance from authority have jurisdiction indicating approval of field acceptance tests.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fire pumps and components in factory packing. Comply with manufacturer's rigging and installation instructions.
- B. Protect fire pumps and components from physical damage including effects of weather, water, and construction debris.
- C. Provide temporary inlet and outlet caps, and maintain in place until installation.

PART 2 PRODUCTS

2.01 GENERAL

- A. Fire pump manufacturer shall provide equipment listed in Division 21 specifications and Drawings enclosed within in a factory-assembled, self framing building

2.02 FIRE PUMPS

- A. Vertical turbine type; UL 448 and UL 778, centrifugal.
 - 1. Basis of Design Manufacturer: AC Fire Pump, a xylem brand; Model FP16DMC, (Impeller B8822): www.acfirepump.com.
 - 2. Casing: Cast iron, rated for 250 psi or 1.20 times actual discharge working pressure discharge gauge, air vent, wear rings, seal flush connection, drain plug, and flanged discharge.
 - 3. Impellers: Bronze, fully enclosed, keyed to shaft or secured with lock nut.
 - 4. Shaft: Stainless steel or carbon steel with bronze or stainless steel sleeve through seal chamber.
 - 5. Seals: Packing gland with minimum four rings graphite impregnated packing and bronze lantern rings.
 - 6. Performance:
 - a. Flow: 2500 gpm,
 - b. Head: 186 psig.
 - c. No. of Stages: 3.
 - d. Pump Max BHP: 400.

- e. Pump RPM: 1770.
- B. Accessories (for each pump unless noted otherwise):
 - 1. Right angle gear drive: A-C Fire Pump Systems, Model G400, 1:1 ratio.
 - 2. Concentric increaser and check valve in pump discharge and OS&Y gate or butterfly valve on system side of check valve.
 - 3. Cla-Val 33ATD Air Release / Vacuum Break Valve, 2" NPT, 500 PSI Max. Working Pressure.
 - 4. Casing Relief Valve, 3/4", 20-300 PSI Adjustment Range.
 - 5. Sole Plate for Vertical Turbine Fire Pump.
 - 6. Suction pressure gauge, 4-1/2 inch diameter dial with snubber, valve cock and lever handle.
 - 7. Discharge pressure gauge (0-300 PSIG) mounted on board attached to pump, with snubber, valve cock and lever handle.
 - 8. One Hose valve manifold with 8-2-1/2 inch angle, cast brass, test header valves with caps and chains, 10 inch inlet.
 - 9. Flow metering system for closed loop testing, A-C Fire Pump Systems, Model GVI-8-2500, 8 inch pipe size, 1250-5000 gpm range.
 - 10. One pilot controlled main relief valve, UL1478, 6 inch size, Class 300 PSI max, 6x10 size.
 - 11. One closed Waste Cone w/ Sightglass, Size: 6" x 10", 150# Flanges

2.03 DIESEL ENGINE DRIVE:

- A. Basis of Design Manufacturer: Clarke, Model C13H0-UFAD78, 24V.
 - B. Diesel Engine: Comply with requirements of NFPA 37 and UL 1247; automatic operation with overspeed/overcrank switch and drive, two contactor switches, low oil pressure and high water temperature warning switches, engine block heater, and fuel shut-off solenoid, with wiring terminating in junction box.
 - C. Muffler: Clarke, Residential, Model JRE08-500078.
 - D. Performance:
-

1. Engine Rated BHP: 436 HP
 2. Engine Derated BHP Available: 418.1 HP
 3. RPM: 1760.
- E. Cooling Water System: Closed system with cooling water supply to heat exchanger from fire pump discharge. Include four manual shut-off valves (including by-pass line), two strainers, pressure regulating valve, automatic solenoid valve and pressure gauge.
- F. Storage Batteries: Dual lead acid batteries with cables and battery racks, 24V Neg. Ground (4 batteries), 1400 cold cranking Amps, A-C Fire Pump Systems part no. AC2416 .
- G. Fuel System: 460 gal above ground, double wall, fuel storage tank, fill pipe and cap, manual shut-off valve, flame arrestor, oil level gauge, braided bronze flexible connectors, seamless type L copper tubing with flared joints. Fill tank at completion.
- H. Engine Controller: Basis of Design Manufacturer: Eaton, Model FD140; Automatic; drive enclosed in floor mounted 14 gage, 0.0747 inch steel housing, UL (DIR) and New York Department of Building (NYSB) listed and labelled, and shall meet Factory Mutual Research (FM) 1321/1323.
1. Controller: Function to automatically start fire pump from water pressure control switch or test switch.
 2. Power: Universal Voltage Supply; The controller can be powered with supply voltages from 100Vac to 240 Vac.
 3. Stop Push Button: To manually stop engine.
 4. Automatic Conditions: Controller shall alternate batteries automatically on each 15 second cranking cycle. Alarm if engine not started after six attempts.
 5. Construction:
 - a. All internal components shall be front mounted and wired for ease of inspection and maintenance. All relays shall have visual indication to show that the relays are energized. The controller shall include an LCD display to indicate battery voltage and amperes as well as system pressure, in PSI or Bars.
 - b. The controller shall have twin battery chargers meeting Factory Mutual Research (FM) requirements. The battery chargers shall have reverse polarity protection/ indication and be capable of recharging a completely discharged battery within 24

- hours. The chargers shall auto detect the input voltage of 100VAC to 240VAC and shall be able to be programmed for either 12VDC or 24VDC output.
- c. The controller shall come standard with a breaker disconnect on the AC line and for both battery connections.
- 6. The controller shall be housed in a NEMA Type 2 (IEC IP11) drip-proof, powder baked finish, freestanding enclosure.
 - 7. Stop Push Button: To manually stop engine.
 - 8. Pressure Sensor: Provide solidstate 420mA pressure sensor. The pressure Start and Stop points shall be adjustable in increments of one (1) PSI. A low pressure prealarm, indicated with a flashing green LED, shall denote a potential pump starting condition and will remain lit once the pump has started to indicate the starting cause.
 - 9. Standard Inputs:
 - a. Remote Start
 - b. Fuel Spill
 - c. Deluge Valve
 - d. Low Suction
 - e. Interlock On
 - f. Pump Start
 - g. Low Fuel
 - h. Programmable Inputs (9)
 - 10. Output Relays:
 - a. Low Fuel
 - b. Auto Mode
 - c. Common Alarm
 - d. Engine Run
 - e. Future #1
-

- f. Future #2
- 11. Option S1 - Low Fuel Level Switch, 16 inch
- 12. Microprocessor Control:
 - a. The following parameters shall be programmable and included as standard:
 - 1) START and STOP PSI points
 - 2) High and Low Pressure Alarm Setpoints
 - 3) Stop mode: manual or auto
 - 4) Run period timer: 0-60 min
 - 5) Ac power failure: enable or disable
 - 6) Sequential start timer: 0-300 sec.
 - 7) Weekly test timer
 - 8) Pressure deviation: 1-99 psi
 - 9) Language: English/French/Spanish/Other
 - b. The following visual and audible alarms shall be provided:
 - 1) Fail to start
 - 2) Low oil pressure engine overspeed battery #1 failure
 - 3) Battery #2 failure remote start
 - 4) Low pressure speed switch fault
 - 5) ECM selector in alt position fuel injector malfunction starter #1 failure
 - 6) Starter #2 failure transducer failure data cable disconnect dc fail
 - 7) High engine temp. Engine run
 - 8) Low fuel
 - 9) Charger #1 failure
 - 10) Charger #2 failure deluge valve interlock on

- 11) Low suction ECM warning ECM failure
 - 12) High raw water temperature low engine temperature
 - 13) Low raw water flow fuel spill
- c. The controller shall have a 4 line by 40-character LCD display mounted on a panel opening in the front door. The LCD display shall indicate the following:
- 1) Main screen displaying system pressure, Battery #1/#2 voltage and amperage, operation mode, shutdown mode, custom messages, alarms, timers, date, and time.
 - 2) Set point review screen displaying the programmed pressure start and stop points, and weekly test time.
 - 3) Controller statistics screen, including:
 - (a) Powered Time
 - (b) Engine Run Time
 - (c) Number of Cranks
 - (d) Number of Starts
 - (e) Last Engine Start Time
 - (f) Last Engine Run Time
 - (g) Last Low Pressure Start
 - (h) Minimum Battery #1 Voltage
 - (i) Maximum Battery #1 Voltage
 - (j) Minimum Battery #2 Voltage
 - (k) Maximum Battery #2 Voltage
 - (l) Minimum Battery #1 Amps
 - (m) Maximum Battery #1 Amps
 - (n) Minimum Battery #2 Amps
 - (o) Maximum Battery #2Amps

- (p) Minimum System Pressure
 - (q) Maximum System Pressure
 - (r) Last System Startup
 - (s) Last Engine Test
 - (t) Last Low Oil Pressure
 - (u) Last Overspeed
 - (v) Last Fail To Start
 - (w) Last Low Fuel
 - (x) Last Charger Failure
 - (y) Last Battery Failure
 - (z) Last ECM Alarm
- 4) Controller diagnostics screen, including:
- (a) Date & Time
 - (b) Firmware Version
 - (c) Shop Order Number
 - (d) Customer Order Number
 - (e) Battery Voltage
 - (f) Internal Board Voltage
 - (g) Transformer Output Voltage
 - (h) Current Transformer Outputs
 - (i) Pressure Transducer Calibrated Settings
 - (j) Input Status
 - (k) Relay Status

- 5) Display last messages screen that will display at least the last 10,000 alarms / messages stored in the controllers' memory.
 - 6) Display up to ten (10) custom messages of up to 100 characters each, which will continually scroll across the fourth line of the display.
 - 7) Remaining time left on active timers.
- d. The controller shall be supplied with six (6) green status LED's for the following:
- 1) Engine Run
 - 2) Remote Start
 - 3) Low Pressure
 - 4) Interlock On
 - 5) Deluge Valve
 - 6) One Programmable LED
- e. The controller shall be supplied with twenty (20) red alarm LED's to indicate the following:
- 1) Battery #1 Failure
 - 2) Battery #2 Failure
 - 3) Charger #1 Failure
 - 4) Charger #2 Failure
 - 5) Speed Switch Fault
 - 6) ECM Selector in Alt Position
 - 7) Fuel Injection Malfunction
 - 8) Low Suction Pressure
 - 9) Fail To Start
 - 10) High Engine Temp.
 - 11) Low Oil Pressure

- 12) Engine Overspeed
- 13) Low Fuel
- 14) ECM Warning
- 15) ECM Failure
- 16) High Raw Water Temperature
- 17) Low Engine Temperature
- 18) Low Raw Water Flow
- 19) Fuel Spill
- 20) One Programmable LED

- f. The microprocessor logic board shall be available with:
 - 1) A USB port for transference of message history, controller status, diagnostics, configuration, statistics and the ability to update firmware.
 - 2) An optional Ethernet port for direct connection to a computer for data transfer.
 - 3) An optional RS485 Serial port for communication to various external software programs.
 - 4) An optional RS232 Serial Port
- g. The controller shall come complete with an embedded web page which allows viewing of the controllers' current status, data values, programmed set points, and downloadable history.
- h. A Fail-to-Start alarm shall occur if the engine does not start after the crank cycle.
- i. A sequential start timer, weekly test timer and AC Failure Start timer shall be provided as standard.
- j. The controller shall be supplied with interlock and shutdown circuits as standard. A flashing green LED shall indicate an interlock on condition.
- k. Where shutdown of the pump(s) due to low suction pressure is required, it shall be accomplished without the addition of a separate panel or enclosure. The LCD

display shall indicate low suction shutdown. Resetting of the condition shall be automatic or manual as selected by the user.

1. Means shall be provided to test the operation of all LED's to ensure their functionality.
13. Programming Menu:
- a. The programming menu shall have the ability to enable an entry password.
 - b. The programming menu shall be limited to two
 - c. (2) levels of password protection.
 - d. The controller shall have three (3) languages as a standard, English, French, and Spanish, with the ability to add a fourth language.
14. The programming menu shall be grouped into 7 main menu headings as follows:
- a. Regional Settings
 - b. Pressure Settings
 - c. Timer Values
 - d. Input/Output Menu
 - e. System Configuration (password protected)
 - f. Language
 - g. Main Menu Password
15. Custom Inputs/Outputs
- a. The controller shall come standard with nine (9) custom inputs, two (2) programmable LED indicators, and two (2) future outputs, with the ability to add up to another 8 outputs via optional relay boards.
 - b. The user shall be able to program the future in- puts/outputs and optional relays through the main programming menu.
 - c. The inputs shall be selectable based on the following criteria:
 - 1) User selected message or twenty four (24) predetermined messages.

- 2) Energize the common alarm relay when the input is received.
 - 3) Link to a future relay and/or LED indicator.
 - 4) Alarm latched until reset.
 - 5) Normally open or closed input.
 - 6) On-delay timer.
 - 7) Energize the buzzer when the input is received.
- d. The LED indicators shall be selectable based on the following criteria:
- 1) Indication based on a minimum of fourteen (14) predetermined alarms or a custom input.
- e. The future relays shall be selectable based on the following criteria:
- 1) Output based on a minimum of forty (40) predetermined alarms, controller status or a custom input.
 - 2) Latched until reset.
 - 3) Energized under normal conditions.
 - 4) On or off delay timer on the output.

2.04 PRESSURE BOOSTER (JOCKEY) PUMP

- A. Basis of Design Manufacturer: A-C Fire Pump Systems, Model 25S17
- B. Electrically operated, submersible turbine type.
- C. Control by automatic jockey pump controller with full voltage starter and minimum run timer to start pump on pressure drop in system and stay in operation for minimum period of time.
Fire pump shall start automatically on further pressure drop or on jockey pump failure.
- D. Performance:
1. Flow: 15 GPM
 2. Head:
 3. Power: 3 HP.
- E. Electrical Characteristics: 208 Volt, 3 Phase, 3 HP.
-

F. Controller:

1. Basis of Design Manufacturer: Eaton XTJP-G07-L1.
 2. The Jockey Pump Controller shall meet the requirements of the latest edition of NFPA 20 as well as meeting CE mark requirements. It shall meet or exceed the requirements of UL 508, Underwriters Laboratories (UL) standards.
 3. Starting Type: The controller shall be Across-the-Line type designed for full voltage starting.
 4. Ratings:
 - a. The Controller shall have a minimum withstand rating of 10,000 symmetrical amperes @ 120V, Single Phase.
 - b. The horsepower rating of the controller shall not exceed 50Hp for three (3) phase units or 10Hp on single phase units.
 5. Construction:
 - a. The controller shall include a combination Circuit Breaker / Overload Motor Protector.
 - b. The motor circuit protector shall be mechanically interlocked such that the enclosure door cannot be opened when the handle is in the ON position except by a tool operated defeater mechanism.
 - c. The controller manufacturer shall manufacture the contactor, motor circuit protector, touchscreen display, and enclosure. Brand-labeled components will not be accepted.
 6. Supply Voltage:
 7. The jockey pump controller shall auto-detect three phase voltage supply from 200VAC to 600VAC, 50/60Hz and single phase from 110VAC to 240VAC, 50/60Hz, without the use of a control transformer.
 8. Coil Voltages:
 - a. The jockey pump controller shall have the following available coil voltages:
 - 1) 120VAC 50/60 Hz or 24VDC
 9. Enclosure:
-

-
- a. The controller shall be housed in a NEMA Type 2 (IEC IP11) drip-proof, powder baked finish, freestanding enclosure.
10. Languages:
- a. The controller shall be available in a variety of languages including, but not limited to:
 - 1) English, French, Spanish, Portuguese, Turkish.
11. Touchscreen Display:
- a. The controller shall be supplied with a color touchscreen display that shall indicate the following: Supply Voltage on all phases, Current Pressure, Start Pressure and Stop Pressure.
 - b. The touchscreen display shall be supplied with a solid-state 4-20mA pressure sensor. The pressure Start and Stop points shall be adjustable in increments of one (1) PSI or 0.1 BAR.
 - c. The touchscreen display shall be a door-mount type that permits exterior programming with the controller door secured.
12. The jockey pump controller shall have the following options:
- a. C1 Extra Contacts “Pump Run”
 - b. C2 Extra Contacts “AC Power Failure”
 - c. FTS Extra Contacts “Fail to Start”
 - d. POL “Power On” Virtual LED
 - e. PRL “Pump Run” Virtual LED
 - f. P7 Low Suction Pressure Switch and Alarm Virtual LED
 - g. P8 Low Suction Shutdown
 - h. P10 Pressure Transducer – Sea Water

2.05 IMMERSION HEATERS FOR PUMP VAULT

A. Over the side heater with vertical riser:

- 1. Basis of Design Manufacturer: Wattco; www.wattco.com.

2. Application: Water.
3. Type : TLCP with vertical riser.

B. Electrical:

1. 5KW, 230v 3ph (56 amps) - 1 circuit.

C. Construction

1. 0.430" dia stainless stell 316 sheath.
2. 3 hairpin tubular elements.
3. 240" stainless steel 316 vertical riser (distance from the top of nema 4 enclosure to abse element of box). Verify in field and coordinate with final pump building floor elvation and vertical fire pump casing depth.
4. 45" immersion sheath length.
5. 5" cold section.
6. Circle 50" diameter.
7. Thermowell with thermocouple Type J for temperature control.
8. Thermowell with thermocouple Type J attached to sheath end for Hi-Limit protection.
9. Nema 4 moisture resistant enclosure
10. Operating conditions: 5 psi @ 50 F.

D. Control Panel:

1. Basis of Design Manufacturer: Wattco
2. Enclosure: NEMA 4 (moisture resistant).
3. Accessories:
 - a. Main disconnect
 - b. Control Transformer
 - c. Contactors and fuses for each heater load and electgrical characteristics.
 - d. Temperature controller +RSMP and Retransmit (4-20 mA).

- e. Element high limit controller +RSMP and Retransmit (4-20 mA).
- f. Remote/Local/OFF selector switch.
- g. Green light for load.
- h. Red light for high limit.
- i. Flow / Level switch interlock.
- j. Dry contact for high limit alarm.
- k. Dry contact for heater ON status.
- l. Emergency Stop switch.
- m. Junction terminals for TC type J.

E. Provide Flow/Level switch within vertical water shaft.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with NFPA 20.
- B. Install diesel engine drive in accordance with NFPA 37.
- C. Provide access space around pumps for service; no less than minimum as recommended by manufacturer.
- D. Install piping in accordance with Section 210500. Decrease from line size with long radius reducing elbows or reducers. Support piping adjacent to pump such that no weight is carried on pump casings. For base mounted pumps, provide supports under elbows on pump suction and discharge.
- E. Provide drains for bases and seals, piped to and discharging into floor drains.
- F. Provide piping for fuel supply and return connected to engine drive. Provide piping to and from exhaust silencer with thimble at wall or roof penetrations. Refer to Section 231113.
- G. Provide for connection to electrical service. Refer to Section 260583.
- H. Lubricate pumps before start-up.

3.02 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in accordance with Section 014000 - Quality Requirements.
- B. Perform hydrostatic tests, flushing, and field acceptance tests as specified in NFPA 20.
- C. Perform field acceptance tests in the presence of Authority Having Jurisdiction.

3.03 CLOSEOUT ACTIVITIES

- A. See Section 017800 - Closeout Submittals, for closeout submittals.
- B. See Section 017900 - Demonstration and Training, for additional requirements.
- C. Demonstration:
- D. Demonstrate automatic operation of system including verification of pressure switch set points to Owner.
- E. Use operation and maintenance data as reference during demonstration.
- F. Briefly describe function, operation, and maintenance of each component.
- G. Conduct walking tour of project.
- H. Training: Train Owner's personnel on operation and maintenance of system.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of two hours of training.

END OF SECTION

**SECTION 213419
PREMANUFACTURED FIRE PUMP BUILDING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufacturer-engineered, shop-fabricated self-framing design utility building.

1.02 REFERENCE STANDARDS

- A. AISC 360 - Specification for Structural Steel Buildings; 2016.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
- C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2020.
- D. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
- F. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2011 (Reapproved 2015).
- G. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2017.
- H. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2018.
- I. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2019.
- J. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- K. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

- L. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems; 2018.
- M. MBMA (MBSM) - Metal Building Systems Manual; 2012.
- N. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on profiles, component dimensions, fasteners.
- C. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections; wall and roof system dimensions, panel layout, general construction details, anchors and methods of anchorage, and installation; framing anchor bolt settings, sizes, locations from datum, and foundation loads; indicate welded connections with AWS A2.4 welding symbols; indicate net weld lengths; provide professional seal and signature.
- D. Manufacturer's Instructions: Indicate preparation requirements, anchor bolt placement.
- E. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection bracing.
- F. Designer's Qualification Statement.
- G. Manufacturer's Qualification Statement: Provide documentation showing metal building manufacturer is accredited under IAS AC472.
 - 1. Include statement that manufacturer designs and fabricates metal building system as integrated components and assemblies, including but not limited to primary structural members, secondary members, joints, roof, and wall cladding components specifically designed to support and transfer loads and properly assembled components form a complete or partial building shell.

1.04 QUALITY ASSURANCE

- A. Designer Qualifications: Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a Professional Structural Engineer experienced in design of this type of work.
 - 1. Design Engineer Qualifications: Licensed in New York.

2. Provide a complete design certification signed and sealed by a registered professional engineer licensed in the State of New York.
 3. Comply with applicable code for submission of design calculations as required for acquiring permits.
- B. Perform work in accordance with AISC 360 and MBMA (MBSM).
- C. Perform welding in accordance with AWS D1.1/D1.1M.
- D. Manufacturer Qualifications: Company specializing in the manufacture of products similar to those required for this project.
1. Not less than three years of documented experience.

1.05 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL

- A. Fire pump manufacturer shall provide equipment listed in specifications and drawings enclosed in a factory-assembled, self-framing building, using the walls and roof as the structural supporting system. Building shall be supplied in single slope roof design and may be shipped in multiple sections. The roof system shall include gutter and rake trim for a finished appearance. Building shall include accessories, steel base system, electrical, HVAC and interior finishes. All assemblies will be completed in a controlled environment.
- B. Off-loading, setting, and connection of utilities is the responsibility of the contractor.
- C. Building will be supplied complete with all necessary component parts, including drill-in foundation anchors, to form a complete building system. All parts will be new and free from any defects or imperfections.
- D. The building width and length will be measured from the outside of the building wall panels, and the height of the building will be the distance measured from the bottom surface of the base channel to the exterior juncture of the roof and side wall panels.
- E. Building shall be factory erected in a controlled environment on a tube skid. The structural tube skid shall be hot-dipped galvanized.

2.02 PERFORMANCE REQUIREMENTS

- A. Design building for the following loads, in addition to the stationary weight (dead load) of the building. Reduction of gravity loads due to tributary loaded areas will not be permitted.
- B. The Ground Snow Load of the building will not be less than 40 pounds per square foot applied on the Horizontal projection of the roof.
- C. The Collateral Load of the building will not be less than 10 pounds per square foot applied on the Horizontal projection of the roof.
- D. The design Wind Load of the building will not be less than 115 miles per hour (3 second gust) and will be distributed and applied in accordance with the 2020 Building Code of New York State.
- E. The design Seismic Load of the building will be calculated, distributed and applied in accordance with the 2020 Building Code of New York State. A 0.2 second Spectral Response Acceleration of 19.8 percent and a 1.0 second Spectral Response Acceleration of 6.0 percent will be used for design.
- F. *Building shall be designed to Risk Category IV requirements.*
- G. Exterior wall and roof system shall withstand imposed loads with maximum allowable deflection of 1/90 of span.
- H. Provide drainage to exterior for water entering or condensation occurring within wall or roof system.
- I. Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of 120 degrees F.
- J. Building Fire Protection:
 - 1. Protect fire pump building with an automatic sprinkler system installed in accordance with NFPA 13. Automatic sprinkler system shall be provided as an Extra Hazard Group 2 occupancy (NFPA 20, 4.14.1.3).
- K. Pump House Electrical System:
 - 1. Provide complete electrical system including a 200 amp 120/208V, 3-phase panelboard with main circuit breaker and load circuit breakers. AIC ratings shall be 22000. Provide 120V receptacle circuits, lighting circuits, heating/cooling system circuit, fire alarm panel circuit, 100kA/phase surge protection & circuit, and all circuits related to the Fire

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- Pump such as immersion heaters, fire pump block heaters, jockey pump control panel, battery charger, and all misc. loads.
2. Provide equipment power and disconnects, interior GFI receptacles, and exterior WP GFI receptacles.
 3. Provide LED lighting for interior and exterior entrance of the building. Interior lighting shall meet or exceed 30 footcandles. Provide emergency lights inside and at the exterior door to meet all code requirements.
 4. Provide an addressable fire alarm control panel with fixed heat detectors and visual strobe device inside, and WP horn/strobe at the exterior. Provide all fire alarm monitoring modules, and tamper/flow switches as required for fire pump monitoring. Fire alarm control panel shall be addressable and networkable with battery back up. Provide Fiber optic connection to fire alarm panel for networking connection to building D and other FACPs.
 5. Refer to related division 26 and 28 specifications for all requirements.

2.03 MATERIALS - FRAMING

- A. Structural Steel Members: ASTM A992/A992M.
- B. Structural Tubing: ASTM A500/A500M Grade B cold-formed.
- C. Anchor Bolts: ASTM F1554, Grade 36, Class 1A, with hot dip type for protective coating.
- D. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1; galvanized to ASTM A153/A153M.
- E. Primer: SSPC-Paint 20 zinc rich.
- F. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
 2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.

2.04 MATERIALS - WALLS AND ROOF

- A. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Designation SS (structural steel), Grade 33 (230), with G90/Z275 coating.
- B. Sealant: Manufacturer's standard type.

-
- C. Trim, Closure Pieces, Caps, Flashings, Gutters, Downspouts, Rain Water Diverter, Fascias, and Infills: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

2.05 COMPONENTS

A. Doors and Frames:

1. Doors shall be 1-3/4 inches thick flush type. Door panels shall be nominal 18 gauge galvanized steel reinforced by lamination to an insulated core enclosed with 16 gauge end channel. The hinge reinforcements shall be nominal 7 gauge and the lock reinforcements shall be nominal 16 gauge.
2. Door frames will be either 3 inches deep, single rabbit or 4-3/4 inches deep, double rabbeted type, of nominal 16- gauge galvanized steel. Frames will have hinge reinforcement of a nominal 7-gauge and lock reinforcement of a nominal 16-gauge.
3. Doors and frames shall be factory painted with one coat of primer. All single-leaf doors shall be preassembled in their frames and hardware installed and tested prior to shipment. Field installation of single leaf door units shall not require any frame assembly, or door hanging.
4. Door leaf and frame will receive one factory applied finish coat of polyester paint to match the wall color.

B. Door Hardware:

1. 3 - 4-1/2 inches x 4-1/2 inches standard weight plain bearing hinges per ANSI #A5133, 630 satin stainless finish with non-rising pins.
2. 3-5/16 inches wide x 7/8 inch high extruded aluminum threshold. (Out Swing)
3. Polypropylene/aluminum rigid rubber weather-stripping.
4. Door closer is certified to conform to ANSI 156.4 Grade 1 and meets exterior barrier free codes in 689 aluminum lacquer finish.
5. Cylindrical key in knob lockset per ANSI A156.2, Series 4000, Grade 2, Function F81, 630 satin stainless steel finish

C. Wall Louvers

1. Fixed Wall Louvers shall be fixed blade type with blades set on a 45 degree slope. Blades and frames shall be nominal 14 gauge extruded aluminum with natural mill finish. Louvers shall include #18-14 aluminum mesh insect screens.

D. Roof Access Hatches

1. Provide roof hatch for each fire pump, Bilco E50TB or equal.
2. Center roof hatch over fire pump.
3. Coordinate placement of fire pump with casing. Allow for placement of vertical turbine jockey pump in one of the two fire pump casings.

2.06 ROOF PANELS

- A. Supply roof panels in a single continuous length from eave line to eave line. Roof panels shall tightly interlock so that no fasteners are required at intermediate points along the panel side laps.
- B. Roof panels shall be a maximum of 16 inches wide with a smooth surface between the interlocking side ribs. The interlocking ribs shall be a minimum 3 inches high and shall be turned upward. All roof panels shall be factory punched for connection at the eave line of the building. There will be no fastener penetrations through the roof covering except at eave lines, ridge lines and roof accessory openings, such as access hatches and ventilators.
- C. Roof panels shall be nominal 24-gauge galvanized steel conforming to ASTM A 653 specifications with the galvanized coating conforming to G90 (0.90 oz. commercial) standards. Minimum yield strength of the panel material will be 50,000 PSI. All exterior surfaces of the galvanized steel roof panels will receive two factory, roller applied paint coats having a combined coating thickness of 0.8 to 1.1 mils of dry film thickness. The finished coat for the roof panels will be a white siliconized polyester formulation.
- D. The roof panel color coating will carry a low fire hazard rating equal to a Class 1 material as defined by Factory Mutual. The panel coating will have achieved a Flame Spread Index of 0 and a Fuel Contributed Index of 5 or less when tested in accordance with ASTM E 84 test procedures.
- E. The finish coat will be a white siliconized polyester formulation that will meet the following performance standards after 10 years continuous exposure in "normal" atmospheric conditions not containing corrosive fumes, such as chemicals or salt spray.
 1. Panels will show no evidence of blistering, peeling or chipping.

2. Panels will not show surface chalking in excess of the No. 6 rating per ASTM D 4214, Method A, as established by the American Society of Testing Materials (ASTM).
3. Panels will not show color change in excess of 7 Hunter units when measured in accordance with the ASTM D 2244 standard after cleaning per ASTM D 3964.
4. The above performance standards will not apply where panels have been damaged by fire, radiation or other physical damage.

2.07 WALL PANELS

- A. Exterior wall panels shall be a single continuous length from the base channel to the roof line of the building at the side walls and end walls except where interrupted by wall openings.
- B. Wall panels shall be 16 inches wide with a 3 inch deep inward-turned interlocking side rib. Wall panels will contain two 3/4 inch deep by 3-1/8 inches wide fluted recesses, each starting 2-7/16 inches from the panel edge.
- C. Wall panels will be fastened internally to the base channel and eave cap of the building with 3/8" diameter plated machine bolts placed within the panel interlock. The fastening system will be designed so that no wall fasteners are exposed on the exterior surface of the walls.
- D. Wall panels shall be nominal 24-gauge galvanized steel conforming to ASTM A 653 specifications with the galvanized coating conforming to G90 (0.90 oz. commercial) standards.
- E. Minimum yield strength of the panel material will be 40,000 PSI. Panel material will be embossed with a random pattern pebble embosser of approximately 0.007-0.008 depth.
- F. All exterior surfaces of the galvanized steel wall covering and exterior trim will receive a factory, roller applied paint coating having an exterior coating thickness of 0.95 to 1.1 mils of dry film thickness. The finish coat for wall panels shall be a siliconized polyester formulation, Shell Gray color.
- G. The wall panel color coating will carry a low fire hazard rating equal to a Class 1 material as defined by Factory Mutual. The panel coating will have achieved a Flame Spread Index of 0 and a Fuel Contributed Index of 5 or less when tested in accordance with ASTM E 84 test procedures.
- H. Exterior color coatings will meet the following performance standards after 10 years continuous exposure in normal atmospheric conditions not containing corrosive fumes, such as chemical fumes or salt spray.

1. Panels will show no evidence of blistering, peeling or chipping. Paint finish will not peel, flake or otherwise lose adhesion to an extent that is apparent on ordinary visual observation. NOTE: Slight crazing or cracking may occur on roll-formed edges or break bends at the time of forming.
2. Panels will not show surface chalking in excess of the No. 8 rating per ASTM D 4214, Method A as established by the American Society of Testing Materials (ASTM).
3. Panels will not show color change in excess of five Hunter units when measured in accordance with the ASTM D 2244 standard after cleaning per ASTM D 3964.
4. The above performance standards will not apply where panels have been damaged by fire, radiation or other physical damage.

2.08 INTERIOR FINISHES

A. Wall Liner:

1. The interior of the building shall be finished with a factory-assembled, insulated metal liner panel having no exposed fasteners except at the matching base, ceiling and accessory trim. The liner system will have a concealed insulating board of 1-1/2 inches thick polyisocyanurate foam impaled on rib clips, and the void between the exterior wall panel and the lock-in liner panel will be insulated with 16 inches wide, 3-1/2 inches thick R13 unfaced fiberglass insulation. Liner panels will be 16 inches wide, nominal 26-gauge, embossed galvanized steel, prepainted at manufacturer's standard color. Insulation will be non-combustible, nominal 1" thick, 2# minimum density fiberglass laminated to the liner panel.
2. Provide 1/4 inch layer of continuous, reflective, polyethylene insulation (R-7.75, U-0.13) inside of the exterior panel ribs.

B. Ceiling and Roof:

1. The metal ceiling system will consist of 3 inches deep, 16 inches wide interlocking panels of nominal 24-gauge embossed galvanized steel, factory painted, manufacturer's standard color. The ceiling system will be supported at its perimeter by concealed angles. The ceiling system will be furnished complete with all necessary connectors and fasteners.
2. The ceiling will be insulated with 16 inches wide by 3-1/2 inches thick R13 unfaced fiberglass insulation laid in panel void. A 1/4 inch layer of continuous, reflective, polyethylene insulation (R-7.55, U-0.13) will be laid on top of the ceiling panel ribs. A

second layer of 16 inches wide by 3-1/2 inches thick R13 unfaced fiberglass insulation will be laid on top at right angles to the panel ribs. A third layer of 16 inches wide by 3-1/2 inches thick R13 unfaced fiberglass insulation will be laid on top, parallel to the ceiling panel ribs. The "U" value through the finished ceiling will be a maximum of 0.032 BTUs per square foot.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position.

3.02 ERECTION - FRAMING

- A. Erect framing in accordance with AISC 360.
- B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing. Locate braced bays as indicated.
- C. Set column base plates with non-shrink grout to achieve full plate bearing.
- D. Do not field cut or alter structural members without approval.
- E. After erection, prime welds, abrasions, and surfaces not shop primed.

3.03 ERECTION - WALL AND ROOF PANELS

- A. Install in accordance with manufacturer's instructions.
- B. Use concealed fasteners.
- C. Install sealant and gaskets, providing weather tight installation.

3.04 ERECTION - GUTTERS AND DOWNSPOUTS

- A. Rigidly support and secure components. Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts.
- B. Slope gutters minimum 1/8 inch/ft.
- C. Install splash pans under each downspout.

3.05 INSTALLATION - ACCESSORY COMPONENTS IN WALL SYSTEM

- A. Install door frames, doors, overhead doors, and windows and glass in accordance with manufacturer's instructions.

END OF SECTION

SECTION 284601
FIRE DETECTION AND ALARM - FIRE PUMP BUILDING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fire alarm system design and installation, including all components, wiring, and conduit.
- B. Transmitters for communication with supervising station.
- C. Maintenance of fire alarm system under contract for specified warranty period.

1.02 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. IEEE C62.41.2 - IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits; 2002 (Corrigendum 2012).
- D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. NFPA 72 - National Fire Alarm and Signaling Code; Most Recent Edition Cited by Referring Code or Reference Standard.
- F. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. UL 268 - Standard for Smoke Detectors for Fire Alarm Systems; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. Evidence of designer qualifications.
- B. Design Documents: Submit all information required for plan review and permitting by authorities having jurisdiction, including but not limited to floor plans, riser diagrams, and description of operation:

1. Copy (if any) of list of data required by authority having jurisdiction.
 2. NFPA 72 "Record of Completion", filled out to the extent known at the time.
 3. Clear and concise description of operation, with input/output matrix similar to that shown in NFPA 72 Appendix A-7-5-2.2(9), and complete listing of software required.
 4. System zone boundaries and interfaces to fire safety systems.
 5. Location of all components, circuits, and raceways; mark components with identifiers used in control unit programming.
 6. Circuit layouts; number, size, and type of raceways and conductors; conduit fill calculations; spare capacity calculations; notification appliance circuit voltage drop calculations.
 7. List of all devices on each signaling line circuit, with spare capacity indicated.
 8. Manufacturer's detailed data sheet for each component, including wiring diagrams, installation instructions, and circuit length limitations.
 9. Description of power supplies; if secondary power is by battery include calculations demonstrating adequate battery power.
 10. Detailed drawing of graphic annunciator(s).
 11. Certification by either the manufacturer of the control unit or by the manufacturer of each other component that the components are compatible with the control unit.
 12. Certification by the manufacturer of the control unit that the system design complies with Contract Documents.
 13. Certification by Contractor that the system design complies with Contract Documents.
- C. Evidence of installer qualifications.
- D. Evidence of instructor qualifications; training lesson plan outline.
- E. Inspection and Test Reports:
1. Submit inspection and test plan prior to closeout demonstration.
 2. Submit documentation of satisfactory inspections and tests.
 3. Submit NFPA 72 "Inspection and Test Form," filled out.
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- F. Operating and Maintenance Data: See Section 017800 for additional requirements; revise and resubmit until acceptable; have one set available during closeout demonstration:
1. Complete set of specified design documents, as approved by authority having jurisdiction.
 2. Additional printed set of project record documents and closeout documents, bound or filed in same manuals.
 3. Contact information for firm that will be providing contract maintenance and trouble call-back service.
 4. List of recommended spare parts, tools, and instruments for testing.
 5. Replacement parts list with current prices, and source of supply.
 6. Detailed troubleshooting guide and large scale input/output matrix.
 7. Preventive maintenance, inspection, and testing schedule complying with NFPA 72; provide printed copy and computer format acceptable to Owner.
 8. Detailed but easy to read explanation of procedures to be taken by non-technical administrative personnel in the event of system trouble, when routine testing is being conducted, for fire drills, and when entering into contracts for remodeling.
- G. Project Record Documents: See Section 017800 for additional requirements; have one set available during closeout demonstration:
1. Complete set of floor plans showing actual installed locations of components, conduit, and zones.
 2. "As installed" wiring and schematic diagrams, with final terminal identifications.
 3. "As programmed" operating sequences, including control events by device, updated input/output chart, and voice messages by event.
- H. Closeout Documents:
1. Certification by manufacturer that the system has been installed in compliance with manufacturer's installation requirements, is complete, and is in satisfactory operating condition.
 2. NFPA 72 "Record of Completion", filled out completely and signed by installer and authorized representative of authority having jurisdiction.
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3. Certificate of Occupancy.
4. Report on training results.
- I. Maintenance Materials, Tools, and Software: Furnish the following for Owner's use in maintenance of project.
 1. Furnish the following:
 - a. All tools, software, and documentation necessary to modify the fire alarm system using Owner's personnel; minimum modification capability to include addition and deletion of devices, circuits, and zones, and changes to system description, operation, and evacuation and instructional messages.
 - b. Two copies, on CD-ROM, of all software not resident in read-only-memory.
 - c. Extra Fuses: Two for each installed fuse; store inside applicable control cabinet.

1.04 QUALITY ASSURANCE

- A. Copies of Design Criteria Documents: Maintain at the project site for the duration of the project, bound together, an original copy of NFPA 72, the relevant portions of applicable codes, and instructions and guidelines of authorities having jurisdiction; deliver to Owner upon completion.
- B. Designer Qualifications: NICET Level III or IV (3 or 4) certified fire alarm technician or registered fire protection engineer, employed by fire alarm control panel manufacturer, Contractor, or installer, with experience designing fire alarm systems in the jurisdictional area of the authorities having jurisdiction.
- C. Installer Qualifications: Firm with minimum 3 years documented experience installing fire alarm systems of the specified type and providing contract maintenance service as a regular part of their business.
 1. Authorized representative of control unit manufacturer; submit manufacturer's certification that installer is authorized; include name and title of manufacturer's representative making certification.
 2. Installer Personnel: At least 2 years of experience installing fire alarm systems.
 3. Supervisor: NICET level III or IV (3 or 4) certified fire alarm technician; furnish name and address.
 4. Licensed in New York as fire alarm installer.

- D. Instructor Qualifications: Experienced in technical instruction, understanding fire alarm theory, and able to provide the required training; trained by fire alarm control unit manufacturer.
- E. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.05 WARRANTY

- A. Provide control panel manufacturer's warranty that system components other than wire and conduit are free from defects and will remain so for 1 year after date of Substantial Completion.
- B. Provide installer's warranty that the installation is free from defects and will remain so for 1 year after date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fire Alarm Control Units and Accessories - Basis of Design: Honeywell Security & Fire Solutions/Notifier, as indicated under product descriptions below; www.notifier.com.
- B. Initiating Devices and Notification Appliances:
 - 1. Same manufacturer as control units.
 - 2. Provide initiating devices and notification appliances made by the same manufacturer, where possible.
- C. Substitutions: See Section 016000 - Product Requirements.
 - 1. For substitution of products by manufacturers not listed, submit product data showing features and certification by Contractor that the design will comply with Contract Documents.

2.02 FIRE ALARM SYSTEM

- A. Fire Alarm System: Provide a new automatic fire detection and alarm system:
 - 1. Provide all components necessary, regardless of whether shown in Contract Documents or not.

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2. Provide networking and integration for Fire Alarm Control Panels to monitor and display status of the Fire Pump Building.
 3. Protected Premises: Entire building shown on drawings.
 4. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:
 - a. ADA Standards.
 - b. The requirements of the State Fire Marshal.
 - c. The requirements of the local authority having jurisdiction.
 - d. Applicable local codes.
 - e. Contract Documents (drawings and specifications).
 - f. NFPA 101.
 - g. NFPA 72; where the word "should" is used consider that provision mandatory; where conflicts between requirements require deviation from NFPA 72, identify deviations clearly on design documents.
 5. Evacuation Alarm: Single smoke zone; general evacuation of entire premises.
 6. Fire Command Center: Location indicated on drawings.
 7. Fire Alarm Control Unit: New, located at each building in paragraph 2.02(A)(2).
- B. Supervising Stations and Fire Department Connections:
1. Remote Supervising Station: UL-listed central station under contract to facility.
 2. Means of Transmission to Remote Supervising Station: Digital alarm communicator transmitter (DACT), cellular service.
- C. Circuits:
1. Signaling Line Circuits (SLC) Within Single Building: two per FACP or node (provide nodes as required to accommodate devices as shown on plans, plus spare capacity noted below), Isolated Intelligent, Class B. Provide loop expander module(s) as required to accommodate multiple SLC..

2. Notification Appliance Circuits (NAC): four per FACP or node (provide nodes as required to accommodate devices as shown on the plans, plus spare capacity noted below), Class B.

D. Spare Capacity:

1. Initiating Device Circuits: Minimum 50 percent spare capacity.
2. Notification Appliance Circuits: Minimum 50 percent spare capacity.
3. Fire Alarm Control Units: Capable of handling all circuits utilized to capacity without requiring additional components other than plug-in control modules.

E. Power Sources:

1. Primary: Dedicated branch circuits of the facility power distribution system.
2. Secondary: Storage batteries.
3. Capacity: Sufficient to operate entire system for period specified by NFPA 72.
4. Each Computer System: Provide uninterruptible power supply (UPS).

2.03 FIRE SAFETY SYSTEMS INTERFACES

A. Supervision: Provide supervisory signals in accordance with NFPA 72 for the following:

1. Sprinkler water control valves.
2. Sprinkler system pressure.
3. Fire Pump Building low temperature.
4. Fire pump(s).
5. Airburst system trouble alarm(s).

B. Alarm: Provide alarm initiation in accordance with NFPA 72 for the following:

1. Sprinkler water flow.

2.04 COMPONENTS

A. General:

1. Provide flush mounted units where installed in finish areas; in unfinished areas, surface mounted unit are acceptable.

2. Provide legible, permanent labels for each control device, using identification used in operation and maintenance data.
- B. Fire Alarm Control Units: Digital, addressable type; listed, classified, and labeled as suitable for the purpose intended.
- C. Addressable Fire Alarm Control Unit - Basis of Design: Notifier ONYX Series NFS2-320.
- D. Master Control Unit: As specified for Basis of Design above, or equivalent.
- E. Initiating Devices:
 1. Addressable Systems:
 - a. Addressable Devices: Individually identifiable by addressable fire alarm control unit.
 - b. Provide suitable addressable interface modules as indicated or as required for connection to conventional (non-addressable) devices and other components that provide a dry closure output.
 2. Manual Pull Stations: addressable type, dual action
 - a. Provide 1 extra.
 3. Smoke Detectors: intelligent addressable photoelectric type with base.
 - a. Provide 1 extra.
 4. Heat Detectors: intelligent addressable thermal/rate of rise and fixed temperature as indicated on plans.
 - a. Provide 1 extra.
 5. Addressable Interface Devices: intelligent addressable type compatible with FACP.
 - a. Provide 1 extra.
- F. Notification Appliances:
 1. Horn/Strobes: selectable output and visual cd level.
 - a. Provide 1 extra.
 2. Strobes: selectable visual cd level.

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- a. Provide 1 extra.
 - G. Circuit Conductors: Copper; provide 200 feet extra; color code and label Cable shall be installed in conduit in all areas except within finished spaces where it can be concealed within walls and above suspended ceilings. Refer to specification section 260533.13: 2.01 Conduit Applications, I & J for requirements both subject and not subject to physical damage. Provide J-hooks and support cabling where installed exposed above suspended ceilings.
 - H. Surge Protection: In accordance with IEEE C62.41.2 category B combination waveform and NFPA 70; except for optical fiber conductors.
 - 1. Signaling Line Circuits: Provide surge protection at each point where circuit exits or enters a building, rated to protect applicable equipment.
 - I. Locks and Keys: Deliver keys to Owner.
 - 1. Provide the same standard lock and key for each key operated switch and lockable panel and cabinet; provide 5 keys of each type
 - J. Instruction Charts: Printed instruction chart for operators, showing steps to be taken when a signal is received (normal, alarm, supervisory, and trouble); easily readable from normal operator's station.
 - 1. Frame: Stainless steel or aluminum with polycarbonate or glass cover.
 - 2. Provide one for each control unit where operations are to be performed.
 - 3. Obtain approval of Owner prior to mounting; mount in location acceptable to Owner.
 - 4. Provide extra copy with operation and maintenance data submittal.
 - K. Storage Cabinet for Spare Parts and Tools: Steel with baked enamel finish, size appropriate to quantity of parts and tools.
 - 1. Padlock eye and hasp for lock furnished by Owner.
 - 2. Locate as directed by Owner.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with applicable codes, NFPA 72, NFPA 70, and Contract Documents.
- B. Conceal all wiring, conduit, boxes, and supports where installed in finished areas.

- C. Obtain Owner's approval of locations of devices, before installation.
- D. Install instruction cards and labels.

3.02 INSPECTION AND TESTING FOR COMPLETION

- A. Notify Owner 7 days prior to beginning completion inspections and tests.
- B. Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.
- C. Provide the services of the installer's supervisor or person with equivalent qualifications to supervise inspection and testing, correction, and adjustments.
- D. Prepare for testing by ensuring that all work is complete and correct; perform preliminary tests as required.
- E. Provide all tools, software, and supplies required to accomplish inspection and testing.
- F. Perform inspection and testing in accordance with NFPA 72 and requirements of local authorities; document each inspection and test.
- G. Correct defective work, adjust for proper operation, and retest until entire system complies with Contract Documents.
- H. Diagnostic Period: After successful completion of inspections and tests, Operate system in normal mode for at least 14 days without any system or equipment malfunctions.
 - 1. Record all system operations and malfunctions.
 - 2. If a malfunction occurs, start diagnostic period over after correction of malfunction.
 - 3. Owner will provide attendant operator personnel during diagnostic period; schedule training to allow Owner personnel to perform normal duties.
 - 4. At end of successful diagnostic period, fill out and submit NFPA 72 "Inspection and Testing Form."

3.03 CLOSEOUT

- A. Closeout Demonstration: Demonstrate proper operation of all functions to Owner.
 - 1. Be prepared to conduct any of the required tests.

2. Have at least one copy of operation and maintenance data, preliminary copy of project record drawings, input/output matrix, and operator instruction chart(s) available during demonstration.
 3. Have authorized technical representative of control unit manufacturer present during demonstration.
 4. Demonstration may be combined with inspection and testing required by authority having jurisdiction; notify authority having jurisdiction in time to schedule demonstration.
 5. Repeat demonstration until successful.
- B. Substantial Completion of the project cannot be achieved until inspection and testing is successful and:
1. Specified diagnostic period without malfunction has been completed.
 2. Approved operating and maintenance data has been delivered.
 3. Spare parts, extra materials, and tools have been delivered.
 4. All aspects of operation have been demonstrated to Owner.
 5. Final acceptance of the fire alarm system has been given by authorities having jurisdiction.
 6. Occupancy permit has been granted.
 7. Specified pre-closeout instruction is complete.

END OF SECTION